Executive Summary

This Corrective Action Plan (CAP) was prepared for the U.S. Army Corp of Engineers, Sacramento District, to address the former 850,000-gallon (gal) aboveground storage tank (AST-2) located on the Petroleum, Oil, and Lubricant (POL) Hill Outparcel at Hamilton Army Airfield (HAAF) in Novato, California.

This CAP presents the results of previous environmental investigations and characterizes environmental conditions at the POL Hill AST-2 Area. This information is used to identify the chemicals of concern, develop corrective action objectives, identify appropriate corrective action technologies, and develop corrective action alternatives. The CAP also recommends and justifies the preferred corrective action alternative that will take the site to regulatory closure.

The POL Hill Outparcel operated as the Base fuel-storage center from 1942 until prior to May 1986, when the storage tanks were removed. AST-2 stood on the hillside bench within the POL Hill Outparcel and supplied jet propellant fuel (i.e., jet-propellant 4 [JP-4]) for aircraft operations to the former tank-farm area by gravity feed through a pipeline. Discharges of unknown quantities of jet fuel over the years of operation have impacted the soil and groundwater beneath the former AST-2.

When the tank was removed in 1986, the soils containing petroleum hydrocarbons in excess of 1,000 milligrams per kilogram (mg/kg) on the AST-2 hillside bench area were excavated and replaced with clean backfill. In 1990, the pipeline that supplied the lower tank farm was removed. At this time, further soil removal (to 100 mg/kg) and replacement with clean fill was conducted (IT, 1991). These remedial activities addressed all the impacted soils that could be practically removed beneath AST-2.

During the tank and soil excavation activities, a rock outcrop, which surrounds the southern area immediately behind the former AST-2 location, had an area of visible staining. A composite sample of the rock outcrop was collected and analyzed. It was determined that the outcrop staining did not represent a significant environmental concern and that there were no associated assumed human health or ecological risks (IT, 1999).

The remedial investigation (RI) activities established that petroleum hydrocarbons were the sole chemicals of concern for the POL Hill AST-2 Area (IT, 1999). Groundwater samples were collected beneath the former POL Hill AST-2 Area in March 1994, February 1997, March/April 1998, June/July 1998, August/September 1998, January 1999, September 2001, February 2002, and August 2002 to characterize the environmental impacts. Among constituents detected in groundwater samples from the POL Hill AST-2 Area, only total petroleum hydrocarbon (TPH) concentration measured as gasoline (purgeable) and TPH measured as diesel (extractable) exceeded General Services Administration (GSA) Phase 1 residential cleanup goals (RCGs).

The results of the historical investigations indicate that petroleum-hydrocarbon contamination is present in groundwater within discontinuous bedrock fractures beneath the location of former AST-2, but that the extent of impact appears to be limited to the

vicinity of former AST-2 as shown on Figures 2-1 through 2-4. Monitoring well PL-MW-101, constructed immediately east of the former tank location, accounted for the maximum concentrations of TPH among the AST-2 area monitoring wells.

The highest concentration of TPH measured as diesel (9,800 µg/L) and TPH measured as gasoline (6,200 µg/L) was detected in groundwater samples from monitoring well PL-MW-101 during the February 2002 sample round. This well also exhibited the only benzene concentrations in the former POL Hill AST-2 Area; however, benzene was not detected in any samples collected after August 1992 . The detections of TPH measured as diesel and gasoline are consistent with the expected nature of the petroleum-hydrocarbon chemical constituents in this area, since AST-2 was known to be a JP-4 storage tank.

Analyses of groundwater samples from AST-2 Area wells between March 1994 and January 1999 have shown a consistent pattern of decrease in all wells except PL-MW-101. TPH concentrations in well PL-MW-101 have fluctuated somewhat during this period with concentration spikes observed in February 1997 and February 2002. Overall, these data still support the conclusion that the hydrocarbon-contaminated groundwater in bedrock is stable and shrinking. Other groundwater-monitoring results indicate that natural attenuation has been occurring at the site (IT, 1999; SOTA, 2002).

The results of previous environmental investigations and evaluation of remedial alternatives for the POL Hill AST-2 Area were presented in a meeting on May 2, 2001 between California Regional Water Quality Control Board (RWQCB) regulators and U.S. Army Corps of Engineers (USACE). It was decided at that meeting that monitored natural attenuation (MNA) was an appropriate remedial alternative for contaminated groundwater at the POL Hill AST-2 Area and that three semi-annual rounds of groundwater analysis would be collected to confirm the viability of MNA as the chosen remedial alternative.

Since that meeting, three additional rounds of groundwater sampling have been conducted between September 2001 and August 2002 in the AST-2 Area. The results of that groundwater sampling program are provided in Appendix I (SOTA, 2002) and summarized in Table 4-1 of this report. In general, the results support the argument that MNA is a viable remedial alternative for the site. The results of the recent sampling provide the basis for further discussions with regulators on the viability of MNA as the remedial option for this site and the implications for long-term monitoring and ultimate closure of this site.

An interim monitoring program is proposed for existing groundwater wells. This CAP also proposes a decision rationale for evaluating the ongoing groundwater-monitoring data to determine when the site is ready for closure. Basically, the site will be considered ready for closure once the interim groundwater-monitoring data indicate that residual petroleum-hydrocarbon contamination in groundwater has been reduced to levels below the RCGs and that rebound of the contaminant concentrations will not occur. The historical and interim groundwater-sampling data will then be integrated into a POL Hill AST-2 Area closure report for review and acceptance by regulatory authorities.