RESPONSE TO U.S. ENVIRONMENTAL PROTECTION AGENCY COMMENTS ON CAPTURE ZONE ANALYSIS AT WEST-SIDE AQUIFERS TREATMENT SYSTEM MOFFETT FEDERAL AIRFIELD, CALIFORNIA DATED MARCH 30, 2000

This document presents responses to U.S. Environmental Protection Agency (EPA) comments on capture zone maps presented in the May 1999 Draft Quarterly Report for Moffett Federal Airfield (MFA), dated October 4, 1999. Comments were received from Ms. Roberta Blank and Ms. Eugenia Chow in a letter dated March 30, 2000. EPA comments are presented in **bold** type; responses follow in regular type.

GENERAL COMMENT

Comment 1: **In evaluating the capture zones, it became evident to EPA that in order to draw groundwater contours and to define capture zones based on actual data rather than professional interpretation, additional groundwater monitoring locations are needed in the West-Side Aquifers Treatment System (WATS) area. For example, the closest well to assess the eastern edge of the capture zone around EA1-6 is located approximately 350 feet east of EA1-6.**

Since the groundwater contamination is the responsibility of multiple parties and since groundwater plumes have commingled, it is recommended that groundwater contour maps and estimated capture zones be based on actual data points, especially in the vicinity of the extraction wells, to produce defensible data which can be used in the evaluation of remedy effectiveness.

EPA is therefore, requesting that:

1. **The extent of a sufficient groundwater capture zone for each extraction well be determined;**

2. **Piezometers be installed near each extraction well and placed at a predetermined distance from the associated extraction well, so that the water levels measured in the piezometers indicate whether the capture zone has been achieved (that is, whether the groundwater flow gradient is from the piezometer toward the extraction well); and**

3. **A sufficient number of piezometers be installed near each extraction well to determine the lateral extent of the capture zone.**

Response: The ultimate success of the remedial action for the regional groundwater plume at MFA will be measured by chemical concentrations in groundwater, and not on the size or location of capture zones. Additional piezometers would serve the short-term purpose of more accurately evaluating capture zones. However, protracted negotiations involving the Navy, EPA, and the Middlefield-Ellis-Whisman (MEW) companies would likely be necessary to establish the size of a "sufficient" capture zone, the predetermined piezometer offset distances, and the

number of piezometers needed to demonstrate the lateral extent of each capture zone. Past, similar negotiations related to areas of responsibility and numbers and locations of groundwater extraction wells were both time-consuming and costly. In addition, significant expense would be involved in installing and monitoring these additional piezometers. Therefore, the Navy does not believe that the value added by these additional piezometers would justify the expense, especially considering the short-term nature of the benefit.

SPECIFIC COMMENTS

Comment 1: **Figure 18: The 4-foot contour is shown curving south of extraction well EA1-5 creating an approximately 400-foot area with a flat gradient. EPA's evaluation shows that only the 5-foot contour curves south of EA1-5 creating a more realistic representation of groundwater flow in the area.**

Response: As discussed during the February 17, 2000 meeting between the Navy and EPA, capture zone maps presented in the quarterly reports (including Figure 18, mentioned in this comment) represent the Navy's interpretation of the conditions at MFA. The Navy recognizes that alternative interpretations are possible, but the capture zone maps represent the Navy's interpretations and will not be modified.

Comment 2: **Figure 18: Since the groundwater level is essentially flat in the area between extraction wells EA1-6 and REG-6A, it appears appropriate to draw a combined groundwater capture zone for both wells.**

Response: Please refer to the response to specific comment 1.

Comment 3: **When EPA's estimated capture zones are compared to the extent of the trichloroethene (TCE) plume in the A1-aquifer zone (as presented in Figure 7 of the May 1999 Draft Quarterly Report dated October 4, 1999), it appears that several portions of the TCE plume are not captured by the current regional groundwater extraction system:**

a. TCE-contaminated groundwater with concentrations between 10 and 100 µg/L [micrograms per liter] underlying the area east of Hangar 1;

b. Contaminated groundwater underlying an approximately 30-foot-wide area starting north of extraction well EA1-1 and extending to the area between extraction wells EA1-4 and EA1-5; and

c. Contaminated groundwater underlying the area between the capture zones of extraction wells EA1-1 and EA1-2.

Please indicate what measures will be taken to address these areas.

Response: (a) Analytical results for samples collected in the area east of extraction well EA1-5 do not indicate that TCE contamination in groundwater east of Hangar 1 is migrating past well EA1-5. TCE concentrations in samples collected from well WU4-21, located approximately 250 feet east of well EA1-5, have been

measured at 1 µg/L (or not detected at 1 µg/L) in three samples collected since March 1999. Higher concentrations would be expected in samples from well WU4-21 if TCE concentrations ranging from 10 µg/L to 100 µg/L were not captured, but were instead migrating beyond extraction well EA1-5.

(b) All contaminated groundwater leaving the Navy's area of responsibility (roughly from east of Hangar 1 to McCord Avenue) is captured by extraction wells EA1-3, EA1-4, EA1-5, and EA1-6. More recent capture zone maps (presented in the August 1999 Draft Quarterly Report, dated December 30, 1999) do not show a gap between the capture zones of wells EA1-4 and EA1-5.

(c) All contaminated groundwater leaving the Navy's area of responsibility, including any groundwater between extraction wells EA1-1 and EA1-2, is captured by extraction wells EA1-3, EA1-4, EA1-5, and EA1-6.

Comment 4: **It appears inappropriate to draw capture zones around EA1-1, since no constant drawdown in the well has been achieved at this time. Please indicate the actions which will be performed to achieve the design flow rate or show that sufficient capture can be achieved with a lower flow rate.**

Response: The Navy is operating extraction well EA1-1 in a cycling mode to evaluate whether this type of operation will result in formation of an adequate capture zone around the well. Monitoring of nearby wells UST85-MW-02 and -03 is continuing to support this evaluation. The Navy will propose additional actions as necessary based on the results.