ORANGE COUNTY WATER DISTRICT

M60050.001107
MCAS EL TORO
SSIC # 5090.3

March 30, 1995

95 MAR 31 PM 3:42

William A. Dos Santos
Commander, CEC, U.S. Navy
Naval Facilities Engineering Command
1220 Pacific Highway, Room 135
San Diego, CA 92132-5187

Dear Commander Dos Santos:

Thank you for the opportunity to meet with you and your staff on March 22 to review and comment on the additional alternatives being considered by the Department of Navy (DON) for the MCAS El Toro OU-1 remedial program feasibility study. Although we understand that DON's evaluation of these alternatives is not complete, several issues arose during the discussion and afterward which we believe deserve special consideration at this time in order to avoid a potentially flawed analysis.

TDS Increase Impacts to Water Usage

The probable increase in TDS concentrations in existing or proposed extraction wells should be incorporated into the analysis of future water usage scenarios. Increased salinity could jeopardize the future use of the water (if not desalted) by The Irvine Company (TIC) for agriculture having a use limitation of 750 mg/L or by Irvine Ranch Water District (IRWD) in its reclaimed water system which has a TDS discharge limitation of 720 mg/L. TIC well 110 was shut down in 1989 due to TDS concentrations of over 1,400 mg/L, and well ET-1's continued operation is tentative because of its TDS concentrations of 1,000 mg/L. If left unchecked, OCWD staff believes it is only a matter of time before these salts invade the potential future DON well(s) in the Woodbridge area and the TIC and IRWD Culver Drive wells.

Given the expected 40+ year duration of TCE plume cleanup and probable increased salinity, how can DON give assurances that the Culver Drive wells and DON well(s) will continue to operate without salinity control?

TDS Increase Impacts to Reinjection

DON's analysis includes the possible reinjection of groundwater produced from potential future extraction well(s) in the Woodbridge area in the event that seasonal or long-term usage of the groundwater cannot be guaranteed. With the Woodbridge North Lake well (TDS approx. 800 mg/L) closest to the theoretical DON extraction well(s), it is unlikely that extracted water of this quality will be allowed to be injected downgradient of Culver Drive where TDS is generally less than 500 mg/L. Such injection would also hasten the salinity degradation at the Culver Drive wells.

OFFICE OF THE
GENERAL MANAGER

MAILING ADDRESS:
P.O. BOX 8300
FOUNTAIN VALLEY
CA 92728-8300

5500 ELLIS AVENUE
FOUNTAIN VALLEY
CA 92708

TELEPHONE (714) 378-3200
FAX (714) 378-3371

An upgradient injection alternative was also suggested in the vicinity of the 133 Freeway, but it seems that this would only steepen the hydraulic gradient and accelerate the movement of TCE, salts, and nitrates with potentially less ability to be controlled by downgradient wells. We also wish to point out that Santa Ana River Basin Plan water quality parameters in addition to TDS, such as sulfate and chloride, should be considered when evaluating ambient water quality impacts by discharges through injection.

Cleanup Duration

The independent DON alternative appears to include a relatively small amount of groundwater production from the deep aquifer. Even if the modeling runs indicate that this alternative maintains control of the TCE plume, it seems that a low extraction rate will result in a very long cleanup period. (We estimate that the plume encompasses approximately 150,000 acre-feet.)

As basin managers, we have an interest in a reasonably rapid cleanup of the VOC-affected area because:

1. IRWD's water supply master plan includes the development of a well field west of Culver Drive which could be hampered by an indefinite plume cleanup duration.

2. The local land owner, TIC, desires to remove the threat of reduced land values in order to continue to market its lands.

At this point, our observation of the proposal to simply add one or two extraction wells near North Lake, which might extract an additional 1,400 acre-feet per year at the toe of the 5-mg/L portion of the plume, is that it will provide an additional measure of plume control until the salinity issues negate both its value and the Culver Drive wells' value. The proposed DON well is functionally equivalent to relocating well ET-1, a plume control well, to a new location. This does not constitute an effective remediation program.

Injection Rates

OCWD has operated injection wells for over twenty years, and our experience has been that typical injection rates are, at best, one-third to one-half of the extraction rate in the same location. Injection wells in the vicinity of the 133 Freeway would probably be able to inject 200 to 300 gpm based on recently constructed Irvine Desalter production wells with flow rates ranging from 500 to 800 gpm. Given the need to reinject 2,000 gpm from a DON extraction well, at least seven ten injection wells may be required.

Because regular redevelopment of injection wells is essential in maintaining injection rates, it occurred to us that this could become a problem with the described injection scenario using shallow on-base wells for the following reason. Maximizing injection rates by using wells screened over a relatively thick vadose zone (as is the case at MCAS El Toro) is theoretically possible initially, but redeveloping well screens adjacent to unsaturated formation will be largely ineffective without the ability to extract development water. Therefore, we expect the medium- and long-term injection rates of these wells would be severely limited as a function of how effectively they can be redeveloped. Although we support the concept of a separate on-base shallow aquifer remediation system, we believe that substantially more than 30 shallow injection wells will be required to inject the same volume of water produced by 30 shallow extraction wells.

In closing, as trustees of the groundwater resources of north Orange County, we desire an effective remediation program. The residents of the area and the local property owners deserve more than a plume control program. Our meeting on March 22 and meetings in coming weeks should continue to promote open discussions on factors affecting any considered remedial alternatives. We look forward to our next meeting on April 20.

Sincerely,

William R. Mills Jr.

William R. Mills Jr., P.E.
General Manager

cc: Jerry Thibeault, Santa Ana RWQCB
Bob McVicker, IRWD
Greg Smith, Office of Congressman Dornan