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MCAS EL TORO
SSIC # 5090.3

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August 9, 1993

Mr. Andy Piszkin
Southwest Naval Facilities Engineering Command
1220 Pacific Highway
San Diego, CA 92132-5190

Subjects: 1) Comments to MCAS El Toro Draft RI Technical Memorandum
2) Request for Digital RI Data

Dear Mr. Piszkin:

Staff of the Orange County Water District (OCWD) have reviewed the Draft Technical Memorandum for the Phase I Remedial Investigation (RI) at Marine Corps Air Station (MCAS) El Toro. This letter presents our comments regarding the aforementioned document and additionally serves to formally request selected data presented therein in digital format.

Phase I RI Technical Memorandum Comments:

The comments presented herein address the key issues of hydrogeologic characterization and subsurface conceptual modeling of the base and surrounding vicinity, as they pertain to developing an effective groundwater contamination remediation strategy. Our comments do not generally address issues such as data collection methodology, QA/QC, risk assessment, and shallow (vadose zone) soil characterization as these areas fall outside OCWD's primary interests and/or are beyond the ability of staff resources to adequately review.

We understand that the purpose of the tech memo was to present data collected during the Phase I RI rather than final interpretations. However, we are concerned with the apparent lack of time allotted to data interpretation relative to the time spent on work plan

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preparation, meetings, data collection and compilation. Although we believe the tech memo was organized sufficiently and the data presented clearly in graphical and tabular format to allow review by the reader with little difficulty, the narrative sections regarding the regional and on-base hydrogeology (Operable Unit 1) indicated that additional effort is necessary to pull the data together into a cohesive conceptual framework. Following are specific comments:

1. Fig. 1-4: Use of the term "bedrock" in a geologic or hydrogeologic map does not follow standard practice and should be avoided if possible. A more descriptive term, such as "consolidated or semi-consolidated sedimentary rock" would be more definitive. The terms bedrock, consolidated sediments, and others are used interchangeably throughout the text, which leads to confusion. A suggestion for the final report is that each geologic unit (Fernando, Oso, Capistrano, etc.) and its grouping hydrogeologically (e.g. shallow aquifer, middle aquifer, non-water-bearing) be clearly defined up front in the report and used consistently thereafter.

2. Fig. 1-7, p. 1-41, p. 1-48: The terms "Los Angeles Basin", "Orange County Groundwater Basin", "Main Basin", "Tustin Basin groundwater system", and "Irvine Basin" are used inconsistently and without clear definition. For future reference, we suggest using the following description: The Irvine subbasin is generally considered as comprising the aquifer system bounded by the Costa Mesa (55) Freeway, San Joaquin Hills, and Santa Ana Mountains. As such, the entire study area falls within the Irvine subbasin. The Irvine subbasin is an extension of and is hydraulically connected to the Main Orange County Groundwater Basin (a.k.a. Main basin). The Irvine subbasin and Main basin underlie the Tustin Plain and Downey Plain (DWR, 1967), which are surficial physiographic features.

3. p. 1-48, 2nd paragraph; p. 3-5, 1st paragraph: If the Phase I RI data only indicate semiconfined aquifer conditions beneath the base, then what does this imply regarding downward percolation of surficial recharge at the base? The term "semiconfined" may infer a lack of ability of downward contaminant/groundwater flow through a semiconfining layer. Based on ample evidence of shallow groundwater contamination on base, shallow aquifers, particularly along the unlined wash channels, no doubt receive surficial recharge and are, therefore, not uniformly capped by impervious sediments.

4. Table 1-5 (p. 1-49): What is the purpose of attempting to correlate geologic and hydrogeologic formations between the Irvine subbasin and the Main basin? The tech memo quotes Banks (1984) as stating that correlating specific aquifer units is difficult. This appears to be beyond the scope of work required in the RI. The point to be made is that the aquifers in the Irvine subbasin are hydraulicly connected to aquifers in the Main basin. This table is confusing and should be revised or deleted.

5. p. 1-51, 2nd paragraph: This paragraph correctly states that vertical gradients measured in off-base multipoint wells indicate a downward flow potential from shallow aquifers to deeper ones, but it then proceeds to state, "A downward vertical gradient may occur for the same reason at the Station. However, limited past investigations at MCAS El Toro have failed to detect a vertical gradient in multiple-depth wells installed at the facility (JMM, 1990)." Why are the new Phase I RI multi-depth well data not mentioned here? Do these data agree with JMM's cluster well findings? Does this imply that pumping effects do not extend beneath the base, or that shallow piezometric levels on base are able to equilibrate with deeper piezometric levels due to a lack of continuous intervening aquitards?

   Determining the vertical flow potential between shallow and deeper aquifers on base is one of the more important issues of the RI. An entire section should be written on this subject in the future final RI report. Section 3 of the tech memo provides some insight of vertical piezometric level variations, but it fails to provide even an attempt at a conceptual model based on the data. Hydrographs of the multi-depth wells, shown on p. 3-69, are presented on different scales which can mislead the interpreter. The bottom screen (1A) at Well 18-BGMW01 appears to be in consolidated sediments from the Stiff diagrams and cross sections, and the remaining shallower screens show virtually the same piezometric elevations with little seasonal fluctuation. The magnitudes of seasonal piezometric variation in these wells must be compared to other multi-depth wells in the vicinity, particularly MCAS-3. Why do the piezometric fluctuations show such small amplitude as compared to MCAS-3? Do the aquifers (both shallow and deep) beneath the base respond less to seasonal pumping and recharge than aquifers further to the west?

   Unless a better understanding is developed of observed seasonal piezometric fluctuations at all aquifers and their vertical/lateral interrelationships, assumptions and results of the ongoing multilayer modeling exercise cannot be properly evaluated.

6. p. 1-52, 2nd paragraph: The sentence beginning, "The second facies, characteristic of groundwater lying between 200 and 450 feet deep. . ." should end in ". . . this zone is where VOC contamination has occurred <u>off base</u>." The on-base VOC contamination generally occurs in the shallow aquifers which may not necessarily be chemically correlated with the second facies off-base.

7. p. 1-52, last paragraph: Metropolitan Water District (MWD) should be replaced by Irvine Ranch Water District (IRWD).

8. Table 1-6 (p. 1-53): This table should include more recent gradient data reported by OCWD in its 1989 and 1990 reports.

9. Table 1-7 (p. 1-55): OCWD (1990) presented additional aquifer test results which should be included in this table. Also, the reference to Banks (1984) implies that Banks is the source of the data for the whole table, including data more recent than 1984.

10. p. 3-2, last paragraph: The paragraph states, "Because of the discontinuous nature of the deposits, it is not possible to discern the discrete widespread aquifer units beneath MCAS El Toro. Hydrogeologic data suggests that vertical hydraulic communication exists beneath the units. Groundwater was typically found to be semi confined beneath the uppermost permeable saturated unit encountered during drilling, with confinement increasing with depth." The first two sentences may be true, but no supporting data and interpretations have been presented in the tech memo to support these statements. Only one "deep" geologic cross section was drawn through the base itself using all available data (lithology, geophysical logs, Stiff diagrams, etc.). Numerous cross sections or fence diagrams transecting all portions of the base through the entire active flow system should be prepared to support such statements.

11. p. 3-19, 3rd paragraph: The "regional groundwater gradient" described presumably refers to the shallow on-base aquifer, which may or may not be readily connected/correlated to the regional main aquifer groundwater gradient maps prepared by OCWD.

12. p. 3-19, 4th paragraph: The statement: "These maps suggest that the uppermost aquifer is not affected by pumping of deeper hydrogeologic units." contradicts other tech memo statements such as "vertical hydraulic communication exists among the units, and that the unconsolidated sediments form a single heterogeneous aquifer" and "a generally downward vertical gradient in the uppermost saturated zones . . . most likely in response to deep pumping of irrigation wells that lie west of the station"(p. 8-5).

    As the pumping effects of deeper wells on shallow aquifers is an extremely important issue directly relating to remedial extraction alternatives, such statements must be supported by a preponderance of the data and not one map comparison. In addition, one must define "affected". Does this mean that shallow water levels are not obviously drawn down, or that groundwater cannot flow vertically downward through an aquitard due to increased stresses induced by pumping? The distinction between these two possible scenarios could make or break the rationale behind recommending an on-base shallow VOC extraction system (or developing a complex 3-D flow model on which such recommendations will be based).

The conclusion drawn by OCWD staff from these apparent inconsistencies and contradictions is that there is no current understanding of, nor has there been adequate time spent to understand, the relationship of shallow and deeper aquifers on base, hence OCWD's stated position against attempting to model such an undefined relationship.

13. It is apparent, after reviewing Bechtel's comments (letter to Mr. John Hamill, dated July 2, 1993) to the tech memo that their scientists had similar concerns as those stated above. However, one Bechtel comment (pp. 7-8) regarding the use of submersible pumps to collect VOC samples drew some additional interest. We disagree with a blanket statement that submersible pumps are not suitable for VOC sampling. Studies by Hargis+Associates and Blasland, Bouck & Lee concluded that this method is reliable in obtaining statistically equivalent concentrations as compared to bailers and bladder pumps. OCWD's experience, and that of another consultant (Seacor) at an Anaheim VOC investigation, in comparing bailer vs. pumped samples, has shown equivalent or higher VOC concentrations derived from the pumped sample.

    One way to address this issue, which is what Hargis has done at other Superfund sites, is to do a site-specific comparison of various methods at a selected number of wells. If no unreasonable variation (considering the overall objectives of the project) in concentration is found between the various methods, then the continued use of submersible pumps could be validated.

    Regarding whether the submersible pumps "heat" the water samples, we find this difficult to believe, given the extremely short period of pump motor contact time with the water. In addition, the "high" temperatures of 25 to 28+ degrees C reported in the tech memo <u>are representative</u> of water temperatures measured by OCWD in the off-base multi-point monitoring wells (Westbay). In-situ measured temperatures ranged between 22.5 degrees C (45' deep at MCAS-2) to 28.9 degrees C (494' deep at MCAS-3). Temperatures as high as 38 degrees C occur at depths of 1,100 feet (in consolidated sediments) at off-base well MCAS-7.

<u>Request for Digital RI Data</u>:

In the interests of the El Toro RI/FS, OCWD continues to provide the Navy's consultant, CH2M Hill, with a large amount of time-series water level and water quality data, geographic coverages (groundwater contours, well locations, geology), boring logs, electric logs, aquifer test data, and well construction information both in digital and hardcopy format. In addition, we will forward a copy of the Irvine Desalter production well report to you when completed in September.

In order for OCWD to continue its basin analysis and management programs using the valuable data collected during the RI, and to stay current with our periodic presentations of RI findings, we request your authorization to allow CH2M Hill to provide OCWD with requested RI data in digital format. At this time, the most useful (and easily transferable) data to incorporate into our computer system are the various water level contour maps, chemical concentration contour maps, and well location coordinates (Arc/Info coverages). With your permission, OCWD staff will contact the appropriate CH2M Hill staff to determine which additional data would be easily converted by OCWD into a system-compatible format.

I trust these comments will be useful in the Navy's efforts to prepare for the Phase II RI and final RI and FS reports, especially with regards to Operable Unit 1. Your assistance in authorizing the digital data transfer between CH2M Hill and OCWD will also be appreciated. As always, I would be happy to discuss any of the above comments with you and the "RPM group".

Sincerely,

Roy L. Herndon
Manager, Hydrogeology Department

cc: John Broderick, Santa Ana RWQCB
John Hamill, EPA Region IX
Joe Zarnoch, Dept. Toxic Substances Control, Long Beach
John Dolegowski, CH2M Hill