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John Scandura
CalEPA, Department of Toxic Substances Control
Office of Military Affairs
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Daniel A. Meer
U.S. Environmental Protection Agency
Region IX SFD-8-2
75 Hawthorne St.
San Francisco, CA 94105

Gerald Thibeault
Santa Ana Regional Water Quality Control Board
3737 Main St., Suite 500
Riverside, CA 92501-3339

RE: Final ROD for Sites 2 & 17 at MCAS El Toro

Dear Mr. Scandura, Mr. Meera, and Mr. Thibeault:

I am writing on behalf of the City of Irvine regarding the Final Record of Decision (ROD) for Sites 2 & 17 at MCAS El Toro. The City of Irvine is concerned that there are data indicating possible anthropogenic sources of uranium in groundwater and stormwater and that this poses a significant threat to health. We ask that there be further analysis of the data to determine its origin, that the sources of any anthropogenic uranium be identified and remediation strategies be evaluated, and that the issue be addressed in the ROD.

The most important toxic effect of uranium is damage to the kidneys, resulting in functional loss and ultimately, renal failure, although it also affects liver function and

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muscle tissue, and the nervous system.¹ The MCL (maximum contaminant level) of 20 pCi/L is set to avoid these impacts. In addition, radioactive exposures may occur at sufficiently high levels of uranium contamination whether through ingestion or inhalation (exposure through aerosols while showering) with resulting increases in risk of cancer.

Our specific concern is associated with the October 1999 sampling and analysis data presented in Tables 3-1 and 4-1 of the *Draft Technical Memorandum, Evaluation of Radionuclides in Groundwater at Former Landfill Sites and the EOD Range, MCAS El Toro*, prepared by EARTH TECH, Inc., March 2000. The sampling shows that there are four locations where total uranium was above the MCL ranging from 23.93 pCi/L to 45.82 pCi/L.

Although the EARTH TECH asserts that the "isotopic ratio of uranium [U^{238}/U^{235}] detected in the groundwater is consistent (within measurement error) with the published isotopic ratio of naturally occurring uranium," the data in the report suggest otherwise.

The naturally occurring ratio of U^{238}/U^{235} as weight percentages is approximately 99.289/0.711 (a ratio of approximately 138). Uranium altered to increase the concentration of the isotope U^{235} (e.g., to create reactor fuel or weapons) is considered enriched. Concentrations less than 20 percent and higher than 0.7 percent (ratios between 138 and 4) are considered low enriched. Fifteen of the seventeen samples given in Table 3-1 show U^{238}/U^{235} weight percentage ratios of less than 138 (with a low 67). This suggests that the groundwater may be contaminated with this low enriched uranium.

To the best of our knowledge, the data presented in the *Draft Technical Memorandum* or additional data presented in the Navy's Response to Comments (Table 1) regarding the Working Draft Final ROD for Sites 2 & 17 have not reviewed by your agencies or received comment from the public. Thus, it is premature to base policy on the conclusions of the report.

It is critical to conduct further analysis to verify if the uranium ratios are from an anthropogenic source. The potential health risks are significant and, if present, require that the uranium sources be addressed in the ROD for Sites 2 and 17.

Please do not hesitate to contact me with any questions you may have.

Sincerely,



Michael S. Brown, Ph.D.

Cc: Allison Hart, City Manager, City of Irvine
Dan Jung, Executive Assistant, City of Irvine
Peter Hersh, Assistant to the City Manager, City of Irvine

¹ Stephen McGuire, "Chemical Toxicity of Uranium Hexafluoride Compared to Radioactivity Toxicity," NUREG-1391, 1988.