



California Regional Water Quality Control Board

Central Valley Region



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WELL DESTRUCTION PERMIT DOCUMENTATION, INACTIVE WATER SUPPLY WELL AT BUILDING 151, NATIONAL AERONAUTICS AND SPACE ADMINISTRATION (NASA) CROWS LANDING FLIGHT FACILITY, ADMINISTRATION PLUME AT INSTALLATION RESTORATION PROGRAM (IRP) SITE 17, CROWS LANDING, CALIFORNIA

We have reviewed the *Well Destruction Permit Documentation, Inactive Water Supply Well at Building 151, National Aeronautics and Space Administration (NASA) Crows Landing Flight Facility, Administration Plume at Installation Restoration Program (IRP) Site 17, Crows Landing, California* (Documentation), received 22 December 2000. The documentation modifies the Navy's Work Plan (*Soil Vapor Extraction Optimization for the Remediation of UST Cluster 1 and Site Verification Activities at Various Sites Work Plans*) for abandoning this water supply well (well), located inside of Building 151. The commingled petroleum hydrocarbon plume and volatile organic compounds (VOCs) plume now encompasses an area over 40 acres, and has spread to within 500 feet of the eastern boundary of the facility. This water supply well is located near a boundary for that plume.

This 12-inch diameter well has an estimated well depth of 440 feet (sounded), although the casing may have collapsed at that depth. Drilling logs do not exist for this well. The Corcoran Clay, which separates the lower aquifer and upper aquifer, has been logged in nearby wells at approximately 220 feet below ground surface (bgs). The Navy attempted to video log the entire well, but heavy incrustation on the well casing and floating material foiled attempts to locate the perforations in, and condition of, the casing. A split seam was logged at 18 feet bgs, above the water table located at 67 feet bgs. The well provides a potential pathway for contaminant transport from the upper aquifer into the lower aquifer.

Groundwater was sampled in the well at 175 feet bgs and 400 feet bgs. Analytical results revealed the following:

- Chloroform at 0.9 ug/L (below the 1.1 ug/L, Cal/EPA Potency Factor as a Drinking Water Level) from 175 feet bgs,
- Hexavalent chromium at 17 ug/L (above the 0.2 ug/L, California Public Health Goal in Drinking Water) from 400 feet bgs,
- Diesel range organics at 60 ug/L (175 feet bgs) and 70 ug/L (400 feet bgs), and
- Motor oil range organics at 50 ug/L at 400 feet bgs.

General Comments

1. We are concerned that the Navy proposes to perforate the entire well from 100 to 400 feet bgs. The video noted a split seam in the well casing at 18 feet bgs (page 2, number 2). There exists a high potential that the over 50-year old casing may collapse in a zone of flowing sands, which would fill the well without adequately sealing the upper aquifer from the lower aquifer. Provide a contingency plan for the worst-case scenario of the well filled with flowing sands.

2. The Navy supplied the well logs from several nearby wells with the package. While these logs will provide a general idea of the lithology and stratigraphy for the area, the logs cannot provide the precise location of the casing perforations, clay lenses and zones of high permeability. Since well logs are not available for the well, videoing of the well proved unsuccessful, and the Navy does not want to brush the casing due to questionable casing integrity and cross-contamination issues, we suggest that the Navy consider using downhole geophysical methods to identify these features. Geophysical methods available include:

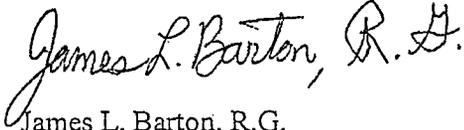
- Dual density gamma-gamma and gamma (clays),
- Neutron (porosity),
- Four Arm Independent Caliper Logs (perforations),
- Deviation/Directional Log (plumbness), and
- Spinner Log (vertical velocity flow between perforated zones).

Specific Comments

1. On page two, number three; the text states that explosives will be used to perforate the entire well from 100-400 feet bgs. We are concerned that residual explosives may be left in the aquifer after detonation, and that there is not an adequate description of the process. Other concerns are stated in general comment 1. Provide a detailed description of the proposed activity, including rationale for the intervals and locations for explosive charges, safeguards to prevent the collapse of the well while grouting, grout pressures and volumes estimates, estimates of residual explosives left in the various formations, and contingency plans to ensure the protection of the aquifer's water quality.

2. On page two, number four; the text states that standing groundwater, both above and below the Corcoran Clay, will be sampled prior to abandoning the well, for the purpose of waste characterization. The Navy proposes to release the purged water directly into a drainage ditch while grouting the well. The groundwater sampling activity was conducted on November 15, 2000. Results of the sampling revealed that carbon tetrachloride (CT) was not detected at a practical quantitation limit (PQL) equal to the maximum contaminant level (MCL) of 0.5 ug/L at either 175 or 400 feet bgs in the well. The CT PQL is above the California Public Health Goal (PHG) of 0.1 ug/L. The detected level of Cr⁺⁶ (17 ug/L) exceeds the PHG of 0.2 ug/L. Acetone, ethylene dibromide, methyl ethyl ketone, and methyl isobutyl ketone were not reported, although they are the newest contaminants of concern in the groundwater plume. In addition, the volume of water in the well currently exceeds 8740 gallons. Therefore, we do not concur with the Navy's proposal to discharge the water directly into the drainage channel. We suggest that the Navy pump the water into a tank and then characterize the waste prior to disposal.

If you have any questions please contact me at (916) 255-3050 or bartonj@rb5s.swrcb.ca.gov.



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