



DEPARTMENT OF THE NAVY
SOUTHWEST DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
1220 PACIFIC HIGHWAY
SAN DIEGO, CA 92132-5190

N00217.000447
HUNTERS POINT
SSIC NO. 5090.3

5090
Ser 06CH.RM/0530
June 11, 2001

Mr. Brad Job
Regional Water Quality Control Board
San Francisco Bay Region
1515 Clay Street, Suite 1400
Oakland, CA 94612

Dear Mr. Job:

The A-aquifer groundwater beneath Hunters Point Shipyard (HPS) is not of sufficient quality to be used as a potential drinking water source pursuant to State Water Resources Control Board (SWRCB) Sources of Drinking Water Policy Resolution 88-63 (SWRCB Resolution 88-63) and California Regional Water Quality Control Board San Francisco Bay Region (RWQCB) Resolution 89-39. The purpose of this letter is to request concurrence from the RWQCB that A-aquifer groundwater beneath HPS meets the exemption criteria for SWRCB Resolution 88-63.

The Navy is currently conducting environmental investigations and cleanup as part of the Installation Restoration Program prior to transfer of HPS, which was closed in 1974. Cleanup levels for shallow groundwater must consider drinking water standards if groundwater beneath HPS has a municipal and domestic water supply beneficial use designation. To avoid consideration of groundwater cleanup to drinking water standards, which would be unnecessary and inappropriate, the Navy is requesting that the RWQCB concur with the Navy's finding that A-aquifer groundwater beneath HPS is not a potential drinking water source pursuant to SWRCB Resolution 88-63 and RWQCB Resolution 89-39.

The Navy finds that A-aquifer groundwater beneath HPS is not suitable as a drinking water source and meets the exemption criteria in SWRCB Resolution 88-63 and RWQCB Resolution 89-39 because:

- Water quality does not meet TDS criteria
- The artificial fill forming Hunters Point Shipyard is not an aquifer
- There is no historic or planned future use of groundwater at HPS
- Well construction requirements prohibit water supply wells
- The shallow water-bearing zone is susceptible to contamination
- Pumping would cause saltwater intrusion and land subsidence

The Navy has found that groundwater does not meet the criteria for a municipal and domestic water supply at the Navy Fleet and Industrial Supply Center Oakland (FISCO) and the Alameda Annex in Oakland, California, and Naval Station Treasure Island, San Francisco, California, based on the hydrogeologic conditions and other limiting factors. The RWQCB has written letters of concurrence that groundwater meets the exemption criteria in the SWRCB Resolution 88-63 for FISCO, the Alameda Annex, and Naval

Station Treasure Island. The overall hydrogeologic conditions (artificial fill within San Francisco Bay) and groundwater quality at these facilities are similar to conditions at HPS. The following discussion describes the groundwater conditions at HPS and the factors limiting the use of shallow groundwater at HPS.

GEOLOGY AND HYDROGEOLOGY

The peninsula forming HPS is within a northwest-trending belt of the Franciscan Complex bedrock known as the Hunters Point Shear zone. Six geologic units underlie HPS, five unconsolidated sedimentary deposits of Quaternary age and the Jurassic-Cretaceous-age Franciscan Complex bedrock. In general, the stratigraphic sequence of these geologic units, from youngest (shallowest) to oldest (deepest), is as follows: Artificial Fill, Slope Debris and Ravine Fill, Undifferentiated Upper Sand Deposits, Bay Mud Deposits, Undifferentiated Sedimentary Deposits, and the San Francisco Complex.

Three water-bearing units underlie the site. The first water-bearing zone is referred to as the A-aquifer. The A-aquifer consists of artificial fill material, slope debris, and undifferentiated upper sand deposits. The A-aquifer was primarily created by removing soil from upland areas at HPS and depositing the soil in the bay. The top of the A-aquifer water table ranges from 2 to 17 feet below ground surface (bgs) and the thickness ranges from approximately 2 to 50 feet. Although, groundwater flow is locally complex, groundwater in the A-aquifer generally flows toward the Bay, except where reversed due to the influence of Pump Station A and in the tidal influence zone along the shoreline. The A-aquifer is separated from the second water-bearing zone, referred to as the B-aquifer, by the Bay Mud in most locations across the site. The B-aquifer consists of undifferentiated sedimentary deposits underlying the Bay Mud and overlying the bedrock. In some areas, the A-aquifer directly overlies the bedrock water-bearing zone. The bedrock water-bearing zone is present in the upper weathered portions of the Franciscan Complex Bedrock. Groundwater in the bedrock occurs in discrete fractures.

The A-aquifer at Hunters Point is essentially man-made. Of the 493 acres of land surface at HPS, approximately 400 acres were created by infilling the bay with upland sediments. Artificial fill should not be considered an aquifer. An aquifer is best defined as "a saturated permeable geologic unit that can transmit significant quantities of water under ordinary hydraulic gradients" (Freeze and Cherry 1979). Groundwater recharge at Hunters Point Shipyard occurs through infiltration of precipitation in the unpaved areas and piping system leakage from storm drains, potable water lines and sanitary sewer lines.

GROUNDWATER QUANTITY AND QUALITY

Under the SWRCB Resolution 88-63, all groundwater and surface waters in the state should be considered a potential source of drinking water except where:

1. The total dissolved solids (TDS) exceed 3,000 mg/L and (emphasis added) it is not reasonably expected by Regional Boards to supply a public water system, or
2. There is contamination, either by natural processes or by human activity (unrelated to a specific pollution incident), that cannot reasonably be treated for domestic use using either best management practices or best economically achievable treatment practices, or
3. The water source does not provide sufficient water to supply a single well capable of producing an average, sustained yield of 200 gallons per day.

Average TDS concentrations across the base were consistently greater than the 3,000 mg/L standard cited in SWRCB Resolution 88-63. During the 2001 sampling event, TDS concentrations were collected from 205 A-aquifer wells at Parcels C, D, and E. The average TDS concentration for these wells is 6,743 mg/L. The average TDS concentration for all samples collected at A-aquifer wells from 1990 - 2001 is 8,989 mg/L. Based on these average TDS values, it is clear that the average A-aquifer TDS concentration at Hunters Point Shipyard is well above the RWQCB standard of 3,000 mg/L.

HISTORIC, CURRENT, AND POTENTIAL FUTURE GROUNDWATER USE

There are no groundwater supply wells and no record of historic groundwater use at Hunters Point Shipyard. The only groundwater wells at Hunters Point Shipyard are monitoring wells for CERCLA activities. These monitoring wells cannot be used for water supply because the wells do not meet state well construction standards for water supply wells. Groundwater at Hunters Point Shipyard has not been used historically and is not currently used for any purposes. One water supply system currently serves Hunters Point Shipyard. The water supply is provided by the San Francisco Water Department.

WELL CONSTRUCTION REQUIREMENTS

The California Department of Water Resources (DWR) has developed standard well construction requirements for annular surface seals to prevent contamination of water supply wells by chemicals and biologic hazards related to point and non-point sources. The minimum depth bgs to which an annular seal must extend is 50 feet for community and industrial water supply wells and 20 feet for individual domestic, agricultural, and other types of water supply wells. Assuming a 10-foot long screen, an individual domestic well would be installed to a minimum depth of 30 feet bgs. To meet these requirements, several domestic wells would have to be installed within the Bay mud unit or the B-aquifer because the A-aquifer is oftentimes too thin to support a 30-foot seal. Furthermore, assuming a minimum depth of 60 feet bgs for community and industrial supply wells, nearly all of these wells would be installed in the Bay mud or B-aquifer.

Currently, the city prohibits the installation of domestic use wells. This City prohibition indicates a low potential for groundwater at HPS to be used as a drinking water source.

POTENTIAL CONTAMINATION OF SHALLOW WATER-BEARING ZONE

The shallow-water-bearing zone at Hunters Point Shipyard is typically around 10 feet bgs and is vulnerable to contamination from surface and near surface sources. Infiltration of chemicals from surface spills, stormwater runoff from roadways or other impervious surfaces, sanitary sewer line leaks, and application of fertilizers, pesticides, and herbicides in lawns and other planter areas could cause degradation of the A-aquifer at HPS.

To protect groundwater that has a potential beneficial use from being degraded by contaminant migration from adjacent areas, the DWR well ordinance requires that single domestic use wells be situated a minimum of 50 feet from a potential source of contamination. According to DWR, subsurface utility lines (including storm drain and sanitary sewer lines) may act as potential conduits of contamination to shallow water-bearing units located in artificial fill. Due to the large number of pipelines at HPS, the vulnerability to surface and near surface contamination makes it impractical to use the shallow groundwater at HPS as a potential drinking water source.

SALTWATER INTRUSION AND LAND SUBSIDENCE

HPS is adjacent to and juts into the San Francisco Bay. Prior to the creation of land at HPS, most of HPS was the Bay. HPS is adjacent to and underlain by saltwater. Pumping of shallow groundwater from the artificial fill would induce further saltwater intrusion. Prolonged pumping of the shallow groundwater at HPS would result in dewatering and compaction of the shallow sediments, which would result in land subsidence. Compaction would increase the potential for differential settlement of the soils and could lead to possible damage to overlying structures.

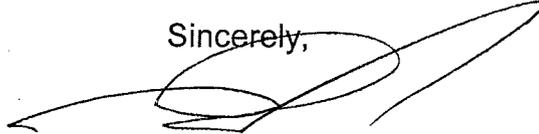
CONCLUSIONS AND RECOMMENDATIONS

The A-aquifer groundwater at HPS is not of sufficient quality and nature to be a potential drinking water source pursuant to SWRCB Resolution 88-63. The artificial fill forming HPS is not an aquifer. There is no historic or current use of groundwater at HPS, and potential future use of groundwater at HPS for a drinking water supply is limited by State of California well construction requirements, potential contamination of the shallow water-bearing zone, saltwater intrusion, and land subsidence. The Navy requests that the RWQCB provide written concurrence that A-aquifer groundwater at HPS meets the exemption criteria for SWRCB Resolution 88-63.

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Should you have any questions concerning this matter, please contact me at (619) 532-0913.

Sincerely,



RICHARD G. MACH JR., P.E.
BRAC Environmental Coordinator
By direction of the Commander

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