

DEPARTMENT OF TOXIC SUBSTANCES CONTROL

700 HEINZ AVENUE, SUITE 200
BERKELEY, CALIFORNIA 94710

N00217.002496
HUNTERS POINT
SSIC NO. 5090.3



(510) 540-3724

January 17, 1992

Commanding Officer
Attn: Mr. Eddie Sarmiento
Naval Station Treasure Island
Building 1 (Code 84)
San Francisco, California 94130-5000

Dear Mr. Sarmiento:

**HUNTERS POINT ANNEX - COMMENTS ON THE "DRAFT PHASE 1 AQUIFER
TESTING RESULTS/RECOMMENDATIONS FOR PHASE II"**

The Department has reviewed the "Draft Phase 1 Aquifer Testing Results/Recommendations for Phase II" report for the Hunters Point Annex. The enclosed comments (Enclosure A) incorporate comments from the Department's Technical Services Support Branch. For the record, the Department received and logged this document on December 9, 1991. Pursuant to Section 21.1 of the Federal Facility Agreement the "time limitation shall commence upon receipt" of the document. Therefore, given the 45 day review period, these comments are due on or before January 23, 1992. I can be reached at (510) 540-3816 if you have any questions.

Sincerely,

A handwritten signature in cursive script that reads "Bonnie Arthur".

Bonnie Arthur
Associate Hazardous Materials
Specialist
Site Mitigation Branch
Region 2

Enclosure

cc: Ms. Louise T. Lew (Code 1811)
Naval Facilities Engineering Command
900 Commodore Drive
San Bruno, California 94066-0720

Mr. Eddie Sarmiento
January 17, 1992
Page Two

Ms. Roberta Blank (H-7-5)
Remediation Project Manager
U.S. Environmental Protection Agency
Region IX
75 Hawthorne Street
San Francisco, California 94105

Ms. Barbara Smith
Regional Water Quality Control Board
2101 Webster Street, Suite 500
Oakland, California 94612

Enclosure A

General

- 1) The Quality Assurance/Quality Control (QA/QC) utilized in the gathering, processing and evaluation of data shall be included in the draft final report.
- 2) Include all data used to support the results from the slug testing in the draft final report. This will allow the Department to perform an independent analysis of the slug testing results.
- 3) There is a lack of consistency throughout the report between methods of data analysis and evaluation.
- 4) The objectives of the pump tests should be more clearly defined. Utilize contour maps and other information gathered from the slug testing to determine which wells to use for the pump tests. For each pump test, make a preliminary determination of the analysis which would best evaluate the aquifer conditions. Careful evaluation of site conditions which would affect the pump tests must be incorporated into the planning process.
- 5) The data derived from the slug testing may have to be reassessed based on specific comments given below.

Specific Comments

1. Page 2: Slug testing was apparently performed prior to the distribution of a workplan and QA/QC standards. Therefore, please provide the documentation to address these issues:
 - ◆ Were the slug tests coordinated with the tidal fluctuations at the Site? This is important as rises in water levels in some wells may change the aquifer conditions from unconfined to semiconfined to confined, thus altering the data curves from the wells. Evaluating tidal influence information is also important while planning pump tests to determine which areas will be affected by tidal influx.
 - ◆ How and how often was equipment checked? If the tests were conducted with potentially uncalibrated equipment, the accuracy of the tests might be in question.
 - ◆ What steps were implemented to ensure that the eighty-nine slug tests were conducted in a consistent manner?
 - ◆ What level of precision was applied to data analysis?

- 2) Page 5, last paragraph; page 6, last paragraph: The report states that data was analyzed using AQTESOLV, which is a program which uses both the Bouwer and Rice, and Cooper methods for solving slug tests. The use of the Cooper method is probably inappropriate. Even though the tests were short term, the Cooper method is not valid for unconfined aquifers. If certain conditions are met, the Cooper method can be used for semiconfined aquifers. However, these conditions are neither specified nor are they defined in the report.

Since the degree of confinement varies, depending on tidal height and location of the wells, the degree of accuracy from the Cooper analysis varies. Similar materials show up to six orders of magnitude difference in permeability using the Cooper method. Additionally, up to one-third of the data curves provided questionable matches.

The Department would like to conduct an independent analysis of the results. To facilitate this process, please provide the following information in the draft final report: the volume of the slug, the aquifer parameters at the wells and the value of the alpha curve, beta and the corresponding matching point.

Recommendation: Evaluate the Cooper method results to determine the degree of confinement of the wells which the tests were performed upon. Using the wells for which the Cooper method is determined to be valid, draw a permeability contour map.

- 3) The Bouwer and Rice method should have been the primary analysis upon which the conclusions and recommendations were based upon. This method can be applied for unconfined, semiconfined and confined aquifer conditions and doesn't require curve matching techniques. Hence, the method does not contain the inherent errors of curve matching. Consequently, the method is more statistically precise for the Site's conditions. Note that the Bouwer and Rice method yielded permeabilities which varied one to two orders of magnitude less than those from the Cooper analysis.

One problem with the Bouwer and Rice analysis presented in the report is the inconsistent use of the data curves as described below:

The data curves from several of the slug tests had a double straight line, while others used the first straight line (which generally reflects the characteristics of the filter pack) or the second straight line (which generally reflects the characteristics of the undeveloped aquifer). For example, the slug tests from IR06MW23A and IR05MW77A show very similar plots of displacement vs. time and both show a double straight line. In determining K for MW23A, the first straight line was used. In MW77A, the second straight line was used. Consequently, K for MW23A was calculated to be four times that of MW77A. This would appear to be unlikely since MW77A had recovered to 90% by five and a half minutes, while MW23A still had not recovered to 90% by ten minutes.

Recommendation: Establish a criteria for determining when to use the first straight line vs. the second straight line for the Bouwer and Rice method of analysis. Reevaluate the slug test results using this criteria. Draw a permeability contour map using this new information.

- 4) Section 4: Recommendations for Phase II Aquifer Testing: To further utilize the large volume of slug testing data, the Department recommends that further analysis is performed. Contour maps showing apparent permeabilities can be drawn to indicate where areas of relatively high and low permeabilities are located. These contour maps could also show where filled stream channels and preferential flow zones are located. By superimposing the monitoring well locations over this contour maps, the wells which would show the best response to a pump test can be identified. Areas where additional wells are needed can also be identified.