

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION
111 MCKINSON STREET, ROOM 6040
OAKLAND 94607

Phone: Area Code 415
464-1255



July 17, 1986

File No. 2189.8009 (TJB)

Commanding Officer
Moffett Field Naval Air Station
Moffett Field, CA 94035

SUBJECT: IDENTIFICATION, LOCATION, EVALUATION, AND DESTRUCTION OF POTENTIAL
DEEP WELL CONDUITS - MOFFETT FIELD NAVAL AIR STATION

Dear Commander:

This letter is written regarding the need for the Navy to investigate private and public wells located on and in the vicinity of Moffett field which may be potential conduits for pollution to migrate from shallow aquifers to deep aquifers.

As a result of investigations in the City of Mountain View where pollution has been found in deep aquifers below 200 feet, we are concerned, to a much greater degree, about the potential of private or public wells to serve as vertical conduits of pollution. In my May 23, 1986 letter to the Western Division, Naval Facilities Engineering Command, I requested that the proposed investigation of private wells proceed ahead of the other tasks contained in your Step II Confirmation Study work plan.

On July 10, 1986, Tom Berkins of my staff and myself met with members of your staff to discuss the Step II work plan and the potential conduit investigation. During that meeting we expressed our concern with the need to conduct a more thorough and timely investigation, beyond the work conducted during the previous step of investigation at Moffett Field, to identify, locate, and evaluate any private wells in the vicinity of Moffett Field. The fact that volatile organic chemical pollution has been detected in Moffett's monitoring well W3-1C at a depth of approximately 250 feet underscores the need to conduct a more thorough investigation.

During the July 10, 1986 meeting we distributed copies of the enclosed Regional Board staff guidelines for investigating potential deep well conduits to members of your staff and your consultant. We briefly summarized the contents of the guidelines and informed your staff that we are requiring a number of sites in the South Bay to submit a proposal within 30 days to investigate wells as potential conduits, adapting the approach described in the enclosed memo to fit the characteristics of that particular site.

At that time your staff expressed concern over the Navy's inability to submit a proposal within the 30 day time frame due to contractual and procurement procedures and suggested that it may take up to three months or more to submit a proposal. It is unacceptable to us to wait three months

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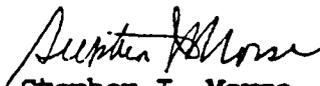
July 17, 1986

for such a critical investigation proposal to be submitted. Therefore, pursuant to Section 13267(b) of the California Water Code, you are requested to submit a technical report by August 22, 1986, outlining the scope of the investigation to be conducted to identify, locate, evaluate, and destroy any potential deep well conduits. The report should also contain a time schedule for conducting the investigation. Failure to submit the report by this date may result in penalties as described in Section 13268 of the California Water Code.

Based on comments from your staff, we are concerned with the ability of the Navy to submit a proposal within the specified time frame. Thus, we request a letter by August 1, 1986 indicating your ability to meet the August 22, 1986 technical report submittal date.

We appreciate your cooperation in this matter. We are available to meet with you and your staff prior to the August 22, 1986 submittal date to discuss this issue if you so desire. If you have any questions or comments regarding this letter, please contact Tom Berkins of my staff at (415) 464-1249.

Sincerely,


Stephen I. Morse, Chief
South Bay Toxics Division

Enclosure: Potential Conduits Guidelines

cc: Craig Von Bargaen, Camp Dresser & McKee
✓ Alex Dong, Western Div., NAVFACENGCOM
Lee Esquibel, Santa Clara County Health Dept.
Michael Evans, Kennedy/Jenks/Chilton
Thomas Frutchey, City of Mountain View
Cmdr. Guild, Western Div., NAVFACENGCOM
Howard Hatayama, DOHS/Toxics Division
Ensign Hawkins, Public Works Office, Moffett Field
Tom Iwamura, Santa Clara Valley Water Dist.
Glenn Kistner, EPA Region 9
Louise Lew, Western Div., NAVFACENGCOM
Lewis Mitani, EPA Region 9
Cmdr. Sims, Public Works Office, Moffett Field
Gil Torres, State Water Resources Control Board

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

- M E M O -

To: Steven I. Morse, Chief
South Bay Division

July 3, 1986
File No. 1114.17(TJB)

From: *Thomas J. Berkins*
Thomas J. Berkins
Environmental Engineer

Subject: Guidelines for the Identification, Location, and Evaluation of
Potential Deep Well Conduits

PURPOSE

Per your request this memo proposes Division staff guidelines for requiring dischargers to identify, locate, and evaluate private and public wells which may be potential conduits for contamination to migrate from shallow aquifers to deep aquifers. The guidelines below are based on the investigations which we have required some companies in the City of Mountain View to follow in the course of their investigation to define the extent of pollution.

INTRODUCTION

Recent investigations by companies in Mountain View have detected volatile organic chemical (VOC) pollution in a number of deep (C aquifer) monitoring wells installed to a depth of 500 feet. The contamination of the deep aquifer apparently occurred via improperly abandoned private wells located within the shallow aquifer contamination plume. It is important to note that pollution from the shallow aquifer zones (less than 100 feet) has reached the deep C aquifer zone (greater than 200 feet) even though there is a relatively clean aquifer zone and a 20-30 foot thick aquitard in between the shallow and deep aquifers.

Thus, it is important to require a more extensive investigation of potential conduits at other sites, beyond simply relying upon the records of the Santa Clara Valley Water District (SCVWD). The scope of the investigation to be conducted at each site will depend on the extent of contamination (known and unknown), available information, and the degree of uncertainty.

TECHNICAL REPORT

The following steps outline the minimum effort which should be considered by dischargers in cases where active and inactive/improperly abandoned private wells are known to exist within and in the vicinity of the contamination plume.

I. IDENTIFICATION OF WELLS

A. Records and Map Search

Typically, sites located in the Santa Clara Valley have relied solely upon the records of the SCVWD to obtain information regarding the location and status of any known wells in the vicinity of a site. However, the SCVWD

POTENTIAL CONDUITS GUIDELINES

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REQUEST FOR A TECHNICAL REPORT FOR THE
IDENTIFICATION, LOCATION, EVALUATION,
AND DESTRUCTION OF POTENTIAL
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1220 PACIFIC HIGHWAY
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It would also be useful to list the wells by status, for example:

- a) wells officially listed as properly destroyed under a SCVWD permit
- b) active wells, including seasonal or standby wells
- c) inactive wells
- d) abandoned wells, location known but method of abandonment unknown
- e) abandoned wells, location unknown and method of abandonment unknown

B. AERIAL PHOTOGRAPHY SEARCH

Upon completion of the records and map search, a thorough search and review of historical aerial photographs should be conducted. Analysis of aerial photos has proven useful in identifying wells which were previously unknown (i.e., not found in the records or map search). The aerial photo search has also been shown to be useful in locating wells for which records were available but the well location was uncertain. Conducting the aerial photo search after the records search will enable one to better locate wells for which records exist but the location is uncertain. I recommend that all sites conducting the records and map search should also conduct the aerial photo review. The time and effort to be spent in this regard should be determined on a case-by-case basis.

Historical aerial photos should be obtained dating back to the period prior to residential and industrial development at the site. It is also important to obtain aerial photos taken intermittently over time (e.g., 1940, 1945, 1950, 1955, etc.). It would also be preferable to obtain aerial photos taken over a shorter time period during the period of residential growth in the area. Aerial photos with the smallest scale (i.e. greatest resolution) are obviously of much more use than larger scale photos. Oblique photos are very useful since they are usually taken from lower altitudes and therefore are in more detail for identifying wells, storage tanks, etc.

The following is a list of sources where aerial photos can be obtained or reviewed:

1. Local aerial surveyors (Aero-Geodetic and Pacific Aerial Surveys)
2. City and County Planning Departments
3. University's library, map room
 - a) U.C. Berkeley and U.C. Santa Cruz
 - b) Stanford University
 - c) University of Santa Clara
 - d) Whittier College, Geology Department, "Fairchild Collection"
 - e) San Jose State
4. U. S. Geological Survey, Western Mapping Center, Menlo Park
5. U. S. Department of Agriculture, Agriculture Adjustment Administration photos (these may be available at the University libraries)

POTENTIAL CONDUITS GUIDELINES

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are covered over. The use of a metal detector was instrumental in locating improperly abandoned agricultural wells located under a concrete parking garage in Mountain View. An attempt should be made to uncover any well identified by the metal detector to the extent technically feasible.

The results of the door-to-door survey, including copies of any survey forms, should be documented in a technical report. A map showing the known and/or general location of all identified wells should also be provided.

III. EVALUATION OF POTENTIAL CONDUITS

Based on the results of the well identification and location program, it may then be appropriate to conduct an evaluation to determine a well's potential to act as a conduit. All wells located during the field survey that are found to be in a condition that is adequate for sampling and downhole inspection should be investigated. An attempt should be made to uncover any wells if the general location is known. An attempt should also be made to unplug wells (e.g., remove silt and/or surface concrete plugs which may be present) in order to conduct a proper investigation. Wells which have a potential to be a conduit should be investigated. It may be appropriate to conduct the following investigations on such wells:

1. borehole television inspection
2. natural gamma log
3. water quality and water level sampling

As part of the water quality sampling, the discharger may also want to consider time series sampling. It may also be appropriate to conduct "packer tests" for wells which are screened in more than one aquifer. Pumps which may be present in the wells should be removed to obtain access to the well for depth sounding, geophysical logging, TV inspection, water quality sampling and water level measurement, as appropriate.

Based on the results of the potential conduit evaluation it may be necessary to destroy certain wells. If the results of the evaluation indicate that a well is screened in a single discrete aquifer and is not contaminated it may be useful to utilize that well for future monitoring purposes. General criteria which may be used to decide whether to destroy a well include:

1. the well is located within the known contamination plume
2. groundwater at the well is contaminated
3. the well is screened and/or gravel packed in more than one aquifer
4. well depth

Similar to the identification and location portions of the potential conduit investigation, the results of the evaluation of potential conduits should be submitted in a technical report. The report should include all data, maps, logs, interpretation of logs, etc. In addition, the rationale for excluding any wells from a complete investigation and evaluation should also be provided.

POTENTIAL CONDUIT INVESTIGATION
DOOR-TO-DOOR SURVEY FORM

ATTACHMENT

LL DATA

- 1) Place _____
Owner: _____
- 2) Source of Information: _____
Collected by: _____ Date: _____
- 3) Is well water used and for what purpose is it used?

- 4) Does the household also receive water from the city or water company?

- 5) Is a connection to city or water company possible?

- 6) Number of people in the household.

- 7) Has the water ever been tested? If so what for and the results.

- 8) How long has this person lived in this household?

- 9) Where is the well located? (Draw on back).

- 10) Does well water go into a storage tank prior to distribution?

- 11) Is there a valve for sampling? If not where was sampling taken?

- 12) What material is used for piping water into the house? (PVC, Cu, Fe)?

- 13) Do they know of any other wells in the area?

- 14) Are existing or former cesspools or septic tanks on property?

- 15) Number or Name: _____
Date Drilled: _____

POTENTIAL CONDUIT INVESTIGATION
DOOR-TO-DOOR SURVEY FORM

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WELL DATA

(23) Frequency of Use

(24) Flood Hazard

(25) Remarks and Defects:

(Use other side if necessary)

(26) Show well log on other side.