

April 6, 1989

D. V. Shuter
Brigadier General, United States Marine Corps
Commanding General
Marine Corps Air Station El Toro
El Toro, CA 92709-5001

Dear General Shuter:

The Orange County Water District has completed an investigation of TCE contamination in the vicinity of the El Toro U.S. Marine Corps Air Station El Toro. A report which is the culmination of nearly four years of investigative effort, at a cost to OCWD of approximately \$750,000, is hereby submitted for your review. We strongly urge that the USMC pursue immediate follow-up action, based on the findings and conclusions of the report.

TCE was first detected in wells near the base in 1985. The District conducted the investigation to determine the nature and extent of the groundwater contamination and to identify possible sources. Four multi-level monitoring wells were constructed and those, as well as existing active and inactive irrigation wells in the area, were tested extensively. The Marines undertook a concurrent investigation within the base boundaries to assess on-base contamination resulting from past solvent use and disposal practices. The District and the Marines have shared information gathered from the respective studies, and data from both studies have been incorporated into the analysis, findings and conclusions of this investigation.

The OCWD investigation revealed that TCE occurs off-base at depths ranging from 200 to 450 feet below ground surface, and that the downgradient contamination extends approximately three miles west of the USMCAS El Toro. It was determined that the TCE plume underlies approximately 2,900 acres, impacting as much as 150,000 acre-feet of groundwater, and is migrating westward at an estimated rate of one to four feet daily. The Marine study detected TCE in on-base monitoring wells at concentrations as high as 90 $\mu\text{g}/\text{l}$. The report finds that off-base TCE contamination is continuous with on-base contamination. Hydraulic pathways and forces have induced vertical and lateral migration of TCE contamination originating on-base to migrate off-base. The report concludes that, based on past solvent use and disposal practices and on data generated through OCWD's and the Marines' investigations, the USMCAS El Toro is the source of TCE in the Irvine area. The urgency of the situation demands that a remedial program to contain the movement of the plume be initiated quickly.

Due to the serious threat that the TCE contamination poses to the basin supplies, it is imperative that the Marines proceed immediately with the following actions:

- Initiate cleanup of TCE detected on-base;
- Continue investigation into the nature and extent of on-base contamination and look for possible active sources; and
- Install necessary monitoring wells and construct groundwater model to evaluate the effectiveness of OCWD's interim TCE pumpout project.

Due to the conclusive evidence identifying the USMCAS El Toro as the source of TCE, it is also appropriate at this time for the Marines to:

- Reimburse the Orange County Water District for the cost of the investigations and
- Fund the District's interim TCE pumpout project.

Please inform this District, at the earliest possible date, of your intention to comply with these measures.

Very truly yours,

William R. Mills Jr., P.E.
General Manager

Enclosure

Extensive Pollution of Ground Water Determined in Study

By STEVEN R. CHURM, Times Staff Writer

A cancer-causing chemical has polluted a vast pool of underground water stretching more than 3 miles from the western edge of the El Toro Marine Corps Air Station to the heart of residential Irvine, a study released Wednesday by the Orange County Water District showed.

Ground water contamination near the military base has been suspected for several years, but the extent of contamination—more than 2,000 acres—had not been identified until the water district recently completed its yearlong, nearly \$1-million study.

The report, presented Wednesday to the district's 10 member board of Directors, blamed the polluted ground water on the military, which routinely disposed of toxic wastes, including cancer-causing trichloroethylene, also known as TCE, at the base for nearly four decades before the practice was halted in the early 1960s.

No Immediate Threat Posed

The result, the study concluded, is been widespread contamination of up to 100,000 acre feet of ground water. (About five acre feet is the equivalent of about an inch of water a year.)

Water district officials stressed that the polluted ground water does not pose any immediate threat to commercial or domestic water supplies in the area. The nearest residential water well, located by the Irvine Ranch Water District 3 miles away from the spread-

ing contamination.

"There is absolutely no threat to any domestic water supplies," district spokesman James Van Haun said.

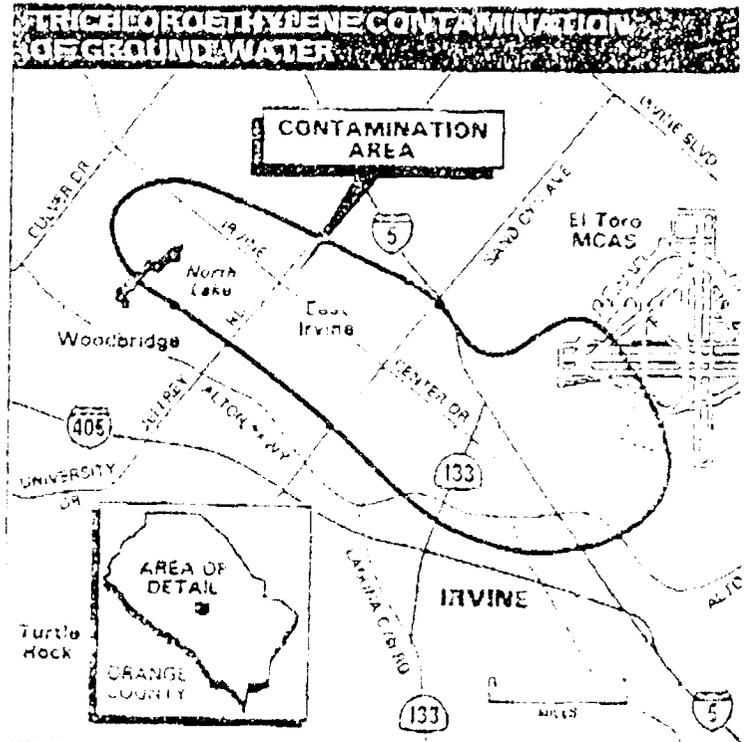
Levels of TCE in water analyzed from some agricultural and test wells located between North Lake in Irvine and the western boundary of the Marine base were, in some cases, 10 times the allowable limit for safe drinking water, the report concluded.

The pocket or "plume" of contaminated water, the report stated, is about 3 miles long and half a mile wide and is moving in a westward direction at a rate of 1 to 4 feet a day. Since 1955, when the water district first detected TCE traces in the ground water, officials estimate the plume has "migrated" west about a mile, to a point halfway between Jeffrey Road and Culver Drive in the Woodbridge area of Irvine.

While there is no present health threat, water district General Manager William R. Mills warned that the plume, if left unchecked, eventually could reach the Irvine Ranch Water District's domestic water wells. In time, it could also threaten an area near Irvine Center Drive, where the Irvine Ranch district is contemplating sinking several new domestic water wells.

As a result, the Orange County Water District board agreed Wednesday to negotiate with the Irvine Co. and the Irvine Ranch district to begin pumping the contaminated water out of the aquifer.

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STEVEN NELSON Los Angeles Times

WATER: Contamination Found

Continued from Page 3

and mixing it with reclaimed water used for irrigating crops and land crops. Once the tainted water is exposed to air, the TCEs "volatilize" and dissipate into the atmosphere, greatly reducing any health or safety risk to plant life or humans, Van Haun said.

But even if the cleanup approach is implemented, it would only remove about 2,000 acre feet of contaminated water a year.

"It would not solve the problem overnight," Mills said. "But at least we might slow the migration of the plume."

The only wells now affected by the contaminated water are used for agricultural purposes, but Van Haun said that could change. As rapidly growing Irvine continues to urbanize, it may need to convert those wells for commercial or domestic use.

"But that would be impossible unless the ground water is cleaned up," Van Haun said.

The cost of the Orange County Water District study, including drilling of four new wells to test for contaminants, was close to \$1 mil-

lion. District officials contend that the military should eventually reimburse the agency for the cost. Any cleanup costs, including the proposed pumping out of the aquifer, should also be paid by the military, Mills said.

Military 'Unconvinced'

But military officials, who are nearing completion of their own \$1.2-million ground-water study within base boundaries, believe they may not be entirely responsible for the contamination.

Capt. Stan Horn of the Navy's civil engineer corps said Wednesday that the TCE contamination could have come from the Orange County International Raceway, a drag strip that operated for 17 years before closing in 1983 along the Santa Ana Freeway, just west of the Marine base.

"We know we have some [TCE] hot spots that have moved off the base that we have to address," Holm told the water board.

But during a break in the meeting, Holm said the military remains "unconvinced" that it is to blame for all the contamination.

The TCE-contaminated ground water—as well as three on-base landfills containing solid wastes—prompted the U.S. Environmental Protection Agency last June to add the El Toro facility to its Superfund hazardous waste cleanup list.

Most of the toxic waste produced at the base, including TCEs, stems from maintaining jets and helicopters. For example, each year the El Toro base disposes of 166,000 gallons of used motor oil and hydraulic fluid and 281,000 gallons of waste fuel, according to county health records.

stake, to Greece, where he has relatives. Gi... was granted preliminary custody of the child in January after a bitter custody

California resident and has been for a long time."

At an earlier news conference, Newport Beach police Sgt. Mi-

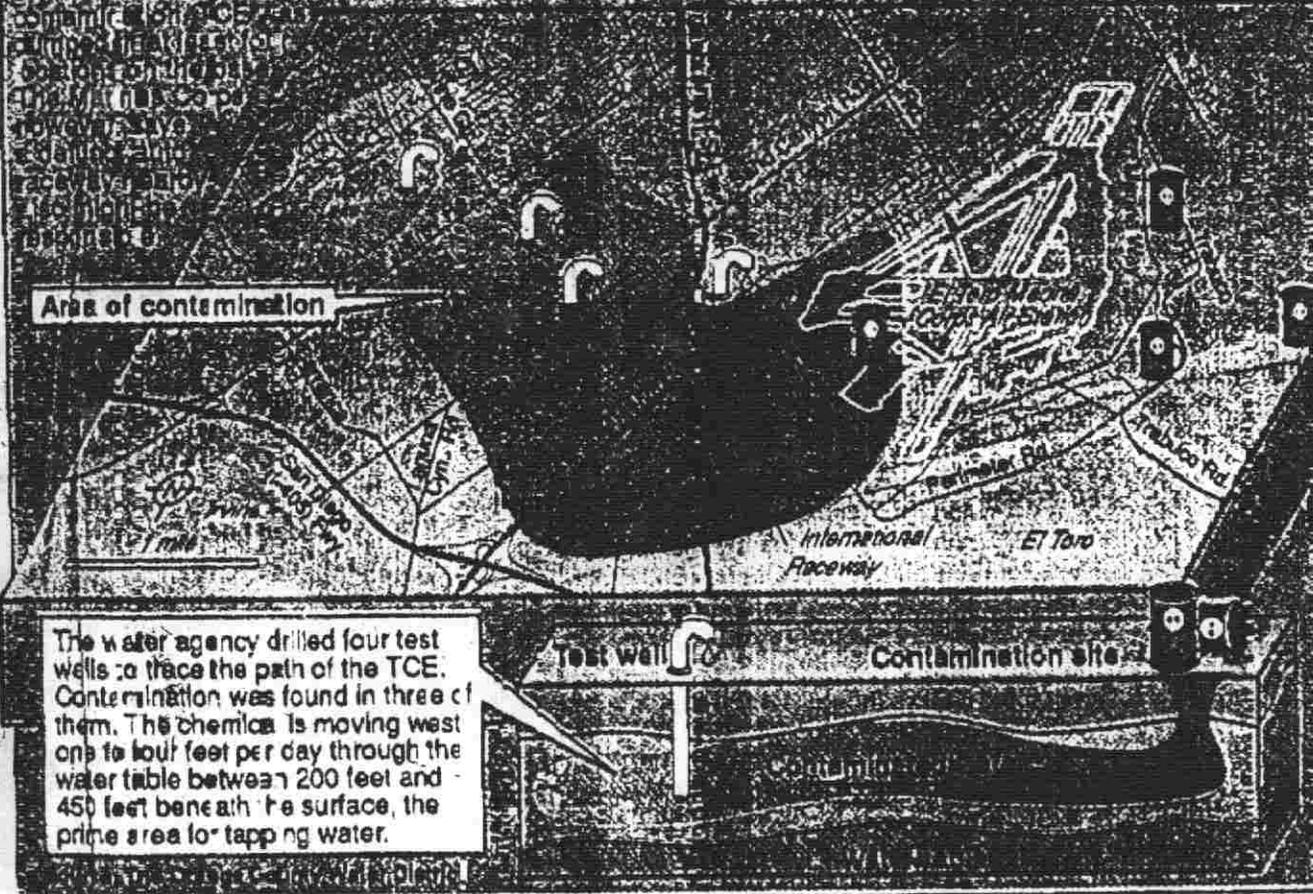
He added that friends of Glonis... investigators the doctor in... to flee to Greece with his... Please see WAYNE/12

sure of independence in 1956, and it now appears that Poles, up... by economic disaster, have the ad- vantage of the changes wrought in... Please see SOLIDARITY/4

Agency acts to clean up worst OC toxic spill

Toxic spill

...has contaminated a large water basin now used for agricultural purposes. A new... 250 feet thick, more than a mile wide and three miles long. The Orange County... investigation conducted under the Marine Corps base in El Toro. The source of the...



By Maria Cone
The Register

In an unprecedented decision, the Orange County Water District decided Wednesday to begin cleaning up a spreading toxic spill that already stretches underground three miles from the Marine Corps Air Station in El Toro and has rendered a valuable water supply undrinkable.

A yearlong investigation confirmed the water agency's suspicions that the sprawling underground contamination — by far the worst in the county's history — flowed from the military base.

But after hearing that the spill was 250 feet thick, more than a mile wide, three miles long and moving one to four feet a day toward another major drinking supply, the water-district board decided that the threat was too serious to wait for the Marines to act.

The water district's board agreed to spend \$500,000 of its own funds to begin removing the tainted water. A well to slowly pump the water will be drilled possibly within two months.

"We've studied it enough. Now

The water agency drilled four test wells to trace the path of the TCE. Contamination was found in three of them. The chemical is moving west one to four feet per day through the water table between 200 feet and 450 feet beneath the surface, the prime area for tapping water.

Kevin Boyd / The Register

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Orange County Register April 6, 1989

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WATER: Marine Corps base source of toxic spill, study says

FROM 1

it's time to clean it up," said William Mills, the water district's general manager.

The board, however, will wait two weeks before deciding whether to blame the Marine Corps for the spill and seek reimbursement of \$1.25 million for the investigation and cleanup.

The subterranean spill has contaminated the water basin from the El Toro base almost to Culver Drive in Irvine, according to the water district's investigation.

The chemical, which poses a long-term cancer risk if ingested, means the aquifer cannot be used to supply drinking water to proposed new communities in the area.

Approximately 30,000 to 150,000 acre-feet, enough to serve the 1.8 million residents of northern Orange County for several months, has been rendered undrinkable. The water is worth \$7 million to \$35 million when compared with the price of imported water.

To make matters worse, the report concluded, the TCE, or trichloroethylene, is creeping west at a

relatively rapid rate, threatening drinking-water wells that serve residents of Santa Ana and Tustin. Those wells are three miles from the suspected boundary of the spill.

"Every day we wait, there's that much more contaminated water," Mills said.

The source of the toxic chemical has been a point of contention for four years between the Marine Corps and state and local water-quality officials. The spill was discovered in 1985 when routine tests showed three agricultural wells owned by The Irvine Co. were polluted with TCE.

TCE, a solvent widely used by the Marines for degreasing aircraft and other equipment until the late 1970s, was dumped in at least four major locations and used in 13 more at the El Toro base, military records show.

For two years the Marine Corps has refused to comply with a state order from the Santa Ana Regional Water Quality Control Board to investigate and clean up the chemical underneath The Irvine Co.'s land.

Officials at the El Toro base say they are prohibited from spending Defense Department money to investigate pollution underneath private property unless there is proof the military base was responsible.

To break the deadlock, the water agency initiated its own investigation a year ago.

To trace the chemical's path, four test wells were drilled by the water district and eight by the Marine Corps. In addition, samples from 14 existing irrigation wells were analyzed, said James Reilly, the agency's water-quality director, who headed the investigation.

The investigation proved "well beyond a reasonable doubt" that the Marine base was to blame, Mills said.

In the four years of dispute with the Marines, he said, the spill has spread as much as a mile.

Marine Corps officials said Wednesday for the first time that they now agree that TCE has leaked off their property. But they remain unconvinced that they are the sole source or that they should have to pay for the entire cleanup.

"Clearly, we have a TCE problem and clearly it went off the base in some amount. But we don't know to what extent," said Capt. Stan Holm, director of facilities management at the El Toro and Tustin bases.

"The jury's still out on that. There's more engineering work that has to be done before we can link all this to the one plume from the base."

The Marines are "absolutely committed to finding out how much of this problem is due to Marine Corps past practices and we're committed to cleaning it up," Holm said.

However, he said more tests should be made because he suspects another source could be responsible, too. The Marine Corps persuaded the water agency to postpone fixing blame for the spill until April 19, when the Marines will supply evidence from their own \$1.2 million study.

The water district's decision to take the cleanup into its own hands is unprecedented in Orange County.

Environmental laws require the source responsible for a spill to clean it up. But the Defense Department's involvement has slowed the process and frustrated local and state water-quality officials, so the water district decided to dip into its new \$4 million emergency toxic-cleanup fund.

The contamination is deep underground; it starts about 200 feet below the surface and spreads down to 450 feet deep — the prime area pumped by irrigation and drinking-water wells.

In a letter drafted but not yet approved by the board or sent to Brig. Gen. David Shuter, commander of the El Toro base, Mills asks the Marines to pay \$1.25 million.

"The urgency of the situation demands that (cleanup) be initiated quickly," he wrote.

The water contamination is one of many serious toxic-waste problems that have surfaced in the past few years at the military base because of widespread dumping and spilling of jet fuel, acidic waste and other chemicals between 1940 and the early 1970s.

The El Toro base qualified last year for the federal Superfund list

of the nation's most hazardous dump sites. It is expected to officially added to the list this summer, the US Environmental Protection Agency said.

The water agency will drill within two months to begin cleaning the TCE-tainted water, Mills said. The cleanup will take 10 to 15 years, he said.

One well might not be a permanent solution, but "at least we'll be able to slow the rate of migration down," Mills said.

The recovered water will be used to irrigate nearby crops and greenery. The chemical will vaporize during the spraying.

"We'll be cleaning it up, and at the same time instead of wasting the water, we will be using it. That water's especially valuable now at times of shortages," Reilly said.

The Marine Corps said the now-defunct Orange County International Raceway next to the base might have been partially responsible for the TCE. Holm said interviews with past employees of the raceway showed solvents were dumped there.

But water officials said they have no evidence the raceway used the solvent.

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