

12.02 4/17/98 595



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C. 20460

APR 17 1998

OFFICE OF  
WATER

Ms. Sherric Goodman  
Deputy Under Secretary of Defense  
for Environmental Security  
3400 Defense Pentagon  
Room 3E791  
Washington, D.C. 20301-3400

Dear Ms. Goodman:

I am writing to request the continued collaboration of our agencies to address the potential for perchlorate contamination of ground and surface waters. Perchlorate has been detected in drinking water supplies in Western States and is becoming an issue of growing concern for the Environmental Protection Agency (EPA), states, water utilities and purveyors, and the general public. To better understand the geographic extent of the potential for perchlorate contamination, we need additional assistance to comprehensively identify facilities across the nation associated with its manufacture and use.

*found  
Lake Meade*

As you are aware, ammonium perchlorate is a solid inorganic salt used as the oxidizer in solid rocket fuel and readily dissolves in water. Recent improvements in the ability to detect perchlorate at much lower levels have resulted in its detection in ground and surface water resources in California, Nevada, Utah, and Arizona. Eighteen public drinking water supply wells have been shut down in California to date. Our limited data indicates that drinking water supplies appear to be most vulnerable to contamination in areas where perchlorate has been manufactured or used in significant quantities.

At this time, the Agency has not established a National Primary Drinking Water Regulation (NPDWR) or a Health Advisory for perchlorate. In 1992, EPA's Superfund Technical Support Center issued provisional guidance recommending a range of 4 - 18 parts per billion (ppb) for ground water cleanup levels at Superfund sites. The State of California set a provisional action level at 18 ppb based on EPA's work. Due to the limited toxicological database currently available, however, considerable uncertainty remains as to the scope of potential health effects from exposure to perchlorate at low levels in drinking water.

To address these concerns, the Air Force is funding several toxicity studies of perchlorate that are currently underway. EPA appreciates the Air Force's strong commitment in moving these studies forward, and in working with EPA to ensure that the experimental design

Printed on Recycled Paper

P.03/04 513 476 1455

HO RFWC/JR WPAFB OH

JUN-23-1998 08:26

TOTAL P. 04

2

and data analysis will have adequate peer review by both EPA and the scientific community. The results will strengthen the toxicological database on the potential health effects of perchlorate in drinking water.

In addition, there is a lack of information on the occurrence, exposure, aquatic toxicity, and effective treatment technologies for perchlorate. To facilitate information exchange on the wide array of issues with perchlorate contamination, an intergovernmental Perchlorate Steering Committee has been formed and being co-chaired by EPA and the Air Force. The steering committee includes representation from Federal agencies, States, and local governments.

Due to the increased concern over the potential for perchlorate contamination and the many uncertainties regarding its health effects and effective removal from drinking water supplies, the Agency recently included perchlorate on the final Contaminant Candidate List (CCL), which I signed on February 6, 1998, and which was published in the Federal Register on March 2, 1998. The CCL is a list of contaminants that are potential candidates for future drinking water research, guidance development, and regulation, if necessary. The CCL identifies perchlorate as a contaminant needing additional research in the areas of occurrence, health effects, and treatment technologies before EPA can make an informed determination of whether or not to regulate it with a NPDWR.

EPA is pleased to have developed a positive, collaborative partnership working with the Air Force to assess the potential impacts of perchlorate on our Nation's drinking water resources. To further assist in these efforts, I am requesting that the Department of Defense provide EPA with a comprehensive list of both current and former facilities that have used perchlorate in their operations. Please send this information to Mike Osinski in the Office of Ground Water and Drinking Water, mailcode (4607). We are concurrently requesting this information from the National Aeronautics and Space Administration.

Thank you very much for your assistance in this matter. I look forward to the continued cooperation between our agencies in characterizing the scientific and policy issues regarding perchlorate. If you have any questions or need additional information, please do not hesitate to contact me, or have your staff contact Bill Diamond, Director of the Standards and Risk Management Division, at 202-260-7575.

Sincerely,



Robert Perciasepe  
Assistant Administrator

THE UNDER SECRETARY OF DEFENSE  
3010 DEFENSE PENTAGON  
WASHINGTON, D.C. 20301-3010



11 JUN 1998

IGN AND  
CLOCK

MEMORANDUM FOR UNDER SECRETARY OF THE ARMY  
UNDER SECRETARY OF THE NAVY  
UNDER SECRETARY OF THE AIR FORCE

SUBJECT: Perchlorate Inventory

Perchlorate, a frequently used component of rocket fuel, is increasingly a source of contamination of ground and surface water, as noted in the attached letter from the Environmental Protection Agency to the Department of Defense. The EPA is concerned about contamination of 18 public drinking water systems in the western United States. The lack of information concerning the occurrence, exposure, toxicology, and treatment technologies for perchlorate has prompted EPA and the Air Force to co-chair an intergovernmental Perchlorate Steering Committee to facilitate information exchange on perchlorate and to determine the extent of potential contamination. To assist in this work, EPA has asked DoD to provide them with a comprehensive list of both current and former DoD facilities that have used perchlorate in their operations.

Please determine where, in your Military Department, perchlorate is being, or has been, handled, or used. I ask that you request both your operational and environmental organizations to respond to this inquiry and supply this information to Lt. Col. Ed Stern, SAF/MIQ, available by phone at (703) 614-2458, and by fax at (703) 614-2884. I ask that you provide this information no later than July 17, 1998. On behalf of DoD, the Air Force will provide one consolidated response to EPA no later than July 31, 1998.

Thank you in advance for your prompt attention to this request.

J. S. Gansler

Attachment:  
As stated



TOTAL P.02

513 476 1455 P.02/04

HA AFMC/JA WPAFB OH

JUN-23-1998 08:26

**MARINE CORPS AIR STATION EL TORO**  
**RESTORATION ADVISORY BOARD MEETING**

**September 24, 1997**

*MEETING MINUTES*

A Restoration Advisory Board (RAB) meeting for Marine Corps Air Station (MCAS) El Toro was held Wednesday, September 24, 1997 at the Irvine City Hall. The meeting began at 6:35 p.m. These minutes summarize the discussions and presentations from the meeting.

**WELCOME, INTRODUCTIONS, AGENDA REVIEW**

Mr. Joseph Joyce, Marine Corps RAB Co-Chair, opened the meeting by introducing himself and welcoming everyone. He reminded the group to sign in and include their name and address on the sign-in sheet, so all in attendance will receive a copy of the meeting minutes and the next RAB meeting agenda. Following self-introductions made by all in attendance, Mr. Joyce provided an overview of the meeting agenda. Two new items were added: 1) a presentation by Capt. Matt Morgan regarding rocket propelled ordinance and ammonium perchlorate; and 2) discussion of a questionnaire for RAB members developed by Greg Hurley, RAB Community Co-Chair.

Mr. Joyce also had three announcements:

- In regard to the next update to the MCAS El Toro Base Realignment and Closure (BRAC) Cleanup Plan (BCP), he extended an invitation for two members from the RAB's BCP Subcommittee to participate in a January 1998 meeting pertaining to the document.
- Two Record of Decisions (RODs) were in the process of being signed by the BRAC Cleanup Team. The ROD for Operable Unit (OU) 2A, Site 24, Volatile Organic Compound (VOC) Source Area, Soil Vapor Extraction in the Vadose Zone had been signed on September 23, 1997 by both the State of California's Regional Water Quality Control Board, Santa Ana Region and MCAS El Toro. The U.S. Environmental Protection Agency (U.S. EPA) and State of California's Department of Toxic Substances Control (DTSC) were expected to sign the ROD by September 30, 1997. The ROD for OU-2A and OU-3A No Action Sites is also expected to be signed by the BRAC Cleanup Team by September 30, 1997.
- Mr. Joyce offered an opportunity for RAB members and others interested community members to participate in the upcoming October 29, 1997 RAB subcommittee meeting covering budget

priorities and corresponding projects that support the Station's cleanup effort.

## OLD BUSINESS

-

### Review and Approval of August 6, 1997 Meeting Minutes

-

A motion was raised to amend the minutes on page four. It was noted that the chemical, perchloric acid, should be changed to ammonium perchlorate. The motion was adopted and the RAB minutes were approved.

### Rocket Propelled Ordnance - Capt. Matt Morgan, BRAC Public Affairs Officer, MCAS El Toro

Capt. Matt Morgan's presentation regarding rocket propelled ordnance provided clarification of a concern first raised at the August 6, 1997 RAB meeting. The concern centered on the use and disposal of rocket propelled munitions at MCAS El Toro and the chemical ammonium perchlorate, a substance used in the solid rocket fuel of these weapon systems. Capt. Morgan explained that rocket propelled munitions are stored in magazines at the Station. These munitions meet hazardous materials (HAZMAT) handling and storage requirements and are accompanied with Material Safety Data Sheets (MSDSs) with detailed information and instructions. He further explained that this ordnance, when used for training operations, is attached to various aircraft at MCAS El Toro. When aircraft return to the Station they are no longer carrying these munitions.

Concerning the disposal of rocket propelled munitions at the Station, Capt. Morgan said, that to the best of his knowledge, no rocket propelled munitions have ever been disposed of at the Station's Explosive Ordnance Disposal (EOD) Range, also referred to as Installation Restoration Program Site 1. The order of detonation for these munitions is too high to be disposed of at MCAS El Toro, therefore, ordnance disposal of this type is conducted at Naval Air Facility El Centro, Camp Pendleton, and other bases suited to handle such activities. If some unusual circumstances occur and an aircraft that is carrying these munitions has to return to MCAS El Toro, and the aircraft cannot make it to Camp Pendleton, the ordnance is disposed of out at sea in a specially designated area.

Capt. Morgan explained that the Station's EOD Range is primarily a training facility that exclusively uses the explosive substances, C4 and TNT, to dispose of ordnance. He informed the group that Station has an agreement with the Orange County Sheriff's Department and the Fire Department to dispose of confiscated ammunition (primarily small arms rounds) and fireworks, especially around

the July 4<sup>th</sup> holiday. In response to a question regarding ammunition disposal at the EOD Range, Capt. Morgan said that bullets are packed in a C4 formula, it is exploded using TNT, and the explosion vaporizes the ammunition. In regard to the environmental investigations at the EOD Range, RAB members need to discuss those issues with Joseph Joyce and Glenn Kistner, U.S. EPA Project Manager.

A RAB member expressed concern about the residue from C4 and TNT. Mr. Joyce informed the RAB that the Army Corps of Engineers will ensure that Site 1 will meet close out requirements, which include investigation for residue from explosives, when the site is no longer being used for ordnance training. Close out of Site 1 will be coordinated through the appropriate regulatory oversight agency. Future updates will be provided to the RAB.

## **NEW BUSINESS**

### **Community Questionnaire - Greg Hurley, RAB Community Co-Chair**

At the August 6, 1997 RAB meeting, Mr. Hurley, provided a brief reminder to RAB members about their responsibility to talk with members of the community about the environmental cleanup program at MCAS El Toro. In a follow-up to that reminder, he prepared a "Community Questionnaire" requesting input from RAB members on what the RAB can collectively do to better assist or facilitate such communication with the respective constituency each RAB member represents, the general community, or other interested parties. He welcomed everyone at the meeting to fill out the questionnaire and return it tonight or by mail to either himself or Joseph Joyce. Mr. Hurley said he would compile the responses and report back to the RAB.

### **MCAS El Toro Installation Restoration Program Site Tour - Joseph Joyce, RAB Marine Corps Co-Chair**

Mr. Joyce announced that on Saturday, October 25, 1997 at 9:00 a.m. a tour of the Installation Restoration Program sites at MCAS El Toro would be conducted. The bus tour would show current treatment systems that are operational and some of the remedial actions that have taken place. Mr. Joyce asked that the reservation form (provided at the sign-in table) be completed and returned to him by October 10, 1997 to ensure a seat on the bus. He reminded meeting attendees to provide the number people in their party on the reservation form. Along with the reservation form, the tour information flyer included directions to the tour starting point at the Officer's Club and Mr. Joyce's mailing address and fax number. He said the bus will depart promptly at 9:00 a.m. from the Officer's Club.

### **Regulatory Agency Comment Update - Glenn Kistner, Project Manager, U.S. EPA and**



## Need No. 1927

**1. ID Number: 1927**

**2. Title:** (T0900.27) Additional information on ammonium perchlorate developmental bone marrow, and thyroid toxicology are needed to refine the human risk assessment.

**3. Pillar Supported:** Occupational Health

**4. Priority:** High

**5. Media:** Soil, Water

**6. Contaminant(s):**

**7. Key Policy or Regulatory Driver:**

- Resource Conservation and Recovery Act (RCRA)
- Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)

**8. Need Description:** Ammonium perchlorate is an energetic highly water soluble compound that is used as a solid rocket propellant. The anion perchlorate is currently found in and around Air Force Plant 70 in the ground water. The current provisional reference dose for perchlorate is in the range of 1 - 5 E-4 mg/kg/day. Based on the body of human studies it appears that perchlorate doses above 1.4 mg/kg/day have adverse effects on the thyroid. Doses in the range of 6-14 mg/kg/day appear to cause fatal bone marrow effects in some subjects treated for two months or longer. Perchlorate can block the passage of iodine to the thyroid, inhibiting its proper functioning. The toxicology database for perchlorate has been characterized by the EPA National Center for Environmental Assessment as severely limited by the fact that there is no chronic study which has been conducted at doses low enough to demonstrate a No Observed Adverse Effect Level which examines the full range of potential toxicities.

**Current System Description:** The EPA has adopted a provisional reference dose of 1 to 5 E-4 mg/kg/day

**Current Cost of Process:** If clean-up levels below the NOEL are mandated costs to clean up the AP contaminated groundwater will become prohibitive.

**Extent of the Problem:** Problem exists for potential receptors of contaminated groundwater around AFP 70.

**Known R&D Efforts:** Dave Mattie, Ph.D.

Armstrong Lab

513-255-5150

785-5150

mattied@falcon.al.wpafb.af.mil

**9. Urgency:** 1998-2000

## 10. Alternative Options:

**Current Method of Reducing the Problem:** Pump and treat is able to obtain hydraulic control but not ultimate remediation of AP from groundwater.

**Potential Solutions:** Provide/perform additional toxicology to perhaps relax the provisional EPA reference dose.

**Minimal Success Criteria:** A better understanding of AP toxicity may help refine risk assessment and arrive a cleanup goal for groundwater that is both cost effective and provides an adequate margin of safety for all potential receptors.

## 11. Contacts:

### *Program:*

Mr Greg Harvey, ASC/EMR, COM: (513)-255-7716-302, DSN: 785-7716

### *Technical:*

Dr David Mattie, AL/OEMH, COM: (513)-255-5150 , DSN: 785-5150

### *Other Customer(s)/User(s):*

Ms April Lewis, ASC/EMR, COM: (513)-255-7716 , DSN: 785-7716

Mr. Steve Drahe, ASC/EMR, COM: (513)-255-7716 , DSN: 785-7716

*Last updated: Sep 25, 1997. You can contact the WebMaster at [Webmaster@em.brooks.af.mil](mailto:Webmaster@em.brooks.af.mil)*

Howe

Saturday, August 02, 1997

Online

## Water officials sample public wells for perchlorate

A chemical discovered in Lake Mead can have profound effects on human growth and development.

By Keith Rogers  
Review-Journal

The presence of a chemical used in the rocket engine industry has turned up in Lake Mead, prompting Southern Nevada officials Friday to check for it in public wells that supply drinking water.

"We're pulling the samples now," David Donnelly, deputy general manager of the Southern Nevada Water Authority, said Friday. "I told the guys today to sample."

The authority was alerted to the presence of perchlorate -- an ion that forms such compounds as ammonium perchlorate, the oxidizing ingredient of rocket and missile engines -- after the Los Angeles Metropolitan Water District detected it at Hoover Dam and downstream in the Colorado River system.

About 85 percent of Southern Nevada's drinking water comes from Lake Mead. The remaining 15 percent comes from deep wells. ([See map of locations of public wells.](#))

Testing for the chemical in private wells is the responsibility of each owner, said Allen Biaggi, deputy administrator of Nevada's Environmental Protection Division.

The primary health concern related to perchlorate is that it can interfere with the thyroid gland's ability to use iodine to produce hormones. In a hormone-deficient condition, normal metabolism, growth and development can be affected, according to California's Department of Health Services.

Perchlorate, in very high doses, has been used as a medicine to treat Graves' disease, a condition in which excessive amounts of thyroid hormone are produced.

News

Sports

Business

Lifestyles

Neon

Opinion

in-depth

Help/About

Search

Classifieds

Real Estate

TV

Weather

Columnists

Archive

Feedback

Headlines

Home

Biaggi said Nevada's environmental officials are treating the perchlorate discovery in Lake Mead as an emerging issue.

"It's not clear this is a public health threat. It's not clear what the analytical procedures are, and there are other higher-priority compounds out there," he said.

Donnelly said the water authority decided to test Lake Mead, and some of the 72 public wells, after California authorities shut down 18 wells where perchlorate was found in excess of that state's guideline. The first results of the authority's tests are expected Friday.

The tests only detect the presence of the perchlorate ion. They don't distinguish what compound the ion stems from, such as whether it came from ammonium perchlorate or one of its raw materials, sodium perchlorate.

The perchlorate component, while it is regarded as a hazardous material, is not regulated under the federal Safe Drinking Water Act, and Nevada has no safe-consumption standard for it. But California requires remedial action for any level of perchlorate in water that exceeds 18 parts per billion.

The highest concentration of perchlorate found in a Southern California drinking well was 130 parts per billion, in Redlands, 70 miles east of Los Angeles near a Lockheed Martin Corp. operation, according to Gary Yamamoto, regional engineer for California's Health Services Drinking Water Field Office.

Samples from the Colorado River system collected by the Los Angeles water district July 22 contained perchlorate at 8 parts per billion at the Lake Mead outlet tower at Hoover Dam. Samples collected June 9, downstream at Lake Havasu, showed 6 parts per billion perchlorate.

Upstream of Lake Mead, samples collected July 22 at the Lake Powell outlet below Glen Canyon Dam showed no perchlorate.

Los Angeles water district spokesman Rob Hallwachs said, "It's not enough to draw any conclusions, but it's obviously something we're going to continue to monitor."

Biaggi said none of the 100 or so monitoring wells in and around the Basic Management Inc. industrial complex near Henderson, where

ammonium perchlorate has been produced since the 1950s, has been sampled for perchlorate.

"There is no approved analytical technique. How can you look for it? There are 70,000 compounds out there that have health concerns, (and) there is not a standard method to evaluate this chemical in water," Biaggi said.

Kerr-McGee Chemical Corp. at the BMI complex produces about 4,000 tons of ammonium perchlorate a year. Plant manager Pat Corbett said the facility began manufacturing ammonium perchlorate in 1953 at the rate of about 2,000 tons annually. Production increased in the 1960s to about 8,000 tons a year; then to 10,000 tons a year in the 1970s; with production peaking in the mid-1980s at 15,000 tons a year.

Kerr-McGee stores 5,000 tons of ammonium perchlorate at its Apex facility, 17 miles northeast of Las Vegas.

American Pacific Corp. -- the only other U.S. producer of ammonium perchlorate -- had manufactured the chemical for 30 years at its Pacific Engineering & Production Co. of Nevada, or PEPCON, facility off Lake Mead Drive near Henderson until a chain of explosions involving thousands of tons of the compound leveled the plant in 1988, leaving two workers dead.

The company resumed its production the following year at its Western Electrochemical Co. plant, 14 miles northwest of Cedar City, Utah, where another explosion involving the compound killed one worker Wednesday.

Both Kerr-McGee and the old Pacific Engineering site are located about 10 miles downgrade from Southern Nevada's nearest drinking-supply wells, making it unlikely that any chemicals from the plants migrated to the wells' supply, according to Biaggi.

**Related story:**

EXPLOSION PROBE: The Utah Occupational Safety and Health Division completed its inquiry Friday into a chemical factory explosion outside Cedar City earlier this week.

Give us your FEEDBACK on this or any story.

## Water Officials Issue Order Giving Firm Time to Develop Drinking Water Plan

LOS ANGELES--Regional water quality officials issued an order July 18 giving Lockheed Martin Corp. nearly three months to develop a proposal to combat a new form of pollution threatening drinking water supplies in the San Bernardino-Riverside, Calif., area. The administrative action targets an industrial chemical, ammonium perchlorate, found in and near a rapidly moving plume of dilute solvents linked to a rocket fuel facility once owned by Lockheed. Perchlorate is used as an oxidizer in the manufacture of solid rocket fuel. The cleanup order approved by the Santa Ana Regional Water Quality Control Board requires Lockheed to submit by Aug. 15 a list of tasks and schedules for the cleanup. A detailed cleanup and implementation plan is due 60 days later. Until recently, an analytical method for detecting low levels of perchlorate in drinking water did not exist, according to the water board. As a result, perchlorate has not been considered a common contaminant, and no federal or state drinking water standards exist. However, discovery of the pollutant in ground water at the Aerojet superfund site near Sacramento, Calif., prompted the California Department of Health Services to look for perchlorate at other aerospace and munitions facilities around the state. Along with the perchlorate pollution found in the San Bernardino-Riverside area, DHS has discovered the chemical in wells that serve the San Gabriel Valley area of Los Angeles County -- another massive ground water basin also endangered by dilute solvents, primarily trichloroethylene. DHS has since adopted a provisional action level for perchlorate of 18 parts per billion and developed a test with a detection limit of 4 parts per billion. Officials also have recommended that utilities promptly notify customers about the presence of perchlorate whenever the concentration exceeds the provisional action level. Perchlorate can interfere with the thyroid gland's ability to produce hormones and regulate the body's metabolism. In very high doses, it can interfere with a child's development. Sampling in water systems that tap into the massive aquifer that serves the San Bernardino-Riverside area in April and May revealed concentrations of perchlorate ranging from seven parts per billion to 130 parts per billion in several wells. In June, Lockheed supplied bottled water and arranged an emergency connection to the city of San Bernardino water system for one purveyor who was forced to shut down a well that serves 1,000 customers. Little information is available on treatment technologies for perchlorate in drinking water, Santa Ana water board staff noted in a report. Aerojet General Corp., which is leading the cleanup effort at its Sacramento rocket testing facility, is involved in a pilot project that could prove useful for the Bunker Hill ground water basin cleanup plan Lockheed was ordered to develop, the report added. Cleanup Options.

Lockheed is already looking at cleanup options and will comply with the order, Gail Rymer, a spokeswoman for the firm, told BNA June 22. An industry group has been formed to evaluate containment and cleanup methods, she added. "The first thing is to negotiate water supply contingency plans with the water purveyors," she said. In April 1994, the water board ordered Lockheed to clean up the trichloroethylene contamination involving the Bunker Hill basin. The firm is in compliance with that order and has identified the leading edge of that plume. All along Lockheed has blamed the contamination on other industrial firms that operated in the area near the one-time Lockheed Propulsion Co. plant. Calendar