PRIORITIZATION PROTOCOL FOR PERCHLORATE IMPACTS TO DRINKING WATER FROM DEPARTMENT OF DEFENSE FACILITIES IN CALIFORNIA

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Introduction

Perchlorate is being found at increasing frequency in drinking water in California. To better assess the threat that this chemical may pose to drinking water supplies, State agencies are evaluating potential sources of perchlorate throughout California. As part of this evaluation, State agencies are gathering information from a variety of manufacturers and users of perchlorate, including Department of Defense (DoD) installations (USMC, Air Force, Army, and Navy) and Formerly Used Defense Sites (FUDS). The Office of the Secretary of Defense has communicated the DoD commitment to work with the State of California in setting priorities for determining the source and magnitude of perchlorate problems at military facilities, communicating and understanding California's requirements related to perchlorate and assisting in marshalling assets and resources for researching effective treatment technologies. Although State agencies are interested in obtaining information pertaining to state-designated emergent chemicals (n-nitrosodimethylamine, 1,4-dioxane, 1,2,3-trichloropropane, hexavalent chromium, and polybrominated diphenyl ether), this document pertains only to gathering additional perchlorate information from DoD installations and FUDS in California.

Purpose and Scope

The purpose of this document is to aid DoD Services and State Agencies in prioritizing perchlorate sampling activities. Both the State Agencies and DoD recognize that, for the most part, the cost of investigation of perchlorate releases has not been included in the environmental restoration budgets, nor have the investigation activities been programmed into the schedule of environmental activities at most DoD installations and FUDS. Where these activities were unplanned and unbudgeted, given limited funding and competing sampling needs, this document is intended to aid DoD and the State in prioritizing perchlorate investigations, assigning the highest priority to those DoD installations in California where perchlorate releases have impacted drinking water sources.

Because the most pressing concern is the protection of California's water supply, this guideline focuses its sampling and investigation efforts on drinking water impacts. This focus is not intended to discount or dismiss other potential impacts or exposure pathways that may also pose a concern.

This prioritization protocol is not intended to delay or replace perchlorate sampling and response actions where DoD Services and installations have already budgeted resources and scheduled activities. This includes sampling and response actions associated with ongoing regulatory activities being overseen and/or directed by US EPA, the State, and/or the military in its capacity as lead agent under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). For sites where resources have already been budgeted and activities scheduled that include perchlorate, the ongoing

efforts to characterize and respond to known perchlorate contamination should continue and should not be delayed by re-assessing the installation/site using this protocol.

This guideline is only a first step in identifying potential perchlorate releases at DoD installations and FUDS. If perchlorate releases are discovered, it is the intention of both DoD and the State to more fully characterize and respond to those problems by timely integration into DoD's Munitions Response Site Prioritization Protocol [10 USC 2710(b)] and DoD's existing environmental response programs under the Defense Environmental Restoration Program (DERP), appropriate Base Realignment and Closure (BRAC) programs, Resource Conservation and Recovery Act (RCRA), and/or the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

In many instances, DoD installations and FUDS have voluntarily sampled for perchlorate at Defense Environmental Restoration Program sites, in accordance with CERCLA and the NCP, and at drinking water supply systems in accordance with the Unregulated Contaminant Monitoring Rule, as implemented by states. Much of the information collected to date has been made available to State agencies. DoD Services and their Installations will continue providing this data to the State as it becomes available.

This protocol does not apply to operational ranges. Ranges are addressed as part of a separate DoD program as referenced in the "DoD Sampling Policy" section of this document, immediately below.

DoD Sampling Policy

To adequately plan and budget for future program requirements, DoD issued policy on 29 Sep 2003 (see attached), which directs DoD Components to: 1) continue to consolidate existing perchlorate occurrence data; 2) sample any previously unexamined sites where a perchlorate release is suspected because of DoD activities and where a complete human exposure pathway is likely to exist; and 3) establish and maintain databases containing perchlorate sampling data collected during the course of compliance monitoring. In carrying out this policy in California, DoD Services and their installations propose to work with State agencies in accordance with the following guidelines.

It is noteworthy to mention that Ranges are addressed in the DoD Munitions Action Plan (MAP) with a web link shown here - https://www.denix.osd.mil/denix/DOD/Working/OEESCM/Map/map-finalnov01.doc. Further, the DoD interim Policy on Perchlorate Sampling of 29 Sep 03 addresses Ranges as follows:

> "Assessing operational ranges for the potential for off-range migration of perchlorate is consistent with the Munitions Action Plan and the Defense Planning Guidance (DPG) requirements. The DPG requires the Secretaries of the Military Departments to assess potential hazards from off-range migration of munitions constituents. This policy memorandum requires the Military Departments to include perchlorate in future range assessments".

State Responsibilities

The State environmental regulatory agencies are responsible for ensuring protection of public health and the environment, including protection of the waters of the state as well as other resources. This document is not intended to substitute or abridge the State agencies' responsibilities or authorities in fulfilling its public health and environmental protection mandates.

Guidelines

These guidelines outline planning, prioritization, investigation/sampling and reporting of perchlorate activities to be undertaken by the DoD Services at installations and FUDS in California in coordination with State agencies.

1. Planning

In accordance with DoD Interim Sampling Policy of 29 Sep 03, the cognizant service office will screen those installations and FUDS where DoD use of perchlorate may have resulted in a release to the environment. The purpose of these planning activities is to gather information related to the following three questions to assist in the prioritization effort:

1) Was perchlorate used, and if so, where?
2) Was perchlorate released into the environment, and if so, is there information to indicate quantities?
3) Is there a likely complete human exposure pathway for drinking water (public and private sources)?

The following are activities to be carried out by DoD Services and the Installations and State agencies in this planning effort:

DoD:

a) Review existing records to determine the history of perchlorate use and the likelihood of releases to the environment. Activities that could potentially result in or contribute to perchlorate releases are identified in Table 1. DoD Services and Installations should consider the amount of perchlorate used, or disposed, and/or the extent of perchlorate related activities at active or closed installations, non-operational ranges and FUDS.
b) Work with State agencies to assess if a perchlorate release is likely to have occurred.
c) Evaluate the relationship between the proximity of the potential perchlorate-release areas to the likelihood of human exposure.
d) Coordinate all findings with State agencies.

State Agencies:

Use Geographical Information System (GIS) data and analytical results from drinking water source testing to:

a) Develop maps and other resources to illustrate the proximity between perchlorate detections at a concentration of ≥ 6 ppb in drinking water supply wells and sources and nearby (within 1 (one) and 5 (five) miles) DoD installations or FUDS.
b) For those drinking water supply wells where perchlorate has been detected at a concentration of ≥ 6 ppb and which are located within one mile or five miles of the nearest DoD installation or FUDS, determine if perchlorate has been detected more than once, using historical analytical results.
c) Develop maps and other resources to illustrate the proximity between any other public drinking water supply wells or sources and nearby (within one mile or five miles) DoD installations or FUDS.
d) Determine whether a non-DoD perchlorate release is within 1 or 5 miles of the impacted public water supply source.
e) Coordinate all findings with DoD Services and Installations.

2. Prioritization

Sites identified through the planning step as potential or actual sources of perchlorate contamination and for which environmental data are not available will be prioritized for sampling in coordination with State agencies. A Relative Priorities Table (See Table 2) is provided to aid the project managers in prioritizing perchlorate sampling at installations and FUDS.

The relative priority is a function of that which is known about perchlorate in sources of drinking water, that which is known about releases of perchlorate, and the proximity of the DoD installation or FUDS where a release may have occurred to a source of drinking water. The close proximity (within one mile) of an impacted drinking water source to a known perchlorate release at a DoD installation or FUDS would warrant the highest priority for sampling.

3. Investigation/Sampling

State agencies and DoD Services and Installations will work cooperatively to define sampling requirements for each installation or FUDS.

DoD:

a) Identify significant data gap(s) at installations and FUDS with highest priority rankings during the planning and prioritization steps. The DoD Services and Installations will develop a sampling plan and schedule to address the data gap(s). The sampling plan and schedule should consider previously scheduled environmental response activities, available funding, and base closure activities (if applicable).
b) The sampling plan should address primarily groundwater sampling, using existing sampling locations. The plan may also consider sampling groundwater treatment system influent and/or effluent as an option for determining groundwater and surface water impacts. In situations where no sampling locations exist between a facility and an impacted well, the necessary investigation to determine if perchlorate has been released to groundwater will be decided between the agency and installation.
c) The sampling plan should specify the use of US EPA or California approved analytical methods for the appropriate media and address analytical reporting limits and any potential interference that may affect the reporting limit.

Sampling plan and schedule development for each installation or FUDS will be coordinated with the appropriate state agencies.

State Agencies:

a) Provide information on sampling requirements, including reviewing elevated detection limits, potential migration pathways, and laboratory methods.
b) Coordinate requirements with DoD Services and Installations.
c) If State agencies desire to collect split samples, such a request will be communicated at the time of the development of the plan.
d) Will request DHS to pursue water purveyors to sample public water supply sources that have not been tested within one mile or five miles of DoD sites.

4. Reporting

Installations and FUDS will report results of investigation/sampling to regulatory agencies concurrent with reporting required by the DoD sampling policy. Results will be submitted in a format consistent with the format required by the DoD sampling policy.

The current analytical reporting limit per the approved US EPA-method for drinking water is 4 ppb and any results below this value may be reported as < 4ppb or verification of selected samples should be done using LC/MS/MS. Values lower than 4 ppb should also be reported with qualifications of the testing method.

5. Response Actions

This document is intended to address only the collection and submittal of perchlorate data in accordance with the above-described guidelines. If perchlorate releases are discovered, it is the intention of both DoD and the State to more fully characterize and respond to those problems by timely integration into DoD's Munitions Response Site Prioritization Protocol [10 USC 2710(b)] and DoD's existing environmental response programs under the Defense Environmental Restoration Program (DERP), appropriate Base Realignment and Closure (BRAC) programs, Resource Conservation and Recovery Act (RCRA), and/or the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Any activities beyond the reporting of data will be addressed separately.

Anti-Deficiency Act

Any requirement for the payment, expenditure or obligation of funds by a DoD Installation with regards to work under this Protocol, shall be subject to the availability of appropriated funds and the provisions of 10 U.S.C. section 2703. No provision of this Protocol shall be interpreted to require obligation or payment of funds in violation of the Anti-Deficiency Act, 31 U.S.C. section 1341. In cases where payment or obligation of funds would constitute a violation of the Anti-Deficiency Act, the schedules and dates established requiring the payment or obligation of such funds shall be appropriately adjusted.

TABLE 1
DoD ACTIVITIES WITH POTENTIAL FOR PERCHLORATE RELEASE

Activity	Yes	Maybe	Comments
Solid Fuel Missile & Rocket Manufacture/Maintenance	X		"Hog out" due to shelf –life limitations
Munitions Manufacture/Maintenance	X		
Munitions Training or Testing	X		
Munitions Demilitarization	X		"Hog-Out" of solid propellants
Munitions Open Burn/Open Detonation Facility	X		
JATO Bottle Maintenance		X	
Flare Disposal	X		
Ordnance Propellants Manufacture/Maintenance		X	
Pyrotechnics	X		
Dye Marker Disposal		X	by-product or an impurity
Electroplating Facility		X	by-product or an impurity
* This table does not identify all possible perchlorate activities. The list reflects major types of activities that should be considered for this initial prioritization.			

TABLE 2
RELATIVE PRIORITIES

Priority		Drinking Water Supply Impact? ♦			Perchlorate Release Area?			Distance Between Perchlorate Release Area (or Installation or Site Boundary) and Drinking Water Supply Source ♦	
		Yes	Unknown	No*	Yes	Unknown	No**	Within 1 mile	> 1 mile but < 5 miles
HIGHEST	a.	X			X			X	
	b.	X			X				X
	c.	X				X		X	
	d.	X				X			X
	e.		X		X			X	
	f.		X		X				X
	g.			X	X			X	
	h.			X	X				X
	i.		X			X		X	
	j.		X			X			X
	k.			X		X		X	
	l.			X		X			X
	m.†	X					X	X	
	n.†	X					X		X
	o.†		X				X	X	
LOWEST	p.†		X				X		X

♦ Drinking water supply refers to either the drinking water well or surface water intake.

* Available data shows that testing was performed but that perchlorate was not detected at detectable levels.

** This category includes sites where perchlorate has been handled but information available shows no evidence of a release.

† No action required at this time. Although under this protocol sampling may not be required, this is not equivalent to a State agency regulatory decision of "No Further Action."

PRIORITIZATION PROTOCOL FOR PERCHLORATE AT DEPARTMENT OF DEFENSE FACILITIES IN CALIFORNIA

PLANNING

DoD

- Review records for onsite perchlorate use, disposal, processing
- Determine DoD installations and FUDS where use of perchlorate may have resulted in a release to the environment.
- Coordinate with State agencies on the assessment of a potential perchlorate release and the likelihood of a completed pathway to human receptors

State Agencies

- Evaluate the proximity between water supply sources and DoD installations or FUDS
- Evaluate historical analytical results of water supply sources to determine if perchlorate has been detected, and if so, more than once.
- Coordinate with DoD installations in the planning process.

PRIORITIZATION

DoD

- Identify and prioritize potential and actual perchlorate contaminated sites for sampling, according to the state-provided ranking.
- Coordinate with State agencies on prioritizing sites.

State Agencies

- Provide ranking system to aid project managers in prioritizing perchlorate sampling at installations.
- Coordinate with DoD Services and Installations in submitting a sampling plan or reporting sampling data based on the prioritization rank.

INVESTIGATION /SAMPLING

DoD

- Develop sampling plan and schedule for high priority facilities with data gaps. Treatment system influent and effluent can be used as one way to determine impacts to groundwater.
- Potential perchlorate release(s) to an impacted drinking water source will be considered.

State Agencies

- Provides advice on sampling requirements, including reviewing elevated detection limits, potential migration pathways, split samples, and laboratory methods.
- Coordinates requirements with DoD Services and Installations