

WEST BASIN MUNICIPAL WATER DISTRICT

AUGUST 6, 2003 - Water Resources
McDonald, Little

AUGUST 25, 2003 - Board Meeting

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INFORMATION CALENDAR

SEAWATER BARRIER WATER CONSERVATION PROJECT UPDATESUMMARY:**Revised "Draft" Groundwater Recharge Regulations**

On July 21, 2003, the State Department of Health Services (DHS) issued new draft groundwater recharge regulations. These draft regulations serve as the basis for DHS' recommendations to the state agency charged with issuing permits for groundwater injection projects, the Regional Water Quality Control Board. DHS has been developing the draft regulations over the past 10-15 years and has not yet promulgated them, but in effect they serve as a set of "defacto" rules or regulations.

The most significant revision is the requirement to monitor for new or emerging unregulated compounds. The new list includes action levels, endocrine disrupting compounds, pharmaceuticals, and other substances.

Action Level Compounds

Action Levels are unregulated compounds that DHS develops a health advisory, non-enforceable limit without having to weave through a lengthy standards setting process. "Health advisory" levels can be quickly set for a compound that has been recently detected or suspected to be present in a source water. This concept was developed in 1979 in response to new chemicals discovered during special monitoring associated with the EPA Superfund sites in both the San Gabriel and San Fernando groundwater basins. The contamination was primarily from discharge and/or storage of industrial solvents that "leaked" into the underground aquifers. The first "action levels" were set for two industrial solvents, formerly used by the defense industry, referred to as PCE and TCE. Since then the "list" of action levels has grown to almost 40 compounds. In comparison, the present list of regulated compounds (enforceable drinking water standards) totals 107 compounds. The following is a list of action levels that that DHS is requiring monitoring for:

Boron, Chromium 6, Dichlorodifluoromethane, Ethyl tert-butyl ether (ETBE), perchlorate, Tert amyl methyl ether (TAME), Tertiary butyl alcohol (TBA), 1,2,3-Trichloropropane (1,2,3-TCP), Vanadium, formaldehyde, n-butylbenzene, sec-butylbenzene, tert-butylbenzene, carbon disulfide, chlorate, 2-chlorotoluene, diazinon, 1,4-dioxane, formaldehyde, isopropylbenzene, n-propylbenzene, 1,2,4 - trimethylbenzene, and 1,3,5-trimethylbenzene.

Other chemicals of interest to monitor because of their derivative nature to NDMA are:

N-Nitrosodiethylamine (NDEA) and N-Nitrosopyrrolidine.

Staff has already initiated a program to begin monitoring for the action levels, with the following results:

**ACTION LEVEL COMPARISON
 FOR MF/RO PRODUCT WATER AT WBWRP**

Contaminant	AL (mg/L)	Maximum Concentration in MF/RO water
Boron	1	0.42
Carbon disulfide	0.16	ND
Chlorate	0.8	ND
Perchlorate	0.004	ND
Formaldehyde	0.1	0.013
Vanadium	0.05	0.034
1,4-Dioxane	0.003	ND
1,3-Dichlorobenzene	0.6	ND
Diazinon	0.006	ND
N-Nitrosodimethylamine	0.00001	0.000088*
Tert butyl alcohol (TBA)	0.012	ND
1,2,3-Trichloropropane (1,2,3-TCP)	0.000005	ND
1,2,4-Trimethylbenzene	0.33	ND
1,3,5-Trimethylbenzene	0.33	ND
2-Chlorotoluene	0.14	ND
Dichlorodifluoromethane	1	ND
Isopropylbenzene	0.77	ND
n-Butylbenzene	0.07	ND
n-Propylbenzene	0.26	ND
Naphthalene	0.17	ND
sec-Butylbenzene	0.26	ND
tert-Butylbenzene	0.26	ND
Phenol	4.2	ND
Aldrin	0.000002	ND
Dieldrin	0.000002	ND

* As part of the barrier expansion project, UV radiation will reduce NDMA levels < 0.00001 mg/L.

Endocrine Disrupting Compounds (EDCs)

Hormones are naturally released from our endocrine system into our bloodstream to regulate our bodily functions such as growth, metabolism and reproduction. When an imbalance in its release exists, hormones can be supplemented from prescription pills, such as steroids. However, when an extreme imbalance persists, either from an under or over presence of the hormones, the endocrine system can be disrupted, which can lead to human health implications. This is referred to as "Endocrine Disrupting Compounds" or EDC's. Also included for your reference in Exhibit "A", is a most Frequently Asked Questionnaire (FAQ) on EDC's.

These class of compounds refer to chemicals that could be present in a source water, such as recycled water, and that in a few European studies have shown to have some possible effect to aquatic organisms when present in a low part per billion (i.e.

1 second in 32 years) or part per trillion (i.e. 1 second in 32,000 years) concentration level. In most instances the effect to human health is unknown. DHS' requirement to monitor for these compounds is in response to the issue of public perception. In a best case scenario, the compounds would be non-detect that would either reflect their absence prior to or following RO treatment. Staff has anticipated many of these monitoring requirements, and with the on-going support of the Board, has begun testing for some of these compounds.

Monitoring List for EDC's and other Substances

DHS clearly states that these samples are being collected for information purposes only, and that monitoring for these chemicals is viewed as a "diligent way of assessing and verifying recycled water quality characteristics that can be useful in addressing issues of public perception about the safety of recharge projects". Many of these chemicals do not have an approved EPA or DHS test method. DHS recommends that they should be consulted prior to implementing a monitoring program.

Following is the list of EDC's and other substances that DHS is requiring monitoring for:

Ethinyl estradiol, 17-B estradiol, estrone, bisphenol A, nonylphenol and nonylphenol polyethoxylates, octylphenol and octylphenol polyethoxylates, polybrominated diphenyl ethers, acetaminophen, amoxicillin, azithromycin, caffeine, carbamazepine, ciprofloxacin, ethylenediamine tetra-acetic acid (EDTA), gemfibrozil, ibuprofen, iodinated contrast media, lipitor, methadone, morphine, salicylic acid and triclosan.

District Response to EDC's

In anticipation of these issues, the District has already engaged a number of studies on this subject. During the 100% Barrier Expert Review Panel meetings, the panel recommended testing for emerging pharmaceutical compounds. Staff consulted with a leading University on this subject matter, California Berkley. At that time, UC Berkley had developed a method to analyze for specific number of pharmaceutical compounds, namely the most commonly used pharmaceuticals. The concept was that this "short" list could quickly determine a presence-absence of these drugs in a waste water treatment system. Samples were analyzed on two different occasions with the following results:

Pharmaceuticals

		Detection Limit	Units	RO Effluent
ibuprofen	anti-inflammatory	10	ng/L	ND
naproxen	anti-inflammatory	10	ng/L	ND
gemfibrozil	cholesterol	10	ng/L	ND
diclofenac	anti-inflammatory	10	ng/L	ND
ketoprofen	anti-inflammatory	10	ng/L	ND
indometacine	anti-inflammatory	10	ng/L	ND
ciprofloxacin	antibiotic	20	ng/L	ND
sulfamethoxazole	antibiotic	20	ng/L	ND

In addition, numerous research projects have been approved by the Board to address the issue of how effective does Reverse Osmosis remove trace levels of organic compounds. Initial results indicate that many, if not all, of the previously described compounds are effectively rejected by thin film composite RO membranes.

Other Items

In the revised regulations, DHS also notes that they are continuing to seek input from the regulated community on the most effective minimum UV and hydrogen peroxide dose. Staff anticipates engaging an advanced oxidation consultant to assist the District in working closely with DHS on establishing the appropriate feed dose of hydrogen peroxide for the Barrier expansion project.

FISCAL IMPACTS:

The fiscal year 2003-04 budget programs include designated funds in the Capital Improvement budget to achieve the aforementioned Project activities.

ENVIRONMENTAL COMPLIANCE:

The Board has authorized staff to engage consulting services for developing the documents to comply with the CEQA and NEPA requirements.

COMMITTEE STATUS:

This item was reviewed by the Water Resources Committee on August 6, 2003 and agendized to the August 25, 2003 Board meeting Consent Calendar.

RECOMMENDED MOTION:

This item is for information only.

EXHIBIT:

Exhibit "A" - Most Frequently Asked Questions on EDC's

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