

**MWD**

METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

August 24, 1992

*To:* Board of Directors (Engineering & Operations Committee--Information)  
*From:* General Manager  
*Subject:* Evaluation of Laboratory Expansion Alternatives

Report

The Water Quality Laboratory (WQL) was designed in 1981 to accommodate 57 chemists, microbiologists, technicians, and engineers by 1991. However, the number of WQL staff has increased to 73 in 1992, owing to the increased regulatory activity from adoption of the Safe Drinking Water Act (SDWA) amendments in 1986. Under the SDWA amendments, 62 new maximum contaminant levels (MCLs) were set in 1992 for a current total of 83. More MCLs are expected in the near future. In addition to overcrowding problems, the existing facilities are inadequate for several advanced analytical methods essential for monitoring water quality. Accordingly, additional laboratory space is required to accommodate current overcrowding (approximately 35 percent) and provide facilities to meet regulations anticipated by 2001 (approximately 65 percent).

In October 1991, your Board approved Appropriation No. 635 to finance a conceptual and preliminary design and environmental feasibility study of an expansion of the WQL in La Verne. In July 1992, your Board approved authorization to enter into a contractual agreement with the consulting firm of Stone Marraccini Patterson for the maximum amount payable of \$300,000 to develop conceptual and preliminary design of the WQL expansion. This board letter is in response to questions raised at the July Board meeting concerning the use of contract laboratories, leasing laboratory space, and/or delaying the expansion as alternatives.

Metropolitan currently sends out about \$40,000 of contract analyses annually. These services are generally used when it is not cost-effective to develop the method in-house (Table 1). The benefits of using contract laboratories include avoiding the capital, operation, and maintenance requirements of

laboratory facilities. However, there can be significant limitations to using contract laboratories. For example, in August 1991, a contract laboratory found extremely high levels of diethylhexylphthalate (DEHP) in Lake Mathews (see Item 1 in Table 2). Based on these results, Lake Mathews potentially could have been taken out of service to avoid an MCL violation. Metropolitan rapidly developed and performed the analysis in-house and determined the contract laboratory data were wrong. Similar problems occurred with the contract laboratory analyses for the human pathogen Giardia (see Item 2 in Table 2).

Some analyses which are essential for Metropolitan's day-to-day, applied research, and planning needs are not available at contract laboratories (Table 3). For example, Metropolitan developed a method for detecting bromate, a disinfection by-product of ozone and PEROXONE treatment, which could represent a significant health concern and possibly jeopardize the use of ozone/PEROXONE.

Another limitation of using contract laboratories occurs when fast turnaround times are critical. For example, operational changes at source water reservoirs and treatment plants to avoid massive consumer taste-and-odor complaints requires extremely rapid turnaround time of analyses. If a contract laboratory agrees to rush an analysis, there is often at least a 100 percent surcharge. Rapid in-house analyses also become critical for assisting Metropolitan's member agencies and sub-agencies when water quality problems arise. Such analyses have been conducted for metals, taste-and-odor, lead and copper, coliform bacteria, volatile organic compounds, and problems due to nitrification. In addition, extensive in-house capability allows direct response to chemical spills or potential sabotage incidents (see Items 3 and 4 in Table 2). In-house, state-of-the-art capabilities have also provided data for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary hearings (see Item 5 in Table 2), and have been essential for assisting other Metropolitan divisions as requested.

Other alternatives to expanding the WQL are leasing laboratory space and extending laboratory hours. There is currently no available laboratory space for lease in the proximity of the WQL. Also, leasing would separate staff who currently must deal with each other face-to-face on a daily basis, and this decentralization would require additional office support staff. Importantly, the laboratory-consulting firm of Earl Walls Associates has estimated that retrofit of existing

August 24, 1992

office/warehouse space would cost approximately \$3 million more than the projected WQL expansion. Extending laboratory hours (beyond the 12 hours daily operation) would result in the need for additional technical and supervisory staff and equipment which would compound the already crowded conditions in the WQL. Automation at the WQL is currently maximized. Modifying the inside of the building to maximize usage has already been accomplished and some laboratory staff are currently being housed off-site temporarily due to lack of space even though this causes inefficiencies.

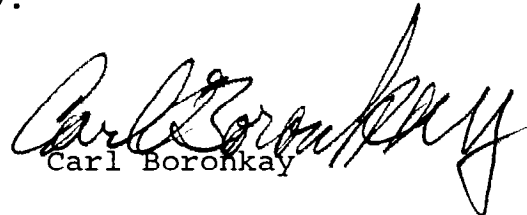
Board Committee Assignments

This letter was referred for information to:

The Engineering and Operations Committee because of its authority to study, advise, and make recommendations with regard to the production and treatment of water pursuant to Administrative Code 2431 (c).

Recommendation

For information only.

  
Carl Boronkay

SEB:EGM:rma  
BOARD/AM2

Attachments

**TABLE 1**

**Analyses Performed by Contract Laboratories for Metropolitan**

Radiological

Certain pesticides and other  
organic compounds

Asbestos

Biological/chemical  
oxygen demand

Foaming agents

Sulfides

Oil and Grease

Boron

**TABLE 3**

**Analyses Currently Not Available at Contract Laboratories**

Disinfection by-products

Bromate

Aldehydes

Cyanogen bromide

Chloral hydrate

Flavor profile analyses

Ammonia oxidizing bacteria

**TABLE 2: Examples of Problems with Contract Laboratories**

	<u>Date</u>	<u>Problem</u>	<u>Ramifications</u>	<u>Resolution</u>
1.	8/91	High levels of diethylhexylphthalate erroneously detected by contract laboratory	Violation of drinking water standard, remove source water from service	In-house staff analyses showed data were invalid
2.	8/91 - 12/91	Poor recovery of <u>Giardia</u> by contract laboratory for pilot studies	Misleading removal of <u>Giardia</u> may have altered treatment	Put pilot work on hold until MWD staff can be made available, pursued alternative physical solutions
3.	6/92	Insufficient analytical turnaround time to identify copper sulfate spill on shore at Lake Skinner	Potential to be declared a hazardous waste spill, requiring expensive cleanup; potential harm to public	Same day analyses by staff showed white powder to be essentially copper sulfate, an algicide which was washed into lake
4.	2/91	Insufficient analytical turnaround time to address potential contamination threat of the California aqueduct	Shut down aqueduct	Staff worked past midnight to run a range of analyses to show normal water quality
5.	5/92	Delta Wetlands Project obtained erroneous trihalomethane formation potential data on Delta water using contract lab	If erroneous data had been accepted, they would have indicated less impact from seasonal wetlands on Delta	MWD staff ran split samples, showed errors
6.	Ongoing	Only one laboratory performs taste and odor analyses; turnaround time is too slow	Avoid massive consumer complaints	Develop analyses in-house