



WATER QUALITY MANAGEMENT PROGRAM 2009 PROGRAM REPORT

This annual report summarizes 2009 water quality monitoring data and provides an update on Zone 7 Water Agency's Water Quality Management Program (WQMP), which the agency established with its Retailers and interested contractors in 2003. The WQMP provides the basis for identifying ways to meet anticipated future regulations, reduce public health risks, and improve the delivered water quality - especially its taste, odor and hardness, by effectively managing water quality issues, guiding operations, upgrading or improving facilities, and providing new facilities when necessary.

WQMP WATER QUALITY TARGETS are internal goals that Zone 7 applies to specific constituents that affect potable and non-potable water quality. These targets set goals that are significantly more stringent than existing regulations. Some of these constituents have been identified as "key parameters of concern" based upon the concerns expressed by our customers and the levels found in our local drinking water supplies, and anticipated changes in regulations. In 2009, Zone 7 met all of its primary drinking water standards (PDWS) and non-potable water quality targets. However, some of our operational and secondary (non health-related, often called aesthetic) water quality targets were not met consistently, including those for drinking water hardness, total dissolved solids, chloride, chloramine residuals, free ammonia residuals, and total trihalomethanes.

HOW ARE WE MEETING WQMP WATER QUALITY TARGETS? Zone 7 continued to work on and support operational and planning activities that help meet our water quality targets and ensure that the service area has enough water. In addition to ongoing internal agency planning, we also work closely with various organizations to protect source water at the State level. Water quality improvement projects were identified in Zone 7's Capital Improvement Program (CIP). The Mocho Groundwater Demineralization Plant, was started up in July 2009 and is planned to be operated approximately nine months per year (except during drought periods) to meet the salt removal goal from the groundwater basin per the Salt Management Plan and to facilitate achieving the WQMP's target hardness and TDS (less than 150 mg/L and 500 mg/L respectively) in delivered water supply. Other key improvement projects are anticipated for later completion (permanent Taste and Odor Treatment at Del Valle and Patterson Pass Water Treatment Plants which will be scheduled based on estimated costs and funding availability; and the next phase of demineralization currently planned for 2018). In the interim, Zone 7 will continue seasonal powdered activated carbon (PAC) feed at Del Valle and Patterson Pass treatment plants to assist in reducing levels of odor-causing compounds.

DEFINITIONS

Primary Drinking Water Standard (PDWS): *MCLs and MRDLs (Maximum Residual Disinfectant Levels) for contaminants that affect health along with their monitoring and reporting requirements, and water treatment requirements.*

MCL: *Maximum Contaminant Level, the highest level of a contaminant that is allowed in drinking water. Primary MCLs are set as close to the PHGs (Public Health Goals) or MCLGs (Maximum Contaminant Level Goals) as is economically and technologically feasible. Secondary MCLs are set to protect the non health-related or aesthetic characteristics of water such as odor, taste, and appearance of drinking water.*

mg/L: *milligrams per liter, a unit expressing the concentration of chemical constituents in solution as weight (milligram) of solute per unit volume (liter) of water; equivalent to one part per million;*

Table 1. Status of Potable Water Quality Targets

Key Parameters of Concern	Water Quality Targets ¹	Target Currently Met	Requires Optimization	Requires Capital Investment	Supplemental Table/Figure
Appearance	Minimize air bubbles/cloudiness events ⁴	✓			Table 2b
Arsenic (µg/L)	<5	✓			Figure 1
Chloramines					
Total Residual (mg/L as Cl ₂)	2.0 - 2.5 from water treatment plants (WTPs), wells will be operated to be as close to this target range as feasible	✓ ²			Figure 6
Cl ₂ :NH ₃ -N	4:1 to 5:1	✓ ³			
Minimize odor	Chloraminate above pH 8.0 for WTPs	✓			
Prevent Nitrification:					
Free Ammonia Residual (mg/L as N)	<0.15 at retailer turnouts	✓			Figure 7
Nitrite (mg/L as N) ⁷	<0.02	NA			
Consistency	Provide consistent chloramine residual at all wells and WTPs	✓ ²			Figure 6
Chloride (mg/L)	<100	✓ ²			Figure 3
Chromium VI Cr⁶⁺ (µg/L)	<20 (pending potential regulations)	✓			Figure 2
Cryptosporidium	4-log removal, including multi-barrier control	✓			
Disinfection By-Products (DBPs)					
Maximum leaving WTP	Total Trihalomethanes (TTHMs) <64 µg/L	✓			Figure 9a
	Five Haloacetic acids (HAA5) <48 µg/L	✓			Figure 9b
Running Annual Average (RAA) DBPs at Retailer Turnouts	TTHM <40 µg/L	✓ ⁸	✓		Figure 8a
	HAA5 <30 µg/L	✓			Figure 8b
N-Nitrosodimethylamine (NDMA) (ng/L)	<10 (pending potential regulations)	NA ⁶			
Hardness (mg/L as CaCO₃)	<150	✓ ⁵	✓		Figure 5
pH (Units)	non-corrosive	✓			
	pH leaving WTP at +/- 0.2 units of target	✓			
Radon (pCi/L)	<1000 (pending potential regulations)	NA			
Taste and Odor (earthy/musty)					
Odor Threshold Concentrations					
2-Methylisoborneol (MIB)	9 ng/L	✓	✓	✓	
Geosmin	4 ng/L	✓	✓	✓	
Events ⁴	No events	✓	✓	✓	Table 2a
Total Dissolved Solids (TDS) (mg/L)	<500	✓ ²		✓	Figure 4

¹Targets are either at the secondary MCLs or 80% of the primary MCLs except for the key parameters of concern in the table above.

² Averages met target.

³ Ratio is adjusted to meet target free ammonia residual.

⁴ An event is defined as when three or more similar complaints are received in a 7-day period. There were no events in 2009.

⁵ Averages met target for CWS and Livermore only.

⁶ Latest NDMA monitoring conducted in 2008.

⁷ Monitoring discontinued with retailer consent in 2006 due to lack of any nitrite detections. Future monitoring to be conducted as requested by retailers.

⁸ Averages were met except for City of Livermore. City of Livermore RAA was 43 ug/L.

Table 2a. Retail Customer Water Quality Complaints reported to Zone 7*

Parameter	Dublin San Ramon Services District (DSRSD)	City of Pleasanton	Cal Water Service	City of Livermore	Totals
Odor					
chlorinous		4			4
earthy/musty					
unspecified/other					
Colored/Murky					
Turbidity/Suspended Solids					
Salty Taste					
Hardness		34			34
Others					

Table 2b. Cloudy Water Complaints*

Retailer	Cloudy/Air
DSRSD	
Pleasanton	1
CWS	
Livermore	

*The complaints are reported to Zone 7 by the end of each month and are deemed to be directly related to the Zone 7 water supply.

Table 3. Status of Non-Potable Water Quality Targets

Key Parameters of Concern	Units	Maximum Applied Level/Targets	Average Targets	SBA***		
		Vineyards		Avg	Min	Max
Boron**	mg/L	<1	<0.5	0.16	<0.1	0.31
Chloride	mg/L	<200	<125	75	20	127
Emitter Clogging Potential Ca+Mg+	mEq/L	3 to 4	3 to 4	2.1	1.4	3.3
Available Nitrogen from Nitrate	mg/L as N	-	<10 during summer	0.5	0.1	1.2
pH	---	-	<8.0	7.8	7.4	8.1
Sodium	mg/L	<200	<100	55	23	85
Total Dissolved Solids	mg/L	-	<650	278	162	401

**Boron minimum reporting limit (MRL) is at 0.10 mg/L.

***SBA data is an average of monthly untreated water samples taken from the Del Valle WTP and the Patterson Pass WTP.

Figure 1. Arsenic

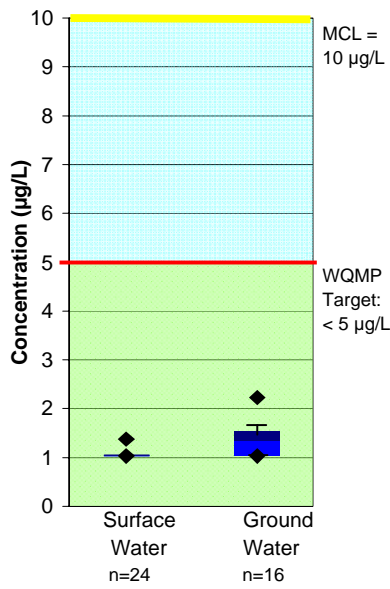


Figure 2. Total Chromium

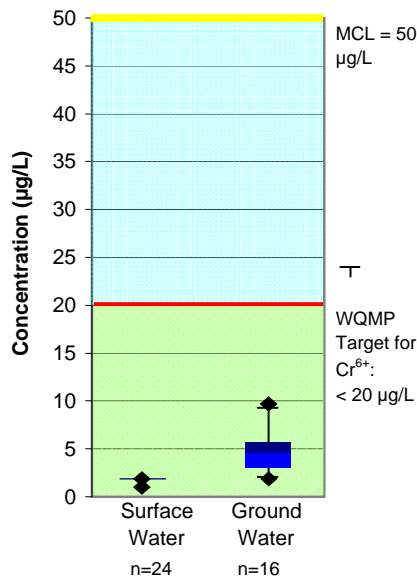
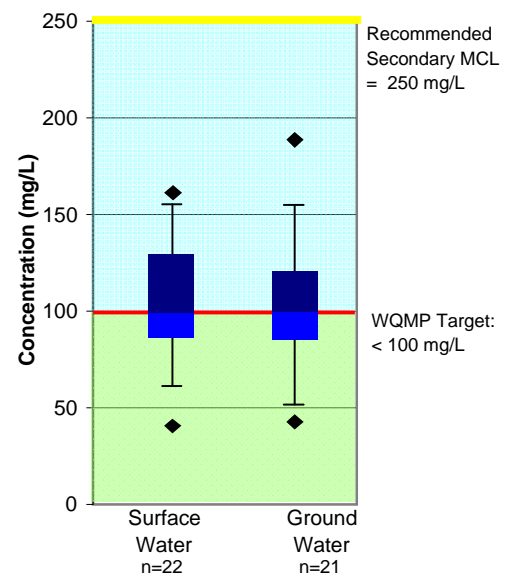
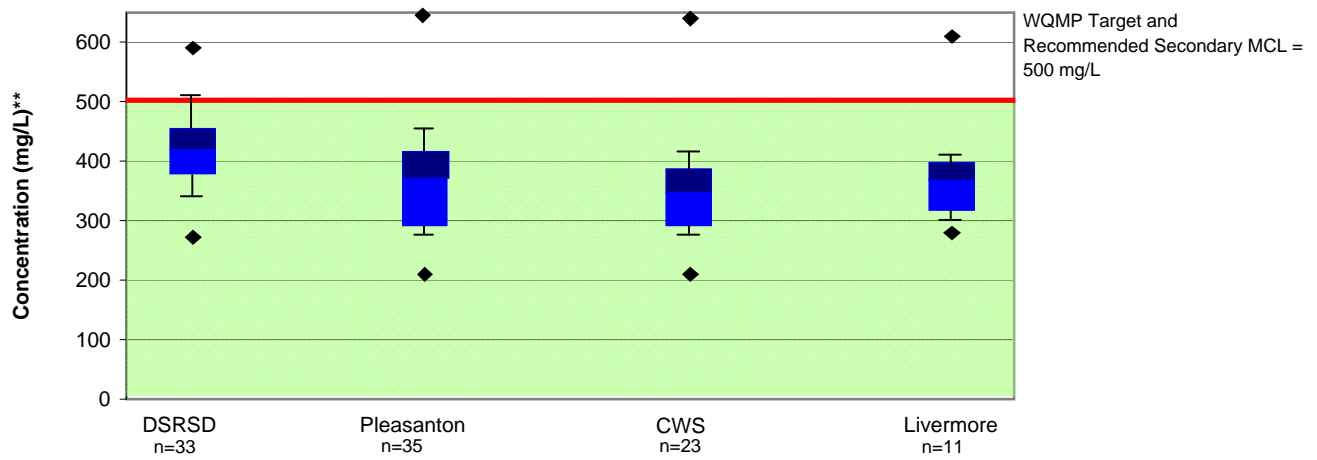


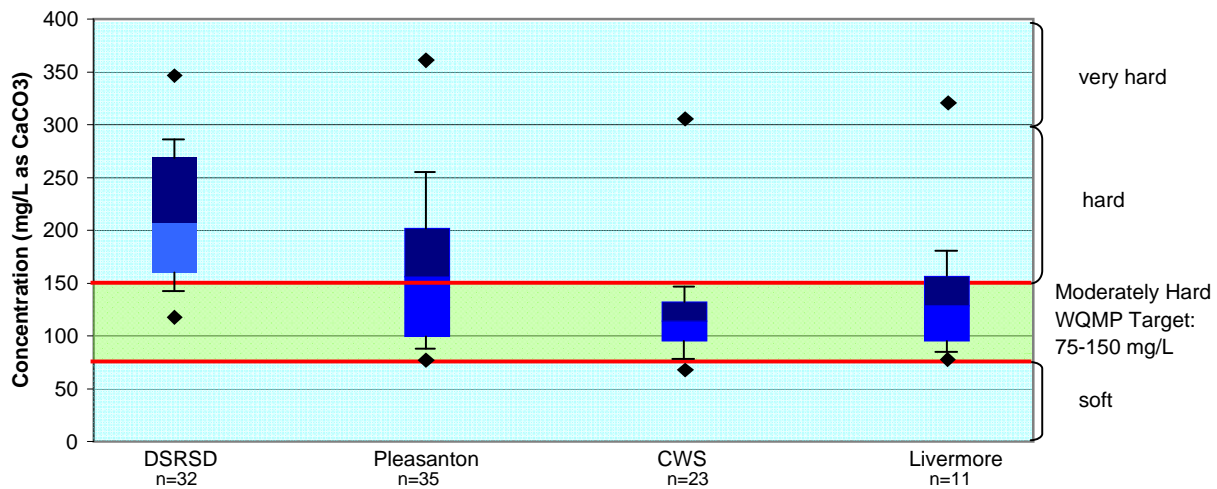
Figure 3. Chloride



**Figure 4. Total Dissolved Solids (TDS)*
Retailer Turnout Samples**



**Figure 5. Total Hardness
Retailer Turnout Samples**



*TDS is estimated from electrical conductivity

HOW TO READ WATER QUALITY TARGET GRAPHS Each bar on the chart represents the range of measurements for various constituents monitored during 2009. The junction of the light blue and dark blue bars represent the average values over the year. The span of the light and dark blue bars represents the 75th and 25th percentile values of the data set. The error bars represent the 90th and 10th percentile values, and the black diamonds represent the data set outliers. WQMP water quality targets or ranges are highlighted in green. Any applicable maximum contaminant level (MCL) set by state and federal water quality regulations are highlighted by the yellow bar at the top of each chart. "n" represents the number of samples analyzed.

- ◆ ← Outlier
- ← 90%
- ← 75%
- ← Average
- ← 25%
- ← 10%
- ◆ ← Outlier

**Figure 6. Total Residual Chlorine*, **
Retailer Turnout Samples**

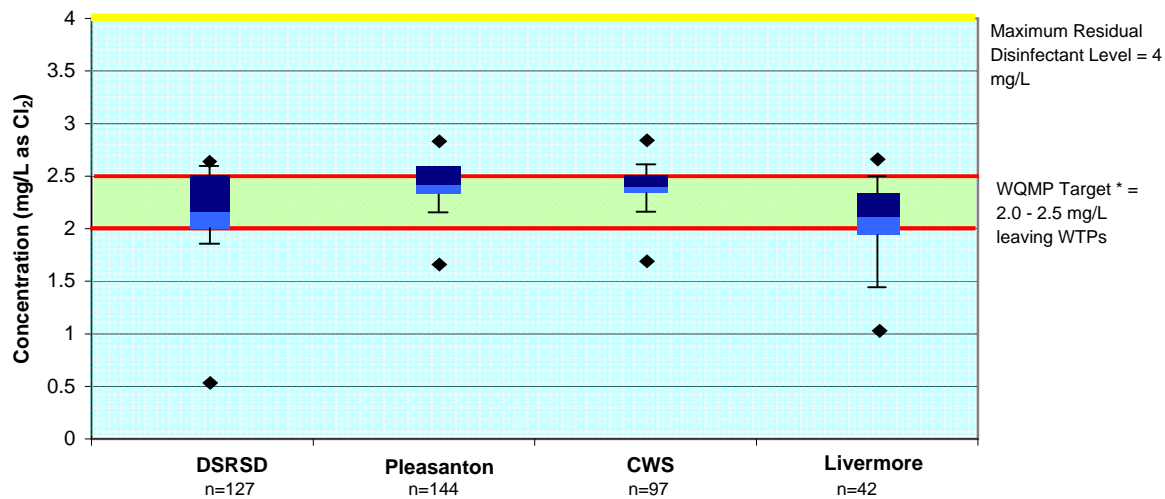
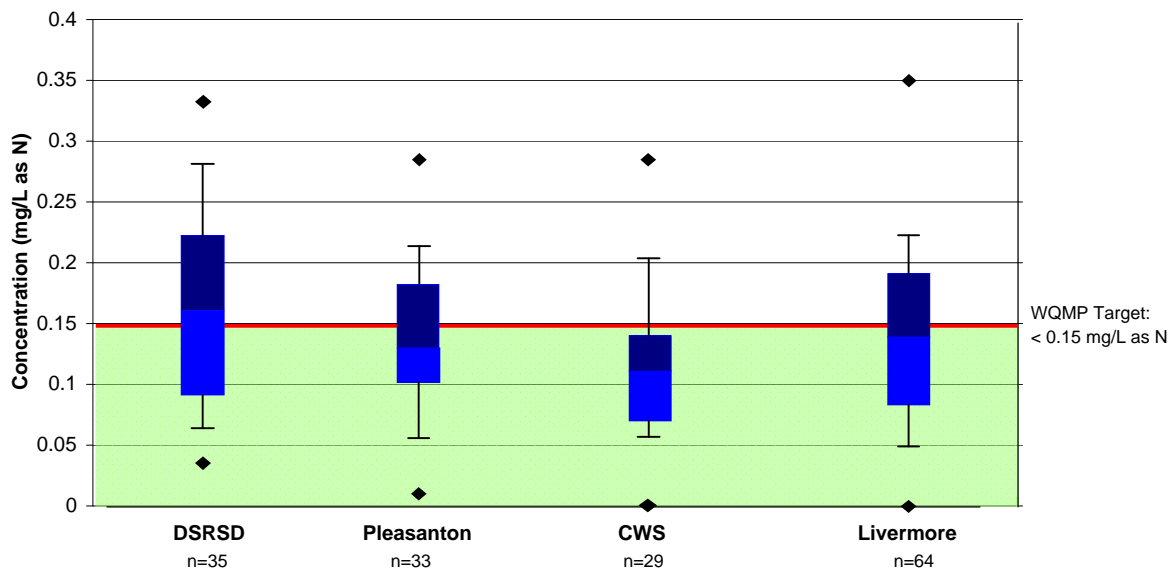


Figure 7. Free Ammonia*, *
Retailer Turnout Samples**

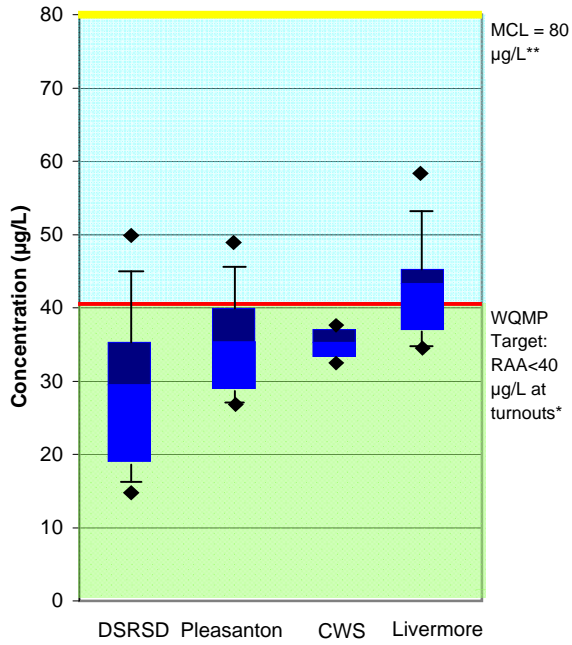


* Data represents weekly monitoring for each retailer.

** Lower residuals are mostly from groundwater sources. Residuals leaving WTPs are mostly within the target range except for a few brief incidents during a plant startup.

*** There is no established MCL for Free Ammonia

**Figure 8a. Total Trihalomethanes (TTHMs)* **
Retailer Turnout Samples**



**Figure 8b. Five Haloacetic Acids (HAA5)* **
Retailer Turnout Samples**

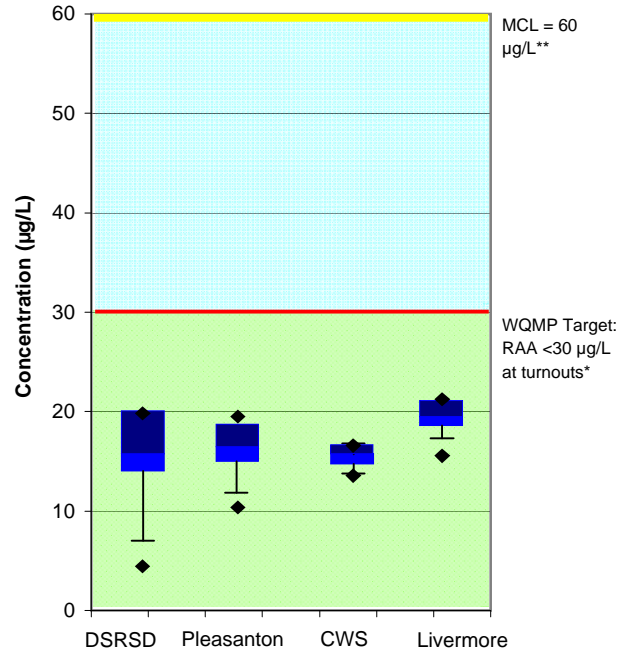


Figure 9a. Total Trihalomethanes (TTHMs)*
WTP Effluent Samples**

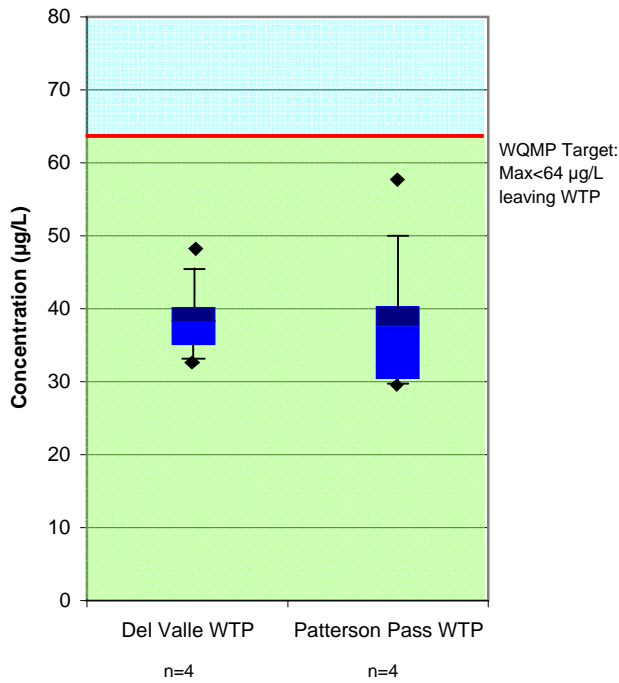
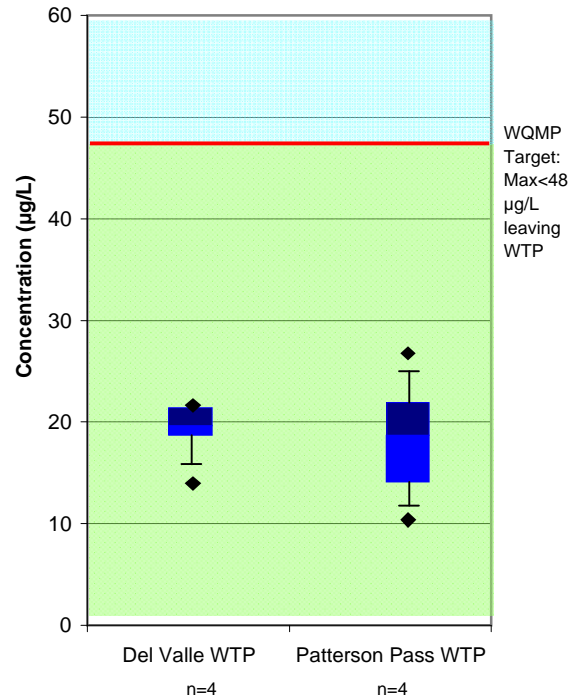


Figure 9b. Five Haloacetic Acids (HAA5s)*
WTP Effluent Samples**



* Quarterly running annual average (RAA) DBPs at Retailer's turnouts.

** Retailer MCL compliance for TTHMs/HAA5s is determined by system-wide RAA of quarterly samples.

*** There is no MCL for TTHMs/HAA5s leaving WTP.