Regional Water Quality Newsletter

DATE: Report for April 2011
Sampling conducted January – April 2011
A Tempe, Glendale, Peoria, CAP, SRP – ASU Regional Water Quality Partnership

http://enpub.fulton.asu.edu/pwest/tasteandodor.htm

New Format and Frequency

The Newsletter will come about every other month due to a reduction in funding for monitoring. We still hope to respond to interesting water events while continuing long term monitoring.

Quick Update of Water Supplies for April 2011

Source	Trend in supply	Discharge to water supply system	Flow into SRP Canal System	**MIB** (Geosmin) [Cyclocitrol] Concentration (ng/L)	Dissolved organic carbon Concentration (mg/L)
Salt River	Reservoirs nearly full	8 cfs	539 cfs into **Arizona Canal**	**12** (3) [<2]	5.3 mg/L
Verde River	Reservoirs nearly full	1142 cfs	469 cfs into **South Canal**	**<2** (<2) [<2]	3.4 mg/L
Colorado River	Reservoirs at near historic lows (Lake Pleasant is nearly full)	3601 cfs from Colorado River (Lake Pleasant filling slowly at 5 cfs)	No **CAP water** passing into SRP canals	**<2** (<2) [<2]	3.1 mg/L
Groundwater	Generally increasing due to recharge	76 cfs pumping by SRP	76 cfs **Groundwater Pumping** into SRP Canals	--	0.5 to 1 mg/L

SUMMARY: EVALUATION AND RECOMMENDATIONS

1. MIB plus geosmin levels above 10 ng/L in finished water lead to noticeable earthy-musty odors by customers. Currently MIB+geosmin levels are below 10 ng/L in the canals and treated water. However, concentrations are increasing already in Saguaro Lake. Cyclocitrol has been 5 to 10 ng/L for the past 3 months.

2. We show long term trends in DOC concentrations in the reservoir systems as some cities consider ordering more CAP water, with lower DOC, into the SRP canal system.

3. Data from a local study on powder activated carbons for control of trihalomethanes (THMs), a disinfection by-product, are included. They show that a super-fine PAC lead to improved THM control.

4. Update on fluoride regulations from February 2011 by the USEPA

Taste and Odor Data

MIB plus geosmin levels above 10 ng/L in finished water lead to noticeable earthy-musty odors by customers. Currently MIB+geosmin levels are above 10 ng/L in the canals.

Water Supply Sources

Reservoir Samples – April 5, 2011

Sample Description	Location	MIB (ng/L)	Geosmin (ng/L)	Cyclocitral (ng/L)
Lake Pleasant (March11)	Eplimnion	<2.0	<2.0	<2.0
Lake Pleasant (March11)	Hypolimnion	<2.0	<2.0	<2.0
Verde River @ Beeline		<2.0	2.3	4.9
Bartlett Reservoir	Epilimnion	<2.0	<2.0	<2.0
Bartlett Reservoir	Epi-near dock	<2.0	<2.0	<2.0
Bartlett Reservoir	Hypolimnion	<2.0	<2.0	<2.0
Salt River @ BluePt Bridge				
Saguaro Lake	Epilimnion	12.7	3.3	<2.0
Saguaro Lake	Epi - Duplicate	12.6	3.5	<2.0
Saguaro Lake	Epi-near dock	<2.0	2.3	<2.0
Saguaro Lake	Hypolimnion	<2.0	<2.0	<2.0
Lake Havasu (March11)		<2.0	<2.0	<2.0
Verde River at Tangle Creek (Feb11)		<2.0	2.2	<2.0

Reservoir Samples – March 1, 2011

Sample Description	Location	MIB (ng/L)	Geosmin (ng/L)	Cyclocitral (ng/L)
Lake Pleasant (Feb11)	Eplimnion	<2.0	<2.0	<2.0
Lake Pleasant (Feb11)	Hypolimnion	<2.0	<2.0	<2.0
Verde River @ Beeline		<2.0	<2.0	6.3
Bartlett Reservoir	Epilimnion	<2.0	<2.0	<2.0
Bartlett Reservoir	Epi-near dock	<2.0	<2.0	<2.0
Bartlett Reservoir	Hypolimnion	<2.0	<2.0	<2.0
Salt River @ BluePt Bridge				
Saguaro Lake	Epilimnion	<2.0	3.1	<2.0
Saguaro Lake	Epi - Duplicate	<2.0	3.6	<2.0
Saguaro Lake	Epi-near dock	2.2	2.8	<2.0
Saguaro Lake	Hypolimnion	2.0	<2.0	<2.0
Lake Havasu (Feb11)		<2.0	3.4	<2.0
Verde River at Tangle Creek (Jan11)		<2.0	2.9	<2.0

Taste and Odor Sampling continued

Canal Sampling				
		Cyclocitral Concentration (ng/L)		
System	**Sample Description**	**11-Feb**	**Mar-11**	**Apr-11**
CAP	Waddell Canal	**<2.0**	**<2.0**	**2.1**
	Union Hills Inlet			
	CAP Canal at Cross-connect			**4.7**
	Salt River @ Blue Pt Bridge			
	Verde River @ Beeline	**3.4**	**6.3**	**4.9**
AZ	AZ Canal above CAP Cross-connect	**4.5**	**3.3**	**3.9**
Canal	AZ Canal below CAP Cross-connect	**3.3**	**18.5**	**4.7**
	AZ Canal at Highway 87	**18.0**	**2.9**	**5.4**
	AZ Canal at Pima Rd.	**3.7**	**4.7**	**4.5**
	AZ Canal at 56th St.		**7.8**	**4.1**
	AZ Canal - Central Avenue	**<2.0**	**7.8**	**5.1**
	AZ Canal - Inlet to Glendale WTP	**<2.0**	**11.7**	**5.5**
South	South Canal below CAP Cross-connect		**5.6**	**2.5**
Tempe	Head of the Tempe Canal	**2.6**	**5.1**	**5.1**
Canals	Tempe Canal - Inlet to Tempe's South Plant	**2.1**		

Concentrations of MIB in canals WTP locations were
< 3 ng/L

(data available upon request)

Organic Matter in Water Treatment Plants

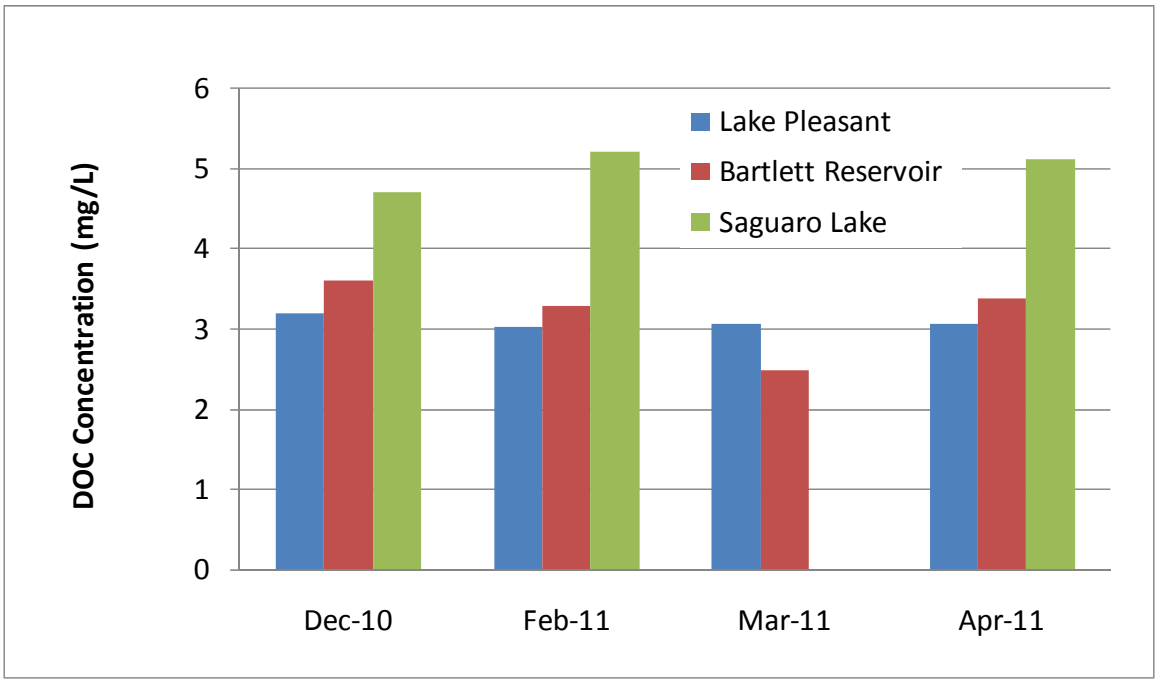
Water Treatment Plants –April 04, 2011									
Sample Description	**DOC (mg/L)**	**UV254 (1/cm)**	**SUVA (L/mg-m)**	**TDN**		**DOC removal (%)**			
Union Hills Inlet	**2.60**	**0.04**	**1.60**	**0.58**			Data from Waddell Canal		
Union Hills Treated	**2.29**	**0.02**	**1.08**	**0.52**		**12**			
Tempe North Inlet	**3.09**	**0.07**	**2.40**	**0.32**					
Tempe North Plant Treated	**1.99**	**0.03**	**1.60**	**0.28**		**36**			
Tempe South WTP									
Tempe South Plant Treated							offline		
Greenway WTP Inlet	**3.00**	**0.07**	**2.35**	**0.82**					
Greenway WTP Treated	**2.57**	**0.03**	**1.16**	**1.06**		**14**			
Glendale WTP Inlet	**3.30**	**0.07**	**2.24**	**0.57**					
Glendale WTP Treated							offline		

DOC = Dissolved organic carbon
UV254 = ultraviolet absorbance at 254 nm (an indicator of aromatic carbon content)
SUVA = UV254/DOC
TDN = Total dissolved nitrogen (mgN/L)

Sample Description	**DOC (mg/L)**	**UV254 (1/cm)**	**SUVA (L/mg-m)**	**TDN**
Waddell Canal	**2.60**	**0.04**	**1.60**	**0.58**
Union Hills Inlet				
CAP Canal at Cross-connect				
Salt River @ Blue Pt Bridge				
Verde River @ Beeline	**3.00**	**0.07**	**2.48**	**0.22**
AZ Canal above CAP Cross-connect	**2.98**	**0.07**	**2.46**	**0.24**
AZ Canal below CAP Cross-connect	**2.99**	**0.07**	**2.42**	**0.23**
AZ Canal at Highway 87	**3.02**	**0.07**	**2.43**	**0.21**
AZ Canal at Pima Rd.	**3.24**	**0.07**	**2.29**	**0.59**
AZ Canal at 56th St.	**3.06**	**0.07**	**2.36**	**0.34**
AZ Canal - Inlet to 24th Street WTP				
AZ Canal - Central Avenue	**3.20**	**0.07**	**2.27**	**0.38**
AZ Canal - Inlet to Deer Valley WTP				
AZ Canal - Inlet to Glendale WTP	**3.30**	**0.07**	**2.24**	**0.57**
AZ Canal - Inlet to Greenway WTP	**3.00**	**0.07**	**2.35**	**0.82**
South Canal below CAP Cross-connect	**2.95**	**0.07**	**2.49**	**0.33**
South Canal at Val Vista WTP				
Head of the Tempe Canal	**3.06**	**0.07**	**2.44**	**0.26**
Tempe Canal - Inlet to Tempe's South Plant				
Chandler WTP – Inlet				

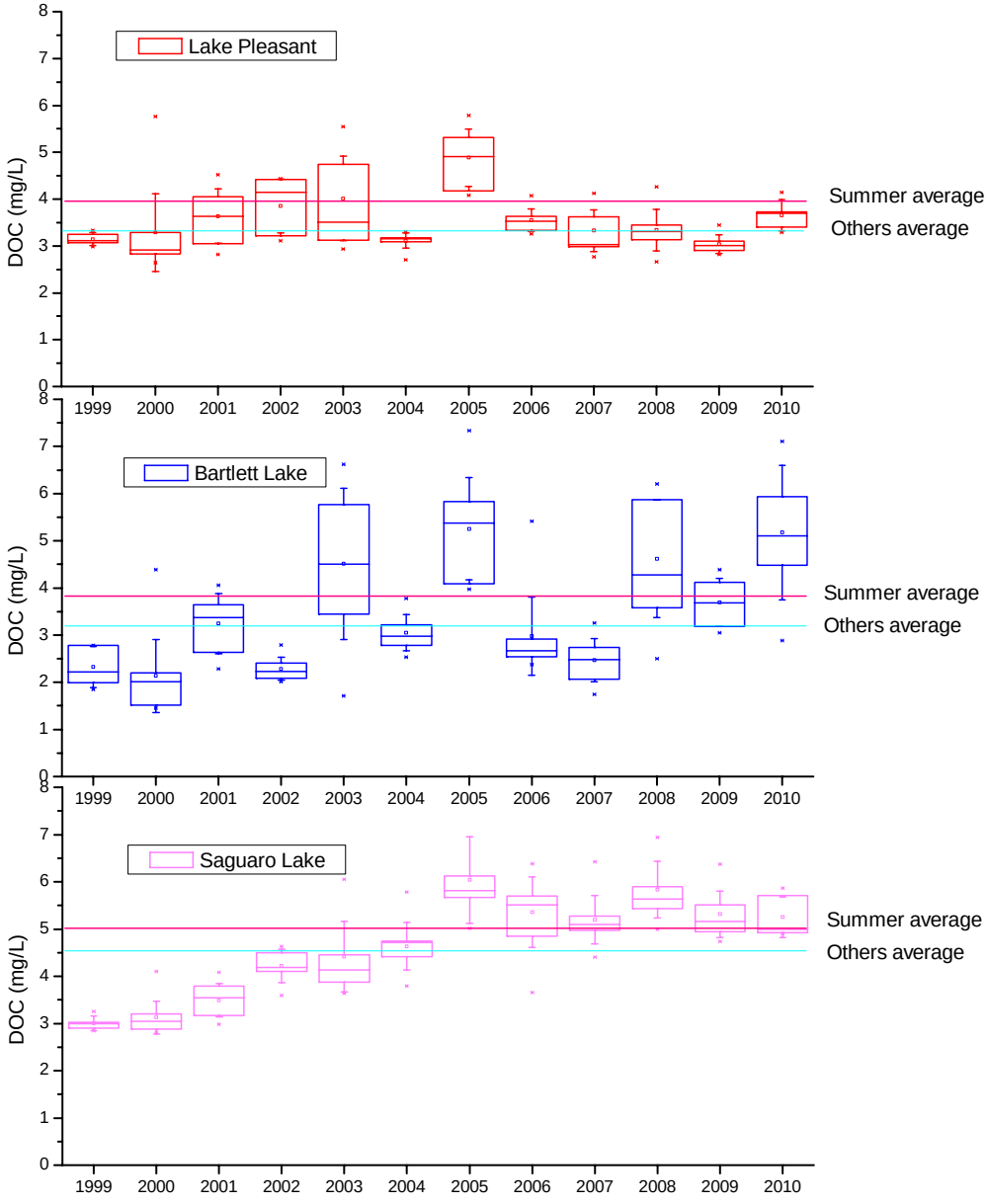
Table 4 - Reservoir Samples – April 04, 2011					
Reservoir sampling will be conducted only monthly.					
CAP is sampling Lake Pleasant on slightly different days than the other reservoirs.					
Sample Description	**Location**	**DOC (mg/L)**	**UV254 (1/cm)**	**SUVA (L/mg-m)**	**TDN**
Lake Pleasant - March 2011	Eplimnion	**3.06**	**0.05**	**1.58**	**0.39**
Lake Pleasant - March 2011	Hypolimnion	**3.06**	**0.05**	**1.58**	**0.39**
Verde River @ Beeline		**3.00**	**0.07**	**2.48**	**0.22**
Bartlett Reservoir	Epilimnion	**3.77**	**0.09**	**2.30**	**0.35**
Bartlett Reservoir	Epi-near dock				
Bartlett Reservoir	Hypolimnion	**3.38**	**0.08**	**2.32**	**0.25**
Salt River @ BluePt Bridge					
Saguaro Lake	Epilimnion	**5.41**	**0.09**	**1.75**	**0.57**
Saguaro Lake	Epi - Duplicate	**5.25**	**0.09**	**1.75**	**0.46**
Saguaro Lake	Epi-near doc				
Saguaro Lake	Hypolimnion	**5.12**	**0.09**	**1.84**	**0.40**
Verde River at Tangle	Jan-11	**5.00**	**0.19**	**3.73**	**0.22**
Havasu	Feb-11	**2.90**	**0.04**	**1.42**	**0.60**

Four month Trend in DOC levels in the Reservoirs



Long Term Trends in DOC
For the Terminal Water Supply Reservoirs in metro-Phoenix

The graph below shows annual statistics in DOC levels for the 3 primary reservoir supplies. The bar and wisker diagrams show averages (middle line in box) and then different percentiles. Lake Pleasant is fairly constant, except in 2005 when heavy rains brought water and organics down the Aqua Fria River into Lake Pleasant. Bartlett Lake on the Verde River shows the greatest annual variability because of a lake of significant upstream storage to attenuate fluctuations from runoff. A gradual increase in DOC concentrations in Saguaro Lake, which is the lower most reservoir of 5 on the Salt River, has occurred since 2001.



Use of Powder activated carbon (PAC) to control organics and THM precursors

("S" is a super-fine PAC)

Figures excerpted from *Deer Valley Water Treatment Plant Chlorine Dioxide and Ferrous Chloride Full-Scale Demonstration Testing.* Prepared by Malcolm Pirnie, Inc. and Wilson Engineers.DRAFT: November 2010.

Figure 3-49: TOC Removal with PAC Types

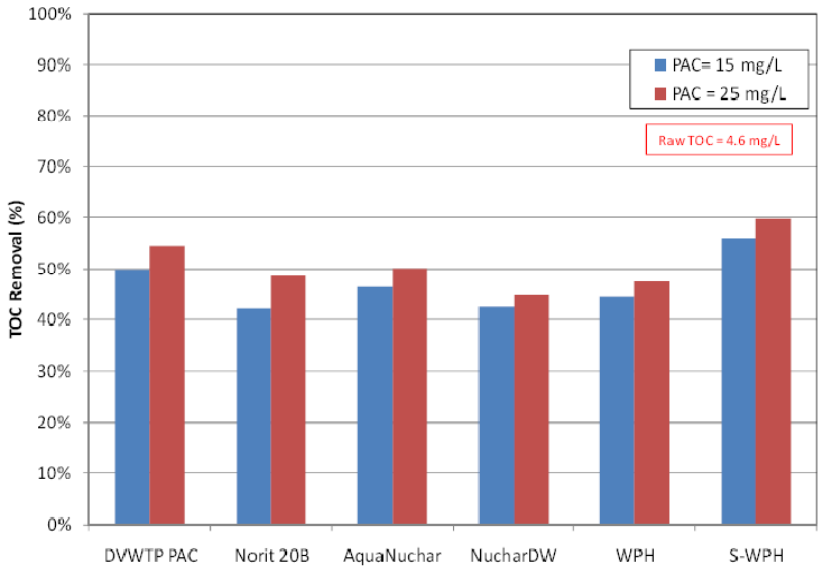
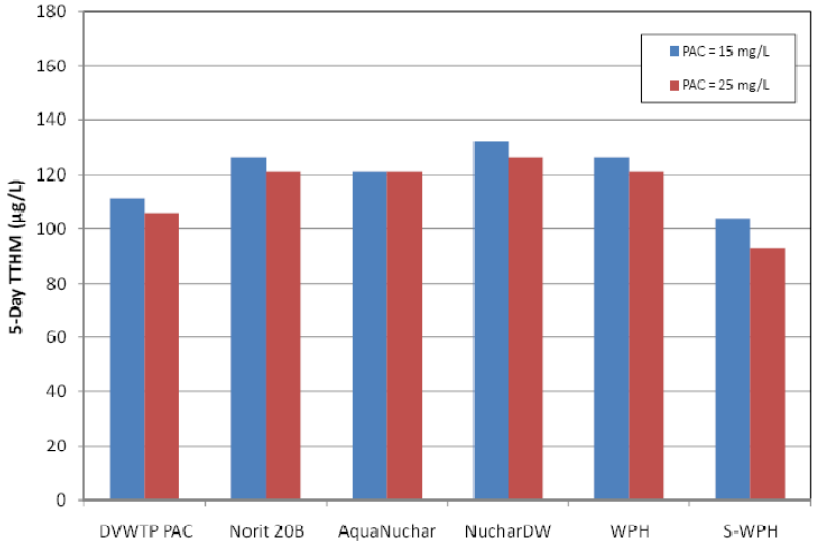


Figure 3-50: TTHM Formation with PAC Types



News Release

FOR IMMEDIATE RELEASE
Friday, January 7, 2011

Contact: OASH ashmedia@hhs.gov 202-205-0143
EPA isa.jalil@epa.gov or 202-564-3226

HHS and EPA announce new scientific assessments and actions on fluoride

Agencies working together to maintain benefits of preventing tooth decay while preventing excessive exposure

WASHINGTON – The U.S. Department of Health and Human Services (HHS) and the U.S. Environmental Protection Agency (EPA) today are announcing important steps to ensure that standards and guidelines on fluoride in drinking water continue to protect the American people while promoting good dental health, especially in children. HHS is proposing that the recommended level of fluoride in drinking water can be set at the lowest end of the current optimal range to prevent tooth decay, and EPA is initiating review of the maximum amount of fluoride allowed in drinking water.

These actions will maximize the health benefits of water fluoridation to Americans by continuing to prevent tooth decay while reducing the possibility of children receiving too much fluoride.

"One of water fluoridation's biggest advantages is that it benefits all residents of a community—at home, work, school, or play," said HHS Assistant Secretary for Health Howard K. Koh, MD, MPH. "And fluoridation's effectiveness in preventing tooth decay is not limited to children, but extends throughout life, resulting in improved oral health."

"Today both HHS and EPA are making announcements on fluoride based on the most up to date scientific data," said EPA Assistant Administrator for the Office of Water, Peter Silva. "EPA's new analysis will help us make sure that people benefit from tooth decay prevention while at the same time avoiding the unwanted health effects from too much fluoride."

HHS and EPA reached an understanding of the latest science on fluoride and its effect on tooth decay prevention and the development of dental fluorosis that may occur with excess fluoride consumption during the tooth forming years, age 8 and younger. Dental fluorosis in the United States appears mostly in the very mild or mild form – as barely visible lacy white markings or spots on the enamel. The severe form of dental fluorosis, with staining and pitting of the tooth surface, is rare in the United States.

There are several reasons for the changes seen over time, including that Americans have access to more sources of fluoride than they did when water fluoridation was first introduced in the United States in the 1940s. Water is now one of several sources of fluoride. Other common sources include dental products such as toothpaste and mouth rinses, prescription fluoride supplements, and fluoride applied by dental professionals. Water fluoridation and fluoride toothpaste are largely responsible for the significant decline in tooth decay in the U.S. over the past several decades. The Centers for Disease Control and Prevention named the fluoridation of drinking water one of the ten great public health achievements of the 20th century.

HHS' proposed recommendation of 0.7 milligrams of fluoride per liter of water replaces the current recommended range of 0.7 to 1.2 milligrams. This updated recommendation is based on recent EPA and HHS scientific assessments to balance the benefits of preventing tooth decay while limiting any unwanted health effects. These scientific assessments will also guide

EPA in making a determination of whether to lower the maximum amount of fluoride allowed in drinking water, which is set to prevent adverse health effects.

The new EPA assessments of fluoride were undertaken in response to findings of the National Academies of Science (NAS). At EPA's request, in 2006 NAS reviewed new data on fluoride and issued a report recommending that EPA update its health and exposure assessments to take into account bone and dental effects and to consider all sources of fluoride. In addition to EPA's new assessments and the NAS report, HHS also considered current levels of tooth decay and dental fluorosis and fluid consumption across the United States.

The notice of the proposed recommendation will be published in the Federal Register soon and HHS will accept comments from the public and stakeholders on the proposed recommendation for 30 days at CWFcomments@cdc.gov. HHS is expecting to publish final guidance for community water fluoridation by spring 2011. You may view a prepublication version of the proposed recommendation at http://www.hhs.gov/news/press/2011pres/01/pre_pub_frn_fluoride.html. Comments regarding the EPA documents, *Fluoride: Dose-Response Analysis For Non-cancer Effects and Fluoride: Exposure and Relative Source Contribution Analysis* should be sent to EPA at FluorideScience@epa.gov. The documents can be found at http://water.epa.gov/action/advisories/drinking/fluoride_index.cfm

For more information about community water fluoridation, as well as information for health care providers and individuals on how to prevent tooth decay and reduce the chance of children developing dental fluorosis, visit http://www.cdc.gov/fluoridation. For information about the national drinking water regulations for fluoride, visit: http://water.epa.gov/drink/contaminants/basicinformation/fluoride.cfm