

REGIONAL WATER QUALITY NEWSLETTER

DATE: Report for March 2007

Samples Collected on March 12-13, 2007

From the Phoenix, Tempe, Peoria, CAP, SRP – ASU Regional Water Quality Partnership

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

DISTRIBUTION: **Phoenix:** Greg Ramon, Walid Alsmadi, Edna Bienz, Frank Blanco, Alice Brawley-Chesworth, Paul Burchfield, Jennifer Calles, Aimee Conroy, Mark Royce, Tom Doyle, Ron Jennings, Francisco Gonzales, Randy Gottler, Yu Chu Hsu, Maureen Hymel, Ron Jennings, Tom Martin, Shan Miller, Erin Pysell, Paul Mally, Matt Palencia, Chris Rounseville, Raymond Schultz, Bonnie Smith, Jeff Van Hoy, Brian Watson; **SRP:** Gregg Elliott, Brian Moorehead, Rick Prigg; **CAWCD:** Doug Crosby, Patrick Dent, Brian Henning, Tim Kacerek; Steve Rottas; **Tempe:** Tom Hartman; Michael Bershad, Grant Osburn, Sherman McCutcheon.; **Scottsdale:** Michelle DeHaan, B. Vernon; Suzanne Grendahl; **Gilbert:** Antonio Trejo, Bill Taylor; **Glendale:** Tracey Hockett, Usha Iyer, Stephen Rot, Kim Rimmel, Tracy Hockett; **Mesa:** Alan Martindale; Charolette Jones; William Hughes; Matt Rexing **Peoria:** John Kerns, Dave Van Fleet, Linda Wahlstrom; **Chandler:** Lori McCallum, Robert Goff, Victoria Sharp, Jackie Strong, Chris Kincaid, Wendy Chambers; **Tucson:** Michael Dew. **American Water:** Jeff Stuck, Nina Miller **Chaparral City Water Company (CCWC):** Bob Carlson **Consultants:** G. Maseeh, S. Kommineni (Malcom Pirnie); Warren Swanson (Schmueser Gordon Meyer, Inc., Colorado); Troy Day (CZN); Vance Lee, Bob Ardizzone (Carollo Engineering); Paul Westcott, Applied Biochemists, Shugen Pan, Greeley and Hanson, Larry Baker; **ASU Team:** Paul Westerhoff, Marisa Masles, KC Kruger, Hu Qiang, Milt Sommerfeld, Tom Dempster, Paul Westerhoff, **EPA:** Marvin Young; **DEQ,** Casey Roberts

If you wish to receive the *Newsletter* and are not on our list, send your email address to Dr. Paul Westerhoff (p.westerhoff@asu.edu) get a free “subscription”.

SUMMARY: EVALUATION AND RECOMMENDATIONS

1. SRP is releasing nearly 75% Salt River water and 25% Verde River water now into the SRP canals.
2. Saguaro Lake Reservoir contains >100 ng/L of Geosmin near the surface of the reservoir, but not near the bottom where the release gates are located. There is an apparent bloom of T&O producing algae in Saguaro Lake. geosmin levels have increased dramatically over the past month. One reason for the disconnect between geosmin in the Saguaro Lake and not in the Salt River may be that SRP is releasing water from Canyon Lake for repairs on the dam this year. As a result, this water may be moving through Saguaro Lake with minimal mixing.
3. Cyclocitrol produces earthy-musty-moldy odors, and is present throughout the water supply, and is not being removed during water treatment. Concentrations above 20 ng/L become obvious to the public.
4. DOC values are >2.5 mg/L higher now than in February of 2007 at the WTPs, this is because the Salt River has higher DOC levels (4.75 mg/L) than the Verde River (1.9 mg/L). As the water warms this will produce elevated levels of DBPs this summer.
5. We have a NEW feature section for our Newsletter called “For Salt Sakes” – see page 6
6. Although not a scientific magazine, Men’s Health gives the water in our valley a F grade and rates it as 100th in quality for the US (article attached).

Table 1 Summary of WTP Operations

	Union Hills	24 th Street WTP	N.Tempe J.G. Martinez	Deer Valley	Greenway WTP	Val Vista	South Tempe	
Location	CAP	Arizona Canal System				South Canal System		
PAC Type and Dose	None	None		None	None	None	None	
Copper Sulfate	None	None		None	None	None	None	
PreOxidation	None	None		None	1 ppm Ozone	None	None	
Alum Dose Alkalinity pH	6.68ppm ¹ 138/129 7.9	40 ppm 152 7-7.2		45ppm 155/122 7.13	20ppm 149 7.65	40ppm+20ppm H ₂ SO ₄ 194 7.0	15ppm 194 7.46	
Finished water DOC DOC removal ²	2.33 ppm 13%	2.50 ppm 32%		2.55 ppm 25%	2.05 ppm 27%	2.65 ppm 20%		
WTP plant comments			Plant is shut down			Plant reports 35% TOC removal		

¹ **Ferric chloride instead of alum**

² Calculated based upon influent and filtered water DOC (note that DOC – not TOC – is used in this calculation)

Table 2 - Water Treatment Plants – March 12, 2007

Sample Description	MIB (ng/L)	Geosmin (ng/L)	Cyclocitral (ng/L)
24 th Street WTP Inlet	<2.0	2.0	<2.0
24 th Street WTP Treated	<2.0	2.4	<2.0
Deer Valley Inlet	<2.0	<2.0	<2.0
Deer Valley WTP Treated	<2.0	<2.0	<2.0
Val Vista Inlet	<2.0	2.4	13.3
Val Vista WTP Treated –East			
Val Vista WTP Treated -West	<2.0	2.6	7.0
Union Hills Inlet	<2.0	<2.0	10.7
Union Hills Treated	<2.0	<2.0	<2.0
Tempe North Inlet			
Tempe North Plant Treated			
Tempe South WTP	<2.0	<2.0	14.3
Tempe South Plant Treated	<2.0	<2.0	10.7
Tempe South Plant Treated (Lab)			
Chandler WTP Inlet	<2.0	<2.0	2.9
Chandler WTP Treated	<2.0	<2.0	<2.0
Greenway WTP Inlet	<2.0	2.5	<2.0
Greenway WTP Treated	<2.0	<2.0	<2.0

Table 3 - Canal Sampling – March 12, 2007

System	Sample Description	MIB (ng/L)	Geosmin (ng/L)	Cyclocitral (ng/L)
CAP	Waddell Canal	<2.0	<2.0	4.8
	Union Hills Inlet	<2.0	<2.0	10.7
	CAP Canal at Cross-connect	<2.0	<2.0	5.2
AZ Canal	Salt River @ Blue Pt Bridge	<2.0	8.9	13.2
	Verde River @ Beeline	<2.0	<2.0	14.7
	AZ Canal above CAP Cross-connect	<2.0	3.7	8.5
	AZ Canal below CAP Cross-connect	<2.0	<2.0	7.7
	AZ Canal at Highway 87	<2.0	<2.0	<2.0
	AZ Canal at Pima Rd.	<2.0	<2.0	<2.0
	AZ Canal at 56th St.	<2.0	<2.0	<2.0
	AZ Canal - Inlet to 24 th Street WTP	<2.0	2.0	<2.0
	AZ Canal - Central Avenue	<2.0	<2.0	10.1
	AZ Canal - Inlet to Deer Valley WTP	<2.0	<2.0	<2.0
	AZ Canal - Inlet to Greenway WTP	<2.0	2.5	<2.0
South and Tempe Canals	South Canal below CAP Cross-connect	<2.0	5.3	5.3
	South Canal at Val Vista WTP	<2.0	2.4	13.3
	Head of the Tempe Canal	<2.0	<2.0	6.8
	Tempe Canal - Inlet to Tempe's South Plant	<2.0	<2.0	14.3
	Chandler WTP – Inlet	<2.0	<2.0	2.9

Table 4 - Reservoir Samples – March 13, 2007

Sample Description	Location	MIB (ng/L)	Geosmin (ng/L)	Cyclocitral (ng/L)
Lake Pleasant (February 6, 2007)	Epilimnion	<2.0	<2.0	8.4
Lake Pleasant	Hypolimnion	<2.0	<2.0	12.9
Verde River @ Beeline		<2.0	<2.0	14.7
Bartlett Reservoir	Epilimnion	<2.0	<2.0	7.7
Bartlett Reservoir	Epi-near dock	<2.0	<2.0	18.6
Bartlett Reservoir	Hypolimnion	<2.0	<2.0	8
Salt River @ BluePt Bridge		<2.0	8.9	13.2
Saguaro Lake	Epilimnion	<2.0	152.0	4.5
Saguaro Lake	Epi - Duplicate	<2.0	144.9	4.7
Saguaro Lake	Epi-near doc	<2.0	132.9	5.7
Saguaro Lake	Hypolimnion	<2.0	16.0	4.2
Verde River at Tangle (February 28, 2007)		<2.0	<2.0	<2.0
Havasu (February 6, 2007)		<2.0	<2.0	6.4

Below is the data for February 2007 in Saguaro Lake. As can be seen the geosmin levels have increased dramatically over the past month. One reason for this may be that SRP is releasing water from Canyon Lake for repairs on the dam this year. As a result, this water may be moving through Saguaro Lake with minimal mixing.

Reservoir Samples – February 6, 2007

Sample Description	Location	MIB (ng/L)	Geosmin (ng/L)	Cyclocitral (ng/L)
Saguaro Lake	Epilimnion	<2.0	16.7	8.8
Saguaro Lake	Epi - Duplicate	<2.0	21.3	5.8
Saguaro Lake	Epi-near doc	<2.0	24.9	11.1
Saguaro Lake	Hypolimnion	<2.0	<2.0	3.2

Table 5 - SRP/CAP OPERATIONS

Values in cfs, for March 12, 2007

System	SRP Diversions	CAP
Arizona Canal	381	175
South Canal	167	0
Pumping	389	0
Total	937	175

SRP is releasing water from both Verde and Salt River Systems. Salt River release from Saguaro Lake: 311 cfs; Verde River release from Bartlett Lake: 100 cfs.

New Feature Section: For Salt Sakes

This section will periodically give updates on salinity related issues in the valley. If you have something to add, please send it along.

Central Arizona Salinity Study (CASS) - Concentrate Management Study

The Bureau of Reclamation and SROG have entered into an agreement as a follow-up to CASS Phase II, to study a regional concentrate management solution. For the purposes of this study, a regional concentrate management solution is a plan in which any or all the communities of central Arizona can use to dispose of their concentrate in an economical and environmentally safe manner. Attached is the background and tentative schedule for the Concentrate Management Study.

If you have any questions, please call Tom Poulson (Bureau of Reclamation) at 623-773-6278.

Table 6 - Water Treatment Plants – March 12, 2007

Sample Description	DOC (mg/L)	UV254 (1/cm)	SUVA	TDN
24 th Street WTP Inlet	3.67	0.075	2.06	0.49
24 th Street WTP Treated	2.50	0.038	1.51	0.61
Deer Valley Inlet	3.39	0.068	2.02	0.51
Deer Valley WTP Treated	2.55	0.040	1.59	0.41
Val Vista Inlet	3.33	0.071	2.12	0.36
Val Vista WTP Treated –East				
Val Vista WTP Treated -West	2.65	0.031	1.17	0.36
Union Hills Inlet	2.55	0.039	1.53	0.60
Union Hills Treated	2.23	0.023	1.02	0.58
Tempe North Inlet				
Tempe North Plant Treated				
Tempe South WTP	0.53	0.006	1.17	3.20
Tempe South Plant Treated	0.50	0.006	1.27	3.26
Chandler WTP Inlet				
Chandler WTP Treated				
Greenway WTP Inlet	2.81	0.051	1.82	2.83
Greenway WTP Treated	2.05	0.018	0.87	2.49

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)

Tempe south plant has high TDN and low DOC/UVA, I did notice quite a bit of algal growth in the sedimentation basins. The ammonia concentrations are low (<0.02 NH₃-N), and this TDN is mostly nitrate from the groundwater wells. The MCL for nitrate is 10 mg-NO₃-N/L. Groundwater contains low DOC, and is unlikely to form substantial levels of DBPs.

Table 7 - Canal Sampling – March 12, 2007

System	Sample Description	DOC (mg/L)	UV254 (1/cm)	SUVA	TDN
CAP	Waddell Canal	2.57	0.039	1.51	0.61
	Union Hills Inlet	2.55	0.039	1.53	0.60
	CAP Canal at Cross-connect	2.95	0.039	1.31	0.71
AZ Canal	Salt River @ Blue Pt Bridge	4.75	0.100	2.10	0.32
	Verde River @ Beeline	1.63	0.045	2.79	0.25
	AZ Canal above CAP Cross-connect	3.92	0.085	2.18	0.27
	AZ Canal below CAP Cross-connect	3.25	0.061	1.89	0.45
	AZ Canal at Highway 87	3.40	0.062	1.81	0.43
	AZ Canal at Pima Rd.	3.35	0.062	1.85	0.45
	AZ Canal at 56th St.	3.41	0.065	1.90	0.44
	AZ Canal - Inlet to 24 th Street WTP	3.67	0.075	2.06	0.49
	AZ Canal - Central Avenue	3.47	0.064	1.84	0.88
	AZ Canal - Inlet to Deer Valley WTP	3.39	0.068	2.02	0.51
	AZ Canal - Inlet to Greenway WTP	2.81	0.051	1.82	2.83
South and Tempe Canals	South Canal below CAP Cross-connect	3.76	0.087	2.32	0.27
	South Canal at Val Vista WTP	3.33	0.070	2.11	0.36
	Head of the Tempe Canal	0.90	0.011	1.17	1.26
	Tempe Canal - Inlet to Tempe's South Plant	0.53	0.006	1.17	3.20
	Chandler WTP – Inlet				

Table 8 - Reservoir Samples – March 12, 2007

Sample Description	Location	DOC (mg/L)	UV254 (1/cm)	SUVA	TDN
Lake Pleasant	Eplimnion	3.01	0.042	1.41	0.40
Lake Pleasant	Hypolimnio	3.04	0.044	1.44	0.43
Verde River @ Beeline		1.63	0.045	2.79	0.25
Bartlett Reservoir	Epilimnion	1.88	0.043	2.29	0.21
Bartlett Reservoir	Epi-near dock				
Bartlett Reservoir	Hypolimnio	1.85	0.046	2.49	0.24
Salt River @ BluePt Bridge		4.75	0.100	2.10	0.32
Saguaro Lake	Epilimnion	4.97	0.105	2.10	0.30
Saguaro Lake	Epi - Duplicate	4.84	0.103	2.12	0.29
Saguaro Lake	Epi-near doc				
Saguaro Lake	Hypolimnio	4.95	0.103	2.09	0.09
Verde River at Tangle		1.06	0.024	2.29	0.13
Havasu		2.61	0.036	1.39	0.63

When SRP shifts back to Salt River water in the spring, there will be higher DOC that needs to be treated and the potential for higher chlorine demand and more THM formation. This summer could see quite high THM levels.

Magazine ranks 100 cities for water 'cleanliness'

PHOENIX — When it comes to tap water, the city of Phoenix has a bone to pick with the national magazine [*Men's Health*](#).

In a recent [article](#), the magazine put Phoenix tap water last on a list of 100 US cities ranked for tap-water "cleanliness." On the other end of the scale, Denver's tap water ranked as the cleanest.

The magazine cautioned that Phoenix's water was safe to drink and that all the cities on the list had 2005 contaminant levels below the allowed federal maximums.

Men's Health explained that its ranking was based, it said, on "the most recent data on levels of arsenic, lead, halo-acetic acids, and total trihalomethanes (linked to cancer), and total coliform bacteria, plus the number of EPA [US Environmental Protection Agency] water system violations from 1995 to 2005."

In a story carried by [KTVK-TV](#), the Phoenix Water Department's Ken Kroski disputes the magazine's report, saying it's based on "a computer glitch" in which EPA's computer "is listing thousands of violations that never occurred, and this is something the city and state are working on with the EPA."

Like other cities, Phoenix sends out a water quality report every year to the public, showing where its water comes from, how it tests the water, and what substances are found in it, Kroski said

Drinking Problem?

How clean is your drinking water?

Illustrations by: Dung Hoang

Before you folks in Phoenix start screaming, let us say that your water is safe to drink. You don't need to tap a cactus, because what's flowing from the faucet is A-okay. So how come the F? While your H₂O is safe, the water in 99 other cities is cleaner. We examined the most recent data on levels of arsenic, lead, halo-acetic acids and total trihalomethanes (linked to cancer), and total coliform bacteria, plus the number of EPA water-system violations from 1995 to 2005. All the water supplies came in below the EPA's Maximum Contaminant Levels (MCLs) for 2005, although some, like Denver's, are farther below the MCLs than others. As for water-system violations--given for exceeding an MCL or making a monitoring mistake--many cities (uh, Phoenix) racked up thousands. This doesn't mean today's water is tainted, only that there's a history of problems. Still, as glass-half-full types, we'd say that our first-world water supply is generally first rate.

Least Pure

100. Phoenix, AZ	F
99. Indianapolis, IN	F
98. Charlotte, NC	F
97. Los Angeles, CA	F
96. Charleston, WV	D
95. Fort Wayne, IN	D
94. Hartford, CT	D
93. Greensboro, NC	D
92. Billings, MT	D
91. Raleigh, NC	D
90. Yonkers, NY	D
89. Manchester, NH	D
88. Newark, NJ	D
87. Columbus, OH	D
86. Seattle, WA	D
85. Columbia, SC	D
84. Burlington, VT	D
83. Bakersfield, CA	D
82. Salt Lake City, UT	D
81. Oklahoma City, OK	D
80. Orlando, FL	C
79. Sioux Falls, SD	C
78. Cleveland, OH	C
77. Las Vegas, NV	C
76. Boise, ID	C
75. Houston, TX	C
74. Jacksonville, FL	C
73. El Paso, TX	C
72. Portland, OR	C
71. Anchorage, AK	C
70. Bangor, ME	

69.	Toledo, OH	C	
68.	San Diego, CA		C
67.	Durham, NC	C	
66.	Tampa, FL	C	
65.	San Jose, CA		C
64.	Fort Worth, TX		C
63.	Tucson, AZ	C	
62.	Tulsa, OK	C	
61.	Grand Rapids, MI		C
60.	Jackson, MS	C	
59.	Lubbock, TX	C	
58.	Chicago, IL	C	
57.	Cheyenne, WY		C
56.	Pittsburgh, PA	C	
55.	Boston, MA	C	
54.	Milwaukee, WI		C
53.	Sacramento, CA		C
52.	Providence, RI		C
51.	Madison, WI	C	

50.	Austin, TX	C	
49.	Wichita, KS	C	
48.	Miami, FL	C	
47.	Washington, DC		C
46.	Cincinnati, OH		C
45.	Minneapolis, MN		C
44.	Colorado Springs, CO		C
43.	Little Rock, AR		C
42.	Omaha, NE	C	
41.	St. Louis, MO	C	
40.	Albuquerque, NM		C
39.	San Antonio, TX	B	
38.	Wilmington, DE	B	
37.	New York, NY	B	
36.	Philadelphia, PA	B	
35.	Riverside, CA	B	
34.	Spokane, WA	B	
33.	Atlanta, GA	B	
32.	Aurora, CO	B	
31.	Dallas, TX	B	
30.	Corpus Christi, TX		B
29.	Lexington, KY	B	
28.	Arlington, TX	B	
27.	Detroit, MI	B	
26.	Buffalo, NY	B	
25.	Richmond, VA	B	
24.	Rochester, NY	B	
23.	Fresno, CA	B	
22.	Louisville, KY	B	
21.	San Francisco, CA		B
20.	Des Moines, IA	B	
19.	Jersey City, NJ	B	
18.	Lincoln, NE	B	


17. St. Paul, MN B
16. Fargo, ND B
15. Anaheim, CA B
14. Modesto, CA B
13. Nashville, TN B
12. Birmingham, AL B
11. Fremont, CA A
10. Honolulu, HI A
9. Montgomery, AL A
8. St. Petersburg, FL A
7. Oakland, CA A
6. Baltimore, MD A
5. Memphis, TN A
4. Norfolk, VA A
3. Kansas City, MO A
2. Baton Rouge, LA A
1. Denver, CO A

H2uh-Oh

You need a water filter but figure you're covered by the one in your refrigerator's water dispenser. You figure wrong. Most fridge filters remove only offending flavors, with those they miss masked by the ice-cold temp. "The colder temperature numbs your sense of taste," says Tom Boving, Ph.D., a professor of hydrology at the University of Rhode Island.

Dirty Tricks

Last year, the Better Business Bureau took nearly 1,200 consumer complaints about water-testing companies. The most common scenario: A door-to-door salesperson performs a free water test, claims you're drinking sewage, and then sells you thousands of dollars in filtration equipment. Of course, in reality, your water may be just fine. "In most cases, you're pretty much guaranteed it's a scam," says Steve Cox, a spokesman for the Council of Better Business Bureaus. To double-check a dire warning, contact your local water company. (Go to drinktap.org/consumer_dnn/ and click on "Find it here!" to locate your provider.)

http://www.menshealth.com/cda/recipe.do?site=MensHealth&channel=weight.loss&category=abs.diet&conitem=23e099edbbd201099edbbd2010cfe793cd_____&cm_mmc=AbsDietNL_-2007_02_12_-Body_02_-Artery-Aid_St


2007 RODALE INC. ALL rights reserved

<http://www.menshealth.com/cda/article.do?site=MensHealth&channel=health&category=...> 2/13/2007