

REGIONAL WATER QUALITY NEWSLETTER

DATE: Report for November 16, 2006

Samples Collected on November 14, 2006

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

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

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SUMMARY: EVALUATION AND RECOMMENDATIONS

1. SRP is releasing nearly 100% Verde River water into the SRP canals, but is also pumping 118 cfs of groundwater
2. Had SRP been using Salt River water this year (e.g., if we were in an immediate drought), we would be having a considerable MIB problem. The MIB concentration in Saguaro Lake is 20 ng/L – mixed throughout the depth of the lake.
3. Canal Dry-up season is upon us: SRP will be working on portions of the Southside canals from Nov. 17 to Dec. 17 and CANAL WORK STARTS IN NOVEMBER portions of Northside canals from Jan. 5 to Feb. 4. Southside and Northside canals refer to major SRP canals south and north of the Salt River, respectively.
4. DOC concentrations for the month are provided.
5. A time series of arsenic data is presented.
6. Arizona Water Institute funds several projects, including several related to water quality.
7. The ASU/UofA Water Quality Center had its meeting this week – check out the website if you want to join (<http://wqc.asu.edu/program.pdf>)
8. A brief summary of a new water treatment (City of Phoenix Lake Pleasant Plant) is provided. This facility includes processes that will treat for T&O compounds.

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	Chandler WTP
Location	CAP	Arizona Canal System				South Canal System		
PAC Type and Dose	None	None	None	None	None			
Copper Sulfate	None	None	None	None	None			
PreOxidation	None	None	None	None	Ozone 1.2 mg/L			
Alum Dose Alkalinity pH	2.5 ¹ 127/125 7.8	40 224 7.1	34 ³ 234 8.3	45 242/212 7.2	15 247 7.8			**

¹ Ferric chloride instead of alum (Pre-treatment facility is down for scheduled maintenance.)

² Calculated based upon influent and filtered water DOC

³ also adding 3.7 ppm floc aid

**Chandler plant is off line at this time, for the canal dryup. We will more than likely be done through January, due to the plant expansion work.

Table 2 - Water Treatment Plants – December 5, 2006

Sample Description	MIB (ng/L)	Geosmin (ng/L)	Cyclocitral (ng/L)
24 th Street WTP Inlet	2.2	3.5	5.2
24 th Street WTP Treated	2.9	<2.0	9.9
Deer Valley Inlet	<2.0	<2.0	<2.0
Deer Valley WTP Treated	2.5	<2.0	3.0
Val Vista Inlet			
Val Vista WTP Treated –East			
Val Vista WTP Treated -West			
Union Hills Inlet	2.0	2.6	<2.0
Union Hills Treated	2.6	3.2	2.5
Tempe North Inlet	<2.0	3.1	3.2
Tempe North Plant Treated	<2.0	<2.0	2.0
Tempe South WTP			
Tempe South Plant Treated			
Tempe South Plant Treated (Lab)			
Chandler WTP Inlet			
Chandler WTP Treated			
Greenway WTP Inlet	<2.0	3.7	8.2
Greenway WTP Treated	<2.0	3.7	<2.0

Table 3 - Canal Sampling – December 5, 2006

System	Sample Description	MIB (ng/L)	Geosmin (ng/L)	Cyclocitral (ng/L)
CAP	Waddell Canal	2.3	4	<2.0
	Union Hills Inlet	2.0	2.6	<2.0
	CAP Canal at Cross-connect	<2.0	4.0	<2.0
AZ Canal	Salt River @ Blue Pt Bridge	<2.0	<2.0	2.5
	Verde River @ Beeline	2.2	<2.0	<2.0
	AZ Canal above CAP Cross-connect	2.2	4.3	2.4
	AZ Canal below CAP Cross-connect	3.5	3.3	13.6
	AZ Canal at Highway 87	3.2	2.1	4.7
	AZ Canal at Pima Rd.	<2.0	2.8	5.5
	AZ Canal at 56th St.	<2.0	2.5	<2.0
	AZ Canal - Inlet to 24 th Street WTP	2.2	3.5	5.2
	AZ Canal - Central Avenue	2.6	<2.0	4.7
	AZ Canal - Inlet to Deer Valley WTP	<2.0	<2.0	<2.0
	AZ Canal - Inlet to Greenway WTP	<2.0	3.7	8.2
South and Tempe Canals	South Canal below CAP Cross-connect	2.4	<2.0	8.5
	South Canal at Val Vista WTP			
	Head of the Tempe Canal			
	Tempe Canal - Inlet to Tempe's South Plant			
	Chandler WTP – Inlet			

Table 4 - Reservoir Samples – December 5, 2006

Sample Description	Location	MIB (ng/L)	Geosmin (ng/L)	Cyclocitral (ng/L)
Lake Pleasant	Eplimnion	<2.0	<2.0	6.8
Lake Pleasant	Hypolimnion	2.4	<2.0	11.0
Verde River @ Beeline		2.2	<2.0	<2.0
Bartlett Reservoir	Epilimnion	<2.0	<2.0	7.2
Bartlett Reservoir	Epi-near dock	<2.0	<2.0	3.1
Bartlett Reservoir	Hypolimnion	2.5	<2.0	8.3
Salt River @ BluePt Bridge		<2.0	<2.0	2.5
Saguaro Lake	Epilimnion	19.0	2.0	<2.0
Saguaro Lake	Epi - Duplicate	19.0	<2.0	<2.0
Saguaro Lake	Epi-near doc	20.9	3.5	6.4
Saguaro Lake	Hypolimnion	18.1	3.4	10.6
Verde River at Tangle		<2.0	2.8	<2.0
Havasu		<2.0	<2.0	5.1

Had SRP been releasing significant Salt River water this year – we would be having an MIB problem.

Table 6 - SRP/CAP OPERATIONS

Values in cfs, for December 5, 2006

System	SRP Diversions	CAP
Arizona Canal	419	50
South Canal	115	0
Pumping	118	0
Total	652	50

SRP is releasing water from both Verde and Salt River Systems. Salt River release from Saguaro Lake: 8 cfs; Verde River release from Bartlett Lake: 534 cfs.

Canal Dry-up season is here:

We will be working on portions of the Southside canals from **Nov. 17 to Dec. 17** and CANAL WORK STARTS IN NOVEMBER portions of Northside canals from Jan. 5 to Feb. 4. Southside and Northside canals refer to major SRP canals south and north of the Salt River, respectively.

From the SRP Waterways Newsletter

(<http://www.srpnet.com/water/pdfx/WATERWAYS1006.pdf>)

ORGANICS

Table 7 - Water Treatment Plants – December 5, 2006

Sample Description	DOC (mg/L)	UV254 (1/cm)	SUVA	TDN
24 th Street WTP Inlet	2.25	0.056	2.5	0.46
24 th Street WTP Treated	1.76	0.031	1.7	0.423
Deer Valley Inlet	2.14	0.055	2.6	0.311
Deer Valley WTP Treated	1.70	0.030	1.7	0.373
Val Vista Inlet				
Val Vista WTP Treated –East				
Val Vista WTP Treated -West				
Union Hills Inlet	2.77	0.036	1.3	
Union Hills Treated	2.62	0.023	0.9	0.472
Tempe North Inlet	2.23	0.053	2.4	0.444
Tempe North Plant Treated	1.99	0.038	1.9	
Tempe South WTP				
Tempe South Plant Treated				
Chandler WTP Inlet				
Chandler WTP Treated				
Greenway WTP Inlet	2.10	0.055	2.6	0.373
Greenway WTP Treated	1.65	0.016	1.0	0.522

Table 8 - Canal Sampling – December 5, 2006

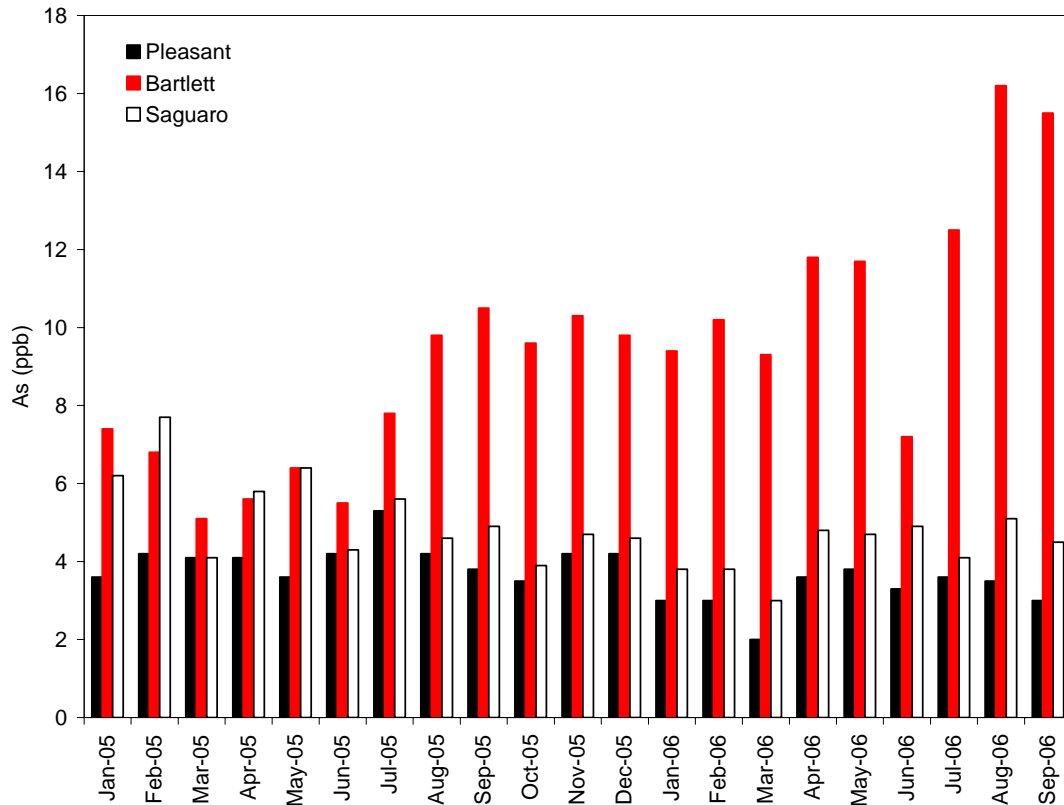
System	Sample Description	DOC (mg/L)	UV254 (1/cm)	SUVA	TDN
CAP	Waddell Canal	2.66	0.0400	1.5	0.453
	Union Hills Inlet	2.77	0.0360	1.3	0.472
	CAP Canal at Cross-connect	3.21	0.0370	1.1	0.57
AZ Canal	Salt River @ Blue Pt Bridge	3.96	0.0860	2.2	0.261
	Verde River @ Beeline	2.04	0.0540	2.7	0.229
	AZ Canal above CAP Cross-connect	2.63	0.0410	1.6	0.398
	AZ Canal below CAP Cross-connect	2.18	0.0510	2.3	0.309
	AZ Canal at Highway 87	2.24	0.0550	2.6	0.425
	AZ Canal at Pima Rd.	2.12	0.0550	2.6	0.204
	AZ Canal at 56th St.	2.23	0.0540	2.4	0.448
	AZ Canal - Inlet to 24 th Street WTP	2.25	0.0560	2.5	0.460
	AZ Canal - Central Avenue	2.67	0.0580	2.2	0.485
	AZ Canal - Inlet to Deer Valley WTP	2.14	0.0550	2.6	0.303
	AZ Canal - Inlet to Greenway WTP	2.10	0.0550	2.6	0.373
South and Tempe Canals	South Canal below CAP Cross-connect	2.05	0.0550	2.7	0.250
	South Canal at Val Vista WTP				
	Head of the Tempe Canal				
	Tempe Canal - Inlet to Tempe's South Plant				
	Chandler WTP – Inlet				

Table 9 - Reservoir Samples – December 5, 2006

Sample Description	Location	DOC (mg/L)	UV254 (1/cm)	SUVA	TDN
Lake Pleasant	Eplimnion	3.26	0.0480	1.5	0.353
Lake Pleasant	Hypolimnion	3.30	0.0490	1.5	0.354
Verde River @ Beeline		2.04	0.0540	2.7	0.229
Bartlett Reservoir	Epilimnion	2.54	0.0620	2.4	0.282
Bartlett Reservoir	Epi-near dock				
Bartlett Reservoir	Hypolimnion	3.01	0.0610	2.0	0.357
Salt River @ BluePt Bridge		3.96	0.0860	2.2	0.261
Saguaro Lake	Epilimnion	4.90	0.1040	2.1	0.338
Saguaro Lake	Epi - Duplicate				
Saguaro Lake	Epi-near doc				
Saguaro Lake	Hypolimnion	5.23	0.1080	2.1	0.414
Verde River at Tangle		5.24	0.0180	0.3	0.391
Havasu		0.79	0.0370	4.7	0.104

Arsenic Timetrend for Terminal Reservoirs

Below is a plot of arsenic occurrence in the three reservoirs on the Verde River (Bartlett Lake), Salt River (Saguaro Lake), and CAP Canal/Aqua Fria River (Lake Pleasant). Verde River water is currently being supplied by SRP to the SRP canal system. Higher levels of arsenic in the Verde River are naturally occurring, and tend to increase during low baseflow in the Verde River above Bartlett Lake due to contribution of certain geologic rock formations containing arsenic. The drinking water MCL for arsenic is 10 ppb.



Arizona Water Institute:

For additional information, please feel free to contact us or visit our website at <http://www.azwaterinstitute.org/>.

AWI funds 11 new projects: The response to this initial solicitation was truly overwhelming, with 70 proposals submitted for over 3 million dollars. We are extremely pleased with the level of interest shown in this initial AWI RFP. Given that the initial offering was only \$400,000, we have only been able to select 11 proposals to move forward to the contract negotiation stage. The proposal review process included two review committees and a final decision by the Executive Committee. The first review committee was comprised entirely of stakeholders; their recommendations resulted in the number of proposals being narrowed from 70 to 36. The second committee included stakeholders, agency personnel, and university representatives. They forwarded 15 projects for consideration by the Executive Committee, which ultimately selected the 11 projects for funding. If for any reason we are unable to reach agreement with those whose proposals have been selected for funding, there is still the possibility that some proposals will be reconsidered. Further, all three universities are planning to evaluate the remaining proposals from the perspective of funding them from on-campus discretionary project funds that are associated with the Arizona Water Institute. Decisions regarding these funds will be made in the next 1-3 months, so there is still a possibility of AWI funding for additional projects.

Title of Proposal Funding Award Lead PI & Institution E-mail Contact Co-PI's and Institutions Matching Sources

1. "Proof-of-Concept Development of a Microfabricated Tuning-Fork Based Sensor for Disinfection By-products in Drinking Water" \$26,500 **Westerhoff** (ASU)
p.westerhoff@asu.edu Tao (ASU) & Guzman (UA) EmRG Cluster & SRP
2. "Verde River Ecological Flow Science - A Collaborative Approach" \$47,628 Springer (NAU) abe.springer@nau.edu Campbell (TNC) & Eden (UA) & Haney (TNC) & Marshall (TNC) & Pearthree (AGS) & Spitz (UA) & Stevens (NAU) & Stromberg (ASU) & Turner (TNC) NAU & WRRC & TNC
3. "Enhanced Data Accessibility Using Web Services Technology" \$50,000 Carpenter (UA) & Gries (ASU) kylec@sahra.arizona.edu Davulcu (ASU) & Gries (ASU) & Liu (ASU) UA & ASU & SRP & ADWR & ADEQ
4. "Comparison of Estrogenic Compound Removal Efficiency from POTWs Across Arizona" \$49,971 Propper (NAU) Catherine.Propper@nau.edu Vail (NAU) & Ingram (NAU) & Saez (UA) & Karpiscak (UA) & Westerhoff (ASU) & Adler (AZDeptHS) NAU & UA & King Co Washington & ASU
5. "Assessment of the Navajo Nation Hydroclimate Network" \$45,694 Garfin (UA) gmgarfin@email.arizona.edu Ellis (ASU) & Selover (ASU) & Anderson (NAU) & Tecle (NAU) & Crimmins (UA) & Leeper (NDWR) & Showa (NDWR) NDWR & UA

6. "Collaborative Approach to Analyzing Emergent Contaminants in Arizona Water" \$50,000 Chorover (UA) chorover@cals.arizona.edu Propper (NAU) & Westerhoff (ASU) & Waddell (ADHS) & Adler (ADHS) UA
7. "Evaluation of the Arizona Department of Water Resources Management Plans for the Active Management Areas" \$48,813 Megdal (UA) smegdal@ag.arizona.edu Smith (NAU) ADWR
8. "Improved Tools for Drought Planning and Management" \$50,000 Shangraw (ASU) rick.shangraw@asu.edu Hirschboeck (UA) & Miller (ASU) & Block (ASU) East Valley Water Forum
9. "Approaches to Water Management by Tribes in Arizona" \$38,000 Mariella (ASU) Pat.Mariella@asu.edu Auberle (NAU) & Colby (UA) ITCA
10. "Electrocoagulation Technology in Semiconductor Manufacturing: A Pilot Test on Treatment of Cooling Tower Waters" \$50,000 Baygents (UA) jcb@maxwell.che.arizona.edu Crittenden (ASU) Intel Corp
11. "Database Connectivity Component for the AHIS" \$3,920 Dieter-Otte (NAU) dieter.otte@nau.edu none NAU

Special Update – New water treatment plant to come on line in 2007

City of Phoenix Lake Pleasant WTP

General Information:

- 1st phase is 80 MGD (expandable to 320 MGD)
 - Construction cost \$232 M
 - O&M costs (present worth for 15 years of operation) \$125 M
- Processes: actiflow, ozone, deep bed filters, post-filtration GAC w/ onsite regeneration, and two 20M gallon reservoirs

L4 Pleasant Water Treatment Plant
City of Phoenix Project No. WS 85350005

Facility Start-up and
Acceptance Test Plan

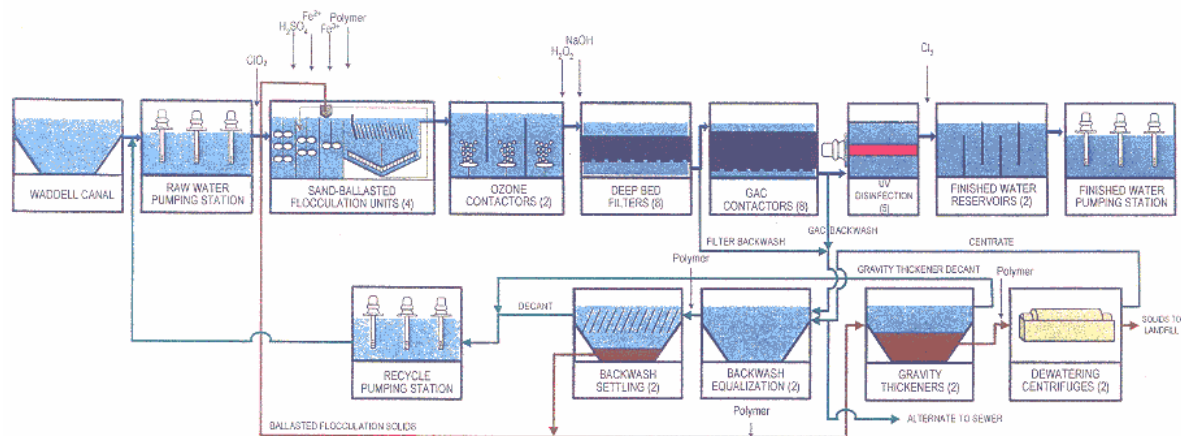


Exhibit E-2

Lake Pleasant WTP Process Flow Diagram