Regional Water Quality NEWSLETTER

DATE: Report for August 2008
Sampling conducted August 5 & 6 2008

From the Phoenix, Tempe, Glendale, 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. Our Regional water quality annual Workshop is scheduled for Thursday October 9, 2008 at Phoenix City Hall from 8:30- 11am. MARK YOUR CALENDARS.
2. MIB and geosmin levels are less than 10 ng/L in raw & finished waters. Cyclocitrol occurs at slightly higher levels. Plants using PAC show MIB and Geosmin removal is occurring.
3. DOC levels in the SRP canal system are around 4.4 mg/L and 3.2 mg/L in the CAP system. WTPs are using a wide range of Alum dosages (30 to 70 ppm), with higher levels of alum leading to higher levels of DOC removal (up to nearly 50% removal). Improved DOC removal will lead to better control of THM and HAA formation.
4. Pharmaceutical data for May and June 2008 in the Verde River, a water treatment plant, and a wastewater treatment plant are presented. Levels are < 2 ng/L in most river samples and the WTP finished water. In contrast high levels are observed at the wastewater treatment plant.

Table 1 Summary of WTP Operations

	Verde WTP	Union Hills	24th Street WTP	N.Tempe J.G. Martinez	Deer Valley	Glendale Cholla WTP [3]	Peoria Greenway WTP	Val Vista	South Tempe	Chandler WTP
	Verde River	CAP Canal	Arizona Canal					South Canal		
PAC Type and Dose	None		Calgon WPH 15 ppm	Norit Hydrodarco O. 14 ppm	Calgon 14.9 ppm	None		15 ppm starting Monday after sampling	30 ppm Norit	
Copper Sulfate	None		0.48 ppm	None	None	None		0.2 ppm	None	
PreOxidation	None		None	None	None	Periodic for 12 hours		None	None	
Alum Dose Alkalinity pH	55 112 6.9		65 134 6.5	35 128 7.3	60 140 6.7	35 136 6.8		70 104 6.9	30 116 7.5	
Finished water DOC DOC removal[2]		2.5 mg/L 20%	2.6 mg/L 42%	3.7 mg/L 17%	2.4 mg/L 46%	2.9 mg/L 35%	4 mg/L 11%	3.1 mg/L 30%	3.4 mg/L 27%	
Average turbidity over last 7 days	10 NTU		20 NTU	19 NTU	30 NTU	18 NTU		15 NTU	8 NTU	
Recommendations										

[1] Ferric chloride instead of alum; plus ppm polymer (308)
[2] Calculated based upon influent and filtered water DOC (note that DOC – not TOC – is used in this calculation)
[3] Sample from finished water includes a blend of surface and ground water sources

The Phoenix WTPs are adding high alum dosages (50 to 70 ppm). This is leading to higher DOC removal than observed at other WTPs.

SRP/CAP OPERATIONS - Values in cfs, for August 4, 2008

System	SRP Diversions	CAP
Arizona Canal	860	100
South Canal	722	0
Pumping	89	0
Total	1671	100

- **SRP is releasing water from both Verde and Salt River Systems**. Salt River release from Saguaro Lake: 1173cfs; Verde River release from Bartlett Lake: 400 cfs.
- Lake Roosevelt is 91% full and the Verde River system is 63% full. Flow over Granite Reef dam into the Salt River Channel = 0 cfs.

Lake Powell on the Colorado River changed a multi-year decline and increased in reservoir capacity this year. Total inflows for water year **2008**: 11,435,550 acre feet while Total releases for water year **2008**: 7,538,494 acre feet. Lake Powell stands at 62% of full capacity. More information can be found at: http://lakepowell.water-data.com/

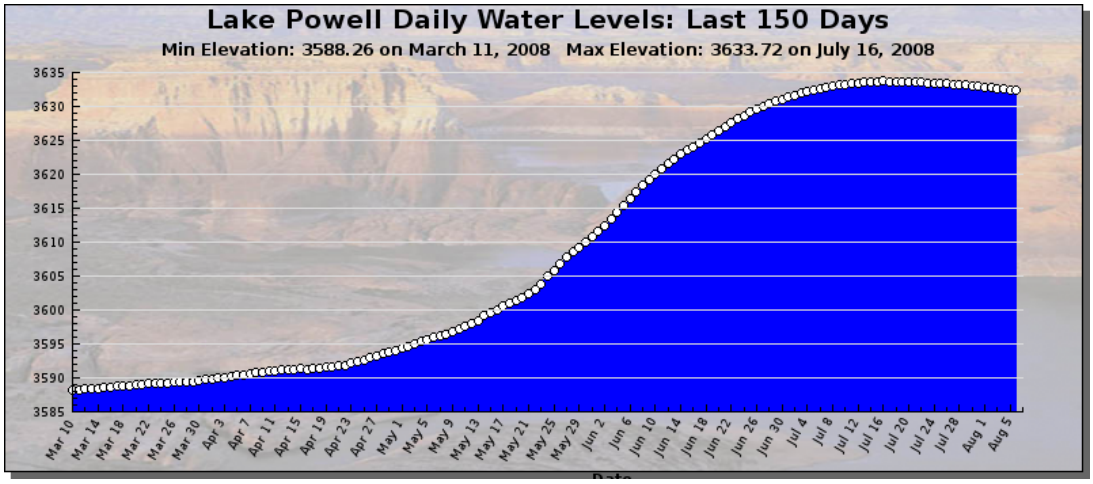


Table 2 - Water Treatment Plants – August 4, 2008

Sample Description	MIB (ng/L)	Geosmin (ng/L)	Cyclocitral (ng/L)
24th Street WTP Inlet	2.9	4.1	6.8
24th Street WTP Treated	<2.0	<2.0	<2.0
Deer Valley Inlet	2.2	3.9	5.9
Deer Valley WTP Treated	<2.0	<2.0	<2.0
Val Vista Inlet	2.8	3.5	12.0
Val Vista WTP Treated –East	3.2	2.4	6.0
Val Vista WTP Treated -West	2.1	<2.0	<2.0
Union Hills Inlet	<2.0	5.7	2.2
Union Hills Treated	2.1	6.2	<2.0
Tempe North Inlet	<2.0	3.0	6.8
Tempe North Plant Treated	<2.0	4.5	6.1
Tempe South WTP	4.3	2.7	<2.0
Tempe South Plant Treated	<2.0	<2.0	<2.0
Tempe South Plant Treated (Lab)			
Greenway WTP Inlet	7.5	3.3	3.3
Greenway WTP Treated	<2.0	<2.0	<2.0
Glendale WTP Inlet	2.2	3.1	7.1
Glendale WTP Treated	<2.0	<2.0	<2.0
Glendale WTP Treated (Lab)			

Table 3 - Canal Sampling – August 4, 2008

System	Sample Description	MIB (ng/L)	Geosmin (ng/L)	Cyclocitral (ng/L)
CAP	Waddell Canal			
	Union Hills Inlet	<2.0	5.7	2.2
	CAP Canal at Cross-connect	2.9	3.7	4.6
AZ Canal	Salt River @ Blue Pt Bridge	<2.0	<2.0	13.4
	Verde River @ Beeline	3.3	2.3	6.5
	AZ Canal above CAP Cross-connect	2.7	2.8	12.2
	AZ Canal below CAP Cross-connect	2.6	3.2	10.9
	AZ Canal at Highway 87	2.7	2.6	11.6
	AZ Canal at Pima Rd.	3.1	3.2	<2.0
	AZ Canal at 56th St.	2.2	3.1	<2.0
	AZ Canal - Inlet to 24th Street WTP	2.9	4.1	6.8
	AZ Canal - Central Avenue	<2.0	<2.0	<2.0
	AZ Canal - Inlet to Deer Valley WTP	2.2	3.2	5.9
	AZ Canal - Inlet to Glendale WTP	<2.0	<2.0	<2.0
South and Tempe Canals	South Canal below CAP Cross-connect	2.7	2.6	11.6
	South Canal at Val Vista WTP	2.8	3.5	12.0
	Head of the Tempe Canal	3.0	3.9	11.4
	Tempe Canal - Inlet to Tempe's South Plant	4.3	2.7	<2.0
	Chandler WTP – Inlet			

Table 4 - Reservoir Samples – August 5, 2008

Sample Description	Location	MIB (ng/L)	Geosmin (ng/L)	Cyclocitral (ng/L)
Lake Pleasant	Eplimnion			
Lake Pleasant	Hypolimnio			
Verde River @ Beeline		**3.3**	**2.3**	**6.5**
Bartlett Reservoir	Epilimnion	**8.1**	**<2.0**	**<2.0**
Bartlett Reservoir	Epi-near dock	**8.0**	**<2.0**	**<2.0**
Bartlett Reservoir	Hypolimnio	**8.3**	**<2.0**	**<2.0**
Salt River @ BluePt Bridge		**<2.0**	**<2.0**	**13.4**
Saguaro Lake	Epilimnion	**<2.0**	**4.1**	**3.9**
Saguaro Lake	Epi - Duplicate	**<2.0**	**4.0**	**7.8**
Saguaro Lake	Epi-near doc	**<2.0**	**3.9**	**8.8**
Saguaro Lake	Hypolimnio	**<2.0**	**<2.0**	**2.5**
Verde River at Tangle Creek Havasu				

Table 5 - Water Treatment Plants – August 04, 2008

Sample Description	DOC (mg/L)	TDN	DOC removal (%)
24th Street WTP Inlet	4.49	0.603	
24th Street WTP Treated	2.58	0.505	42
Deer Valley Inlet	4.37	0.633	
Deer Valley WTP Treated	2.36	0.524	46
Val Vista Inlet	4.68	0.552	
Val Vista WTP Treated –East	3.34	0.509	29
Val Vista WTP Treated -West	3.02	0.515	35
Union Hills Inlet	3.16	0.615	
Union Hills Treated	2.53	0.556	20
Tempe North Inlet	4.50	0.607	
Tempe North Plant Treated	3.71	0.557	17
Tempe South WTP	4.58	0.591	
Tempe South Plant Treated	3.35	0.500	27
Greenway WTP Inlet	4.51	0.689	
Greenway WTP Treated	4.01	0.836	11
Glendale WTP Inlet	4.46	0.644	
Glendale WTP Treated	2.89	1.085	35

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)

Table 6

Sample Description	DOC (mg/L)	TDN
Waddell Canal		
Union Hills Inlet	3.16	0.615
CAP Canal at Cross-connect	3.24	0.603
Salt River @ Blue Pt Bridge	4.96	0.651
Verde River @ Beeline	3.58	0.295
AZ Canal above CAP Cross-connect	4.61	0.519
AZ Canal below CAP Cross-connect	4.32	0.536
AZ Canal at Highway 87	4.47	0.537
AZ Canal at Pima Rd.	4.56	0.609
AZ Canal at 56th St.	4.55	0.626
AZ Canal - Inlet to 24th Street WTP	4.49	0.603
AZ Canal - Central Avenue	4.43	0.623
AZ Canal - Inlet to Deer Valley WTP	4.37	0.633
AZ Canal - Inlet to Glendale WTP	4.46	0.644
AZ Canal - Inlet to Greenway WTP	4.51	0.689
South Canal below CAP Cross-connect	4.48	0.509
South Canal at Val Vista WTP	4.68	0.552
Head of the Tempe Canal	4.52	0.589
Tempe Canal - Inlet to Tempe's South Plant	4.58	0.591
Chandler WTP – Inlet		

Table 7 - Reservoir Samples – August 04, 2008

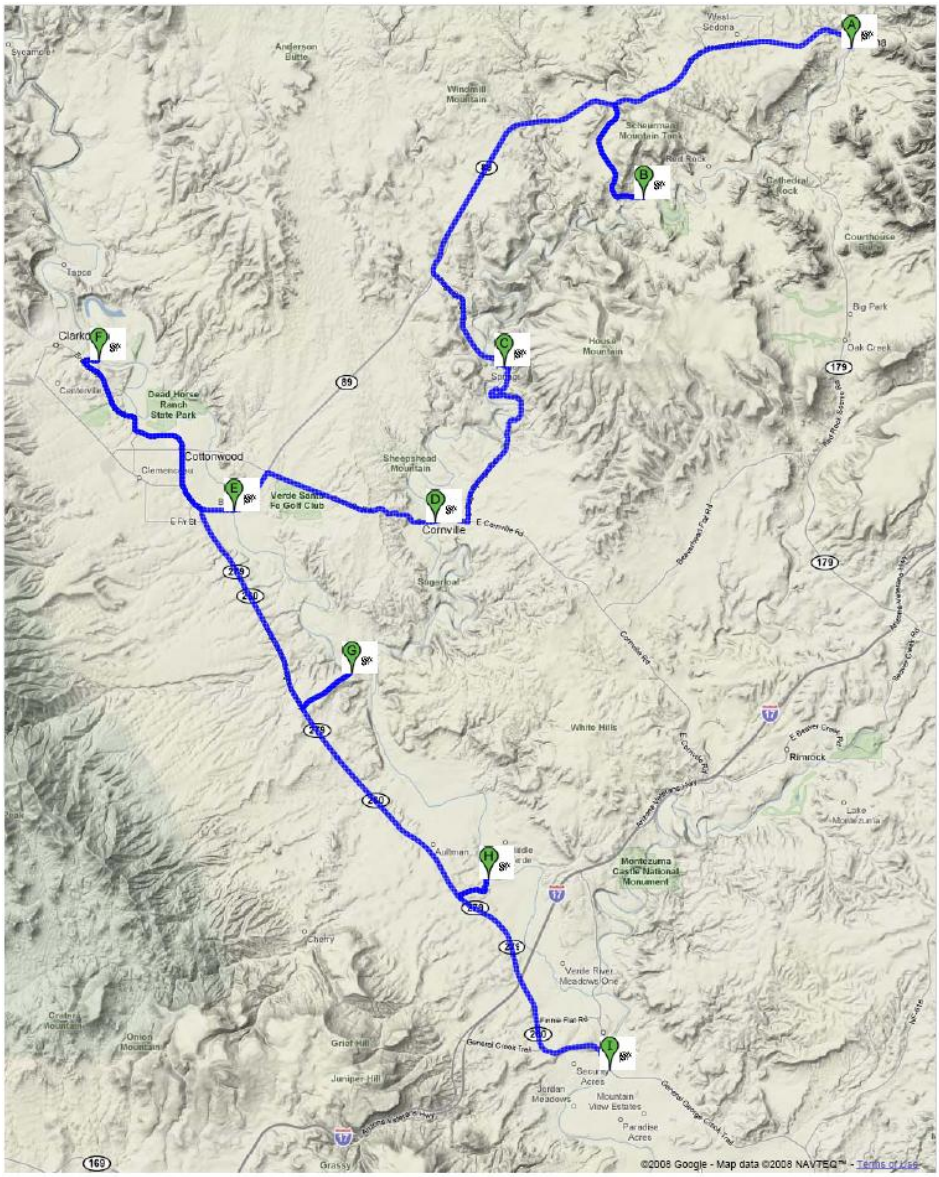
Reservoir sampling will be conducted only monthly.

CAP is sampling Lake Pleasant on slightly different days than the other reservoirs.

Sample Description	Location	DOC (mg/L)	TDN
Lake Pleasant	Eplimnion		
Lake Pleasant	Hypolimnio		
Verde River @ Beeline		**3.58**	**0.30**
Bartlett Reservoir	Epilimnion	**5.23**	**0.78**
Bartlett Reservoir	Epi-near dock		
Bartlett Reservoir	Hypolimnio	**5.93**	**0.54**
Salt River @ BluePt Bridge		**4.96**	**0.65**
Saguaro Lake	Epilimnion	**5.90**	**0.50**
Saguaro Lake	Epi - Duplicate	**4.71**	**0.45**
Saguaro Lake	Epi-near doc		
Saguaro Lake	Hypolimnio	**5.00**	**0.36**
Verde River at Tangle			
Havasu			

Pharmaceutical data for May & June 2008

Samples were collected and analyzed by ASU at Arizona Department of Health Services with funding from Salt River Project and Central Arizona Project. Samples were collected around Sedona, AZ and Camp Verde (see map below)



Hormones Data

All concentrations are reported in ng/L. The reporting level for our method is 2 ng/L. So all stream water samples were below the reporting level. Actual values are shown in the table below though, even though the are below 2 ng/L. On the raw and treated wastewater samples (WWTP) show hormone concentrations above 2 ng/L (raw water), but not in finished water.

May 2008

Sample Name	Estradiol	Ethynyl Estradiol	Testosterone	Progesterone
lab blank	ND	0.47	0.33	ND
field blank	ND	0.48	0.33	0.27
Sedona A	0.53	0.52	0.34	0.32
Sedona A Duplicate	0.48	0.52	0.34	0.36
Sedona B	0.53	0.52	0.33	0.28
Sedona C	0.55	0.61	0.33	0.28
Sedona D	0.55	0.49	0.33	0.28
Verde E	0.57	0.52	0.36	0.49
Verde E (Duplicate)	0.50	0.50	0.37	0.29
Verde F	0.49	0.50	0.35	0.30
Verde G	0.63	0.48	0.33	0.34
Verde H	0.56	0.75	0.36	0.32
Verde I	0.53	0.53	0.35	0.33
Verde I (duplicate)	0.53	0.49	0.35	0.30
Hwy 87 at Beeline	0.62	ND	0.38	0.30
Blue Point Bridge	0.51	0.51	0.40	0.32
WTP Raw water	0.51	0.78	0.36	0.28
WTP Settled water	0.49	0.55	0.42	0.33
WTP after chlorine	0.49	0.59	0.34	0.32
WWTP raw	8.17	5.42	56.70	12.10
WWTP treated	0.49	0.51	0.34	0.27
WWTP treated - post UV	0.59	0.55	0.35	0.33

June 2008

Sample Name	Estradiol	Ethynyl Estradiol	Testosterone	Progesterone
lab blank	ND	0.50	0.33	0.27
field blank	ND	0.49	0.34	0.28
Sedona A	0.51	0.48	0.35	0.29
Sedona A Duplicate	0.50	0.51	0.34	0.29
Sedona B	0.59	0.75	0.38	0.28
Sedona C	0.56	0.49	0.35	0.27
Sedona D	0.53	0.64	0.37	0.32
Verde E	0.58	0.51	0.37	0.29
Verde E (Duplicate)	0.53	0.63	0.33	0.32
Verde F	0.54	0.51	0.34	0.28
Verde G	0.53	0.54	0.34	0.30
Verde H	0.52	0.51	0.33	0.28
Verde I	0.49	0.48	0.34	0.28
Verde I (duplicate)	0.57	0.50	0.33	0.32
Hwy 87 at Beeline	0.72	0.63	0.34	0.43
Blue Point Bridge	0.61	0.59	0.36	0.29
WTP Raw water	0.53	0.56	0.32	0.29
WTP Settled water	0.51	0.57	0.45	0.29
WTP after chlorine	0.54	0.76	0.36	0.29
WWTP raw	8.81	5.31	62.70	18.50
WWTP treated	0.50	0.49	ND	0.28
WWTP treated - post UV	0.54	0.48	0.33	0.29

Pharmaceutical and personal care products

PPCPs were analyzed by two methods so each are presented separately. The reporting level is again 2 ng/L, but all data is shown for informative purposes. There is some triclosan and a flame retardant (TBPA) in some samples, and a single high detect of ibuprofen in one Verde River sample. We started reporting Sucralose (the artificial sweetner) based upon recommendations from Dr. Rosy Krajmalnik-Brown (Assistant professor, Department of Civil and Environmental Engineering at ASU). Sucralose is among the highest PPCP observed in the WWTP effluents, and as such may be a very good marker of wastewater in river samples. This work will continue.

May 2008

Sample Name	Ibuprofen	Naproxen	Warfarin	Dilantin	Triclosan	Diclofenac	TBPA	Sucralose
lab blank	ND	ND	0.24	ND	0.69	0.62	< 0	< 0
field blank	ND	ND	ND	0.23	1.11	0.72	0.19	< 0
Sedona A	ND	ND	ND	0.48	0.87	0.89	< 0	< 0
Sedona A Duplicate	ND	ND	ND	ND	1.01	1.23	< 0	< 0
Sedona B	ND	ND	ND	ND	0.65	1.07	8.65	< 0
Sedona C	ND	0.69	ND	ND	1.13	1.49	6.61	< 0
Sedona D	ND	ND	ND	0.49	0.59	1.10	2.35	< 0
Verde E	ND	ND	ND	0.39	0.88	0.85	5.80	ND
Verde E (Duplicate)	ND	ND	ND	ND	1.05	0.86	10.90	< 0
Verde F	55.50	ND	ND	ND	1.28	1.31	7.78	< 0
Verde G	ND	ND	ND	ND	0.84	1.14	8.80	< 0
Verde H	ND	ND	ND	ND	1.38	1.07	7.96	< 0
Verde I	ND	ND	ND	0.55	0.56	0.54	7.03	< 0
Verde I (duplicate)	ND	ND	ND	ND	0.70	0.97	7.50	< 0
Hwy 87 at Beeline	ND	0.82	ND	ND	0.91	0.54	9.12	7.51
Blue Point Bridge	ND	0.70	ND	0.45	1.22	ND	27.40	< 0
WTP Raw water	ND	0.78	ND	ND	0.74	0.45	< 0	< 0
WTP Settled water	ND	0.86	ND	0.39	1.22	0.90	2.74	< 0
WTP after chlorine	ND	0.67	ND	0.49	0.84	ND	< 0	ND
WWTP raw	6570.00	7470.00	3.08	175.00	816.00	110.00	444.00	4250.00
WWTP treated	8.79	80.20	0.41	143.00	59.10	72.50	< 0	910.00
WWTP treated - post UV	8.18	67.40	0.42	120.00	39.50	46.20	< 0	908.00

June 2008

Sample Name	Ibuprofen	Naproxen	Warfarin	Dilantin	Triclosan	Diclofenac	TBPA	Sucralose
lab blank	ND	ND	ND	ND	1.04	0.69	< 0	< 0
field blank	ND	ND	ND	0.34	0.97	0.84	< 0	< 0
Sedona A	ND	ND	ND	ND	0.78	0.63	2.01	< 0
Sedona A Duplicate	1.29	ND	ND	ND	1.34	1.27	15.10	< 0
Sedona B	1.40	ND	ND	0.54	2.03	ND	19.70	< 0
Sedona C	2.21	0.75	ND	ND	1.04	ND	5.41	1.36
Sedona D	ND	ND	ND	ND	1.56	ND	4.38	< 0
Verde E	3.85	1.28	ND	ND	0.90	ND	0.96	< 0
Verde E (Duplicate)	4.22	1.90	ND	0.50	1.13	0.64	< 0	< 0
Verde F	ND	ND	ND	ND	1.51	ND	3.78	< 0
Verde G	ND	ND	ND	ND	2.23	ND	0.68	< 0
Verde H	ND	ND	ND	0.64	1.07	0.46	3.85	< 0
Verde I	ND	ND	ND	ND	1.16	0.72	1.42	< 0
Verde I (duplicate)	ND	ND	ND	ND	0.68	0.62	0.95	< 0
Hwy 87 at Beeline	ND	0.86	ND	0.79	1.04	ND	< 0	< 0
Blue Point Bridge	1.31	0.71	ND	0.69	0.72	ND	< 0	0.60
WTP Raw water	ND	0.91	ND	0.99	1.16	ND	< 0	< 0
WTP Settled water	ND	0.87	ND	0.70	0.66	ND	< 0	0.97
WTP after chlorine	1.54	0.89	ND	0.54	1.09	ND	< 0	< 0
WWTP raw	7380.00	8740.00	3.23	155.00	1400.00	96.20	447.00	4060.00
WWTP treated	10.80	19.50	0.47	156.00	111.00	70.90	< 0	1010.00
WWTP treated - post UV	10.70	17.20	0.46	127.00	57.90	53.30	< 0	976.00

May 2008

Sample Name	Acetominophpen	Caffeine	Carbamazepine	Cotinine	Diazepam	Fluoxetine	Hydrocodone	Meprobamate	Pentoxifylline	Oxybenzone	Sulfamethoxazole	DEET	Erythromycin	Trimethoprim	Primidone	Atrazine	Diuron	Prometryne	Imazamox	Imazthapyr
lab blank	ND	< 0	ND	ND	ND	0.39	ND	ND	ND	1.49	ND	0.52	ND	ND	ND	ND	ND	ND	ND	ND
field blank	ND	4.09	ND	ND	ND	0.40	ND	ND	ND	2.84	ND	0.67	ND	ND	ND	ND	ND	ND	ND	ND
Sedona A	ND	13.30	0.13	< 0	ND	ND	ND	ND	ND	4.59	ND	1.41	ND	ND	ND	ND	ND	ND	ND	ND
Sedona A Duplicate	ND	5.81	0.13	< 0	ND	ND	ND	ND	ND	3.69	0.75	0.94	ND	ND	ND	ND	ND	ND	ND	ND
Sedona B	ND	7.66	0.24	< 0	ND	0.39	ND	ND	ND	7.89	ND	2.56	ND	ND	ND	ND	ND	0.45	ND	ND
Sedona C	ND	4.73	0.60	< 0	ND	0.51	ND	ND	ND	3.43	ND	3.10	ND	ND	ND	ND	1.26	0.45	ND	ND
Sedona D	ND	4.43	0.13	< 0	ND	0.39	ND	ND	ND	2.71	1.53	1.77	ND	ND	ND	ND	0.53	0.45	ND	ND
Verde E	ND	2.42	< 0	< 0	ND	0.38	ND	ND	ND	3.21	1.41	1.22	ND	ND	ND	ND	0.53	ND	ND	ND
Verde E (Duplicate)	ND	4.51	< 0	< 0	ND	ND	ND	ND	ND	2.75	1.28	1.09	ND	ND	1.80	ND	ND	ND	ND	ND
Verde F	0.34	25.10	< 0	< 0	ND	0.38	ND	ND	ND	15.00	ND	3.01	ND	ND	ND	ND	0.35	ND	ND	ND
Verde G	0.69	6.10	0.01	< 0	ND	ND	ND	ND	ND	4.70	0.87	1.24	ND	ND	ND	ND	0.51	ND	ND	ND
Verde H	0.20	2.94	0.22	< 0	ND	ND	ND	ND	ND	3.41	0.84	3.25	ND	ND	ND	ND	0.49	ND	ND	ND
Verde I	ND	5.56	0.08	< 0	ND	0.43	ND	ND	ND	3.44	1.28	5.69	ND	ND	ND	1.14	0.50	ND	ND	ND
Verde I (duplicate)	ND	3.18	0.06	< 0	ND	ND	ND	ND	ND	3.65	1.11	5.33	ND	ND	ND	1.13	ND	ND	ND	ND
Hwy 87 at Beeline	ND	6.01	0.25	< 0	ND	ND	ND	ND	ND	2.37	2.98	1.49	ND	ND	ND	ND	0.60	ND	ND	ND
Blue Point Bridge	ND	14.00	< 0	0.71	ND	ND	ND	ND	0.83	26.70	0.78	5.07	ND	ND	ND	ND	1.95	0.49	ND	ND
WTP Raw water	ND	9.90	0.09	0.39	ND	ND	ND	ND	0.28	5.22	1.21	3.03	ND	ND	ND	ND	1.09	0.46	ND	ND
WTP Settled water	0.34	10.90	0.08	0.42	ND	ND	ND	ND	0.73	20.60	1.31	3.30	ND	ND	ND	ND	1.28	0.46	ND	ND
WTP after chlorine	ND	4.37	0.04	0.41	ND	0.38	ND	ND	ND	1.21	ND	3.49	ND	ND	ND	ND	0.73	ND	ND	ND
WWTP raw	20400.00	52500.00	358.00	856.00	3.32	18.60	73.90	932.00	5.76	1860.00	2330.00	698.00	214.00	481.00	937.00	ND	23.20	4.62	ND	ND
WWTP treated	ND	12.00	280.00	12.30	1.61	9.32	50.10	455.00	1.36	21.60	1590.00	107.00	86.00	140.00	173.00	ND	9.79	ND	ND	ND
WWTP treated - post UV	0.46	16.90	272.00	11.40	1.52	6.71	43.00	468.00	1.55	18.80	1400.00	95.80	87.30	141.00	135.00	ND	10.00	ND	ND	ND

June 2008

Sample Name	Acetominophpen	Caffeine	Carbamazepine	Cotinine	Diazepam	Fluoxetine	Hydrocodone	Meprobamate	Pentoxifylline	Oxybenzone	Sulfamethoxazole	DEET	Erythromycin	Trimethoprim	Primidone	Atrazine	Diuron	Prometryne	Imazamox	Imazthapyr
lab blank	ND	1.41	< 0	ND	ND	ND	ND	ND	ND	1.80	ND	0.69	ND	ND	ND	ND	ND	ND	ND	ND
field blank	ND	1.12	ND	ND	ND	ND	ND	ND	ND	2.16	ND	2.34	ND	ND	ND	ND	ND	ND	ND	ND
Sedona A	0.15	3.95	0.13	< 0	ND	ND	ND	ND	ND	4.18	0.89	2.61	ND	ND	ND	ND	ND	ND	ND	ND
Sedona A Duplicate	0.03	5.71	0.09	< 0	ND	ND	ND	ND	ND	5.88	ND	2.87	ND	ND	ND	ND	ND	ND	ND	ND
Sedona B	1.03	9.33	0.21	< 0	ND	ND	ND	ND	ND	21.70	0.91	8.94	ND	ND	ND	ND	ND	ND	ND	ND
Sedona C	0.25	6.68	0.59	< 0	ND	ND	ND	ND	ND	2.40	1.09	7.83	ND	ND	ND	ND	1.38	0.45	ND	ND
Sedona D	1.03	6.95	0.14	< 0	ND	ND	ND	ND	ND	6.32	1.05	10.80	ND	ND	ND	ND	ND	0.44	ND	ND
Verde E	0.77	18.20	ND	< 0	ND	ND	ND	ND	ND	4.06	1.80	5.01	ND	ND	ND	ND	ND	ND	ND	ND
Verde E (Duplicate)	0.65	22.10	< 0	< 0	ND	ND	ND	ND	ND	3.65	1.97	5.33	ND	ND	ND	ND	ND	ND	ND	ND
Verde F	0.39	13.10	< 0	< 0	ND	ND	ND	ND	ND	7.11	ND	2.08	ND	ND	ND	ND	ND	ND	ND	ND
Verde G	0.04	7.99	ND	< 0	ND	ND	ND	ND	ND	2.33	0.86	2.82	ND	ND	ND	ND	ND	ND	ND	ND
Verde H	ND	4.91	0.15	< 0	ND	ND	ND	ND	ND	3.10	ND	3.96	ND	ND	ND	ND	ND	ND	ND	ND
Verde I	0.14	6.19	0.02	< 0	ND	ND	ND	ND	ND	9.94	1.04	2.01	ND	ND	ND	1.47	ND	ND	ND	5.71
Verde I (duplicate)	0.17	5.83	0.07	< 0	ND	ND	ND	ND	ND	7.61	1.04	2.01	ND	ND	ND	1.43	ND	ND	ND	5.51
Hwy 87 at Beeline	0.86	25.50	0.07	1.43	ND	ND	ND	ND	0.93	64.80	ND	5.78	ND	ND	ND	ND	2.08	ND	ND	ND
Blue Point Bridge	ND	6.07	0.34	< 0	ND	ND	ND	ND	ND	1.82	3.27	1.30	ND	ND	ND	ND	0.71	ND	ND	ND
WTP Raw water	1.24	9.49	0.23	0.66	ND	ND	ND	ND	ND	15.30	2.26	3.07	ND	ND	ND	ND	1.32	0.47	ND	ND
WTP Settled water	1.59	13.30	0.20	0.89	ND	ND	ND	ND	ND	56.60	2.08	4.11	ND	ND	ND	ND	1.31	ND	ND	ND
WTP after chlorine	ND	10.90	0.09	1.48	ND	ND	ND	ND	ND	1.38	ND	4.68	ND	ND	ND	ND	0.67	ND	ND	ND
WWTP raw	28400.00	51300.00	274.00	1670.00	6.03	15.20	114.00	826.00	110.00	3270.00	4110.00	762.00	131.00	889.00	692.00	ND	13.50	ND	ND	6.46
WWTP treated	ND	13.90	243.00	14.80	1.72	6.44	43.50	357.00	ND	30.80	1000.00	188.00	47.80	64.20	145.00	ND	13.30	ND	ND	ND
WWTP treated - post UV	0.60	19.70	243.00	14.60	1.38	5.14	39.00	383.00	0.28	29.10	744.00	175.00	47.40	69.10	169.00	ND	10.90	ND	ND	ND