Special Issue
Regional Water Quality Newsletter

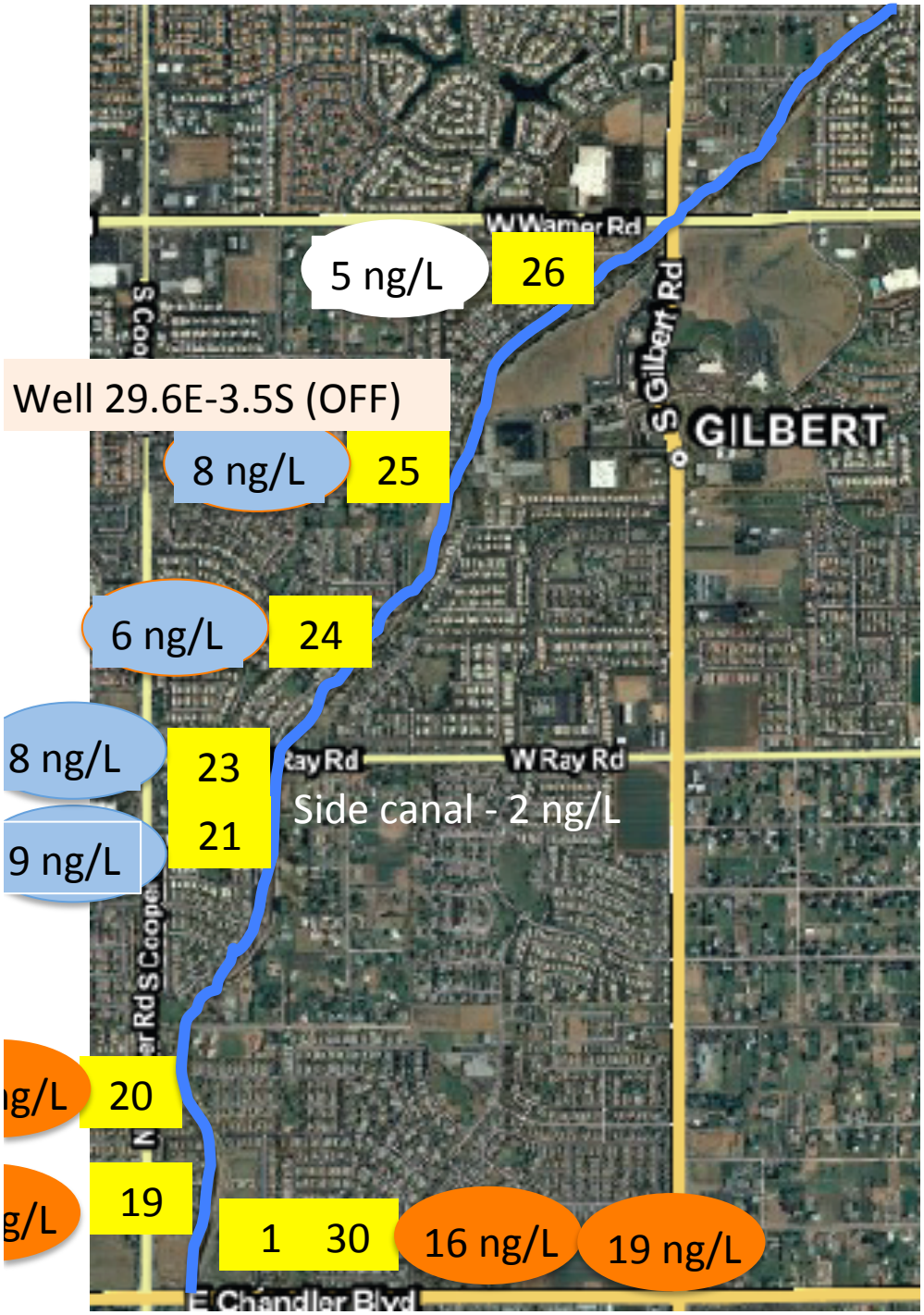
July 2013

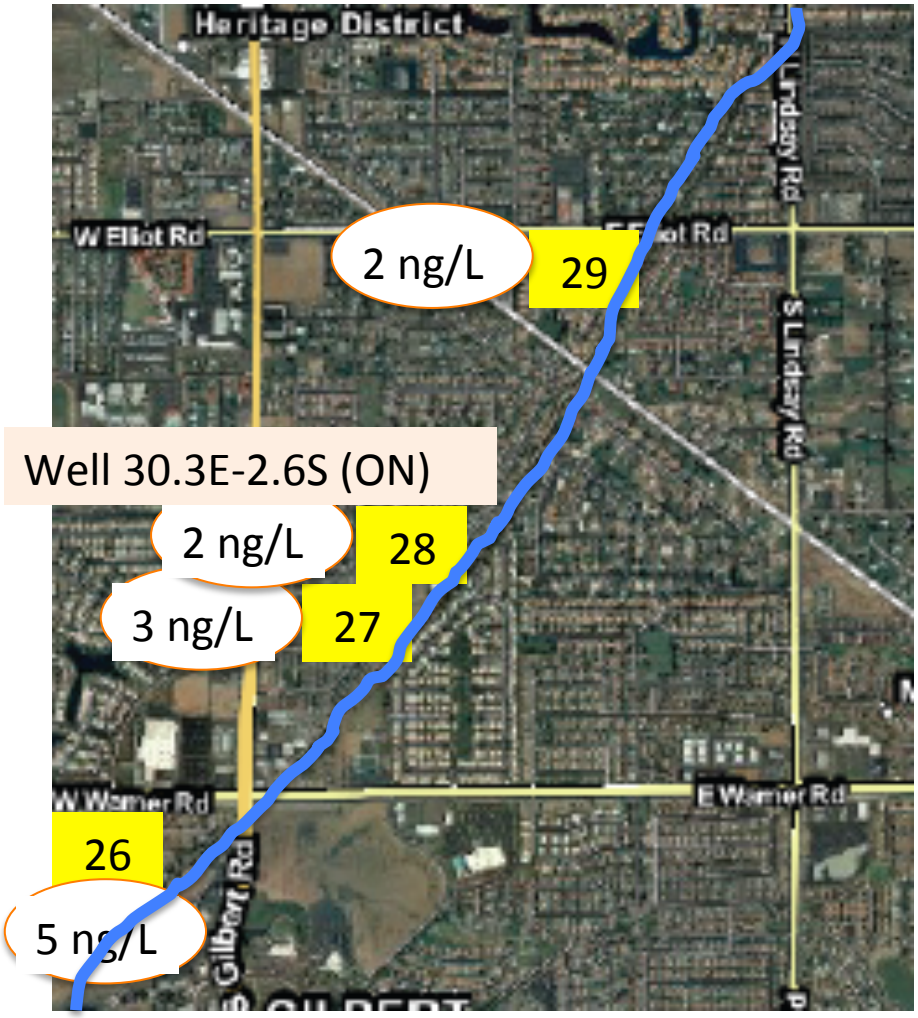
Content

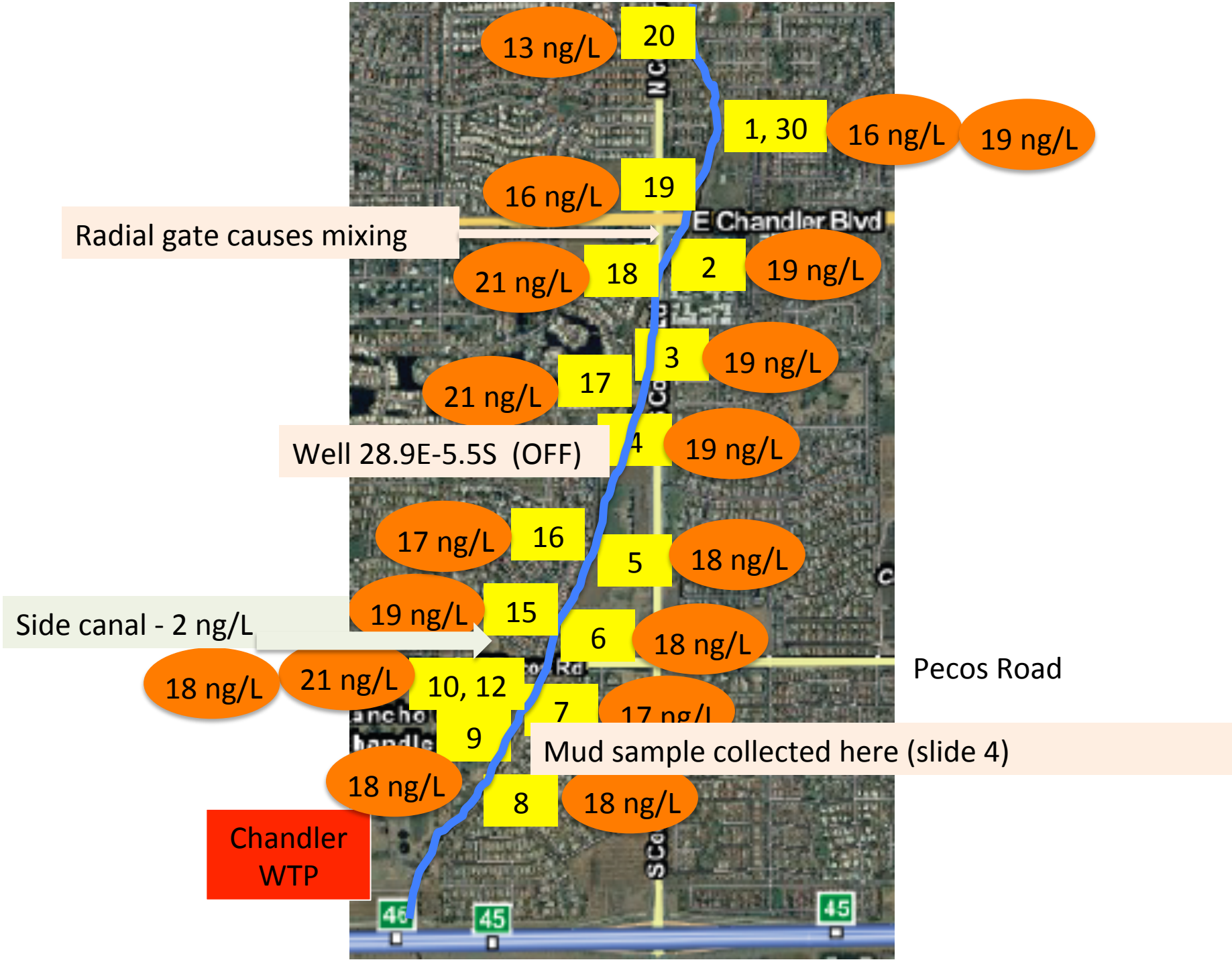
- Data for this month are shown at the end of the slides
- The focus is on “finding the source of geosmin in the Consolidated Canal” this month (see next slides)
- Recommendations for treating the “geosmin producing hot-spot” in the Consolidated Canal are provided

The Consolidated Canal

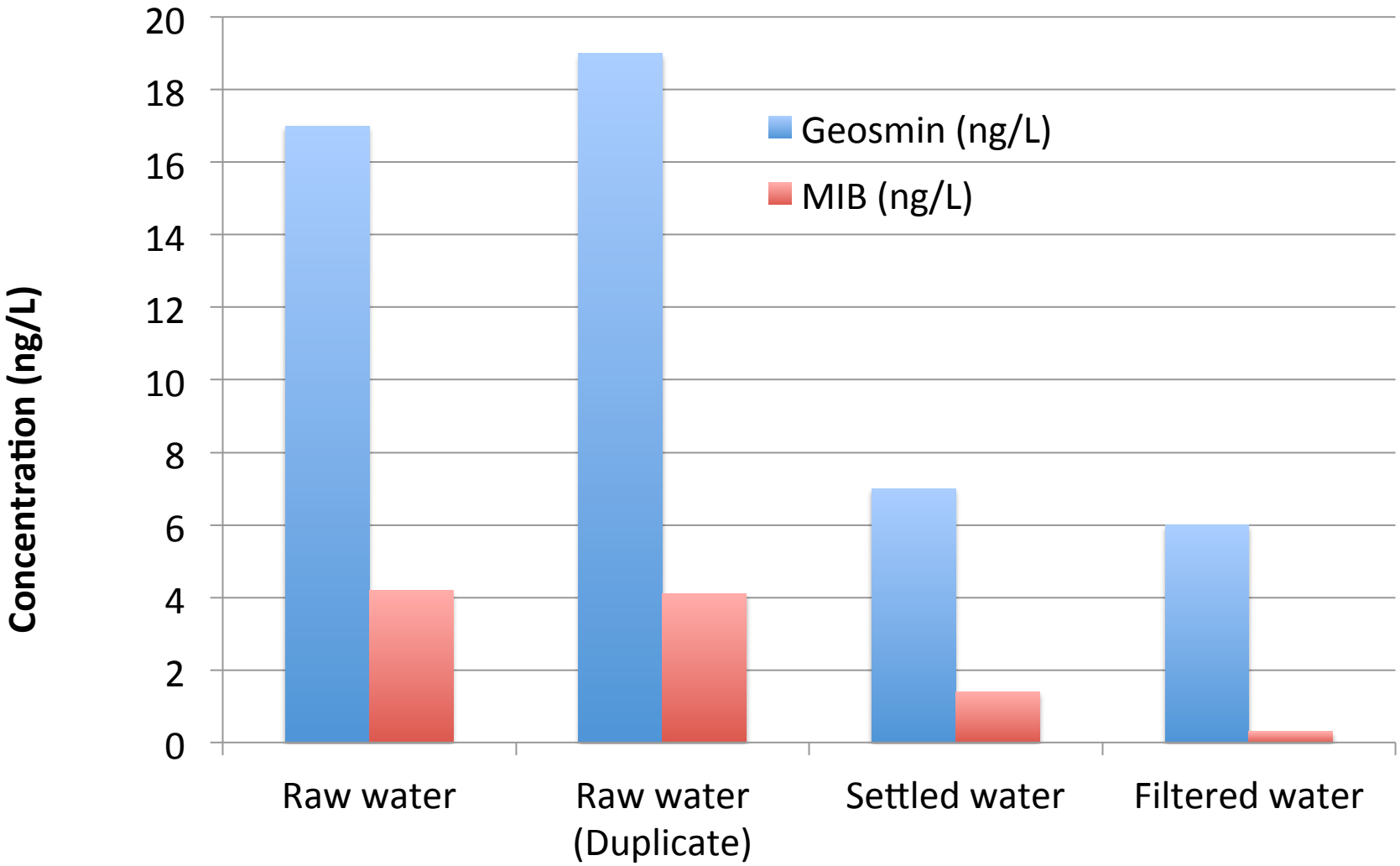
- The consolidated canal flows off the SRP South Canal, and provides the water supply for the Chandler WTP
- As noted in previous newsletters this year, consistent geosmin production in the canal has occurred
- The level of geosmin exceeds the capacity of current Powder Activated Carbon (PAC) treatment to reduce to below a consumer threshold level and the city has experienced customer complaints
- Numerous wells flow into the Consolidated Canal
- The next slides show geosmin concentration (ng/L) over a several mile section of the Consolidated Canal upstream of the Chandler WTP intake


W Warner Rd
5 ng/L
26
S Gilbert Rd
GILBERT
Well 29.6E-3.5S (OFF)
8 ng/L
25
6 ng/L
24
8 ng/L
23
9 ng/L
21
W Ray Rd
Side canal - 2 ng/L
20
19
1
30
16 ng/L
19 ng/L
E Chandler Blvd


Heritage District
W Elliot Rd
Lindsay Rd
2 ng/L
29
Well 30.3E-2.6S (ON)
2 ng/L
28
3 ng/L
27
W Warner Rd
E Warner Rd
26
5 ng/L


13 ng/L
20
1, 30
16 ng/L
19 ng/L
16 ng/L
19
E Chandler Blvd
Radial gate causes mixing
21 ng/L
18
2
19 ng/L
3
19 ng/L
21 ng/L
17
Well 28.9E-5.5S (OFF)
4
19 ng/L
17 ng/L
16
5
18 ng/L
Side canal - 2 ng/L
19 ng/L
15
6
18 ng/L
Pecos Road
18 ng/L
21 ng/L
10, 12
7
17 ng/L
9
Mud sample collected here (slide 4)
18 ng/L
8
18 ng/L
Chandler WTP
46
45
45

Chandler WTP

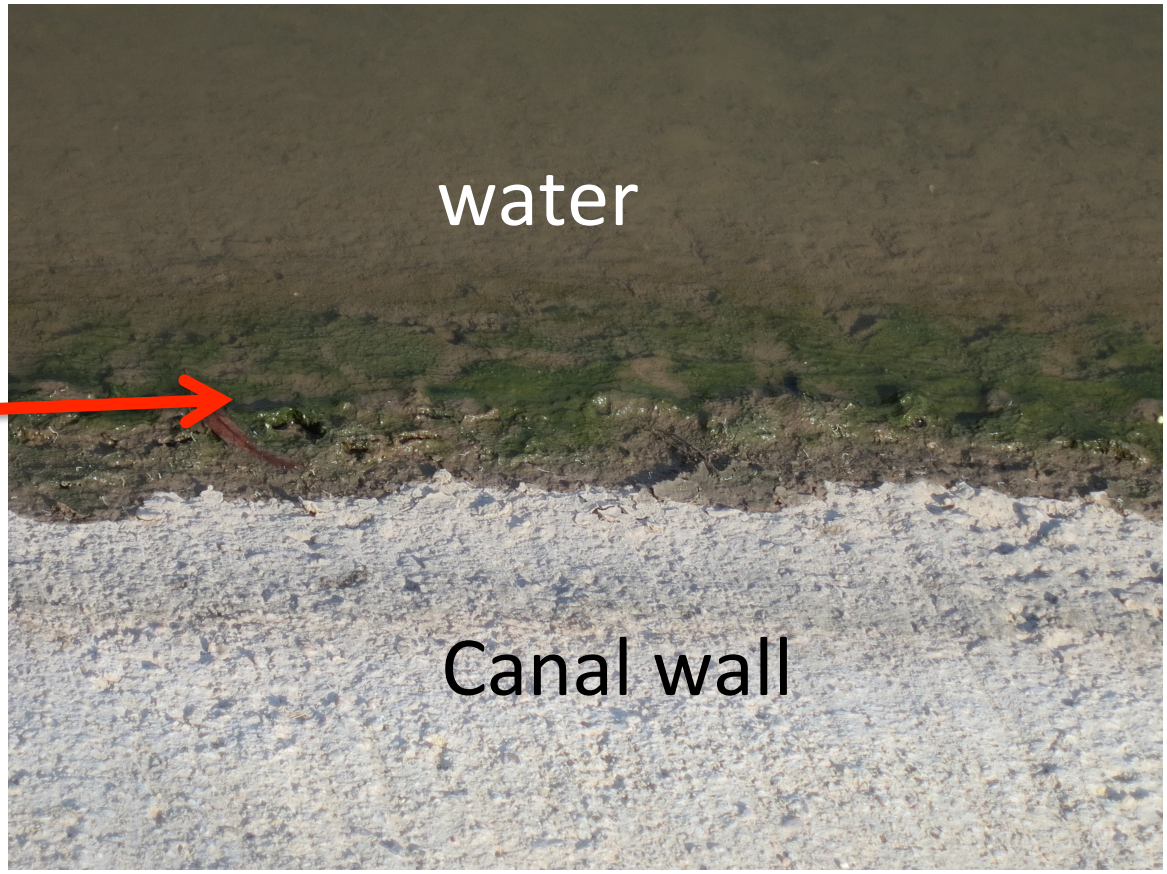


Mud sample scraped from East Canal Wall (between

In liquid with mud sample:

- 65 ng/L MIB
- 235 ng/L Geosmin

Algae at water-line
(mud sample collected here)



Geosmin Source & Control Options

Implication:
Biomass is growing on the sides of the canal that produce Geosmin
Possibly caused from well (Well 30.3E-2.6S **) pumping into canal**

Recommendation:
1. Have SRP brush canal (both sides) from Ray Road to influent of WTP (this will increase large biomass/turbidity to enter Chandler WTP for 1 day)
2. Within 2-3 days have SRP treat the canal with copper. Copper is complete removed during coag/sedimentation at WTP. There are a lot of carp/fish in this section of the canal – so SRP needs to consider this in selecting copper dosage.
3. See if SRP can deliver more surface water and no groundwater into the head of Consolidated Canal and stop pumping wells into the Consolidated Canal

MIB & Geosmin for Other Locations

Table 2 - Water Treatment Plants – July 1, 2013

Sample Description	MIB (ng/L)	Geosmin (ng/L)	Cyclocitral (ng/L)
Union Hills Inlet	<2.0	<2.0	<2.0
Union Hills Treated	<2.0	<2.0	<2.0
Tempe North Inlet	3.0	<2.0	<2.0
Tempe North Plant Treated	2.8	<2.0	<2.0
Tempe South WTP	<2.0	<2.0	<2.0
Tempe South Plant Treated	2.1	2.6	<2.0
Anthem Inlet	<2.0	<2.0	<2.0
Anthem Treated	<2.0	<2.0	<2.0
Chandler Inlet			
Chandler Treated			
Greenway WTP Inlet	9.3	11.5	<2.0
Greenway WTP Treated	<2.0	<2.0	<2.0
Glendale WTP Inlet	<2.0	2.5	<2.0
Glendale WTP Treated	<2.0	<2.0	<2.0

Table 3 - Canal Sampling – July 1, 2013

System	Sample Description	MIB (ng/L)	Geosmin (ng/L)	Cyclocitral (ng/L)
CAP	Waddell Canal	<2.0	<2.0	<2.0
	Union Hills Inlet	<2.0	<2.0	<2.0
	CAP Canal at Cross-connect			
AZ Canal	Salt River @ Blue Pt Bridge	3.0	<2.0	<2.0
	Verde River @ Beeline	4.8	2.4	<2.0
	AZ Canal above CAP Cross-connect	3.0	<2.0	<2.0
	AZ Canal below CAP Cross-connect	2.7	<2.0	<2.0
	AZ Canal at Highway 87	2.8	<2.0	<2.0
	AZ Canal at Pima Rd.	2.7	<2.0	<2.0
	AZ Canal at 56th St.	2.8	<2.0	<2.0
	AZ Canal - Central Avenue	2.7	<2.0	<2.0
	AZ Canal - Inlet to Glendale WTP	<2.0	2.5	<2.0
	Head of the Consolidated Canal			
	Middle of the Consolidated Canal			
South Tempe Canals	South Canal below CAP Cross-connect	3.0	<2.0	<2.0
	Head of the Tempe Canal	2.6	<2.0	<2.0
	Tempe Canal - Inlet to Tempe's South Plant	<2.0	<2.0	<2.0
	Mesa Turnout (June)	<2.0	<2.0	<2.0
	Salt-Gila Pump (June)	<2.0	<2.0	<2.0

Table 4 - Reservoir Samples – July 2, 2013

Sample Description	Location	MIB (ng/L)	Geosmin (ng/L)	Cyclocitral (ng/L)
Lake Pleasant (June)	Eplimnion	<2.0	<2.0	<2.0
Lake Pleasant (June)	Hypolimnion	<2.0	<2.0	<2.0
Verde River @ Beeline		4.8	2.4	<2.0
Bartlett Reservoir	Epilimnion	2.7	3.1	<2.0
Bartlett Reservoir	Epi-near dock	2.9	2.6	<2.0
Bartlett Reservoir	Hypolimnion	<2.0	<2.0	<2.0
Salt River @ BluePt Bridge		3.0	<2.0	<2.0
Saguaro Lake	Epilimnion	3.6	2.4	<2.0
Saguaro Lake	Epi - Duplicate	3.8	2.2	<2.0
Saguaro Lake	Epi-near dock	3.6	<2.0	<2.0
Saguaro Lake	Hypolimnion	2.1	<2.0	<2.0
Lake Havasu (June)		<2.0	3.3	<2.0
Verde River at Tangle Creek (June)		<2.0	<2.0	<2.0

Dissolved Organic Matter Information

Table 2 - Water Treatment Plants – July 1, 2013

Sample Description	DOC (mg/L)	UV254 (1/cm)	SUVA (L/mg-m)	TDN	DOC removal (%)
Union Hills Inlet	3.0	0.060	2.0	0.4	
Union Hills Treated	2.5	0.037	1.5	0.4	16
Tempe North Inlet	3.9	0.077	2.0	0.5	
Tempe North Plant Treated	3.1	0.045	1.5	0.3	21
Tempe South Inlet	2.7	0.050	1.9	1.3	
Tempe South Plant Treated	2.3	0.028	1.2	1.2	13
Greenway WTP Inlet	3.4	0.072	2.1	1.5	
Greenway WTP Treated	1.1	0.017	1.5	1.0	68
Glendale WTP Inlet	4.2	0.085	2.0	1.5	
Glendale WTP Treated	2.4	0.040	1.7	1.0	43
Anthem WTP Inlet	2.9	0.048	1.6	0.4	
Anthem WTP Treated	2.8	0.049	1.7	0.4	4
Chandler WTP Inlet	3.0	0.059	2.0	0.9	
Chandler WTP Treated	2.3	0.022	1.0	1.1	22

Table 3 - Rivers and Canals – July 1, 2013

Sample Description	DOC (mg/L)	UV254 (1/cm)	SUVA (L/mg-m)	TDN
Waddell Canal	3.1	0.052	1.7	0.4
Anthem WTP Inlet	2.9	0.048	1.6	0.4
Union Hills Inlet	3.0	0.060	2.0	0.4
CAP Salt-Gila Pump Station (Jun)	3.0	0.051	1.7	0.4
CAP Mesa Turnout (Jun)	3.1	0.051	1.7	0.5
CAP Canal at Cross-connect	no flow			
Salt River @ Blue Pt Bridge	3.9	0.059	1.5	0.4
Verde River @ Beeline	3.2	0.092	2.9	0.5
AZ Canal above CAP Cross-connect	3.9	0.072	1.9	0.3
AZ Canal below CAP Cross-connect	3.9	0.072	1.9	0.3
AZ Canal at Highway 87	3.8	0.071	1.9	0.3
AZ Canal at Pima Rd.	3.9	0.082	2.1	0.3
AZ Canal at 56th St.	3.9	0.075	1.9	0.5
AZ Canal - Central Avenue	3.9	0.095	2.5	0.3
AZ Canal - Inlet to Glendale WTP	4.2	0.085	2.0	1.5
AZ Canal - Inlet to GreenwayWTP	3.4	0.072	2.1	1.5
South Canal below CAP Cross-connect	3.9	0.059	1.5	0.3
Head of the Tempe Canal	3.6	0.064	1.8	0.5
Tempe Canal - Inlet to Tempe's South Plant	2.7	0.050	1.9	1.9
Head of the Consolidated Canal	Not Available			
Middle of the Consolidated Canal (approximate location)	2.9	0.058	2.0	1.0
Chandler WTP – Inlet	3.0	0.059	2.0	0.9

Table 4 - Reservoir Samples – July 2, 2013

Reservoir sampling conducted monthly. CAP is sampling Lake Pleasant and Havasu, and USGS is sampling Verde River at Tangle and Salt River above Roosevelt on slightly different days than the other reservoirs.

Sample Description	Location	DOC (mg/L)	UV254 (1/cm)	SUVA (L/mg-m)	TDN
Havasu (Jun)		2.9	0.054	1.9	0.5
Lake Pleasant (Jun)	Epilimnion	3.1	0.051	1.6	0.5
	Hypolimnion	3.1	0.047	1.5	0.3
Verde River (Jun)	@ Tangle	1.2	0.032	2.8	0.2
Verde River	@ Beeline Hwy	3.2	0.092	2.9	0.5
Bartlett Reservoir	Epilimnion	5.7	0.118	2.1	0.3
	Hypolimnion	4.7	0.144	3.0	0.3
Saguaro Lake	Epilimnion	5.0	0.077	1.5	0.4
	Epi - Duplicate	5.5	0.078	1.4	0.6
	Hypolimnion	4.5	0.068	1.5	0.5
Salt River	@ Blue Point Bridge	3.9	0.059	1.5	0.4