

Cyanotoxin Monitoring Plan (April 2018)

Clearlake Oaks County Water District

Step 1. Visual Inspection and Monitoring Schedule Visually inspect source waters for algae blooms (typically April through Nov). Observations include algae at surface, presence of toxic producing genera present in microscopy, algae build up on raw pH probe. Sample for microcystins ¹ in raw and finish water on a biweekly basis during presence of algae. Sampling is concurrent with tribes biweekly (Adda specific - ELISA). <i>If microcystin concentration exceeds 0.3 ug/L in 2 of 3 finish water samples, continue to Step 2.</i>	
Cyanotoxin Monitoring	Treatment Optimization
Step 2. Confirmation Sample (within 24 hours) Notify stakeholders and collect a confirmation sample at the entrance to the distribution system. <i>Primary ELISA option: Karola</i> <i>Secondary laboratory option: Bend Genetics (916) 550-1048</i> <i>If confirmation sample at entrance to distribution is >0.3 ug/L microcystin, continue to Step 3 and notify stakeholders.</i>	Monitor raw pH and use NTU readings to track plant performance. Monitor ozone dosage, pending extra- and intra-cellular results and microscopy (if <i>Lyngbya</i> or <i>Anabaena</i> – lower dosage). If bloom is in growth stage, consider reducing ozone to less than 2.7 mg/L. If bloom is in decay stage, maximize ozone.
Step 3. Positive Lab Sample Distribute public notice and conduct daily sampling at entrance to the distribution system. <i>If microcystin concentration is less than 0.3 ug/L at entrance to distribution system, continue to Step 4.</i>	Use bench top charge analyzer to optimize coagulation/flocculation process and evaluated condition of GAC media. Monitor sludge accumulation at locations with drinking water contact. Consider sampling at the source for extra- and intra-cellular toxins. Use CT sheet to determine appropriate chlorine dosage. Increase filter backwash operations. Evaluate possibility of coagulant aid and filter aid operations.
Step 4. Confirmation and Lifting notice Collect samples at locations in distribution system specified in Cyanotoxin Sampling Schedule and at the entrance to the distribution system. <i>If any samples are positive, sample at Step 3 locations. If all laboratory samples are absent microcystins, lift notice and conduct weekly monitoring.</i>	Resume operations

¹ Consider sampling for cylindrospermopsin or other toxins if corresponding genera are present.

Cyanotoxin Sampling Schedule

	Step 1. Routine Monitoring	Step 2 @ WTP <i>confirm</i>		Step 3 +MC	Step 4 OFF (DAY1)	Step 4 OFF (DAY2)
Frequency	BIWEEKLY	TRIGGER	Notify stakeholders, distribute PN	DAILY	DAY1	DAY2
Test-Type	ADDA ELISA	ADDA ELISA		ADDA ELISA	ADDA ELISA	ADDA ELISA
LOCATION:						
RAW	X	X		M ^F		M
postOzone		M		M		
postClarifier		M		M		
postFilter		M		M		
postGAC		M		M		
EntryToDist	2/3 Step 2	X		X	X	X
Keys		X			X	X
North Dist					X	X
South Dist					X	X
Elevated Dist						
Other					Flush	

M = maybe, pending cost; PN – public notification; F = fractionate source sample to look at extra- and intra-cellular distribution of toxin in source water

STAKEHOLDERS:

Public Health Officer, Sara Goldgraben: (707) 263-1090

District Office, Sheri Miller (707) 576-2145

Tribal Communication (707)295-8577 (Karola) (707) 263-3924 x132 (Sarah)

Hospitals: AH Clear Lake (707) 994-6486

Veterinarians: Clearlake Vet (707) 994-9100 Waddington: (707) 995-1138