

**Microcystin, Cylindrospermopsin, Saxitoxin & Anatoxin-a Report**  
**Project: Utah DEQ – Division of Water Quality**

<u>Sample ID</u>	<u>Site</u>	<u>Date Collected</u>
1	Spanish Fork River	7/20/16
2	Lincoln Beach	7/20/16
3	Saratoga Harbor	7/20/16
4	Saratoga Private	7/20/16
5	Lindon Marina	7/20/16
12	AF Boat Harbor	7/20/16

**Toxins** – microcystins/nodularins (MCs), cylindrospermopsin (CYN), saxitoxin (STX), anatoxin-a (ANTX-A)

**Sample Prep**

Samples were ultrasonicated to lyse cells and release toxins. Samples were filtered prior to ANTX-A analysis, with a duplicate lab fortified matrix (LFM) prepared at 0.1 µg/L. LFM for CYN (1 µg/L) and STX (0.2 µg/L) and MC-LR (1.0 µg/L) were also prepared.

**Analytical Methodology****MC**

The Adda (Abraxis) microcystins enzyme linked immunosorbent assay (ELISA) was utilized for the quantitative and sensitive congener-independent detection of MCs. The current assay is sensitive to down to a LOD/LOQ of 0.15 µg/L for total MCs. The average recoveries of laboratory fortified blanks (LFB) spiked with 1.0 µg/L MCLR was 105% and 112%.

**CYN**

A cylindrospermopsin ELISA (Abraxis) was utilized for the quantitative detection of CYN. The current assay is sensitive down to a LOD/LOQ limit of 0.10 µg/L for CYN. The average LFB recovery was 95%.

## STX

A saxitoxin enzyme linked immunosorbent assay (ELISA) was utilized for the quantitative detection of STX. The current assay is sensitive down to a LOD/LOQ limit of 0.05 µg/L STX. The average LFB recovery was 100%.

## ANTX-A


Liquid chromatography-mass spectrometry/ mass spectrometry (LC-MS/MS) was utilized for the determination of ANTX-A. The  $[M+H]^+$  ion for ANTX-A ( $m/z$  166) was fragmented and the product ions ( $m/z$  56, 91, 107, 131 & 149) were monitored.

### Summary of Results

<u>Sample</u>	<u>MC levels</u> (µg/L)	<u>CYN levels</u> (µg/L)	<u>STX levels</u> (µg/L)	<u>ANTX-A levels</u> (µg/L)
1	ND	ND	ND	ND
2	<b>63</b>	ND	ND	ND
3	<b>0.24</b>	ND	ND	ND
4	ND	ND	ND	ND
5	ND	ND	ND	ND
12	ND	ND	ND	ND
<i>Detection Limits (µg/L)</i>				
	0.15	0.10	0.05	0.05

ND = Not detected above the detection limit

Submitted by:



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Date:

7/26/16