

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

<u>Sample ID</u>	<u>Site</u>	<u>Date Collected</u>
4991820	Jordan River at Cudahy Lane	7/18/16
4991890	Jordan River at 500N Xing	7/18/16
4990880	Surplus Canal at State Canal Road	7/18/16
4991310	Surplus Canal at I-80 Xing	7/18/16
4991290	Surplus Canal NW of Airport	7/18/16
4992290	Jordan River at 1700S Xing	7/18/16
4992890	Jordan River at 3900/4100 Xing	7/18/16

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

Sample Prep

The sample volumes were too low for ultrasonication, so 3 freeze thaw cycles were used to lyse cells. Strata X solid phase extraction (SPE) was utilized to achieve 2x pre-concentration for 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 recovery of a laboratory fortified blank (LFB) spiked with 1 µg/L MCLR was 125%.

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 118%.

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

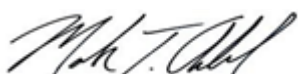
Liquid chromatography-mass spectrometry/ mass spectrometry (LC-MS/MS) was utilized for the determination of ANTX-A. The $[M+H]^+$ ion for ANTX-A (m/z 166) was fragmented and the product ions (m/z 56, 91, 107, 131 & 149) were monitored.

Summary of Results

<u>Sample</u>	<u>MC levels</u> ($\mu\text{g/L}$)	<u>CYN levels</u> ($\mu\text{g/L}$)	<u>STX levels</u> ($\mu\text{g/L}$)	<u>ANTX-A levels</u> ($\mu\text{g/L}$)
4991820	ND	ND	ND	ND
4991890	ND	ND	ND	ND
4990880	ND	ND	ND	ND
4991310	ND	ND	ND	ND
4991290	ND	ND	ND	ND
4992290	ND	ND	ND	ND
4992890	ND	ND	ND	ND
<i>Detection Limits ($\mu\text{g/L}$)</i>	<i>0.15</i>	<i>0.10</i>	<i>0.05</i>	<i>0.05</i>

ND = Not detected above the detection limit

Submitted by:



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Date:

7/23/16