Memo

Date: Monday, February 17, 2025

To: Lori Myott, PE, Lansing Board of Water & Light (BWL)

From: Lara Zawaideh, PE, HDR Michigan, Inc.

Subject: Former Erickson Power Station CCR Impoundments Determination of Statistically Significant Levels (SSL) over Groundwater Protection Standards (GPS) per Code of Federal Regulations (CFR) §257.95(g) and Michigan Part 115 Rule R 299.4441(7).

The U.S. Environmental Protection Agency's (EPA's) 2015 Coal Combustion Residuals (CCR) Rule and Michigan Part 115 regulation established a comprehensive set of requirements for the management and disposal of CCR (or coal ash) in landfills and surface impoundments by electric utilities. The Former Erickson Station had one CCR unit subject to the CCR Rule composed of three surface impoundments: the Forebay, Retention Basin, and Clear Water Pond (CWP). The three CCR impoundments were physically closed by the removal of CCR in 2024, with ongoing groundwater monitoring. The objective of this memorandum is to document the observation of additional statistically significant levels (SSLs) of CCR constituents over groundwater protection standards (GPS).

In accordance with CFR §257.95(h) and Michigan Rule R 299.4441(9), GPS values for the constituents of interest (COIs) monitored for the assessment monitoring programs were previously established. The site-specific background levels, applicable federal and state established criteria, and GPS for the shallow glacial aquifer at the Former Erickson Power Station are presented in **Table 1**.

Table 1. Groundwater Protection Standards for Shallow Glacial Monitoring Wells at Former Erickson Power Station

Constituent	Site-Specific Background Level Upper Tolerance Limit (UTL) (mg/L)	Federal Maximum Contaminant Level (mg/L)	State Non-Residential Drinking Water Cleanup Criteria for Groundwater (mg/L)	State Compliance Program Groundwater Protection Standards for Site (mg/L)	Federal Compliance Program Groundwater Protection Standards for Site (mg/L)
Antimony	0.005	0.006	0.006	0.006	0.006
Arsenic	0.021	0.01	0.01	0.021	0.021
Barium	0.168	2	2	2	2
Beryllium	0.001	0.004	0.004	0.004	0.004
Boron[1]	0.48	NV	0.5	0.5	No GPS
Cadmium	0.0005	0.005	0.005	0.005	0.005
Calcium[1]	188	NV	NV	188	No GPS
Chloride[1]	94.377	250	250	250	No GPS
Chromium	0.005	0.1	0.1	0.1	0.1
Cobalt	0.005	0.006	0.1	0.006	0.006

Table 1. Groundwater Protection Standards for Shallow Glacial Monitoring Wells at Former Erickson Power Station					
Constituent	**Site-Specific Background Level Upper Tolerance Limit (UTL) (mg/L)**	**Federal Maximum Contaminant Level (mg/L)**	**State Non-Residential Drinking Water Cleanup Criteria for Groundwater (mg/L)**	**State Compliance Program Groundwater Protection Standards for Site (mg/L)**	**Federal Compliance Program Groundwater Protection Standards for Site (mg/L)**
Copper[1]	0.005	1.3	1	1	No GPS
Fluoride	1	4	2	2	4
Iron[1]	23.5	0.3	0.3	23.5	No GPS
Lead	0.003	0.015	0.004	0.004	0.015
Lithium	0.0397	0.04	0.35	0.04	0.04
Mercury	0.0002	0.002	0.002	0.002	0.002
Molybdenum	0.024	0.1	0.21	0.1	0.1
Nickel[1]	0.021	NV	0.1	0.1	No GPS
Radium-226/228	5.00 pCi/L	5 pCi/L	NV	5 pCi/L	5 pCi/L
Selenium	0.005	0.05	0.05	0.05	0.05
Silver[1]	0.0005	0.1	0.098	0.098	No GPS
Sulfate[1]	344	250	250	344	No GPS
Thallium	0.002	0.002	0.002	0.002	0.002
Total Dissolved Solids[1]	1168.639	500	500	1168.639	No GPS
Vanadium[1]	0.005	NV	0.062	0.062	No GPS
Zinc[1]	0.036	5	5	5	No GPS

1) Constituent not included in the Federal CCR Rule Assessment Monitoring Program.

Determination of SSLs over GPS

Previous SSLs of monitored constituents in groundwater had been detected and reported for downgradient wells MW-2, MW-5, MW-6 in November 2020, MW-7 in August 2022, and MW-7C, MW-14, MW-16A, and MW-16D in May 2024.

Monitoring well MW-3 was installed on October 15, 2019 as part of the initial investigation of the Former Erickson Station to triangulate the gradient and direction of groundwater flow. Initial monitoring identified MW-3 as cross-gradient to the CCR impoundments. Well MW-3 was added to the monitoring network in May 2021 as a characterization well and continued to be sampled on a semi-annual basis during assessment monitoring events. The August 2024 semi-annual sampling event marked the 8th sampling event for this well; therefore, there were enough sample events to perform a statistical evaluation of the water quality from this well and the findings are described below.

SSLs Under the Federal CCR Rule Compliance Program - §257.95(g)

In accordance with CFR §257.95(e), downgradient well concentrations were compared against background values, and some concentrations were found to be above background values and exceed the GPS. To determine if an exceedance of the GPS was statistically significant, the 95% lower confidence limit (95LCL) was calculated for each of the downgradient wells for each of the federal assessment monitoring COIs. The data set used to calculate the LCL includes assessment monitoring results from the samples collected at these wells since the installation of these wells.

The LCLs for MW-3 that exceed the federal GPS through the August 2024 sampling event are provided in **Table 2**. Additional SSLs were observed at other wells; however, those SSLs have been detected and reported previously. The LCLs of lithium and molybdenum are greater than the federal GPS and represent SSLs over GPS. Since the impoundment was already in assessment monitoring and assessment of corrective measures for lithium and molybdenum, these updated SSL results do not change the status of the ongoing groundwater monitoring program.

Table 2. Monitoring Wells with SSLs that Exceed Federal GPS through August 2024

Monitoring Well	Constituent	Lithium	Molybdenum
	Federal GPS	0.040 mg/l	0.10 mg/l
MW-3	95% LCL	0.078	0.16

SSLs Under Michigan Part 115 Compliance Program - R 299.4441(7)

Similar to the above, in accordance with Michigan Rule R 299.4441(5), downgradient well concentrations were compared against background values, and some concentrations were found to be above background values and above the State compliance program GPS. The LCLs for MW-3 that exceed the State compliance program GPS through the August 2024 sampling event are provided in **Table 3**. The LCLs of boron, calcium, lithium, molybdenum, sulfate, and total dissolved solids (TDS) are greater than the State GPS and represent SSLs over GPS. Since the impoundment was already in assessment monitoring and assessment of corrective measures, the updated SSLs for MW-3 do not change the status of the ongoing groundwater monitoring program.

Table 3. Monitoring Wells with SSLs that Exceed State GPS through August 2024

Monitoring Well	Constituent	Boron	Calcium	Lithium	Molybdenum	Sulfate	TDS
	State GPS	0.50 mg/l	188 mg/l	0.040 mg/l	0.10 mg/l	344 mg/l	1,169 mg/l
MW-3	95% LCL	5.5	240	0.078	0.16	690	1,400

The parameters with SSLs over GPS were previously identified as SSLs in groundwater at different wells in the monitoring program. Incorporating these newly detected SSLs (MW-3) into the list of prior SSL observations results in the detected SSLs for the impoundments through August 2024 shown in **Table 4**.

Table 4. Detected SSLs at Erickson Power Station through August 2024

Monitoring Wells	Constituents with concentrations at SSLs over Federal GPS	Constituents with concentrations at SSLs over State GPS
MW-2	Lithium	Boron, Calcium, Lithium, Sulfate, TDS
MW-3	Lithium, Molybdenum	Boron, Calcium, Lithium, Molybdenum, Sulfate, TDS
MW-5	Lithium	Boron, Calcium, Lithium, Sulfate, TDS
MW-6	Lithium	Boron, Lithium
MW-7	Lithium, Molybdenum	Boron, Lithium, Molybdenum
MW-7C	Lithium, Molybdenum	Boron, Calcium, Lithium, Molybdenum, Sulfate, TDS
MW-14	Lithium	Boron, Lithium
MW-16A*	Lithium	Chloride, TDS
MW-16D*	-	Boron

*An Alternative Source Demonstration (ASD) has been prepared for the SSLs observed within these wells.