



WSP USA Environment & Infrastructure, Inc.  
100 Apollo Drive, Suite 302  
Chelmsford, MA 01824  
USA  
T: 978-692-9090

# Project Memorandum

To: Jeff Loewe / NIPSCO

From: Russell Johnson / WSP      Reviewer: John Storm / WSP

cc: Marc Okin / NIPSCO      File No.: 7382193341.0008  
Joe Kutch / NIPSCO

Date: June 7, 2023

Re: **Northern Indiana Public Service Company LLC  
Michigan City Generating Station – Primary Settling Pond #2  
Corrective Measures Selection of Remedy  
Semi-annual Progress Report #21-05**

In conformance with 40 Code of Federal Regulations (CFR) §257.97(a), WSP USA Environment & Infrastructure Inc. (WSP) has prepared this semi-annual progress report for the Northern Indiana Public Service Company, LLC (NIPSCO) Michigan City Generating Station located at 101 Wabash Street in Michigan City, La Porte County, Indiana (MCGS or Site). The purpose of this memo is to summarize progress towards selection of a corrective measures remedy for the Primary Settling Pond #2 (Primary 2). This is the fifth semi-annual report since filing the Assessment of Corrective Measures (ACM) Report for Primary 2<sup>1</sup>, dated December 7, 2020. The ACM was prepared in conformance with applicable requirements of 40 CFR §257.96, including certification by a qualified Indiana-licensed professional engineer. Subsequently, NIPSCO placed the ACM in the facility operating record, and it was posted to NIPSCO's publicly accessible CCR website. This fifth semi-annual report covers the six-month period from December 8, 2022, through June 7, 2023.

Corrective action under the federal CCR Rule is triggered through a two-phase program of groundwater monitoring: detection and assessment. Primary 2 is currently in the Assessment Monitoring phase of the program (40 CFR §257.95). A statistical evaluation of groundwater monitoring data was conducted, and as of June 8, 2020, Primary 2 was required to enter Groundwater Corrective Action (§257.96 through §257.98) based on statistically significant levels (SSLs) above the Groundwater Protection Standards (GWPS) of 0.017 milligrams per liter (mg/L) for arsenic and 0.002 mg/L for thallium. The GWPS for arsenic is based on the background concentration developed for Primary 2, whereas the GWPS for thallium is based on the Maximum Contaminant Level (MCL). Since that time arsenic and thallium have been consistently detected at SSLs in one or more wells until March 2022 when thallium was not detected as an SSL in any well. New selenium SSLs were identified in two downgradient wells during the March 2022 event. On August 18, 2022, NIPSCO posted a Notice of SSL indicating that as of July 19, 2022, arsenic and selenium were detected at SSLs above the GWPS in wells downgradient of Primary 2. The selenium GWPS is based on the MCL of 0.050 mg/L. In response to the selenium SSL, WSP prepared

<sup>1</sup> Wood, 2020. Assessment of Corrective Measures, Primary Settling Pond No. 2, Michigan City Generating Station, Michigan City, Indiana. December 7, 2020.

Addendum No. 1 to the ACM dated October 19, 2022<sup>2</sup>. Although selenium was not previously detected at an SSL, it was considered in the evaluation of remedial alternatives in the ACM (Wood, 2020), which concluded that all the alternatives considered would be potentially effective at reducing selenium concentrations. As of December 31, 2022, arsenic, selenium, and thallium had been detected at SSLs.

All discharges to Primary 2 were discontinued in October 2018. Groundwater levels in the CCR monitoring wells around Primary 2 that are still monitored, including GAMW-12, GAMW-14, GAMW-15, and GAMW-16, have declined 1.87 to 4.90 feet in the time between October 2018 and March 2022. Upgradient well GAMW-18 was dry in March 2022. Although there has been a notable decline in water levels (and the associated hydraulic gradient), the general pattern of groundwater flow is like the pattern when this impoundment was operating – radially away from Primary 2 to the northeast and southwest.

The 2021-2022 Annual Report for Primary 2 was issued in August 2022<sup>3</sup>. The arsenic concentrations detected in groundwater from the eight<sup>4</sup> downgradient wells at Primary 2 for the 19 events from July 2016 to March 2022 ranged from 0.0062 mg/L to 0.060 mg/L. Thallium concentrations for the same 19 events ranged from 0.000089 mg/L (estimated) to 0.0056 mg/L, whereas selenium concentrations ranged from 0.00092 mg/L (estimated) to 0.650 mg/L.

Prior to filing the ACM for Primary 2 in December 2020, a Closure Application<sup>5</sup> was filed with the Indiana Department of Environmental Management (IDEM) that addressed all five former CCR surface impoundments using closure by removal, including Primary 2. A supplemental addendum to the Closure Application<sup>6</sup> was subsequently filed with IDEM in February 2019. The addendum addressed the post-closure groundwater monitoring network for all five CCR surface impoundments, which includes 24 existing wells and 12 new wells. A virtual public hearing was conducted on April 16, 2020, to present the proposed approach for CCR unit closure at MCGS, after which NIPSCO received several comments from interested stakeholders. IDEM approved the Closure Application on March 10, 2021.

NIPSCO has nearly completed closing all five impoundments by removing source materials pursuant to 40 CFR §257.102(c). As of this report, approximately 46,000 cubic yards of CCR, blast furnace slag, and an additional foot of underlying material has been removed from Primary 2 and replaced with native sand backfill. An 18-inch soil cover having a permeability of  $1 \times 10^{-5}$  centimeters per second, or less, has been placed over the backfilled area. A 6-inch layer of topsoil has been placed above the soil cover and will next be vegetated with an IDEM-approved seed mix. The backfill/soil cover system has been contoured to promote drainage to catch basins that eventually discharge to the Final Pond.

Once the impoundment closures are completed, which is anticipated to be in June 2023, the post-closure monitoring well network for all five impoundments will be installed in two phases because components of the closure include dewatering and water treatment prior to and during excavation and capping, and the staging/management of excavated materials for loading and offsite disposal.

---

<sup>2</sup> WSP, 2022. Assessment of Corrective Measures, Primary Settling Pond No. 2, Addendum No. 1, Michigan City Generating Station, Michigan City, IN. October 19, 2022.

<sup>3</sup> WSP Golder, 2022. 2021-2022 Annual Groundwater Monitoring and Corrective Action Report – Primary 2, NIPSCO LLC Michigan City Generating Station. August 2022.

<sup>4</sup> There are now four downgradient wells, as wells GAMW-09 and GAMW-17 were decommissioned in November 2019, and wells GAMW-08 and GAMW-13 were decommissioned in November 2021.

<sup>5</sup> Wood, 2018. Surface Impoundment Closures (CCR Final Rule and RCRA Regulated) Closure Application, Volume 1 – Closure Plan and Drawings (Appendix A), Michigan City Generating Station, Northern Indiana Public Service Company, Merrillville, Indiana. December 20, 2018.

<sup>6</sup> Wood, 2019. Supplemental Addendum, Monitoring Well Network, Surface Impoundment Closures (CCR Final Rule and RCRA Regulated) Closure Application, Michigan City Generating Station, Northern Indiana Public Service Company, Merrillville, Indiana. February 28, 2019.

As a result, it is anticipated that several months will be required for the groundwater system to rebound from the drawdown associated with pumping and to equilibrate to post-construction conditions. Placement of the low-permeability cover system and the installation of a new drainage system designed to prevent ponding above each cover is expected to result in a net loss of infiltration directly beneath the footprint of each closed impoundment compared to pre-construction conditions. Therefore, the initial phase of the post-closure monitoring network will include the installation of deep wells (i.e., installed below the water table) anticipated for the summer of 2023. After an appropriate period of water-level monitoring to indicate stability of the water table, acknowledging fluctuation associated with precipitation events, the paired shallow wells will be installed to intercept the water table. Those installations are anticipated for late fall/early winter 2023.

Removal of source material is the primary objective in the corrective measure for Primary 2. Therefore, the ACM focused on residuals in groundwater upon closure of Primary 2 and identified five potential groundwater corrective measure alternatives for implementation. The five alternatives include groundwater extraction for treatment with three options for discharge (surface water, publicly owned treatment works, and groundwater reinjection), a permeable reactive barrier (PRB), and monitored natural attenuation (MNA). NIPSCO considered these five alternatives to be viable for the other impoundments slated for closure at the MCGS because of similar contaminants and the proximity of impoundments to one another.

Treatability and column studies were completed in 2019 focusing primarily on arsenic. That study evaluated technologies to simulate ex-situ treatment of extracted groundwater. WSP collected site groundwater from six wells across the Site, including wells near Primary 2. WSP also performed column studies to simulate a PRB. The treatability and column studies demonstrated effective removal of arsenic from groundwater for either the pump and treat or PRB alternatives. WSP reported their findings in a memorandum<sup>7</sup> dated February 12, 2020, which was included as Attachment A of the Primary 2 ACM Report

In late March 2023, 29 wells were sampled, including seven deep wells installed in the native sand aquifer during the 2018 investigation and 22 wells installed during the RCRA Facility Investigations and as required by the CCR Rule. Once these data are validated a plume stability evaluation will be completed to assess whether or not the plume is expanding, shrinking, or stable. In May 2023, WSP engineers visited the Site to initiate a constructability evaluation of the potential remedies, focusing on space limitations between the closed impoundments and nearby features (e.g., the Final Pond, sheet pile along Lake Michigan), the potential influence of sheet pile around Secondary 1 and 2, limitations on construction equipment due to overhead transmission lines, the presence of underground utilities (e.g., recirculation lines to the cooling tower that pass beneath the central portion of the Boiler Slag Pond and south along Primary 2), and limitations/requirements to protect transmission tower foundations.

A three-dimensional numerical groundwater flow model for the MCGS has also been developed using the USGS finite-difference code MODFLOW-NWT<sup>8</sup>. The flow model will be used to simulate the groundwater flow system at MCGS in preparation for subsequent transport simulations using the code MT3D<sup>9</sup>. Additional modeling will be performed to evaluate the effectiveness of each alternative proposed in the ACM for Primary 2, and to assess the estimated times to achieve closure for groundwater.

---

<sup>7</sup> Final Test Report – NIPSCO Pump and Treat Test and Column Study REV 1. February 12, 2020. Attachment A to the ACM for Primary 2

<sup>8</sup> Niswonger, R.G., Panday, Sorab, and Ibaraki, Motomu, 2011, MODFLOW-NWT, A Newton formulation for MODFLOW-2005: U.S. Geological Survey Techniques and Methods 6-A37, 44 p.

<sup>9</sup> Zheng, Chunmiao, and P. Patrick Wang, 1999, MT3DMS, A modular three-dimensional multi-species transport model for simulation of advection, dispersion and chemical reactions of contaminants in groundwater systems; documentation and users guide, U.S. Army Engineer Research and Development Center Contract Report SERDP-99-1, Vicksburg, MS, 202 p.

NIPSCO anticipates performing additional studies of soil and groundwater in 2023 after completion of the impoundment closures and installation of the post-closure monitoring well network. These studies are considered imperative to assessing the groundwater following removal of the source of CCR constituents, to support choosing the most appropriate corrective measure technology. Wood designed these studies to assess the sorption/desorption of CCR constituents, particularly arsenic. The flow and transport model will be updated with this additional information. An updated report will be prepared semi-annually, in conformance with applicable requirements of 40 CFR §257.97(a), that summarizes NIPSCO's progress towards selection of a remedy for groundwater Corrective Measures at Primary 2.