

detections at wells located downgradient of the BSP in 2019, 2020 and 2021 were consistent with the arsenic data through 2018 that were considered in the ACM for the BSP, although a new maximum arsenic detection (0.027 mg/L) was reported for groundwater collected from well GAMW-10 during the October 2019 event, above the prior maximum concentration of 0.023 mg/L. Data from the April and October 2022 groundwater monitoring events will be included in the next annual report for the BSP, which is due in January 2023.

Notifications for arsenic at SSLs downgradient of the BSP were issued in June and August 2019, and April 2020, for the sampling events of October 2018, April 2019, and October 2019, respectively. A new arsenic background value of 0.017 mg/L was established in July 2020 based on data through the April 2020 event. There have been no arsenic SSL notifications for any well downgradient of the BSP for the April and October 2020 events, the April and October 2021 events, March 2022, or the September 2022 event. No other constituents were detected at SSLs above the GWPS through September 2022.

Prior to filing the ACM for the BSP in January 2020, a Closure Application⁶ was filed with the Indiana Department of Environmental Management (IDEM) that addressed all five former CCR surface impoundments using closure by removal, including the BSP. A supplemental addendum to the Closure Application⁷ 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. As stated in the ACM Report (Wood, 2020), during development of the post-closure application and in discussions with IDEM a two-year, post-closure monitoring period was proposed to evaluate the effectiveness of source removal and attenuation before implementing a groundwater corrective action. 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 is currently closing all five impoundments by removing source materials pursuant to 40 CFR §257.102(c). Closure has begun in the BSP and will progress west and south towards Primary 1. 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. CCR will be removed plus an additional one foot of material beyond the CCR/soil interface. Removal of the CCR will be verified in the field by the certifying engineer. As of mid-November 2022, approximately 50% of the CCR has been removed from the BSP, and backfilling had not yet begun. It is anticipated that backfilling will be complete in time for cap placement in Q2 2023.

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

⁶ 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.

⁷ 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.

An ACM Report⁸ for Primary Settling Pond #2 (Primary 2) was prepared in December 2020. Primary 2 is located immediately adjacent to the BSP and there may be overlapping arsenic plumes potentially reflecting historic groundwater flow patterns when the two units were still receiving process water. All discharges to Primary 2 were discontinued in October 2018, and to the adjacent Boiler Slag Pond on April 15, 2019. Groundwater levels in the CCR monitoring wells around Primary 2 that are still being monitored, including GAMW-12, GAMW-14, GAMW-15, and GAMW-16, have declined 1.87 to 4.90 feet in the time between August 2018 and March 2022. Upgradient well GAMW-18 was dry in March 2022.

Treatability and column studies were conducted in 2019 focusing primarily on arsenic. That study looked at technologies to simulate ex-situ treatment of extracted groundwater. Site groundwater was collected from six wells across the Site, including wells near the BSP and Primary 2. Column studies were also performed to simulate a PRB. The treatability and column studies demonstrated very effective removal of arsenic from groundwater for either the pump and treat or PRB alternatives. Findings were reported in a memorandum⁹ prepared by Wood in February 2020, which was included as Attachment A of the Primary 2 ACM Report.

Wood has also developed a three-dimensional numerical groundwater flow model for the MCGS using the USGS finite-difference code MODFLOW-NWT¹⁰. The flow model will be used to simulate the groundwater flow system at MCGS in preparation for subsequent transport simulations using the code MT3D¹¹. Modeling will be performed to evaluate the effectiveness of each alternative evaluated in the ACM for the BSP, and to assess the estimated times to achieve closure for groundwater. The model will be continually modified as new information is gathered.

NIPSCO anticipates performing additional studies of soil and groundwater in Q2 2023, after impoundment closure, to assess the sorption/desorption of CCR constituents, particularly arsenic. In addition, Wood will continue to provide an updated report semi-annually, in conformance with applicable requirements of 40 CFR §257.97(a), that summarizes NIPSCO's progress towards selection of remedy for groundwater corrective measures at the BSP.

⁸ Wood, 2020. Assessment of Corrective Measures, Primary Settling Pond No. 2, Michigan City Generating Station, Michigan City, Indiana. December 7, 2020.

⁹ Final Test Report – NIPSCO Pump and Treat Test and Column Study REV 1. February 12, 2020. Attachment A to the ACM for Primary 2

¹⁰ 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.

¹¹ 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.