Remedy Selection Report

Omaha Public Power District

Nebraska City Station
NC2 Ash Disposal Area

Nebraska City, Nebraska

November 15, 2021

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Acronyms/Abbreviations:

ug/L	micrograms per liters
ACM	Assessment of Corrective Measures
AMSL	Above Mean Sea Level
ASD	Alternate Source Demonstration
CCR	Coal Combustion Residual
CFR	Code of Federal Regulations
GMSMC	Groundwater Monitoring Statistical Methods Certificate
GWPS	Groundwater Protection Standards
HDR	HDR Engineering, Inc.
LCL	Lower Confidence Level
LTPM	Long-Term Performance Monitoring
MCL	Maximum Contaminant Level
MDL	Method Detection Limit
NDEE	Nebraska Department of Environment and Energy
NES	Nature & Extent Study
NPDES	National Pollutant Discharge Elimination System
NC2	Nebraska City Unit 2
OPPD	Omaha Public Power District
RCRA	Resource Conservation and Recovery Act
RSR	Remedy Selection Report
SSL	Statistically Significant Level
UCL	Upper Confidence Level
UPL	Upper Prediction Limit
USEPA	United States Environmental Protection Agency

Note this is a comprehensive list of common acronyms. All acronyms listed above may not have been used in the following report and/or attached tables.

Certification by a Professional Engineer

I hereby certify that this engineering document was prepared by me or under my direct personal supervision and meets the requirements of 40 CFR §257.97 and that I am duly licensed Professional Engineer under the laws of the State of Nebraska.

Print Name: Megan B. Seymour

Signature: Megan B. Seymour

Date: 11-15-2021

License #: E-15931

My license renewal date is December 31, 2022.

1.0 Introduction

HDR Engineering, Inc. (HDR), on behalf of the Omaha Public Power District (OPPD) Nebraska City Station (NCS), has produced this Remedy Selection Report (RSR) for the NC2 Ash Disposal Area, a regulated coal combustion residuals (CCR) landfill located at the NCS. The NC2 Ash Disposal Area is regulated under the current United States Environmental Protection Agency's (USEPA) CCR Rule (40 Code of Federal Regulations [CFR] 257 Subpart D) and permitted under the Nebraska Department of Environment and Energy (NDEE) Title 132 Chapter 7 (Groundwater Monitoring and Remedial Action) regulations for fossil fuel combustion ash disposal areas. In accordance with these regulations, groundwater monitoring is required to assess potential impacts of CCR activities to groundwater

During the spring 2020 sampling event, two statistically significant levels (SSLs) above their respective groundwater protection standards (GWPS) were detected; arsenic and lithium in NC2MW-7. Following the October 2020 sampling event, an additional SSL for arsenic was detected in NC2MW-8 (HDR, 2021a). Prior to these sampling events, site investigations were conducted as part of the NDEE Title 132 groundwater program which included the evaluation of arsenic. A Title 132 Groundwater Assessment Report was submitted to the NDEE with the results of the investigation which concluded that arsenic was a result of natural variation (HDR, 2019a). A notification for an alternate source demonstration (ASD) for arsenic was published in April 2020. NDEE provided a response in a May 5, 2020 correspondence letter that stated the ASD for arsenic was accepted (NDEE, 2020).

In compliance with the USEPA's CCR regulations, an Assessment of Corrective Measures Report (ACM) was published for the NC2 Ash Disposal Area on December 22, 2020 (HDR, 2020c). Based on the approved ASD, arsenic is not considered a constituent of interest (COI) for corrective measures at the NC2 Ash Disposal Area.

1.1 CCR Unit Description

The NCS is located 5.5 miles southeast of Nebraska City, Nebraska along the west shore of the Missouri River (see **Figure 1** for Site location). The NC2 Ash Disposal Area is a CCR landfill permitted for 40.7 acres of disposal. Cell 1 (14.5 acres) and the East Leachate Pond were constructed in 2008/2009 and Cells 2 & 3 (26.2 acres), along with the West Leachate Pond, were completed in January 2018. The NC2 Ash Disposal Area was built in accordance with the EPA's Subtitle D regulations under the Resource Conservation and Recovery Act (RCRA) and includes a liner and leachate collection system.

Base liners for all the cells (Cells 1 through 3) were constructed with 24 inches of re-compacted clay overlain by a 60-mil high-density polyethylene geomembrane and geotextile fabric layer. The leachate collection system for Cell 1 collects leachate at two sumps and is then pumped to the East Leachate Pond. The leachate collection system for Cells 2 & 3 collects leachate at two sumps, one sump in Cell 2 and one sump in Cell 3, which is then pumped to the West Leachate Pond. Some portions of the landfill were built to be more protective than the requirements of the Subtitle D standards and include a double liner system, lined leachate ponds (East and West Leachate Ponds), and additional geosynthetic membrane and leak detection system in the West

Leachate Pond. **Figure 2** identifies site features including the NC2 Ash Disposal Area and the supporting groundwater monitoring network.

1.2 Purpose and Scope

This Remedial Selection Report, or RSR, has been prepared in accordance with 40 CFR §257.97 and was developed to select remedial measures for addressing elevated lithium concentrations in Site groundwater at monitoring well NC2MW-7. This RSR was based on site-specific data and information obtained and described in the Site investigation reports conducted between 2019 and 2021 (HDR, 2019a; HDR, 2020a; HDR, 2020b; HDR, 2021b) and the ACM report (HDR, 2020c). These reports were used to focus the selection of remedial technologies that will achieve the most efficient and reliable method of reducing concentrations of lithium below the site-specific GWPS. Based on site investigations, it has been determined that the COI is not a result of a release through the landfill liner and instead are from windblown ash being deposited outside of the landfill footprint.

The RSR presents the selected remedial strategies for the reduction of lithium present in Site groundwater to acceptable regulatory cleanup levels in accordance with 40 CFR §257.97. A site-specific GWPS value of 42.3 µg/L is used, which was determined based on the respective Site background threshold value (BTV), in accordance with 40 CFR §257.95(h)(3).

1.3 Remedial System Requirements

Per 40 CFR §257.97(b)1 through §257.97(b)5, the selected remedial system is required to, at minimum:

- Be protective of human health and the environment.
- Attain the groundwater protection standards pursuant to 40 CFR §257.95(h).
- Control the source of the releases so as to reduce or eliminate, to the maximum extent feasible, further releases of constituents in Appendix IV to 40 CFR §257.
- Remove from the environment as much of the contaminated material that was released from the CCR unit as is feasible, taking into account factors such as avoiding inappropriate disturbance of sensitive ecosystems.
- Comply with standards for management of wastes as specified in 40 CFR §257.98(d).

The effectiveness of the selected remedy in meeting these requirements is discussed in **Section 4.**

2.0 Site Background

2.1 Site Operational History

OPPD owns and operates Nebraska City Station, located approximately 5.5 miles southeast of Nebraska City, in Otoe County, Nebraska. The Nebraska City Station (Site or Station) occupies approximately 1,600-acres of land on the Frazer Island Floodplain adjacent to the Missouri River. The Station currently has two fossil-fuel-fired generating units (Unit 1 and Unit 2), related facilities, and two on-site landfills for disposal of Unit 1 and Unit 2 ash. Unit 1 (or NC1) was commissioned in May 1979. A second generating unit (Unit 2 or NC2) began commercial operation in 2009. The Station has two landfills (NC1 Ash Disposal Area & NC2 Ash Disposal Area) that serve for disposal of CCR ash (**Figure 2**). The NC1 Ash Disposal Area has been closed and received final closure approval from NDEE. Currently, CCR generated at the Station is disposed in the NC2 Ash Disposal Area (as previously described in **Section 1.1**). This report is applicable to the NC2 Ash Disposal Area.

2.2 Hydrogeologic Site Conditions

The Site is situated on the floodplain with the Missouri River to the east and uplands to the west. Natural topography within the vicinity of the Site generally slopes downward and eastward from the uplands to the Missouri River from approximately 1,210 feet to 900 feet above mean sea level (AMSL) over an approximate distance of 6.6 miles. The area immediately surrounding the Site primarily consists of agricultural farmland.

The hydrogeologic characterization of the Site focuses on two geologic formations: alluvium, consisting of interbedded layers of clay, silt, sand, and gravel, and the Wabaunsee Group, a succession of marine limestones interbedded with shales and sandy shales of Pennsylvanian age, which represents the uppermost bedrock in the area. Based on soil boring logs for the onsite production and service wells, limestone was encountered between 92 to 99 feet below ground surface (bgs).

Based on data obtained in 1995 by SCS Engineers Hydrologic Investigations Report, as well as more recent boring activities completed by HDR in 2006 and 2018, the Site is underlain by the unconsolidated wind-blown and glacial deposits of Pleistocene age, consisting of fine-grained or cohesive deposits (SCS, 1995). Based on a study conducted by D'Appolonia Consulting Engineers in 1975, these deposits consist of silty clays, clayey silts, silty sands and fine sands. The bedrock underlying the Site area is medium hard red to gray shale. Several areas outside the Site area are underlain by a thin formation of limestone interbedded with shale (D'Appolonia, 1975; HDR, 2006; HDR, 2018).

Data from the boring logs for the monitoring wells and soil borings at the Site indicate that the subsurface geology at the NC2 Ash Disposal Area generally consists of the following:

- Approximately 3 feet of light brown to dark grayish brown lean clay (CL) (Fill/Topsoil), overlying,

- Approximately 9 feet of alluvium consisting of light brown to grayish brown silty clayey sand (SM), poorly graded sand with silty sand (SP-SM), silt with very fine sand (ML/SM), and high plastic clay (CH), overlying,
- Approximately 28 to 77 feet of gray poorly graded sand (SP) to boring completion depths varying from 40 to 100 feet bgs.

In the general vicinity around the Site, two primary sources of groundwater are present: Missouri River Alluvium in the Missouri River flood plain (located beneath the Site), and glacial deposits in the upland area located west of the Site. The uppermost aquifer beneath the Site is found in the Quaternary alluvial sands and gravels (alluvium) beneath the Missouri River flood plain. Based on data in recent monitoring reports for the NC2 Ash Disposal Area and historical groundwater levels, groundwater flow is generally in the southeasterly direction. However, localized flow direction reversals or steepening of gradients have been observed due to the rise and fall of the Missouri River. The uppermost aquifer beneath the Site, Missouri River Alluvium, is found as shallow as 2 to 17 feet bgs and extends as deep as 100 feet bgs.

2.3 Groundwater Movement

The hydraulic conductivity reported near the NC2 Ash Disposal Area has a range of 1.39×10^{-2} centimeters per second (cm/sec) to 2.42×10^{-3} cm/sec, as reported by HDR in the 2006 Hydrogeologic Characterization Report (HDR, 2006). The geometric mean that has been used for groundwater flow velocity calculations at NC2, based on the hydraulic conductivity tests completed in 2006, is 3.4×10^{-3} cm/sec. Effective porosity was reported as 0.405 (HDR, 2006).

Based on the most recent static groundwater measurements obtained in April 2021 and October 2021, groundwater elevations indicate a groundwater flow direction towards the southeast (refer to **Figure 3** and **Figure 4**), which is the historically observed groundwater flow direction. The calculation of groundwater flow rate in an aquifer (seepage velocity, or tracer velocity) also depends upon the effective porosity of the aquifer materials. A hydraulic conductivity range of 6.96 ft/day to 39.4 ft/day (HDR, 2019b), and an effective porosity of 0.405 was used to determine the seepage velocity in April and October 2021.

For April 2021 data, based on a hydraulic gradient of 0.000743 ft/ft, a representative best estimate for average seepage velocity across the site ranges from 0.0128 to 0.0723 ft/day (4.68 to 26.4 ft/year). For October 2021 data, based on a hydraulic gradient of 0.000471 ft/ft, a representative best estimate for average seepage velocity across the site ranges from 0.00809 to 0.0458 ft /day (2.95 to 16.73 ft/year).

3.0 Selected Remedy

3.1 Overview

The selected remedy for the Site to mitigate and remediate SSLs of lithium within groundwater consists of Source Control through the containment and control of windblown CCR material and Long-Term Performance Monitoring (LTPM) of groundwater. Source Control through improvement of windblown CCR/dust management techniques is designed to lessen CCR materials from moving outside of the permitted lined landfill (HDR, 2020a; HDR, 2021b).

Improved dust control will be achieved by using industry standard dust control binders or encapsulating materials in conjunction with limiting open areas of exposed ash through a phased fill approach. LTPM is intended to verify the effectiveness of the dust control measures by directly evaluating the impacts observed on the groundwater at the NC2 Ash Disposal Area.

3.2 Remedy Selection Process

OPPD initially screened four remedial measures as part of the ACM report that were considered applicable to address lithium identified as an SSL in groundwater near the NC2 Ash Disposal Area, consisting of:

- Measure 1 – Source Controls and LTPM
- Measure 2 – Permeable Reactive Barrier
- Measure 3 – Groundwater Extraction and Treatment
- Measure 4 – Monitored Natural Attenuation

The corrective measure alternatives were evaluated based on the criteria provided in 40 CFR §257.96(c). Prior to the selection of the remedy, the results of the site investigations and the 2020 ACM were presented at a public meeting with interested and affected parties on August 25, 2021. The public meeting was held at least 30 days prior to the selection of the remedy as required by 40 CFR §257.96.

The conclusions of the previous investigation studies, reports, and evaluation of corrective measures in accordance with 40 CFR §257.97(c) resulted in Source Control through improved containment and control of windblown CCR material and LTPM as the selected remedial approach, as detailed in **Section 3.3**.

3.3 Selected Remedial System

3.3.1 Source Control – Windblown CCR Control

For the NC2 Ash Disposal Area, source control measures consist of limiting windblown CCR material from being deposited outside of the landfill. Reduction of windblown CCR material on to the surrounding ground surface will be achieved by 1.) reducing the working surface area of the NC2 Ash Disposal Area and 2.) binding the surface particles (ash) through applications of surface binders to the surface of roadways and the open face of the NC2 Ash Disposal Area. Surface binders (Posi-CLEAR® or Gorilla-Snot®, or similar available products) can be used on both inactive areas of the landfill as well as the surface of roadways near the landfill. Surface binders create a light surface crust that remains water permeable for air and water, yet control

dust by suppressing particulate matter. Surface binders are effective for roads or other traffic areas because it is flexible and can withstand vehicle traffic and environmental conditions (such as rain, snow, and ice).

The reduction of windblown CCR material will also occur through limiting open fill areas with a phased filling plan of CCR material. Areas of the NC2 Ash Disposal Area that are not being actively filled, could be further mitigated from windblown ash by using a surface binder (as previously discussed or using an encapsulating product (e.g., Posi-SHELL® or similar product). An encapsulating product is appropriate for an area that will not be used for an extended period of time. The encapsulating product dries in the form of a thin durable stucco that would last for more than a year; however, it cannot withstand vehicle traffic.

3.3.2 Long-Term Performance Monitoring

Groundwater will continue to be monitored at the Site during and after source control measures are implemented. Groundwater upgradient and downgradient/cross-gradient to the NC2 Ash Disposal Area will continue to be monitored semiannually in accordance with the groundwater monitoring program as required in 40 CFR §257.96(b) and with the site-specific CCR Groundwater Monitoring Certification (HDR, 2019b).

4.0 Effectiveness of Selected Remedy

In accordance with 40 CFR §257.97(b), this section provides an evaluation of the effectiveness of the selected remedy at protecting human health and the environment, attaining groundwater protection standards, controlling the source, removing released material, and managing wastes during the implementation of the remedy. Additionally, this section addresses the consideration of the evaluation factors listed in 40 CFR 257.97(c).

4.1 Protection of Human Health and the Environment

Under 40 CFR §257.97(b)(1), the selected remedy must be protective of human health and the environment. The risk to human health and the environment from exposure to CCR-related constituents in groundwater at the Site was assessed as part of the 2020 Nature and Extent Study (NES) (HDR, 2020b) and the 2020 ACM (HDR, 2020c). The NES included an exposure assessment and a screening-level risk evaluation. The purpose of the evaluation was to identify potential exposure pathways by which human or ecological receptors may contact lithium in groundwater.

Based on the results of these previously conducted Site assessments (HDR, 2020b & 2020c), lithium in the Site groundwater is unlikely to pose an unacceptable risk to human or ecological receptors in the vicinity of the Site under current or near-term future conditions. Until the remedy can be implemented, additional actions are not necessary to protect human health and the environment. Anticipated remedy implementation and resulting site conditions are expected to further reduce these risks.

4.2 Ability to Attain the Groundwater Protection Standards

Under 40 §CFR 257.97(b)(2), the selected remedy must be able to attain the GWPS developed for the Site pursuant to 40 CFR §257.95(h). GWPS must be established for each detected Appendix IV constituent. The GWPS shall be the greater of the background concentration and the maximum contaminant level (MCL) established by the USEPA for that constituent. The selected remedy will achieve the site-specific GWPS for lithium by reducing impacts from NC2 Ash Landfill to groundwater in the vicinity of the detected SSL. Evaluation of whether the remedy has achieved the GWPS will follow the statistical approach outlined in **Section 4.2.1**.

4.2.1 Corrective Action Effectiveness Evaluation

Following implementation of remedial activities, a corrective action groundwater monitoring program will be established in accordance with 40 CFR §257.98(a)(1). The effectiveness of the corrective action will be evaluated by comparing groundwater monitoring results to the site-specific GWPS. A Groundwater Monitoring Statistical Methods Certificate (GMSMC) has been prepared for the Site in accordance with the CCR Rule (HDR, 2021c) and USEPA's *Statistical Analysis of Groundwater monitoring Data at Resource Conservation and Recovery Act (RCRA) Facilities, Unified Guidance* (USEPA, 2009). The GMSMC incorporates a logic process regarding the appropriate statistical analysis of groundwater data collected in compliance with the CCR Rule. Additionally, the GMSMC describes the statistical procedures to be used to establish background conditions and GWPS. The GMSMC has been updated to reflect the corrective action statistical methods which will be used during the remedial action period.

The conclusion that the remedy has successfully decreased concentrations below the GWPS is made when monitoring well-constituent pairs where an SSL has previously been identified are less than the GWPS as determined by statistical analysis (i.e., when the upper confidence limit [UCL] is less than the GWPS). Further, a remedy is considered complete when confidence intervals constructed for Appendix IV constituents for monitoring wells identified with SSLs have not exceeded the GWPS for three consecutive years [40 CFR §257.98(c)(2)]. The GMSMC includes a discussion for calculating the UCL for the monitoring well-constituent pairs based on the nature of the data (i.e., seasonality, distribution of data, significant non-detects, etc.). The corrective action monitoring program meets the requirements of the assessment monitoring program (40 CFR §257.98(a)(1)(i)).

Once the UCL for lithium at NC2MW-7 drops below the site-specific GWPS, confidence intervals will continue to be analyzed for three consecutive years pursuant to 40 CFR §257.98(c)(2) (HDR, 2021c), at which point the remedy will be considered complete and the monitoring network will return to the assessment monitoring program.

4.3 Source Control

In accordance with 40 CFR §257.97(b)(3), the remedy must control the source such that further releases are reduced to the “maximum extent feasible”. The selected remedy is anticipated to control further releases by mitigating windblown CCR material.

4.4 Removal of Released Material

Under 40 CFR §257.97(b)(4), the selected remedy must remove from the environment as much of the contaminated material that was released from the CCR unit as is feasible while taking into account factors such as avoiding inappropriate disturbance of sensitive ecosystems.

As detailed in this 2020 NES (HDR, 2020b), the results of the field investigations conducted during the site investigations (HDR, 2019a & 2020a), the July 2020 sampling event, and the October 2020 sampling event indicate that the horizontal and vertical extent of groundwater impacts have been characterized. Lithium concentrations have been delineated in the area directly downgradient of the NC2 Ash Disposal Area and is within the OPPD property boundary. Vertical delineation of lithium was achieved through the analysis of a deep-screened delineation well and Station production wells which are cross-gradient/downgradient of the lithium exceedances. The potential environmental risk posed by the presence of lithium in the groundwater at the NC2 Ash Disposal Area is considered low.

Based on the low potential environmental risk and the small amount of CCR material that has been deposited over a large area around the NC2 Ash Disposal Area, the removal of the ash from the surrounding area is not feasible nor beneficial. There is a drainage channel and grassland located along the southern boundary of the NC2 Ash Disposal Area, and removal of the CCR material in this area would cause undue disturbance to the ecosystem.

The CCR material will continue to be managed in compliance with applicable RCRA requirements as required under 40 CFR §257.98(d). Groundwater at the Site will continue to be monitored to assess the groundwater concentrations in the vicinity of the impacted area, as well as upgradient and downgradient of the CCR unit.

4.5 Evaluation Factors

In selecting the remedy, the evaluation factors listed in 40 CFR §257.97(c) were considered. A brief summary of each evaluation is provided below.

4.5.1 Long-Term and Short-Term Effectiveness and Protectiveness

In accordance with 40 CFR §257.97(c)(1), the long-term and short-term effectiveness and protectiveness of the potential remedy was evaluated, along with the degree of certainty that the remedy will be successful based on consideration of multiple factors.

As discussed, groundwater impacted with SSLs of lithium is localized to a small area surrounding monitoring network well NC2MW-7. One other monitoring well, NC2MW-2, has been found to contain lithium concentrations over the established BTV. This exceedance of the lithium BTV at monitoring well NC2MW-2 was observed during both July 2020 and October 2020. The UCL for lithium at NC2MW-2 has not exceeded the site-specific GWPS. The risk evaluation found that lithium in and around the NC2 Ash Landfill groundwater is unlikely to pose an unacceptable risk to human or ecological receptors in the vicinity of the site under current or near-term future conditions (HDR, 2020b; HDR, 2020c). Source Control and LTPM is anticipated to reduce lithium concentrations within the vicinity of NC2MW-7 to levels below the site-specific GWPS.

4.5.2 Effectiveness of the Remedy

In accordance with 40 CFR §257.97(c)(3), the effectiveness of the remedy in reducing further releases should include consideration of the extent to which containment practices will reduce further releases and the extent to which treatment technologies may be used. The selected remedy uses industry-standard dust control technologies which are anticipated to reduce the potential for further releases as well as standard LTPM which is intended to monitor the effectiveness of the Source Control measures. The use of groundwater treatment technologies was evaluated for the localized lithium detections at the Site and found to provide little to no benefit.

4.5.3 Ease or Difficulty of Implementation

Improving dust control within the lined landfill area will lessen migration of particles onto the surrounding land. The continuation of this practice, in conjunction with LTPM are anticipated to have a relatively small implementation effort and are expected to help achieve the site-specific GWPS for lithium at NC2MW-7.

The NC2 Ash Disposal Area is permitted under NDEE Title 132 regulations for the construction, operation, and monitoring of a waste management unit. To implement a surface binder and revise the fill plan to reduce the open working face of the ash landfill unit, coordination with the NDEE and amendments to the Title 132 permit are required. Through discussions with the NDEE, it is anticipated to require minimal revisions to the permit documents.

4.5.4 Public Meeting Outreach

Prior to the selection of the remedy, the results of the site investigations (HDR 2019a; HDR, 2020a; HDR 2020b, HDR 2021b) and the ACM report (HDR, 2020c) were presented at a public meeting with interested and affected parties on August 25, 2021. A public notice informing the public of the meeting date, time and how to access and login to the online meeting through

Webex™ was placed in the local newspaper (Nebraska City News Press) on August 3, 2021. Direct contact was made with key stakeholders. The comment period opened on August 6, 2021 and remained open until September 7, 2021. Members of the public could submit comments prior to or after the public meeting through OPPD's online engagement platform, OPPDCommunityConnect, or through direct email. The public was also given the ability to verbally express a question or comment during the public meeting. No comments were received during the meeting or submitted in writing during the public comment period.

4.6 Remedy Completion

The remedy will be considered complete when compliance with the site-specific GWPS has been achieved at all groundwater monitoring system wells, and confidence intervals constructed for Appendix IV constituents for wells identified with SSLs have not exceeded the site-specific GWPS for three consecutive years. Upon completion of the remedy, the facility will prepare a notification that the remedy has been completed. The notification will be certified by a qualified professional engineer or approved by the State Director or USEPA and placed in the operating record (40 CFR §257.98(e)).

5.0 Remedy Implementation

The proposed remedy implementation schedule was developed in accordance with 40 CFR §257.97(d).

5.1 Schedule of Remedial Activities

As discussed within **Section 4**, improving dust control adjacent to the NC2 Ash Disposal Area with the use of surface binders and minimizing the open working area is expected to provide source control measures suitable to limit impacts to groundwater. To implement the use of surface binders and adjust the fill plan for the landfill, permit revisions are required with the NDEE. The first step of implementation of the selected remedy will be coordination with the NDEE to determine the applicable state regulated permit amendments necessary for implementation. Permit revisions are anticipated to be minimal and are planned to be submitted to the NDEE by the end of 2021. The NDEE will require a period to review and provide any comments before final approval.

Following approval from the NDEE, a revision to the operational fill plan will be required. This revision will reduce the active working face of the NC2 Ash Disposal Area and therefore minimizing the area for potential windblown ash. A surface binder or encapsulating product will be used on the inactive areas of the landfill to mitigate the ash from being windblown outside the landfill footprint. The surface binder is anticipated to be applied in the early spring 2022. This allows for adequate time to permit the operational revisions, implement the revised fill plan, and apply the surface binder during appropriate temperatures.

The continuation of this practice (i.e., phased fill plan and surface binder application) will continue as the Source Control portion of this remedy selection. LTPM will be a continuation of semiannual groundwater sampling in compliance with both the CCR regulations and NDEE groundwater monitoring regulations. Lithium trends in groundwater monitoring data will be evaluated to determine if the source control measures are resulting in decreased lithium concentrations in the downgradient monitoring wells.

The selected remedy will be implemented in stages as shown in the proposed schedule below. The schedule may shift based on the response and approval from the NDEE on permit revisions. Application of the products will also be done during temperatures that are above freezing to ensure the product can cure appropriately.

Anticipated Date	Remedial Activity Description
December 31, 2021	Provide draft permit revisions to NDEE
February 25, 2022	Anticipated approval from NDEE
March 16, 2022	Revised fill plan to reduce active areas
March 31, 2022	Implement revised fill plan at the landfill
April 15, 2022	Implement a surface binder to inactive areas of the landfill

5.2 Schedule Implementation Factors

The proposed remedy implementation schedule considers the factors established in 40 CFR §257.97(d), as discussed below. Timing for implementation of the remedy is dependent on approval from the NDEE for permit amendments.

5.2.1 Extent and Nature of Contamination

The extent of lithium groundwater impacts detected as SSLs above the GWPS has been delineated to the area directly downgradient of the NC2 Ash Landfill. Site investigations (HDR, 2020a) resulted in visual verification of windblown ash deposited on the ground surface outside of the NC2 Ash Disposal Area footprint, which, coupled with the shallow groundwater table, is contributing to elevated concentrations of lithium in NC2MW-7.

The selected remedy is anticipated to achieve compliance with the site-specific GWPS. Following the management of windblown CCR material, lithium concentrations are expected to fall below the site-specific GWPS. As previously discussed, LTPM will be implemented with evaluation of lithium trends in monitoring wells downgradient of the NC2 Ash Disposal area to determine if source control measures are decreasing lithium concentrations.

5.2.2 Availability of Treatment or Disposal

Based on the localized area of elevated lithium concentrations, treatment and/or disposal of affected areas provide little to no benefit in meeting the site-specific GWPS.

5.2.3 Potential Risks to Human Health and the Environment

The risk evaluation concluded that lithium in Site groundwater is unlikely to pose an unacceptable risk to human or ecological receptors in the vicinity of the Site under current or near-term future conditions (HDR, 2020b; HDR,2020c). Until the remedy can be implemented, additional actions are not necessary to protect human health and the environment; therefore, potential risks to human health and the environment do not strongly influence the remedy implementation schedule.

5.2.4 Resource Value of the Aquifer

Impacts of lithium at concentrations above the site-specific GWPS at the Site have been delineated to a localized area surrounding NC2MW-7 with no off-site migration or impacts observed. Because there are no off-site impacts and there are no current or future uses of groundwater from the impacted area of the aquifer on-site, the resource value of the aquifer is not affected in a way that would influence the remedy implementation schedule. Additionally, the risk evaluation found lithium in Site groundwater is unlikely to pose an unacceptable risk to human or ecological receptors in the vicinity of the Site under current or near-term future conditions (HDR, 2020b; HDR, 2020c).

Production wells at the Site have been analyzed for lithium as part of the 2020 NES and detections above the laboratory practical quantification limit (PQL) were observed. There were no detections of lithium above the site-specific GWPS. The presence of detectable lithium within the production wells is anticipated due to the gradient of groundwater from the area of the NC2 Ash Disposal Area towards the production wells. Based on preliminary flow models for the site (HDR, 2018), it is anticipated that the productions wells capture the groundwater which is

immediately downgradient of the NC2 Ash Disposal Area. See **Figure 3** and **Figure 4** for the groundwater contours associated with the area around the NC2 Ash Disposal Area. The analysis of the production wells provides additional support for the conclusion that the schedule for remedy implementation is not affected by the resource value of the aquifer.

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Figures

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(402) 399-1000

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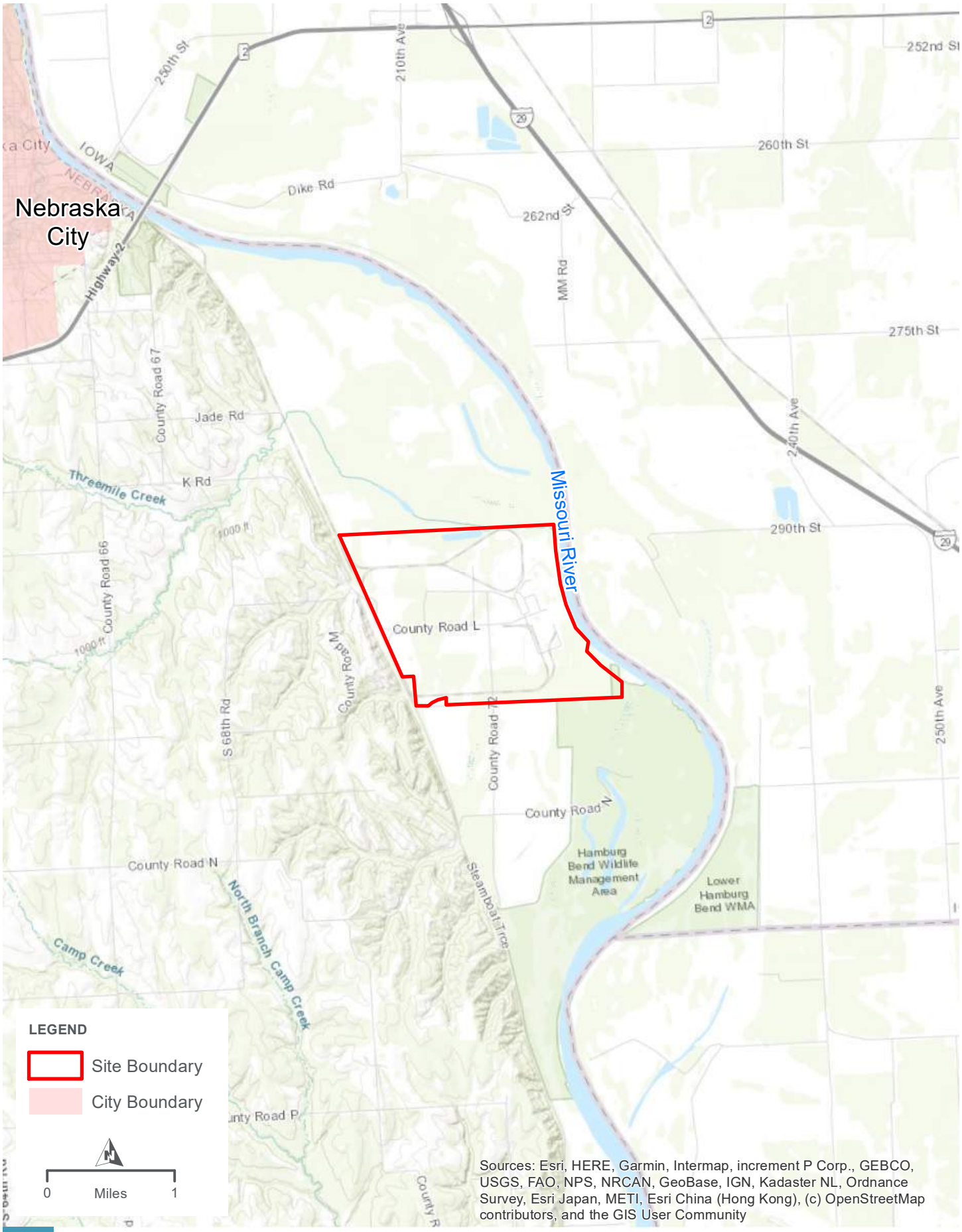


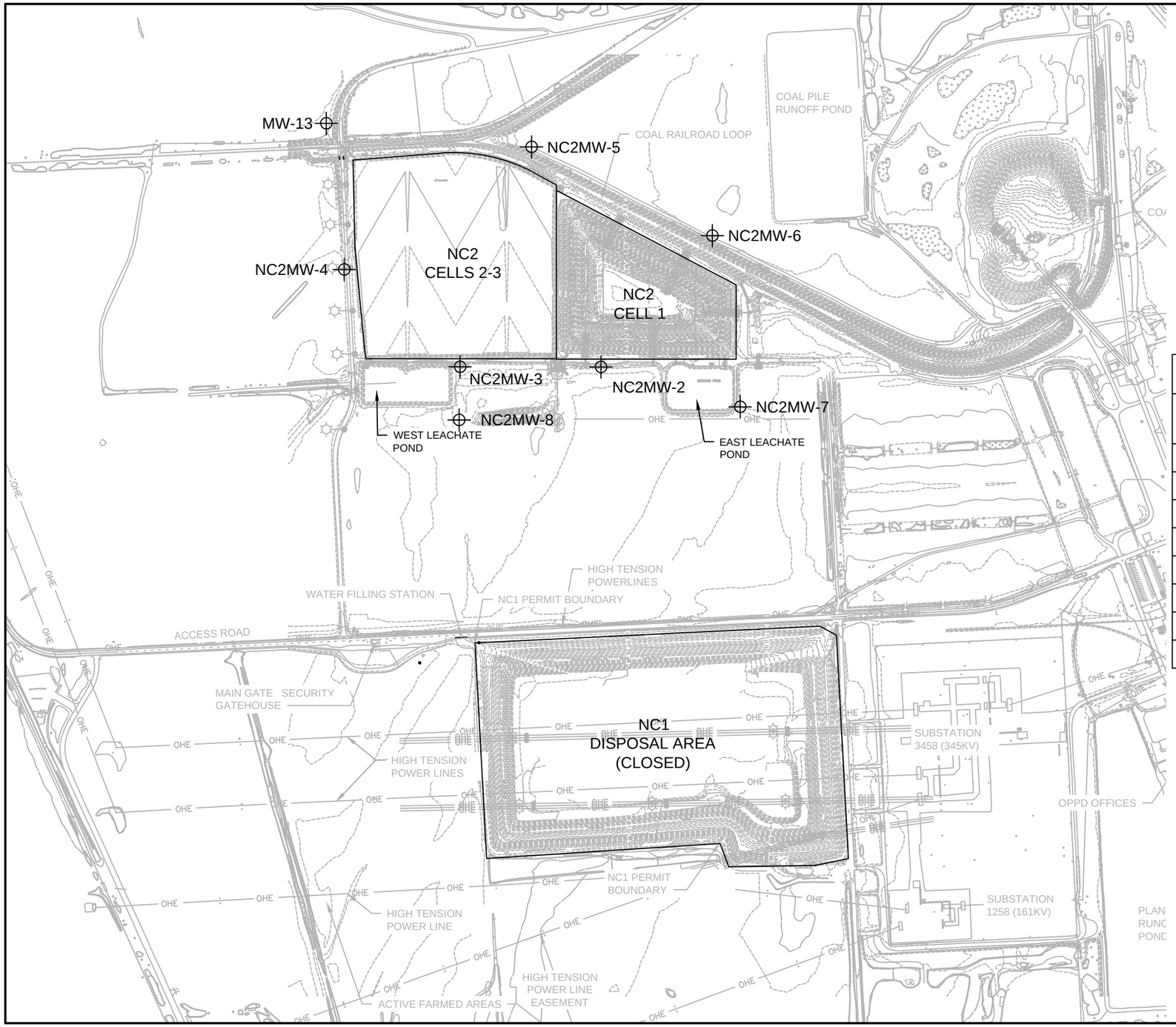
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

SITE LOCATION MAP

OPPD - NEBRASKA CITY STATION

FIGURE 1

PATH: D:\TEMP\AZIGLER\OPPD\NEBRASKA_CITY\FIG1_SITEMAP.MXD - USER: AZIGLER - DATE: 7/31/2019



N

600 0 600 1200

SCALE IN FEET

MONITORING WELL NETWORK					
WELL ID	NORTHING	EASTING	ELEVATION (TOC)	WELL DEPTH (BGS)	LOCATION WITH RESPECT TO NC2 ASH DISPOSAL AREA
MW-13	318186.64	2808434.68	918.05	13.0	BACKGROUND / UPGRADIENT
NC2MW-2	316884.69	2809902.40	922.55	17.0	DOWNGRADIENT
NC2MW-3	316885.96	2809149.54	916.22	12.0	DOWNGRADIENT
NC2MW-4	317405.90	2808530.80	919.62	14.0	BACKGROUND / UPGRADIENT
NC2MW-5	318060.54	2809531.90	922.76	15.2	BACKGROUND / UPGRADIENT
NC2MW-6	317587.46	2810497.97	919.72	11.0	CROSSGRADIENT
NC2MW-7	316671.78	2810647.12	918.37	21.0	DOWNGRADIENT
NC2MW-8	316601.90	2809145.16	918.18	15.0	DOWNGRADIENT

NOTES:

1. TOC - TOP OF CASING
2. TOP OF CASING ELEVATION DETERMINED BY SURVEY DATA OBTAINED JUNE 2019.
3. BGS - BELOW GROUND SURFACE
4. WELL DEPTH MEASUREMENTS REPRESENT DEPTH BELOW GROUND SURFACE.
5. NORTHING AND EASTING COORDINATES ARE NEBRASKA STATE PLANE WHICH HAVE BEEN TRANSLATED BY THE SURVEYOR.

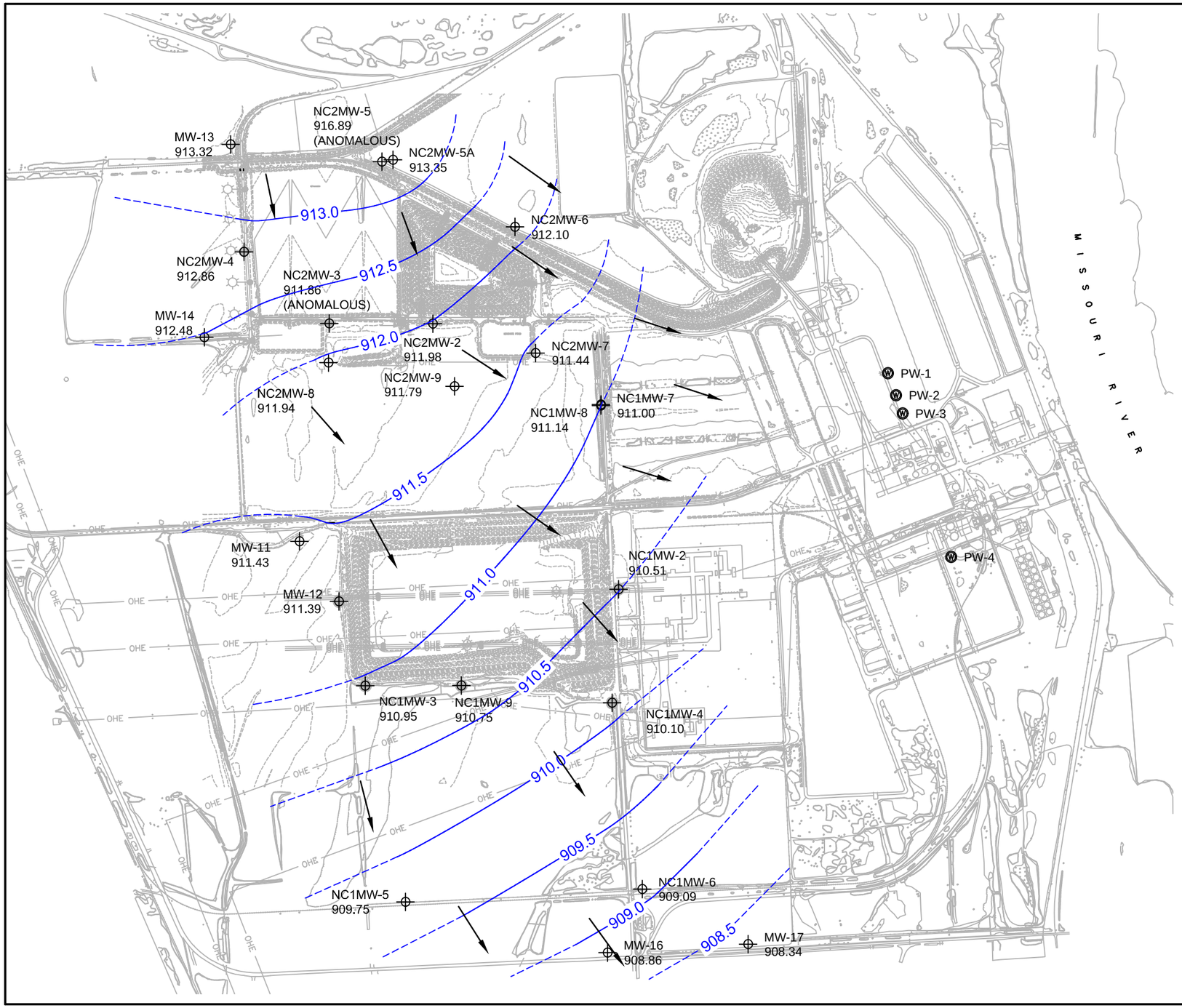
Omaha Public Power District

OPPD NEBRASKA CITY ASH LANDFILL
NEBRASKA CITY UNIT 2 - NC2
MONITORING WELL LOCATION MAP

REMEDY SELECTION REPORT

DATE
NOVEMBER 2021

FIGURE
02



N

800 0 800 1600

SCALE IN FEET

LEGEND:

Ⓦ	PRODUCTION WELL
⊕	MONITORING WELL
909.39	GROUNDWATER ELEVATION
910	GROUNDWATER CONTOUR
	INFERRED GROUNDWATER CONTOUR
→	INFERRED GROUNDWATER FLOW DIRECTION

NOTES:

1. ANOMALOUS - WATER LEVELS LABELED AS SUCH HAVE BEEN OMITTED FROM THE GROUNDWATER CONTOUR DUE TO VAST VARIATIONS IN GROUNDWATER ELEVATIONS BETWEEN WELLS WITH CLOSE PROXIMITY.
2. MONITORING WELL NC1MW-7 WAS NOT USED IN GENERATION OF CONTOUR MAP DUE TO BEING SCREENED AT A DEEPER INTERVAL.

VELOCITY COMPUTATIONS

TRACER VELOCITY = $V_T = \frac{Ki}{n}$

K = HYDRAULIC CONDUCTIVITY (SEE TABLE)

i = GRADIENT = $\frac{0.743\ FT}{1{,}000\ FT}$ = 0.000743 FT/FT

n = POROSITY = 0.405

	K	V_T
LOW	6.96 FT/DAY	0.0128 FT/DAY
HIGH	39.4 FT/DAY	0.0723 FT/DAY

Omaha Public Power District

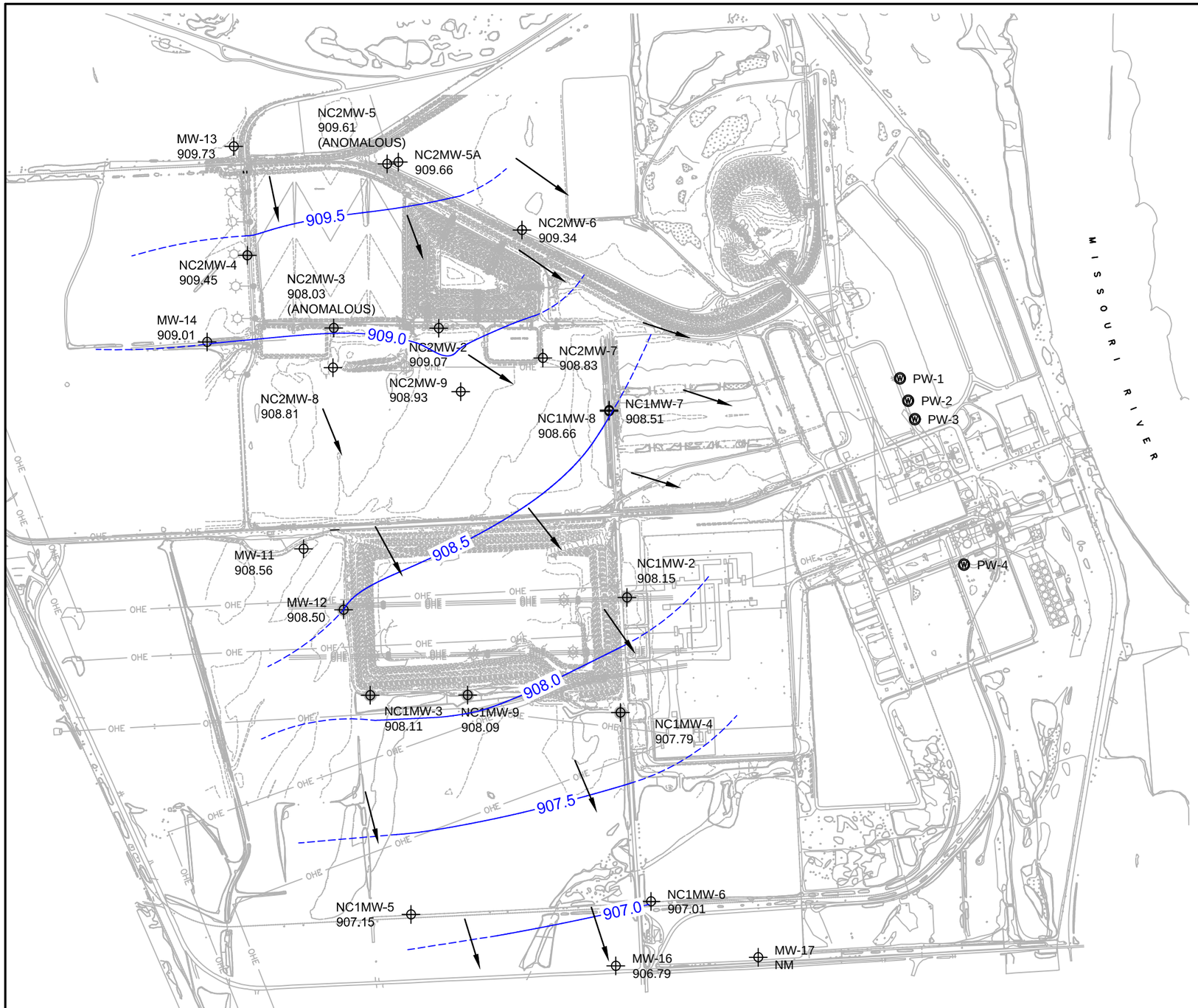
HDR

OPPD NEBRASKA CITY ASH LANDFILL GROUNDWATER CONTOUR MAP APRIL 2021

REMEDY SELECTION REPORT

DATE
NOVEMBER 2021

FIGURE
03



LEGEND:

Ⓦ	PRODUCTION WELL
⊕	MONITORING WELL
908.83	GROUNDWATER ELEVATION
909.0	GROUNDWATER CONTOUR
- - - - - - - - - - - -	INFERRED GROUNDWATER CONTOUR
→	INFERRED GROUNDWATER FLOW DIRECTION

NOTES:

1. ANOMALOUS - WATER LEVELS LABELED AS SUCH HAVE BEEN OMITTED FROM THE GROUNDWATER CONTOUR DUE TO VAST VARIATIONS IN GROUNDWATER ELEVATIONS BETWEEN WELLS WITH CLOSE PROXIMITY.
2. MONITORING WELL NC1MW-7 WAS NOT USED IN GENERATION OF CONTOUR MAP DUE TO BEING SCREENED AT A DEEPER INTERVAL.
3. NM - STATIC WATER LEVEL NOT OBTAINED FROM MONITORING WELL.

VELOCITY COMPUTATIONS

TRACER VELOCITY = $V_T = \frac{Ki}{n}$

K = HYDRAULIC CONDUCTIVITY (SEE TABLE)

i = GRADIENT = $\frac{0.471\ FT}{1{,}000\ FT}$ = 0.000471 FT/FT

n = POROSITY = 0.405

	K	V_T
LOW	6.96 FT/DAY	0.00809 FT/DAY
HIGH	39.4 FT/DAY	0.0458 FT/DAY

Omaha Public Power District

OPPD NEBRASKA CITY ASH LANDFILL GROUNDWATER CONTOUR MAP OCTOBER 2021

REMEDY SELECTION REPORT

DATE
NOVEMBER 2021

FIGURE
04