Alternative Source Designation for Cobalt and Selenium at MW-12

Neal South Monofill

Neal South Energy Center
Salix, Iowa

MidAmerican Energy Company

October 26, 2022

→ The Power of Commitment

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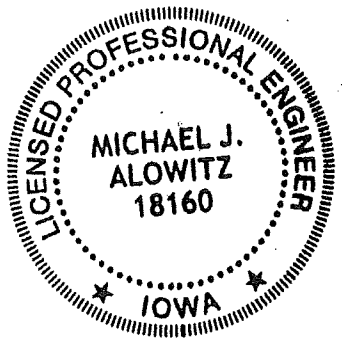

I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

Michael Alowitz 2022.10.26 12:51:11 -05'00'

Michael J. Alowitz, P.E. — October 26, 2022 (Date)

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1. Introduction

This Alternate Source Determination Report (Report) has been prepared by GHD on behalf of MidAmerican Energy Company (MidAmerican) in compliance with the Federal Coal Combustion Residual (CCR) rule (40 CFR Part 257) for the Neal South Energy Center (Neal South) closed CCR Monofill located near Salix, Iowa. The closed Neal South CCR Monofill is located in the NW ¼ of the NW ¼ of Section 5 and the NE ¼ the NE ¼ of Section 6, Township 86N, Range 47W in Woodbury County, Iowa.

MidAmerican initiated baseline groundwater monitoring at the closed CCR Monofill in December 2015 in accordance with the Federal CCR rule, prior to completion of closure activities. The initial eight rounds of baseline monitoring sampling and analysis were completed in July 2017. Data for the eight required baseline monitoring events were reported in the Annual Groundwater Monitoring and Corrective Action Report for Neal South CCR Monofill (2018 AGWMCAR), dated January 31, 2018. The groundwater monitoring well network for the Closed CCR Monofill is shown on Figure 1.

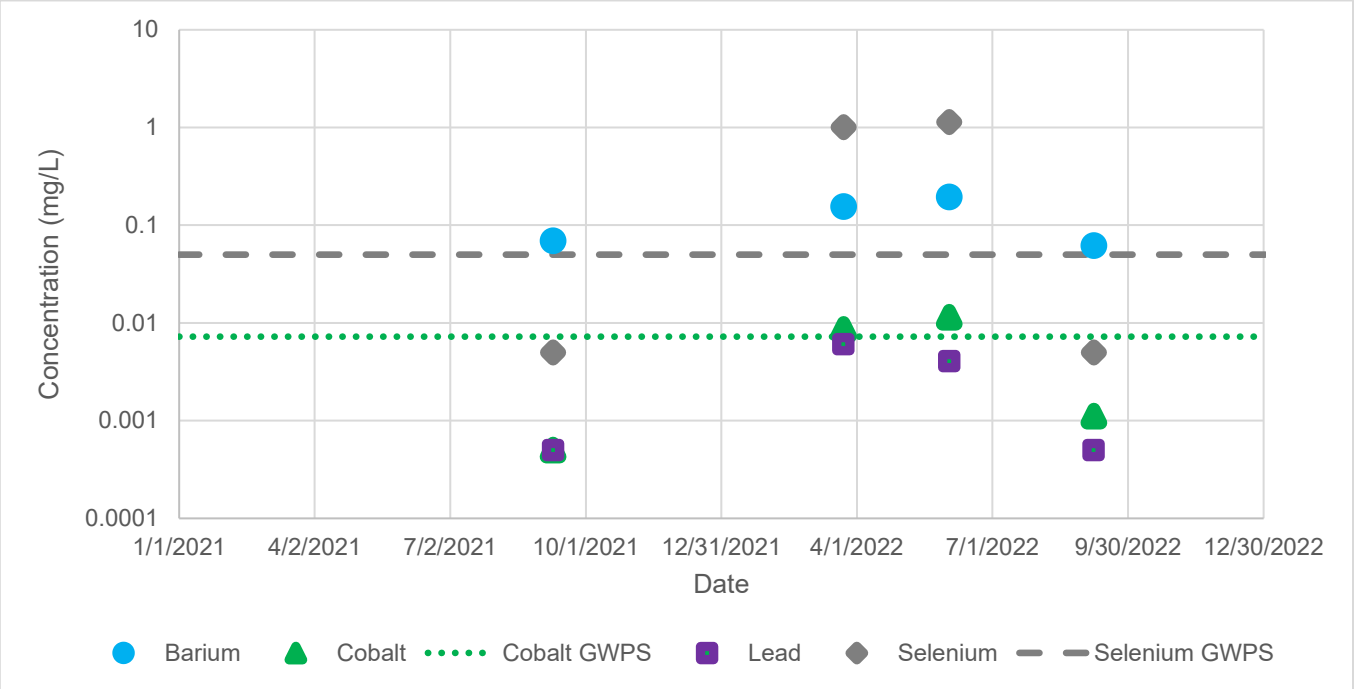
As described in 40 CFR §257.94(e)(2), statistically significant differences from background levels for a constituent may be evaluated to demonstrate that a source other than the CCR unit has caused the statistically significant difference from background or resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. The purpose of this Report is to describe the alternate source determination for the Neal South Closed CCR Monofill.

2. Description of Statistically Significant Increases

A statistically significant increase (SSI) for cobalt and selenium above the groundwater protection standards (GWPSs) of 0.00724 and 0.05 milligrams per liter (mg/L), respectively, was identified at monitoring well MW-12 following a groundwater sampling event in March 2022. The result was verified June 2022. Chart 1 illustrates the concentration pattern for cobalt and selenium plus barium and lead. Barium and lead are included in Chart 1 because the coincidental increases in concentrations of these divalent cations is consistent with this alternative source designation.

Table 1 provides groundwater results for MW-12 for the sample events in September 2021 and September 2022, immediately preceding and following the exceedance of the GWPSs for cobalt and selenium observed in March 2022 and the verification sample event in June 2022. The elevated concentrations observed in March and June were not representative of long-term concentration patterns at MW-12. Sample collection methodology is the apparent source of the elevated concentrations and basis of this alternative source designation.

Chart 1. Recent Barium, Cobalt, Lead, and Selenium Concentrations at MW-12.



Note: Non-detect results are shown at the laboratory Reporting Limit.

Table 1 Select groundwater monitoring results at MW-12 at closed Neal South CCR Monofill.

Parameter	GWPS	9/9/2021	3/23/2022	6/2/2022	9/7/22
Barium	2.0	0.0691	0.155	0.195	0.0620
Cobalt	0.00724	0.000500 U	0.0086	0.0114	0.00111
Lead	0.015	0.000500 U	0.00607	0.00406	0.000500 U
Selenium	0.05	0.00500 U	1.01	1.14	0.00500 U
Turbidity	NA	0.35	6.16	61.1	3.0

U - Not detected at the associated reporting limit.
NA – Not applicable, no limit established.

3. Description of Neal South Monofill Alternate Source Determination

Northwest Iowa is experiencing a prolonged drought. In March 2022, the water level in MW-12 was too low to be sampled with the dedicated pneumatic bladder pump. The pump was removed and the well was sampled with a bailer. A similar procedure was completed for the verification sample in June 2022. The dedicated pneumatic bladder pump was again used in September 2022 and sample results (Table 1) were consistent with September 2021 results and below the GWPSs.

The turbidity for the June 2022 sample (61.1 nephelometric turbidity unites [NTU]) was elevated over other readings. The March 2022 turbidity reading was slightly elevated. Use of the bailer for these two samples created

greater sample variability – the water sample from a bailer is subject to greater variability through the water column than the sample collected from a dedicated bladder pump.

Cobalt and selenium are divalent cations as are barium and lead. All four of these analytes exhibited elevated concentrations for the March and June 2022 samples coinciding with samples collected with the bailer and higher turbidity results. The sample method (bailer) caused the increases in cobalt and selenium concentrations above the GWPSs in March and June 2022.

4. Summary

The lower water table caused by drought conditions led to a change in sample methods to maintain the semi-annual sampling schedule. The bailer sample resulted in collection of additional solid particles relative to sampling with a dedicated bladder pump. Entrainment of particulate in the sample as a result of the sample method is the cause of the elevated concentrations reported in March and June 2022 rather than an impact to groundwater from the closed Neal South Monofill.

5. Reference

GHD, 2018. Annual Groundwater Monitoring and Corrective Action Report. Neal South CCR Monofill, Permit No. 97-SDP-13-98P, Salix Iowa, MidAmerican Energy Company. January 31, 2018.

Figures

LEGEND

- SHALLOW GROUNDWATER MONITORING WELL
- DEEP GROUNDWATER MONITORING WELL
- ABANDONED MONITORING WELL
- UPGRADIENT SAMPLING LOCATION
- DOWNGRADIENT SAMPLING LOCATION
- GAUGING LOCATION

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Map Projection: Lambert Conformal Conic
Horizontal Datum: NAD 1983 2011
Grid: NAD 1983 (2011) IaRCS zone 4

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GHD

MIDAMERICAN ENERGY COMPANY
NEAL SOUTH CCR MONOFILL
SALIX, IOWA

SITE MAP AND
MONITORING WELL LOCATIONS

Project No. 11205258
Revision No. -
Date 07/20/2022

FIGURE 1

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Print date: 20 Jul 2022 - 09:34

Data source: USDA NAIP 2021. Created by: rjcoy