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Remedy Selection Semi-Annual Progress Report

FOR

ELMER SMITH STATION
OWENSBORO MUNICIPAL UTILITIES

4301 State Route 144
Owensboro, KY 42303

November 29, 2019

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1.0 INTRODUCTION

In accordance with the United States Environmental Protection Agency (USEPA) issued Title 40, Code of Federal Regulations (CFR) §257, Subpart D, Disposal of Coal Combustion Residuals from Electric Utilities (CCR Rule) final ruling published in the Federal Register April 17, 2015, Owensboro Municipal Utilities (OMU) is required to publish a Semi-Annual CCR Remedy Selection Progress Report within 6 months after placing the initial CCR Assessment of Corrective Measures (ACM) Report in the facility's operating record. The deadline for completing subsequent reports is 6 months after the date of completing the previous report.

1.1 Background

OMU's Elmer Smith Station is a municipal coal-fired power plant comprised of two power generation units that began operation in 1964. The ash pond area is less than 10 acres in size and consists of three separate unlined ash settling basins (Ponds 1, 2, and 3). The basins are not used for the disposal of CCR but for the temporary storage of CCR material prior to being excavated and transported off-site for disposal or beneficial re-use. Pond 1 is primarily used for Unit 1 boiler slag; Pond 2 receives other ash and drinking water plant blowdown (lime softening sludge), and, Pond 3 receives no ash directly and is used for final settling prior to discharge. Other plant discharges, including coal pile runoff, Flue Gas Desulfurization (FGD) blowdown, roof and floor drains, etc. are also conveyed through the ponds.

1.2 Purpose of the Report (40 CFR §257.97)

This Semi-Annual Coal Combustion Residual (CCR) Remedy Selection Progress Report has been prepared to meet the requirements of Title 40, CFR, Part 257, Subpart 97 (40 CFR §257.97). The purpose of this report is to describe the progress in selecting and designing a remedy for the closure of three Ash Ponds at OMU's Elmer Smith Station (ESS).

1.3 Accessibility of the Semi-Annual CCR Remedy Selection Progress Report (40 CFR §257.97)

OMU must comply with the recordkeeping requirements as described in the final rule.

1.3.1 Placement in Operating Records

In accordance with 40 CFR §257.105(h)(12), a complete copy of this Semi-Annual CCR Remedy Selection Progress Report and associated records are maintained at the facility in the library located on the third floor of the office building. The front office is attended Monday through Friday 8 AM to 4:30 PM.

1.3.2 Publicly-Accessible Internet Site Requirements

In accordance with CFR §257.107(h)(9), OMU will post to the publicly-accessible internet site the Semi-Annual CCR Remedy Selection Progress Report and subsequent amendments within 30 days of being placed in the operating record.

1.3.3 Notification Requirements

In accordance with CFR §257.106(h)(9), OMU will notify the State Director when the Semi-Annual CCR Remedy Selection Progress Report is placed in the operating record and posted to OMU's website.

2.0 SUMMARY OF CORRECTIVE MEASURES (40 CFR §257.97)

OMU's ESS is working to choose a control measure which will address the following corrective measures objectives:

- Be protective of human health and the environment;
- Attain the Groundwater Protection Standard (GWPS) as specified pursuant to §257.97(h);
- Control the source(s) of release so as to reduce or eliminate, to the maximum extent feasible, further releases of constituents in Appendix IV to this part into the environment;
- 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; and,
- Comply with standards for management of wastes as specified in §257.98(d).

2.1 Corrective Measures Options

A total of six potential corrective measures were identified as candidates for implementation. The effectiveness of each corrective measures option (CMO) was evaluated with respect to the areas of impact and volume of contaminated media as well as potential impacts to human health and the environment and achieving the corrective measures objectives listed above. A detailed description of each CMO was provided in the ACM Report dated May 29, 2019, a copy of which is available on OMU's publicly-available internet site. A summary of each option is listed below.

2.1.1 Corrective Measures Option 1 - Monitored Natural Attenuation

Monitored Natural Attenuation (MNA) involves a variety of physical, chemical, and biological natural processes that can reduce the presence of constituents of concerns (COCs) in soil and groundwater without human intervention. These processes include biodegradation, dispersion, dilution, sorption, volatilization, chemical or biological stabilization, transformation or destruction of contaminants. It may be used with other remediation processes as a finishing option or as a stand-alone option if the rate of contaminant degradation is protective of human health and the environment. This

approach includes: demonstration that the plume is not expanding, determination of mechanisms and rates of attenuation, determination of the capacity of the aquifer to attenuate the mass of constituents, and the design of a performance monitoring program. Reliance on these natural processes in conjunction with a monitoring program to assess remedial progress can be effective under certain conditions.

2.1.2 Corrective Measures Option 2 – Waste Excavation and Disposal

This option consists of excavating CCR material and transporting it to a permitted off-site facility for disposal or beneficial re-use (e.g., incorporated into manufactured products such as concrete, roofing, etc.).

2.1.3 Corrective Measures Option 3 – In-Situ Remediation

In-situ remediation involves relying on naturally-occurring micro-organisms or introducing inoculated organisms (bioremediation), chemical oxidants (In-Situ Chemical Oxidation [ISCO]), or chemically-reductive agents (In-Situ Chemical Reduction [ISCR]) in the subsurface to metabolize, react with, degrade, stabilize, or immobilize COCs in soil and/or groundwater. Knowledge of the COCs and the geochemistry of the subsurface environmental media to undergo treatment is required to successfully implement this technology.

2.1.4 Corrective Measures Option 4 – Capping

This corrective measure includes the closure of the Ash Ponds in place without removal of the CCR material. This option would use a final cover system designed to reduce infiltration into the CCR materials. Potential components of this option (from bottom to top) include a 40-mil geomembrane liner, overlaid by a geotextile cushion/drainage layer, and covered with a layer of final cover soil.

2.1.5 Corrective Measures Option 5 – Pump and Treat

This option consists of installing extraction wells to intercept and extract impacted groundwater. The extracted groundwater is either then directed to a treatment system that would ultimately be discharged to surface water under a National Pollutant Discharge

Elimination System (NPDES) permit or to a local publicly-owned treatment works (POTW).

2.1.6 Corrective Measures Option 6 – Cut-Off Wall

This corrective measure assumes that Ash Ponds would be closed in place and engineering controls such as a grout curtain, slurry wall, or sheet piling wall would be constructed surrounding the Ash Ponds to create a low-permeability barrier that would reduce the migration of COCs in groundwater. Groundwater extraction wells would also be required to control the head such that groundwater cannot simply pass around or under the physical barrier. The extracted groundwater would then require processing and treatment through a constructed treatment system.

2.2 Corrective Measure Evaluations

Six potential corrective measures were evaluated for their ability to reduce concentrations of molybdenum in groundwater downgradient from the Ash Ponds. The results of this assessment are summarized below:

Potential Corrective Measure	Status
1. MNA	Retained
2. Excavation	Retained
3. In-Situ Treatment	Dismissed
4. Capping	Dismissed
5. Pump and Treat	Retained
6. Cut-Off Wall	Dismissed

3.0 REMEDY SELCTION PROGRESS (40 CFR §257.97)

As noted in the ACM Report, it is anticipated that source control can be achieved by either leaving CCR materials in place with a CCR-compliant cap system or by removing the CCR material and transporting it off-site for disposal at a licensed/permitted solid waste facility or for beneficial re-use. At this time, OMU management is reviewing the costs associated with the CMOs, as well as the risks and benefits of each source control option. Power Generation Unit #1 was idled in June 2019, and maintenance dredging activities within the Ash Ponds have continued consistent with standard procedure prior to unit shutdown.

3.1 Public Meeting

OMU is continuing to prepare for a public meeting to discuss the results of the ACM as required by 40 CFR §257.96(e). However, due to pending CCR regulations, OMU has chosen to delay the public meeting until CCR regulation amendments are finalized.

4.0 CONCLUSION

Additional updates regarding remedy selection, including additional corrective measures being considered, will be presented twice a year in future semi-annual remedy selection progress reports. Once sufficient data has been collected to select an effective comprehensive remedy for the Ash Ponds, a public meeting will be held 30 days prior to formal remedy selection, followed by a detailed Remedy Selection Report describing the remedy and proposed schedule for implementation. If needed, the next remedy selection progress report for the Ash Ponds is expected in May 2020.