File Note

BRRTS Case Number was changed 02/10/2023 for administrative purposes

Current BRRTS# 07-16-591466, Superior Slips

Former BRRTS# 07-16-585325, North End District/Clough Island Sediment

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Superior Slips

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Date:
August 17, 2022

To:
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Memo

Subject: Draft Remedial Action Options Report – Sediment Area Review Technical Memorandum
Superior Water Light and Power (SWL&P) Manufactured Gas Plant
Winter Street and USH 53, Superior, WI
BRRTS ID: 02-16-275446

AECOM Technical Services, Inc. (AECOM) has prepared this technical memorandum in accordance with Task 3-Existing Data and Review guidelines provided in the Wisconsin Department of Natural Resources' (DNR) request for proposal (RFP) and Scope of Work (SOW) dated April 5, 2022. AECOM has completed a review of the April 27, 2022 Draft Remedial Action Options Report – Sediment Area (RAOR), submitted to the Wisconsin Department of Natural Resources (DNR) by Foth Infrastructure and Environment, LLC (Foth) on behalf of Superior Water, Light & Power (SWL&P) on April 27, 2022. The RAOR is for the remedial action of sediment contamination from the former Manufactured Gas Plant (MGP) Site referenced above (Site).

AECOM has also reviewed DNR's comments based on their review of the RAOR (DNR letter dated July 7, 2022). The DNR Remediation and Redevelopment Program reviewed the RAOR for compliance with Wis. Stats. ch. 292 and Wisconsin Administrative Code (Wis. Admin. Code) chs. NR700 – NR799. The DNR's review was not an engineering review of the document and the DNR indicated that they did not complete a detailed review nor is it providing specific comments on Appendix B (Pre-Design Investigation Result Summary) of the RAOR. Therefore, AECOM performed a more in-depth engineering evaluation of the Pre-design Investigation Result Summary and alternatives' analysis performed by Foth.

Per DNR, the term "Site" is used in this letter as defined in § NR700.03 (56) and includes the area of contamination near the former MGP, gas holder, and Hortonsphere as well as the MGP discharge area north and east of the former MGP including the BNSF right of way, City of Superior property, wastewater treatment plant (WWTP) property and retention pond, Cutler Laliberte McDougal Corporation properties, Lakehead Concrete Works, and the area of contaminated sediment in the slip west of the WWTP (C-Street Slip) where contamination from MGP and subsequent gas storage, distribution, and metering operations was detected.

AECOMs observations and recommendations based on review of the RAOR submittal are presented below:

General comments

Overall, the purpose of the RAOR is to summarize conditions of the Site sediment and evaluate potential remedial actions associated with potential impacts due to a nearby former MGP. Soil and groundwater adjacent to the Slip are contaminated and migration pathways of MGP-related Contaminants of Concern (CoCs) have been identified between the landside

source(s) and Slip sediments. It is unclear how the historical sampling data was used to develop the Pre-design Investigation (PDI) sampling plan for C Street Slip sediment and selection of the targeted CoCs.

Sediment CoCs and other evidence of MGP impacts may include but are not limited to volatile organic compounds (VOCs), phenols, polynuclear-aromatic hydrocarbons (PAHs) and metals (e.g., lead, arsenic, chromium, mercury and cyanide) as well as visible evidence of free product and/or coal tar. Delineating total PAH (tPAH) concentrations only in Slip sediments within the head of the slip as completed by Foth is not sufficient to delineate MGP impacts.

It appears that only tPAH concentrations and comparison of this data to the midpoint effect concentration (MEC) were used for delineation of impacted sediment. It is unclear how the remedial alternative (RA) objectives and subsequent remedy selection criteria were developed from the historical sediment investigation results and which individual PAHs were used to further delineate nature and extent of impacted sediment as total PAH concentrations alone are insufficient to make this determination.

Remedial actions were developed to mitigate risk and exposure pathways associated with tPAH concentrations exceeding MEC concentrations in slip sediment. The current remedial action development, screening and subsequent alternatives analysis may not be suitable for sediment impacted by VOCs, metals and/or other co-located constituents using the selected evaluation criteria.

Although a former MGP Site with confirmed soil and groundwater contamination is located adjacent to the boat slip and detections of CoCs associated with potential MGP activities were detected throughout the slip, it appears that Pre-Design Investigation (PDI) sampling as well as evaluation of MGP effects on slip sediments was limited to the head of slip.

Specific comments:

1.2.1 Site Location and Property Ownership

p.2 The RAOR does not describe the MGP-related impacts that were previously observed and measured in the historical data review. It is also unclear what evidence was measured and/or observed that suggests landside-waterside connectivity with the boat slip. Additionally, statistical evidence is not provided to correlate MGP-related CoCs and deleterious effects in the boat slip sediments.

2.2.1 Historic Sources

p.9 Without source control, MGP impacts will continue to be observed in the boat slip sediments and additional RAs may need to be considered (e.g., reactive barrier wall and/or sediment cap). The RAs screened and evaluated as part of this RAOR were developed with the assumption that upland source control would be successfully completed. Please confirm this assumption and provide the estimated timeline for implementing the upland RA in relation to the boat slip RA.

p.9 The mass balance and schedule for the mass reduction of the upland MGP-impacted source area is unclear. Further describe how the MGP-impacted material will be removed (e.g., excavation, biosparge or other RA).

p.9 “Stable” groundwater concentrations to describe the area and mass of benzene and select PAHs is not defined.

p.9 It is not clear how observations and measurements from historical investigations and/or the PDI suggest that Site chemistry and microbiology favor natural attenuation as suggested.

p.9 The estimated timeline for natural attenuation of benzene, toluene, ethylbenzene, and xylene (BTEX) and PAH concentrations in upland sources needs to be defined based on the previously measured “consistent reductions”.

2.3.2 Evaluation of Recontamination Potential

p.11 Define the use of “stable”. In one reference, stabile/immobile is suggested but consistent description of the upland source material as “stable” may not be an appropriate use of the term.

2.5 Nature and Extent of Contamination

p.12 Nature and extent of impacted material in the boat slip should be evaluated with additional MGP-related constituents (e.g., VOCs and metals) as well as tPAH concentrations.

p.12 Derivation and use of probable effect concentration (PEC) and midpoint effect concentration (MEC) as screening level criteria for evaluating potential risk of total PAHs was not referenced from a peer-reviewed source or a previous PDI(s).

2.5.4.1 Data Usability Review Results

p.16 Although vertical elevation references in earlier datasets may not have been provided or of insufficient quality to use in the tPAH interpolation model (i.e., EVS), the pre-2010 CoC concentrations should still be used to identify data gaps, develop the PDI workplan and subsequently delineate nature and extent.

3. Remedial Action Objectives

p.19 Additional remedial action objectives (RAOs) may be needed that highlight the need to reduce all MGP-related CoCs in sediment to protect aquatic receptors from exposure to Site-related CoCs.

p.19 An additional RAO to limit migration of Site-related CoCs from landside media to sediment and surface water may be needed (e.g., reactive barrier wall).

3.1 Remediation Target Development

p.19 As stated above, the use of a tPAH MEC for determining a remediation target clean-up goal based on tPAH concentrations and that tPAH concentrations can be used to develop site-specific RAOs needs to be cited from a peer-reviewed source and/or a previous state-reviewed PDI.

p.19 Develop and review remediation target clean-up goals for additional MGP-related CoCs for the Site and discuss with DNR if they meet the RAOs.

3.2 Summary of Remediation Target Areas

p.20 Additional description and detail about delineation and volume calculations of the targeted sediment volume for remediation would be useful.

p.20 The target sediment prism(s) may change depending on the method(s) selected to mitigate the potential risk and/or exposure pathway associated with this sediment as hotspot removal will be difficult in the head of slip area due to slopes of the sediment face and depth of the impacted material.

p.20 Additionally, the tPAH concentrations of sediment between hotspots and the southwest corner are just below the MEC. Additional discussion and/or review of the data gaps for sediment between the southeast corner and identified hotspots may be necessary in order to evaluate the impacted sediment volumes.

4.3 Initial Technology Screening

p.22 Although monitored natural recovery (MNR) was not applicable, enhanced MNR (e.g., bioaugmentation, biostimulation or other bioremediation technologies) should be evaluated as a stand-alone remedial action or used in combination with another technology.

p.22-23 The advantages and disadvantages of using mechanical dredge equipment versus hydraulic dredge equipment are not clear in the management of contaminated fall-back and suspended solids, important elements in the evaluation of sediment removal strategy.

p.23 Evaluate hydraulic pumping or comparable alternative(s) as part of the sediment removal options.

4.3.5 Sediment Dewatering and Disposal

p.24 This section should be included as part of section 4.3.3 (sediment removal) as it is part of the overall process flow. Discussion of water treatment should also be included in this discussion.

4.3.6 In Situ Sediment Treatment

p.25 The reagents discussed as viable admixtures for in situ sediment treatment are typically used for solidification to reduce contaminant mobility and bioavailability. The list of in situ treatment strategies is incomplete. Additional reagents and treatments that may be evaluated for in situ sediment treatment of organic contaminants are chemical oxidation, bioremediation and other chemical transformations.

4.5.3 Remedial Option C

p.27 Use of an engineered cap (with or without amendment) over the entire remedial prism for mitigation of MGP-impacted sediment was not evaluated.

p.27 A 25% decrease in the volume of material being dredged in Remedial Option B vs Remedial Option C does not seem like a large enough savings and/or improvement to implementation success. Evidence (i.e., publication and/or case studies) of an engineered cap over 25% of the impacted sediment as a viable and cost-effective alternative (Remedial Option C) compared to Remedial Option B was not provided.

p.27 There is a high probability that a reactive amendment could be beneficial as part of an engineered cap design. Please address in the RA screening level evaluation in Section 4.5.

5. Remedial Options Evaluations

p.29 Nine evaluation criteria and six evaluation criteria are both mentioned in the first paragraph.

5.1.3/5.2.2.3/5.2.3.3 Implementability

These implementation discussions seem incomplete as there are a number of engineering challenges associated with implementation of Remedial Options B and C that were not discussed. For example, a sheet pile wall will require additional geotechnical sampling, hydrology and groundwater flux investigations as installation of a sheet pile wall will need to be modeled for pre-dredge and post-dredge conditions.

Additional investigation into landside-waterside connectivity may be required as there is potential for ongoing migration of MGP-related CoCs and recontamination.

Identification and suitability analysis of a suitable location(s) and contingencies of a nearby location(s) for temporary use for a dredge material management, processing and loadout is crucial in the successful implementation of a mechanical or hydraulic dredging remedial option. Land is expensive (purchase or lease) in the area and alternatives may be limited by the need of available space, proximity of the dredge material management area to the dredge prism as well as requirements for utilities, and transport routes for loadout.

Another common concern typically reviewed as part of the implementability of a project is availability and suitability of a construction window due to weather constraints at this latitude and fish spawning and/or migration. Describe the schedule used to determine costs of implementation. Describe the impacts of executing this project over one, two and three construction seasons to complete the sheet-pile wall installation, dredging and restoration. We assume the pre-design phase of this project (e.g., data gap investigation, permitting and procurement of a contractor will take at least a year.