



September 7, 2023

Roers Companies
c/o: Shane LaFave
110 Cheshire Lane, Suite 120
Minnetonka, MN 53210
Via Email Only to shane@roerscompanies.com

Subject: Remedial Action Options Report Review
Community Within the Corridor - East Block
2748 N. 32nd Street, Milwaukee, WI 53210
BRRTS #02-41-263675, FID #241025400

Dear Mr. LaFave:

On July 25, 2023, the Wisconsin Department of Natural Resources (DNR) received the *Remedial Action Options Report* (Report) from K. Singh & Associates, Inc. (K. Singh) on behalf of the Community Within the Corridor Limited Partnership (CWC) for the above-referenced site. The Report was presented with a technical assistance fee of \$1,050 for DNR review and response. The Report was submitted in response to the DNR's *Review of Interim & Remedial Action Status* letter, dated June 7, 2023, which required CWC to conduct an additional evaluation of remedial action options. On August 24, 2023, the DNR received *Biochar Investigation Report* (Biochar Report) from K. Singh on behalf of CWC, which presented supplemental information for CWC's RAOR. The DNR reviewed the Report for compliance with Wis. Admin. Code ch. NR 722, and has determined that the remedial action plan presented in the Report cannot be approved at this time. Based on the DNR's review, the DNR is requesting that an updated Remedial Action Options Report (RAOR) be submitted that incorporates the feedback summarized below.

Report Overview

The Report provided by CWC includes a limited evaluation of remedial action options considered for additional remedial action at the site. CWC has selected the following remedial actions for the site, as stated in the Report:

1. "Use of Biochar to sequester TCE Vapors;
2. Selective Source Removal – Excavation and Disposal of Contaminated Soils to Degree and Extent Practical;
3. Addition of Depressurization Fans/Improvement of Conditions for Depressurization."

The DNR provides comments addressing CWC's evaluation of remedial action options, the remedial actions selected, and other matters addressed in the Report.

Report Review

General

All of the information required in Wis. Admin. Code § NR 722.13(2) is necessary to include in the updated RAOR so that the DNR can provide you with meaningful technical input on the presented remedial action options

and the selected remedial actions. Additionally, the DNR recommends that you consider a wider range of remedial action options in the updated RAOR. Additional information on these topics is provided below.

1. Wis. Admin. Code § NR 722.13(2) outlines the information that is required to be included within a RAOR. The Report did not include all of the information outlined in Wis. Admin. Code § NR 722.13(2). CWC must provide all the information specified in Wis. Admin. Code § NR 722.13(2)(d) *for each identified remedial action option*, regardless of whether the option is selected. CWC must also provide all the information specified in Wis. Admin. Code § NR 722.13(2)(e) for the selected remedial actions.
2. Pursuant to Wis. Admin. Code § NR 722.07, CWC must identify and evaluate an appropriate range of remedial action options, and then evaluate each option within the range of options for technical and economic feasibility. It appears that not all potentially economically and technically feasible remedial actions were presented in the remedial action options evaluation in the Report. The DNR requests that K. Singh, on behalf of CWC, consider a wider range of remedial action options in order to evaluate an appropriate range of remedial action options. In evaluating each remedial action option identified, address short and long-term effectiveness, implementability, and economic feasibility of the option, as set forth in Wis. Admin. Code § NR 722.07(4). In evaluating the long-term effectiveness of the option, take into account the “the degree to which the toxicity, mobility, and volume of the contamination is expected to be reduced,” and “the degree to which a remedial action option, if implemented, will protect public health, safety, and welfare and the environment over time.” Wis. Admin. Code § NR 722.07(4)(a)1.

Below are examples of additional remedial action options that DNR requests CWC to evaluate in the revised RAOR. The DNR is not indicating that either of the below examples are a comprehensive list of additional remedial actions to consider, or that either of these options should be selected by CWC, but is only requesting that these options be evaluated and discussed in the revised RAOR, in order to consider an appropriate range of remedial action options.

- a. K. Singh does not discuss the evaluation of potential implementation of in-situ destruction of CVOCs (e.g., reductive dechlorination) through soil mixing to potentially sequester and remediate trichloroethene (TCE). The DNR suggests that the technical and economic feasibility of this option be considered as a potential alternative to the proposed soil excavations and application of biochar.
- b. K. Singh does not discuss the evaluation of relying exclusively on the soil excavations taken to-date, the proposed enhancements of the vapor mitigation/soil vapor extraction system and additional sealing measures (without biochar), as a remedial action option. The DNR suggests that this option be evaluated and discussed in the revised RAOR.

Soil Excavation

1. Soil excavations are planned in select locations up to 4 feet beneath the building slab. Within the limits of the proposed additional remedial excavations in Building 1B-W, there is currently no soil data available for the 4-8 foot soil interval. Underlying soil samples collected from 8-10 feet beneath the building slab in this area help to vertically define the extent of TCE. However, given the information presented to-date, the extent and degree of TCE soil contamination is not defined in this 4-8 foot interval within Building 1B-W. Without understanding the extent and degree of soil contamination in this interval, it is difficult to determine how effective the selected remedy will be (including excavation, soil mixing, biochar application, etc.). The DNR recommends collecting additional data from this depth interval prior to completing a remedial options analysis. If this is not feasible, DNR recommends collecting the data during the remedial action to guide the limits of the action and demonstrate the effectiveness of the selected remedial action(s). If these actions are not adequate to address the risk associated with CVOC contaminated soil, then additional actions may be necessary in the future.

2. The areas of proposed remedial soil excavations presented on Figure 2 of the Report do not include Room 1052 (Mechanical Room), Room 1053 (Men’s Locker Room), Room 1054 (Fitness Room), and Room 1055 (Women’s Locker Room). These areas generally identify the some of the highest TCE concentrations in soil in Building 1B-W, many of which exceed the industrial direct contact soil RCL. The DNR recommends that the evaluation of remedial action options (excavation, soil mixing, etc.) include consideration of these areas as this may remove more TCE mass than some of the proposed remedial excavation areas that identified lower concentrations of TCE.
3. If soil excavation continues to be one of the remedial actions that is planned at this site, then provide a figure showing the locations of the confirmation samples that CWC plans to collect from within the excavation areas.
4. Table 3 of the Report presents an estimated mass of TCE that may be removed during the proposed soil excavation activities. A concentration of 3.7 mg/kg was chosen to be the representative maximum residual TCE concentration for each of the areas of planned excavation, as this was determined to be the median concentration of TCE identified in the confirmation soil samples collected from approximately 1.5 feet (ft) below ground surface (bgs) during the 2021 remedial soil excavation event. If excavation continues to be a chosen remedy, update the estimated mass removal once the below-outlined hazardous waste determination is complete.

Hazardous Waste Determination

1. On June 8, 2021, the DNR provided a hazardous waste determination concurrence (June 2021 concurrence) in response to *Contained Out Determination for Proposed Modification of Vapor Mitigation / Extraction System for Community Within the Corridor – East Block*, dated May 11, 2021, submitted by K. Singh on behalf of CWC. The June 2021 concurrence indicated that the soil managed as a part of the soil excavation activities, as presented in the May 11, 2021, report, could be managed as non-hazardous waste. The DNR’s June 2021 concurrence only applies to the soil presented for evaluation in the May 11, 2021, report. Soil data from excavation confirmation soil sample HS-5, identified TCE at 220 mg/kg, which is significantly higher in concentration than the soil data presented in the May 11, 2021, report.

Wis. Admin. Code § NR 722.09(2)(e)(1) states that “[a]ny waste, debris or waste stream generated by the remedial action shall be managed in compliance with all applicable state and federal laws and regulations. Contaminated debris, at a minimum, shall be addressed to minimize the harmful effects to protect health, safety, and welfare and the environment.” Wis. Admin. Code § NR 662.011 outlines the requirements for making hazardous waste determinations. A separate hazardous waste determination will be required for the additional areas of excavation that are proposed within the Report. This hazardous waste determination must be based upon representative soil sampling within the proposed limits of excavation considering all depth intervals, soil types, etc., prior to excavation, and analyzed using Toxic Characteristic Leaching Procedure (TCLP) so that a hazardous waste determination under Wis. Admin. Code § NR 662.011 can be made. A hazardous waste determination is necessary to determine how soil must be managed, including applicable storage, transportation, and disposal requirements. Therefore, if soil excavation is a selected remedial action, include a soil sampling plan that will be used to develop a hazardous waste determination for the proposed soil excavations. Include this plan in your next submittal, as applicable.

Biochar Application

Given the information presented to the DNR to-date, the DNR does not recommend the use of biochar as a remedial action. More specifically, based on the information presented to the DNR to-date, the use of biochar appears to currently be an experimental remedial action option that has not been proven to be successful long-term in a residential setting. Below are DNR's comments on this remedial action option:

1. It appears that the biochar may be successful in adsorbing TCE to its surface; however, there does not appear to be a mechanism for the reduction or destruction of the TCE once it is adsorbed on the layer of biochar that is proposed to be placed in the excavation areas. TCE being concentrated in a layer of material (e.g., biochar) beneath the building slab presents several unknowns and some concern for fate and transport of the adsorbed TCE. The information supporting the use of biochar that is relevant to the site includes the use of a zero valent iron product which is more likely to promote destructive degradation of chlorinated volatile organic compounds (CVOCs) at the site. Future submittals should only include dosing and reference materials which inform the proposed actions for conditions specific to this site.
2. The reference documents provided in the Report for the use of biochar as a remedial action do not provide evidence that the application of biochar is a proven method for TCE soil gas remediation.
3. K. Singh conducted an experiment to determine the feasibility of the use of biochar as a remedial action, and presented their findings in the Report and in Attachment F of *Weekly Progress Report for Week Ending 07/22/2023* (Weekly Report). Based on the limited information that was provided concerning this experiment, the DNR cannot comment on the conclusions of the experiment.
4. The Report proposes to use biochar as a sealant to be applied to wood columns and flooring within the site building to prevent vapor intrusion into the building through the wood columns and floors. Based on information provided, it is unknown whether the sealant mixture will successfully seal these features to prevent vapor intrusion. There is also a possibility that, if the biochar adsorbs TCE to the sealant mixture, it may reach a saturation limit allowing TCE contamination within or beneath these building features to enter the site building in the future causing TCE vapor intrusion at that time. No information was provided about the long-term stability of biochar within a sealant.
 - a. Consider whether the observed small-scale decreases in CVOCs, as presented in the Weekly Report, were a result of the general sealing operations or other variables and unrelated to the use of biochar.
5. K. Singh conducted a pilot scale test for the use of biochar on August 5 – August 8, 2023, as presented within the Biochar Report. Based on DNR's review of the Biochar Report, the DNR does not agree with the conclusions of the experiment. It is not possible to predict the impact of the use of the biochar on low-level TCE in soil vapors beneath the building and within the building material (e.g., wood columns). It cannot be concluded that the use of biochar will be successful long-term based on the pilot scale test.
6. If CWC chooses to implement biochar as a remedial action option, then provide details on how the potential long-term success of this option may be measured and evaluated through monitoring over the long-term use of this application.

Vapor Mitigation System (VMS) Operation

1. Operation of the vapor mitigation system (VMS) is proposed as a remedial action to reduce the mass of TCE contamination. Table 2 of the Report presents estimated removal rates for TCE from the blowers that are currently a part of the VMS. The DNR requests the following information and justification for the proposed use of the VMS system as a form of soil vapor extraction:

- a. All mass removal calculations should include calculations of actual measurements by analytical methods and not estimates.
- b. Air quality discharge requirements outlined in the Wis. Admin. Code ch. NR 400 series must be reviewed and implemented during VMS operations.
- c. Provide runtime information as evidence of mass removal rates. The mass removal rates should be supported using the cubic feet per minute data in conjunction with the effluent data to demonstrate mass removal rates and to calculate total mass.

Other:

1. The DNR requests the information listed below with respect to the Standard Operating Procedures (SOP) prepared by the Hartman Environmental Geoscience (HEG) for the gas chromatograph (GC) units, which were used to collect data presented in the Report:
 - a. Personnel qualifications: Document whether sampling technicians meet the minimum qualifications and training for operating the GC.
 - b. Reporting limits: Indicate what method detection limit and reporting (quantitation) limits are being achieved for TCE. TCE concentrations of 0.00 µg/m³ are portrayed on Table 2, but other concentrations are reported at 0.3 µg/m³. It appears that the reporting limit may be between these values.
 - c. Sample collection: Provide a description of how the sample analyzed was collected and delivered to the GC unit.
 - d. Quality Assurance and Quality Control (QA/QC): Provide a description of how the procedures described in Section 11 of the HEG SOP were complied with, including
 - i. Initial calibration: Procedure, date, and results from calibration of the GC unit prior to its use.
 - ii. On-going QA/QC: A description of the procedures and frequency used to check the accuracy of the device during use, including calibration analysis, blank analysis, replicate analysis, a description of how calibration sample results were used to correct for instrument drift or determine the need for recalibration, and method used for standard preparation. Provide all QA/QC results.
2. The DNR requests the following documentation revisions be included in the updated RAOR:
 - a. The Report indicates that fourteen access points were constructed in the site buildings for the purposes of installing inspection ports or connections to vapor mitigation system (VMS) fans, and that these are displayed on Figure 1. Clearly label which of the features on Figure 1 are the referenced access points.
 - b. There are red dashed lines around the elevator in Figure 4, but these are not included in the legend on Figure 4. Update Figure 4 to include this feature in the legend.
 - c. Figure 7 displays areas of residual soil contamination; however, it appears that not all areas of residual soil contamination are displayed. Update Figure 7 to include all areas of residual soil contamination, or update the legend to more accurately reflect the areas of residual soil contamination that are highlighted.

Next Steps

As stated above, the DNR is requesting that an updated RAOR be submitted that incorporates the feedback provided in this letter. The DNR requests that this updated RAOR be provided within 60 days of the date of this

letter, by November 6, 2023. The DNR will review and respond to the updated RAOR under the same technical assistance fee that was submitted to the DNR on July 25, 2023. The DNR appreciates the actions you are taking to restore the environment at this site. If you have any questions regarding the information in this letter or would like to schedule a meeting to discuss this case, please contact me, the DNR Project Manager, at (414) 435-8021 or jane.pfeiffer@wisconsin.gov to setup a meeting.

Sincerely,

A handwritten signature in cursive script that reads "Jane Pfeiffer". The ink is dark and the signature is centered on the page.

Jane K. Pfeiffer
Project Manager – Hydrogeologist
Remediation & Redevelopment Program

cc: Mr. Que El-Amin, Scott Crawford, Inc., que@scott-crawford.com
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