

Analysis of Brownfields Cleanup Alternatives (ABCA) Proposed Riverfront Park, Hartford/Windsor, Connecticut

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1 Introduction and Background

1.1 Site Location

A riverfront park development project is proposed for the Former Russo Family property which consists of 6 parcels identified as 228, 590, 600, and 610 Leibert Road in Hartford, CT and 100 and 120 Meadow Road in Windsor, CT (the Site). The four Hartford parcels are located within an industrial district zone of the City, while the two Windsor parcels are located in an agricultural zone. A portion of a United States Geological Survey (USGS) topographic map showing the Site location is provided as *Figure 1*.

According to City of Hartford and Windsor records, the Site encompasses approximately 60 acres of land west of the Connecticut River. Riverfront Recapture Inc. (RRI) purchased the parcels from the Russo Family (who owned the parcels since at least 1969) in September 2019.

Structures formerly located on the Site included a vacant cinder block garage on 100 Meadow Road, a vacant one-family residential building located on 228 Leibert Road, and an open storage shed located on 228 Leibert Road. These structures were demolished by RRI in 2020. Historically, a one-family residence and barn were formerly located on the 100 Meadow Road parcel; and a larger “barracks” structure (used as housing for farm workers) was located adjacent to the current residential building on 228 Leibert Road.

Refer to *Figure 2* for a Site plan depicting the Site layout.

1.2 Previous Site Use & History

The Site was used for agricultural purposes dating back at least to 1934, at which time a residential dwelling, farmer “barracks” and several greenhouses were present along the northern portion of the Site. The rest of the property appeared as cultivated farm land. In a 1952 aerial photo, the cinder block building (located on 100 Meadow Road, Windsor) is present, which was reportedly used as a produce washing and refrigeration storage facility.

Permits for quarrying activities at the Site were obtained in the early 1970s and the first evidence of quarrying activities on the Site appears in the 1985 aerial photograph, which depicts a long berm along the Connecticut River. A depression is also visible along the eastern portion of the property likely a result of quarrying activities. Since that time, excavating and fill activities were regularly conducted along the southern portion of

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the Site, as the Site owner (Russo Brothers Inc.) excavated sand and fine material for processing and sale as ice control sand, recreational infield mix, screened topsoil and clay. Russo Brothers Inc. also previously leased approximately 45 acres in the central portion of the Site for agricultural farming.

The western portion of the Site was previously leased to a tenant for truck parking as well as for a contractor equipment laydown area related to railroad construction activities. These leases were terminated in 2019.

1.3 Site Assessment Findings

Previous environmental investigations conducted for the Site include:

- *Phase I Environmental Site Assessment*, Russo Family Properties; prepared by Fuss & O'Neill, Inc., dated January 2018
- *Phase II/III Environmental Site Assessment*, Russo Family Properties; prepared by Fuss & O'Neill, Inc., dated November 2018
- *Phase I Environmental Site Assessment*, Russo Family Properties, prepared by Fuss & O'Neill, Inc., dated February 2019
- *Phase I Environmental Site Assessment*, Russo Family Properties, prepared by Fuss & O'Neill, Inc., dated September 2019

The 2018/2019 Phase I ESAs identified the following nine recognized environmental conditions (RECs) associated with the Site:

- **REC-01:** Berm Along the River (600 Leibert Road)
- **REC-02:** Fill Material on Western Portion of the Site (228 & 610 Leibert Road)
- **REC-03:** Material Stockpiles (228 Leibert Road)
- **REC-04:** Historical Fill Material (600 Leibert Road)
- **REC-05:** Pesticide Use (Site Wide)
- **REC-06:** Oil Stain (228 Leibert Road)
- **REC-07:** Truck Storage and Floor Drains (100 Meadow Road)
- **REC-08:** Potential Historical Underground Storage Tanks (100 & 120 Meadow Road)
- **REC-09:** Former Quarrying Equipment Storage/Staining (228 Leibert Road)

The 2018 Phase II/III ESA summarized the results and findings of investigation activities conducted at the Site between April and October 2018, compared to the state baseline Remediation Standard Regulations (RSR) criteria, as summarized per REC below. The February and September 2019 Phase I ESAs were conducted as part of RRI's pre-acquisition due diligence for the sale of the property.

- **REC – 01 Berm Along River (600 Leibert Road)** – A series of fill events (consisting of rock, masonry material and dredged material) occurred along the river shoreline for erosion protection.

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Soil sampling activities completed during the 2018 Phase II/III ESA identified concentrations of polynuclear aromatic hydrocarbons (PAHs) and several metals at concentrations above the laboratory reporting limits but below the baseline RSR criteria. One sample collected from this REC exhibited extractable total petroleum hydrocarbons (ETPH) concentrations slightly exceeding the Residential Direct Exposure Criteria (Res DEC). Due to the heterogeneity of the unconsolidated deposits that comprise the berm, there is the potential that soil within this area contains detections of metals (particularly lead) and/or PAHs, and may yield detections of ETPH slightly in excess of the Res DEC.

- **REC – 02 Fill Material on Western Portion of the Site (228 & 610 Leibert Road)** – A sequence of fill events occurred on these properties since the 1800's beginning with construction of the railroad. From the 1950's through 2000's agricultural activities on these parcels was discontinued and the area was used for material processing and excavation of earth materials. This included importing material from off-site to fill excavation areas and aerial photographs provide evidence that grades on these parcels have been raised. Based on the findings of the 2018 Phase II/III ESA, soil situated in the western portion of the Site may yield detections of metals and/or PAHs above the baseline RSR criteria.
- **REC – 03 Material Stockpiles (228 Leibert Road)** – Several material stockpiles, predominantly located on 228 Leibert Road, contained soil mixed with concrete and asphalt fragments, shingles, and wood chips. A pile of potentially asbestos-containing tile pipe was previously observed in the southern area of 228 Leibert Road near the southern property boundary. The soil and debris piles were well-vegetated including established shrub and small tree growth indicating that they had been stockpiled for a few years or more.

Select material stockpiles were inspected and sampled as part of the Phase II/III ESA. Soil sampling results identified concentrations of metals (arsenic and lead), PAHs, and pesticides above the baseline RSR criteria from stockpiles that were observed to contain fill materials.

- **REC – 04 Historical Fill Material (600 Leibert Road)** – Since quarrying activities began at the Site in the early 1970s, multiple excavation and fill events have occurred across the southern portion of the property. Based on the findings of the Phase II/III ESA, soil situated in this portion of the Site was not determined to contain concentrations of metals or PAHs above the baseline RSR criteria. Several pesticides were reported in a shallow soil sample collected from this area, however this area was actively farmed and the reported concentrations appear to be indicative of pesticides applied as directed for farming applications.
- **REC – 05 Pesticide Use (Site Wide)** – The Site has been used for agricultural purposes since prior to 1934. Soil sampling activities conducted during the 2018 Phase II/III ESA confirmed that pesticides were detected in shallow soils at concentrations consistent with normal application of pesticides for agricultural purposes. Elevated concentrations of pesticides were also detected in test

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pits and surficial soil samples collected in the vicinity of the former greenhouses at concentrations exceeding baseline RSR criteria in at least one sampling location in that area.

- **REC – 06 Oil Stain (228 Leibert Road)** – This REC was previously identified as “*REC-06 – Drums & Miscellaneous Containers (228 Leibert Road)*” during the 2018 Phase I ESA, and consisted of two 55-gallon drums observed within the open storage shed used and a 5-gallon bucket of petroleum substance located along the northeast corner of the vacant residence at 228 Leibert Road. An approximate 4-square foot stained area was observed on the cracked, concrete sidewalk surface beneath this container. A soil boring was advanced in the vicinity of the drums and the 5-gallon container as part of the 2018 Phase II activities, and concentrations of several metals and PAH compounds were detected in soil at concentrations below the baseline RSR criteria. Prior to the initiation of Phase III investigation activities, the two 55-gallon drums and the miscellaneous 5-gallon container were removed from the Site.

Based on the findings of the 2018 Phase II ESA sampling in this area (which identified constituents primarily associated with the presence of fill/asphalt), and since the containers were no longer present, additional samples were not collected during the Phase III ESA. As such, it was determined that the staining observed on the concrete surface did not impact shallow subsurface soils, and the constituents detected in the soil samples were associated with the presence of loose asphalt fragments and/or fill materials. The oil staining beneath and surrounding the previous 5-gallon container located northeast of the former residence was still present during the September 2019 inspection.

- **REC – 07 Former Truck Storage & Floor Drains (100 Meadow Road)** – Two vehicles were previously located within the former produce washing and refrigerated storage structure on 100 Meadow Road in the vicinity of a floor drain. Oil staining was present on portions of the concrete floor in this area. During the performance of Phase II/III investigation activities, several soil samples and concrete chip samples were collected within the vicinity of the floor staining and former trucks. PAHs, arsenic and/or lead were detected in select soil samples at concentrations below baseline RSR criteria, and polychlorinated biphenyls (PCBs) were detected at a concentration of 1,800 micrograms per kilogram (ug/kg) in a concrete chip sample collected near the truck.
- **REC – 08 Potential Historical Underground Storage Tanks (100 & 120 Meadow Road)** – The 2018 Phase I ESA identified the potential that underground fuel oil storage tanks, which may have been used to heat former structures on the Windsor Site parcels, could have been abandoned at the Site. A ground penetrating radar (GPR) survey was performed as part of the 2018 Phase II/III ESA in an attempt to locate the potential USTs; however, no evidence of potential underground storage tanks was identified near the current or former Site buildings.

There is no evidence of USTs adjacent to the Site structures and this is no longer identified as a Site REC.

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- **REC – 09 Former Quarrying Equipment Storage/Staining (228 Leibert Road)** – Russo Brothers Inc. previously staged equipment and trucks related to quarrying activities on the western portion of the Site near the open storage shed. The equipment and trucks were removed from the Site sometime between the February 2019 and September 2019 inspections. Two small areas of staining were observed on the ground surface at this location.

1.4 Project Goal

This project is an addition to the Hartford-Windsor Riverwalk North Extension project (State Project No. 63-721), which includes the extension of the existing multi-use trail along the Connecticut River. The Riverwalk North Extension project extends along the Connecticut River from the Greater Hartford Jaycees Community Boathouse northerly for approximately two and a half (2.5) miles towards Windsor connecting to the cul-de-sac on Weston Street. The proposed Riverfront Recapture Park will serve as the connection between the Hartford Riverwalk and Windsor Meadows State Park to the north.

RRI is targeting redevelopment of the Site for the Riverwalk connection trail, public access to the river and ultimately for recreational and event space.

The remedial goal for this Site is to satisfy the State clean-up requirements while redeveloping the Site into a park to address community recreations and health needs. The Site is challenged by environmental (polluted fill and pesticides) and physical (i.e. floodplain) challenges that requires an integrated approach to moving forward with remediation and redevelopment activities.

1.5 Regional and Site Vulnerabilities

According to the US Global Change Research Program (USGCRP), climate trends for the northeast region of the United States include increased temperatures, increased precipitation with greater variability, increased extreme precipitation events and rises in sea level). Some of these factors, most specifically increased precipitation that may affect flood waters and stormwater runoff, are most applicable to the cleanup of the Site.

FEMA Flood Zone mapping indicates that the entire Site is located within the 100-year flood zone (*Attachment A*). A changing climate may result in greater storm frequency and intensity which could affect the flood waters within the Connecticut River and the adjacent Meadow Brook.

2 Applicable Regulations and Cleanup Standards

2.1 Cleanup Oversight Responsibility

The Site has been entered into Connecticut's voluntary Abandoned Brownfields Cleanup Program (ABC) and the cleanup will be overseen by RRI and a Connecticut Licensed Environmental Professional (LEP).

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The remedial options for the Site will be integrated into the overall Site design. Construction of the park will contain elements to address the cleanup regulations, preserve and enhance impervious area, provide greening of the site through park development to benefit the community, and address climate resiliency goals.

Urban fill containing coal ash, asphalt fragments, construction debris, and metals (arsenic, lead) as well as the pesticides chlordane, 4-4 DDE, 4,4-DDD, 4,4-DDT in former agricultural areas exceed one or more of the cleanup criteria at the Site. The LEP will prepare cleanup specifications to procure a qualified remediation contractor through a public bid process as well as provide field oversight during the cleanup activities. Subsequently, once RRI has formed a final concept development plan, the LEP will prepare a Remedial Action Plan for the Site.

2.2 Cleanup Standards for Major Contaminants

We understand that in February 2019, the approximately 60-acre property was accepted by Connecticut Department of Energy and Environmental Protection (DEEP) into the ABC Program. As a condition of acceptance into the ABC program, RRI entered the Site into DEEP's voluntary remediation program pursuant to CGS Section 22a-133x. Following entrance into Connecticut's Voluntary Remediation Program, the CT State Remediation Standard Regulations (RSRs) will apply to the Site. The RSRs require soil remediation at the Site to meet both the state direct exposure criteria (DEC) and the pollutant mobility criteria (PMC) for GB-classified groundwater areas.

To the extent that grant funding allows, the remedial objective includes targeted removal and off-site disposal of unsuitable soil, soil mixing in former agricultural areas to address pesticides, consolidation and management of polluted soil, raising grades in a portion of the property with "clean" on-site material generated from the expansion of the existing cove, and capping polluted soil in place out of the flood plain with the new park infrastructure.

2.3 Laws & Regulations Applicable to the Cleanup

As previously mentioned, the Site was entered into a Connecticut Voluntary Remediation Program, which required the preparation and submission of an Environmental Conditions Assessment Form (ECAAF) to the DEEP. Following a 30-day public notice obligation as required by the voluntary cleanup program, remedial activities to remove source material will commence according to state standards and the CT RSRs.

3 Evaluation of Cleanup Alternatives

In this section we provide an analysis of alternatives of the possible remedial options for achieving the remedial objectives described in Section 2.2 using the cleanup grant funding. The sub-sections below evaluate each of the options based on the potential effectiveness, feasibility of implementation and cost.

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3.1 Cleanup Alternatives Considered

The following options have been selected for analysis:

- Alternative No. 1: No action
- Alternative No. 2: Polluted soil excavation and off-Site disposal
- Alternative No. 3: Consolidation and management of polluted soil; targeted soil/debris removal & disposal; soil mixing, capping polluted soil in place & raising Site grades

3.2 Cost Estimate of Cleanup Alternatives

The effectiveness, implementability and cost of each alternative is discussed below followed by selection of the recommended cleanup alternative.

3.2.1 Effectiveness (Including Climate Change Considerations)

- **Alternative No. 1:** By taking no action, there would be no progress toward achieving the remedial objective. No action could result in direct exposure to impacted shallow soils, erosion of impacted soil potentially affecting the adjacent cove, Connecticut River or adjacent wetlands, and would not improve the environmental quality of the Site or prepare the Site for future redevelopment.
- **Alternative No. 2:** The excavation and disposal of the shallow impacted soil from the 228 Leibert Road parcel, and removal of the impacted pesticide and debris stockpiles could achieve compliance with the CT RSRs. However this alternative would create greater areas of disturbance across the Site, require increased transportation and associated increased carbon footprint to transport the material off-site for disposal and overall require more time to complete.
- **Alternative No. 3:** This alternative includes targeted removal and off-site disposal of unsuitable soil, consolidation and management of polluted soil, soil mixing of surface soil in former agricultural areas to address residual pesticides, raising grades in a portion of the property with “clean” on-site material, and capping polluted soil in place out of the flood plain with the new park infrastructure. The approximately 18” clean material profile for the cap and material used to raise Site grades will be obtained from the expansion of the on-Site existing cove located along the Connecticut River. Soil in the top 12 – 18 inches of the former agricultural areas will be mixed in windrows to address residual pesticides,

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This alternative will be effective in removing sources of on-going contamination, prevent human exposure to polluted soil, prevent erosion of polluted soil into the Connecticut River and remove exposure pathways for impacts to the river and estuary.

Additionally, using the clean, native material generated from the expansion of the on-Site cove area located along the Connecticut River would reduce the overall carbon footprint of having to import material to the Site as well as limit the overall excavation of material from the Site, thus reducing the potential for airborne dust, pollutants, etc. The capping of polluted fill material and raising Site grades would also contribute to improved floodplain related issues and risks.

3.2.2 Implementability

- **Alternative No. 1:** No Action would be easy to implement since no activity would occur at the Site.
- **Alternative No. 2:** This alternative, while feasible, could be difficult, time consuming and costly to implement. This alternative requires the RRI and the LEP to coordinate remedial planning with local and state authorities to obtain the permitting necessary to disturb the subsurface within the FEMA floodplain. All excavated soil would be transported and disposed at an approved off-site facility which would be cost prohibitive and would be a separate task from proposed Site development activities.
- **Alternative No. 3:** This alternative is feasible and effective toward achieving cleanup goal progress within the extent of the available funding. This alternative requires the site design team, LEP and RRI to coordinate remedial planning with local and state authorities to obtain the permitting approvals necessary to disturb the subsurface within the FEMA floodplain as well as for incorporating the new park infrastructure (landscape & hardscape) to encapsulate polluted fill and soil in place in accordance with the cleanup regulations.

Soil management and handling including targeted excavation and off-site disposal of hot spot areas, soil mixing, as well as on-site consolidation of polluted soil will be incorporated into the cleanup and Site design planning. The remedial alternatives for the project will be outlined in a Remedial Action Plan and an Engineered Control Variance Request that describes the design of the engineered controls will also be prepared and submitted for approval to the DEEP. Permitting associated with construction of the engineered controls includes preparation of a state storm water permit application. A state structure and filling permit will also be prepared since site grades will be raised in select areas of the site as part of climate resiliency measures. Design at the 90% and 100% phase for the park landscape, hardscape and trail sections that will serve as the environmental engineered controls to address polluted soil will occur. A soil management plan will be prepared to manage contaminated soil handling during park construction, soil mixing in the former agricultural areas, and manage clean soil that will be used to raise site grades generated from expansion of the existing cove. The Site team will conduct community outreach and prepare remediation specifications to procure a remediation contractor through a public bid process.

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The LEP will provide field oversight and prepare a Remedial Action Report documenting remediation activities and cleanup status. An Environmental Land Use Restriction will be filed on the land records to prevent future disturbance of the park infrastructure that serves as the engineered controls.

3.2.3 Cost

- **Alternative No. 1:** The No Action remedial approach would result in no cost
- **Alternative No. 2:** Costs involved with this alternative would primarily be related to the physical excavation, transportation and disposal of impacted soil and oversight activities and would not include permitting, design, or other Site development costs. Costs involved with the implementation of this alternative would far exceed the available EPA grant funding and cost sharing options. The estimated cost would be on the order of \$3,890,000.
- **Alternative No. 3:** Costs involved with this alternative include the permitting, design, and construction costs for capping polluted fill on-Site and overall Site soil management during development activities. RRI has leveraged additional sources of funding as cost sharing options beyond what the EPA grant funding would allow. The estimated total cost for this alternative is estimated to be approximately \$1,930,000. Of which, \$600,000 will be funded by the EPA grant and related RRI cost share.

3.3 Recommended Cleanup Alternative

The recommended cleanup alternative is Alternative #3: Consolidation and management of polluted soil; targeted soil/debris removal & disposal; soil mixing; capping polluted soil in place & raising Site grades.

The option of No Action (Alternative #1) cannot be taken since it does not address the Site risks.

Implementation of Alternative #2 is not recommended because the increased size of the excavation areas and amount of soil to be disposed of off-site would be more cost prohibitive and would create greater areas of disturbance across the Site.

Green and Sustainable Remediation Measures for Selected Alternative

To make the selected alternative greener, or more sustainable, several techniques are planned. The most recent Best Management Practices (BMPs) issued under ASTM Standard E-2893: Standard Guide for Greener Cleanups will be used as a reference in this effort. RRI will require the cleanup contractor to follow an idle-reduction policy and use heavy equipment with advanced emissions controls operated on ultra-low sulfur diesel. The excavation work would be conducted during the dry-weather months (summer) in order to minimize groundwater infiltration into the excavation area, in turn reducing dewatering needs and the amount

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of dewatering liquids requiring disposal/treatment. Additionally, construction of the park will contain elements to preserve and enhance impervious area (including the proposed soil cap).

The number of mobilizations to the Site would be minimized and erosion control measures would be used to minimize runoff into environmentally sensitive areas. In addition, RRI plans to ask bidding cleanup contractors to propose additional green remediation techniques in their response to the Request for Proposals for the cleanup contract.

3.4 Tasks Associated with the Recommended Cleanup Alternative

Construction tasks involved with Cleanup Alternative #3 include the following:

- Removal and off-site disposal of approximately 1,700 tons of contaminated soil stockpiles previously determined unsuitable for reuse
- Cap remaining polluted soil in place on a portion of the site using S1600 separation fabric and 18 inches of clean soil generated from the expansion of an on-Site cove along the Connecticut River
- Soil mixing to address residual pesticides at the surface of the former agricultural areas (if needed)
- Groundwater monitoring and environmental land use restriction preparation
- Construction administration and observation/documentation

Engineering tasks involved with Alternative #3 include:

- The preparation of local inland wetlands, DEEP, and USACE permit applications
- Preparation of Plans and Specification for contractor procurement
- State Voluntary Remediation Program obligations including:
 - preparation and submission of a Community Relations Plan
 - community outreach and public notice
 - contractor procurement and oversight
 - confirmatory soil sampling following excavation of impacted soil
 - preparation of a Remedial Action Report.

Attachments:

Figure 1	Site Location Map
Figure 2	Site Plan
Attachment A	Climate Change Information & FEMA Flood Map

Figures

Attachment A

Climate Change Information and FEMA Flood Map