



Draft Analysis of Brownfield Cleanup Alternatives

Englewood Nature Trail

Zone 1: 5829 S. Loomis Blvd., 5831 S. Loomis Blvd., 5845 S. Loomis Blvd., 5830 S. Ada Street, 5944 S. Ada Street, 1336 W. 59th Street, 1342 W. 59th Street, 1346 W. 59th Street, 1348 W. 59th Street, and 1359 W. 59th Street, Chicago, Illinois 60636

Zone 2: 5815 S. Ada Street and 5812 S. Throop Street, Chicago, Illinois 60636

Zone 3: 5841 S. Ada Street, 5842 S. Throop Street, and 1310 W. 59th Street, Chicago, Illinois 60636

Zone 4: 5835 S. Throop Street, 5839 S. Throop Street, 5841 S. Throop Street, and 5830 S. Elizabeth Street, Chicago, Illinois 60636

Contents

1.0 Introduction.....	1-1
2.0 Background.....	2-1
2.1 Site Location and Description.....	2-1
2.2 Previous Site Uses and Site History	2-2
2.3 Site Assessment Findings	2-2
2.3.1 Phase I ESAs	2-3
2.3.2 Phase II ESAs, CSIR and Additional Investigation.....	2-4
2.4 Observed and Potential Changing Climate Conditions in Site Area	2-5
2.5 Project Goal	2-5
3.0 Cleanup Goals and Objectives.....	3-1
3.1 Cleanup Oversight Responsibility	3-1
3.2 Cleanup Standards for Major Contaminants.....	3-1
3.3 Laws & Regulations Applicable to the Cleanup.....	3-2
4.0 Alternatives Considered	4-1
4.1 Cleanup Alternatives Considered.....	4-1
4.2 Cleanup Alternative Evaluation	4-1
4.2.1 Effectiveness.....	4-2
4.2.2 Implementability	4-2
4.2.3 Climate Change Resilience	4-4
4.2.4 Cost	4-4
5.0 Selected Alternative and Proposed Cleanup Plan	5-1

List of Figures

Figure 2-1 Englewood Nature Trail Remediation Zones

Figure 2-2 Englewood Nature Trail Remediation Areas

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1.0 Introduction

This Analysis of Brownfield Cleanup and Alternatives (ABCA) report has been prepared for the Englewood Nature Trail Site located in Chicago, Illinois (herein referred to as “the Site”). For ease of remediation, the Site has been separated into four Zones:

- Zone 1 includes parcels located at 5829 S. Loomis Blvd., 5831 S. Loomis Blvd., 5845 S. Loomis Blvd., 5830 S. Ada Street, 5944 S. Ada Street, 1336 W. 59th Street, 1342 W. 59th Street, 1346 W. 59th Street, 1348 W. 59th Street, and 1359 W. 59th Street in Chicago, Illinois 60636;
- Zone 2 includes parcels located at 5815 S. Ada Street and 5812 S. Throop in Chicago, Illinois 60636;
- Zone 3 includes parcels located at 5841 S. Ada Street, 5842 S. Throop Street, and 1310 W. 59th Street in Chicago, Illinois; and
- Zone 4 includes parcels located at 5835 S. Throop Street, 5839 S. Throop Street, 5841 S. Throop Street, and 5830 S. Elizabeth Street in Chicago, Illinois 60636.

The proposed cleanup under the Brownfield Cleanup Grant will include hot spot treatment and offsite removal of hazardous concentrations of cadmium, lead, and trichloroethylene (TCE) present at the Site. Elevated concentrations of total petroleum hydrocarbons (TPHs) were also observed within Zone 1 and Zone 3. The elevated TPH concentration will be removed offsite and confirmation samples will be collected to verify the site-specific soil attenuation capacity criteria are met. Additional remedial actions, including the installation of engineered barriers and implementation of institutional and preventive controls, to eliminate the soil ingestion, soil inhalation and groundwater ingestion exposure pathways for areas where soil exceeds the Tiered Approach to Corrective Action Objectives (TACO) Tier 1 Soil Remediation Objectives (SROs) will be completed under separate funding prior to or concurrent with redevelopment.

This ABCA report includes the following:

- A summary of the Site background and the future use of the Property;
- A description of the previous environmental investigations and their findings, including Phase I and Phase II Environmental Site Assessments (ESAs) and Comprehensive Site Investigation Reports (CSIRs) / Remediation Objectives Reports (RORs) / Remedial Action Plans (RAPs);
- Analysis of potential remediation alternatives for cleanup of the Englewood Nature Trail Site; and
- Selection of the most appropriate alternative.

2.0 Background

2.1 Site Location and Description

The Site occupies 19 parcels located in the West Englewood community in the southwestern portion of Chicago, Illinois. The site consists of largely vacant land that is divided into four zones: Zone 1 approximately 1.4 acres, Zone 2 approximately 0.7 acres, Zone 3 approximately 1.7 acres, and Zone 4 approximately 3.8 acres. The Site is comprised of vacant lots with concrete foundations, structures and vegetation. The location of the Site is depicted on **Figure 2-1**.

The Site's topography is generally flat on the northern and southern portions, with a sloped embankment connecting the Site to an historic elevated railroad line (approximately 15 to 16 feet above the Site grade). The elevated railroad line is slated for redevelopment as part of the same proposed Englewood Nature Trail project. The elevation of the flat portion of the Site ranges between 594 and 599 ft above mean sea level (amsl).

The closest surface water body to the Site is at Sherman Park to the north, which is over 2,000 feet north of the Site. The nearest surface water body in the direction of groundwater flow is Lake Michigan which is located approximately 4.0 miles east of the Site. Lake Michigan is the soil source of the City of Chicago's drinking water.

A description of all zones included within the remediation Site is provided below:

Zone 1

Zone 1 occupies 10 parcels (PINs 20-17-128-005-0000, 20-17-128-006-0000, 20-17-128-007-0000, 20-17-128-008-0000, 20-17-128-009-0000, 20-17-128-017-0000, 20-17-128-015-0000, 20-17-128-014-0000, 20-17-128-013-0000, and 20-17-128-012-0000) in the West Englewood community located in the southwestern portion of Chicago, Illinois. The Site is surrounded by several other zones of property slated for redevelopment as part of the same proposed Englewood Nature Trail project, as depicted in **Figure 2-1**.

The Site encompasses approximately 1.4 acres and is comprised of a vacant lot with concrete foundations and vegetation. The subject property is bounded to the north by a historic elevated railroad track, beyond which is a vacant lot; to the west by S. Loomis Blvd., beyond which is a powder coating facility; to the south by W. 59th Street, beyond which is a towing equipment facility and vacant lots; and to the east by S. Ada Street, beyond which is a vacant lot.

Zone 2

Zone 1 occupies 2 parcels (PINs 20-17-129-006-0000 and 20-17-129-019-0000) in the West Englewood community located in the southwestern portion of Chicago, Illinois. The Site is surrounded by several other zones of property slated for redevelopment as part of the same proposed Englewood Nature Trail project, as depicted in **Figure 2-1**.

The Remediation Site totals approximately 0.7 acres and is comprised of a vacant lot with concrete foundations and vegetation. The subject property is bounded to the north by W. 58th Street, beyond which is a vacant lot; to the east by S. Throop Street, beyond which is a former school building; to the

south by a historic elevated railroad track, beyond which is a vacant lot; and to the west by residential homes, beyond which is S. Ada Street, a vacant lot, and a community garden.

Zone 3

Zone 3 occupies 3 parcels (PINs 20-17-129-012-0000, 20-17-129-013-0000 and 20-17-129-020-0000) in the West Englewood community located in the southwestern portion of Chicago, Illinois. The Site is surrounded by several other zones of property slated for redevelopment as part of the same proposed Englewood Nature Trail project, as depicted in **Figure 2-1**.

The Remediation Site totals approximately 1.7 acres and is comprised of a vacant lot with concrete foundations and vegetation. The subject property is bounded to the north by a historic elevated railroad track, beyond which is a vacant lot; to the west by S. Ada St., beyond which is a vacant lot; to the south by W. 59th Street, beyond which are residential homes and vacant lots; and to the east by S. Throop St., beyond which are vacant lots and an auto repair shop.

Zone 4

Zone 4 occupies 4 parcels (PINs 20-17-130-019-0000, 20-17-130-021-0000, 20-17-130-022-0000 and 20-17-130-024-0000) in the West Englewood community located in the southwestern portion of Chicago, Illinois. The Site is surrounded by several other zones of property slated for redevelopment as part of the same proposed Englewood Nature Trail project, as depicted in **Figure 2-1**.

The Remediation Site totals approximately 3.8 acres. The subject property is comprised of a vacant lot with concrete foundations, vegetation, and an abandoned concrete loading platform structure. The subject property is bounded to the north by a historic elevated railroad track, beyond which is a vacant school; to the east by S. Elizabeth Street, beyond which is a large vacant lot; to the south, an alley, beyond which is South Loop Auto Services and vacant lots as well as a social services business, beyond which is W. 59th Street; and to the west S. Throop Street, beyond which is a vacant lot.

2.2 Previous Site Uses and Site History

The City of Chicago acquired the parcels which make up the Site between 1999 and 2014 through tax, judicial and sheriff's liens. Prior to the City of Chicago's ownership, land use at the Site was primarily industrial. Beginning in the 1895, based on historical Sanborn maps, the first known use of the properties is as the American Ceramic Works, a coal and woodshed and blacksmith. Adjoining the sites is the Pittsburg, Cincinnati, and St. Louis Railroad (PCC&StL0), a freight and passenger Midwest continental rail line used during the very late 1800 and 1900s. The freight line contained rail spurs that feed into industrial properties. Beginning in 1926, the Goldsmith Brothers Smelting and Refining Company, a large industrial site, was shown to encompass most of the sites with more rail spurs feeding into the sites. Three more industrial sites are shown to have been constructed on the remaining site that contained metal and paper fabrications. Until 1975, the industrial sites had expanded their operations, encompassed all the sites and contained various types of concerns including but not limited to: various underground storage tanks (USTs), machine shops, smelters, junk shed/yards, furnaces, and more. After 1988, the sites appear to be vacant with only a couple of large warehouses in 1988 but vacant after.

2.3 Site Assessment Findings

The following previous environmental investigations have been completed for this Site and its adjacent properties:

- Phase I ESA, prepared by Mactec Engineering and Consulting, Inc. (Mactec), Chicago, Illinois, December 2009
- Phase II ESA, prepared by Mactec, Chicago, Illinois, February 2010
- Phase I ESA, prepared by Terracon Consultants, Inc. (Terracon), Chicago, Illinois, January 2013
- Phase II ESA, prepared by Terracon, Chicago, Illinois, January 2013
- Phase I ESA, prepared by Terracon, September 4, 2013
- Phase II ESA, prepared by Terracon, October 23, 2013
- Phase I ESA – Englewood Trail Zone 1, prepared by Carnow, Conibear & Assoc., Ltd. (CCA), April 25, 2023
- Phase I ESA – Englewood Trail Zone 2, prepared by CCA, April 25, 2023
- Phase I ESA – Englewood Trail Zone 3, prepared by CCA., April 25, 2023
- Phase I ESA – Englewood Trail Zone 4, prepared by CCA., April 25, 2023

These previous environmental investigations are further described in the following sections.

2.3.1 Phase I ESAs

The following recognized environmental conditions (RECs) were identified based on the Phase I ESA Reports, prepared by Mactec (2009), Terracon (2013), and CCA (2023):

- The historical use of the subject property as a smelting and refining facility with storage tanks from at least 1926 to the 1980s;
- Potential for historic releases as a result of the documented presence of barrels of potentially hazardous substances abandoned in a warehouse on the subject property;
- Historical operation of a junkyard, auto shops, an Iron and Metal Co., a spring manufacturing facility, and a grinding wheel factory;
- Historical reports of garbage/debris as well as auto repair wastes dumping onto the Site;
- Unknown objects observed at the subject property during MACTEC's site reconnaissance including concrete pads with I-beam remnants, steel remnants protruding from the ground, an apparent manhole/sump, and surface staining;
- Vault opening and unknown pipe observed near the loading dock of the subject property;
- Based on the historical use of the subject property for manufacturing, the potential for the presence of underground storage tanks at the subject property;
- Industrial operations including metals, petroleum and hazardous waste utilization and storage the site;
- The potential for releases of hazardous materials and petroleum products, mercury and chemicals from historic storage and operations including unknown material storage, mercury storage, junk yard, mill work and lumber storage at the site;
- Known metals, volatile organic compounds (VOCs), and polynuclear aromatic hydrocarbons (PNAs) impacts previously identified on the subject property in exceedance of Tier 1 SROs;
- Potential for migration of soil/groundwater contamination onto the Site as a result of the historical operation of the adjoining properties as various manufacturing facilities, auto repair shops, and machine shops;
- Fill materials are commonly used in built-up areas in Chicago. The potential for the presence of fill materials at the subject property which have unknown contaminants and chemicals.

Based on the historical Site use and RECs, the primary sources of contamination are likely derived from the historical use of the Site as a smelting and refining facility with storage tanks, and historic industrial and automotive operations on the Site.

2.3.2 Phase II ESAs, CSIR and Additional Investigation

Surface and subsurface environmental investigations, including the Phase II ESAs, sampling associated with the Site's zone specific CSIRs / RORs/ RAP reports and additional investigations were completed for the Site and its adjacent properties between 2010 and 2023. The scope of work and results of each of these investigations are summarized below:

Investigation	Scope of Work	Results
Mactec Engineering and Consulting, Inc, 2010, Phase II ESA, 5812 S Throop Street	Advancement of 8 soil borings Collection of 16 subsurface soil samples	Soil analytical results exceed applicable Illinois TACO SROs for VOCs, PNAs, and inorganics
Terracon Consultants, Inc., 2013, Phase II ESA, 16 vacant parcels along W 59 th and S. Ada Street	Advancement of 18 soil borings Collection of soil samples Collection of groundwater samples	Soil analytical results exceed applicable Illinois TACO SROs for VOCs, PNAs, and inorganics Hazardous concentrations of lead identified in 2 soil samples. Groundwater analytical results exceed applicable Class II GROs for SVOCs and inorganics
Terracon Consultants, Inc., 2013, Phase II ESA, 5835, 5839, 5841 S. Throop St, 5830 S. Elizabeth St, and 5807 S. Racine Ave.	Advancement of 15 soil borings Collection of soil samples	Soil analytical results exceed applicable Illinois TACO SROs for PNAs, PCBs, and inorganics. Hazardous concentrations of lead identified in 1 soil sample.
Carnow, Conibear & Assoc., 2023, Comprehensive Site Investigation (CSIR), Remedial Objectives Report (ROR) and Remedial Action Plan (RAP) – Zone 1	Advancement of 48 soil borings Collection of soil samples Collection of groundwater samples	Soil and groundwater analytical results exceed applicable Illinois TACO SROs/GROs for PNAs and inorganics. Elevated concentration of TPHs. Hazardous concentrations of lead identified within Zone 1.
Carnow, Conibear & Assoc., 2023, CSIR / ROR / RAP – Zone 2	Advancement of 37 soil borings Collection of soil samples Collection of groundwater samples	Soil and groundwater analytical results exceed applicable Illinois TACO SROs/GROs for PNAs, VOCs, and inorganics. Hazardous concentrations of lead and TCE identified within Zone 2.
Carnow, Conibear & Assoc., 2023, CSIR / ROR / RAP – Zone 3	Advancement of 54 soil borings Collection of soil samples Collection of groundwater samples	Soil and groundwater analytical results exceed applicable Illinois TACO SROs/GROs for PNAs and inorganics. Elevated concentration of TPHs. Hazardous concentrations of cadmium, lead and TCE identified within Zone 3.

Investigation	Scope of Work	Results
Carnow, Conibear & Assoc., 2023, CSIR / ROR / RAP – Zone 4	Advancement of 12 soil borings Collection of soil samples Collection of groundwater samples	Soil and groundwater analytical results exceed applicable Illinois TACO SROs/GROs for PNAs and inorganics. Hazardous concentrations of lead identified within Zone 4.

The investigations listed above found that concentrations of VOCs, semi-volatile organic compounds (SVOCs), including PNAs, and inorganics in soil at the Site exceeded applicable Illinois TACO SROs, and that cadmium, lead and TCE concentrations in varying locations throughout the Site exceed the hazardous waste toxicity criteria. Groundwater results from the site investigations exceeded the applicable Class II Groundwater Remediation Objectives (GROs).

Figure 2-2 presents the remediation boundaries identified at the Site within Zone 1 through Zone 4.

2.4 Observed and Potential Changing Climate Conditions in Site Area

The NOAA National Centers for Environmental Information State Climate Summary for Illinois (Frankson, R., K. Kunkel, S. Champion, B. Stewart, D. Easterling, B. Hall, and J. R. Angel, 2017: Illinois State Climate Summary. *NOAA Technical Report NESDIS 149-IL*, 4 pp) was reviewed to assess observed and potential climate changes for northern Illinois in order to evaluate how potential adverse impacts from changing weather events might impact the proposed cleanup remedies for the Site.

The NOAA Summary indicates that the area has experienced a temperature increase of 1 degree F since the beginning of the 20th century, with the warming concentrated in winter and spring. Illinois has experienced a dramatic increase in extreme precipitation events (over 2 inches of precipitation) since 1995, which has negative impacts on both agriculture and urban areas, where heavy rains falling on impervious surfaces with inadequate infrastructure cause urban flooding. Overall precipitation and extreme precipitation events are projected to increase in northern Illinois in the future, with spring precipitation projected to increase 15 to 20% by 2050 as compared to the late 20th Century under a high emissions scenario.

2.5 Project Goal

The cleanup activities to be performed under this grant are critical steps in advancing the Site cleanup for reuse and redevelopment. The ultimate goal is to redevelop the Site for mixed business and residential use, including open public spaces, cultural landscapes and urban growing sites. The Site will also be directly connected to the adjacent Englewood Nature Trail, allowing it to serve as an access point to the elevated greenway and multi-use recreational path.

3.0 Cleanup Goals and Objectives

3.1 Cleanup Oversight Responsibility

The Site has been enrolled in the voluntary Illinois Site Remediation Program (SRP), which is overseen by the Illinois Environmental Protection Agency (Illinois EPA). Four zone specific CSIRs / RORs / RAPs were provided to Illinois EPA in 2023. The Illinois EPA provided their review and comments for each zone-specific report and responses were subsequently submitted. The Illinois EPA approved all zone specific CSIRs / RORs / RAPs in 2024. The next steps in the regulatory process for the Site are to implement the remediation and to prepare a Remedial Action Completion Report (RACR) to document the cleanup actions. The SRP will provide technical support and review of these reports, and will approve or deny reports based on fulfillment of the requirements of the SRP and the Illinois Tiered Approach to Remedial Action Objectives (TACO) regulations that govern environmental cleanups and risk assessment in the state. Successful remediation will result in receipt of a Comprehensive No Further Remediation (NFR) letter from the Illinois EPA in accordance with 35 IAC Part 740 (the SRP) for Zone 1 through Zone 4 at the remediation Site. The proposed cleanup under the Brownfield Cleanup Grant includes the reduction of cadmium, lead and TCE concentrations to below hazardous waste toxicity criteria, which is a critical step to fulfill the SRP requirements.

The City of Chicago will contract with a professional environmental consultant to provide technical assistance, design, report preparation, and oversight services during the remediation process. The consultant will provide the services of professional scientists and engineers licensed in Illinois to prepare, review, and certify technical reports for submittal to the Illinois EPA.

3.2 Cleanup Standards for Major Contaminants

Sites enrolled in the Illinois SRP must evaluate and address exposure pathways for contaminants that exceed applicable cleanup standards in accordance with the rules and regulation found in 35 IAC Parts 740 and 742 (The SRP and TACO). Exclusion of pathways from further consideration is based on effective source control coupled with site conditions such as engineered barriers and, if needed, an appropriate institutional control that effectively prohibits human exposure through a given pathway.

Concentrations of cadmium, lead and TCE exceeded the hazardous waste criteria within the following Zones:

- Zone 1 – Lead and elevated concentration of TPHs
- Zone 2 – Lead and TCE
- Zone 3 – Cadmium, lead, TCE and elevated concentrations of TPHs
- Zone 4 – Lead

The cleanup standards for cadmium, lead and TCE are as follows:

Constituent	Hazardous Waste Toxicity Criteria (mg/L)
Cadmium	1.0
Lead	5.0
TCE	0.5

The cleanup standards for the elevated concentrations of TPH observed within Zone 1 and Zone 3 are as follows:

Constituent	Site-Specific Surface Soil Attenuation Capacity (mg/kg)	Site-Specific Subsurface Soil Attenuation Capacity (mg/kg)
TPHs	75,600	53,000

A TACO Tier 1 soil and groundwater evaluation was completed as part of the human health risk assessment. Based on that evaluation, contaminant of concern (COC) concentrations at the Site exceeded Tier 1 SROs for the residential ingestion and outdoor inhalation exposure routes, construction worker ingestion and inhalation exposure routes, and soil component to groundwater ingestion exposure route. COC concentrations at the Site exceeded the Tier 1 GROs for the Class II groundwater ingestion exposure route and the residential indoor inhalation exposure route.

Proposed cleanup standards for the soil ingestion and inhalation pathway will be the TACO Tier 1 SROs for residential properties in 35 IAC 742. Appendix B, Table A, and Appendix B, Table D (pH-specific SROs) with the exception of the calculated Tier 2 SROs listed below for carcinogenic polycyclic aromatic hydrocarbons (cPAHs).

Constituent	Tier 2 SRO – Ingestion (mg/kg)
	Residential
Benzo(a)anthracene	11*
Benzo(a)pyrene	11*
Benzo(b)fluoranthene	13*
Benzo(k)fluoranthene	64.04
Chrysene	640.35
Dibenz(a,h)anthracene	1.0*
Indeno(1,23-cd)pyrene	6.40

*The calculated Tier 2 value is less than the background value for the City of Chicago. The background value is the selected RO.

The cleanup standards for the groundwater ingestion pathway will be the TACO Tier 1, Class II GROs as defined in 35 IAC 742, Appendix B, Table E and H.

The cleanup standards for the indoor inhalation pathway will be the TACO Tier 1 SGROs as defined in 35 IAC 742, Appendix B, Table G and H.

3.3 Laws & Regulations Applicable to the Cleanup

Laws and regulations that are applicable to this cleanup include the Federal Small Business Liability Relief and Brownfields Revitalization Act, the Federal Davis-Bacon Act, SRP and TACO regulations (35 IAC Parts 740 and 742), federal and state environmental law, and local regulations. Federal, state, and local laws regarding procurement of contractors to conduct the cleanup will be followed.

In addition, all appropriate permits (e.g., notify before you dig, soil transport/disposal manifests) will be obtained prior to the work commencing.

4.0 Alternatives Considered

4.1 Cleanup Alternatives Considered

The proposed Cleanup under the Brownfield Cleanup Grant will include implementation of a remedial technology to reduce cadmium, lead and TCE concentrations identified within each respective Zone of the Site to concentrations below the hazardous waste toxicity criteria. In addition, elevated concentrations of TPHs identified within Zone 1 and Zone 3 will also be excavated. All remediated impacted soils will be transported offsite to a Subtitle D facility. Additional actions to fulfill the SRP requirements and receive an NFR letter will include the installation of an engineered barrier to eliminate soil ingestion and soil inhalation exposure pathways of soil with concentrations of VOCs, SVOCs and inorganics that exceed the applicable TACO Tier 1 SROs.

As part of the NFR letter, institutional controls (ICs) will be implemented in the form of a deed restriction or environmental restrictive covenant to ensure the long-term effectiveness of the soil remedy by protecting the engineered barrier and ensuring health and safety of future construction workers. The ICs would require appropriate health and safety precautions (e.g. site-specific Health and Safety Plan (HASP) and a construction worker caution zone) prior to any future remediation / construction activities.

Remediation of groundwater is not anticipated. No direct groundwater remedy other than remediation of source soils to below hazardous waste toxicity criteria is anticipated. The exposure path of groundwater that exceeds TACO GROs will be addressed by the City of Chicago Municipal Code 11-8-390 which prohibits the installation of new potable water supply wells. Onsite indoor air vapor intrusion will be addressed by requiring a concrete slab-on grade deed restriction for all new building developments.

The following three alternatives warranted further consideration and have been evaluated in subsequent sections, which also include an evaluation of the climate change resilience of these three alternatives:

Alternative #1 – No Action

Alternative #2 – Excavation and Disposal of Soils Exceeding the Hazardous Waste Toxicity Criteria to a Subtitle C (Hazardous Waste) Landfill

Alternative #3 – In-Situ Treatment, Excavation and Disposal of Remediated Hazardous Soils to a Subtitle D (Non-Hazardous Waste) Landfill

4.2 Cleanup Alternative Evaluation

Cleanup technologies proposed to address the soil contamination to be remediated under the Brownfield Cleanup Grant were evaluated based on established criteria including the following: effectiveness (protection of human health and the environment, proven long- and short-term effectiveness of the remedy, regulatory compliance, reduction in toxicity/mobility/volume), implementability (probability of success, feasibility and schedule), ability to accommodate the expected effects of climate change (climate change resilience), and cost. Costs for the additional actions to fulfill the SRP requirements and receive an NFR letter were not included in this evaluation.

4.2.1 Effectiveness

Alternative #1: The Alternative #1 No Action is not considered effective. No Action would leave the Site in its current state and would not address the soil exceeding the hazardous waste toxicity criteria. This alternative would leave soil with cadmium, lead and TCE concentrations that exceed its respective hazardous waste toxicity criteria (considered “source material”) in place. The Site would not meet IEPA TACO regulations and would not be eligible to receive an NFR letter.

Alternative #2: The effectiveness of Alternative #2 Excavation and Disposal of Soils Exceeding the Hazardous Waste Toxicity Criteria to a Subtitle C Landfill is high. Soil Excavation would remove soil containing cadmium, lead and TCE concentrations that exceed hazardous waste toxicity criteria and transport material offsite for disposal at a Subtitle C Landfill. Soil samples collected from the base and walls of the excavation area would confirm soil exceeding the hazardous waste toxicity criteria was fully removed.

Following completion of remedial excavation, additional actions would be implemented to fulfill the SRP requirements including the installation of an engineered barrier (either a 3-foot geological barrier or 18-inch equivalent geotextile and soil barrier) across the full site. This is an effective way to eliminate the soil ingestion exposure route, with an enhanced (10' clean soil or clean fill plus vapor barrier) soil inhalation barrier where needed. The engineered barrier would effectively protect human health and the environment by preventing contact with contaminated soil as long as the barrier is maintained. An institutional control would need to be instituted to protect the engineered barrier and to ensure health and safety of future construction workers. An Operation and Maintenance Plan (O&M Plan) and regular maintenance would be recommended to monitor and protect the engineered barrier.

Alternative #3: The effectiveness of Alternative #3 – In-Situ Treatment, Excavation and Disposal of Remediated Soils to a Subtitle D Landfill is high. In-situ mixing of impacted soil with a reagent has been proven to be effective at reducing concentrations of cadmium, lead and TCE levels below the hazardous waste toxicity criteria when reactants can reach contaminants. Soil mixing is the preferable reactant delivery method in low-permeability soils like those found at the Site. Soil samples will be collected from a variety of depths and locations within the treated mass to confirm the remaining levels of cadmium, lead and TCE in soil are below the hazardous waste toxicity criteria, and this delivery method allows some opportunity to add reagent and re-treat an area that fails confirmation sampling without requiring a later remobilization.

SRP requirements include the installation of an engineered barrier (either a 3-foot geological barrier or 18-inch equivalent geotextile and soil barrier) across the full site. This is an effective way to eliminate the soil ingestion exposure route, with an enhanced (10' clean soil or clean fill plus vapor barrier) soil inhalation barrier where needed. The engineered barrier would effectively protect human health and the environment by preventing contact with contaminated soil as long as the barrier is maintained. An institutional control would need to be instituted to protect the engineered barrier and to ensure health and safety of future construction workers. An Operation and Maintenance Plan (O&M Plan) and regular maintenance would be recommended to monitor and protect the engineered barrier.

4.2.2 Implementability

Alternative #1: Implementing Alternative #1 No Action is simple/effortless. No action is required to be completed.

Alternative #2: The ease of implementing Alternative #2 Excavation and Disposal of Soils Exceeding the Hazardous Waste Toxicity Criteria to a Subtitle C (Hazardous Waste) Landfill is moderate. The

zone of soil exceeding hazardous waste toxicity criteria ranges from surface soil to 10 feet below grade. Implementation would include removal and onsite stockpiling of the top 10 feet of soil, design and installation of an excavation support system, excavation and offsite disposal of Soil exceeding the hazardous waste toxicity criteria to a Subtitle C landfill, and backfilling the excavation using unimpacted spoils from onsite and/or imported clean fill.

Potential for volatilization of TCE during soil excavation is anticipated to be higher than the Alternative #3 soil mixing approach, and thus, presents short-term risks for air quality impacts for implementation of Alternative #2. Risk mitigation options are available to control off-site air quality and odors during remediation include odor/vapor suppression foam, plastic sheeting cover (at the end of daily activities), or other odor/vapor suppression technologies, if warranted.

Earth retention systems and sloping requirements for soil excavation are expected to be the same for Alternative #2 and Alternative #3. The soil excavation depth is up to 10 feet for Alternative #2 and presents increased worker safety precautions and need for equipment operation cautions and construction of intermediate benches within the excavation that may increase the required size of the excavation.

Installation of the engineered barriers would include the removal of surface soil across the site, offsite disposal or reuse of this material as backfill in the excavation area, importing of clean soil and (if needed) geotextile/vapor barrier, and placement of imported material across the site. Regular maintenance in accordance with the O&M Plan would be recommended.

Community air monitoring and dust/odor suppression may be needed during cleanup activities. Short-term disturbance to the community (e.g., trucks transporting contaminated soils and backfill) are anticipated.

Alternative #3: The ease of implementing Alternative #3 – In-Situ Treatment, Excavation and Disposal of Remediated Hazardous Soils to a Subtitle D (Non-Hazardous Waste) Landfill is moderate. The zone of soil exceeding hazardous waste toxicity criteria ranges from surface soil to 10 feet below grade. Implementation would include removal and onsite stockpiling of the top 10 feet of soil, design and installation of an excavation support system, treatment of soil exceeding the hazardous waste toxicity criteria using in-situ mixing of impacted soil with a reagent for stabilization. Limited, additional treatment can be applied during the initial mobilization to address areas that fail confirmation sampling.

Soil mixing operations may result in some volatilization of TCE during soil treatment activities. The short-term risk of air quality impacts is anticipated to be less than Alternative #2 due to the chemical destruction of TCE during soil mixing activities. Risk mitigation options are available to control air quality and odors during remediation include odor/vapor suppression foam, plastic sheeting cover (at the end of daily activities), or other odor/vapor suppression technologies, if warranted.

Installation of the engineered barriers would include the removal and disposal of surface soil across the site, importing of clean soil and (if needed) geotextile/vapor barrier, and placement of imported material across the site. Regular maintenance in accordance with the O&M Plan would be recommended.

Community air monitoring and dust/odor suppression may be needed during cleanup activities.

4.2.3 Climate Change Resilience

Based on the observed and predicted climate changes for the Site area described above, the increase in overall precipitation and increase in frequency of extreme precipitation events appears to be the most important factor to evaluate the remediation alternatives against, due to the vulnerability of Chicago to urban flooding.

Alternative #1: Under Alternative 1 (No Action), significant portions of the site would remain paved with the current impervious surfaces, and no improvements to site stormwater management would be made. Presumably, stormwater from rainfall events would continue to rapidly run off the Site to the storm sewer system.

Alternative #2: Following remedial excavation, it is expected that the Site would be primarily covered with permeable surface materials and would include landscaped plant cover over most of the Site. In addition, the redevelopment plan will take into account stormwater concerns and can be designed to capture and retain stormwater in a manner that releases less rainwater to the storm sewer system and does so more slowly, as compared to an impervious surface. Best management practices will be used to manage stormwater and prevent erosion of soil from the Site during remedial excavation construction work.

Alternative #3: The climate change resilience for Alternative #3 would be essentially the same as Alternative #2, described above. The end use and proposed designs for redevelopment would be the same as described above, and the physical remediation process would also be similar as Alternative #2.

4.2.4 Cost

Alternative #1: The costs to implement No Action would be minimal.

Alternative #2: The estimated rough order of magnitude costs to implement excavation of soil exceeding the hazardous waste toxicity criteria to a Subtitle C (hazardous waste) landfill would be approximately \$18,000,000 for Zone 1 through Zone 4.

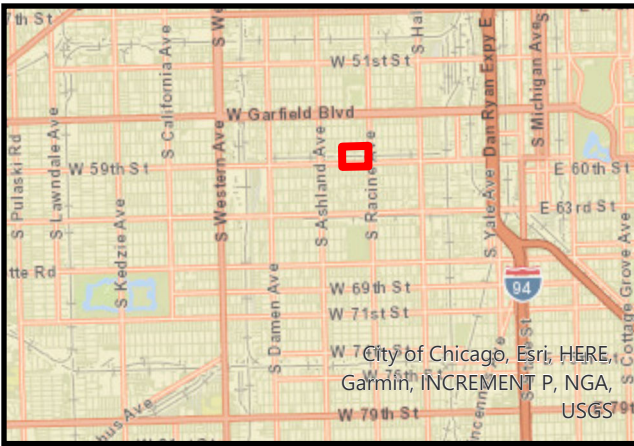
Alternative #3: The estimated rough order of magnitude costs to implement in-Situ treatment, excavation and disposal of remediated hazardous soils to a Subtitle D (non-hazardous waste) landfill would be approximately \$11,300,000 for Zone 1 through Zone 4.

5.0 Selected Alternative and Proposed Cleanup Plan

The recommended cleanup alternative is Alternative #3 – In-Situ Treatment, Excavation and Disposal of Remediated Hazardous Soils to a Subtitle D (Non-Hazardous Waste) Landfill. Alternative #1: No Action cannot be recommended since it does not address site risks to human health and the environment. Both Alternative #2 and Alternative #3 are effective remedial options that use confirmation sampling to verify the reduction of cadmium, lead and TCE in soil to below the hazardous waste toxicity criteria. Both Alternatives #2 and #3 would improve the climate change resilience of the Site due to a reduction in impervious surfaces and an opportunity for new landscaping design to maximize the capture and retention of stormwater. Both Alternative #2 and Alternative #3 have similar long-term maintenance requirements. The estimated remediation cost of Alternative #3 (approximately \$18,000,000) is approximately 37% less than the estimated cost of Alternative #2 (approximately \$11,300,000).

DRAFT

Figures



**Figure 2-1
Englewood Nature Trail Remediation Zones**



Julie Hernandez-Tomlin
Commissioner

City of Chicago
Brandon Johnson, Mayor

Created By: Peter Nielsen
Date: 11/1/2024

Coordinate System:
NAD 1983 StatePlane Illinois East FIPS 1201 Feet



Figure 2-2 Englewood Trail Remediation Areas

Julie Hernandez-Tomlin
Commissioner

City of Chicago
Brandon Johnson, Mayor

Notes: Remediation Areas Are Approximate
Created By: Peter Nielsen Date: 11/1/2024

Coordinate System:
NAD 1983 StatePlane Illinois East FIPS 1201 Feet



Remediation Zones
Hazardous Lead Area
Hazardous Cadmium Area
Hazardous TCE Area