



January 18, 2018

Mr. Todd Davis
Site Assessment Manager
U.S. Environmental Protection Agency, Region 7
11201 Renner Blvd.
Lenexa, Kansas 66219

**Subject: Analysis of Brownfields Cleanup Alternatives Report
Near Southside Employment Coalition, St. Louis, Missouri
EPA Region 7, START 4, Contract No. EP-S7-13-06, Task Order No. 0002.041
Task Monitor: Todd Davis, EPA Site Assessment Manager**

Dear Mr. Davis:

Tetra Tech, Inc. (Tetra Tech) is submitting the attached Analysis of Brownfields Cleanup Alternatives report regarding the Near Southside Employment Coalition property in St. Louis, Missouri. If you have any questions or comments pertaining to this submittal, please call the Project Manager at (816) 412-1761.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Nick Patch'.

Nick Patch
START Project Manager

A handwritten signature in blue ink, appearing to read 'Ted Faile'.

Ted Faile, PG, CHMM
START Program Manager

Enclosures

cc: Debra Dorsey, START Project Officer (cover letter only)

ANALYSIS OF BROWNFIELDS CLEANUP ALTERNATIVES REPORT
NEAR SOUTHSIDE EMPLOYMENT COALITION
ST. LOUIS, MISSOURI

Superfund Technical Assessment and Response Team (START) 4 Contract
Contract No. EP-S7-13-06, Task Order No. 0002.041

Prepared For:

U.S. Environmental Protection Agency
Region 7
11201 Renner Blvd.
Lenexa, Kansas 66219

January 18, 2018

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1.0 INTRODUCTION

Tetra Tech, Inc. (Tetra Tech) was tasked by the U.S. Environmental Protection Agency (EPA) under the Superfund Technical Assessment and Response Team (START) contract (EP-S7-13-06) to conduct a Phase II Targeted Brownfields Assessment (TBA) and Analysis of Brownfields Cleanup Alternatives (ABCA) of the Near Southside Employment Coalition property (subject property), an approximately 0.21-acre lot at 2649 Pestalozzi Street, St. Louis, Missouri. The TBA was completed on November 15, 2017 and the following document is the associated ABCA. The Site is the current location of the Near Southside Employment Coalition (NSEC), founded in 1983. The nonprofit organization provides job readiness, computer training, general equivalency diploma (GED) classes, career planning, and job referrals to local community members from low-income housing developments. NSEC has owned the subject property since 1999.

The subject property has a long history of commercial use, including auto service, filling station, and machine shop activities from at least as early as 1936. Prior to NSEC, another employment assistance company, Human Energies, occupied the property.

A Phase I TBA of the subject property occurred in August 2016. The investigation identified recognized environmental conditions (REC) associated with a former gas station, machine shop, and auto repair shop at the subject property and adjacent properties (Terracon 2016). Tetra Tech completed a Phase II Environmental Site Assessment (ESA) in February 2017 (Tetra Tech 2017a) and detected contaminants in surface soil, subsurface soil, and groundwater typically associated with gas stations. Contaminants at highest concentrations were detected within the western portion of the property, near the area of a former gas station and pump island.

In August and September 2017, Tetra Tech START conducted a Phase II TBA to further investigate contamination identified in the Phase II ESA. Soil samples were collected near and downgradient of the former pump island at depths between 15 and 32 feet below ground surface (ft bgs). One soil sample contained total petroleum hydrocarbons-gasoline range organics (TPH-GRO) above the subsurface soil Tier 1 Risk-Based Target Levels (RBTL) for residential indoor inhalation of vapors from subsurface soils. Concentrations of 1,2,4-trimethylbenzene, benzene, and naphthalene in an indoor air sample collected from the on-site building exceeded residential Tier 1 RBTLs, and the concentration of naphthalene also exceeded the non-residential RBTL; however, these contaminants probably originated from an indoor source since cleaners and gasoline were stored in a nearby area. Trace levels of petroleum-related

compounds were also detected in soil gas samples collected near the site building, probably originating from the known source upgradient the subject property.

2.0 SITE BACKGROUND AND DESCRIPTION

The subject property is approximately 1 mile southwest of the intersection of Interstate 44 and Interstate 55, and is centered at 38.601757 degrees (°) north latitude and 90.225755° west longitude (Appendix A, Figure 1). The property lies within a mixed residential and commercial area. According to St. Louis's property database, the entire area—known as the Benton Park West neighborhood—is zoned for multiple family residential use (Zone C). A one-story building on the site encompasses approximately 50 by 75 feet. Residential properties are north, northeast, south, and west of the site.

The subject property is depicted on the U.S. Geological Survey (USGS) 7.5-minute series Cahokia, Illinois-Missouri (IL-MO), topographic quadrangle map. The site is approximately 520 feet above mean sea level (amsl), and the topographic gradient of the area is generally east (USGS 2015).

The 0.21-acre site is the current location of the NSEC, founded in 1983. The nonprofit organization provides job readiness, computer training, GED classes, career planning, and job referrals to local community members from low-income housing developments. NSEC has owned the subject property since 1999.

The site has a long history of commercial use. Historically, the site building was utilized for auto service activities (Terracon 2016). The site was identified in historical city directories as a filling station from at least as early as 1936 to 1946. It was also identified as a filling station, with one gasoline tank, on a 1950 Sanborn map. The station appeared to operate at the site until at least 1958 based on historical aerial photographs. A machine shop also reportedly operated at the site from at least as early as 1936 to 1978. This is consistent with 1950 and 1990 Sanborn maps, which identify the current on-site building as a machine shop (Terracon 2016). Prior to NSEC, another employment assistance company, Human Energies, occupied the site.

The subject property is bounded north by residential housing; east by an alley, with residential and commercial properties beyond; south by Pestalozzi Street, with residential properties beyond; and west by Ohio Avenue, with residential properties beyond. According to a review of historical documents, the area surrounding the subject property has been used for residential and commercial purposes. Several medium-sized trees grow on the west side of the property, and an approximately 3,500-square foot single-story building is on the east side.

3.0 FUTURE USE

Future use of the subject property is anticipated to continue as a non-profit employment services organization for the local community. Groundwater in the site vicinity is currently not used for drinking water, and no future groundwater use for this purpose is anticipated, because drinking water is a municipal utility. No remedial activities have occurred at the subject property to date.

4.0 PREVIOUS INVESTIGATIONS

A Phase I TBA of the site occurred in August 2016 (Terracon 2016). The investigation identified the following RECs associated with the subject property and adjacent properties (Terracon 2016):

- Potential impact from a historical gas station on the subject property
- Potential impact from a historical machine shop on the subject property
- Potential impact from a historical auto repair shop adjacent to (east of) the site.

Tetra Tech completed a Phase II ESA in February 2017 (Tetra Tech 2017a) for the Missouri Department of Natural Resources (MDNR) to assess presence or absence of contamination on the property in order to confirm or eliminate RECs identified during the Phase I TBA. Phase II ESA activities included collection of four surface soil and four subsurface soil samples at four boring locations. Groundwater samples were collected at two of the borings. The borings were advanced near potentially impacted areas based on findings from the Phase I TBA.

Numerous contaminants typically associated with gas stations were detected during the February 2017 Phase II ESA in surface soil, subsurface soil, and groundwater. Contaminants at highest concentrations were detected within the western portion of the property, near the area of the former gas station and pump island.

START conducted a Phase II TBA in August 2017 (Tetra Tech 2017b) that included indoor air, soil, and soil gas sampling at the subject property (Appendix A, Figure 2). Laboratory analysis of soil samples indicated that concentration of TPH-GRO exceeded the subsurface soil Tier 1 RBTL for residential indoor inhalation of vapors from subsurface soils in one sample. A representative concentration of TPH-GRO beneath a hypothetical future building was calculated per MRBCA guidelines using analytical results from the Phase II ESA and the Phase II TBA. Calculated representative calculation of TPH-GRO did not exceed the residential Tier 1 RBTL. Trace concentrations of petroleum-related compounds detected in the soil gas samples likely had resulted from a petroleum release associated with the former gas station. Concentrations of 1,2,4-trimethylbenzene, benzene, and naphthalene in the indoor air sample

exceeded residential Tier 1 RBTLs, and the concentration of naphthalene also exceeded the non-residential RBTL. Gasoline and cleaners were stored on the property during the sampling period, and materials were the likely source of detected 1,2,4-trimethylbenzene, benzene, and naphthalene.

5.0 POTENTIAL CLEANUP ALTERNATIVES

The overall goal of any Brownfields cleanup action is to address any environmental conditions preventing or impeding the preferred type of site redevelopment, and to do so in a manner protective of human health and the environment.

Brownfields cleanup alternatives were evaluated to address specific environmental impacts identified during the Phase I TBA (Terracon 2016), Phase II ESA (Tetra Tech 2017a), and Phase II TBA (Tetra Tech 2017b). The purpose of the ABCA is to present viable cleanup alternatives based on site-specific conditions, technical feasibility, and preliminary cost evaluations.

The following sections describe Brownfields cleanup alternatives for addressing the petroleum product release, including a “No Action” alternative. Cleanup alternatives for asbestos containing materials (ACM) and lead-based paint (LBP) are not discussed, because a full remodel of the interior occurred in the mid-1980s. Following the description, each alternative is evaluated in terms of its effectiveness, implementability, and cost.

The effectiveness of an alternative refers to its ability to meet the objectives of the Brownfields cleanup. Specific criteria used to assess the effectiveness of an alternative include the following:

- Overall protection of public health and the environment
- Compliance with applicable or relevant and appropriate requirements (ARAR) and other criteria, advisories, and guidance
- Long-term effectiveness
- Reduction of toxicity, mobility, or volume through treatment/removal
- Short-term effectiveness.

Implementability criteria address the technical and administrative feasibility of implementing an alternative, and the availability of various services and materials required during its implementation. Specific criteria used to assess implementability of an alternative are:

- Technical feasibility
- Administrative feasibility
- Availability of services and materials
- State acceptance
- Community acceptance.

Each alternative is evaluated to determine its estimated cost. The evaluations compare each alternative's direct capital costs, which include equipment, services, and contingency allowances. The purpose of evaluating each alternative is to determine its advantages and disadvantages relative to the other alternatives in order to identify key tradeoffs that would affect selection of the preferred alternative.

5.1 EVALUATED CONTAMINATION

Contaminants evaluated as part of this ABCA are associated with a petroleum product release at the subject property. An ACM and LBP survey was not conducted at the site because those materials were not present at the site. This section discusses contaminants identified during previous investigations at the site, and compares them to Missouri Risk-Based Corrective Action (MRBCA) Risk-Based Target Levels (RBTL) found in the MRBCA Technical Guidance (Missouri Department of Natural Resources [MDNR] 2006a).

During the Phase I TBA, Terracon identified a historical on-site gas station and machine shop, and an adjacent auto repair shop (Terracon 2016).

During the Phase II ESA conducted by Tetra Tech for MDNR in February 2017, benzo(a)pyrene, arsenic, and lead were detected in surface soil samples at concentrations exceeding MRBCA RBTLs for residential contact, ingestion, or inhalation (Tetra Tech 2017a). Benzo(a)pyrene and lead have been historically associated with petroleum-based fuels. The concentration of arsenic did not exceed the range of background concentrations typically found in Missouri (Tidball 1984). In subsurface soil, TPH-GRO was detected at concentrations exceeding MRBCA RBTLs for residential indoor inhalation of vapors. In groundwater samples, benzene concentrations exceeded the RBTL for residential indoor inhalation of vapors from for groundwater, while TPH-diesel range organics (DRO) concentrations exceeded RBTLs

for non-residential land use. Contaminants are not compared to RBTLs for residential domestic water use, because a memorandum of agreement between the City of St. Louis and MDNR, and City Ordinance 66777, prohibit installation of drinking water wells and use or attempted use of private wells for drinking water purposes within the corporate limits of the City of St. Louis (MDNR 2006b).

During the Phase II TBA conducted by Tetra Tech in August and September 2017, one subsurface soil sample contained 390 milligrams per kilogram (mg/kg) of TPH-GRO, above the Tier 1 RBTL for TPH-GRO of 385 mg/kg for residential land use (Tetra Tech 2017b). However, the representative concentration of TPH-GRO, calculated per the *MRBCA Process for Petroleum Storage Tanks Technical Guidance* (MDNR 2013), was below the residential land use RBTL. During the Phase II TBA, six direct-push technology (DPT) borings were driven to between 20 and 32 ft bgs; however, no groundwater was encountered at any location. Additionally, two of the four DPT borings from the February 2017 ESA were dry. Because of this, it is likely that the groundwater samples collected during the February Phase II ESA were not collected below the regional water table, but rather from perched, relatively isolated sources.

5.2 EVALUATION OF CLEANUP ALTERNATIVES

Evaluations of cleanup alternatives are based on the anticipated future use scenario for the site as a nonprofit education and employment organization. Evaluated cleanup alternatives address cleanup of petroleum-related contamination only; ACM and LBP are not likely present because a full remodel of the building occurred in the mid-1980s. Evaluations have been developed with specific consideration of MDNR’s Brownfields/Voluntary Cleanup Program (B/VCP) procedural requirements and MRBCA technical guidance—because cleanup projects implemented with EPA Brownfields Cleanup funding require participation in the MDNR B/VCP. For reference, fees associated with enrollment in the MDNR B/VCP include a \$200 application fee and refundable oversight deposit of \$4,000. A comparison of total costs of each alternative is summarized in Table 1 below.

TABLE 1
COMPARISON OF ALTERNATIVE COSTS

No.	Alternative	Cost
1	No Action	\$0
2	Closure with Institutional Controls	\$31,700
3	Closure by Removal	\$82,000

5.2.1 Alternative 1: No Action

Alternative 1 would leave in place petroleum-related contaminants.

Effectiveness

This alternative would be effective for the near term in protecting human health and environment in its current use, because representative concentration of soil and groundwater contamination does not exceed respective non-residential MRBCA RBTLs. The No Action alternative would not be effective in the long term if the property is utilized for future residential use and the contamination has not attenuated to below residential MRBCA RBTLs. This alternative would not allow future development at the site.

Implementation

Implementation of this alternative is straightforward—contaminated material would be left in place.

Cost

This alternative would not involve any direct costs, as reported in Table 1.

5.2.2 Alternative 2: Closure with Institutional Controls

Alternative 2 would leave in place the known contamination and enroll the site in the B/VCP and the Long Term Stewardship program (LTS), because contamination at the site would remain above MBRBCA RBTLs for residential use.

Effectiveness

This alternative would be effective for the near term as the site is currently planned for non-residential utilization, and representative concentrations of contaminants do not exceed respective non-residential MRBCA RBTLs. This alternative would also be effective in the long-term, because deed restrictions would only allow non-residential use of the site, and enrollment in the LTS program would require monitoring for future migration of contamination. This alternative would allow future development of the site for non-residential purposes only.

Implementation

The site would be enrolled in the B/VCP, a risk assessment conducted, and a request made for a No Further Action (NFA) letter from MDNR. Because representative concentrations of contaminants at the

site are below non-residential MRBCA RBTLs, but above residential MRBCA RBTLs, a restrictive NFA and enrollment into the LTS program would be necessary.

Cost

Costs for this alternative would include enrollment into the B/VCP (\$4,000 with a \$200 enrollment fee), completion of a risk assessment (\$12,500), and enrollment in the LTS program (\$15,000). The total cost of this alternative would be \$31,700, as reported in Table 1.

5.2.3 Alternative 3: Closure by Removal

Alternative 3 includes application of conventional excavation and removal techniques regarding contaminated soil. Confirmatory soil sampling would occur to ensure removal of all subsurface contamination above residential MRBCA RBTLs.

Alternative 3 would remove contaminated soil using residential MRBCA RBTLs as cleanup goals. With ample cleanup, a non-restrictive NFA could be obtained, preventing need for enrollment in the LTS program. A risk assessment may be required, and has been included in the cost estimate for this alternative.

Effectiveness

Alternative 3 would be effective in removing the risk to human health posed by the contaminated soil, and would allow for unrestricted redevelopment of the site. This alternative would allow future development of the site for residential and non-residential purposes.

Implementation

Removal and disposal of contaminated soil would be arranged by a qualified environmental remediation company. Based on results of the Phase II ESA and the Phase II TBA, an area of approximately 200 square feet may contain contaminated soil to depths of up to 20 feet. Excavation of approximately 35,000 cubic feet (1,300 cubic yards) of soil may be necessary (Appendix A, Figure 3). Conventional soil sampling procedures would be followed during confirmatory sampling per MRBCA guidance (MDNR 2013). Following excavation, the site would be restored to pre-existing conditions.

Cost

A local vendor (Environmental Works) provided an estimated cost of \$60,000 for cleanup at the site. This estimate includes excavation, clearing of several trees, transportation, disposal, and backfilling of approximately 1,300 cubic yards of impacted soil. The estimate does not include pumping, transportation, and disposal of any contaminated groundwater at the site—cost which has been estimated and included in the final cost of this alternative. A risk assessment is also included in the cost of this alternative. The total cost of this alternative would be \$82,000, as reported in Table 1.

5.3 RECOMMENDED CLEANUP ALTERNATIVE

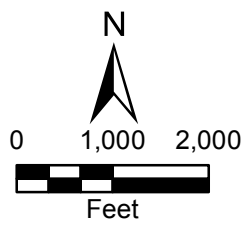
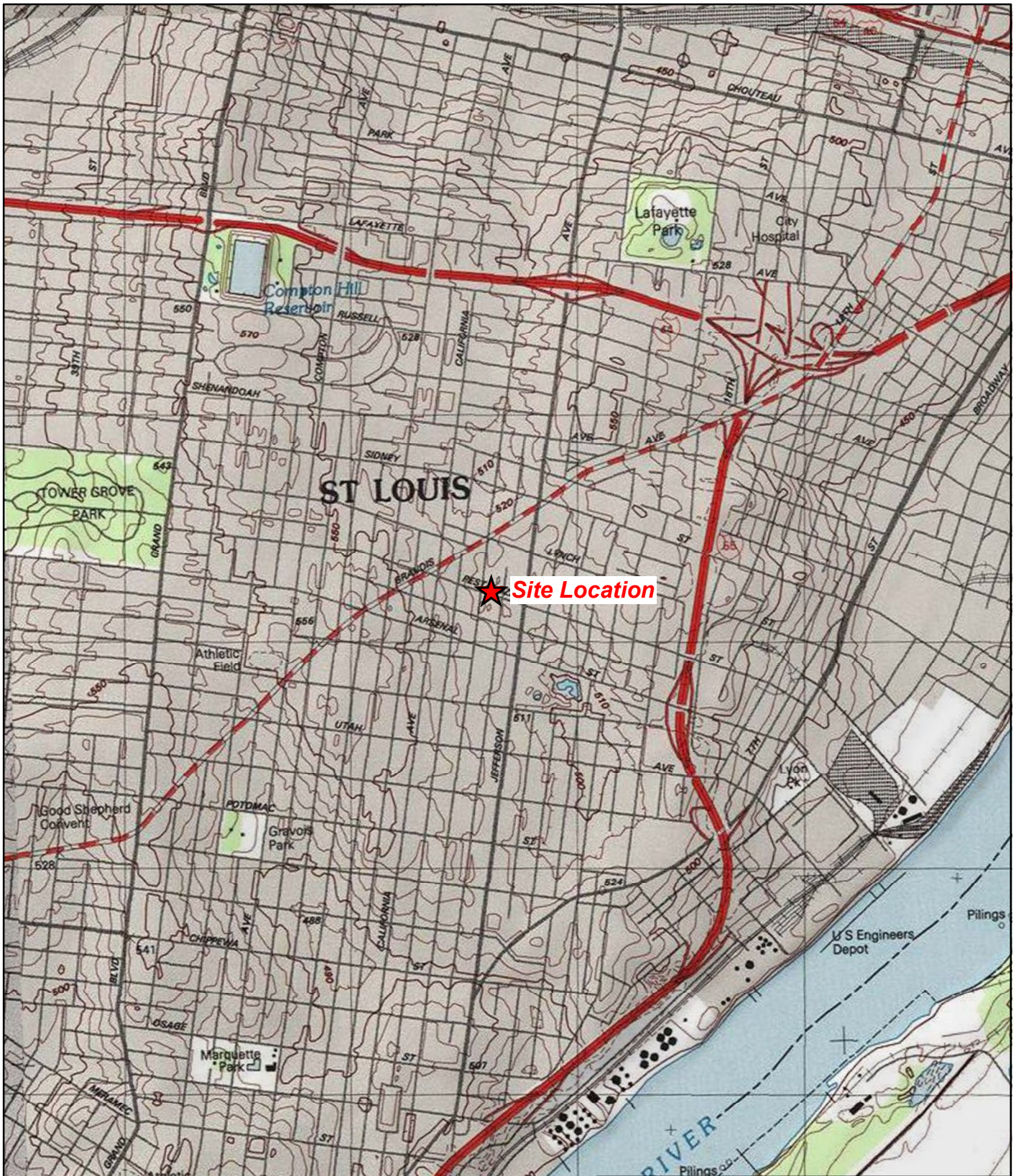
Alternatives 2 and 3 would be protective of human health and the environment. However, Alternative 2 would cost much less while still allowing for further development for non-residential use—the planned utilization at the site. Enrollment in the LTS program under Alternative 2 would ensure that status of contamination at the site is monitored. If residential utilization of the property is desired in the future, a removal option such as Alternative 3 can be carried out at that time. Alternative 2 is the recommended cleanup alternative for the Near Southside Employment Coalition site at 2649 Pestalozzi Street in St. Louis, Missouri.

6.0 REFERENCES

- Missouri Department of Natural Resources (MDNR). 2006a. Missouri Risk-Based Corrective Action Technical Guidance, Appendix B, Default Target Levels and Tier 1 Risk-Based Target Levels. June.
- MDNR. 2006b. Memorandum of Understanding between Missouri Department of Natural Resources and the City of St. Louis regarding Use of Local Groundwater Ordinance as Environmental Institutional Control When Using Missouri's Risk-Based Corrective Action Process on Contaminated Sites. October.
- MDNR. 2013. Missouri Risk-Based Corrective Action Process for Petroleum Storage Tanks. October 17.
- Terracon Consultants, Inc. (Terracon). 2016. Phase I Targeted Brownfields Assessment. Near Southside Employment Coalition, 2649 Pestalozzi, St. Louis, Missouri. August 29.
- Tetra Tech, Inc. (Tetra Tech). 2017a. Final Phase II Environmental Site Assessment, 2649 Pestalozzi Street, St. Louis, Missouri. February.
- Tetra Tech. 2017b. Phase II Targeted Brownfields Assessment, Near Southside Employment Coalition, St. Louis, Missouri. November.
- Tidball, R.R. 1984. Geochemical Survey of Missouri: Geography of Soil Geochemistry and Classification by Factor Analysis of Missouri Agricultural Soils. Geological Survey Professional Paper 954-H, I.
- U.S. Geological Survey. 2015. Cahokia, Illinois – Missouri (IL-MO). USGS 7.5-Minute Topographic Series Map.

APPENDIX A

FIGURES



Near Southside Employment Coalition
St. Louis Missouri

Figure 1
Site Location Map





B-06-28 (27-28)	
Analyte	Result (mg/kg)
Lead	45

B-09-22 (21-22)	
Analyte	Result (mg/kg)
Lead	9.9

B-10-22 (21-22)	
Analyte	Result (mg/kg)
Lead	12

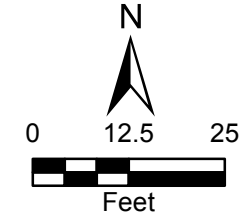
IA-01 (BH)	
Analyte	Result (mg/m ³)
1,2,4-Trimethybenzene	0.0098
Benzene	0.0052
Naphthalene	0.037

B-05-16 (15-16)	
Analyte	Result (mg/kg)
TPH-GRO	390
Lead	13
Naphthalene	0.74

B-08-18 (17-18)	
Analyte	Result (mg/kg)
Lead	10

Legend

- ▲ Ambient air sample location
- ▲ Indoor air sample location
- Soil boring sample location
- Soil gas sample location
- (Red border) Approximate site boundary
- (Blue) Exceedance of DTL in soil samples
- (Yellow) Exceedance of residential RBTL
- (Red) Exceedance of non-residential RBTL
- B-05-16 (15-16) Sample ID (Depth, ft bgs)
- BH Breathing height
- DTL Default target level
- GRO Gasoline range organics
- RBTL Risk-based target level
- TPH Total petroleum hydrocarbons
- ft bgs Feet below ground surface
- mg/kg Milligrams per kilogram
- mg/m³ Milligrams per cubic meter





Near Southside Employment Coalition
St. Louis, Missouri

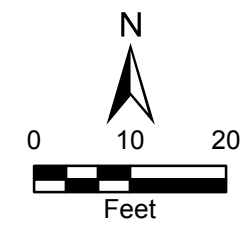
Figure 2
Analyte Concentrations in Exceedance
of DTLs and RBTLs



Source: ESRI, ArcGIS Online, World Imagery, 2017



- Legend**
-  Approximate site boundary
 -  Proposed excavation area



Near Southside Employment Coalition
St. Louis, Missouri

Figure 3
Proposed Excavation Area



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