Analysis of Brownfield Cleanup Alternatives

Former Benjamin Banneker School
701 S. Upland Avenue
River Ridge, Jefferson Parish, Louisiana
EPA Cooperative Agreement 4B-02F88401-0

Prepared for:

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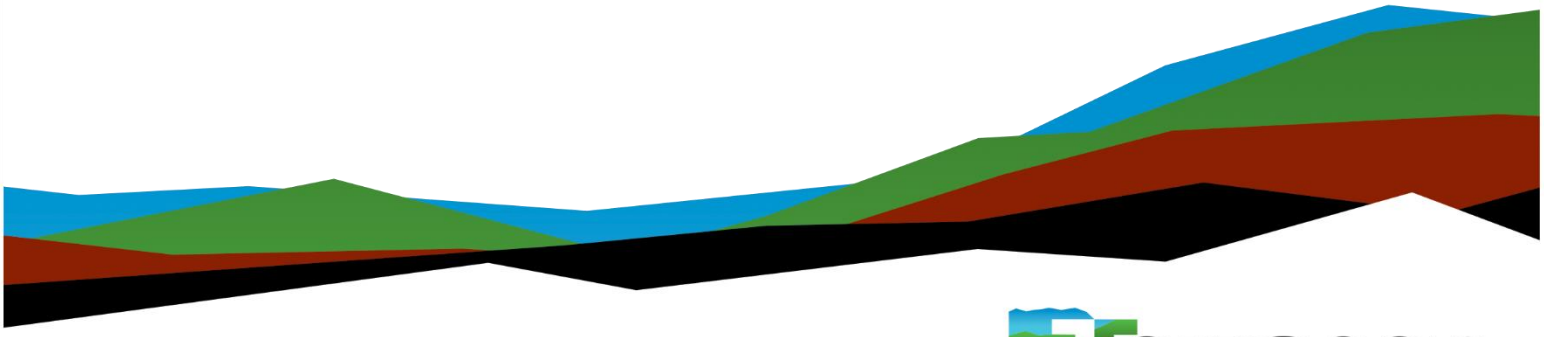

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1.0 INTRODUCTION AND BACKGROUND

This Analysis of Brownfield Cleanup Alternatives (ABCA) evaluates cleanup alternatives and establishes the costs for cleanup activities necessary to address hazardous substances at the Former Benajamin Banneker School site located at 701 S Upland Avenue in River Ridge, Louisiana. The site is currently vacant, and Gulf Coast Housing Partnership, Inc intends to redevelop the site with thirty single-family affordable rental homes.

This ABCA is intended to briefly summarize information about the site and contamination issues, cleanup standards, applicable laws, cleanup alternatives considered, and the proposed cleanup. The ABCA should also include information on the effectiveness, the ability of the grantee to implement each alternative, the cost of each proposed cleanup alternative, an evaluation of how commonly accepted extreme weather conditions might impact proposed cleanup alternatives, and an analysis of the reasonableness of the various cleanup alternatives considered, including the one chosen. The ABCA is intended as a brief document summarizing the larger and more detailed technical and financial evaluations performed in addressing each of these areas. The ABCA may be modified technically and financially or in more depth relative to each of these areas upon award of funding and in response to community interaction.

Cleanup alternatives were evaluated in accordance with EPA Region 6 protocols and general guidance required prior to implementation of a cleanup design using EPA Brownfields Grant funding. More specifically, this ABCA summarizes viable cleanup alternatives based on site-specific conditions, technical feasibility, resiliency to extreme weather conditions, and preliminary cost/benefit analyses. EPA guidance requires a minimum of two different alternatives plus a "No Action" option be considered in this document. Specific cleanup alternatives and associated recommendations are presented in the applicable sections of this report.

1.1 Background

The site encompasses approximately 4 acres of land and is bound by Creston Street and a vacant lot to the north, Richard Avenue to the east, Jesse Owens Playground to the south and residential, Upland Avenue and Starrett Road to the west. The site is located in a predominantly residential area.

According to historical documentation, the site was vacant prior to the late 1960s when the Benjamin Banneker Elementary School was constructed. The site operated as an elementary school until the late 1980s. From approximately 1989 to 2008 the site was used as the Jeferson Parish Sheriff's Office Training Academy, Fourth District Property & Evidence location and Traffic facility. The site has been vacant since 2008. The onsite structures were demolished in August of 2022, with concrete slabs remaining. The site currently consists of vacant land with concrete slabs.

1.2 Site Assessment Findings

According to Jefferson Parish Assessor records, prior to 2020, the site was owned by the Jefferson Parish School Board which had taken ownership of the site from Jefferson Parish in 2008. Banneker, LLC acquired the site in July of 2020. Prior to its acquisition and to maintain bona fide prospective purchaser status, the Banneker, LLC contracted with GIBCO Environmental, LLC (GIBCO) to complete a Phase I Environmental Site Assessment (ESA) of the site. GIBCO's Phase I ESA report dated June 16, 2020, did not identify any recognized environmental conditions.

As part of construction/redevelopment of the property in late 2022, geotechnical testing revealed that there appeared to be a substantial quantity of uncontrolled fill material from an unknown source present below the ground surface. As such, there were concerns that the property may have been used as landfill historically and therefore biodegrading material in the ground could impact the air quality of future residential enclosed structures. Leaaf Environmental, LLC (Leaaf) was contracted to investigate these concerns in March 2023 by performing a Limited Phase II ESA report dated March 2023. The Phase II ESA consisted of soil vapor sampling. The soil vapor sampling results identified concentrations of chloroform, naphthalene, and methane were detected above the US EPA Vapor Intrusion Screening Levels (VISLs). It was recommended that additional sampling be completed to further investigate potential impacts to human health and environment.

The Louisiana Department of Environmental Quality (LDEQ) was notified of the exceedances and a copy of the Phase II ESA report was submitted for their review. Based on the findings, LDEQ requested additional investigation. An additional site investigation was performed in October of 2023 that included the advancement of 16 soil borings with 8 borings converted to temporary wells. Soil and groundwater samples were collected and submitted for chemical analysis. During the advancement of soil borings, vegetative wood debris were observed at depths ranging from 4 to 10 feet below ground surface (bgs) throughout the site, which would be indicative of a wood waste type landfill. The soil analytical results did not identify constituents of concern detected at concentrations above LDEQ's Risk Evaluation/Corrective Action Program (RECAP) Screening Standards. The groundwater analytical results identified detections of acenaphthene, benzo(a)pyrene, fluorene, aromatic C12-C16, aromatic C16-21 and arsenic, lead and vanadium present at concentrations above RECAP Screening Standards. These constituents were further evaluated under RECAP Management Option-1 (MO-1). The MO-1 Evaluation indicated the concentrations present were below their respective MO-1 Limiting RECAP Standard for non-industrial (residential use). Based on the findings of the additional site investigation, Leaaf recommended corrective action to limit exposure to the landfill debris during residential development.

A Corrective Action Plan (CAP) dated August 2024 was prepared to address elevated concentrations of chloroform, naphthalene, and methane in the soil vapor. The CAP proposed the removal of the biodegrading vegetative landfill material followed by

confirmatory soil vapor sampling and groundwater sampling. The CAP was approved by LDEQ in correspondence dated September 20, 2024.

2.0 PROJECT GOALS AND RE-USE PLAN

Cleanup of the Former Benjamin Banneker School site will be necessary for re-use as affordable single-family homes. Redevelopment plans include the construction of 29 sing-family affordable rental homes and a manager's unit. All homes will be built to FORTIFIED Gold storm-resiliency standards and receive Enterprise Green Communities energy-efficiency and sustainability certification. Community amenities will include a "tot-lot" for small children and a paved walking trail.

The site is located in a predominantly residential area. Community input was taken into consideration when developing redevelopment plans for the site. This was done through community outreach meetings and door to door surveying. The following outreach activities were performed:

- Community Meetings were held on 3/15/21, 4/10/23, 7/16/24 and 11/12/24;
- Door-to-door surveying was conducted by New Hope Community Development Corporation (project partner and co-owner) on multiple dates in March and April 2021; and
- Planning Advisory Board meetings occurred on – 7/25/24 and 8/22/24.

During these outreach meetings, a myriad of concerns were expressed by the local community members referring to the Former Benjamin Banneker School as the old dump; expressing concerns regarding the safety for future residents. The project stakeholders took these concerns into account and recognized a significant need to address the concerns and public perception of the project. As a result, it was determined removal of the buried vegetative debris should be strongly considered prior to beginning construction activities.

3.0 APPLICABLE REGULATIONS AND CLEANUP STANDARDS

3.1 Cleanup Responsibility

The Louisiana Department of Environmental Quality's (LDEQ's) Risk Evaluation/Corrective Action Program (RECAP) regulation has been promulgated and became final on October 20, 2003. This regulation establishes the Department's minimum remediation standards for present and past uncontrolled constituent releases. RECAP is the State of Louisiana's

"normal regulatory oversight program" and is consistent with the Environmental Protection Agency's (EPA) guidance on risk assessment. However, RECAP establishes policy decisions for the State of Louisiana that are left open to interpretation in EPA guidance. These policy issues include appropriate risk level, exposure concentration, groundwater use, land use, points of exposure, and points of compliance.

LDEQ's Voluntary Remediation Program (VRP) facilitates the redevelopment of properties with environmental issues by providing applicants the ability to receive a Certificate of Completion (COC) after the successful remediation of environmental contamination at a site. The COC releases the applicant(s) and future site owners, successors and assigns of liability for all past contamination. Through the Voluntary Remediation Program, LDEQ provides administrative, technical, and legal incentives to encourage the redevelopment and reuse of vacant properties that would otherwise remain abandoned.

When a site is eligible for the VRP, such as the Former Benjamin Banneker School site, and contaminants are identified above the LDEQ RECAP Screening Option, the applicant can choose to enter into the VRP or evaluate/remediate the site under LDEQ's normal regulatory process, RECAP.

It has been determined the Site remediation activities will be conducted under LDEQ's RECAP. LDEQ will provide regulatory oversight of the cleanup through its Remediation Division and Brownfield Technical Liaison.

3.2 Cleanup Standards

LDEQ RECAP uses risk evaluation to: (1) determine if corrective action is necessary for the protection of human health and the environment, and (2) identify constituent levels in impacted media that do not pose unacceptable risks to human health or the environment, i.e., RECAP Standards. RECAP consists of a tiered framework composed of a Screening Option and three Management Options. This tiered approach allows site evaluation and corrective action efforts to be tailored to site conditions and risks. As the Management Option level increases, the approach becomes more site-specific and, hence, the level of effort required to meet the objectives of the Option increases. Although the level of effort required for each Option varies, each Option achieves a common goal: protection of human health and the environment. Once a site owner satisfies LDEQ's RECAP requirements, the owner receives a No Further Action-At This Time (NFA-ATT) determination letter.

The Former Benjamin Banneker School Site has been evaluated under RECAP's Management Option-1 tier and site-specific remediation standards for non-industrial re-use have been developed to determine the remediation necessary for protection of human health and the environment and subsequent re-use of the Site. The following standards will be used as the Cleanup Standards for the Site:

- **Soil Gas:** EPA's Vapor Intrusion Screening Level (VISL) Calculator Target Soil Gas Concentrations for residential use.
- **Groundwater:** The following LDEQ Management Option-1 (MO-1) Limiting RECAP Standards were developed for groundwater

Table 1: Groundwater Cleanup Standards

Constituent	MO-1 LRS (mg/L)
Arsenic	0.75
Lead	0.758
Vanadium	68
Acenaphthene	4.2
Benzo(a)pyrene	0.0016
Fluorene	1.2
Aromatics C12-C16	470
Aromatics C16-C21	360

3.3 Laws and Regulations Applicable to the Cleanup

Laws and regulations that are applicable to this cleanup may include the following.

- Federal Small Business Liability Relief and Brownfields Revitalization Act
- Federal Davis-Bacon Act
- Occupational Safety and Health Act
- Resource Conservation and Recovery Act
- Louisiana Revised Statue, 30:2272
- Louisiana Administrative Code, Title 33 Part I Chapter 13

- Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), 42 U.S.C. §§ 9601, et. seq.

All appropriate permits and notifications (e.g. soil disposal acceptance notification, soil transport/disposal manifests, etc.) will be obtained prior to the work commencing.

3.4 Extreme Weather Considerations

Effective with Fiscal Year 2013, EPA's Brownfields Program initiated a change to cooperative agreements for Cleanup and Revolving Loan Fund awards. It requires cooperative agreement recipients to evaluate the resilience of remedial options funded by the award in light of reasonably foreseeable changing extreme weather conditions. As directed under EPA's Climate Change Adaptation Plan, the ABCA must include a discussion of observed and forecasted climate change conditions for the area of the project and the associated site-specific risk factors. Specifically, this is to be presented as part of the ABCA. As the possibility exists that Cleanup grant funds or Revolving Loan Fund grand funds may be utilized for cleanup actions at the site, extreme weather conditions has been considered in this ABCA.

3.4.1 General Considerations

In considering remedy resiliency Terracon consulted the following resources as authoritative sources.

- Climate Resources on Data.gov
- U.S. Global Change Research Program (USGCRP)
- U.S. Climate Resilience Toolkit
- EPA Climate Change on EPA.gov
- USDA Climate Hub

3.4.2 Site-Specific Considerations

The site and Louisiana are in EPA's climate designation of Southeast, according to The Fifth National Climate Assessment (NCA5) report published by the US Global Change Research Program. In this region, sea level rise, extreme temperatures (heatwaves), and decreasing water supply access due to prolonged dry spells are affecting the region and will continue to have impacts in the near term. These changing conditions have significant effects on the Southeast's economy and projected labor losses due to the effects of compounding extreme weather events.

According to the US Climate Resilience toolkit, rising temperatures in this area of the southeast will have negative impacts on labor and human health. The site is located in a predominantly urbanized area. In such an urban environment, extreme weather condition concerns are related to human health, primarily due to dangerous temperature extremes, flash flooding, and air quality issues related to higher humidity, ground-level ozone, and pollen pollution.

These considerations do not identify property-specific risks in considering resiliency of remedy at this property as part of feasibility and implementability.

4.0 EVALUATION OF CLEANUP ALTERNATIVES

EPA guidance requires the ABCA, at a minimum, to consider two different cleanup remedies and a "no action" alternative. To address hazardous substances at the site, three different alternatives were considered (minimum two different alternatives plus a "No Action" option). These alternatives are outlined in the sections that follow. Each subsection presents the following alternatives in greater detail, including estimated costs and potential contingency items.

Table 2: Summary of Cleanup Alternatives

Cleanup Alternative	Description
A	Installation of a Vapor Mitigation System
B	Excavation and Off-Site Disposal of Observed Vegetative Landfill Debris
C	No Action

4.1 Alternative A: Installation of a Vapor Mitigation System

Alternative A would provide vapor mitigation from accumulating sub-slab vapors in soil gas originating from the biodegrading vegetative debris. The purpose of the VMS is to protect residential occupants from potentially harmful accumulating vapors. As the construction of 30 enclosed structures are proposed, consideration should be given to a design that would include sub-slab soil gas collection piping and a sub-slab vapor intrusion barrier for each building. This type of system would offer a robust engineered approach, integrating the VMS with building materials and components, installation by a certified installer, and construction oversight by a certified inspector providing an entire building solution.

4.1.1 Effectiveness – Including Extreme Weather Considerations

This approach is technically effective as it addresses vapor intrusion, however VMS is not recognized as a remediation technology. The alternative requires the operation of passive or active system fitted with alarm indicators in the event of system failure. Maintenance of

this remediation system will be required. The alternative does not address does not fully address the public's perception of the site as buried materials will remain in-place. The CAP approved by the LDEQ (for excavation) would need to be revised and approved by the LDEQ before implementation of this alternative.

This remedy does not require extensive on-site activities by heavy equipment; however, will require construction materials to implement. The manufacturing and shipping of these materials will be needed and limited on-site equipment will be needed for construction.

For any development in the City, ordinance requires a stormwater management plan that evaluates the development's impact on sewer capacity and treatment demand. The construction of 30 residential dwellings will have a short-term impact on stormwater outflow with a long-term increase in sewer and stormwater runoff. This development will have the same long-term impact as other remedial alternatives.

4.1.2 Implementability

This alternative is not readily implementable. The approach requires that a VMS be incorporated in the design of future redevelopment. The remediation system would have to operate for the expected life of the buildings. A drawback of this alternative would be design challenges associated with the foundation recommendation by the geotechnical engineer. This area has very soft soils requiring deep foundations, typically achieved through advancement of timber piles. The timber piles are anticipated to disturb the underlying vegetative debris and provide an exacerbated pathway for vapors to make their way under the slab.

4.1.3 Cost

Based upon Terracon's experience with similar projects, the estimated cost for revision of the existing CAP, VMS design, VMS installation and maintenance, required reporting, and professional environmental consulting services is estimate to be $600,000.

4.2 Alternative B: Excavation and Off-Site Disposal of Observed Vegetative Landfill Debris

Alternative B includes excavation and removal of observed vegetative landfill debris. The extent of excavation encompasses an approximate 83,000 square foot area. The vegetative debris was observed at depths varying from 4 to 10 feet bgs, therefore excavation is not anticipated past 10 feet bgs. The depths of excavation will be terminated once native soil is encountered. Soil confirmation samples will not be collected as previous investigations indicate that the native clay soil is not impacted.

During excavation activities, the overlying non-impacted overburden material will be separated from the vegetative waste and non-vegetative waste. The overburden material

consists of silts, sands, and gravels. Vegetative debris will be disposed of at construction and demolition (C&D) landfill. The nonvegetative waste, if encountered, will be disposed of at a Subtitle D landfill permitted to accept the waste.

Based on the shallow depths of excavation and depths at which groundwater was first encountered during previous investigations, substantial groundwater accumulation in the excavations are not anticipated. However, if groundwater and/or stormwater accumulates in the excavations during remediation it will be treated and/or disposed of in accordance with applicable regulations. To reduce/eliminate the accumulation of groundwater/stormwater, the excavation area will be subdivided, and each subdivided area will be backfilled immediately after excavation of vegetative debris and when native clay soil is encountered. The excavations will be backfilled with the overburden material and clean imported fill back to grade.

Confirmatory soil vapor sampling will be conducted following completion of all backfilling activities. Additionally, temporary monitoring wells will be installed for the collection of groundwater samples. The temporary monitoring wells will be plugged and abandoned upon completion of groundwater sampling activities.

4.2.1 Effectiveness – Including Extreme Weather Considerations

This approach is technically effective as it removes the source of the soil vapor concentration. The Corrective Action Plan dated August 2024 has already been approved by the LDEQ for this site. Maintenance of a remediation system will not be required. This alternative has the added benefit of addressing the community's negative perception of the site.

The site-specific extreme weather conditions identified include increased weather activity, which could impact excavation activities (stormwater contact with contaminated soils) and increase the volume of impacted water for removal and off-site disposal.

This remedy requires extensive on-site activities by excavators, dump trucks, landfill spreaders/equipment, and vacuum trucks, as needed, multiple trips to and from a local landfill, source for clean soil, and the water disposal location, if needed, are required. The fossil fuel consumption and air pollution created by these activities exacerbate existing extreme weather change issues and could pose acute health hazards for the local community associated with air pollution. This remedy also consumes finite landfill space.

4.2.2 Implementability

This alternative is readily implementable and is a mature remedy common in the remediation industry. The approach requires construction equipment readily available in the local construction and engineering markets. The materials for backfill and cover are readily available in the local area. A labor force readily exists in the area to accomplish the remedy. The implementation period is shorter-term, on the order to 1-3 months once remedial activities begin.

4.2.3 Cost

As this alternative is associated with an approved Corrective Action Plan with the LDEQ, a cost estimate associated with the cleanup was readily available for Terracon's review. Based upon Terracon's experience with similar projects, the prior cost estimate provided, the estimated cost for excavation and off-site disposal of landfill debris, backfilling, confirmation sampling, required reporting, and professional environmental consulting services is approximately $3,448,000.

4.3 Alternative C: No Action

The "no action" scenario is required by the EPA ABCA process. No action would be taken to cleanup the vegetative landfill debris and the vegetative debris would continue to biodegrade.

4.3.1 Effectiveness

This alternative is deemed ineffective for brownfield redevelopment. Socially, it does not allay stigma for future investments or disadvantaged community members. This alternative does not address potential current and future risks to human health and the environment. During site redevelopment, workers would face an increased risk of exposure to site contaminants. Construction of affordable housing would not be possible if no action is taken.

4.3.2 Implementability

By its definition, taking no action precludes a discussion of implementation.

4.3.3 Cost

By its definition, taking no action precludes a discussion of cost to implement. This cleanup alternative would not include any specific efforts to remove or maintain vegetative landfill debris in place. There would be no direct cleanup costs associated with this alterative. Further, this alternative may later result in redevelopment complications, delays and increased redevelopment costs due to soil vapor contamination remaining onsite. There would be no additional direct costs associated with alternative. Indirect costs could include the continuing inability to utilize the property for public benefit as is currently planned.

4.4 Cost Comparison Alternatives

The table below presents a brief comparison of factors previously discussed for alternatives under consideration.

Table 3: Summary Comparison of Alternatives

Alternative	Effectiveness	Implementability	Estimated Cost
A – Installation of VMS	Addresses vapor intrusion from biodegrading vegetative debris. Does not address negative public perception. VMS is not recognized as a remediation technology. Requires the operation of a passive or active system fitted with alarm indicators in the event of system failure. The deep foundations required for buildings on-site create a challenge with understanding expected soil gas concentrations and the associated VMS design.	This alternative is technically achievable. The VMS can be incorporated in the design of any future development. Properly maintained, the system would operate for the expected life of the buildings.	$600,000
B – Excavation and Off-Site Disposal of Vegetative Landfill Debris	This approach is technically effective and will reduce soil vapor concentrations by permanent removal of the source. This approach has been reviewed and approved for this site by the LDEQ.	This alternative is technically achievable and common in the remediation industry. Resources to implement this alternative are readily available and time to implement is on the order of 1 to 3 months (inclusive of confirmation soil vapor and groundwater sampling).	$3,448,000
C – No Action	Does not address risks or regulatory requirements.	Not applicable	Negligible direct cost

5.0 RECOMMENDED CLEANUP ALTERNATIVE

The recommended cleanup approach is Alternative B: Excavation and Off-Site Disposal of Vegetative Landfill Debris. This alternative would fully address human health risks using a proven approach consistent with recognized industry standards and has been approved for this site by the LDEQ. Additionally, this alternative addresses the public's negative perception of the site, as well as liabilities associated with the other alternatives, such as the VMS system; while achieving the property owner's goals and re-use planning.