TOEROEK
ASSOCIATES, INC.

March 4, 2021

Mr. Bradley Roberts
Task Order Contracting Officer Representative
U.S. Environmental Protection Agency, Region 7
11201 Renner Blvd.
Lenexa, Kansas 66219

Subject: Contract No. 68HERH19D0018; Task Order (TO) No. 68E0719F0190
WE Building, 3230-3232 Washington Boulevard, St. Louis, Missouri;
Analysis of Brownfields Cleanup Alternatives Report

Dear Mr. Roberts:

Toeroek Associates, Inc. (Toeroek) and our teaming subcontractor, Tetra Tech, Inc. (Tetra Tech), (hereafter "Toeroek Team") are pleased to present the Analysis of Brownfields Cleanup Alternatives report (ABCA) regarding the WE Building site (the subject property) located at 3230-3232 Washington Boulevard in St. Louis, Missouri. This deliverable has been reviewed internally as part of Tech Tech's quality assurance program, as well as Toeroek's quality assurance program, and is consistent with Toeroek's Quality Management Plan for the Resource Conservation and Recovery Act (RCRA) Enforcement and Permitting Assistance (REPA) contract. Documentation of this review is retained in the Toeroek Team's project files.

If you have any questions or comments, please contact Paul Kieler at 303-407-0266 or Kaitlyn Mitchell at 816-412-1742.

Sincerely,

Paul Kieler
Toeroek Team Program Manager

Kaitlyn Mitchell
Toeroek Team Project Manager

Enclosure: ABCA

cc: Frank Novello, EPA Region 7 (cover letter only)
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ANALYSIS OF BRONFIELDS CLEANUP ALTERNATIVES REPORT

WE BUILDING
3230-3232 WASHINGTON BOULEVARD, ST. LOUIS, MISSOURI

Prepared for

U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION 7

Task Order	:	68E0719F0190
Subtask	:	03.03.07
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Date Prepared	:	March 4, 2021
Contract No.	:	68HERH19D0018
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1.0 INTRODUCTION

The U.S. Environmental Protection Agency (EPA) tasked Toeroek Associates, Inc. (Toeroek) and its teaming subcontractor, Tetra Tech, Inc. (Tetra Tech), (hereafter "Toeroek Team") to provide technical support to the EPA Region 7 Brownfields Program under Contract 68HERH19D0018, Task Order (TO) 68E0719F0190. EPA Region 7 requested that the Toeroek Team conduct an Analysis of Brownfields Cleanup Alternatives (ABCA) of the WE Building site (the subject property) at 3230-3232 Washington Boulevard in St. Louis, Missouri (see Appendix A, Figure 1). The Toeroek Team has performed this ABCA based on results of the Targeted Brownfields Assessment (TBA) [Phase II Environmental Site Assessment (ESA) and Hazardous Materials Survey] by the Toeroek Team in September 2020. According to the Brownfields Assessment Application (Missouri Department of Natural Resources [MDNR] 2019), the current property owner, Washington Tabernacle Missionary Baptist Church, is interested in redeveloping/remodeling the existing structure to include multiple uses such as classrooms and conference rooms to support the church body, and office and rental space, depending on findings from the TBA.

The Phase II ESA concluded that no further investigation and/or remediation of environmental media may be necessary based on results of subsurface soil sampling. Therefore, this ABCA presents cleanup alternatives regarding only asbestos-containing material (ACM), lead-based paint (LBP), and hazardous materials in the subject property building. Cleanup alternatives considered are based on state and federal regulations. MDNR regulations outline ACM and LBP inspection, reporting, and disposal requirements for demolition or renovation of commercial buildings (MDNR 2017). This ABCA also includes preliminary cost estimates of evaluated cleanup alternatives.

2.0 BACKGROUND AND DESCRIPTION

The subject property is located at 3230-3232 Washington Boulevard in St. Louis, St. Louis County, Missouri, and is depicted on the Clayton, Missouri, U.S. Geological Survey (USGS) 7.5-minute topographic series map (USGS 1993) (see Appendix A, Figure 1). Coordinates at the approximate center of the subject property are 38.637383 degrees north latitude and 90.226038 degrees west longitude. The subject property is on a 0.3-acre parcel and is improved with a vacant, single-story warehouse building on slab (no basement) that encompasses the entire area of the parcel.

The subject property and surrounding properties have been developed since as early as 1909, and historically hosted primarily residential properties; however, by 1932, the surrounding area had become more commercial, with parcels to the south developed as commercial stores with machine shops. By 1932, the western portion of the subject property was a filling station, and the eastern portion was a residential duplex. North of Washington Boulevard was developed with a tire and filling station. Parcels to the west of the subject property remained residential, but with a warehouse farther west (SCS Engineers [SCS] 2019). The current warehouse building was constructed by 1950, with the southern portion identified as a warehouse and garage. By 1990, several of the parcels to the north and south were vacant, and some structures to the south had been demolished (SCS 2019). By 2012, the western three-quarters of the 3200 block of Locust Street, south of the subject property, was vacant (SCS 2019).

The subject property lies within the central portion of the City of St. Louis, Missouri. It is bounded to the north by Washington Boulevard, with a restaurant and brewery beyond; to the east by a parking lot and Washington Tabernacle Missionary Baptist Church, with North Compton Avenue beyond; to the south by a parking lot and grassy lot, with Locust Street beyond; and to the west by North Leonard Avenue, with a parking lot and commercial building beyond.

3.0 PREVIOUS INVESTIGATIONS

SCS identified the following recognized environmental conditions (RECs) during a Phase I ESA at the subject property in October 2019 (SCS 2019):

- The status of the three underground storage tanks (USTs) associated with the former use of the subject property as a gas station is unknown. No evidence indicates removal of the USTs from the subject property; therefore, possible presence of the USTs poses a threat of release to the environment.
- Based on historical use of the subject property as a gas station, the unknown status of the USTs poses potential for presence of petroleum contamination and therefore a potential vapor encroachment condition (PVEC) at the subject property.

The Phase I ESA report recommended an additional investigation to evaluate subsurface conditions at the subject property.

The Toeroek Team conducted a Phase II ESA in September 2020 to confirm or eliminate the RECs identified during the 2019 Phase I ESA by Terracon (Toeroek 2021a). Subsurface soil samples were collected and were submitted for analyses for the following parameters: volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), total petroleum hydrocarbons (TPH) – gasoline-range organics (GRO), TPH – diesel-range organics (DRO), TPH – oil-range organics (ORO), and Resource Conservation and Recovery Act (RCRA) metals (including mercury). Sample locations are depicted on Figure 2 in Appendix A.

Sampling results during this Phase II ESA indicated the presence of VOCs, TPH, SVOCs, and metals in soil and groundwater at the subject property. Some of these constituents exceeded the Missouri Risk-based Corrective Action (MRBCA) Lowest Default Target Levels (LDTLs) and regional screening levels (RSLs) in soil and LDTLs and EPA Maximum Contaminant Levels (MCLs) in groundwater. LDTLs and MCLs are largely related to protection of groundwater or use of groundwater as a drinking water source; however, groundwater is not currently used as a drinking water source in St. Louis.

None of the constituents detected in soil exceeded the residential MRBCA Tier 1 Risk-based Target Levels (RBTLs), based on the observed soil type (clayey) and the likely exposure pathway (migration of vapors). Other than total metals in groundwater, none of the constituents detected in groundwater exceeded the residential RBTLs, based on the observed soil type (clayey) and the likely exposure pathways (dermal contact for metals and migration of vapors for other constituents). Although total

metals exceeded residential RBTLs in groundwater, none of the dissolved metals exceeded residential RBTLs, suggesting the metals detected were actually in the suspended sediment, not the water.

Differences in the soil sample and duplicate soil sample data demonstrate that the soil medium is heterogeneous and has a large relative percent difference (RPD); therefore, variability in levels of contamination are expected. Because a building encompasses the majority of the subject property, additional samples may be collected in the future if the building is to be demolished in order to further characterize the site; however, based on analytical results from soil and groundwater samples, no further investigation and/or remediation appears warranted at this time.

If the building is demolished, a soil management plan may be required to protect construction or utility workers that may have dermal exposure to contamination in subsurface soil or groundwater.

The Toeroek Team also conducted a hazardous material survey at the subject property in September 2020 that identified ACM, LBP, and hazardous materials at the buildings on the subject property (Toeroek 2021b). Based on these results and the conclusions of the Phase II ESA, this ABCA presents cleanup alternatives regarding only ACM, LBP, and hazardous materials in the subject property buildings.

4.0 FUTURE USE

The current owner of the subject property, Washington Tabernacle Missionary Baptist Church, is interested in redeveloping/remodeling the existing structure to include multiple uses, such as classrooms and conference rooms, to support the church body as well as office and rental space; all dependent on the findings of the Phase II ESA. The subject property is located in the urban center of the City of St. Louis and is surrounded by commercial businesses. Groundwater in the subject property vicinity is not known to be a source of drinking water. No future use for this purpose is anticipated because the City of St. Louis currently derives its drinking water from a private utility supplier, Missouri American Water (Toeroek 2021a). Based on analytical results from subsurface soil, further investigation and/or remediation does not appear to be warranted; however, ACM, LBP, and hazardous materials should be appropriately addressed prior to building renovation or demolition. No remedial activities have occurred at the subject property to date.

5.0 POTENTIAL CLEANUP ALTERNATIVES

The overall goal of any Brownfields cleanup action is to address 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. This ABCA considers cleanup alternatives that would be based on state and federal regulations regarding ACM and LBP.

The Toeroek Team evaluated Brownfields cleanup alternatives to address environmental impacts identified during the hazardous materials survey (Toeroek 2021b). 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 ACM, LBP, and hazardous materials, including a "No Action" alternative. Following the description, each alternative is evaluated in terms of its effectiveness, implementability, and cost. 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.

Effectiveness of an alternative refers to its ability to meet objectives of the Brownfields cleanup. Criteria applied to assess effectiveness of an alternative include the following:

- Overall protection of human 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; and
- Short-term effectiveness.

Criteria applied to assess implementability of an alternative are:

- Technical feasibility,
- Administrative feasibility,
- Availability of services and materials required during implementation of the alternative,
- State acceptance, and
- Community acceptance.

Each alternative is evaluated to determine its estimated cost. The evaluations compare the alternatives' respective 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

Contamination evaluated as part of this ABCA includes ACM, LBP, and hazardous materials. The sections below discuss contaminants/materials identified during the hazardous materials survey at the subject property.

5.1.1 Asbestos-containing Materials

During the ACM survey, the Toeroek Team collected 90 bulk samples of suspect ACM. Figure 3 in Appendix A shows ACM sample locations. Collections of samples of building materials accorded with National Emissions Standards for Hazardous Air Pollutants (NESHAP) as adopted by EPA and Asbestos Hazard and Emergency Response Act of 1986 (AHERA) protocols. Upon completion of sampling activities, the bulk samples were sent to Eurofins EMLab P&K Laboratories (Eurofins). Suspect ACM samples were analyzed per EPA Method 600/R-93/116 via Polarized Light Microscopy (PLM) analysis. AHERA defines ACM as any material or product that contains more than 1% asbestos. The ACM survey yielded the following significant findings:

- Regulated ACM was identified in vinyl floor tile [approximately 6,100 square feet (SF)] on the first floor, throughout the north room.
- Regulated ACM was identified in adhesive associated with ceramic wall tile (approximately 100 SF) in the north room and west restroom on the first floor.
- Regulated ACM was identified in window caulk [approximately 3,000 linear feet (LF)] on the first floor south room windows and throughout the second floor.
- Regulated ACM was identified in transite pipe (approximately 36 LF) on the second floor and more transite material may also be located in inaccessible areas on the roof.
- Regulated ACM was identified in pipe insulation (approximately 24 LF) in the central room on the second floor.
- Regulated ACM was identified in joint compound (approximately 3 LF) in the south room on the second floor.

- Regulated ACM was identified in black mastic (approximately 60 SF) on the roof and second floor near the collapsed part of the roof. More black mastic may also be located in inaccessible areas on the roof.

5.1.2 Lead-based Paint

During the LBP survey, the Toeroek Team tested 36 surfaces in the subject property buildings. Figure 3 in Appendix A shows locations of LBP detections. The LBP survey accorded with protocols similar to the single-family housing inspection procedures in Department of Housing and Urban Development (HUD) *Guidelines for the Evaluation and Control of LBP in Housing* (HUD Guidelines) (HUD 1997).
The Toeroek Team utilized an Innov-X 6000 Alpha Series analyzer to perform the LBP screening. The Innov-X 6000 Alpha Series is an x-ray fluorescence (XRF) spectrum analyzing system for quantitative measurement of lead in paint on various substrates. HUD guidelines suggest that paint applied before 1978 may contain lead. HUD considers LBP as paint with lead levels above 1.0 milligram per square centimeter (mg/cm^2).

Approximately 2,634 SF of various colors of LBP on a variety of substrates was identified throughout the building.

5.1.3 PCBs

During the hazardous materials survey, the Toeroek Team collected one sample of suspected PCB-containing caulk material. Collection of this sample accorded with EPA guidance. Upon completion of sampling activities, the bulk sample was sent to Pace Analytical (Pace) laboratory in Lenexa, Kansas. Suspect PCB-containing caulk materials were analyzed per EPA Method 8082. EPA has set an action level of 50 parts per million (ppm) for PCBs in materials, and that was the benchmark used for this survey. Laboratory results indicated that the sampled building material did not contain a concentration of PCBs above 50 ppm. As such, PCBs will not be addressed in this ABCA.

5.1.4 Hazardous Materials Inventory

The Toeroek Team completed a hazardous materials inventory to quantify items potentially containing hazardous materials inside site buildings. Table 1 below summarizes hazardous materials identified inside site buildings.

TABLE 1

SUMMARY OF HAZARDOUS MATERIALS INVENTORY
WE BUILDING, 3230-3232 WASHINGTON BOULEVARD, ST. LOUIS, MISSOURI

Type of Household Hazardous Waste	Assessed Quantity
Refrigerators	2
Water Heaters	2
Window Fan Units	7
Air Conditioning Units	3
Printer/Scanners	4
Paper Shredder	1
Computer Monitor	1
Fluorescent Tubes	120
Polychlorinated Biphenyl (PCB)-containing Ballasts	52
Automotive Batteries	3
Household Batteries	3
Mercury Thermometers	2
Small Tires	14
Compressed Gas Canisters (including 14-ounce propane, 75.4-kilogram helium, 11-gallon compressed air)	10
5-gallon Buckets (known contents include paint, hydraulic transmission oil, joint compound, wax stripper, and sand mix; other contents unknown)	24
Non-flammable Aerosol Cans	45
Flammable Solvents (Fuel)	8 containers (approximately 38 gallons)
55-gallon Drums	6
30-gallon Drums	4
Miscellaneous Small Containers (known contents include restorer spray, cleaning solution, herbicide, antifreeze, motor oil, acrylic floor finish, water proofer, windshield washer solution, car wax, wood stain, stain remover, lighter fluid, refrigerant, carpet shampoo, roof cement, hand soap, emulsifier, alkaline detergent, mineral spirits, paint thinner, power steering fluid, odor killer, boiler seal, leather cleaner, ceiling texture additive, 2-cycle oil, chain oil, bleach, rubber base sealant; other contents unknown)	176
Fire Extinguishers	10
Lawn Mowers	9
Generator	1
Small Bus	1

5.2 EVALUATION OF CLEANUP ALTERNATIVES

Evaluations of cleanup alternatives are based on the assumed future use scenario at the subject property—residential and/or commercial development. Based on assumed future use of the subject property for residential and/or commercial purposes, and because plans to demolish the building are unknown, the Toeroek Team considered three alternatives for cleanup of ACM and LBP, and two options to address hazardous materials. Evaluations took into account MDNR Brownfields/Voluntary Cleanup Program (B/VCP) procedural requirements—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 $5,000. However, whether the subject property will enroll in the MDNR B/VCP program is unknown. Options to address ACM, LBP, and hazardous materials assume a cleanup prior to demolition of the on-site structures.

5.2.1 Asbestos-containing Material

Regarding ACM, three options were evaluated: (1) no action, (2) all ACM remains in place and is managed through an Operations and Management (O&M) Plan, and (3) abatement of all ACM wastes is conducted. Alternatives 2 and 3 are expected to achieve clearance criteria under the MDNR B/VCP.

Alternative 1: No Action

Alternative 1 (no action) would leave ACM in place at the subject property.

Effectiveness

This alternative would not be effective if the subject property building is demolished. Redevelopment of areas containing ACM would have to be restricted to ensure that those materials remain undisturbed. Additionally, in accordance with NESHAP regulations, demolition of the subject property building cannot proceed before proper abatement; therefore, demolition could not occur if this alternative would be selected. This alternative would also be ineffective in achieving the goal of reducing health risks.

Implementation

Implementation of this alternative is straightforward—ACM left in place. Future redevelopment would have to consider the location and condition of the ACM, and ensure that those materials remain undisturbed. Demolition could not occur prior to abatement.

Cost

This alternative would not involve any direct costs.

Alternative 2: O&M Plan

Alternative 2 (O&M Plan) would leave not damaged or spilled ACM in place at the subject property. The damaged or spilled ACM would require proper abatement by a licensed State of Missouri asbestos abatement contractor in accord with applicable local, state, and federal regulations.

Effectiveness

This alternative would be effective regarding rehabilitation of the subject property building containing ACM. This alternative would also be effective in achieving the goal of reducing health risks. As such, ACM left to remain in place would have to be regularly monitored to ensure it is not damaged, and future redevelopment plans would have to consider locations and condition of the remaining ACM, and ensure those materials would not be disturbed.

Implementation

Implementation of this alternative would include leaving ACM in place and properly abating damaged or spilled ACM. An O&M Plan would be developed to document presence and locations of ACM, and future maintenance procedures regarding the ACM. In addition, filing the O&M Plan on the property's chain-of-title as an institutional control (IC) would be required.

Cost

Cost of completing an O&M Plan described above would be $4,500. This cost does not include abatement of damaged or spilled ACM.

Alternative 3: Abatement of all ACM Wastes

Alternative 3 would involve, prior to demolition or renovations, proper abatement of ACM identified in the subject property building. Abatement by a licensed State of Missouri asbestos abatement contractor would accord with applicable local, state, and federal regulations and a pre-approved Remedial Action Plan (RAP). Regulatory clearance sampling would be conducted according to a pre-approved Quality Assurance Project Plan (QAPP), and potentially pre/post-abatement inspections by MDNR (if required).

Effectiveness

If all identified ACM would be removed, Alternative 3 would address the risk to human health posed by ACM. In addition, full abatement would allow for redevelopment of the subject property without restrictions pertaining to disturbance of ACM.

Implementation

Abatement by a licensed State of Missouri asbestos abatement contractor would accord with applicable local, state, and federal regulations. EPA, State, and Occupational Safety and Health Administration (OSHA) requirements must be met during removal of ACM and during demolition due to the presence of LBP. These regulations would be addressed in the MDNR B/VCP RAP and Health and Safety Plan. ACM was identified at the subject property in 18 of 90 samples collected by the Toeroek Team. The following materials were determined to contain asbestos: Red/beige 9- by 9-inch viny l floor tile with associated mastic, two different colors of 12- by 12-inch vinyl floor tile with associated mastic, ceramic wall tile with adhesive and grout, window caulk, transite pipe, thermal system insulation (TSI), joint compound, and duct sealant. Full abatement would include removal of these materials.

Cost

Estimated abatement costs were gathered from local vendors. Costs per SF or LF are provided, and include removal and disposal costs. Abatement cost for the ACM associated with the subject property building is estimated at $49,655. No restoration costs have been accounted for. Table 2 below summarizes abatement costs for ACM identified in the subject property building. Additional costs to be considered, particularly if the subject property would be enrolled in the MDNR B/VCP, include those for technical reports (RAP, QAPP and Final Abatement Report) and collection of clearance samples. Estimated cost of technical plans/reports is $3,500 per plan/report (cost of plans includes consideration of all environmental issues to be addressed by cleanup activities). Additional costs for oversight and clearance sampling are considered variable based on requirements and duration of abatement. Estimated cost associated with oversight and clearance is $5,000. Total cost of Alternative 3 is estimated at $65,155.

TABLE 2

ASBESTOS-CONTAINING MATERIALS ABATEMENT COSTS
WE BUILDING, 3230-3232 WASHINGTON BOULEVARD, ST. LOUIS, MISSOURI

Material Description	Material Locations	Estimated Quantity	Cost/Unit ($/SF, $/LF, or $/EA)	Total Cost
9" X 9" Red / Beige Vinyl Floor Tile with Black Mastic	Throughout First Floor North Room	3,000 SF	$4.00	$12,000
12" X 12" Red Natural Facade Vinyl Floor Tile with Dark Brown Mastic	First Floor – North Room, West Half Open Area over Vinyl Floor Tile (VFT)	1,700 SF	$4.00	$6,800
12" X 12" Red Ornate Facade Vinyl Floor Tile with Yellow/Brown Mastic	First Floor – North Room, Offices and Southeast Corner over VFT	1,400 SF	$4.00	$5,600
Ceramic Wall Tile with Adhesive and Grout	First Floor – North Room and West Restroom	100 SF	$4.00	$400
Interior White Window Caulk	Second Floor – North Room Open Area Windows, Central Room East Windows, South Room South and East Windows, and First Floor South Room Windows	3,000 LF	$8.00	$24,000
Transite Pipe	Second Floor – Central Room East Area Near Roof Collapse and South Room – Central Area from Ceiling	36 LF	$5.00	$180
2" Pipe Thermal System Insulation	Second Floor – Central Room North Wall East of Stairway	24 LF	$15.00	$360
Joint Compound	Second Floor – South Room South Wall Hole	3 LF	$5.00	$15
Duct Sealant[1]	Roof and Second-Floor East Area Near Roof Collapse	60 SF	$5.00	$300
Total ACM Abatement Cost				**$49,655**

Notes:

[1] Additional duct sealant may be present in the inaccessible area on the roof.

ACM Asbestos-containing material
EA Each
LF Linear feet
SF Square feet

5.2.2 Lead-based Paint

Three cleanup alternatives were evaluated to address LBP found on structures associated with the subject property. These alternatives include: (1) no action, (2) removal through demolition, and (3) stabilization and encapsulation. Each approach (excluding no action) is expected to achieve clearance criteria under the MDNR B/VCP. For sites enrolled in the B/VCP, MDNR requires creation of an O&M Plan to document existence, location, and future maintenance procedures regarding LBP left in place. If demolition is decided, per local, state, and federal regulations, the building may be demolished with the LBP present assuming satisfactory results of a disposal characterization test via Toxicity Characterization Leaching Procedure (TCLP) analysis prior to disposal of the demolition debris.

Alternative 1: No Action

Alternative 1 (no action) would leave LBP in place at the subject property.

Effectiveness

This alternative would not be effective if the subject property building is demolished. Restrictions on proposed demolition of materials containing LBP (depending on condition of the LBP) would be necessary to ensure those materials remain undisturbed. This alternative would also be ineffective in achieving the goal of reducing health risks.

Implementation

Implementation of this alternative would be straightforward—leaving the LBP in place.

Cost

This alternative would not involve any direct costs.

Alternative 2: LBP Removal by Demolition

Alternative 2 includes removal (by demolition) for proper disposal. All surfaces/components that contain LBP determined to be in good condition can be removed/demolished and disposed of as demolition waste—assuming satisfactory results of a disposal characterization test via TCLP analysis prior to disposal of the demolition debris. For surfaces/components that contain LBP determined not to be in good condition, these surfaces would need to be stabilized as described below in Alternative 3 prior to being demolished. Application of removal/demolition techniques would be necessary in a manner that does not chip, shred, mulch, or mill the LBP. For the future site use scenario for the subject property building (i.e., demolition),

this alternative is likely the most appropriate and economically feasible. Regulatory clearance would be obtained through successful implementation of a pre-approved RAP. Any materials not passing the TCLP analysis would have to be disposed of as hazardous waste. Costs specified below assume removal of materials containing LBP.

This alternative is a direct approach, because LBP would be removed, and controls would not be required to manage LBP left in place prior to building demolition. Removal and off-site disposal of LBP-containing material as special (demolition) waste would occur.

Effectiveness

If all identified LBP is removed, Alternative 2 would be effective in addressing the risk to human health posed by the LBP. This alternative would allow for demolition of the subject property building without restrictions pertaining to disturbance and management of LBP.

Implementation

Abatement would accord with applicable state and federal regulations. Prior to disposal, demolition debris would require characterization via TCLP analysis. Surfaces coated with LBP would be disposed of with general building demolitions debris. EPA, State, and OSHA requirements must be met during removal of ACM and during demolition due to the presence of LBP. These regulations will be addressed in the MDNR B/VCP RAP and Health and Safety Plan.

Cost

Estimated costs of this alternative were gathered from local vendors. Prior to disposal, demolition debris would require characterization via TCLP analysis. Assuming five samples will be collected for TCLP analysis, estimated cost is $2,500. Additional costs to be considered, particularly if the subject property would be enrolled in the MDNR B/VCP, include technical reports (RAP and Final Abatement Report). Estimated cost of technical plans/reports is $3,500 per plan/report (cost of plans includes consideration of all environmental issues to be addressed by cleanup activities). Total cost of Alternative is estimated at $9,500 and does not include cost of the demolition and disposal.

Alternative 3: LBP Stabilization and Application of Encapsulation

Alternative 3 includes stabilization of LBP in poor condition (chipping, flaking, etc.) and application of an encapsulant to all LBP surfaces. The encapsulant would be a durable, air- and dust-tight, surface coating material. Application of the encapsulant would ensure that LBP remaining could not leach to the surface and pose a threat to future occupants. In accordance with state regulations, the condition of LBP-containing surfaces should be inspected, and removal of loose (chipped, flaking, etc.) LBP would be required. The removed LBP residue should be segregated for proper disposal. Based on findings of the subject property reconnaissance by the Toeroek Team, numerous surfaces would require stabilization to remove loose LBP.

Waste generation and amount of material sent for disposal would be less than under Alternative 2. Regulatory clearance would be obtained through successful implementation of a pre-approved RAP, a pre-approved QAPP and pre-/post-encapsulation inspections by MDNR. In addition, collection of dust-wipe samples in accordance with MDNR clearance regulations would be necessary after completion of all interior renovations in order to verify that all lead dust levels are below MDNR clearance levels.

Effectiveness

Encapsulation is a relatively simple process that does not significantly alter structural conditions. This alternative would allow redevelopment of the subject property; however, restriction (ICs) would apply concerning future disturbance of LBP. For sites enrolled in the MDNR B/VCP, MDNR requires creation of an O&M Plan to document presence and location of LBP, and future maintenance procedures regarding LBP. In addition, filing the O&M Plan on the property's chain-of-title as an IC would be required.

Implementation

Stabilization and encapsulation by a licensed State of Missouri lead abatement contractor would accord with applicable state and federal regulations. Encapsulation is not a viable alternative for surfaces subject to impact or friction. Encapsulation requires follow-up inspections, maintenance, and possible building restrictions. Abatement by a registered lead paint contractor would accord with applicable state and federal regulations. Segregation and proper disposal of LBP residue removed during stabilization activities (likely as hazardous waste) would be required. Because this technique can generate a hazardous waste stream, careful consideration of precautions concerning worker health and safety would be necessary.

Cost

Estimated costs were gathered from local vendors. Estimated cost of stabilization and encapsulating is $6.00 per SF or LF. Assuming all surfaces containing LBP would require stabilization/encapsulation, the cost of Alternative 3 is estimated at $15,804.00. Additional costs to be considered, particularly if the subject property would be enrolled in the MDNR B/VCP, include technical reports (RAP, QAPP and Final Abatement Report) and collection of clearance samples. Estimated cost of technical plans/reports is $3,500 per plan/report (cost of plans include consideration of all environmental issues to be addressed by cleanup activities). Additional costs for oversight and clearance sampling are estimated at $5,000. This estimated cost may vary depending on the abatement techniques applied. No restoration costs have been accounted for. Total cost for Alternative 3 is estimated at $31,304.

5.2.3 Hazardous Materials

For hazardous materials assumed to remain in buildings scheduled for renovation or demolition, two options were evaluated: (1) no action and (2) proper removal and disposal.

Alternative 1: No Action

Alternative 1 (no action) would leave hazardous materials in place at the subject property.

Effectiveness

This alternative would not be effective regarding redevelopment of the property, and could pose health risks to future occupants.

Implementation

Implementation of this alternative would require no effort because no containment, treatment, removal, or monitoring of contaminants would occur.

Cost

No costs are associated with this alternative because no activities would occur.

Alternative 2: Removal of Hazardous Materials

Alternative 2 would involve removing hazardous materials for proper disposal/recycling prior to rehabilitation or demolition activities. Typically, these materials are classified as universal waste and should be handled by a qualified waste management company.

Effectiveness

Alternative 2 would be effective in removing the items potentially containing hazardous materials.

Implementation

Disposal would be arranged by a qualified waste management company. Hazardous materials inside site buildings would be removed for proper disposal/recycling.

Cost

Estimated disposal/recycling costs were gathered from local vendors and determined via professional judgment. Estimated disposal/recycling cost for the hazardous materials associated with the building is $11,159. Table 3 below lists removal costs for hazardous materials identified in the subject property building.

TABLE 3

HAZARDOUS MATERIALS REMOVAL COSTS
WE BUILDING, 3230-3232 WASHINGTON BOULEVARD, ST. LOUIS, MISSOURI

Items	Quantity	Costs Per Unit	Estimated Costs
Refrigerators	2	$250	$500
Water Heaters	2	$50	$100
Window Fan Units	7	$50	$350
Air Conditioning Units	3	$250	$750
Printer/Scanners	4	$100	$400
Paper Shredder	1	$25	$25
Computer Monitor	1	$100	$100
Fluorescent Tubes	120	$1	$120
Polychlorinated Biphenyl (PCB)-containing Ballasts	52	$8	$416
Automotive Batteries	3	$10	$30
Household Batteries	3	$2	$6
Mercury Thermometers	2	$25	$50
Small Tires	14	$15	$210
Compressed Gas Canisters (including 14-ounce propane, 75.4-kilogram helium, 11-gallon compressed air)	10	$100	$1,000
5-gallon Buckets (known contents include paint, hydraulic transmission oil, joint compound, wax stripper, and sand mix; other contents unknown)	24	$125	$3,000
Non-flammable Aerosol Cans	45	$15	$675
Flammable Solvents (Fuel)	8 containers (approximately 38 gallons)	$25 per gallon	$950
55-gallon Drums	6	$10	$60
30-gallon Drums	4	$10	$40

TABLE 3

HAZARDOUS MATERIALS REMOVAL COSTS
WE BUILDING, 3230-3232 WASHINGTON BOULEVARD, ST. LOUIS, MISSOURI

Items	Quantity	Costs Per Unit	Estimated Costs
Miscellaneous Small Containers (known contents include restorer spray, cleaning solution, herbicide, antifreeze, motor oil, acrylic floor finish, water proofer, windshield washer solution, car wax, wood stain, stain remover, lighter fluid, refrigerant, carpet shampoo, roof cement, hand soap, emulsifier, alkaline detergent, mineral spirits, paint thinner, power steering fluid, odor killer, boiler seal, leather cleaner, ceiling texture additive, 2-cycle oil, chain oil, bleach, rubber base sealant; other contents unknown)	176	$8	$1,408
Fire Extinguishers	10	$15	$150
Lawn Mowers	9	$25	$225
Generator	1	$100	$100
Small Bus	1	$500	$500
Total Estimated Removal/Disposal Cost			**$11,165**

5.3 RECOMMENDED CLEANUP ALTERNATIVES

This section recommends cleanup alternatives for ACM, LBP, and hazardous materials at the subject property.

5.3.1 Asbestos-containing Material

Alternative 3—abatement of ACM—is the recommended cleanup alternative for ACM. Future plans at the subject property include either rehabilitation/renovation or demolition; therefore, removal of the identified ACM would be required prior to initiation of those activities.

5.3.2 Lead-based Paint

Alternative 2—LBP removal by demolition—is the recommended cleanup alternative for LBP identified at the subject property. Building materials containing LBP would be demolished and disposed of as demolition waste. This alternative could be implemented by general construction/demolition workers. Based on presence of lead, construction/demolition work must accord with Occupational Safety and Health Administration (OSHA) guidelines for protection of workers.

5.3.3 Hazardous Materials

Alternative 2—removal of hazardous materials—is the recommended cleanup alternative for hazardous waste in the subject property buildings.

5.3.4 Total Cleanup Cost

Table 4 below summarizes total cleanup costs. Based on the recommended cleanup alternatives, estimated total cleanup cost is $91,020, which includes site enrollment in the MDNR B/VCP and technical consulting fees. The fee for site enrollment in the MDNR B/VCP program is $5,200. Whether the subject property will be enrolled in the MDNR B/VCP program is unknown; however, fees associated with the program have been included for planning purposes.

TABLE 4

SUMMARY OF COSTS
ST. LOUIS, 3230-3232 WASHINGTON BOULEVARD, ST. LOUIS, MISSOURI

Contaminant/Material	Recommended Alternative	Action - Cost	Total Cost
ACM	Alternative 3 – Abatement of ACM	Abatement – $49,655	$65,155
		Oversight and Clearance Sampling – $5,000	
		Technical Reporting – $10,500	
LBP	Alternative 2 – LBP Removal by Demolition	TCLP Analysis - $2,500	$9,500
		Technical Reporting – $7,000	
Hazardous Materials	Alternative 2 – Removal of Hazardous Materials	Removal and Disposal/Recycling – $11,159	$11,165
MDNR B/VCP Fees			$5,200
Total Cost			**$91,020**

Notes:

ACM Asbestos-containing material
B/VCP Brownfields/Voluntary Cleanup Program
LBP Lead-based paint
MDNR Missouri Department of Natural Resources

6.0 REFERENCES

Missouri Department of Natural Resources (MDNR). 2017. Air Pollution Control Program Fact Sheet – Asbestos Requirements for Demolition and Renovation Projects. May.

Missouri Department of Natural Resources (MDNR). 2019. Brownfields Assessment Application, Submitted by Washington Tabernacle Missionary Baptist Church for the WE Building property. June 17.

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Toeroek Associates, Inc. (Toeroek). 2021a. Targeted Brownfields Assessment, Phase II Environmental Site Assessment, WE Building, 3230-3232 Washington Boulevard, St. Louis, Missouri. January 15.

Toeroek Associates, Inc. (Toeroek). 2021b. Targeted Brownfields Assessment, Hazardous Materials Survey, WE Building, 3230-3232 Washington Boulevard, St. Louis, Missouri. January 15.

U.S. Department of Housing and Urban Development (HUD). 1997. *Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing*.

U.S. Geological Survey (USGS). 1998. Clayton, Missouri Quadrangle. USGS 7.5-Minute Topographic Series.

U.S. Geological Survey (USGS). 2020. Average concentrations of elements in Saint Louis County, Missouri. https://mrdata.usgs.gov/geochem/county.php?place=f29189&el=As&rf=east-central

APPENDIX A

FIGURES

Legend

Approximate site boundary

N

0 50 100

Feet

Source: Esri, ArcGIS Online, World Imagery (Clarity)

WE Building
3230-3232 Washington Boulevard
St. Louis, Missouri

Figure 1
Site Layout Map

TETRA TECH

Date: 10/14/2020 Drawn By: Nick Wiederholt Project No: 103Z65210190.03.05

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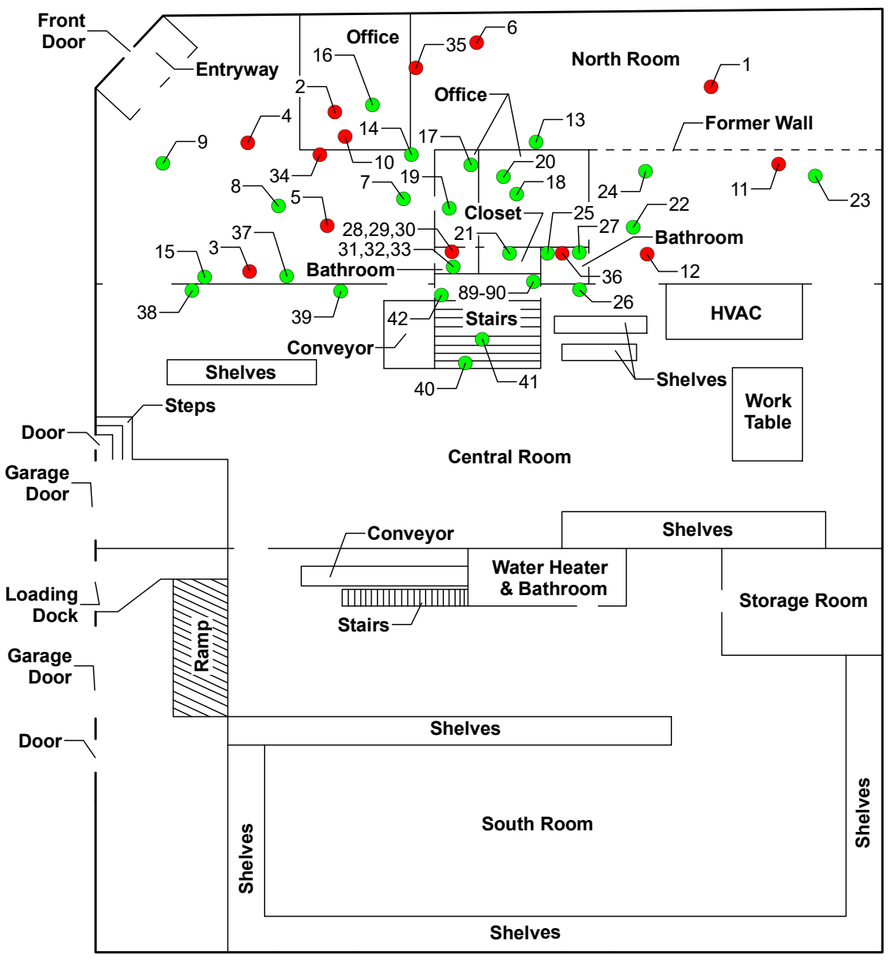
Sample Key Table

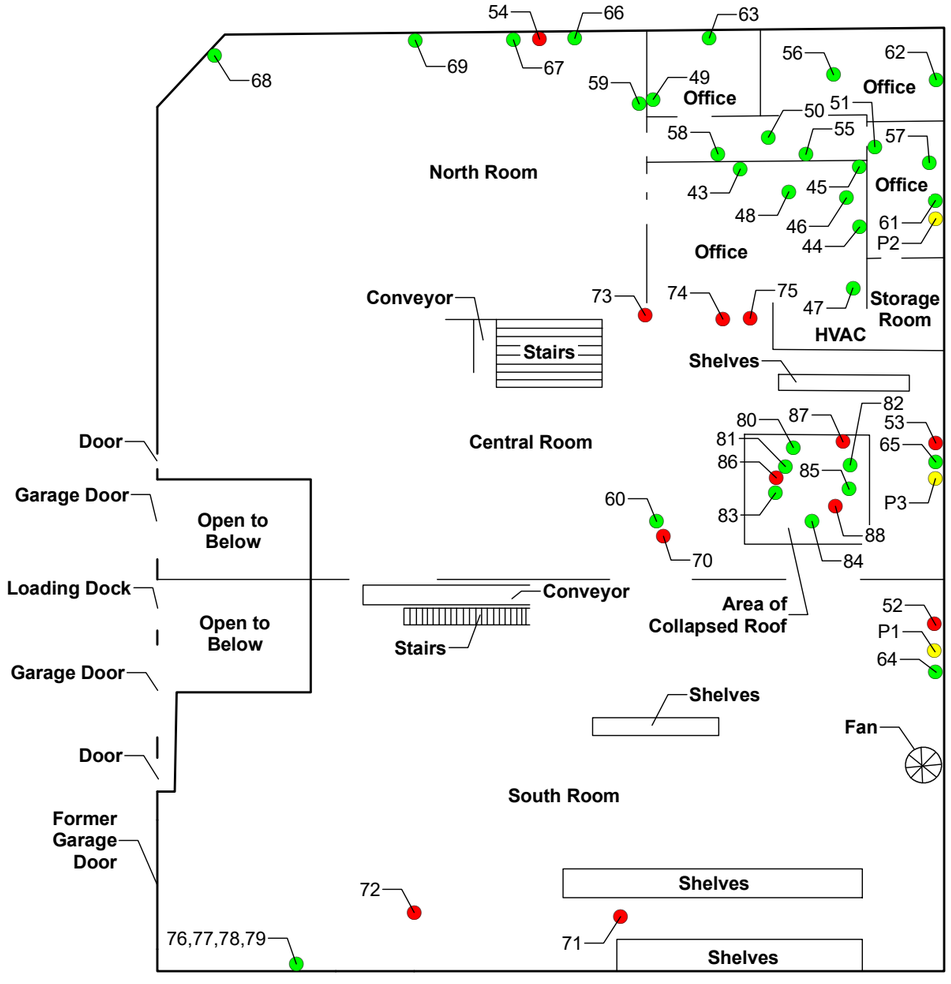
Key	Sample No.
Asbestos	
1	WE-VFT-01
2	WE-VFT-02
3	WE-VFT-03
4	WE-VFT2-01
5	WE-VFT2-02
6	WE-VFT2-03
7	WE-VFT3-01
8	WE-VFT3-02
9	WE-VFT3-03
10	WE-VFT4-01
11	WE-VFT4-02
12	WE-VFT4-03
13	WE-CT-01
14	WE-CT-02
15	WE-CT-03
16	WE-CT2-01
17	WE-CT2-02
18	WE-CT2-03
19	WE-CM-01
20	WE-CM-02
21	WE-CM-03
22	WE-CGB-01
23	WE-CGB-02
24	WE-CGB-03
25	WE-WM-01
26	WE-WM-02
27	WE-WM-03
28	WE-CWT-01
29	WE-CWT-02
30	WE-CWT-03
31	WE-CFT-01
32	WE-CFT-02
33	WE-CFT-03
34	WE-DW-01
35	WE-DW-02
36	WE-DW-03
37	WE-DW2-01
38	WE-DW2-02
39	WE-DW2-03
40	WE-ST-01
41	WE-ST-02
42	WE-ST-03
43	WE-CB-01
44	WE-CB-02
45	WE-CB-03
46	WE-CTX-01
47	WE-CTX-02
48	WE-CTX-03

49	WE-CM2-01
50	WE-CM2-02
51	WE-CM2-03
52	WE-CLK-01
53	WE-CLK-02
54	WE-CLK-03
55	WE-CTX2-01
56	WE-CTX2-02
57	WE-CTX2-03
58	WE-DW3-01
59	WE-DW3-02
60	WE-DW3-03
61	WE-CLK2-01
62	WE-CLK2-02
63	WE-CLK2-03
64	WE-CLK3-01
65	WE-CLK3-02
66	WE-CLK3-03
67	WE-WM2-01
68	WE-WM2-02
69	WE-WM2-03
70	WE-TP-01
71	WE-TP-02
72	WE-TP-03
73	WE-TSI-01
74	WE-TSI-02
75	WE-TSI-03
76	WE-WM3-01
77	WE-WM3-02
78	WE-JC-01
79	WE-JC-02
80	WE-EF-01
81	WE-EF-02
82	WE-EF-03
83	WE-R-01
84	WE-R-02
85	WE-R-03
86	WE-DS-01
87	WE- DS -02
88	WE- DS -03
89	WE-SC-01
90	WE-SC-02
PCB	
P1	WE-PCB-01
P2	WE-PCB-02
P3	WE-PCB-03

Floor 1



Floor 2



Legend

- Asbestos-containing material sample location
- Non-asbestos-containing material sample location
- PCB sample location

PCB Polychlorinated biphenyl

N

0 10 20

Feet

WE Building
3230-3232 Washington Boulevard
St. Louis, Missouri

Figure 2
Asbestos and PCB
Sample Location Map

TETRA TECH

Date: 10/14/2020 Drawn By: Nick Wiederholt Project No: 103Z65210190.03.05

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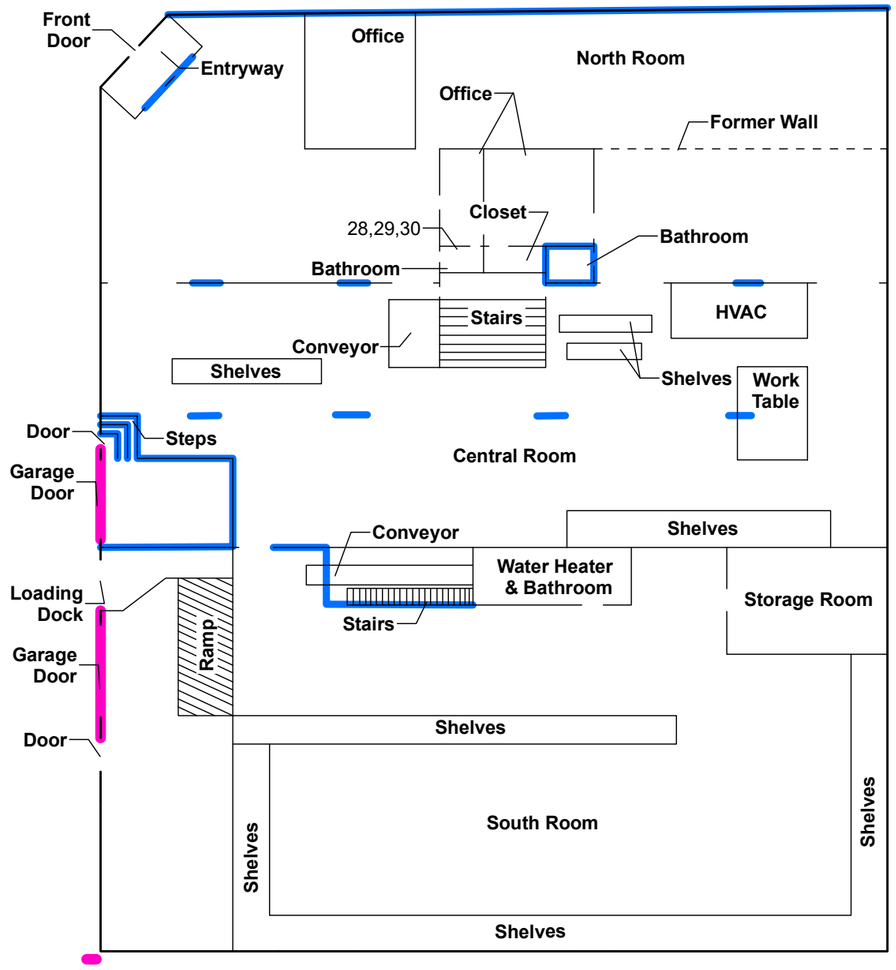
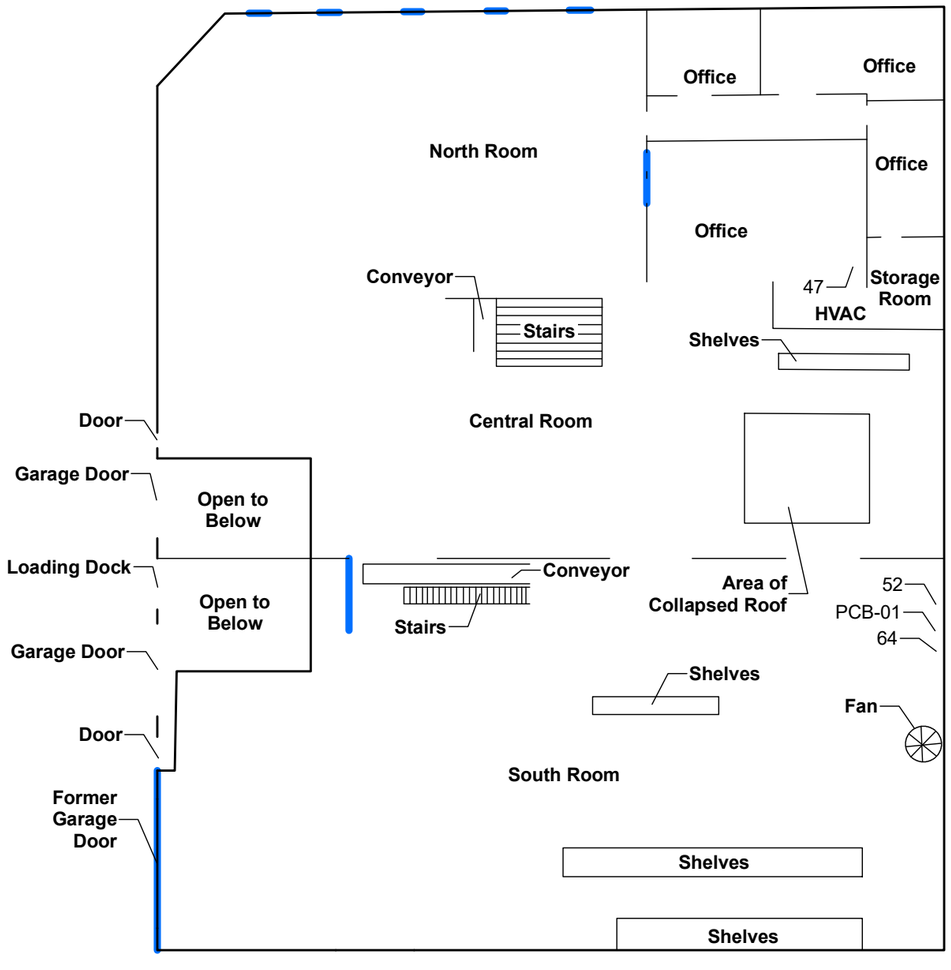
Floor 1



Floor 2



Legend

- Area containing LBP (exterior wall)
- Area containing LBP (interior wall)

LBP Lead-based paint

N

0 10 20

Feet

WE Building
3230-3232 Washington Boulevard
St. Louis, Missouri

Figure 3

Lead-Based Paint Location Map

TETRA TECH

Date: 10/7/2020 Drawn By: Nick Wiederholt Project No: 103Z65210190.03.05

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