DRAFT ANALYSIS OF BROWNFIELDS CLEANUP ALTERNATIVES FOR WHEELOCK ACADAMEY CAMPUS – BATHHOUSE

GARVIN, MCCURTAIN COUNTY, OKLAHOMA

Prepared For

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Date Prepared: August 15, 2025

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LIST OF ACRONYMS

ACBA	Analysis of Brownfields Cleanup Alternatives
ACM	asbestos-containing material
AL	action level
AQCC	Air Quality Control Commission
AHERA	Asbestos Hazard Emergency Response Act
APCD	Air Pollution Control Division
ASTM	American Society for Testing and Materials
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CH	Chrysotile
COC	contaminant of concern
CPSC	Consumer Product Safety Commission
EC	engineering control
EPA	United States Environmental Protection Agency
ESA	environmental site assessment
f/cc	fibers per cubic centimeter
HMWMD	Hazardous Material and Waste Management Division
IC	institutional control
ID	identification
LBP	lead-based paint
LF	linear feet
N/A	Not Applicable
O&M	Operations and Maintenance
ODOL	Oklahoma Department of Labor
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Limit
P.G.	Professional Geologist
PLM	polarized light microscopy
RACM	regulated asbestos-containing material
sq. ft.	square feet
START	Superfund Technical Assessment and Response Team
SOO	Statement of Objectives
TDD	Technical Direction Document
TSI	thermal system insulation

SUMMARY

Crystal Creek LLC was tasked to conduct a brownfield cleanup alternatives analysis at the Wheelock Academy Campus. The site is located at 1377 Wheelock Road, Garvin, Oklahoma 74736. Previous ACM and LBP testing was previously conducted at the Wheelock Academy Campus including the Mission Church by Crystal Creek, LLC, an Oklahoma licensed engineer firm, for the Choctaw Nation and completed in July 2024. The *Phase II Environmental Site Assessment* for Wheelock Academy Campus – *Bathhouse Building, Garvin, Oklahoma,* details the work performed, methods used, information and data acquired, and evaluation and interpretation of results as part of the Phase II ESA. This draft Analysis of Brownfields Cleanup Alternatives is based upon the information presented in the Brownfields Pilot Project, Phase II ESA report and is for the Bathhouse Building only.

SCOPE OF CLEANUP

Based upon the results of the Phase II ESA for Wheelock Academy, the specific concerns addressed in this conceptual cleanup alternatives analysis for the Site include:

A. Asbestos-containing materials (ACM) identified at the Site
B. Lead-Based Paint components (LBP) identified at Site.
C. Lead in soil identified at the Site.

EVALUATION CRITERIA

Cleanup alternatives considered as part of this analysis were evaluated against the following criteria:

- Compliance;
- Effectiveness;
- Difficulty of Implementation;
- Cost.

PREFERRED ALTERNATIVE SELECTED

Of the three cleanup alternatives evaluated for selection at the Wheelock Academy located at 1377 Wheelock Road, Gavin, Oklahoma 74736, the preferred alternative recommended for Bathhouse is:

Alternative 3: Removal of All ACM, Abatement of LBP, and Lead in Soil by a Combination of Removal, Replacement, Enclosure and Encapsulation

This alternative was selected based upon overall compliance with tribal and federal regulations, effectiveness in protecting human health and the environment in both the short-term and long-

term, feasibility of implementation, and cost effectiveness. In addition, this alternative is the closest match to the detailed plans for reuse that have already been considered.

Presented below are the engineering costs to remediate the COCs at the Site. Engineering costs were determined based upon information obtained from the previous Phase I & Phase II ESA (2024), additional sampling and past experience on similar projects. Actual bids from companies to perform the work may vary from this estimate depending on local conditions and other factors outside of the assessor's knowledge. Final design specifications, features, and cost of the actual remedy may differ from the conceptual design presented.

Actual bids from companies to perform the work may vary from this estimate depending on local conditions and other factors outside of the assessor's knowledge. Final design specifications, features, and cost of the actual remedy may differ from the conceptual design presented. A detailed conceptual cost estimate breakdown for the total shown below is presented on Table 1.

Remediation Task	Remediation Cost
Removal of All ACM and Abatement LBP	$93,480
Total	**$93,480**

This summary is a general description of the cleanup alternatives analysis for the Site. This section is not intended to be used alone and does not include the basis of all conclusions presented. The report should be read and used in its entirety and in conjunction with the Brownfields Pilot Project and Phase II ESA report. Information included in this section is subject to the scope of services and limitations noted in the full ABCA, Brownfields Pilot Project and Phase II ESA reports.

1.0 INTRODUCTION

Crystal Creek LLC was tasked to conduct a Phase II Environmental Site Assessment (ESA) and Analysis of Brownfields Cleanup Alternatives at Wheelock Academy and Wheelock Mission Church. The site is located at 1377 Wheelock Road, Gavin, Oklahoma 74736 (Site). The Phase II ESA report, for Wheelock Academy and Wheelock Mission Church Properties, McCurtain County, Oklahoma, details the work performed, methods used, information and data acquired, and evaluation and interpretation of results. This Analysis of Brownfields Cleanup Alternatives is based upon the information presented in the Crystal Creek, LLC's, Phase II Environmental Site Assessment (ESA) dated July, 2024 and the Wheelock Academy Limited Soil Screening dated March 3, 2025. This draft Analysis of Brownfields Cleanup Alternatives is based upon the information presented in the Phase II ESA is for the Bathhouse only.

1.1 Background-History

The original school at Wheelock was a small "day" school, established in 1833 in conjunction with a nearby Christian mission. This marked the beginning of formal education at the site. In 1842, with the establishment of the Choctaw National School System, the institution began receiving financial support from treaty funds secured by the Choctaw Nation from the U.S. Government and was designated as a women's seminary and managed by missionaries with a board of trustees.

Wheelock Seminary was closed in 1861 at the onset of the Civil War. The original structure was destroyed by fire at the close of the Civil War. In the early 1880s Choctaw national leaders decided to rebuild the school on a new site a few hundred yards northeast of the old mission station, school, and church. The present Wheelock Academy building (Bathhouse) was constructed, and a Choctaw orphanage was opened there in September 1884. Over the following seventy years, the Academy flourished as a center of learning for Choctaw girls and young women, ultimately ceasing operations in 1955. The U.S. government assumed jurisdiction over the school in 1910 and full control as well as funding in 1932. After 1955 the facility remained virtually abandoned until later returned to ownership of the Choctaw Nation.

Wheelock Academy served as a model for educational institutions operated by the Five Civilized Tribes and although it played a significant role in advancing indigenous education in Indian Territory it has a complicated history for the Choctaw people, as many boarding schools do. Recognizing its historical and cultural significance, whether positive or negative, Wheelock Academy was later designated a National Historic Landmark by the Secretary of Interior. Today, several of its remaining buildings, along with an on-site museum, preserve and interpret the history of the school and the Choctaw Nation's dedication to education.

In 2001, a report to Congress titled *National Historic Landmarks at the Millennium* identified Wheelock Academy as one of America's "Threatened Landmarks," underscoring the need for continued preservation efforts.

The Wheelock Academy Campus consists of approximately 47 acres and nine (9) Structures located approximately 2 miles north of Highway 70 and approximately 2.5 miles east of Millerton, Oklahoma. The Wheelock Academy Property contains the requested eight (8) buildings which were included in the Phase II which have LBP, lead in soil and/or Asbestos material which need attention. The buildings requested are as follows:

1. McCurtain Hall
2. Caretaker Cottage
3. Superintendent's Office
4. Pushmataha Hall
5. Willson Hall
6. Wheelock Mission Church
7. Boiler House
8. Bathhouse
9. Well House (no regulated material)

ACM and LBP with lead-in-soil testing was conducted in all Wheelock Academy Buildings by Crystal Creek, LLC for a Phase II except the Groundskeepers Cottage which was tested by Choctaw Nation LBP Risk Assessors. Crystal Creek, LLC's, Phase II Environmental Site Assessment (ESA) dated July, 2024 for ACMs and LBP which was identified on/in pipes (ACM), soil (ACM & LBP) wall components (LBP), ceilings (LBP), window components (LBP), door components (LBP) and exterior components.

The Bathhouse was constructed in 1927 is approximately 1,050 sq ft and is vacant. It was originally used as girl's school. The interior structure is in dilapidated conditions. The visual inspection determined the building surfaces were dilapidated throughout and is currently not in use.

The ground surface at the site slopes to the north. Groundcover consists primarily of grasses, trees, landscaped areas and concrete sidewalks. The property can be accessed from Wheelock Road approximately 1.5 miles east of the intersection of Main Street and Highway 70, Millerton, Oklahoma

1.2 Summary of Phase II ESA Results

The Phase II ESA was conducted in accordance with *ASTM International – Standard Practice for Environmental Site Assessments: Phase II Environmental Site Assessment Process E1903-19.* The results of the Phase II ESA confirmed the presence of contaminants of concern (COCs) at the Site.

The following list is a summary of the conclusions regarding COCs and associated media identified at the Site that are addressed in this cost estimate:

ACM: Of the samples submitted for laboratory analysis, fourteen samples were reported as "positive" (>1% asbestos) for asbestos. Asbestos was identified in most Buildings of the Wheelock Academy. ACM is considered to be a contaminant of concern (COC) in relation to the Site. The asbestos pipe insulation (TSI) was found in two areas of the Bathhouse Building. The following table indicates the location and estimated extent of ACM identified at the Site.

TABLE 2: SUMMARY OF HOMOGENEOUS SAMPLING AREAS
BATHHOUSE- BUILDING 5

HA #	HOMOGENEOUS MATERIAL DESCRIPTION	HOMOGENEOUS MATERIAL LOCATION	FRIABILITY (F/NF)	% ASBESTOS*	# OF SAMPLES COLLECTED	CONDITION	APPROXIMATE QUANTITY
M-02	*Window Caulk*	*Windows Exterior Facing*	*NF*	*5% C*	*3*	*Good*	*~45 LF*

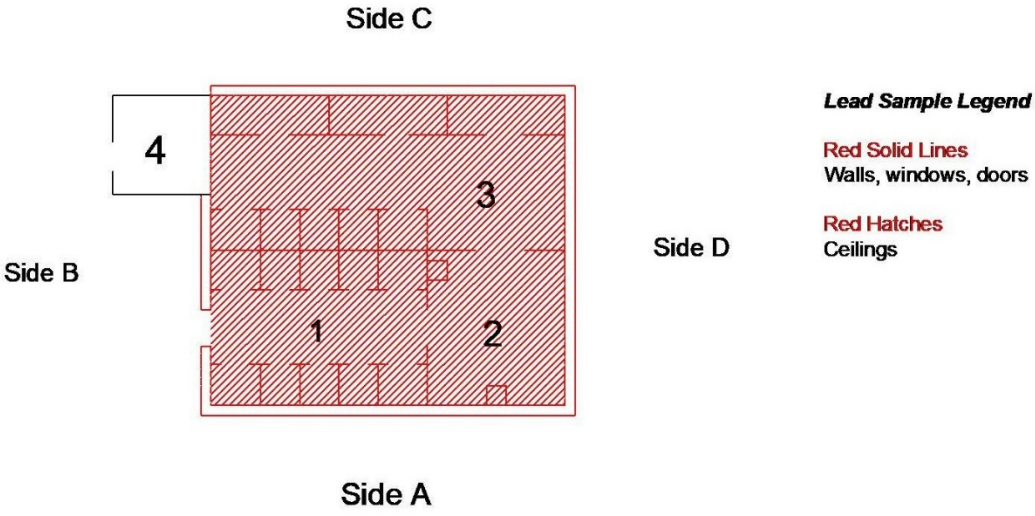
NA= Not Applicable **ND= None Detected** **MAS= Mastic** **CT= Ceiling Tile** **C= Chrysotile**
NIS= Not in Scope of Work **DW= Drywall** **JC= Joint Compound** **TXT= Texturing** **V= Vermiculite**
SD= Significantly Damaged **D= Damaged**

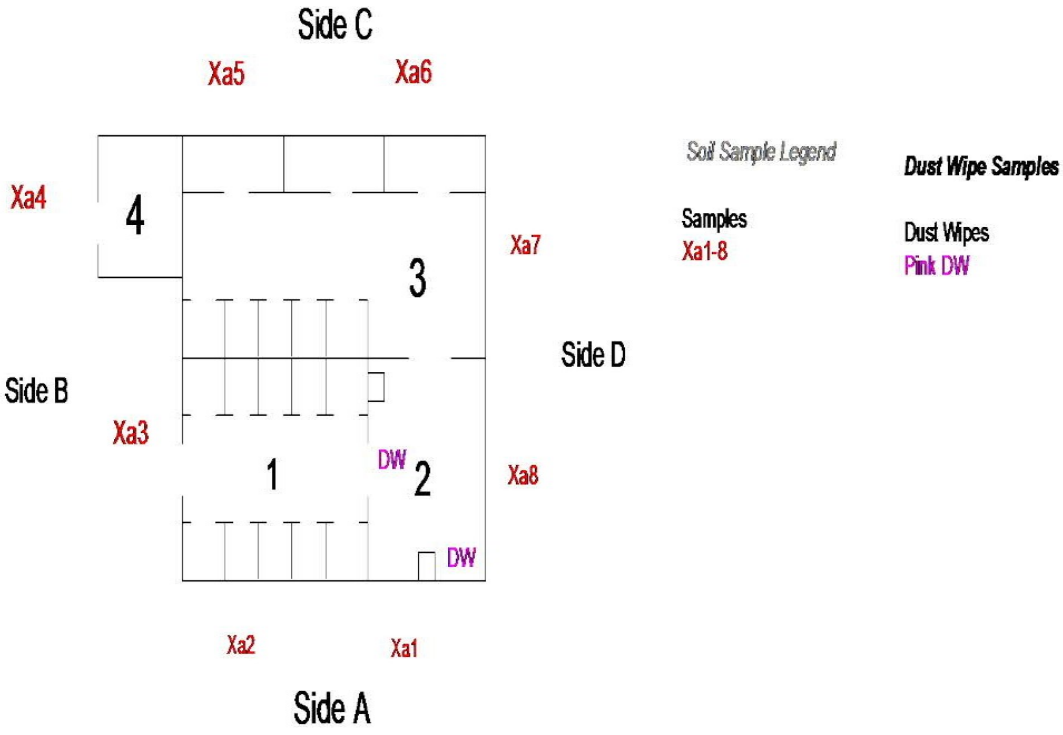
LF – linear feet
SF – square feet
CH – Chrysotile
A - Amosite

LBP - The inspection of Bathhouse Building was conducted following the U.S. Department of Housing and Urban Development (HUD) Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing with the 1997 revision. The standard for lead-based paint as per HUD/EPA standard of 1.0 mg/cm^2 was followed. All requirements for the NITON XRF usage contained in the Performance Characteristics Sheet for the specific XRF were followed. LBP was identified throughout the Bathhouse Building. LBP is considered to be a contaminant of concern (COC) in relation to the Site.

Interior Materials Bathhouse Building

The following tested painted components were found to contain lead in a concentration greater than the federal threshold of 1.0 mg/cm^2 of surface as measured by an XRF.


Side C
4
3
Side B
Side D
1
2
Side A
Lead Sample Legend
Red Solid Lines
Walls, windows, doors
Red Hatches
Ceilings


Side C
Xa5
Xa6
Xa4
4
3
Xa7
Side D
Side B
Xa3
DW
1
2
Xa8
DW
Xa2
Xa1
Side A
Soil Sample Legend
Samples
Xa1-8
Dust Wipe Samples
Dust Wipes
Pink DW

Exterior Materials – Bathhouse Building

Exterior painted surfaces tested (homogeneous areas) were found to contain lead in a concentration greater than the federal threshold of 1.0 mg/cm^2 of surface as measured by the XRF. See above.

1.3 Project Goals / Site Reuse Plan

Based on information that the Choctaw Nation Brownfields Program, the current site reuse plan will be determined and finalized by the Choctaw Nation Tribal Council. However, at this time of this ABCA document there were six reuse plans being considered and drafted which include expansion of the current museum, an interpretive center, retreat center, historic tourism, recreation, tribal education, college or training center. Any finalized reuse plans shall be finalized by the decision of the Tribal Council and the Chief of the Choctaw Nation of Oklahoma.

1.4 Cleanup Scope and Goals

Based upon the results of the Phase II ESA conducted, the specific concerns addressed in this conceptual cleanup alternatives analysis for the Site include:

A. ACM, LBP and lead in soil identified at the Site

The overall purpose of a cleanup at the Site is to allow the property to be redeveloped while mitigating the risk that COCs currently present at the Site pose to human health and the environment. The cleanup goal(s) for the Site are listed below:

- Remove and dispose of COCs to allow for redevelopment of the property;
- Conduct cleanup operations that are compliant with applicable local, Tribal, and federal standards that will protect human health and the environment;
- Implement cleanup alternative(s) that are practical and effective in mitigating COCs to protect human health and the environment in both the short-term and long-term.

2.0 EVALUATION CRITERIA FOR ALTERNATIVES

Each of the potential cleanup alternatives is evaluated against the following set of four criteria:

2.1 Compliance

Compliance with applicable state, federal and tribal regulations.

2.1.a Cleanup Oversight Responsibility

The cleanup will be overseen by the Tribal Environmental Department in consultation with EPA. In addition, all documents prepared for this site are submitted to the Tribal

environmental department under CNO Tracking Number MCTTT01116 and to EPA under ACRES site number 244077. It is recommended that the following regulations be followed: The Small Business Relief and Brownfields Revitalization Act, Occupational Safety and Health Act, and any applicable provisions of the Clean Air Act, Resource Conservation and Recovery Act, the Toxic Substance Control Act, and Comprehensive Environmental Response, Comprehensive, and Liability Act where they pertain to remediation and disposal of lead in soil. Applicable sections of the CNO Environmental Codes and the CNO LBP/Asbestos Policies will be followed. Also, the following qualifications should be held by the remedial contractor(s) selected to oversee and/or implement the following remediation tasks and activities:

ACM Remediation

All aspects of ACM Cleanup Oversight must be conducted in accordance with the CNO Asbestos Policy, Occupational Safety and Health Administration (OSHA) 1926.1101, Asbestos NESHAP found in 40 CFR Part 61, Subpart M and DEQ has the delegated responsibility to regulate this NESHAP in Oklahoma. When selecting firm(s) and/or individuals to utilize, it is recommended that the following certifications be verified, at a minimum:

1) State of Oklahoma licensed Asbestos Management Planner to perform:
   - Development of asbestos project designs;
   - Air monitoring for asbestos fibers;

2) State of Oklahoma licensed Asbestos Abatement Contractor.

3) Abatement required air monitoring shall be overseen by a licensed third-party contractor. All clearance will be overseen by that same third-party contractor. So that the abatement activities and clearance activities are overseen by two different contractors.

LBP Abatement

All aspects of LBP Cleanup Oversight must be conducted in accordance with OSHA Lead in Construction Standard found in 29 CFR Part 1926, 40 CFR Part 745 and TSCA Title IV 402/404. When selecting firm(s) and/or individuals to utilize, it is recommended that the following certifications be verified, at a minimum:

4) State of Oklahoma license Lead-Based Paint Firm to perform:

- Development of LBP abatement plan;

5) State of Oklahoma licensed LBP Abatement Workers.

6) Clearance testing by a state/federal licensed LBP Risk Assessor

2.1.b Cleanup Standards for Contaminants

The following standards are recommended to be met during the remediation tasks and activities:

ACM Remediation

Cleanup levels for ACM remediation must meet standards in accordance with 40 CFR Part 61, Subpart M and DEQ has the delegated responsibility to regulate this NESHAP in Oklahoma. Occupational Safety and Health Administration (OSHA) 1926.1101. Examples of applicable standards include:

Asbestos Action Levels		
Asbestos Sample	**Regulatory Action Level**	**Source of Regulation**
Regulated Asbestos-Containing Material (RACM) – Bulk Materials	>1% asbestos	Asbestos Hazard Emergency Response Act (AHERA)
Asbestos Air Monitoring - Workers	0.1 fibers/cubic centimeter (f/cc) (action level [AL])	Occupational Safety and Health Administration (OSHA) 1926.1101
	0.2 f/cc (Permissible Exposure Level [PEL])	OSHA 1926.1101
Asbestos Air Monitoring – Final Clearance	0.01 f/cc	EPA AHERA

A list of solid waste landfills approved to accept friable asbestos waste is provided in Appendix A.

LBP Remediation

Cleanup levels for LBP remediation must meet standards in accordance with OSHA Lead in Construction Standard found in 29 CFR Part 1926.62. Examples of applicable standards include:

LBP Action Levels		
LBP Sample	**Regulatory Action Level**	**Source of Regulation**
Lead-Based Paint	1.0 mg/cm2	EPA, 40 CFR Part 745
Lead in Air Monitoring - Workers	30 µg/m^3 (action level [AL])	Occupational Safety and Health Administration (OSHA) 29 CFR Part 1926.62
	50 µg/m^3 (Permissible Exposure Level [PEL])	OSHA 29 CFR Part 1926.62

EPA & HUD LBP Clearance Limits for Sample Locations

Sample Location	HUD Clearance Limits	EPA Clearance Limits
Floor	10 µg/sq. ft.	5 µg/sq. ft
Window Sills	100.00 µg/sq. ft.	40.00 µg/sq. ft.
Window Trough	400 µg/sq. ft.	100 µg/sq. ft.
Play Area Soil	400 PPM	400 PPM
Dripline Soil	1200 PPM.	1200 PPM
Abatement of Soil	5000 PPM	5000 PPM

2.1.c Laws & Regulations Applicable to Cleanup

The following laws and regulations are mandatory and/or recommended to be followed during the cleanup tasks and activities:

ACM Abatement

- Occupational Safety and Health Administration (OSHA) 1926.1101
- Asbestos NESHAP is found in 40 CFR Part 61, Subpart M and DEQ has the delegated responsibility to regulate this NESHAP in Oklahoma – Governs the disposal of asbestos waste and the management of asbestos contamination.

LBP Abatement

- Oklahoma Department of Environmental Quality, OAC 252:110 Lead-Based Paint Management, which implements the OK Lead-Based Paint Management Act – Governs LBP abatement on child occupied housing in Oklahoma.
- OSHA Lead in Construction Standard found in 29 CFR Part 1926.62 – Governs the lead in air for abatement and construction.
- Title IV of the Toxic Substances Control Act (TSCA), as well as other authorities in the Residential Lead-Based Paint Hazard Reduction Act of 1992
- Small Business Liability Relief and Brownfields Revitalization Act, enacted in 2002, which amended the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)
- 40 CFR Part 745

2.2 Effectiveness

- Protection of human health and the environment, including workers during implementation;
- Feasibility for mitigation of risk in the short-term and long-term effectiveness;
- Complete removal of contaminants;
- Achievability of the cleanup goals;

2.3 Difficulty of Implementation

- Technical feasibility;
- Availability of work force, materials, and equipment;
- Administrative ability;
- Construction feasibility;
- Maintenance and monitoring requirements.

2.4 Cost (Conceptual costs for comparative analysis only)

- Time requirements, materials, equipment, labor and waste disposal locations.

The selection of "effectiveness", "feasibility", and "cost" as evaluation criteria is based upon the EPA's *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA* (EPA, 1988). In addition, the selection of "compliance" as an evaluation criterion is used consider variations between federal, state, and/or local regulations, if applicable, on a site-by-site basis.

3.0 CLEANUP ALTERNATIVES FOR EVALUATION

Listed below are the specific cleanup alternatives evaluated based upon the results of the Phase II ESA conducted at the Site. In addition, alternatives considered, but not evaluated due to site-specific factors which eliminated the alternative from further analysis are also listed, if applicable.

3.1 Cleanup Alternatives Evaluated

The following removal action alternatives were considered as part of this evaluation.

- Alternative 1: **No Action**
- Alternative 2: **Contain and/or Encapsulate Damage Friable ACM, Implement Operations and Maintenance. Specialized Cleaning and Painting**
- Alternative 3: **Removal of All ACM and Abatement LBP by a Combination of Removal, Replacement, Enclosure and Encapsulation**

4.0 COMPARATIVE ANALYSIS OF CLEANUP ALTERNATIVES

The potential cleanup alternatives for the Site were evaluated using the evaluation criteria described in Section 2. General descriptions of the conceptual design of each alternative are described below. Discussions of the pros and cons of each alternative are presented in the following subsections. Final design specifications and features of the actual remedy may differ from the conceptual design described herein.

Alternative 1: (No Action) The No Action alternative would involve leaving the Site in its current state. There would be no removal, containment, engineering control (EC), or institutional control (IC) actions implemented. The No Action alternative provides a baseline against which other alternatives can be compared. A consideration of risk is taken into account if no action is taken as opposed to implementing a cleanup action.

Alternative 2: Contain and/or Encapsulate Damaged Friable Asbestos, Implement Operations and Maintenance Plan, Specialized Cleaning and Painting as Interim Controls Consists of containing/encapsulating the deteriorated asbestos-containing material (ACM). This would include applying a lap cloth, CP 11 or a bridging encapsulant to damaged ACM. The deteriorated lead-based paint (LBP) in the building with deteriorated was found in some interiors plaster walls, metal ceilings, two doors, some exterior walls, windows and wood components. The areas with the deteriorated LBP would be wet scrape, primed and painted with quality paint (interim controls). The entire facility would undergo specialized cleaning to reduce the amount of LBP dust on the floors. The development and implementation of an Operations and Maintenance (O&M) Plan for ACM and LBP would result in LBP/ACM left in place in this alternative.

Alternative 3: Removal of All ACM and Abatement LBP by a Combination of Removal, Replacement, Enclosure and Encapsulation. Alternative 3 consists of removing and disposing of all ACM. The abatement will follow the Project Design developed by a licensed Project Designer. The asbestos abatement will also follow all federal regulations and be completed by a licensed asbestos abatement contractor. The lead-based paint (LBP) in the building was found throughout the facility on plaster walls, metal ceilings, some exterior walls, wood components & windows. The areas with the deteriorated LBP would be wet scrape, primed and painted with elastomeric LBP encapsulant paint. The entire facility would undergo specialized cleaning to reduce the amount of LBP dust on the floors. The development and implementation of an Operations and Maintenance (O&M) Plan for LBP left in place after abatement.

4.1 Compliance

Alternative 1 (No Action) would not be compliant with Tribal and/or federal regulations for the Site in its current condition due to the presence and deteriorated condition of the known COCs. The areas with asbestos and LBP damage should have very limited access. Personnel entering these areas should have awareness training at a minimum. This alternative will increase ongoing maintenance.

Alternative 2 Contain and/or Encapsulate Damage Friable Asbestos, Implement Operations and Maintenance Plan, Specialized Cleaning and Painting as Interim Controls. Alternative 2 consists of containing/encapsulating the deteriorated asbestos containing material. This would include applying a bridging encapsulant to damage asbestos containing material (ACM). The deteriorated lead-based paint (LBP) in the building was found in throughout and is currently not in use. The areas with the deteriorated lead-based paint (LBP) will be wet scraped, primed and painted with quality paint (interim controls). The entire facility would undergo specialized cleaning to reduce the amount of LBP dust on the floors. Based on lead levels in Soils require abatement options, removed and replace or enclosed with a pavement. The development and implementation of an Operations and Maintenance (O&M) Plan for ACM and LBP left in place for this alternative is required by CNO Policy. Federal regulations do not require the asbestos & LBP need to be removed. Therefore, Alternative 2 follows Tribal and federal regulations for ACM and LBP.

Alternative 3 Removal of All ACM and Abatement LBP by a Combination of Removal, Replacement, Enclosure and Encapsulation. Alternative 3 consists of removing and disposing of all ACM according to all federal, state and local regulations. The LBP abatement will follow all federal, local regulations. The abatement does not remove all LBP but does manage the intact LBP according to the LBP O&M Plan. The abatement option for LBP in soil for this site will be remove and place with clean tested soil. Therefore, Alternative 3 is in compliance with CNO LBP Policy, federal and local regulations for ACM and LBP.

4.2 Effectiveness

Alternative 1 (No Action) will not reduce the potential for exposure of human health and the environment to COCs or provide a reduction in the toxicity, mobility, or volume of contaminants as site conditions will deteriorate continually with time. The estimated risk from COCs to potential receptors would not be decreased in the short-term or long-term.

Alternative 2 Contain and/or Encapsulate Damaged Friable Asbestos, Implement Operations and Maintenance Plan, Specialized Cleaning and Painting (Interim Controls) consists of containing/encapsulating the deteriorated asbestos containing material and deteriorated

LBP which will reduce the potential for exposure of human health and the environment to COCs. Soils would require abatement options, removed and replace or encapsulate with a pavement. The estimated risk from COCs to potential receptors would be decreased in the short-term. Alternative 2 would **not** achieve the cleanup goals set for the Site in the long-term. This alternative does achieve a use outcome for the property.

Alternative 3 Removal of All ACM and Abatement LBP by a Combination of Removal, Replacement, Enclosure and Encapsulation will be effective in the short-term and long-term due to the removal of all or stabilization of the COCs. If implemented properly, due to no asbestos contaminants left on-site and stabilization or remove/replacement of LBP hazards and with an LBP O&M Plan, there will be no risk to human health or the environment remaining at the Site. This alternative is the only one that is the safest for workers and eliminates the chance of asbestos and LBP potential for exposure to human health and the environment. This alternative will allow for the CNO cleanup goal to be achieved.

4.3 Difficulty of Implementation

Alternative 1 No Action is technically and administratively feasible. Maintenance or monitoring will be required. Changes in climate will not alter the risk associated with this alternative. Although implementation is possible, the "No Action" alternative would not meet the cleanup goal may expose current occupants to COCs.

Alternative 2 Contain and/or Encapsulate Damage Friable Asbestos, Implement Operations and Maintenance Plan, Specialized Cleaning and Painting (Interim Controls) consists of containing/encapsulating the deteriorated asbestos containing material. Soils would require abatement options, removed and replace or encapsulate with a pavement. An Operations and Maintenance (O&M) Plan for ACM and LBP left in place for this alternative will be developed and on-site maintenance personnel will be trained to implement the plans. This type of cleanup and stabilization is feasible and is standard practice of asbestos and LBP projects. Difficulty to implement this plan is moderate. Coordination during interim control activities is anticipated with short-term low-level disturbances to the site. This alternative would also require an Asbestos Management Plan and continued quarterly and annual monitoring.

Alternative 3: Removal of All ACM and Abatement LBP by a Combination of Removal, Replacement, Enclosure and Encapsulation. Alternative 3 consists of the removal of and/or stabilization of the COCs. If implemented properly, due to no asbestos contaminants left on-site and stabilization or removal/replacement of LBP hazards and with an LBP O&M Plan, there will be no risk to human health or the environment remaining at the Site. The ACM abatement will follow the Project Design and the LBP will follow the LBP Abatement Plan. An Operations and Maintenance (O&M) Plan for LBP left in place for this alternative will be develop and on-site maintenance personnel will be trained to implement the plans.

The difficulty level of implementing this plan is moderate to high - moderate. Coordination during cleanup activities is anticipated with short-term moderate disturbance to the site. THPO consultation would also be required and coordinated with EPA, SOI, and CNO would be required.

Access to the Site is currently available and no areas are inaccessible by passenger vehicles. No road improvements would be required to provide access for construction equipment and personnel.

4.4 Cost

Costs incurred are evaluated on a scale of low, moderate, and high in relation to each of the other alternatives and based upon past experience with similar projects. Conceptual costs (not intended for budgetary estimates) were evaluated for time, effort, labor, and materials necessary.

Alternative 1 (No Action) has low costs associated with this option. Minimal amounts of time, effort, and labor would be required.

Alternative 2 Alternative 2 Contain and/or Encapsulate Damage Friable Asbestos, Implement Operations and Maintenance Plan, Specialized Cleaning and Painting (Interim Controls). This level of work will take similar time and effort as removal, except asbestos materials are left in place and will require monitoring. This option will require pest control of wasp that are living in wall and floors

Alternative 3: Removal of All ACM and Abatement LBP by a Combination of Removal, Replacement, Enclosure and Encapsulation consists of removing and disposing of all ACM and encapsulation and/or removal of LBP. An Operations and Maintenance (O&M) Plan for LBP left in place for this alternative will be developed. This option will require pest control of wasp that are living in walls and floors

A summary of the cost comparison of each of the alternatives is presented in the following table, with the most expensive alternative listed as 3rd and the least expensive alternative listed as 1st.

4.5 Summary Comparison of Potential Alternatives

Comparisons are based on the four evaluation criteria previously discussed. A summary of the comparison of each of the alternatives is presented below along with status as to whether the alternative was retained for consideration as the preferred alternative selected.

Cleanup Alternative	Compliance	Effectiveness	Implementability	Cost	Comment
Alternative 1: No Action	Non-compliant	Not effective	Implementable	$5,000-$12,000	This alternative does not satisfy the cleanup goals for this site. Cost to secure the building.
Alternative 2: Encapsulation of Friable ACM - RACM and LBP Interim Controls (IC) on Poor Condition Paint and LBP in Soils, The dripline soil will require abatement.	Compliant	Effective	Implementable	Asbestos $ 2,000 LBP IC $ 39,500 LBP Soil & Chips $ 25,350 Total $ 66,850	This alternative does satisfy the cleanup goals for this site and allows for continued current use of the property. It leaves the asbestos in the basement/crawl space that will require monitoring and needs to be removed in future if utilities are upgraded. Remove paint chips and soils will require TCLP testing to determine the if waste is non-hazardous or hazardous for disposal.
Alternative 3: Abatement of All ACM and LBP Abatement will be a Combination of Removal, Replacement, Enclosure and Encapsulation on Poor Condition Paint and on LBP in Soils	Compliant	Effective	Implementable	Asbestos $ 3,000 LBP $ 65,130 LBP Soil & Chips $ 25,350 Total $ 93,480	This alternative satisfies the cleanup goal for the building and is the option that permanently mitigates the asbestos and manages the LBP with a minimum twenty-year abatement option. Remove paint chips and soils will require TCLP testing to determine the if waste is non-hazardous or hazardous for disposal. However, it is the most expensive alternative but is the most compliant and effective option.

Bathhouse Abatement Cost Breakdown:

Asbestos:

Removal of ~ 45 LF of asbestos containing window caulking	$ 3,000.00
Subtotal	**$ 3,000.00**

LBP:

Abatement of ~ 3,440 sf of deteriorated LBP walls, ceilings & components	$ 40,350.00
Abatement of ~ 1,620 sf of deteriorated exterior LBP walls & components	$ 21,280.00
Cleaning & sealing of floors	$ 3,500.00
Subtotal	**$ 65,130.00**

LBP Soil & Paint Chips	
Removal of 16 cy LBP non-hazardous soil	$ 5,800.00
Disposal of 16 cy LBP non-hazardous soil	$ 15,750.00
Disposal of LBP hazardous paint chips	$ 3,800.00
Subtotal	**$ 25,350.00**
Total	**$ 93,480.00**

5.0 PERFERRED CLEANUP ALTERNATIVE

5.1 ACM REMOVAL AND LBP ABATEMENT

Of the three cleanup alternatives evaluated for selection at the Wheelock Academy located at 1377 Wheelock Road, Gavin, Oklahoma 74736, the preferred alternative recommended is:

Alternative 3: Removal of All ACM and Abatement LBP by a Combination of Removal, Replacement, Enclosure and Encapsulation

This alternative was selected based upon overall compliance with state and/or federal regulations, effectiveness in protecting human health and the environment in both the short-term and long-term, feasibility of implementation, and cost effectiveness. In addition, this alternative is the closest match to the detailed plans for reuse that have already been considered.

Presented below are the engineering costs to remediate the COCs at the Site. Engineering costs were determined based upon information obtained from the previous Phase I & Phase II ESA (2024), and past experience on similar projects. Actual bids from companies to perform the work may vary from this estimate depending on local conditions and other factors outside of the assessor's knowledge. Final design specifications, features, and cost of the actual remedy may differ from the conceptual design presented.

6.0 SPECIFICATIONS FOR REPORT USE AND RELIANCE

6.1 Special Terms and Conditions

This document has been prepared for the Choctaw Nation for the use and benefit of the Choctaw Nation. Any use of this document or information herein by persons or entities other than Choctaw Nation without the express written consent will be at the sole risk and liability of said person or entity. It is understood that this document may not include all information pertaining to the described site.

6.2 Disclaimers

The cost estimate in this report is based upon the Phase II Environmental Site Assessment (ESA 2024) by Crystal Creek LLC, Inc. Phase II Environmental Site Assessment (ESA) which were in general conformance with the scope and limitations of ASTM E1903-19. The cost estimate presented herein is based on costs from engineering estimate past experience on similar projects as selected alternative presented in this document. Professional opinions are based solely on data collected during the assessment and/or interpretation of information and past data provided for review. Crystal Creek LLC does not warrant or guarantee information obtained from third parties used for this assessment are correct, complete, and/or current.

7.0 REFERENCES

Oklahoma Department of Labor, Oklahoma Asbestos Control Act 40 O.S. § 450, et seq. Abatement of Friable Asbestos Materials Rules OAC 380:50

Asbestos NESHAP is found in 40 CFR Part 61, Subpart M and DEQ has the delegated responsibility to regulate this NESHAP in Oklahoma.

American Society for Testing and Materials (ASTM), 2021. E1903-19, *Standard Practice for Environmental Site Assessments: Phase II Environmental Site Assessment Process.*

EPA, 1988. *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA*. (EPA/540/G-89/004).

HUD LBP Guidelines for the Evaluation and Control of LBP hazards in Housing, Chapter 7

Phase I Environmental Site Assessment (2020), A & M Engineering and Environmental Services, Inc.

Phase II Environmental Site Assessment (2024), Crystal Creek LLC

APPENDIX A
SOLID WASTE LANDFILLS APPROVED TO ACCEPT FRIABLE ASBESTOS WASTE

DRAFT ANALYSIS OF BROWNFIELDS CLEANUP ALTERNATIVES FOR WHEELOCK ACADAMEY CAMPUS – BOILER HOUSE

GARVIN, MCCURTAIN COUNTY, OKLAHOMA

Prepared For

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Date Prepared: August 15, 2025

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LIST OF ACRONYMS

ACBA	Analysis of Brownfields Cleanup Alternatives
ACM	asbestos-containing material
AL	action level
AQCC	Air Quality Control Commission
AHERA	Asbestos Hazard Emergency Response Act
APCD	Air Pollution Control Division
ASTM	American Society for Testing and Materials
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CH	Chrysotile
COC	contaminant of concern
CPSC	Consumer Product Safety Commission
EC	engineering control
EPA	United States Environmental Protection Agency
ESA	environmental site assessment
f/cc	fibers per cubic centimeter
HMWMD	Hazardous Material and Waste Management Division
IC	institutional control
ID	identification
LBP	lead-based paint
LF	linear feet
N/A	Not Applicable
O&M	Operations and Maintenance
ODOL	Oklahoma Department of Labor
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Limit
P.G.	Professional Geologist
PLM	polarized light microscopy
RACM	regulated asbestos-containing material
sq. ft.	square feet
START	Superfund Technical Assessment and Response Team
SOO	Statement of Objectives
TDD	Technical Direction Document
TSI	thermal system insulation

SUMMARY

Crystal Creek LLC was tasked to conduct a brownfield cleanup alternatives analysis at the Wheelock Academy Campus. The site is located at 1377 Wheelock Road, Garvin, Oklahoma 74736. Previous ACM and LBP testing was previously conducted at the Wheelock Academy Campus including the Mission Church by Crystal Creek, LLC, an Oklahoma licensed engineer firm, for the Choctaw Nation and completed in July 2024. The *Phase II Environmental Site Assessment* for Wheelock Academy Campus – *Boiler House Building, Garvin, Oklahoma,* details the work performed, methods used, information and data acquired, and evaluation and interpretation of results as part of the Phase II ESA. This draft Analysis of Brownfields Cleanup Alternatives is based upon the information presented in the Brownfields Pilot Project, Phase II ESA report and is for the Boiler House Building only.

SCOPE OF CLEANUP

Based upon the results of the Phase II ESA for Wheelock Academy, the specific concerns addressed in this conceptual cleanup alternatives analysis for the Site include:

A. Asbestos-containing materials (ACM) identified at the Site
B. Lead-Based Paint components (LBP) identified at Site.
C. Lead in soil identified at the Site.

EVALUATION CRITERIA

Cleanup alternatives considered as part of this analysis were evaluated against the following criteria:

- Compliance;
- Effectiveness;
- Difficulty of Implementation;
- Cost.

PREFERRED ALTERNATIVE SELECTED

Of the three cleanup alternatives evaluated for selection at the Wheelock Academy located at 1377 Wheelock Road, Gavin, Oklahoma 74736, the preferred alternative recommended for Boiler House is:

Alternative 3: Removal of All ACM, Abatement of LBP, and Lead in Soil by a Combination of Removal, Replacement, Enclosure and Encapsulation

This alternative was selected based upon overall compliance with tribal and federal regulations, effectiveness in protecting human health and the environment in both the short-term and long-

term, feasibility of implementation, and cost effectiveness. In addition, this alternative is the closest match to the detailed plans for reuse that have already been considered.

Presented below are the engineering costs to remediate the COCs at the Site. Engineering costs were determined based upon information obtained from the previous Phase I & Phase II ESA (2024), additional sampling and past experience on similar projects. Actual bids from companies to perform the work may vary from this estimate depending on local conditions and other factors outside of the assessor's knowledge. Final design specifications, features, and cost of the actual remedy may differ from the conceptual design presented.

Actual bids from companies to perform the work may vary from this estimate depending on local conditions and other factors outside of the assessor's knowledge. Final design specifications, features, and cost of the actual remedy may differ from the conceptual design presented. A detailed conceptual cost estimate breakdown for the total shown below is presented on Table 1.

Remediation Task	Remediation Cost
Removal of All ACM and Abatement LBP	$31,900
Total	**$31,900**

This summary is a general description of the cleanup alternatives analysis for the Site. This section is not intended to be used alone and does not include the basis of all conclusions presented. The report should be read and used in its entirety and in conjunction with the Brownfields Pilot Project and Phase II ESA report. Information included in this section is subject to the scope of services and limitations noted in the full ABCA, Brownfields Pilot Project and Phase II ESA reports.

1.0 INTRODUCTION

Crystal Creek LLC was tasked to conduct a Phase II Environmental Site Assessment (ESA) and Analysis of Brownfields Cleanup Alternatives at Wheelock Academy and Wheelock Mission Church. The site is located at 1377 Wheelock Road, Gavin, Oklahoma 74736 (Site). The Phase II ESA report, for Wheelock Academy and Wheelock Mission Church Properties, McCurtain County, Oklahoma, details the work performed, methods used, information and data acquired, and evaluation and interpretation of results. This Analysis of Brownfields Cleanup Alternatives is based upon the information presented in the Crystal Creek, LLC's, Phase II Environmental Site Assessment (ESA) dated July, 2024 and the Wheelock Academy Limited Soil Screening dated March 3, 2025. This draft Analysis of Brownfields Cleanup Alternatives is based upon the information presented in the Phase II ESA is for the Boiler House only.

1.1 Background-History

The original school at Wheelock was a small "day" school, established in 1833 in conjunction with a nearby Christian mission. This marked the beginning of formal education at the site. In 1842, with the establishment of the Choctaw National School System, the institution began receiving financial support from treaty funds secured by the Choctaw Nation from the U.S. Government and was designated as a women's seminary and managed by missionaries with a board of trustees.

Wheelock Seminary was closed in 1861 at the onset of the Civil War. The original structure was destroyed by fire at the close of the Civil War. In the early 1880s Choctaw national leaders decided to rebuild the school on a new site a few hundred yards northeast of the old mission station, school, and church. The present Wheelock Academy building was constructed, and a Choctaw orphanage was opened there in September 1884. Over the following seventy years, the Academy flourished as a center of learning for Choctaw girls and young women, ultimately ceasing operations in 1955. The U.S. government assumed jurisdiction over the school in 1910 and full control as well as funding in 1932. After 1955 the facility remained virtually abandoned until later returned to ownership of the Choctaw Nation.

Wheelock Academy served as a model for educational institutions operated by the Five Civilized Tribes and although it played a significant role in advancing indigenous education in Indian Territory it has a complicated history for the Choctaw people, as many boarding schools do. Recognizing its historical and cultural significance, whether positive or negative, Wheelock Academy was later designated a National Historic Landmark by the Secretary of Interior. Today, several of its remaining buildings, along with an on-site museum, preserve and interpret the history of the school and the Choctaw Nation's dedication to education.

In 2001, a report to Congress titled *National Historic Landmarks at the Millennium* identified Wheelock Academy as one of America's "Threatened Landmarks," underscoring the need for continued preservation efforts.

The Wheelock Academy Campus consists of approximately 47 acres and nine (9) Structures located approximately 2 miles north of Highway 70 and approximately 2.5 miles east of Millerton, Oklahoma. The Wheelock Academy Property contains the requested eight (8) buildings which were included in the Phase II which have LBP, lead in soil and/or Asbestos material which need attention. The buildings requested are as follows:

1. McCurtain Hall
2. Caretaker Cottage
3. Superintendent's Office
4. Pushmataha Hall
5. Willson Hall
6. Wheelock Mission Church
7. Bathhouse
8. Boiler House
9. Well House (no regulated material)

ACM and LBP with lead-in-soil testing was conducted in all Wheelock Academy Buildings by Crystal Creek, LLC for a Phase II except the Groundskeepers Cottage which was tested by Choctaw Nation LBP Risk Assessors. Crystal Creek, LLC's, Phase II Environmental Site Assessment (ESA) dated July, 2024 for ACMs and LBP which was identified on/in pipes (ACM), soil (ACM & LBP) wall components (LBP), ceilings (LBP), window components (LBP), door components (LBP) and exterior components.

The Boiler House was constructed in 1934 is approximately 3,00 sq ft and is vacant. It was originally used as the hot water plant. The interior structure is in dilapidated conditions. The visual inspection determined the building surfaces were dilapidated throughout and is currently not in use.

The ground surface at the site slopes to the east. Groundcover consists primarily of grasses, trees, landscaped areas and concrete sidewalks. The property can be accessed from Wheelock Road approximately 1.5 miles east of the intersection of Main Street and Highway 70, Millerton, Oklahoma

1.2 Summary of Phase II ESA Results

The Phase II ESA was conducted in accordance with *ASTM International – Standard Practice for Environmental Site Assessments: Phase II Environmental Site Assessment Process E1903-19.* The results of the Phase II ESA confirmed the presence of contaminants of concern (COCs) at the Site.

The following list is a summary of the conclusions regarding COCs and associated media identified at the Site that are addressed in this cost estimate:

ACM: Of the samples submitted for laboratory analysis, fourteen samples were reported as "positive" (>1% asbestos) for asbestos. Asbestos was identified in most Buildings of the Wheelock Academy. ACM is considered to be a contaminant of concern (COC) in relation to the Site. The asbestos pipe insulation (TSI) was found in one area of the Boiler House Building. The following table indicates the location and estimated extent of ACM identified at the Site.

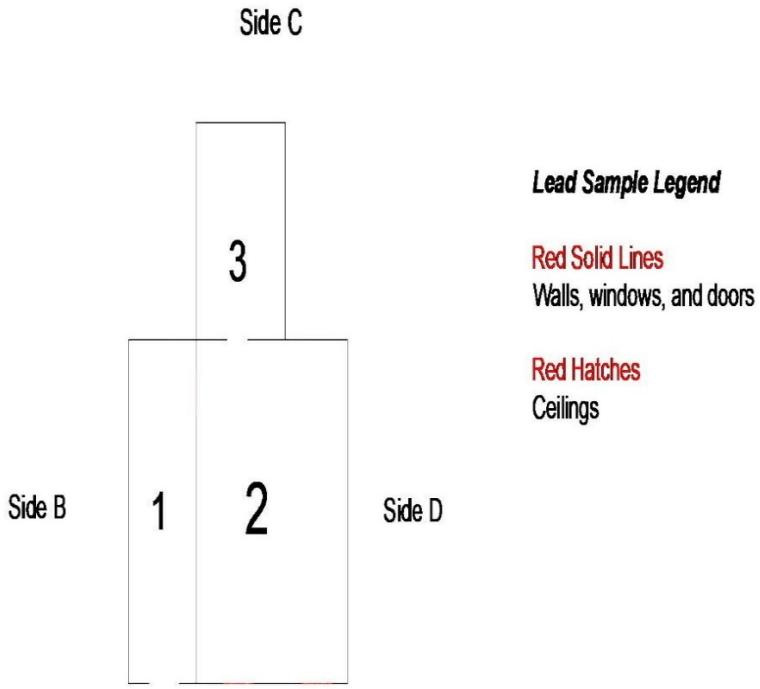
A #	Homogeneous Material Description	Homogeneous Material Location	Friability (F /NF)	% Asbestos*	# of Samples Collected	Condition	Approximate Quantity
M-01	*Cementitious Roof Panels*	*Exterior Roof*	*NF*	*20% C*	*3*	*Good*	*~450 LF*
I-01A	*Pipe Thermal Insulation (Packed)*	*Utility Tunnel-- Pipe Elbow/Joint*	*F*	*8% C 5% A 2% CRO.*	*1*	*SD*	*QNA*
I-01B	*Pipe Thermal Insulation (Air-O-Cell)*	*Utility Tunnel-- Pipe Long Run*	*F*	*5%C*	*1*	*SD*	*QNA*
I-02A	*Pipe Thermal Insulation (Packed)*	*Utility Tunnel-- Pipe Elbow/Joint*	*F*	*10%C*	*1*	*SD*	*QNA*
I-02B	*Pipe Thermal Insulation (Packed)*	*Utility Tunnel-- Pipe Long Run*	*F*	*8% C 5% A 2% CRO.*	*1*	*SD*	*QNA*
SI-03	*Pipe Thermal Insulation (Packed)*	*Utility Tunnel-- Pipe Long Run*	*F*	*5%C*	*1*	*SD*	*QNA*
SI-04	*Pipe Thermal Insulation (Packed)*	*Utility Tunnel-- Pipe Long Run*	*F*	*10%C*	*1*	*SD*	*QNA*
SI-05	*Pipe Thermal Insulation (Packed)*	*Utility Tunnel-- ASSUMMED ELBOW and RUN*	*F*	*PACM*	*NONE*	*NA*	*QNA*
I-06A	*Pipe Thermal Insulation (Packed)*	*Utility Tunnel-- Pipe Elbow/ Joint*	*F*	*10%C*	*1*	*SD*	*QNA*
I-06B	*Pipe Thermal Insulation (Packed)*	*Utility Tunnel-- Pipe Long Run*	*F*	*5%C*	*1*	*SD*	*QNA*
I-07A	*Pipe Thermal Insulation (Packed)*	*Utility Tunnel-- Pipe Elbow/ Joint*	*F*	*8% C 5% A 2% CRO.*	*1*	*SD*	*QNA*
I-07B	*Thermal System Insulation*	*Utility Tunnel-- Pipe Long Run*	*F*	*8% C 5% A 2% CRO.*	*1*	*D*	*QNA*

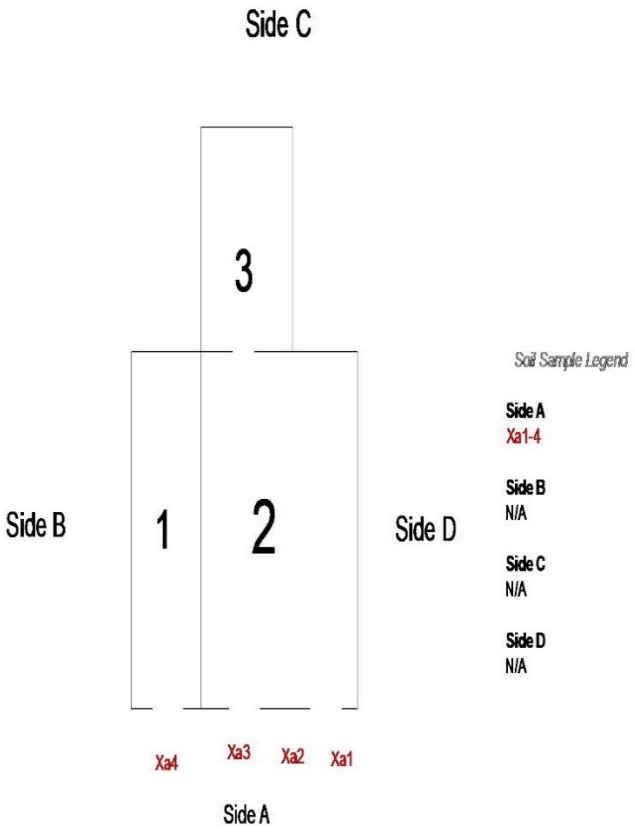
= Not Applicable ND= None Detected MAS= Mastic CT= Ceiling Tile C= Chrysotile Asbestos
S= Not in Scope of Work DW= Drywall JC= Joint Compound TXT= Texturing A= Amosite Asbestos
= Significantly Damaged D= Damaged QNA= Quantification Not Achievable CRO= Crocidolite Asbestos

LBP - The inspection of Boiler House Building was conducted following the U.S. Department of Housing and Urban Development (HUD) Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing with the 1997 revision. The standard for lead-based paint as per HUD/EPA standard of 1.0 mg/cm^2 was followed. All requirements for the NITON XRF usage contained in the Performance Characteristics Sheet for the specific XRF were followed. LBP was identified throughout the Boiler House Building. LBP is considered to be a contaminant of concern (COC) in relation to the Site.

Interior Materials Boiler House Building

The following tested painted components were found to contain lead in a concentration greater than the federal threshold of 1.0 mg/cm^2 of surface as measured by an XRF.





Exterior Materials – Boiler House Building

Exterior painted surfaces tested (homogeneous areas) were found to contain lead in a concentration greater than the federal threshold of 1.0 mg/cm^2 of surface as measured by the XRF. See above.

1.3 Project Goals / Site Reuse Plan

Based on information that the Choctaw Nation Brownfields Program, the current site reuse plan will be determined and finalized by the Choctaw Nation Tribal Council. However, at this time of this ABCA document there were six reuse plans being considered and drafted which include expansion of the current museum, an interpretive center, retreat center, historic tourism, recreation, tribal education, college or training center. Any finalized reuse plans shall be finalized by the decision of the Tribal Council and the Chief of the Choctaw Nation of Oklahoma.

1.4 Cleanup Scope and Goals

Based upon the results of the Phase II ESA conducted, the specific concerns addressed in this conceptual cleanup alternatives analysis for the Site include:

A. ACM, LBP and lead in soil identified at the Site

The overall purpose of a cleanup at the Site is to allow the property to be redeveloped while mitigating the risk that COCs currently present at the Site pose to human health and the environment. The cleanup goal(s) for the Site are listed below:

- Remove and dispose of COCs to allow for redevelopment of the property;
- Conduct cleanup operations that are compliant with applicable local, Tribal, and federal standards that will protect human health and the environment;
- Implement cleanup alternative(s) that are practical and effective in mitigating COCs to protect human health and the environment in both the short-term and long-term.

2.0 EVALUATION CRITERIA FOR ALTERNATIVES

Each of the potential cleanup alternatives is evaluated against the following set of four criteria:

2.1 Compliance

Compliance with applicable state, federal and tribal regulations.

2.1.a Cleanup Oversight Responsibility

The cleanup will be overseen by the Tribal Environmental Department in consultation with EPA. In addition, all documents prepared for this site are submitted to the Tribal environmental department under CNO Tracking Number MCTTT01116 and to EPA under ACRES site number 244077. It is recommended that the following regulations be followed: The Small Business Relief and Brownfields Revitalization Act, Occupational Safety and Health Act, and any applicable provisions of the Clean Air Act, Resource Conservation and Recovery Act, the Toxic Substance Control Act, and Comprehensive Environmental Response, Comprehensive, and Liability Act where they pertain to remediation and disposal of lead in soil. Applicable sections of the CNO Environmental Codes and the CNO LBP/Asbestos Policies will be followed. Also, the following qualifications should be held by the remedial contractor(s) selected to oversee and/or implement the following remediation tasks and activities:

ACM Remediation

All aspects of ACM Cleanup Oversight must be conducted in accordance with the CNO Asbestos Policy, Occupational Safety and Health Administration (OSHA) 1926.1101, Asbestos NESHAP found in 40 CFR Part 61, Subpart M and DEQ has the delegated responsibility to regulate this NESHAP in Oklahoma. When selecting

firm(s) and/or individuals to utilize, it is recommended that the following certifications be verified, at a minimum:

1) State of Oklahoma licensed Asbestos Management Planner to perform:
   - Development of asbestos project designs;
   - Air monitoring for asbestos fibers;

2) State of Oklahoma licensed Asbestos Abatement Contractor.

3) Abatement required air monitoring shall be overseen by a licensed third-party contractor. All clearance will be overseen by that same third-party contractor. So that the abatement activities and clearance activities are overseen by two different contractors.

LBP Abatement

All aspects of LBP Cleanup Oversight must be conducted in accordance with OSHA Lead in Construction Standard found in 29 CFR Part 1926, 40 CFR Part 745 and TSCA Title IV 402/404. When selecting firm(s) and/or individuals to utilize, it is recommended that the following certifications be verified, at a minimum:

4) State of Oklahoma license Lead-Based Paint Firm to perform:
   - Development of LBP abatement plan;

5) State of Oklahoma licensed LBP Abatement Workers.

6) Clearance testing by a state/federal licensed LBP Risk Assessor

2.1.b Cleanup Standards for Contaminants

The following standards are recommended to be met during the remediation tasks and activities:

ACM Remediation

Cleanup levels for ACM remediation must meet standards in accordance with 40 CFR Part 61, Subpart M and DEQ has the delegated responsibility to regulate this NESHAP in Oklahoma. Occupational Safety and Health Administration (OSHA) 1926.1101. Examples of applicable standards include:

Asbestos Action Levels		
Asbestos Sample	**Regulatory Action Level**	**Source of Regulation**
Regulated Asbestos-Containing Material (RACM) – Bulk Materials	>1% asbestos	Asbestos Hazard Emergency Response Act (AHERA)
Asbestos Air Monitoring - Workers	0.1 fibers/cubic centimeter (f/cc) (action level [AL])	Occupational Safety and Health Administration (OSHA) 1926.1101
	0.2 f/cc (Permissible Exposure Level [PEL])	OSHA 1926.1101
Asbestos Air Monitoring – Final Clearance	0.01 f/cc	EPA AHERA

A list of solid waste landfills approved to accept friable asbestos waste is provided in Appendix A.

LBP Remediation

Cleanup levels for LBP remediation must meet standards in accordance with OSHA Lead in Construction Standard found in 29 CFR Part 1926.62. Examples of applicable standards include:

LBP Action Levels		
LBP Sample	**Regulatory Action Level**	**Source of Regulation**
Lead-Based Paint	1.0 mg/cm2	EPA, 40 CFR Part 745
Lead in Air Monitoring - Workers	30 µg/m^3 (action level [AL])	Occupational Safety and Health Administration (OSHA) 29 CFR Part 1926.62
	50 µg/m^3 (Permissible Exposure Level [PEL])	OSHA 29 CFR Part 1926.62

EPA & HUD LBP Clearance Limits for Sample Locations

Sample Location	HUD Clearance Limits	EPA Clearance Limits
Floor	10 µg/sq. ft.	5 µg/sq. ft
Window Sills	100.00 µg/sq. ft.	40.00 µg/sq. ft.

Window Trough	400 µg/sq. ft.	100 µg/sq. ft.
Play Area Soil	400 PPM	400 PPM
Dripline Soil	1200 PPM.	1200 PPM
Abatement of Soil	5000 PPM	5000 PPM

2.1.c Laws & Regulations Applicable to Cleanup

The following laws and regulations are mandatory and/or recommended to be followed during the cleanup tasks and activities:

ACM Abatement

- Occupational Safety and Health Administration (OSHA) 1926.1101
- Asbestos NESHAP is found in 40 CFR Part 61, Subpart M and DEQ has the delegated responsibility to regulate this NESHAP in Oklahoma – Governs the disposal of asbestos waste and the management of asbestos contamination.

LBP Abatement

- Oklahoma Department of Environmental Quality, OAC 252:110 Lead-Based Paint Management, which implements the OK Lead-Based Paint Management Act – Governs LBP abatement on child occupied housing in Oklahoma.
- OSHA Lead in Construction Standard found in 29 CFR Part 1926.62 – Governs the lead in air for abatement and construction.
- Title IV of the Toxic Substances Control Act (TSCA), as well as other authorities in the Residential Lead-Based Paint Hazard Reduction Act of 1992
- Small Business Liability Relief and Brownfields Revitalization Act, enacted in 2002, which amended the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)
- 40 CFR Part 745

2.2 Effectiveness

- Protection of human health and the environment, including workers during implementation;
- Feasibility for mitigation of risk in the short-term and long-term effectiveness;

- Complete removal of contaminants;
- Achievability of the cleanup goals;

2.3 Difficulty of Implementation

- Technical feasibility;
- Availability of work force, materials, and equipment;
- Administrative ability;
- Construction feasibility;
- Maintenance and monitoring requirements.

2.4 Cost (Conceptual costs for comparative analysis only)

- Time requirements, materials, equipment, labor and waste disposal locations.

The selection of "effectiveness", "feasibility", and "cost" as evaluation criteria is based upon the EPA's *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA* (EPA, 1988). In addition, the selection of "compliance" as an evaluation criterion is used consider variations between federal, state, and/or local regulations, if applicable, on a site-by-site basis.

3.0 CLEANUP ALTERNATIVES FOR EVALUATION

Listed below are the specific cleanup alternatives evaluated based upon the results of the Phase II ESA conducted at the Site. In addition, alternatives considered, but not evaluated due to site-specific factors which eliminated the alternative from further analysis are also listed, if applicable.

3.1 Cleanup Alternatives Evaluated

The following removal action alternatives were considered as part of this evaluation.

- Alternative 1: **No Action**
- Alternative 2: **Contain and/or Encapsulate Damage Friable ACM, Implement Operations and Maintenance. Specialized Cleaning and Painting**
- Alternative 3: **Removal of All ACM and Abatement LBP by a Combination of Removal, Replacement, Enclosure and Encapsulation**

4.0 COMPARATIVE ANALYSIS OF CLEANUP ALTERNATIVES

The potential cleanup alternatives for the Site were evaluated using the evaluation criteria described in Section 2. General descriptions of the conceptual design of each alternative are described below. Discussions of the pros and cons of each alternative are presented in the following subsections. Final design specifications and features of the actual remedy may differ from the conceptual design described herein.

Alternative 1: (No Action) The No Action alternative would involve leaving the Site in its current state. There would be no removal, containment, engineering control (EC), or institutional control (IC) actions implemented. The No Action alternative provides a baseline against which other alternatives can be compared. A consideration of risk is taken into account if no action is taken as opposed to implementing a cleanup action.

Alternative 2: Contain and/or Encapsulate Damaged Friable Asbestos, Implement Operations and Maintenance Plan, Specialized Cleaning and Painting as Interim Controls Consists of containing/encapsulating the deteriorated asbestos-containing material (ACM). This would include applying a lap cloth, CP 11 or a bridging encapsulant to damaged ACM. The pipe tunnels can be sealed and the tunnel asbestos left in place. The deteriorated lead-based paint (LBP) in the building with deteriorated was found in some interiors plaster walls, metal ceilings, two doors, some exterior walls, windows and wood components. The areas with the deteriorated LBP would be wet scrape, primed and painted with quality paint (interim controls). The entire facility would undergo specialized cleaning to reduce the amount of LBP dust on the floors. The development and implementation of an Operations and Maintenance (O&M) Plan for ACM and LBP would result in LBP/ACM left in place in this alternative.

Alternative 3: Removal or Enclosure of All ACM and Abatement LBP by a Combination of Removal, Replacement, Enclosure and Encapsulation. Alternative 3 consists of removing and disposing or enclosure of all ACM. The abatement will follow the Project Design developed by a licensed Project Designer. The pipe tunnels can be sealed and the tunnel asbestos left in place. The asbestos abatement will also follow all federal regulations and be completed by a licensed asbestos abatement contractor. The lead-based paint (LBP) in the building was found on two one interior door and one exterior door system. The areas with the deteriorated LBP would be wet scrape, primed and painted with elastomeric LBP encapsulant paint. The entire facility would undergo specialized cleaning to reduce the amount of LBP dust on the floors. The development and implementation of an Operations and Maintenance (O&M) Plan for LBP left in place after abatement.

4.1 Compliance

Alternative 1 (No Action) would not be compliant with Tribal and/or federal regulations for the Site in its current condition due to the presence and deteriorated condition of the known COCs. The areas with asbestos and LBP damage should have very limited access. Personnel entering these areas should have awareness training at a minimum. This alternative will increase ongoing maintenance.

Alternative 2 Contain and/or Encapsulate Damage Friable Asbestos, Implement Operations and Maintenance Plan, Specialized Cleaning and Painting as Interim Controls. Alternative 2 consists of containing/encapsulating the deteriorated asbestos containing material. This would include applying a bridging encapsulant to damage asbestos containing material (ACM). The pipe tunnels can be sealed and the tunnel asbestos left in place. The deteriorated lead-based paint (LBP) in the building was found on two doors and is currently not in use. The areas with the deteriorated lead-based paint (LBP) will be wet scraped, primed and painted with quality paint (interim controls). The entire facility would undergo specialized cleaning to reduce the amount of LBP dust on the floors. The development and implementation of an Operations and Maintenance (O&M) Plan for ACM and LBP left in place for this alternative is required by CNO Policy. Federal regulations do not require the asbestos & LBP need to be removed. Therefore, Alternative 2 follows Tribal and federal regulations for ACM and LBP.

Alternative 3 Removal or Enclosure of All ACM and Abatement LBP by a Combination of Removal, Replacement, Enclosure and Encapsulation. Alternative 3 consists of removing and disposing or enclosure of all ACM according to all federal, state and local regulations. The pipe tunnels can be sealed and the tunnel asbestos left in place. The LBP abatement will follow all federal, local regulations. The abatement does not remove all LBP but does manage the intact LBP according to the LBP O&M Plan. Therefore, Alternative 3 is in compliance with CNO LBP Policy, federal and local regulations for ACM and LBP.

4.2 Effectiveness

Alternative 1 (No Action) will not reduce the potential for exposure of human health and the environment to COCs or provide a reduction in the toxicity, mobility, or volume of contaminants as site conditions will deteriorate continually with time. The estimated risk from COCs to potential receptors would not be decreased in the short-term or long-term.

Alternative 2 Contain and/or Encapsulate Damaged Friable Asbestos, Implement Operations and Maintenance Plan, Specialized Cleaning and Painting (Interim Controls)

consists of containing/encapsulating the deteriorated asbestos containing material and deteriorated LBP which will reduce the potential for exposure of human health and the environment to COCs. The pipe tunnels can be sealed and the tunnel asbestos left in place. Alternative 2 would **not** achieve the cleanup goals set for the Site in the long-term. This alternative does achieve a use outcome for the property.

Alternative 3 Removal or Enclosure of All ACM and Abatement LBP by a Combination of Removal, Replacement, Enclosure and Encapsulation will be effective in the short-term and long-term due to the removal, enclosure of all or stabilization of the COCs. The pipe tunnels can be sealed and the tunnel asbestos left in place. If implemented properly, due to no asbestos contaminants left in the building and stabilization or remove/replacement of LBP hazards and with an LBP O&M Plan, there will be no risk to human health or the environment remaining at the Site. This alternative is the only one that is the safest for workers and eliminates the chance of asbestos and LBP potential for exposure to human health and the environment. This alternative will allow for the CNO cleanup goal to be achieved.

4.3 Difficulty of Implementation

Alternative 1 No Action is technically and administratively feasible. Maintenance or monitoring will be required. Changes in climate will not alter the risk associated with this alternative. Although implementation is possible, the "No Action" alternative would not meet the cleanup goal may expose current occupants to COCs.

Alternative 2 Contain and/or Encapsulate Damage Friable Asbestos, Implement Operations and Maintenance Plan, Specialized Cleaning and Painting (Interim Controls) consists of containing/encapsulating the deteriorated asbestos containing material. The pipe tunnels can be sealed and the tunnel asbestos left in place. An Operations and Maintenance (O&M) Plan for ACM and LBP left in place for this alternative will be developed and on-site maintenance personnel will be trained to implement the plans. This type of cleanup and stabilization is feasible and is standard practice of asbestos and LBP projects. Difficulty to implement this plan is moderate. Coordination during interim control activities is anticipated with short-term low-level disturbances to the site. This alternative would also require an Asbestos Management Plan and continued quarterly and annual monitoring.

Alternative 3: Removal or Enclosure of All ACM and Abatement LBP by a Combination of Removal, Replacement, Enclosure and Encapsulation. Alternative 3 consists of the removal, enclosure of and/or stabilization of the COCs. If implemented properly, due to the asbestos contaminants left in tunnel that is sealed with CMU walls and stabilization or removal/replacement of LBP hazards and with an LBP O&M Plan, there will be no risk to human health or the environment remaining at the Site. The ACM abatement will follow the Project Design and the LBP will follow the LBP Abatement Plan. An Operations and

Maintenance (O&M) Plan for LBP left in place for this alternative will be develop and on-site maintenance personnel will be trained to implement the plans.

The difficulty level of implementing this plan is moderate to high - moderate. Coordination during cleanup activities is anticipated with short-term moderate disturbance to the site. THPO consultation would also be required and coordinated with EPA, SOI, and CNO would be required.

Access to the Site is currently available and no areas are inaccessible by passenger vehicles. No road improvements would be required to provide access for construction equipment and personnel.

4.4 Cost

Costs incurred are evaluated on a scale of low, moderate, and high in relation to each of the other alternatives and based upon past experience with similar projects. Conceptual costs (not intended for budgetary estimates) were evaluated for time, effort, labor, and materials necessary.

Alternative 1 (No Action) has low costs associated with this option. Minimal amounts of time, effort, and labor would be required.

Alternative 2 Alternative 2 Contain and/or Encapsulate Damage Friable Asbestos, Implement Operations and Maintenance Plan, Specialized Cleaning and Painting (Interim Controls). This level of work will take similar time and effort as removal, except asbestos materials are left in place and will require monitoring. This option will require pest control of wasp that are living in wall and floors

Alternative 3: Removal or Enclosure of All ACM and Abatement LBP by a Combination of Removal, Replacement, Enclosure and Encapsulation consists of asbestos contaminants in tunnel that is sealed with CMU walls and encapsulation and/or removal of LBP. An Operations and Maintenance (O&M) Plan for LBP left in place for this alternative will be developed.

A summary of the cost comparison of each of the alternatives is presented in the following table, with the most expensive alternative listed as 3rd and the least expensive alternative listed as 1st.

4.5 Summary Comparison of Potential Alternatives

Comparisons are based on the four evaluation criteria previously discussed. A summary of the comparison of each of the alternatives is presented below along with status as to whether the alternative was retained for consideration as the preferred alternative selected.

Cleanup Alternative	Compliance	Effectiveness	Implementability	Cost	Comment
Alternative 1: No Action	Non-compliant	Not effective	Implementable	$00.0-$12,000	This alternative does not satisfy the cleanup goals for this site. Cost to secure the building.
Alternative 2: Encapsulation of Friable ACM - RACM and LBP Interim Controls (IC) on Poor Condition Paint and LBP in Soils, The dripline soil will require abatement.	Compliant	Effective	Implementable	Asbestos $ 17,200 LBP IC $ 1,300 LBP Soil & Chips $ 1,200 Total $ 19,700	This alternative does satisfy the cleanup goals for this site and allows for continued current use of the property. It leaves the asbestos in the pipe tunnel space that will require monitoring and needs to be removed in future if utilities are upgraded. Remove paint chips and soils will require TCLP testing to determine the if waste is non-hazardous or hazardous for disposal.
Alternative 3: Abatement of All ACM and LBP Abatement will be a Combination of Removal, Replacement, Enclosure and Encapsulation on Poor Condition Paint and on LBP in Soils	Compliant	Effective	Implementable	Asbestos $ 29,200 LBP $ 1,500 LBP Soil & Chips $ 1,200 Total $ 31,900	This alternative satisfies the cleanup goal for the building and is the option that leaves the asbestos in the pipe tunnel space that will require monitoring and manages the LBP with a minimum twenty-year abatement option. The tunnel will be sealed with CMU wall at each entry. Remove paint chips and soils will require TCLP testing to determine the if waste is non-hazardous or hazardous for disposal. However, it is the most expensive alternative but is the most compliant and effective option.

Boiler House Abatement Cost Breakdown:

Asbestos:

Removal of ~ 2300 SF of asbestos containing singles	$ 17,200.00
Seal pipe tunnel system	$ 12,000.00
Subtotal	**$ 29,200.00**

LBP:

Abatement of 110 sf of deteriorated LBP (2 Doors)	$ 1,200.00
Cleaning floors around doors.	$ 300.00
Subtotal	**$ 1,500.00**

LBP Paint Chips	
Disposal of LBP hazardous paint chips	$ 1,200.00
Subtotal	**$ 1,200.00**
Total	**$ 31,900.00**

5.0 PERFERRED CLEANUP ALTERNATIVE

5.1 ACM REMOVAL AND LBP ABATEMENT

Of the three cleanup alternatives evaluated for selection at the Wheelock Academy located at 1377 Wheelock Road, Gavin, Oklahoma 74736, the preferred alternative recommended is:

Alternative 3: Removal or Enclosure of All ACM and Abatement LBP by a Combination of Removal, Replacement, Enclosure and Encapsulation

This alternative was selected based upon overall compliance with state and/or federal regulations, effectiveness in protecting human health and the environment in both the short-term and long-term, feasibility of implementation, and cost effectiveness. In addition, this alternative is the closest match to the detailed plans for reuse that have already been considered.

Presented below are the engineering costs to remediate the COCs at the Site. Engineering costs were determined based upon information obtained from the previous Phase I & Phase II ESA (2024), and past experience on similar projects. Actual bids from companies to perform the work may vary from this estimate depending on local conditions and other factors outside of the assessor's knowledge. Final design specifications, features, and cost of the actual remedy may differ from the conceptual design presented.

6.0 SPECIFICATIONS FOR REPORT USE AND RELIANCE

6.1 Special Terms and Conditions

This document has been prepared for the Choctaw Nation for the use and benefit of the Choctaw Nation. Any use of this document or information herein by persons or entities other than Choctaw Nation without the express written consent will be at the sole risk and liability of said person or entity. It is understood that this document may not include all information pertaining to the described site.

6.2 Disclaimers

The cost estimate in this report is based upon the Phase II Environmental Site Assessment (ESA 2024) by Crystal Creek LLC, Inc. Phase II Environmental Site Assessment (ESA) which were in general conformance with the scope and limitations of ASTM E1903-19. The cost estimate presented herein is based on costs from engineering estimate past experience on similar projects as selected alternative presented in this document. Professional opinions are based solely on data collected during the assessment and/or interpretation of information and past data provided for review. Crystal Creek LLC does not warrant or guarantee information obtained from third parties used for this assessment are correct, complete, and/or current.

7.0 REFERENCES

Oklahoma Department of Labor, Oklahoma Asbestos Control Act 40 O.S. § 450, et seq. Abatement of Friable Asbestos Materials Rules OAC 380:50

Asbestos NESHAP is found in 40 CFR Part 61, Subpart M and DEQ has the delegated responsibility to regulate this NESHAP in Oklahoma.

American Society for Testing and Materials (ASTM), 2021. E1903-19, *Standard Practice for Environmental Site Assessments: Phase II Environmental Site Assessment Process.*

EPA, 1988. *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA*. (EPA/540/G-89/004).

HUD LBP Guidelines for the Evaluation and Control of LBP hazards in Housing, Chapter 7

Phase I Environmental Site Assessment (2020), A & M Engineering and Environmental Services, Inc.

Phase II Environmental Site Assessment (2024), Crystal Creek LLC

APPENDIX A
SOLID WASTE LANDFILLS APPROVED TO ACCEPT FRIABLE ASBESTOS WASTE

Oklahoma Department of Environmental Quality
Oklahoma Landfills Accepting Regulated Asbestos Waste

OAC 252:515-19-31 states that the disposal of friable asbestos waste at a solid waste disposal facility is prohibited unless the facility is a municipal solid waste landfill (MSWLF) or non-hazardous industrial waste (NHIW) landfill specifically authorized by the permit to accept such waste. Disposal practices for asbestos and materials containing asbestos must be in compliance with appropriate regulations as set forth in OAC 252:100-40-5.

COUNTY	SOLID WASTE PERMIT NO.	FACILITY
Permitted to Accept Friable and Non-Friable Asbestos		
BECKHAM	3505009	Elk City Municipal Landfill (580) 225-3230
BECKHAM	3505011	Sayre Municipal Landfill (580) 928-2260
CANADIAN	3509005	Oklahoma Environmental Authority Landfill (405) 483-5402
GARVIN	3525012	Pauls Valley Landfill 405-495-0800
GRADY	3526013	Southern Plains Landfill (405) 224-3680
JACKSON	3533005	City of Altus Landfill (580) 477-1950
MAJOR	3547002	Red Carpet Landfill (580) 776-2255
MUSKOGEE	3551020	Muskogee Community RDF (918) 682-7284
OKLAHOMA	3555018	Oklahoma Landfill (405) 745-3091
OKLAHOMA	3555028	SE Oklahoma City Landfill (405) 745-4141
OKLAHOMA	3555036	East Oak Sanitary Landfill (405) 427-1112
OSAGE	3557021	American Environmental Landfill (918)245-7786
OSAGE	3557025	Osage Landfill (918) 336-3159
PAYNE	3560010	Stillwater Landfill (405) 372-6628
PONTOTOC	3562006	City of Ada Municipal Sanitary LF (580) 436-1403
PUSHMATAHA	3564004	Clinton Lewis Construction Co. Landfill (580) 298-3729
SEMINOLE	3567020	Sooner Land Management Landfill (405) 257-6108
SEQUOYAH	3568008	Sallisaw Solid Waste Disposal Facility (918)775-6241
TULSA	3572042	Quarry Landfill (918) 437-7773

DRAFT ANALYSIS OF BROWNFIELDS CLEANUP ALTERNATIVES FOR WHEELOCK ACADAMEY CAMPUS – PUSHMATAHA HALL

GARVIN, MCCURTAIN COUNTY, OKLAHOMA

Prepared For

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Prepared by:

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7909 NW 39th Street
Bethany, Oklahoma 73008

Date Prepared: August 15, 2025

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LIST OF ACRONYMS

ACBA	Analysis of Brownfields Cleanup Alternatives
ACM	asbestos-containing material
AL	action level
AQCC	Air Quality Control Commission
AHERA	Asbestos Hazard Emergency Response Act
APCD	Air Pollution Control Division
ASTM	American Society for Testing and Materials
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CH	Chrysotile
COC	contaminant of concern
CPSC	Consumer Product Safety Commission
EC	engineering control
EPA	United States Environmental Protection Agency
ESA	environmental site assessment
f/cc	fibers per cubic centimeter
HMWMD	Hazardous Material and Waste Management Division
IC	institutional control
ID	identification
LBP	lead-based paint
LF	linear feet
N/A	Not Applicable
O&M	Operations and Maintenance
ODOL	Oklahoma Department of Labor
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Limit
P.G.	Professional Geologist
PLM	polarized light microscopy
RACM	regulated asbestos-containing material
sq. ft.	square feet
START	Superfund Technical Assessment and Response Team
SOO	Statement of Objectives
TDD	Technical Direction Document
TSI	thermal system insulation

SUMMARY

Crystal Creek LLC was tasked to conduct a brownfield cleanup alternatives analysis at the Wheelock Academy Campus. The site is located at 1377 Wheelock Road, Garvin, Oklahoma 74736. Previous ACM and LBP testing was previously conducted at the Wheelock Academy Campus including the Mission Church by Crystal Creek, LLC, an Oklahoma licensed engineer firm, for the Choctaw Nation and completed in July 2024. The *Phase II Environmental Site Assessment* for Wheelock Academy Campus – *Pushmataha Hall Building, Garvin, Oklahoma,* details the work performed, methods used, information and data acquired, and evaluation and interpretation of results as part of the Phase II ESA. This draft Analysis of Brownfields Cleanup Alternatives is based upon the information presented in the Brownfields Pilot Project, Phase II ESA report and is for the Pushmataha Hall Building only.

SCOPE OF CLEANUP

Based upon the results of the Phase II ESA for Wheelock Academy, the specific concerns addressed in this conceptual cleanup alternatives analysis for the Site include:

A. Asbestos-containing materials (ACM) identified at the Site
B. Lead-Based Paint components (LBP) identified at Site.
C. Lead in soil identified at the Site.
D. Asbestos in soil (debris under pipe) identified at the Site.

EVALUATION CRITERIA

Cleanup alternatives considered as part of this analysis were evaluated against the following criteria:

- Compliance;
- Effectiveness;
- Difficulty of Implementation;
- Cost.

PREFERRED ALTERNATIVE SELECTED

Of the three cleanup alternatives evaluated for selection at the Wheelock Academy located at 1377 Wheelock Road, Gavin, Oklahoma 74736, the preferred alternative recommended for Pushmataha Hall is:

Alternative 3: Removal of All ACM, Asbestos in Soil, Abatement of LBP, and Lead in Soil by a Combination of Removal, Replacement, Enclosure and Encapsulation

This alternative was selected based upon overall compliance with tribal and federal regulations, effectiveness in protecting human health and the environment in both the short-term and long-term, feasibility of implementation, and cost effectiveness. In addition, this alternative is the closest match to the detailed plans for reuse that have already been considered.

Presented below are the engineering costs to remediate the COCs at the Site. Engineering costs were determined based upon information obtained from the previous Phase I & Phase II ESA (2024), additional sampling and past experience on similar projects. Actual bids from companies to perform the work may vary from this estimate depending on local conditions and other factors outside of the assessor's knowledge. Final design specifications, features, and cost of the actual remedy may differ from the conceptual design presented.

Actual bids from companies to perform the work may vary from this estimate depending on local conditions and other factors outside of the assessor's knowledge. Final design specifications, features, and cost of the actual remedy may differ from the conceptual design presented. A detailed conceptual cost estimate breakdown for the total shown below is presented on Table 1.

Remediation Task	Remediation Cost
Removal of All ACM and Abatement LBP	$616,200
Total	

This summary is a general description of the cleanup alternatives analysis for the Site. This section is not intended to be used alone and does not include the basis of all conclusions presented. The report should be read and used in its entirety and in conjunction with the Brownfields Pilot Project and Phase II ESA report. Information included in this section is subject to the scope of services and limitations noted in the full ABCA, Brownfields Pilot Project and Phase II ESA reports.

1.0 INTRODUCTION

Crystal Creek LLC was tasked to conduct a Phase II Environmental Site Assessment (ESA) and Analysis of Brownfields Cleanup Alternatives at Wheelock Academy and Wheelock Mission Church. The site is located at 1377 Wheelock Road, Gavin, Oklahoma 74736 (Site). The Phase II ESA report, for Wheelock Academy and Wheelock Mission Church Properties, McCurtain County, Oklahoma, details the work performed, methods used, information and data acquired, and evaluation and interpretation of results. This Analysis of Brownfields Cleanup Alternatives is based upon the information presented in the Crystal Creek, LLC's, Phase II Environmental Site Assessment (ESA) dated July, 2024 and the Stronghold Asbestos Soil Report dated September 26, 2024. This draft Analysis of Brownfields Cleanup Alternatives is based upon the information presented in the Phase II ESA is for the Pushmataha Hall only.

1.1 Background-History

The original school at Wheelock was a small "day" school, established in 1833 in conjunction with a nearby Christian mission. This marked the beginning of formal education at the site. In 1842, with the establishment of the Choctaw National School System, the institution began receiving financial support from treaty funds secured by the Choctaw Nation from the U.S. Government and was designated as a women's seminary and managed by missionaries with a board of trustees.

Wheelock Seminary was closed in 1861 at the onset of the Civil War. The original structure was destroyed by fire at the close of the Civil War. In the early 1880s Choctaw national leaders decided to rebuild the school on a new site a few hundred yards northeast of the old mission station, school, and church. The present Wheelock Academy building (Pushmataha Hall) was constructed, and a Choctaw orphanage was opened there in September 1884. Over the following seventy years, the Academy flourished as a center of learning for Choctaw girls and young women, ultimately ceasing operations in 1955. The U.S. government assumed jurisdiction over the school in 1910 and full control as well as funding in 1932. After 1955 the facility remained virtually abandoned until later returned to ownership of the Choctaw Nation.

Wheelock Academy served as a model for educational institutions operated by the Five Civilized Tribes and although it played a significant role in advancing indigenous education in Indian Territory it has a complicated history for the Choctaw people, as many boarding schools do. Recognizing its historical and cultural significance, whether positive or negative, Wheelock Academy was later designated a National Historic Landmark by the Secretary of Interior. Today, several of its remaining buildings, along with an on-site museum, preserve and interpret the history of the school and the Choctaw Nation's dedication to education.

In 2001, a report to Congress titled *National Historic Landmarks at the Millennium* identified Wheelock Academy as one of America's "Threatened Landmarks," underscoring the need for continued preservation efforts.

The Wheelock Academy Campus consists of approximately 47 acres and nine (9) Structures located approximately 2 miles north of Highway 70 and approximately 2.5 miles east of Millerton, Oklahoma. The Wheelock Academy Property contains the requested eight (8) buildings which were included in the Phase II which have LBP, lead in soil and/or Asbestos material which need attention. The buildings requested are as follows:

1. McCurtain Hall
2. Caretaker Cottage
3. Superintendent's Office
4. Pushmataha Hall
5. Willson Hall
6. Wheelock Mission Church
7. Boiler House
8. Bathhouse
9. Well House (no regulated material)

ACM and LBP and lead-in-soil testing was conducted in all Wheelock Academy Buildings by Crystal Creek, LLC for a Phase II except the Groundskeepers Cottage which was tested by Choctaw Nation LBP Risk Assessors. Crystal Creek, LLC's, Phase II Environmental Site Assessment (ESA) dated July, 2024 for ACMs and LBP which was identified on/in pipes (ACM), soil (ACM & LBP) wall components (LBP), ceilings (LBP), window components (LBP), door components (LBP) and exterior components.

The Pushmataha Hall was constructed in 1883 is approximately 17,250 sq ft and is vacant. It was originally used as girl's dormitory. The interior structure is mostly in poor conditions. The visual inspection determined the building surfaces were mostly dilapidated throughout the facility and is currently not in use.

The ground surface at the site slopes to the north and east. Groundcover consists primarily of grasses, trees, landscaped areas, paved parking areas, and concrete sidewalks. The property can be accessed from Wheelock Road approximately 1.5 miles east of the intersection of Main Street and Highway 70, Millerton, Oklahoma

1.2 Summary of Phase II ESA Results

The Phase II ESA was conducted in accordance with *ASTM International – Standard Practice for Environmental Site Assessments: Phase II Environmental Site Assessment Process E1903-19.* The results of the Phase II ESA confirmed the presence of contaminants of concern (COCs) at the Site.

The following list is a summary of the conclusions regarding COCs and associated media identified at the Site that are addressed in this cost estimate:

ACM: Of the samples submitted for laboratory analysis, fourteen samples were reported as "positive" (>1% asbestos) for asbestos. Asbestos was identified in most Buildings of the Wheelock Academy. ACM is considered to be a contaminant of concern (COC) in relation to the Site. The asbestos pipe insulation (TSI) was found in two areas of the Pushmataha Hall Building. The following table indicates the location and estimated extent of ACM identified at the Site.

TABLE 2: SUMMARY OF POSITVE SAMPLING AREAS PUSHMATAHA HALL

HA #	HOMOGENEOUS MATERIAL DESCRIPTION	HOMOGENEOUS MATERIAL LOCATION	FRIABILITY (F/NF)	% ASBESTOS*	# OF SAMPLES COLLECTED	CONDITION	APPROXIMATE QUANTITY
M-10	*Blue Flooring Bricks*	*2nd Floor Room 13 & 25*	*F*	*10%C*	*3*	*SD*	*~145 SF Joint/Elbows (Run-Cut)*
M-12	*Sheet Vinyl & Burlap*	*2nd Floor Room 27*	*F*	*10% C*	*3*	*SD*	*~30 SF Joints/Elbow (Run- Cut) & Debris ~15 SF*
TSI-02-06	*Pipe- Thermal System Insulation Joint*	*Basement*	*F*	*3% to 8% C 2% to 5% C*			*~346 LF Pipe Insulation & Wrap (Packed Run & Elbow) 15 SF Debris in Soil*

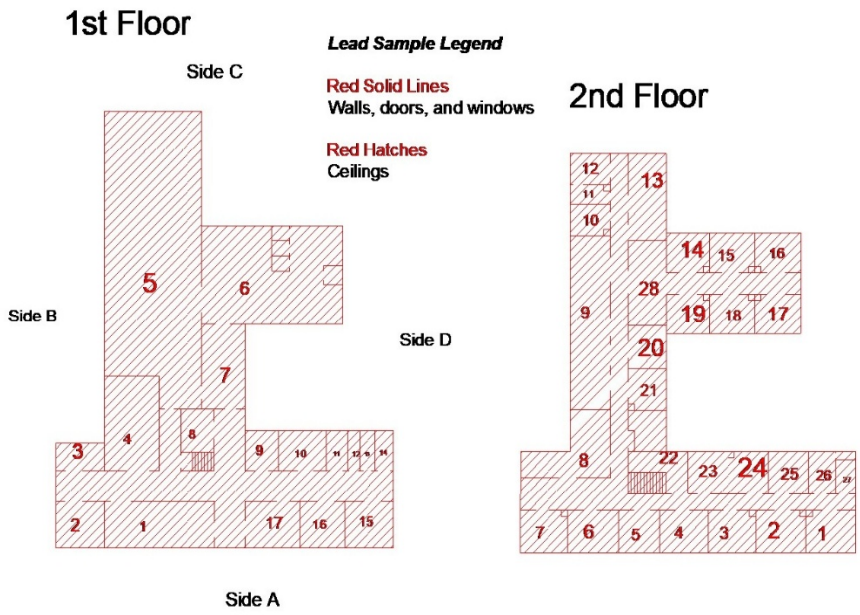
NA= Not Applicable ND= None Detected MAS= Mastic CT= Ceiling Tile C= Chrysotile NIS= Not in Scope of Work DW= Drywall JC= Joint Compound TXT= Texturing V= Vermiculite SD= Significantly Damaged D= Damaged

Notes:
LF – linear feet
SF – square feet
CH – Chrysotile
A - Amosite

LBP - The inspection of Pushmataha Hall Building was conducted following the U.S. Department of Housing and Urban Development (HUD) Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing with the 1997 revision. The standard for lead-based paint as per HUD/EPA standard of 1.0 mg/cm^2 was followed. All requirements for the NITON XRF usage contained in the Performance Characteristics Sheet for the specific XRF were followed. LBP was identified throughout the Pushmataha Hall Building. LBP is considered to be a contaminant of concern (COC) in relation to the Site.

Interior Materials Pushmataha Hall Building

The following tested painted components were found to contain lead in a concentration greater than the federal threshold of 1.0 mg/cm^2 of surface as measured by an XRF.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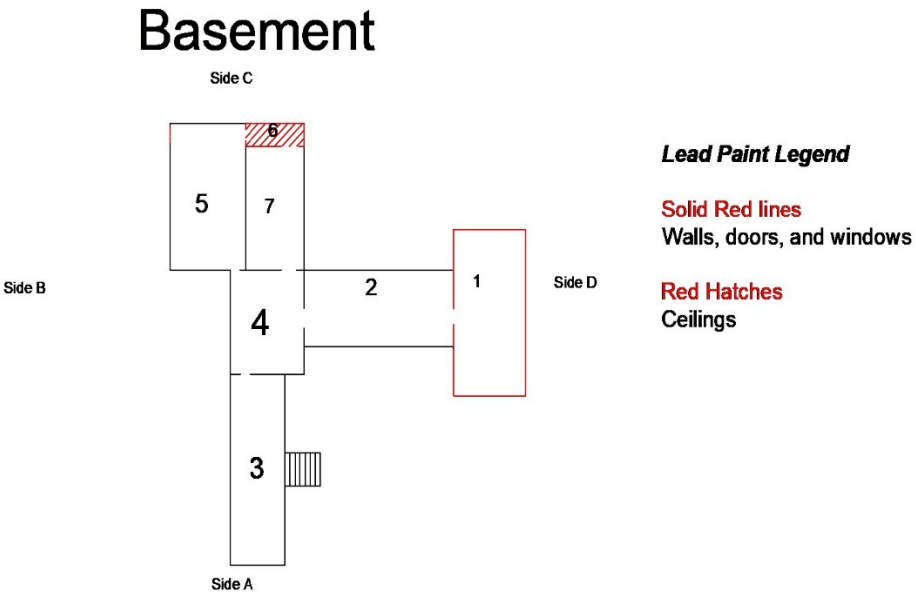
Lead Sample Legend
Red Solid Lines
Walls, doors, and windows
Red Hatches
Ceilings
Side C
Side B
Side D
Side A
2nd Floor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Side D
Side A
Lead Paint Legend
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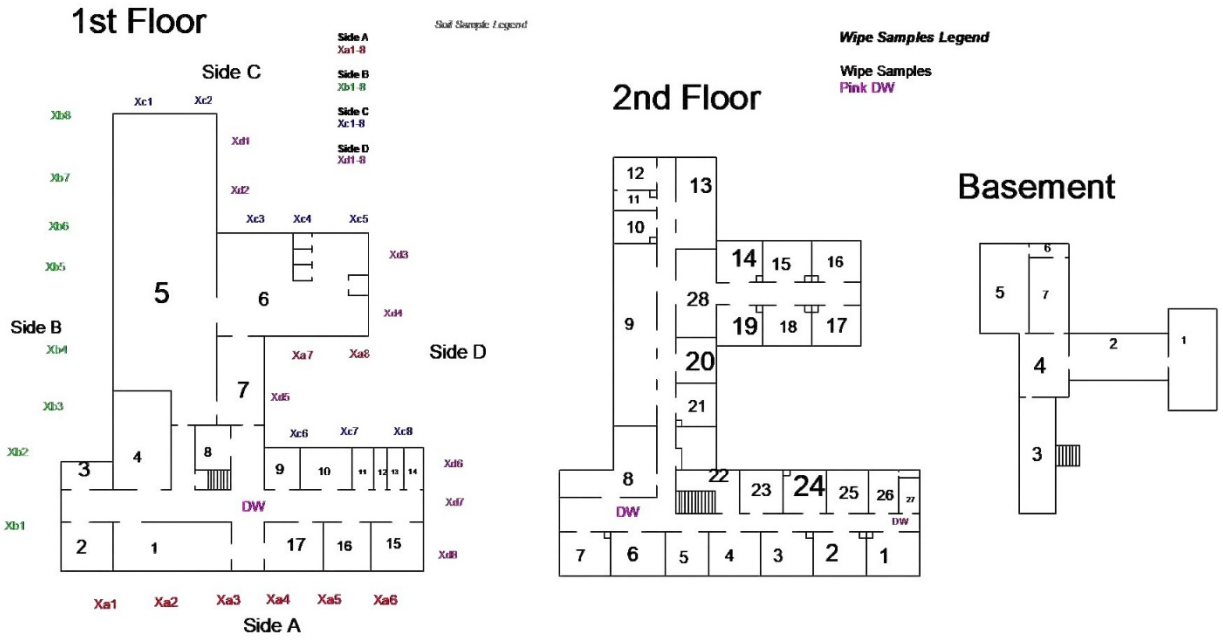
Walls, doors, and windows
Red Hatches
Ceilings



Exterior Materials – Pushmataha Hall Building

Exterior painted surfaces tested (homogeneous areas) were found to contain lead in a concentration greater than the federal threshold of 1.0 mg/cm^2 of surface as measured by the XRF. See above.

1.3 Project Goals / Site Reuse Plan

Based on information that the Choctaw Nation Brownfields Program, the current site reuse plan will be determined and finalized by the Choctaw Nation Tribal Council. However, at this time of this ABCA document there were six reuse plans being considered and drafted which include expansion of the current museum, an interpretive center, retreat center, historic tourism, recreation, tribal education, college or training center. Any finalized reuse plans shall be finalized by the decision of the Tribal Council and the Chief of the Choctaw Nation of Oklahoma.

1.4 Cleanup Scope and Goals

Based upon the results of the Phase II ESA conducted, the specific concerns addressed in this conceptual cleanup alternatives analysis for the Site include:

A. ACM, asbestos in soil, LBP and lead in soil identified at the Site

The overall purpose of a cleanup at the Site is to allow the property to be redeveloped while mitigating the risk that COCs currently present at the Site pose to human health and the environment. The cleanup goal(s) for the Site are listed below:

- Remove and dispose of COCs to allow for redevelopment of the property;
- Conduct cleanup operations that are compliant with applicable local, Tribal, and federal standards that will protect human health and the environment;
- Implement cleanup alternative(s) that are practical and effective in mitigating COCs to protect human health and the environment in both the short-term and long-term.

2.0 EVALUATION CRITERIA FOR ALTERNATIVES

Each of the potential cleanup alternatives is evaluated against the following set of four criteria:

2.1 Compliance

Compliance with applicable state, federal and tribal regulations.

2.1.a Cleanup Oversight Responsibility

The cleanup will be overseen by the Tribal Environmental Department in consultation with EPA. In addition, all documents prepared for this site are submitted to the Tribal environmental department under CNO Tracking Number MCTTT01116 and to EPA under ACRES site number 244077. It is recommended that the following regulations be followed: The Small Business Relief and Brownfields Revitalization Act, Occupational Safety and Health Act, and any applicable provisions of the Clean Air Act, Resource Conservation and Recovery Act, the Toxic Substance Control Act, and Comprehensive Environmental Response, Comprehensive, and Liability Act where they pertain to remediation and disposal of lead in soil. Applicable sections of the CNO Environmental Codes and the CNO LBP/Asbestos Policies will be followed. Also, the following qualifications should be held by the remedial contractor(s) selected to oversee and/or implement the following remediation tasks and activities:

ACM Remediation

All aspects of ACM Cleanup Oversight must be conducted in accordance with the CNO Asbestos Policy, Occupational Safety and Health Administration (OSHA) 1926.1101, Asbestos NESHAP found in 40 CFR Part 61, Subpart M and DEQ has the delegated responsibility to regulate this NESHAP in Oklahoma. When selecting

firm(s) and/or individuals to utilize, it is recommended that the following certifications be verified, at a minimum:

1) State of Oklahoma licensed Asbestos Management Planner to perform:
   - Development of asbestos project designs;
   - Air monitoring for asbestos fibers;

2) State of Oklahoma licensed Asbestos Abatement Contractor.

3) Abatement required air monitoring shall be overseen by a licensed third-party contractor. All clearance will be overseen by that same third-party contractor. So that the abatement activities and clearance activities are overseen by two different contractors.

LBP Abatement

All aspects of LBP Cleanup Oversight must be conducted in accordance with OSHA Lead in Construction Standard found in 29 CFR Part 1926, 40 CFR Part 745 and TSCA Title IV 402/404. When selecting firm(s) and/or individuals to utilize, it is recommended that the following certifications be verified, at a minimum:

4) State of Oklahoma license Lead-Based Paint Firm to perform:
   - Development of LBP abatement plan;

5) State of Oklahoma licensed LBP Abatement Workers.

6) Clearance testing by a state/federal licensed LBP Risk Assessor

2.1.b Cleanup Standards for Contaminants

The following standards are recommended to be met during the remediation tasks and activities:

ACM Remediation

Cleanup levels for ACM remediation must meet standards in accordance with 40 CFR Part 61, Subpart M and DEQ has the delegated responsibility to regulate this NESHAP in Oklahoma. Occupational Safety and Health Administration (OSHA) 1926.1101. Examples of applicable standards include:

Asbestos Action Levels		
Asbestos Sample	**Regulatory Action Level**	**Source of Regulation**
Regulated Asbestos-Containing Material (RACM) – Bulk Materials	>1% asbestos	Asbestos Hazard Emergency Response Act (AHERA)
Asbestos Air Monitoring - Workers	0.1 fibers/cubic centimeter (f/cc) (action level [AL])	Occupational Safety and Health Administration (OSHA) 1926.1101
	0.2 f/cc (Permissible Exposure Level [PEL])	OSHA 1926.1101
Asbestos Air Monitoring – Final Clearance	0.01 f/cc	EPA AHERA

A list of solid waste landfills approved to accept friable asbestos waste is provided in Appendix A.

LBP Remediation

Cleanup levels for LBP remediation must meet standards in accordance with OSHA Lead in Construction Standard found in 29 CFR Part 1926.62. Examples of applicable standards include:

LBP Action Levels		
LBP Sample	**Regulatory Action Level**	**Source of Regulation**
Lead-Based Paint	1.0 mg/cm2	EPA, 40 CFR Part 745
Lead in Air Monitoring - Workers	30 µg/m^3 (action level [AL])	Occupational Safety and Health Administration (OSHA) 29 CFR Part 1926.62
	50 µg/m^3 (Permissible Exposure Level [PEL])	OSHA 29 CFR Part 1926.62

EPA & HUD LBP Clearance Limits for Sample Locations

Sample Location	HUD Clearance Limits	EPA Clearance Limits
Floor	10 µg/sq. ft.	5 µg/sq. ft
Window Sills	100.00 µg/sq. ft.	40.00 µg/sq. ft.

Window Trough	400 µg/sq. ft.	100 µg/sq. ft.
Play Area Soil	400 PPM	400 PPM
Dripline Soil	1200 PPM.	1200 PPM
Abatement of Soil	5000 PPM	5000 PPM

2.1.c Laws & Regulations Applicable to Cleanup

The following laws and regulations are mandatory and/or recommended to be followed during the cleanup tasks and activities:

ACM Abatement

- Occupational Safety and Health Administration (OSHA) 1926.1101
- Asbestos NESHAP is found in 40 CFR Part 61, Subpart M and DEQ has the delegated responsibility to regulate this NESHAP in Oklahoma – Governs the disposal of asbestos waste and the management of asbestos contamination.

LBP Abatement

- Oklahoma Department of Environmental Quality, OAC 252:110 Lead-Based Paint Management, which implements the OK Lead-Based Paint Management Act – Governs LBP abatement on child occupied housing in Oklahoma.
- OSHA Lead in Construction Standard found in 29 CFR Part 1926.62 – Governs the lead in air for abatement and construction.
- Title IV of the Toxic Substances Control Act (TSCA), as well as other authorities in the Residential Lead-Based Paint Hazard Reduction Act of 1992
- Small Business Liability Relief and Brownfields Revitalization Act, enacted in 2002, which amended the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)
- 40 CFR Part 745

2.2 Effectiveness

- Protection of human health and the environment, including workers during implementation;
- Feasibility for mitigation of risk in the short-term and long-term effectiveness;

- Complete removal of contaminants;
- Achievability of the cleanup goals;

2.3 Difficulty of Implementation

- Technical feasibility;
- Availability of work force, materials, and equipment;
- Administrative ability;
- Construction feasibility;
- Maintenance and monitoring requirements.

2.4 Cost (Conceptual costs for comparative analysis only)

- Time requirements, materials, equipment, labor and waste disposal locations.

The selection of "effectiveness", "feasibility", and "cost" as evaluation criteria is based upon the EPA's *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA* (EPA, 1988). In addition, the selection of "compliance" as an evaluation criterion is used consider variations between federal, state, and/or local regulations, if applicable, on a site-by-site basis.

3.0 CLEANUP ALTERNATIVES FOR EVALUATION

Listed below are the specific cleanup alternatives evaluated based upon the results of the Phase II ESA conducted at the Site. In addition, alternatives considered, but not evaluated due to site-specific factors which eliminated the alternative from further analysis are also listed, if applicable.

3.1 Cleanup Alternatives Evaluated

The following removal action alternatives were considered as part of this evaluation.

- Alternative 1: **No Action**
- Alternative 2: **Contain and/or Encapsulate Damage Friable ACM, Implement Operations and Maintenance. Specialized Cleaning and Painting**
- Alternative 3: **Removal of All ACM and Abatement LBP by a Combination of Removal, Replacement, Enclosure and Encapsulation**

4.0 COMPARATIVE ANALYSIS OF CLEANUP ALTERNATIVES

The potential cleanup alternatives for the Site were evaluated using the evaluation criteria described in Section 2. General descriptions of the conceptual design of each alternative are described below. Discussions of the pros and cons of each alternative are presented in the following subsections. Final design specifications and features of the actual remedy may differ from the conceptual design described herein.

Alternative 1: (No Action) The No Action alternative would involve leaving the Site in its current state. There would be no removal, containment, engineering control (EC), or institutional control (IC) actions implemented. The No Action alternative provides a baseline against which other alternatives can be compared. A consideration of risk is taken into account if no action is taken as opposed to implementing a cleanup action.

Alternative 2: Contain and/or Encapsulate Damaged Friable Asbestos, Implement Operations and Maintenance Plan, Specialized Cleaning and Painting as Interim Controls Consists of containing/encapsulating the deteriorated asbestos-containing material (ACM). This would include applying a lap cloth, CP 11 or a bridging encapsulant to damaged ACM. The deteriorated lead-based paint (LBP) in the building with deteriorated was found in bathrooms on second floor that are currently not in use. The areas with the deteriorated LBP would be wet scrape, primed and painted with quality paint (interim controls). The entire facility would undergo specialized cleaning to reduce the amount of LBP dust on the floors. The development and implementation of an Operations and Maintenance (O&M) Plan for ACM and LBP would result in LBP/ACM left in place in this alternative.

Alternative 3: Removal of All ACM and Abatement LBP by a Combination of Removal, Replacement, Enclosure and Encapsulation. Alternative 3 consists of removing and disposing of all ACM. The abatement will follow the Project Design developed by a licensed Project Designer. The asbestos abatement will also follow all federal regulations and be completed by a licensed asbestos abatement contractor. The deteriorated lead-based paint (LBP) in the building was found throughout the facility on walls, all door components, most window components and all interior wood components. The areas with the deteriorated LBP would be wet scrape, primed and painted with elastomeric LBP encapsulant paint. The entire facility would undergo specialized cleaning to reduce the amount of LBP dust on the floors. The development and implementation of an Operations and Maintenance (O&M) Plan for LBP left in place after abatement.

4.1 Compliance

Alternative 1 (No Action) would not be compliant with Tribal and/or federal regulations for the Site in its current condition due to the presence and deteriorated condition of the known COCs.

The areas with asbestos and LBP damage should have very limited access. Personnel entering these areas should have awareness training at a minimum. This alternative will increase ongoing maintenance.

Alternative 2 Contain and/or Encapsulate Damage Friable Asbestos, Implement Operations and Maintenance Plan, Specialized Cleaning and Painting as Interim Controls. Alternative 2 consists of containing/encapsulating the deteriorated asbestos containing material. This would include applying a lap cloth, CP 11 or a bridging encapsulant to damage asbestos containing material (ACM). The deteriorated lead-based paint (LBP) in the building was found in throughout and is currently not in use. The areas with the deteriorated lead-based paint (LBP) will be wet scraped, primed and painted with quality paint (interim controls). The entire facility would undergo specialized cleaning to reduce the amount of LBP dust on the floors. Based on lead levels in Soils require abatement options, removed and replace or enclosed with a pavement. The development and implementation of an Operations and Maintenance (O&M) Plan for ACM and LBP left in place for this alternative is required by CNO Policy. Federal regulations do not require the asbestos & LBP need to be removed. The conditions of the material impact or friction areas are required to be in good condition to eliminate asbestos fiber release and LBP dust in occupied areas. Therefore, Alternative 2 follows Tribal and federal regulations for ACM and LBP.

Alternative 3 Removal of All ACM and Abatement LBP by a Combination of Removal, Replacement, Enclosure and Encapsulation. Alternative 3 consists of removing and disposing of all ACM according to all federal, state and local regulations. The LBP abatement will follow all federal, local regulations. The abatement does not remove all LBP but does manage the intact LBP according to the LBP O&M Plan. The abatement option for LBP in soil for this site will be remove and place with clean tested soil. Therefore, Alternative 3 is in compliance with CNO LBP Policy, federal and local regulations for ACM and LBP.

4.2 Effectiveness

Alternative 1 (No Action) will not reduce the potential for exposure of human health and the environment to COCs or provide a reduction in the toxicity, mobility, or volume of contaminants as site conditions will deteriorate continually with time. The estimated risk from COCs to potential receptors would not be decreased in the short-term or long-term.

Alternative 2 Contain and/or Encapsulate Damaged Friable Asbestos, Implement Operations and Maintenance Plan, Specialized Cleaning and Painting (Interim Controls) consists of containing/encapsulating the deteriorated asbestos containing material and deteriorated

LBP which will reduce the potential for exposure of human health and the environment to COCs. Soils would require abatement options, removed and replace or encapsulate with a pavement. The estimated risk from COCs to potential receptors would be decreased in the short-term. Alternative 2 would **not** achieve the cleanup goals set for the Site in the long-term. This alternative does achieve a use outcome for the property.

Alternative 3 Removal of All ACM and Abatement LBP by a Combination of Removal, Replacement, Enclosure and Encapsulation will be effective in the short-term and long-term due to the removal of all or stabilization of the COCs. If implemented properly, due to no asbestos contaminants left on-site and stabilization or remove/replacement of LBP hazards and with an LBP O&M Plan, there will be no risk to human health or the environment remaining at the Site. This alternative is the only one that is the safest for workers and eliminates the chance of asbestos and LBP potential for exposure to human health and the environment. This alternative will allow for the CNO cleanup goal to be achieved.

4.3 Difficulty of Implementation

Alternative 1 No Action is technically and administratively feasible. Maintenance or monitoring will be required. Changes in climate will not alter the risk associated with this alternative. Although implementation is possible, the "No Action" alternative would not meet the cleanup goal may expose current occupants to COCs.

Alternative 2 Contain and/or Encapsulate Damage Friable Asbestos, Implement Operations and Maintenance Plan, Specialized Cleaning and Painting (Interim Controls) consists of containing/encapsulating the deteriorated asbestos containing material. Soils would require abatement options, removed and replace or encapsulate with a pavement. An Operations and Maintenance (O&M) Plan for ACM and LBP left in place for this alternative will be developed and on-site maintenance personnel will be trained to implement the plans. This type of cleanup and stabilization is feasible and is standard practice of asbestos and LBP projects. Difficulty to implement this plan is moderate. Coordination during interim control activities is anticipated with short-term low-level disturbances to the site. This alternative would also require an Asbestos Management Plan and continued quarterly and annual monitoring.

Alternative 3: Removal of All ACM and Abatement LBP by a Combination of Removal, Replacement, Enclosure and Encapsulation. Alternative 3 consists of the removal of and/or stabilization of the COCs. If implemented properly, due to no asbestos contaminants left on-site and stabilization or removal/replacement of LBP hazards and with an LBP O&M Plan, there will be no risk to human health or the environment remaining at the Site. The ACM abatement will follow the Project Design and the LBP will follow the LBP Abatement Plan. An Operations and Maintenance (O&M) Plan for LBP left in place for this alternative will be develop and on-site maintenance personnel will be trained to implement the plans.

The difficulty level of implementing this plan is moderate to high - moderate. Coordination during cleanup activities is anticipated with short-term moderate disturbance to the site. THPO consultation would also be required and coordinated with EPA, SOI, and CNO would be required.

Access to the Site is currently available and no areas are inaccessible by passenger vehicles. No road improvements would be required to provide access for construction equipment and personnel.

4.4 Cost

Costs incurred are evaluated on a scale of low, moderate, and high in relation to each of the other alternatives and based upon past experience with similar projects. Conceptual costs (not intended for budgetary estimates) were evaluated for time, effort, labor, and materials necessary.

Alternative 1 (No Action) has low costs associated with this option. Minimal amounts of time, effort, and labor would be required.

Alternative 2 Alternative 2 Contain and/or Encapsulate Damage Friable Asbestos, Implement Operations and Maintenance Plan, Specialized Cleaning and Painting (Interim Controls). This level of work will take similar time and effort as removal, except asbestos materials are left in place and will require monitoring. This option will require pest control of wasp that are living in wall and floors

Alternative 3: Removal of All ACM and Abatement LBP by a Combination of Removal, Replacement, Enclosure and Encapsulation consists of removing and disposing of all ACM and encapsulation and/or removal of LBP. An Operations and Maintenance (O&M) Plan for LBP left in place for this alternative will be developed. This option will require pest control of wasp that are living in walls and floors

A summary of the cost comparison of each of the alternatives is presented in the following table, with the most expensive alternative listed as 3rd and the least expensive alternative listed as 1st.

4.5 Summary Comparison of Potential Alternatives

Comparisons are based on the four evaluation criteria previously discussed. A summary of the comparison of each of the alternatives is presented below along with status as to whether the alternative was retained for consideration as the preferred alternative selected.

Cleanup Alternative	Compliance	Effectiveness	Implementability	Cost[(1)]	Comment
Alternative 1: No Action	Non-compliant	Not effective	Implementable	$5,000-$12,000	This alternative does not satisfy the cleanup goals for this site. Cost to secure the building.
Alternative 2: Encapsulation of Friable ACM - RACM and LBP Interim Controls (IC) on Poor Condition Paint and LBP in Soils, The dripline soil will require abatement.	Compliant	Effective	Implementable	Asbestos $ 24,500 LBP IC $ 365,350 LBP Soil & Chips $33,210 Total $423,060	This alternative does satisfy the cleanup goals for this site and allows for continued current use of the property. It leaves the asbestos in the basement/crawl space that will require monitoring and needs to be removed in future if utilities are upgraded. Remove paint chips and soils will require TCLP testing to determine the if waste is non-hazardous or hazardous for disposal.
Alternative 3: Abatement of All ACM and LBP Abatement will be a Combination of Removal, Replacement, Enclosure and Encapsulation on Poor Condition Paint and on LBP in Soils	Compliant	Effective	Implementable	Asbestos $ 36,500 LBP $ 546,490 LBP Soil & Chips $33,210 Total $616,205	This alternative satisfies the cleanup goal for the building and is the option that permanently mitigates the asbestos and manages the LBP with a minimum twenty-year abatement option. Remove paint chips and soils will require TCLP testing to determine the if waste is non-hazardous or hazardous for disposal. However, it is the most expensive alternative but is the most compliant and effective option.

Pushmataha Hall Abatement Cost Breakdown:

Asbestos:

Removal of 346 LF of asbestos containing pipe insulation	$ 27,500.00
Removal of 175 SF of asbestos containing flooring bricks & sheet vinyl	$ 3,000.00
Removal of debris & soil under damaged asbestos pipe	$ 6,000.00
Subtotal	**$ 36,500.00**

LBP:

Abatement of 45,800 Sf of deteriorated LBP walls & ceilings	$ 407,620.00
Abatement of 11,500 Sf of deteriorated LBP walls & components	$ 95,750.00
Cleaning & sealing of floors	$ 43,120.00
Subtotal	**$ 546,490.00**

LBP Soil & Paint Chips	
Removal of 45 cy LBP hazardous soil	$ 10,300.00
Disposal of 45 cy LBP hazardous paint chips	$ 15,750.00
Disposal of LBP hazardous paint chips	$ 6,960.00
Subtotal	**$ 33,210.00**
Total	**$ 616,205.00**

5.0 PERFERRED CLEANUP ALTERNATIVE

5.1 ACM REMOVAL AND LBP ABATEMENT

Of the three cleanup alternatives evaluated for selection at the Wheelock Academy located at 1377 Wheelock Road, Gavin, Oklahoma 74736, the preferred alternative recommended is:

Alternative 3: Removal of All ACM and Abatement LBP by a Combination of Removal, Replacement, Enclosure and Encapsulation

This alternative was selected based upon overall compliance with state and/or federal regulations, effectiveness in protecting human health and the environment in both the short-term and long-term, feasibility of implementation, and cost effectiveness. In addition, this alternative is the closest match to the detailed plans for reuse that have already been considered.

Presented below are the engineering costs to remediate the COCs at the Site. Engineering costs were determined based upon information obtained from the previous Phase I & Phase II ESA (2024), and past experience on similar projects. Actual bids from companies to perform the work may vary from this estimate depending on local conditions and other factors outside of the assessor's knowledge. Final design specifications, features, and cost of the actual remedy may differ from the conceptual design presented.

6.0 SPECIFICATIONS FOR REPORT USE AND RELIANCE

6.1 Special Terms and Conditions

This document has been prepared for the Choctaw Nation for the use and benefit of the Choctaw Nation. Any use of this document or information herein by persons or entities other than Choctaw Nation without the express written consent will be at the sole risk and liability of said person or entity. It is understood that this document may not include all information pertaining to the described site.

6.2 Disclaimers

The cost estimate in this report is based upon the Phase II Environmental Site Assessment (ESA 2024) by Crystal Creek LLC, Inc. Phase II Environmental Site Assessment (ESA) which were in general conformance with the scope and limitations of ASTM E1903-19. The cost estimate presented herein is based on costs from engineering estimate past experience on similar projects as selected alternative presented in this document. Professional opinions are based solely on data collected during the assessment and/or interpretation of information and past data provided for review. Crystal Creek LLC does not warrant or guarantee information obtained from third parties used for this assessment are correct, complete, and/or current.

7.0 REFERENCES

Oklahoma Department of Labor, Oklahoma Asbestos Control Act 40 O.S. § 450, et seq. Abatement of Friable Asbestos Materials Rules OAC 380:50

Asbestos NESHAP is found in 40 CFR Part 61, Subpart M and DEQ has the delegated responsibility to regulate this NESHAP in Oklahoma.

American Society for Testing and Materials (ASTM), 2021. E1903-19, *Standard Practice for Environmental Site Assessments: Phase II Environmental Site Assessment Process.*

EPA, 1988. *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA*. (EPA/540/G-89/004).

HUD LBP Guidelines for the Evaluation and Control of LBP hazards in Housing, Chapter 7

Phase I Environmental Site Assessment (2020), A & M Engineering and Environmental Services, Inc.

Phase II Environmental Site Assessment (2024), Crystal Creek LLC

APPENDIX A
SOLID WASTE LANDFILLS APPROVED TO ACCEPT FRIABLE ASBESTOS WASTE

Oklahoma Department of Environmental Quality
Oklahoma Landfills Accepting Regulated Asbestos Waste

OAC 252:515-19-31 states that the disposal of friable asbestos waste at a solid waste disposal facility is prohibited unless the facility is a municipal solid waste landfill (MSWLF) or non-hazardous industrial waste (NHIW) landfill specifically authorized by the permit to accept such waste. Disposal practices for asbestos and materials containing asbestos must be in compliance with appropriate regulations as set forth in OAC 252:100-40-5.

COUNTY	SOLID WASTE PERMIT NO.	FACILITY
Permitted to Accept Friable and Non-Friable Asbestos		
BECKHAM	3505009	Elk City Municipal Landfill (580) 225-3230
BECKHAM	3505011	Sayre Municipal Landfill (580) 928-2260
CANADIAN	3509005	Oklahoma Environmental Authority Landfill (405) 483-5402
GARVIN	3525012	Pauls Valley Landfill 405-495-0800
GRADY	3526013	Southern Plains Landfill (405) 224-3680
JACKSON	3533005	City of Altus Landfill (580) 477-1950
MAJOR	3547002	Red Carpet Landfill (580) 776-2255
MUSKOGEE	3551020	Muskogee Community RDF (918) 682-7284
OKLAHOMA	3555018	Oklahoma Landfill (405) 745-3091
OKLAHOMA	3555028	SE Oklahoma City Landfill (405) 745-4141
OKLAHOMA	3555036	East Oak Sanitary Landfill (405) 427-1112
OSAGE	3557021	American Environmental Landfill (918)245-7786
OSAGE	3557025	Osage Landfill (918) 336-3159
PAYNE	3560010	Stillwater Landfill (405) 372-6628
PONTOTOC	3562006	City of Ada Municipal Sanitary LF (580) 436-1403
PUSHMATAHA	3564004	Clinton Lewis Construction Co. Landfill (580) 298-3729
SEMINOLE	3567020	Sooner Land Management Landfill (405) 257-6108
SEQUOYAH	3568008	Sallisaw Solid Waste Disposal Facility (918)775-6241
TULSA	3572042	Quarry Landfill (918) 437-7773

DRAFT ANALYSIS OF BROWNFIELDS CLEANUP ALTERNATIVES FOR WHEELOCK ACADAMEY CAMPUS – SUPERINTENDENT'S OFFICE

GARVIN, MCCURTAIN COUNTY, OKLAHOMA

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Date Prepared: August 4, 2025

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LIST OF ACRONYMS

ACBA	Analysis of Brownfields Cleanup Alternatives
ACM	asbestos-containing material
AL	action level
AQCC	Air Quality Control Commission
AHERA	Asbestos Hazard Emergency Response Act
APCD	Air Pollution Control Division
ASTM	American Society for Testing and Materials
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CH	Chrysotile
COC	contaminant of concern
CPSC	Consumer Product Safety Commission
EC	engineering control
EPA	United States Environmental Protection Agency
ESA	environmental site assessment
f/cc	fibers per cubic centimeter
HMWMD	Hazardous Material and Waste Management Division
IC	institutional control
ID	identification
LBP	lead-based paint
LF	linear feet
N/A	Not Applicable
O&M	Operations and Maintenance
ODOL	Oklahoma Department of Labor
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Limit
P.G.	Professional Geologist
PLM	polarized light microscopy
RACM	regulated asbestos-containing material
sq. ft.	square feet
START	Superfund Technical Assessment and Response Team
SOO	Statement of Objectives
TDD	Technical Direction Document
TSI	thermal system insulation

SUMMARY

Crystal Creek LLC was tasked to conduct a brownfield cleanup alternatives analysis at the Wheelock Academy Campus. The site is located at 1377 Wheelock Road, Garvin, Oklahoma 74736. Previous ACM and LBP testing was previously conducted at the Wheelock Academy Campus including the Mission Church by Crystal Creek, LLC, an Oklahoma licensed engineer firm, for the Choctaw Nation and completed in July 2024. The *Phase II Environmental Site Assessment* for Wheelock Academy Campus – *Superintendent's Office Building, Garvin, Oklahoma,* details the work performed, methods used, information and data acquired, and evaluation and interpretation of results as part of the Phase II ESA. This draft Analysis of Brownfields Cleanup Alternatives is based upon the information presented in the Brownfields Pilot Project, Phase II ESA report, Wheelock Academy Limited Soil Screening and is for the Superintendent's Office Building only.

SCOPE OF CLEANUP

Based upon the results of the Phase II ESA for Wheelock Academy, the specific concerns addressed in this conceptual cleanup alternatives analysis for the Site include:

A. Asbestos-containing materials (ACM) identified at the Site
B. Lead-Based Paint components (LBP) identified at Site.
C. Lead in soil identified at the Site.
D. Asbestos in soil (debris under pipe) identified at the Site.

EVALUATION CRITERIA

Cleanup alternatives considered as part of this analysis were evaluated against the following criteria:

- Compliance;
- Effectiveness;
- Difficulty of Implementation;
- Cost.

PREFERRED ALTERNATIVE SELECTED

Of the three cleanup alternatives evaluated for selection at the Wheelock Academy located at 1377 Wheelock Road, Gavin, Oklahoma 74736, the preferred alternative recommended is:

Alternative 3: Removal of All ACM, Asbestos in Soil, Abatement of LBP, and Lead in Soil by a Combination of Removal, Replacement, Enclosure and Encapsulation

This alternative was selected based upon overall compliance with tribal and federal regulations, effectiveness in protecting human health and the environment in both the short-term and long-term, feasibility of implementation, and cost effectiveness. In addition, this alternative is the closest match to the detailed plans for reuse that have already been considered.

Presented below are the engineering costs to remediate the COCs at the Site. Engineering costs were determined based upon information obtained from the previous Phase I & Phase II ESA (2024), additional sampling and past experience on similar projects. Actual bids from companies to perform the work may vary from this estimate depending on local conditions and other factors outside of the assessor's knowledge. Final design specifications, features, and cost of the actual remedy may differ from the conceptual design presented.

Actual bids from companies to perform the work may vary from this estimate depending on local conditions and other factors outside of the assessor's knowledge. Final design specifications, features, and cost of the actual remedy may differ from the conceptual design presented. A detailed conceptual cost estimate breakdown for the total shown below is presented on Table 1.

Remediation Task	Remediation Cost
Removal of All ACM and Abatement LBP	$26,500
Total	

This summary is a general description of the cleanup alternatives analysis for the Site. This section is not intended to be used alone and does not include the basis of all conclusions presented. The report should be read and used in its entirety and in conjunction with the Brownfields Pilot Project and Phase II ESA report. Information included in this section is subject to the scope of services and limitations noted in the full ABCA, Brownfields Pilot Project and Phase II ESA reports.

1.0 INTRODUCTION

Crystal Creek LLC was tasked to conduct a Phase II Environmental Site Assessment (ESA) and Analysis of Brownfields Cleanup Alternatives at Wheelock Academy and Wheelock Mission Church. The site is located at 1377 Wheelock Road, Gavin, Oklahoma 74736 (Site). The Phase II ESA report, for Wheelock Academy and Wheelock Mission Church Properties, McCurtain County, Oklahoma, details the work performed, methods used, information and data acquired, and evaluation and interpretation of results. This Analysis of Brownfields Cleanup Alternatives is based upon the information presented in the Crystal Creek, LLC's, Phase II Environmental Site Assessment (ESA) dated July, 2024. This draft Analysis of Brownfields Cleanup Alternatives is based upon the information presented in the Phase II ESA report and is for the Superintendent's Office only.

1.1 Background-History

The original school at Wheelock was a small "day" school, established in 1833 in conjunction with a nearby Christian mission. This marked the beginning of formal education at the site. In 1842, with the establishment of the Choctaw National School System, the institution began receiving financial support from treaty funds secured by the Choctaw Nation from the U.S. Government and was designated as a women's seminary and managed by missionaries with a board of trustees.

Wheelock Seminary was closed in 1861 at the onset of the Civil War. The original structure was destroyed by fire at the close of the Civil War. In the early 1880s Choctaw national leaders decided to rebuild the school on a new site a few hundred yards northeast of the old mission station, school, and church. The present Wheelock Academy building (Superintendent's Office) was constructed, and a Choctaw orphanage was opened there in September 1884. Over the following seventy years, the Academy flourished as a center of learning for Choctaw girls and young women, ultimately ceasing operations in 1955. The U.S. government assumed jurisdiction over the school in 1910 and full control as well as funding in 1932. After 1955 the facility remained virtually abandoned until later returned to ownership of the Choctaw Nation.

Wheelock Academy served as a model for educational institutions operated by the Five Civilized Tribes and although it played a significant role in advancing indigenous education in Indian Territory it has a complicated history for the Choctaw people, as many boarding schools do. Recognizing its historical and cultural significance, whether positive or negative, Wheelock Academy was later designated a National Historic Landmark by the Secretary of Interior. Today, several of its remaining buildings, along with an on-site museum, preserve and interpret the history of the school and the Choctaw Nation's dedication to education.

In 2001, a report to Congress titled *National Historic Landmarks at the Millennium* identified Wheelock Academy as one of America's "Threatened Landmarks," underscoring the need for continued preservation efforts.

The Wheelock Academy Campus consists of approximately 47 acres and nine (9) Structures located approximately 2 miles north of Highway 70 and approximately 2.5 miles east of Millerton, Oklahoma. The Wheelock Academy Property contains the requested eight (8) buildings which were included in the Phase II which have LBP, lead in soil and/or Asbestos material which need attention. The buildings requested are as follows:

1. McCurtain Hall
2. Caretaker Cottage
3. Superintendent's Office
4. Pushmataha Hall
5. Willson Hall
6. Wheelock Mission Church
7. Boiler House
8. Bathhouse
9. Well House (no regulated material)

ACM and LBP and lead-in-soil testing was conducted in all Wheelock Academy Buildings by Crystal Creek, LLC for a Phase II. Crystal Creek, LLC's, Phase II Environmental Site Assessment (ESA) dated July, 2024 for ACMs and LBP which was identified no ACM, soil (LBP), walls (LBP), ceilings (LBP), exterior walls (LBP), exterior crown trim (LBP) and exterior door (LBP).

The Superintendent's Office was constructed in 1928 is approximately 750 sq ft and is occupied. It was originally used as superintendent's office and is still used as an office. The interior structure is mostly in very good conditions. The visual inspection determined the building surfaces were mostly intact with the only area in poor condition are on the exterior components.

The ground surface at the site slopes to the east. Groundcover consists primarily of grasses, trees, and concrete sidewalk. The property can be accessed from Wheelock Road approximately 1.5 miles east of the intersection of Main Street and Highway 70, Millerton, Oklahoma

1.2 Summary of Phase II ESA Results

The Phase II ESA was conducted in accordance with *ASTM International – Standard Practice for Environmental Site Assessments: Phase II Environmental Site Assessment Process E1903-19.* The results of the Phase II ESA confirmed the presence of contaminants of concern (COCs) at the Site.

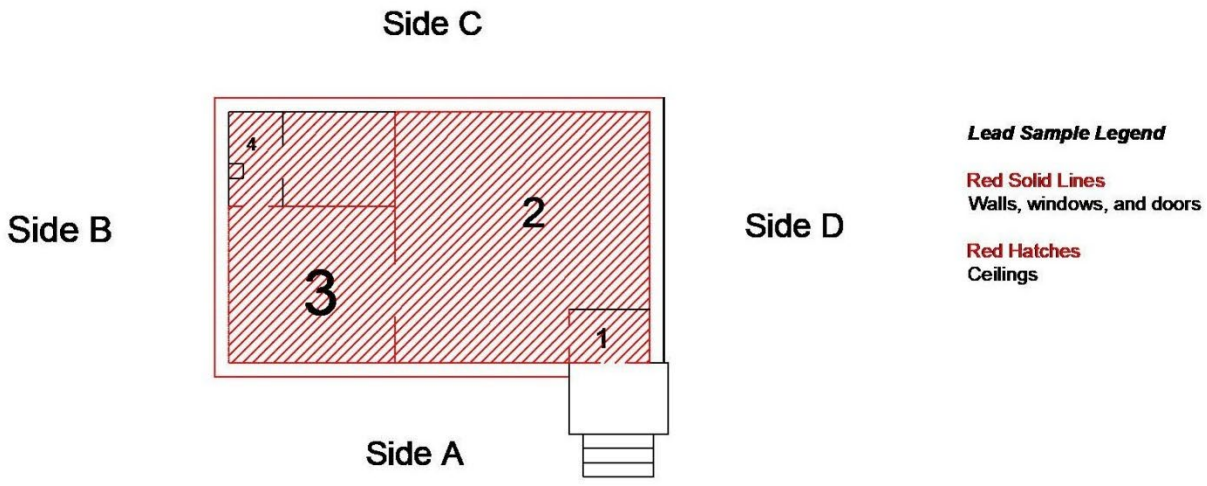
The following list is a summary of the conclusions regarding COCs and associated media identified at the Site that are addressed in this cost estimate:

ACM: Of the samples submitted for laboratory analysis, all samples were reported as "negative" (>1% asbestos) for asbestos.

LBP - The inspection of Superintendent's Office Building was conducted following the U.S. Department of Housing and Urban Development (HUD) Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing with the 1997 revision. The standard for lead-based paint as per HUD/EPA standard of 1.0 mg/cm^2 was followed. All requirements for the NITON XRF usage contained in the Performance Characteristics Sheet for the specific XRF were followed. LBP was identified throughout the Superintendent's Office Building. LBP is considered to be a contaminant of concern (COC) in relation to the Site.

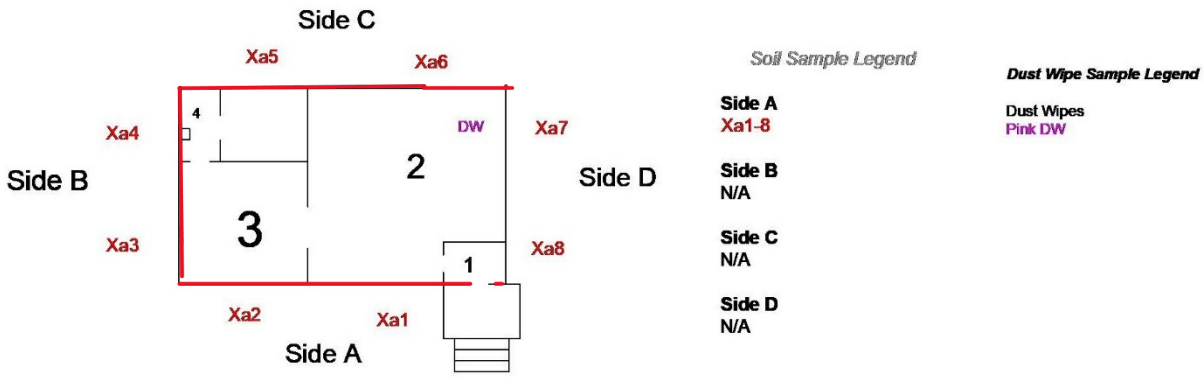
Interior Materials Superintendent's Office Building

The following tested painted components were found to contain lead in a concentration greater than the federal threshold of 1.0 mg/cm^2 of surface as measured by an XRF.



Exterior Materials – Superintendent's Office Building

Exterior painted surfaces tested (homogeneous areas) were found to contain lead in a concentration greater than the federal threshold of 1.0 mg/cm^2 of surface as measured by the XRF. See above.



1.3 Project Goals / Site Reuse Plan

Based on information that the Choctaw Nation Brownfields Program, the current site reuse plan will be determined and finalized by the Choctaw Nation Tribal Council. However, at this time of this ABCA document there were six reuse plans being considered and drafted which include expansion of the current museum, an interpretive center, retreat center, historic tourism, recreation, tribal education, college or training center. Any finalized reuse plans shall be finalized by the decision of the Tribal Council and the Chief of the Choctaw Nation of Oklahoma.

1.4 Cleanup Scope and Goals

Based upon the results of the Phase II ESA conducted, the specific concerns addressed in this conceptual cleanup alternatives analysis for the Site include:

A. LBP and lead in soil identified at the Site

The overall purpose of a cleanup at the Site is to allow the property to be redeveloped and or continue curt use while mitigating the risk that COCs currently present at the Site that may pose r to human health and the environment. The cleanup goal(s) for the Site are listed below:

- Remove and dispose of COCs to allow for redevelopment of the property;
- Conduct cleanup operations that are compliant with applicable local, Tribal, and federal standards that will protect human health and the environment;
- Implement cleanup alternative(s) that are practical and effective in mitigating COCs to protect human health and the environment in both the short-term and long-term.

2.0 EVALUATION CRITERIA FOR ALTERNATIVES

Each of the potential cleanup alternatives is evaluated against the following set of four criteria:

2.1 Compliance

Compliance with applicable state, federal and tribal regulations.

2.1.a Cleanup Oversight Responsibility

The cleanup will be overseen by the CNO Tribal Response Program in consultation with EPA. In addition, all documents prepared for this site are submitted to the CNO Tribal Response Program/CNO Brownfields Program under CNO Tracking Number MCTTT01116 and to EPA under ACRES site number 244077. It is recommended that the following regulations be followed: The Small Business Relief and Brownfields Revitalization Act, Occupational Safety and Health Act, and any applicable provisions of the Clean Air Act, Resource Conservation and Recovery Act, the Toxic Substance Control Act, and Comprehensive Environmental Response, Comprehensive, and Liability Act where they pertain to remediation and disposal of lead in soil. Applicable sections of the CNO Environmental Codes and the CNO LBP Policies will be followed. Also, the following qualifications should be held by the remedial contractor(s) selected to oversee and/or implement the following remediation tasks and activities:

LBP Abatement

All aspects of LBP Cleanup Oversight must be conducted in accordance with OSHA Lead in Construction Standard found in 29 CFR Part 1926, 40 CFR Part 745 and TSCA Title IV 402/404. When selecting firm(s) and/or individuals to utilize, it is recommended that the following certifications be verified, at a minimum:

1) State of Oklahoma license Lead-Based Paint Firm to perform:
   - Development of LBP abatement plan;

2) State of Oklahoma licensed LBP Abatement Workers.

3) Clearance testing by a state/federal licensed LBP Risk Assessor

2.1.b Cleanup Standards for Contaminants

The following standards are recommended to be met during the remediation tasks and activities:

LBP Remediation

Cleanup levels for LBP remediation must meet standards in accordance with OSHA Lead in Construction Standard found in 29 CFR Part 1926.62. Examples of applicable standards include:

LBP Action Levels		
LBP Sample	**Regulatory Action Level**	**Source of Regulation**
Lead-Based Paint	1.0 mg/cm2	EPA, 40 CFR Part 745
Lead in Air Monitoring - Workers	30 µg/m^3 (action level [AL])	Occupational Safety and Health Administration (OSHA) 29 CFR Part 1926.62
	50 µg/m^3 (Permissible Exposure Level [PEL])	OSHA 29 CFR Part 1926.62

EPA & HUD LBP Clearance Limits for Sample Locations

Sample Location	HUD Clearance Limits	EPA Clearance Limits
Floor	10 µg/sq. ft.	5 µg/sq. ft
Window Sills	100.00 µg/sq. ft.	40.00 µg/sq. ft.
Window Trough	400 µg/sq. ft.	100 µg/sq. ft.
Play Area Soil	400 PPM	400 PPM

Dripline Soil	1200 PPM.	1200 PPM
Abatement of Soil	5000 PPM	5000 PPM

2.1.c Laws & Regulations Applicable to Cleanup

The following laws and regulations are mandatory and/or recommended to be followed during the cleanup tasks and activities:

ACM Abatement

- Occupational Safety and Health Administration (OSHA) 1926.1101
- Asbestos NESHAP is found in 40 CFR Part 61, Subpart M and DEQ has the delegated responsibility to regulate this NESHAP in Oklahoma – Governs the disposal of asbestos waste and the management of asbestos contamination.

LBP Abatement

- Oklahoma Department of Environmental Quality, OAC 252:110 Lead-Based Paint Management, which implements the OK Lead-Based Paint Management Act – Governs LBP abatement on child occupied housing in Oklahoma.
- OSHA Lead in Construction Standard found in 29 CFR Part 1926.62 – Governs the lead in air for abatement and construction.
- Title IV of the Toxic Substances Control Act (TSCA), as well as other authorities in the Residential Lead-Based Paint Hazard Reduction Act of 1992
- Small Business Liability Relief and Brownfields Revitalization Act, enacted in 2002, which amended the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)
- 40 CFR Part 745

2.2 Effectiveness

- Protection of human health and the environment, including workers during implementation;
- Feasibility for mitigation of risk in the short-term and long-term effectiveness;
- Complete removal of contaminants;
- Achievability of the cleanup goals;

2.3 Difficulty of Implementation

- Technical feasibility;
- Availability of work force, materials, and equipment;
- Administrative ability;
- Construction feasibility;
- Maintenance and monitoring requirements.

2.4 Cost (Conceptual costs for comparative analysis only)

- Time requirements, materials, equipment, labor and waste disposal locations.

The selection of "effectiveness", "feasibility", and "cost" as evaluation criteria is based upon the EPA's *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA* (EPA, 1988). In addition, the selection of "compliance" as an evaluation criterion is used consider variations between federal, state, and/or local regulations, if applicable, on a site-by-site basis.

3.0 CLEANUP ALTERNATIVES FOR EVALUATION

Listed below are the specific cleanup alternatives evaluated based upon the results of the Phase II ESA conducted at the Site. In addition, alternatives considered, but not evaluated due to site-specific factors which eliminated the alternative from further analysis are also listed, if applicable.

3.1 Cleanup Alternatives Evaluated

The following removal action alternatives were considered as part of this evaluation.

- Alternative 1: **No Action**
- Alternative 2: **Implement Operations and Maintenance. Specialized, Cleaning and Painting**
- Alternative 3: **Abatement LBP by a Combination of Removal, Replacement, Enclosure and Encapsulation**

4.0 COMPARATIVE ANALYSIS OF CLEANUP ALTERNATIVES

The potential cleanup alternatives for the Site were evaluated using the evaluation criteria described in Section 2. General descriptions of the conceptual design of each alternative are described below. Discussions of the pros and cons of each alternative are presented in the

following subsections. Final design specifications and features of the actual remedy may differ from the conceptual design described herein.

Alternative 1: (No Action) The No Action alternative would involve leaving the Site in its current state. There would be no removal, containment, engineering control (EC), or institutional control (IC) actions implemented. The No Action alternative provides a baseline against which other alternatives can be compared. A consideration of risk is taken into account if no action is taken as opposed to implementing a cleanup action.

Alternative 2: Implement Operations and Maintenance Plan, Specialized Cleaning and Painting as Interim Controls Consists of interim controls on deteriorated lead-based paint (LBP) on the building. The areas with the deteriorated LBP would be wet scrape, primed and painted with quality paint (interim controls). The entire facility would undergo specialized cleaning with a focus around the windows to reduce the amount of LBP dust on the floors, window sills and window troughs. Sod will be placed in the driplines as a soil interim control. The development and implementation of an Operations and Maintenance (O&M) Plan for ACM and LBP would result in LBP/ACM left in place in this alternative.

Alternative 3: Abatement LBP by a Combination of Removal, Replacement, Enclosure and Encapsulation. Alternative 3 abatement of all deteriorated lead-based paint (LBP) on the building components. LBP was found throughout the facility on walls, and ceilings and exterior wood components. The areas with the deteriorated LBP would be wet scrape, primed and painted with elastomeric LBP encapsulant paint. The entire facility would undergo specialized cleaning to reduce the amount of LBP dust on the floors, window sills and window troughs. Sod will be placed in the driplines as a soil interim control. The development and implementation of an Operations and Maintenance (O&M) Plan for LBP left in place after abatement.

4.1 Compliance

Alternative 1 (No Action) would not be compliant with Tribal and/or federal regulations for the Site in its current condition due to the presence and deteriorated condition of the known COCs. The areas with asbestos and LBP damage should have very limited access. Personnel entering these areas should have awareness training at a minimum. This alternative will increase ongoing maintenance.

Alternative 2 Implement Operations and Maintenance Plan, Specialized Cleaning and Painting as Interim Controls. Alternative 2 consists of interim controls on deteriorated lead-based paint (LBP) on the building. The areas with the deteriorated lead-based paint (LBP) would be wet scraped, primed and painted with quality paint (interim controls). The entire facility would undergo specialized cleaning to reduce the amount of LBP dust on the floors

window sills and window troughs. The development and implementation of an Operations and Maintenance (O&M) Plan for LBP left in place for this alternative is required by CNO Policy. Federal regulations do not require the LBP to be removed. Therefore, Alternative 2 follows Tribal and federal regulations for LBP but is not a long-term solution and does not achieve the use outcome of the CNO.

Alternative 3 Removal of All ACM and Abatement LBP by a Combination of Removal, Replacement, Enclosure and Encapsulation. Alternative 3 consists of LBP abatement which will follow all federal, local regulations. The abatement does not remove all LBP but deteriorated lead-based paint (LBP) would be wet scraped, primed and painted with lead-based paint elastomeric encapsulant with 20-year life. The intact LBP and lead in soil will be managed according to the LBP O&M Plan. Therefore, Alternative 3 is in compliance with CNO LBP Policy, federal and local regulations for ACM and LBP.

4.2 Effectiveness

Alternative 1 (No Action) will not reduce the potential for exposure of human health and the environment to COCs or provide a reduction in the toxicity, mobility, or volume of contaminants as site conditions will deteriorate continually with time. The estimated risk from COCs to potential receptors would not be decreased in the short-term or long-term.

Alternative 2 Implement Operations and Maintenance Plan, Specialized Cleaning and Painting (Interim Controls) This alternative consists of interim control on deteriorated LBP which will reduce the potential for exposure of human health and the environment to COCs'. The estimated risk from COCs to potential receptors would be decreased in the short term and medium term. Changes in climate will not significantly alter the risk associated with this alternative. Alternative 2 would **not** achieve the cleanup goals set for the Site in the short-term or long-term. This alternative not effective in achieving the CNO use outcome for the property.

Alternative 3 Abatement LBP by a Combination of Removal, Replacement, Enclosure and Encapsulation. Will be effective in the short-term and long-term due to the removal of/or stabilization of the COCs. If implemented properly, stabilization of LBP hazards with a 20-year encapsulant elastomeric paint and following the LBP O&M Plan, there will be no risk to human health or the environment remaining at the Site. This alternative is the only one that is the safest for workers and eliminates the chance of LBP potential for exposure to human health and the environment. This alternative will allow for the CNO cleanup goal and use plan to be achieved.

4.3 Difficulty of Implementation

Alternative 1 No Action is technically and administratively feasible. Maintenance or monitoring will be required. Although implementation is possible, the "No Action" alternative would not meet the cleanup goal may expose current occupants to COCs.

Alternative 2 Implement Operations and Maintenance Plan, Specialized Cleaning and Painting (Interim Controls). Alternative 2 consists of containing/encapsulating the deteriorated LBP which will reduce the potential for exposure of human health and the environment to COCs. An Operations and Maintenance (O&M) Plan for ACM and LBP left in place for this alternative will be developed and on-site maintenance personnel will be trained to implement the plans. This type of cleanup and stabilization is feasible and is standard practice of LBP projects. Difficulty to implement this plan is low to moderate. Coordination during interim control activities is anticipated with short-term low-level disturbances to the site. This alternative is effective for the short-term but the materials used may need to be applied every few years. Therefore, it is not effective for the use for the building and adjacent buildings.

Alternative 3: Abatement LBP by a Combination of Removal, Replacement, Enclosure and Encapsulation. Alternative 3 will be effective in the short-term and long-term due to the removal of/or stabilization of the COCs. If implemented properly, stabilization of LBP hazards with a 20-year encapsulant elastomeric paint and following the LBP O&M Plan, there will be no risk to human health or the environment remaining at the Site. On-site maintenance personnel will be trained to implement the LBP O&M Plan.

The difficulty level of implementing this plan is moderate. Coordination during cleanup activities is anticipated with short-term moderate disturbance to the site. THPO consultation would also be required and coordinated with EPA, SOI, and CNO would be required.

Access to the Site is currently available and no areas are inaccessible by passenger vehicles. No road improvements would be required to provide access for construction equipment and personnel.

4.4 Cost

Costs incurred are evaluated on a scale of low, moderate, and high in relation to each of the other alternatives and based upon past experience with similar projects. Conceptual costs (not intended for budgetary estimates) were evaluated for time, effort, labor, and materials necessary.

Alternative 1 (No Action) has low costs associated with this option. Minimal amounts of time, effort, and labor would be required.

Alternative 2 Implement Operations and Maintenance Plan, Specialized Cleaning and Painting (Interim Controls). This level of work will take similar time and effort as abatement, except it will require additional monitoring. This option will be almost the same work as abatement except the paint material will not resist deterioration like the abatement option in alternative 3. This will make this option cost more over the next 20 years.

Alternative 3: Abatement LBP by a Combination of Removal, Replacement, Enclosure and Encapsulation. Stabilization of LBP hazards with a 20-year encapsulant elastomeric paint and following the Operations and Maintenance (O&M) Plan for will allow for the CNO cleanup goal and use plan to be achieved.

A summary of the cost comparison of each of the alternatives is presented in the following table, with the most expensive alternative listed as 3rd and the least expensive alternative listed as 1st.

4.5 Summary Comparison of Potential Alternatives

Comparisons are based on the four evaluation criteria previously discussed. A summary of the comparison of each of the alternatives is presented below along with status as to whether the alternative was retained for consideration as the preferred alternative selected.

Cleanup Alternative	Compliance	Effectiveness	Implementability	Cost	Comment
Alternative 1: No Action	Non-compliant	Not effective	Implementable	0.00	This alternative does not satisfy the cleanup goals for this site.
Alternative 2: Encapsulation of Friable ACM - RACM and LBP Interim Controls (IC) on Poor Condition Paint and LBP in Soils, The dripline soil will require abatement.	Compliant	Effective	Implementable	Interim Controls of Exterior & Interior Cleaning. $15,000 Soil Interim Control $3,000 Total 18,000	This alternative does satisfy the cleanup goals for this site and allows for continued current use of the property. Removed paint chips and soils (If required) will require TCLP testing to determine the if waste is non-hazardous or hazardous for disposal.

Cleanup Alternative	Compliance	Effectiveness	Implementability	Cost	Comment
Alternative 3: Abatement of All ACM and LBP Abatement will be a Combination of Removal, Replacement, Enclosure and Encapsulation on Poor Condition Paint and on LBP in Soils	Compliant	Effective	Implementable	Abatement of Exterior & Interior Cleaning. $16,250 Soil Abatement $10,000 Total 26,250	This alternative satisfies the cleanup goal for the building and is the option that permanently mitigates the asbestos and manages the LBP with a minimum twenty-year abatement option. Removed paint chips and soils (if required) will require TCLP testing to determine the if waste is non-hazardous or hazardous for disposal. However, it is the most expensive alternative but is the most compliant and effective option.

5.0 PERFERRED CLEANUP ALTERNATIVE

5.1 ACM REMOVAL AND LBP ABATEMENT

Of the three cleanup alternatives evaluated for selection at the Wheelock Academy located at 1377 Wheelock Road, Gavin, Oklahoma 74736, the preferred alternative recommended is:

Alternative 3: Abatement LBP by a Combination of Removal, Replacement, Enclosure and Encapsulation

This alternative was selected based upon overall compliance with state and/or federal regulations, effectiveness in protecting human health and the environment in both the short-term and long-term, feasibility of implementation, and cost effectiveness. In addition, this alternative is the closest match to the detailed plans for reuse that have already been considered.

Presented below are the engineering costs to remediate the COCs at the Site. Engineering costs were determined based upon information obtained from the previous Phase I & Phase II ESA (2024), and past experience on similar projects. Actual bids from companies to perform the work may vary from this estimate depending on local conditions and other factors outside of the assessor's knowledge. Final design specifications, features, and cost of the actual remedy may differ from the conceptual design presented.

6.0 SPECIFICATIONS FOR REPORT USE AND RELIANCE

6.1 Special Terms and Conditions

This document has been prepared for the Choctaw Nation for the use and benefit of the Choctaw Nation. Any use of this document or information herein by persons or entities other than Choctaw Nation without the express written consent will be at the sole risk and liability of said person or entity. It is understood that this document may not include all information pertaining to the described site.

6.2 Disclaimers

The cost estimate in this report is based upon the Phase II Environmental Site Assessment (ESA 2024) by Crystal Creek LLC, Inc. Phase II Environmental Site Assessment (ESA) which were in general conformance with the scope and limitations of ASTM E1903-19. The cost estimate presented herein is based on costs from engineering estimate past experience on similar projects as selected alternative presented in this document. Professional opinions are based solely on data collected during the assessment and/or interpretation of information and past data provided for review. Crystal Creek LLC does not warrant or guarantee information obtained from third parties used for this assessment are correct, complete, and/or current.

7.0 REFERENCES

Oklahoma Department of Labor, Oklahoma Asbestos Control Act 40 O.S. § 450, et seq. Abatement of Friable Asbestos Materials Rules OAC 380:50

Asbestos NESHAP is found in 40 CFR Part 61, Subpart M and DEQ has the delegated responsibility to regulate this NESHAP in Oklahoma.

American Society for Testing and Materials (ASTM), 2021. E1903-19, *Standard Practice for Environmental Site Assessments: Phase II Environmental Site Assessment Process.*

EPA, 1988. *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA*. (EPA/540/G-89/004).

HUD LBP Guidelines for the Evaluation and Control of LBP hazards in Housing, Chapter 7

Phase I Environmental Site Assessment (2020), A & M Engineering and Environmental Services, Inc.

Phase II Environmental Site Assessment (2024), Crystal Creek LLC

DRAFT ANALYSIS OF BROWNFIELDS CLEANUP ALTERNATIVES FOR WHEELOCK ACADAMEY CAMPUS – WILSON HALL

GARVIN, MCCURTAIN COUNTY, OKLAHOMA

Prepared For

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Date Prepared: August 15, 2025

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LIST OF APPENDICES

LIST OF ACRONYMS

ACBA	Analysis of Brownfields Cleanup Alternatives
ACM	asbestos-containing material
AL	action level
AQCC	Air Quality Control Commission
AHERA	Asbestos Hazard Emergency Response Act
APCD	Air Pollution Control Division
ASTM	American Society for Testing and Materials
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CH	Chrysotile
COC	contaminant of concern
CPSC	Consumer Product Safety Commission
EC	engineering control
EPA	United States Environmental Protection Agency
ESA	environmental site assessment
f/cc	fibers per cubic centimeter
HMWMD	Hazardous Material and Waste Management Division
IC	institutional control
ID	identification
LBP	lead-based paint
LF	linear feet
N/A	Not Applicable
O&M	Operations and Maintenance
ODOL	Oklahoma Department of Labor
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Limit
P.G.	Professional Geologist
PLM	polarized light microscopy
RACM	regulated asbestos-containing material
sq. ft.	square feet
START	Superfund Technical Assessment and Response Team
SOO	Statement of Objectives
TDD	Technical Direction Document
TSI	thermal system insulation

SUMMARY

Crystal Creek LLC was tasked to conduct a brownfield cleanup alternatives analysis at the Wheelock Academy Campus. The site is located at 1377 Wheelock Road, Garvin, Oklahoma 74736. Previous ACM and LBP testing was previously conducted at the Wheelock Academy Campus including the Mission Church by Crystal Creek, LLC, an Oklahoma licensed engineer firm, for the Choctaw Nation and completed in July 2024. The *Phase II Environmental Site Assessment* for Wheelock Academy Campus – *Wilson Hall Building, Garvin, Oklahoma,* details the work performed, methods used, information and data acquired, and evaluation and interpretation of results as part of the Phase II ESA. This draft Analysis of Brownfields Cleanup Alternatives is based upon the information presented in the Brownfields Pilot Project, Phase II ESA report and is for the Wilson Hall Building only.

SCOPE OF CLEANUP

Based upon the results of the Phase II ESA for Wheelock Academy, the specific concerns addressed in this conceptual cleanup alternatives analysis for the Site include:

A. Asbestos-containing materials (ACM) identified at the Site
B. Lead-Based Paint components (LBP) identified at Site.
C. Lead in soil identified at the Site.
D. Asbestos in soil (debris under pipe) identified at the Site.

EVALUATION CRITERIA

Cleanup alternatives considered as part of this analysis were evaluated against the following criteria:

- Compliance;
- Effectiveness;
- Difficulty of Implementation;
- Cost.

PREFERRED ALTERNATIVE SELECTED

Of the three cleanup alternatives evaluated for selection at the Wheelock Academy located at 1377 Wheelock Road, Gavin, Oklahoma 74736, the preferred alternative recommended for Wilson Hall is:

Alternative 3: Removal of All ACM, Asbestos in Soil, Abatement of LBP, and Lead in Soil by a Combination of Removal, Replacement, Enclosure and Encapsulation

This alternative was selected based upon overall compliance with tribal and federal regulations, effectiveness in protecting human health and the environment in both the short-term and long-term, feasibility of implementation, and cost effectiveness. In addition, this alternative is the closest match to the detailed plans for reuse that have already been considered.

Presented below are the engineering costs to remediate the COCs at the Site. Engineering costs were determined based upon information obtained from the previous Phase I & Phase II ESA (2024), additional sampling and past experience on similar projects. Actual bids from companies to perform the work may vary from this estimate depending on local conditions and other factors outside of the assessor's knowledge. Final design specifications, features, and cost of the actual remedy may differ from the conceptual design presented.

Actual bids from companies to perform the work may vary from this estimate depending on local conditions and other factors outside of the assessor's knowledge. Final design specifications, features, and cost of the actual remedy may differ from the conceptual design presented. A detailed conceptual cost estimate breakdown for the total shown below is presented on Table 1.

Remediation Task	Remediation Cost
Removal of All ACM and Abatement LBP	$110,650
Total	$110,650

This summary is a general description of the cleanup alternatives analysis for the Site. This section is not intended to be used alone and does not include the basis of all conclusions presented. The report should be read and used in its entirety and in conjunction with the Brownfields Pilot Project and Phase II ESA report. Information included in this section is subject to the scope of services and limitations noted in the full ABCA, Brownfields Pilot Project and Phase II ESA reports.

1.0 INTRODUCTION

Crystal Creek LLC was tasked to conduct a Phase II Environmental Site Assessment (ESA) and Analysis of Brownfields Cleanup Alternatives at Wheelock Academy and Wheelock Mission Church. The site is located at 1377 Wheelock Road, Gavin, Oklahoma 74736 (Site). The Phase II ESA report, for Wheelock Academy and Wheelock Mission Church Properties, McCurtain County, Oklahoma, details the work performed, methods used, information and data acquired, and evaluation and interpretation of results. This Analysis of Brownfields Cleanup Alternatives is based upon the information presented in the Crystal Creek, LLC's, Phase II Environmental Site Assessment (ESA) dated July, 2024 and the Wheelock Academy Limited Soil Screening dated March 3, 2025. This draft Analysis of Brownfields Cleanup Alternatives is based upon the information presented in the Phase II ESA is for the Wilson Hall only.

1.1 Background-History

The original school at Wheelock was a small "day" school, established in 1833 in conjunction with a nearby Christian mission. This marked the beginning of formal education at the site. In 1842, with the establishment of the Choctaw National School System, the institution began receiving financial support from treaty funds secured by the Choctaw Nation from the U.S. Government and was designated as a women's seminary and managed by missionaries with a board of trustees.

Wheelock Seminary was closed in 1861 at the onset of the Civil War. The original structure was destroyed by fire at the close of the Civil War. In the early 1880s Choctaw national leaders decided to rebuild the school on a new site a few hundred yards northeast of the old mission station, school, and church. The present Wheelock Academy building (Wilson Hall) was constructed, and a Choctaw orphanage was opened there in September 1884. Over the following seventy years, the Academy flourished as a center of learning for Choctaw girls and young women, ultimately ceasing operations in 1955. The U.S. government assumed jurisdiction over the school in 1910 and full control as well as funding in 1932. After 1955 the facility remained virtually abandoned until later returned to ownership of the Choctaw Nation.

Wheelock Academy served as a model for educational institutions operated by the Five Civilized Tribes and although it played a significant role in advancing indigenous education in Indian Territory it has a complicated history for the Choctaw people, as many boarding schools do. Recognizing its historical and cultural significance, whether positive or negative, Wheelock Academy was later designated a National Historic Landmark by the Secretary of Interior. Today, several of its remaining buildings, along with an on-site museum, preserve and interpret the history of the school and the Choctaw Nation's dedication to education.

In 2001, a report to Congress titled *National Historic Landmarks at the Millennium* identified Wheelock Academy as one of America's "Threatened Landmarks," underscoring the need for continued preservation efforts.

The Wheelock Academy Campus consists of approximately 47 acres and nine (9) Structures located approximately 2 miles north of Highway 70 and approximately 2.5 miles east of Millerton, Oklahoma. The Wheelock Academy Property contains the requested eight (8) buildings which were included in the Phase II which have LBP, lead in soil and/or Asbestos material which need attention. The buildings requested are as follows:

1. McCurtain Hall
2. Caretaker Cottage
3. Superintendent's Office
4. Pushmataha Hall
5. Willson Hall
6. Wheelock Mission Church
7. Boiler House
8. Bathhouse
9. Well House (no regulated material)

ACM and LBP and lead-in-soil testing was conducted in all Wheelock Academy Buildings by Crystal Creek, LLC for a Phase II except the Groundskeepers Cottage which was tested by Choctaw Nation LBP Risk Assessors. Crystal Creek, LLC's, Phase II Environmental Site Assessment (ESA) dated July, 2024 for ACMs and LBP which was identified on/in pipes (ACM), soil (ACM & LBP) wall components (LBP), ceilings (LBP), window components (LBP), door components (LBP) and exterior components.

The Wilson Hall was constructed in 1922, expanded 1931 is approximately 7,460 sq ft and is vacant. It was originally used as girl's school. The interior structure is mostly in good conditions. The visual inspection determined the building surfaces were dilapidated on some walls and ceilings in the facility and is currently not in use.

The ground surface at the site slopes to the north and west. Groundcover consists primarily of grasses, trees, landscaped areas, paved parking areas, and concrete sidewalks. The property can be accessed from Wheelock Road approximately 1.5 miles east of the intersection of Main Street and Highway 70, Millerton, Oklahoma

1.2 Summary of Phase II ESA Results

The Phase II ESA was conducted in accordance with *ASTM International – Standard Practice for Environmental Site Assessments: Phase II Environmental Site Assessment Process E1903-19.* The results of the Phase II ESA confirmed the presence of contaminants of concern (COCs) at the Site.

The following list is a summary of the conclusions regarding COCs and associated media identified at the Site that are addressed in this cost estimate:

ACM: Of the samples submitted for laboratory analysis, fourteen samples were reported as "positive" (>1% asbestos) for asbestos. Asbestos was identified in most Buildings of the Wheelock Academy. ACM is considered to be a contaminant of concern (COC) in relation to the Site. The asbestos pipe insulation (TSI) was found in two areas of the Wilson Hall Building. The following table indicates the location and estimated extent of ACM identified at the Site.

TABLE 2: SUMMARY OF HOMOGENEOUS SAMPLING AREAS WILSON HALL- BUILDING 1

HA #	HOMOGENEOUS MATERIAL DESCRIPTION	HOMOGENEOUS MATERIAL LOCATION	FRIABILITY (F /NF)	% ASBESTOS*	# OF SAMPLES COLLECTED	CONDITION	APPROXIMATE QUANTITY
M-01	*Window Caulking*	*Throughout Windows*	*NF*	*3% C*	*3*	*Good*	*~450 LF*
MAS-01	*Black Mastic on Concrete*	*Basement Gym--Room 14*	*NF*	*5% C*	*3*	*Good*	*~2,500 SF*
TSI-01	*Thermal System Insulation*	*Crawlspace*	*F*	*30% C*	*1*	*D*	*~250 LF*

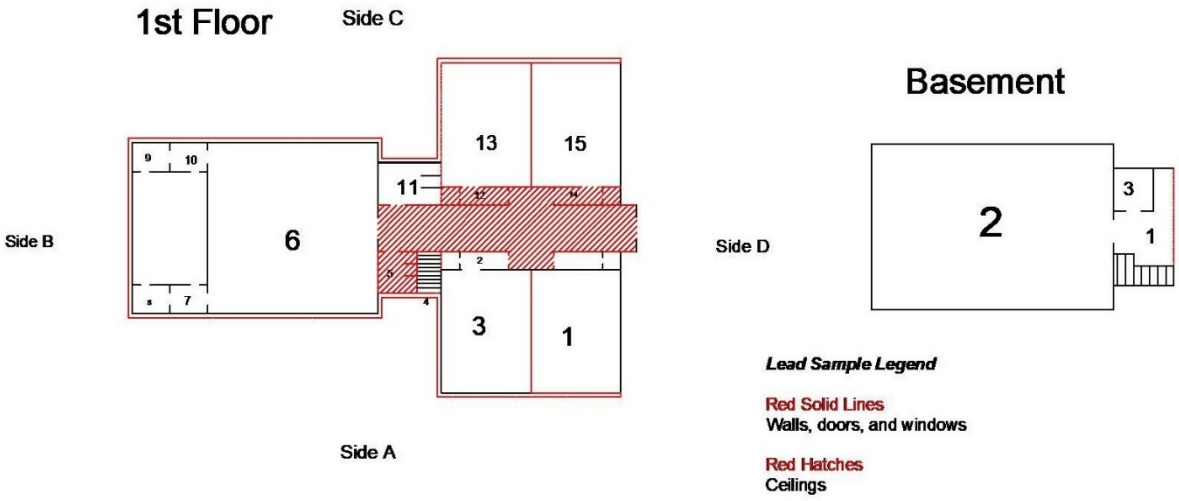
NA= Not Applicable ND= None Detected MAS= Mastic CT= Ceiling Tile C= Chrysotile NIS= Not in Scope of Work DW= Drywall JC= Joint Compound TXT= Texturing V= Vermiculite SD= Significantly Damaged D= Damaged

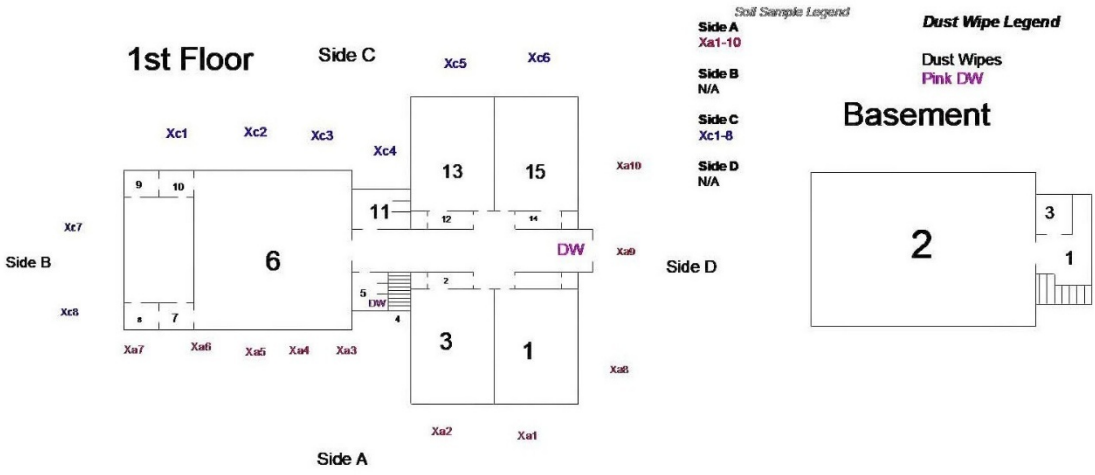
LF – linear feet
SF – square feet
CH – Chrysotile
A - Amosite

LBP - The inspection of Wilson Hall Building was conducted following the U.S. Department of Housing and Urban Development (HUD) Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing with the 1997 revision. The standard for lead-based paint as per HUD/EPA standard of 1.0 mg/cm^2 was followed. All requirements for the NITON XRF usage contained in the Performance Characteristics Sheet for the specific XRF were followed. LBP was identified throughout the Wilson Hall Building. LBP is considered to be a contaminant of concern (COC) in relation to the Site.

Interior Materials Wilson Hall Building

The following tested painted components were found to contain lead in a concentration greater than the federal threshold of 1.0 mg/cm^2 of surface as measured by an XRF.


1st Floor
Side C
Side B
Side A
Side D
Basement
Lead Sample Legend
Red Solid Lines
Walls, doors, and windows
Red Hatches
Ceilings


Soil Sample Legend
Side A
Xa1-10
Side B
N/A
Side C
Xc1-8
Side D
N/A
Dust Wipe Legend
Dust Wipes
Pink DW
1st Floor
Side C
Side B
Side A
Side D
Basement
DW

Exterior Materials – Wilson Hall Building

Exterior painted surfaces tested (homogeneous areas) were found to contain lead in a concentration greater than the federal threshold of 1.0 mg/cm^2 of surface as measured by the XRF. See above.

1.3 Project Goals / Site Reuse Plan

Based on information that the Choctaw Nation Brownfields Program, the current site reuse plan will be determined and finalized by the Choctaw Nation Tribal Council. However, at this time of this ABCA document there were six reuse plans being considered and drafted which include expansion of the current museum, an interpretive center, retreat center, historic tourism, recreation, tribal education, college or training center. Any finalized reuse plans shall be finalized by the decision of the Tribal Council and the Chief of the Choctaw Nation of Oklahoma.

1.4 Cleanup Scope and Goals

Based upon the results of the Phase II ESA conducted, the specific concerns addressed in this conceptual cleanup alternatives analysis for the Site include:

A. ACM, asbestos in soil, LBP and lead in soil identified at the Site

The overall purpose of a cleanup at the Site is to allow the property to be redeveloped while mitigating the risk that COCs currently present at the Site pose to human health and the environment. The cleanup goal(s) for the Site are listed below:

- Remove and dispose of COCs to allow for redevelopment of the property;
- Conduct cleanup operations that are compliant with applicable local, Tribal, and federal standards that will protect human health and the environment;
- Implement cleanup alternative(s) that are practical and effective in mitigating COCs to protect human health and the environment in both the short-term and long-term.

2.0 EVALUATION CRITERIA FOR ALTERNATIVES

Each of the potential cleanup alternatives is evaluated against the following set of four criteria:

2.1 Compliance

Compliance with applicable state, federal and tribal regulations.

2.1.a Cleanup Oversight Responsibility

The cleanup will be overseen by the Tribal Environmental Department in consultation with EPA. In addition, all documents prepared for this site are submitted to the Tribal environmental department under CNO Tracking Number MCTTT01116 and to EPA under ACRES site number 244077. It is recommended that the following regulations

be followed: The Small Business Relief and Brownfields Revitalization Act, Occupational Safety and Health Act, and any applicable provisions of the Clean Air Act, Resource Conservation and Recovery Act, the Toxic Substance Control Act, and Comprehensive Environmental Response, Comprehensive, and Liability Act where they pertain to remediation and disposal of lead in soil. Applicable sections of the CNO Environmental Codes and the CNO LBP/Asbestos Policies will be followed. Also, the following qualifications should be held by the remedial contractor(s) selected to oversee and/or implement the following remediation tasks and activities:

ACM Remediation

All aspects of ACM Cleanup Oversight must be conducted in accordance with the CNO Asbestos Policy, Occupational Safety and Health Administration (OSHA) 1926.1101, Asbestos NESHAP found in 40 CFR Part 61, Subpart M and DEQ has the delegated responsibility to regulate this NESHAP in Oklahoma. When selecting firm(s) and/or individuals to utilize, it is recommended that the following certifications be verified, at a minimum:

1) State of Oklahoma licensed Asbestos Management Planner to perform:
   - Development of asbestos project designs;
   - Air monitoring for asbestos fibers;

2) State of Oklahoma licensed Asbestos Abatement Contractor.

3) Abatement required air monitoring shall be overseen by a licensed third-party contractor. All clearance will be overseen by that same third-party contractor. So that the abatement activities and clearance activities are overseen by two different contractors.

LBP Abatement

All aspects of LBP Cleanup Oversight must be conducted in accordance with OSHA Lead in Construction Standard found in 29 CFR Part 1926, 40 CFR Part 745 and TSCA Title IV 402/404. When selecting firm(s) and/or individuals to utilize, it is recommended that the following certifications be verified, at a minimum:

4) State of Oklahoma license Lead-Based Paint Firm to perform:
   - Development of LBP abatement plan;

5) State of Oklahoma licensed LBP Abatement Workers.

6) Clearance testing by a state/federal licensed LBP Risk Assessor

2.1.b Cleanup Standards for Contaminants

The following standards are recommended to be met during the remediation tasks and activities:

ACM Remediation

Cleanup levels for ACM remediation must meet standards in accordance with 40 CFR Part 61, Subpart M and DEQ has the delegated responsibility to regulate this NESHAP in Oklahoma. Occupational Safety and Health Administration (OSHA) 1926.1101. Examples of applicable standards include:

Asbestos Action Levels		
Asbestos Sample	**Regulatory Action Level**	**Source of Regulation**
Regulated Asbestos-Containing Material (RACM) – Bulk Materials	>1% asbestos	Asbestos Hazard Emergency Response Act (AHERA)
Asbestos Air Monitoring - Workers	0.1 fibers/cubic centimeter (f/cc) (action level [AL])	Occupational Safety and Health Administration (OSHA) 1926.1101
	0.2 f/cc (Permissible Exposure Level [PEL])	OSHA 1926.1101
Asbestos Air Monitoring – Final Clearance	0.01 f/cc	EPA AHERA

A list of solid waste landfills approved to accept friable asbestos waste is provided in Appendix A.

LBP Remediation

Cleanup levels for LBP remediation must meet standards in accordance with OSHA Lead in Construction Standard found in 29 CFR Part 1926.62. Examples of applicable standards include:

LBP Action Levels		
LBP Sample	**Regulatory Action Level**	**Source of Regulation**
Lead-Based Paint	1.0 mg/cm2	EPA, 40 CFR Part 745
Lead in Air Monitoring - Workers	30 µg/m^3 (action level [AL])	Occupational Safety and Health Administration (OSHA) 29 CFR Part 1926.62
	50 µg/m^3 (Permissible Exposure Level [PEL])	OSHA 29 CFR Part 1926.62

EPA & HUD LBP Clearance Limits for Sample Locations

Sample Location	HUD Clearance Limits	EPA Clearance Limits
Floor	10 µg/sq. ft.	5 µg/sq. ft
Window Sills	100.00 µg/sq. ft.	40.00 µg/sq. ft.
Window Trough	400 µg/sq. ft.	100 µg/sq. ft.
Play Area Soil	400 PPM	400 PPM
Dripline Soil	1200 PPM.	1200 PPM
Abatement of Soil	5000 PPM	5000 PPM

2.1.c Laws & Regulations Applicable to Cleanup

The following laws and regulations are mandatory and/or recommended to be followed during the cleanup tasks and activities:

ACM Abatement

- Occupational Safety and Health Administration (OSHA) 1926.1101
- Asbestos NESHAP is found in 40 CFR Part 61, Subpart M and DEQ has the delegated responsibility to regulate this NESHAP in Oklahoma – Governs the disposal of asbestos waste and the management of asbestos contamination.

LBP Abatement

- Oklahoma Department of Environmental Quality, OAC 252:110 Lead-Based Paint Management, which implements the OK Lead-Based Paint Management Act – Governs LBP abatement on child occupied housing in Oklahoma.
- OSHA Lead in Construction Standard found in 29 CFR Part 1926.62 – Governs the lead in air for abatement and construction.
- Title IV of the Toxic Substances Control Act (TSCA), as well as other authorities in the Residential Lead-Based Paint Hazard Reduction Act of 1992
- Small Business Liability Relief and Brownfields Revitalization Act, enacted in 2002, which amended the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)
- 40 CFR Part 745

2.2 Effectiveness

- Protection of human health and the environment, including workers during implementation;
- Feasibility for mitigation of risk in the short-term and long-term effectiveness;
- Complete removal of contaminants;
- Achievability of the cleanup goals;

2.3 Difficulty of Implementation

- Technical feasibility;
- Availability of work force, materials, and equipment;
- Administrative ability;
- Construction feasibility;
- Maintenance and monitoring requirements.

2.4 Cost (Conceptual costs for comparative analysis only)

- Time requirements, materials, equipment, labor and waste disposal locations.

The selection of "effectiveness", "feasibility", and "cost" as evaluation criteria is based upon the EPA's *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA* (EPA, 1988). In addition, the selection of "compliance" as an evaluation criterion is used consider variations between federal, state, and/or local regulations, if applicable, on a site-by-site basis.

3.0 CLEANUP ALTERNATIVES FOR EVALUATION

Listed below are the specific cleanup alternatives evaluated based upon the results of the Phase II ESA conducted at the Site. In addition, alternatives considered, but not evaluated due to site-specific factors which eliminated the alternative from further analysis are also listed, if applicable.

3.1 Cleanup Alternatives Evaluated

The following removal action alternatives were considered as part of this evaluation.

- Alternative 1: **No Action**
- Alternative 2: **Contain and/or Encapsulate Damage Friable ACM, Implement Operations and Maintenance. Specialized Cleaning and Painting**
- Alternative 3: **Removal of All ACM and Abatement LBP by a Combination of Removal, Replacement, Enclosure and Encapsulation**

4.0 COMPARATIVE ANALYSIS OF CLEANUP ALTERNATIVES

The potential cleanup alternatives for the Site were evaluated using the evaluation criteria described in Section 2. General descriptions of the conceptual design of each alternative are described below. Discussions of the pros and cons of each alternative are presented in the following subsections. Final design specifications and features of the actual remedy may differ from the conceptual design described herein.

Alternative 1: (No Action) The No Action alternative would involve leaving the Site in its current state. There would be no removal, containment, engineering control (EC), or institutional control (IC) actions implemented. The No Action alternative provides a baseline against which other alternatives can be compared. A consideration of risk is taken into account if no action is taken as opposed to implementing a cleanup action.

Alternative 2: Contain and/or Encapsulate Damaged Friable Asbestos, Implement Operations and Maintenance Plan, Specialized Cleaning and Painting as Interim Controls Consists of containing/encapsulating the deteriorated asbestos-containing material (ACM). This would include applying a lap cloth, CP 11 or a bridging encapsulant to damaged ACM. The deteriorated lead-based paint (LBP) in the building with deteriorated was found in some interiors plaster walls, metal ceilings, two doors, some exterior walls, windows and wood components. The areas with the deteriorated LBP would be wet scrape, primed and painted with quality paint (interim controls). The entire facility would undergo specialized cleaning to reduce the amount of LBP dust on the floors. The development and implementation of an Operations and Maintenance (O&M) Plan for ACM and LBP would result in LBP/ACM left in place in this alternative.

Alternative 3: Removal of All ACM and Abatement LBP by a Combination of Removal, Replacement, Enclosure and Encapsulation. Alternative 3 consists of removing and disposing of all ACM. The abatement will follow the Project Design developed by a licensed Project Designer. The asbestos abatement will also follow all federal regulations and be completed by a licensed asbestos abatement contractor. The lead-based paint (LBP) in the building was found throughout the facility on plaster walls, metal ceilings, some exterior walls, wood components & windows. The areas with the deteriorated LBP would be wet scrape, primed and painted with elastomeric LBP encapsulant paint. The entire facility would undergo specialized cleaning to reduce the amount of LBP dust on the floors. The development and implementation of an Operations and Maintenance (O&M) Plan for LBP left in place after abatement.

4.1 Compliance

Alternative 1 (No Action) would not be compliant with Tribal and/or federal regulations for the Site in its current condition due to the presence and deteriorated condition of the known COCs. The areas with asbestos and LBP damage should have very limited access. Personnel entering these areas should have awareness training at a minimum. This alternative will increase ongoing maintenance.

Alternative 2 Contain and/or Encapsulate Damage Friable Asbestos, Implement Operations and Maintenance Plan, Specialized Cleaning and Painting as Interim Controls. Alternative 2 consists of containing/encapsulating the deteriorated asbestos containing material. This would include applying a lap cloth, CP 11 or a bridging encapsulant to damage asbestos containing material (ACM). The deteriorated lead-based paint (LBP) in the building was found in throughout and is currently not in use. The areas with the deteriorated lead-based paint (LBP) will be wet scraped, primed and painted with quality paint (interim controls). The entire facility would undergo specialized cleaning to reduce the amount of LBP dust on the floors. Based on lead levels in soils require abatement interim control options, removed and replace or cover with sod. The development and implementation of an Operations and Maintenance (O&M) Plan for ACM and LBP left in place for this alternative is required by CNO Policy. Federal regulations do not require the asbestos & LBP need to be removed. The conditions of the material impact or friction areas are required to be in good condition to eliminate asbestos fiber release and LBP dust in occupied areas. Therefore, Alternative 2 follows Tribal and federal regulations for ACM and LBP.

Alternative 3 Removal of All ACM and Abatement LBP by a Combination of Removal, Replacement, Enclosure and Encapsulation. Alternative 3 consists of removing and disposing of all ACM according to all federal, state and local regulations. The LBP abatement will follow all federal, local regulations. The abatement does not remove all LBP but does manage the intact LBP according to the LBP O&M Plan. The abatement option for LBP in soil for this site will be remove and place with clean tested soil. Therefore, Alternative 3 is in compliance with CNO LBP Policy, federal and local regulations for ACM and LBP.

4.2 Effectiveness

Alternative 1 (No Action) will not reduce the potential for exposure of human health and the environment to COCs or provide a reduction in the toxicity, mobility, or volume of contaminants as site conditions will deteriorate continually with time. The estimated risk from COCs to potential receptors would not be decreased in the short-term or long-term.

Alternative 2 Contain and/or Encapsulate Damaged Friable Asbestos, Implement Operations and Maintenance Plan, Specialized Cleaning and Painting (Interim Controls) consists of containing/encapsulating the deteriorated asbestos containing material and deteriorated LBP which will reduce the potential for exposure of human health and the environment to COCs. Soils would require abatement options, removed and replace or encapsulate with a pavement. The estimated risk from COCs to potential receptors would be decreased in the short-term. Alternative 2 would **not** achieve the cleanup goals set for the Site in the long-term. This alternative does achieve a use outcome for the property.

Alternative 3 Removal of All ACM and Abatement LBP by a Combination of Removal, Replacement, Enclosure and Encapsulation will be effective in the short-term and long-term due to the removal of all or stabilization of the COCs. If implemented properly, due to no asbestos contaminants left on-site and stabilization or remove/replacement of LBP hazards and with an LBP O&M Plan, there will be no risk to human health or the environment remaining at the Site. This alternative is the only one that is the safest for workers and eliminates the chance of asbestos and LBP potential for exposure to human health and the environment. This alternative will allow for the CNO cleanup goal to be achieved.

4.3 Difficulty of Implementation

Alternative 1 No Action is technically and administratively feasible. Maintenance or monitoring will be required. Changes in climate will not alter the risk associated with this alternative. Although implementation is possible, the "No Action" alternative would not meet the cleanup goal may expose current occupants to COCs.

Alternative 2 Contain and/or Encapsulate Damage Friable Asbestos, Implement Operations and Maintenance Plan, Specialized Cleaning and Painting (Interim Controls) consists of containing/encapsulating the deteriorated asbestos containing material. Soils would require abatement options, removed and replace or encapsulate with a pavement. An Operations and Maintenance (O&M) Plan for ACM and LBP left in place for this alternative will be developed and on-site maintenance personnel will be trained to implement the plans. This type of cleanup and stabilization is feasible and is standard practice of asbestos and LBP projects. Difficulty to implement this plan is moderate. Coordination during interim control activities is anticipated with short-term low-level disturbances to the site. This alternative would also require an Asbestos Management Plan and continued quarterly and annual monitoring.

Alternative 3: Removal of All ACM and Abatement LBP by a Combination of Removal, Replacement, Enclosure and Encapsulation. Alternative 3 consists of the removal of and/or stabilization of the COCs. If implemented properly, due to no asbestos contaminants left on-site and stabilization or removal/replacement of LBP hazards and with an LBP O&M Plan, there will be no risk to human health or the environment remaining at the Site. The ACM abatement will

follow the Project Design and the LBP will follow the LBP Abatement Plan. An Operations and Maintenance (O&M) Plan for LBP left in place for this alternative will be develop and on-site maintenance personnel will be trained to implement the plans.

The difficulty level of implementing this plan is moderate to high - moderate. Coordination during cleanup activities is anticipated with short-term moderate disturbance to the site. THPO consultation would also be required and coordinated with EPA, SOI, and CNO would be required.

Access to the Site is currently available and no areas are inaccessible by passenger vehicles. No road improvements would be required to provide access for construction equipment and personnel.

4.4 Cost

Costs incurred are evaluated on a scale of low, moderate, and high in relation to each of the other alternatives and based upon past experience with similar projects. Conceptual costs (not intended for budgetary estimates) were evaluated for time, effort, labor, and materials necessary.

Alternative 1 (No Action) has low costs associated with this option. Minimal amounts of time, effort, and labor would be required.

Alternative 2 Alternative 2 Contain and/or Encapsulate Damage Friable Asbestos, Implement Operations and Maintenance Plan, Specialized Cleaning and Painting (Interim Controls). This level of work will take similar time and effort as removal, except asbestos materials are left in place and will require monitoring. This option will require pest control of wasp that are living in wall and floors

Alternative 3: Removal of All ACM and Abatement LBP by a Combination of Removal, Replacement, Enclosure and Encapsulation consists of removing and disposing of all ACM and encapsulation and/or removal of LBP. An Operations and Maintenance (O&M) Plan for LBP left in place for this alternative will be developed. This option will require pest control of wasp that are living in walls and floors

A summary of the cost comparison of each of the alternatives is presented in the following table, with the most expensive alternative listed as 3rd and the least expensive alternative listed as 1st.

4.5 Summary Comparison of Potential Alternatives

Comparisons are based on the four evaluation criteria previously discussed. A summary of the comparison of each of the alternatives is presented below along with status as to whether the alternative was retained for consideration as the preferred alternative selected.

Cleanup Alternative	Compliance	Effectiveness	Implementability	Cost[(1)]	Comment
Alternative 1: No Action	Non-compliant	Not effective	Implementable	$5,000-$12,000	This alternative does not satisfy the cleanup goals for this site. Cost to secure the building.
Alternative 2: Encapsulation of Friable ACM - RACM and LBP Interim Controls (IC) on Poor Condition Paint and LBP in Soils, The dripline soil will require abatement.	Compliant	Effective	Implementable	Asbestos $ 15,000 LBP IC $ 36,700 LBP Soil & Chips $ 7,700 Total $ 59,400	This alternative does satisfy the cleanup goals for this site and allows for continued current use of the property. It leaves the asbestos in the basement/crawl space that will require monitoring and needs to be removed in future if utilities are upgraded. Remove paint chips and soils will require TCLP testing to determine the if waste is non-hazardous or hazardous for disposal.
Alternative 3: Abatement of All ACM and LBP Abatement will be a Combination of Removal, Replacement, Enclosure and Encapsulation on Poor Condition Paint and on LBP in Soils	Compliant	Effective	Implementable	Asbestos $ 35,150 LBP $ 67,800 LBP Soil & Chips $ 7,700 Total $ 110,650	This alternative satisfies the cleanup goal for the building and is the option that permanently mitigates the asbestos and manages the LBP with a minimum twenty-year abatement option. Remove paint chips and soils will require TCLP testing to determine the if waste is non-hazardous or hazardous for disposal. However, it is the most expensive alternative but is the most compliant and effective option.

Wilson Hall Abatement Cost Breakdown:

Asbestos:

Removal of ~ 250 LF of asbestos containing pipe insulation	$ 19,900.00
Removal of ~ 2,500 SF of asbestos floor mastic and window caulking	$ 13,500.00
Removal of debris & soil under damaged asbestos pipe	$ 2,000.00
Subtotal	**$ 35,150.00**

LBP:

Abatement of ~ 1,450 Sf of deteriorated LBP walls & ceilings	$ 18,900.00
Abatement of ~ 4,000 Sf of deteriorated exterior LBP walls & components	$ 40,750.00
Cleaning & sealing of floors	$ 8,150.00
Subtotal	**$ 67,800.00**

LBP Soil & Paint Chips	
Removal of 15 cy LBP non-hazardous soil	$ 4,300.00
Disposal of 15 cy LBP non-hazardous soil	$ 1,500.00
Disposal of LBP hazardous paint chips	$ 1,900.00
Subtotal	**$ 7,700.00**
Total	**$ 110,650.00**

5.0 PERFERRED CLEANUP ALTERNATIVE

5.1 ACM REMOVAL AND LBP ABATEMENT

Of the three cleanup alternatives evaluated for selection at the Wheelock Academy located at 1377 Wheelock Road, Gavin, Oklahoma 74736, the preferred alternative recommended is:

Alternative 3: Removal of All ACM and Abatement LBP by a Combination of Removal, Replacement, Enclosure and Encapsulation

This alternative was selected based upon overall compliance with state and/or federal regulations, effectiveness in protecting human health and the environment in both the short-term and long-term, feasibility of implementation, and cost effectiveness. In addition, this alternative is the closest match to the detailed plans for reuse that have already been considered.

Presented below are the engineering costs to remediate the COCs at the Site. Engineering costs were determined based upon information obtained from the previous Phase I & Phase II ESA (2024), and past experience on similar projects. Actual bids from companies to perform the work may vary from this estimate depending on local conditions and other factors outside of the assessor's knowledge. Final design specifications, features, and cost of the actual remedy may differ from the conceptual design presented.

6.0 SPECIFICATIONS FOR REPORT USE AND RELIANCE

6.1 Special Terms and Conditions

This document has been prepared for the Choctaw Nation for the use and benefit of the Choctaw Nation. Any use of this document or information herein by persons or entities other than Choctaw Nation without the express written consent will be at the sole risk and liability of said person or entity. It is understood that this document may not include all information pertaining to the described site.

6.2 Disclaimers

The cost estimate in this report is based upon the Phase II Environmental Site Assessment (ESA 2024) by Crystal Creek LLC, Inc. Phase II Environmental Site Assessment (ESA) which were in general conformance with the scope and limitations of ASTM E1903-19. The cost estimate presented herein is based on costs from engineering estimate past experience on similar projects as selected alternative presented in this document. Professional opinions are based solely on data collected during the assessment and/or interpretation of information and past data provided for review. Crystal Creek LLC does not warrant or guarantee information obtained from third parties used for this assessment are correct, complete, and/or current.

7.0 REFERENCES

Oklahoma Department of Labor, Oklahoma Asbestos Control Act 40 O.S. § 450, et seq. Abatement of Friable Asbestos Materials Rules OAC 380:50

Asbestos NESHAP is found in 40 CFR Part 61, Subpart M and DEQ has the delegated responsibility to regulate this NESHAP in Oklahoma.

American Society for Testing and Materials (ASTM), 2021. E1903-19, *Standard Practice for Environmental Site Assessments: Phase II Environmental Site Assessment Process.*

EPA, 1988. *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA*. (EPA/540/G-89/004).

HUD LBP Guidelines for the Evaluation and Control of LBP hazards in Housing, Chapter 7

Phase I Environmental Site Assessment (2020), A & M Engineering and Environmental Services, Inc.

Phase II Environmental Site Assessment (2024), Crystal Creek LLC

APPENDIX A
SOLID WASTE LANDFILLS APPROVED TO ACCEPT FRIABLE ASBESTOS WASTE

Oklahoma Department of Environmental Quality
Oklahoma Landfills Accepting Regulated Asbestos Waste

OAC 252:515-19-31 states that the disposal of friable asbestos waste at a solid waste disposal facility is prohibited unless the facility is a municipal solid waste landfill (MSWLF) or non-hazardous industrial waste (NHIW) landfill specifically authorized by the permit to accept such waste. Disposal practices for asbestos and materials containing asbestos must be in compliance with appropriate regulations as set forth in OAC 252:100-40-5.

COUNTY	SOLID WASTE PERMIT NO.	FACILITY
Permitted to Accept Friable and Non-Friable Asbestos		
BECKHAM	3505009	Elk City Municipal Landfill (580) 225-3230
BECKHAM	3505011	Sayre Municipal Landfill (580) 928-2260
CANADIAN	3509005	Oklahoma Environmental Authority Landfill (405) 483-5402
GARVIN	3525012	Pauls Valley Landfill 405-495-0800
GRADY	3526013	Southern Plains Landfill (405) 224-3680
JACKSON	3533005	City of Altus Landfill (580) 477-1950
MAJOR	3547002	Red Carpet Landfill (580) 776-2255
MUSKOGEE	3551020	Muskogee Community RDF (918) 682-7284
OKLAHOMA	3555018	Oklahoma Landfill (405) 745-3091
OKLAHOMA	3555028	SE Oklahoma City Landfill (405) 745-4141
OKLAHOMA	3555036	East Oak Sanitary Landfill (405) 427-1112
OSAGE	3557021	American Environmental Landfill (918)245-7786
OSAGE	3557025	Osage Landfill (918) 336-3159
PAYNE	3560010	Stillwater Landfill (405) 372-6628
PONTOTOC	3562006	City of Ada Municipal Sanitary LF (580) 436-1403
PUSHMATAHA	3564004	Clinton Lewis Construction Co. Landfill (580) 298-3729
SEMINOLE	3567020	Sooner Land Management Landfill (405) 257-6108
SEQUOYAH	3568008	Sallisaw Solid Waste Disposal Facility (918)775-6241
TULSA	3572042	Quarry Landfill (918) 437-7773

DRAFT ANALYSIS OF BROWNFIELDS CLEANUP ALTERNATIVES FOR WHEELOCK ACADAMEY CAMPUS – CARETAKER COTTAGE

GARVIN, MCCURTAIN COUNTY, OKLAHOMA

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Date Prepared: July 31, 2025

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LIST OF ACRONYMS

ACBA	Analysis of Brownfields Cleanup Alternatives
ACM	asbestos-containing material
AL	action level
AQCC	Air Quality Control Commission
AHERA	Asbestos Hazard Emergency Response Act
APCD	Air Pollution Control Division
ASTM	American Society for Testing and Materials
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CH	Chrysotile
COC	contaminant of concern
CPSC	Consumer Product Safety Commission
EC	engineering control
EPA	United States Environmental Protection Agency
ESA	environmental site assessment
f/cc	fibers per cubic centimeter
HMWMD	Hazardous Material and Waste Management Division
IC	institutional control
ID	identification
LBP	lead-based paint
LF	linear feet
N/A	Not Applicable
O&M	Operations and Maintenance
ODOL	Oklahoma Department of Labor
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Limit
P.G.	Professional Geologist
PLM	polarized light microscopy
RACM	regulated asbestos-containing material
sq. ft.	square feet
START	Superfund Technical Assessment and Response Team
SOO	Statement of Objectives
TDD	Technical Direction Document
TSI	thermal system insulation

SUMMARY

Crystal Creek LLC was tasked to conduct a brownfield cleanup alternatives analysis at the Wheelock Academy Campus. The site is located at 1377 Wheelock Road, Garvin, Oklahoma 74736. Previous ACM and LBP testing was previously conducted at the Wheelock Academy Campus did not include the Caretaker Cottage by Crystal Creek, LLC, an Oklahoma licensed engineer firm, for the Choctaw Nation and completed in July 2024. The Choctaw Nation Environmental conducted a Lead-Based Paint Inspect followed by an LBP Risk Assessment/Elevated Blood Lead Level (EBLL) Investigation for Wheelock Academy Campus – *Caretaker Cottage, Garvin, Oklahoma,* details the work performed, methods used, information and data acquired, and evaluation and interpretation of results as part of these reports. The EBLL Investigation is usually conducted after a child is determined to have a BLL of over the action level of 3.5 µg/dl. This draft Analysis of Brownfields Cleanup Alternatives is based upon the information presented in the Brownfields Pilot Project, Phase II ESA report, Choctaw Nation Environmental Lead-Based Paint Inspect followed by a Choctaw Nation Environmental LBP Risk Assessment/Elevated Blood Lead Level (EBLL) Investigation and is for the Caretaker Cottage only.

SCOPE OF CLEANUP

Based upon the results of the Choctaw Nation Environmental LBP Risk Assessment/Elevated Blood Lead Level (EBLL) Investigation of the Caretaker Cottage at Wheelock Academy the specific concerns addressed in this conceptual cleanup alternatives analysis for the Subject Site include:

A. Lead-Based Paint components (LBP) identified at Site.
B. Hazardous Lead-Based Paint (deteriorated)components (LBP) identified at Site.
C. Lead in soil identified at the Site.

EVALUATION CRITERIA

Cleanup alternatives considered as part of this analysis were evaluated against the following criteria:

- Compliance;
- Effectiveness;
- Difficulty of Implementation;
- Cost.

PREFERRED ALTERNATIVE SELECTED

Of the three cleanup alternatives evaluated for selection at the Wheelock Academy located at 1377 Wheelock Road, Gavin, Oklahoma 74736, the preferred alternative recommended is:

Alternative 3: Abatement of Deteriorated LBP, LBP Friction Points, and Lead in Soil by a Combination of Removal, Replacement, Enclosure and Encapsulation

This alternative was selected based upon overall compliance with tribal and federal regulations, effectiveness in protecting human health and the environment in both the short-term and long-term, feasibility of implementation, and cost effectiveness. In addition, this alternative is the closest match to the detailed plans for reuse that have already been considered.

Presented below are the engineering costs to remediate the COCs at the Site. Engineering costs were determined based upon information obtained from the previous Phase I & Phase II ESA (2024), additional sampling and past experience on similar projects. Actual bids from companies to perform the work may vary from this estimate depending on local conditions and other factors outside of the assessor's knowledge. Final design specifications, features, and cost of the actual remedy may differ from the conceptual design presented.

Actual bids from companies to perform the work may vary from this estimate depending on local conditions and other factors outside of the assessor's knowledge. Final design specifications, features, and cost of the actual remedy may differ from the conceptual design presented. A detailed conceptual cost estimate breakdown for the total shown below is presented on Table 1.

Remediation Task	Remediation Cost
Abatement of Deteriorated LBP, LBP Friction Points, and Lead in Soil	$ 39,500
Total	**$ 39,500**

This summary is a general description of the cleanup alternatives analysis for the Site. This section is not intended to be used alone and does not include the basis of all conclusions presented. The report should be read and used in its entirety and in conjunction with the Brownfields Pilot Project and Phase II ESA report. Information included in this section is subject to the scope of services and limitations noted in the full ABCA, Brownfields Pilot Project, Phase II ESA reports, Choctaw Nation Environmental LBP Risk Assessment/Elevated Blood Lead Level (EBLL) Investigation.

1.0 INTRODUCTION

Crystal Creek LLC was tasked to conduct a Phase II Environmental Site Assessment (ESA) and Analysis of Brownfields Cleanup Alternatives at Wheelock Academy and Wheelock Mission Church. The site is located at 1377 Wheelock Road, Gavin, Oklahoma 74736 (Site). The Phase II ESA report, for Wheelock Academy and Wheelock Mission Church Properties, McCurtain County, Oklahoma, details the work performed, methods used, information and data acquired, and evaluation and interpretation of results. This Analysis of Brownfields Cleanup Alternatives is based upon the information presented in the Choctaw Nation Environmental Lead-Based Paint Inspect, dated September 13, 2024, and an LBP Risk Assessment/Elevated Blood Lead Level (EBLL) Investigation, dated September 11, 2024, for Wheelock Academy Campus – Caretaker Cottage.

1.1 Background-History

The original school at Wheelock was a small "day" school, established in 1833 in conjunction with a nearby Christian mission. This marked the beginning of formal education at the site. In 1842, with the establishment of the Choctaw National School System, the institution began receiving financial support from treaty funds secured by the Choctaw Nation from the U.S. Government and was designated as a women's seminary and managed by missionaries with a board of trustees.

Wheelock Seminary was closed in 1861 at the onset of the Civil War. The original structure was destroyed by fire at the close of the Civil War. In the early 1880s Choctaw national leaders decided to rebuild the school on a new site a few hundred yards northeast of the old mission station, school, and church. The present Wheelock Academy building (Pushmataha Hall) was constructed, and a Choctaw orphanage was opened there in September 1884. Over the following seventy years, the Academy flourished as a center of learning for Choctaw girls and young women, ultimately ceasing operations in 1955. The U.S. government assumed jurisdiction over the school in 1910 and full control as well as funding in 1932. After 1955 the facility remained virtually abandoned until later returned to ownership of the Choctaw Nation.

Wheelock Academy served as a model for educational institutions operated by the Five Civilized Tribes and although it played a significant role in advancing indigenous education in Indian Territory it has a complicated history for the Choctaw people, as many boarding schools do. Recognizing its historical and cultural significance, whether positive or negative, Wheelock Academy was later designated a National Historic Landmark by the Secretary of Interior. Today, several of its remaining buildings, along with an on-site museum, preserve and interpret the history of the school and the Choctaw Nation's dedication to education.

In 2001, a report to Congress titled *National Historic Landmarks at the Millennium* identified Wheelock Academy as one of America's "Threatened Landmarks," underscoring the need for continued preservation efforts.

The Wheelock Academy Campus consists of approximately 47 acres and nine (9) Structures located approximately 2 miles north of Highway 70 and approximately 2.5 miles east of Millerton, Oklahoma. The Wheelock Academy Property contains the requested eight (8) buildings which were included in the Phase II which have LBP, lead in soil and/or Asbestos material which need attention. The buildings requested are as follows:

1. McCurtain Hall
2. Caretaker Cottage
3. Superintendent's Office
4. Pushmataha Hall
5. Willson Hall
6. Wheelock Mission Church
7. Boiler House
8. Bathhouse
9. Well House (no regulated material)

ACM and LBP and lead-in-soil testing was conducted in all Wheelock Academy Buildings by Crystal Creek, LLC for a Phase II except the Groundskeepers Cottage which was tested by Choctaw Nation LBP Inspectors and Risk Assessors. Crystal Creek, LLC's, Phase II Environmental Site Assessment (ESA) dated July, 2024 and the Choctaw Nation Environmental Lead-Based Paint Inspect, dated September 13, 2024, and an LBP Risk Assessment/Elevated Blood Lead Level (EBLL) Investigation, dated September 11, 2024 identified LBP on all types of components; walls in bathroom and laundry room, ceiling in bathroom, baseboards, cabinets, doors (includes jams & trim) and window (all moving and non-moving parts).

The caretaker cottage was constructed in the 1930's, is approximately 1,385 sq ft and is occupied. It was originally used as and is currently used as a single-family house. The interior structure is mostly in very good conditions with siding covering LBP. The visual inspection determined the building surfaces were mostly intact with the only area in dilapidated condition were walls in the laundry room.

The ground surface at the site slopes to the east. Groundcover consists primarily of grasses, trees, landscaped areas, paved parking areas, and concrete sidewalks. The property can be accessed from Wheelock Road approximately 1.5 miles east of the intersection of Main Street and Highway 70, Millerton, Oklahoma

1.2 Summary of LBP Inspection and LBP Risk Assessment/EBLL Investigation

LBP - The inspection of Caretaker Cottage was conducted following the U.S. Department of Housing and Urban Development (HUD) Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing with the 1997 revision. The standard for lead-based paint as per HUD/EPA standard of 1.0 mg/cm^2 was followed. All requirements for the NITON XRF usage contained in the Performance Characteristics Sheet for the specific XRF were followed. LBP was identified throughout the Caretaker Cottage. LBP is considered to be a contaminant of concern (COC) in relation to the Site.

Interior Materials Caretaker Cottage

The LBP inspection indicated that, based upon the current HUD guideline levels, the following are testing combinations found to contain lead-based paint above or equal to 1.0 mg/cm^2:

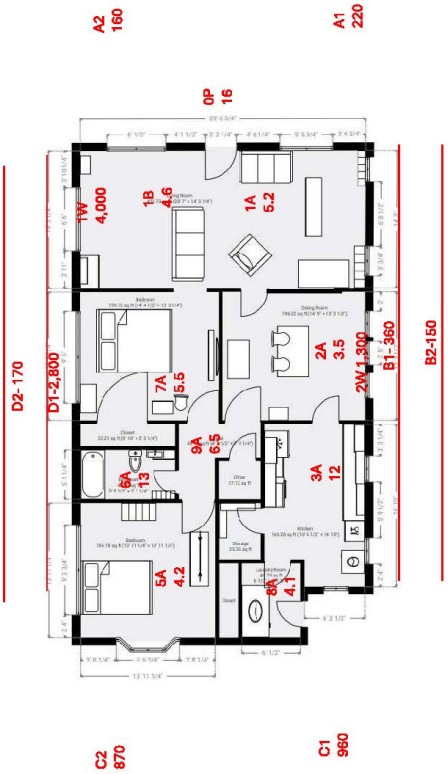
1. All wood trim on windows and doors and the baseboards are LBP in intact condition.
2. The walls and ceiling in the bathroom are LBP in intact condition.
3. The walls in the laundry room are LBP in Poor condition. (These walls are the original outside walls)
4. The shelves in the pantry are LBP in intact condition.
5. All exterior surfaces are LBP. They are all covered by vinyl siding.

Exterior Materials – Caretaker Cottage Building

All exterior painted surfaces tested (homogeneous areas) were found to contain lead in a concentration greater than the federal threshold of 1.0 mg/cm^2 of surface as measured by the XRF. The exterior LBP surfaces have been covered with vinyl siding.

Figure 1. LBP Location

Figure 2. LBP Wipe & Soil Samples



Sample Location & Results

Sample #	Location	Description	Lab Results	Hazard?
1A	Living room floor	Dust sample	5.2	
1B	Living room floor	Dust sample	4.6	
1W	Living room windowsill	Dust sample	4,000	YES
2A	Dining room floor	Dust sample	3.5	
2W	Dining room windowsill	Dust sample	1,300	YES
3A	Kitchen floor	Dust sample	12	YES
5A	Bedroom 1 floor	Dust sample	4.2	
6A	Bathroom floor	Dust sample	13	YES
7A	Bedroom 2 floor	Dust sample	5.5	
8A	Laundry room floor	Dust sample	4.1	
9A	Hallway floor	Dust sample	6.5	
0P	Front porch floor	Dust sample	16	
A1	Front of house left side	Soil sample	220	
A2	Front of house right side	Soil sample	160	
B1	Left side dripline	Soil sample	360	
B2	Left side 10 feet from house	Soil sample	150	
C1	Back of house left side	Soil sample	960	YES
C2	Back of house right side	Soil sample	870	YES
D1	Right side of house dripline	Soil sample	2,800	YES
D2	Right side 10 feet from house	Soil sample	170	

1.3 Project Goals / Site Reuse Plan

Based on information that the Choctaw Nation Brownfields Program, the current site reuse plan will be determined and finalized by the Choctaw Nation Tribal Council. However, at this time of this ABCA document there were six reuse plans being considered and drafted which include expansion of the current museum, an interpretive center, retreat center, historic tourism, recreation, tribal education, college or training center. Any finalized reuse plans shall be finalized by the decision of the Tribal Council and the Chief of the Choctaw Nation of Oklahoma.

1.4 Cleanup Scope and Goals

Based upon the results of the LBP Inspection and RA/EBLL conducted, the specific concerns addressed in this conceptual cleanup alternatives analysis for the Site include:

A. LBP on building components and lead in soil identified at the Site

The overall purpose of a cleanup at the Site is to allow the property to be occupied while mitigating the risk that COCs currently present at the Site pose to human health and the environment. The cleanup goal(s) for the Site are listed below:

- Remove, replace, enclosed, encapsulate and dispose of COCs to allow for safe use of the property;

- Conduct cleanup operations that are compliant with applicable local, Tribal, and federal standards that will protect human health and the environment;
- Implement cleanup alternative(s) that are practical and effective in mitigating COCs to protect human health and the environment in both the short-term and long-term.

2.0 EVALUATION CRITERIA FOR ALTERNATIVES

Each of the potential cleanup alternatives is evaluated against the following set of four criteria:

2.1 Compliance

Compliance with applicable state, federal and tribal regulations.

2.1.a Cleanup Oversight Responsibility

The cleanup will be overseen by the Tribal Environmental Department in consultation with EPA. In addition, all documents prepared for this site are submitted to the Tribal environmental department under CNO Tracking Number MCTTT01116 and to EPA under ACRES site number 244077. It is recommended that the following regulations be followed: The Small Business Relief and Brownfields Revitalization Act, Occupational Safety and Health Act, and any applicable provisions of the Clean Air Act, Resource Conservation and Recovery Act, the Toxic Substance Control Act, and Comprehensive Environmental Response, Comprehensive, and Liability Act where they pertain to remediation and disposal of lead in soil. Applicable sections of the CNO Environmental Codes and the CNO LBP Policies will be followed. Also, the following qualifications should be held by the remedial contractor(s) selected to oversee and/or implement the following remediation tasks and activities:

LBP Abatement

All aspects of LBP Cleanup Oversight must be conducted in accordance with OSHA Lead in Construction Standard found in 29 CFR Part 1926, 40 CFR Part 745 and TSCA Title IV 402/404. When selecting firm(s) and/or individuals to utilize, it is recommended that the following certifications be verified, at a minimum:

1) State of Oklahoma license Lead-Based Paint Firm to perform:
   - Development of LBP abatement plan;

2) State of Oklahoma licensed LBP Abatement Workers.

3) Clearance testing by a state/federal licensed LBP Risk Assessor

2.1.b Cleanup Standards for Contaminants

The following standards are recommended to be met during the remediation tasks and activities:

LBP Remediation

Cleanup levels for LBP remediation must meet standards in accordance with OSHA Lead in Construction Standard found in 29 CFR Part 1926.62. Examples of applicable standards include:

LBP Action Levels (OSHA)		
LBP Sample	**Regulatory Action Level**	**Source of Regulation**
Lead-Based Paint	1.0 mg/cm2	EPA, 40 CFR Part 745
Lead in Air Monitoring - Workers	30 µg/m^3 (action level [AL])	Occupational Safety and Health Administration (OSHA) 29 CFR Part 1926.62
	50 µg/m^3 (Permissible Exposure Level [PEL])	OSHA 29 CFR Part 1926.62

EPA & HUD LBP Clearance Limits for Sample Locations

Sample Location	HUD Clearance Limits	EPA Clearance Limits
Floor	10 µg/sq. ft.	5 µg/sq. ft
Window Sills	100.00 µg/sq. ft.	40.00 µg/sq. ft.
Window Trough	400 µg/sq. ft.	100 µg/sq. ft.
Play Area Soil	400 PPM	400 PPM
Dripline Soil	1200 PPM.	1200 PPM
Abatement of Soil	5000 PPM	5000 PPM

2.1.c Laws & Regulations Applicable to Cleanup

The following laws and regulations are mandatory and/or recommended to be followed during the cleanup tasks and activities:

LBP Abatement

- Oklahoma Department of Environmental Quality, OAC 252:110 Lead-Based Paint Management, which implements the OK Lead-Based Paint Management Act – Governs LBP abatement on child occupied housing in Oklahoma.
- OSHA Lead in Construction Standard found in 29 CFR Part 1926.62 – Governs the lead in air for abatement and construction.
- Title IV of the Toxic Substances Control Act (TSCA), as well as other authorities in the Residential Lead-Based Paint Hazard Reduction Act of 1992
- 40 CFR Part 745

2.2 Effectiveness

- Protection of human health and the environment, including workers during implementation;
- Feasibility for mitigation of risk in the short-term and long-term effectiveness;
- Complete removal of contaminants;
- Achievability of the cleanup goals;

2.3 Difficulty of Implementation

- Technical feasibility;
- Availability of work force, materials, and equipment;
- Administrative ability;
- Construction feasibility;
- Maintenance and monitoring requirements.

2.4 Cost (Conceptual costs for comparative analysis only)

- Time requirements, materials, equipment, labor and waste disposal locations.

The selection of "effectiveness", "feasibility", and "cost" as evaluation criteria is based upon the EPA's *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA* (EPA, 1988). In addition, the selection of "compliance" as an evaluation criterion is used consider variations between federal, state, and/or local regulations, if applicable, on a site-by-site basis.

3.0 CLEANUP ALTERNATIVES FOR EVALUATION

Listed below are the specific cleanup alternatives evaluated based upon the results of the Phase II ESA conducted at the Site. In addition, alternatives considered, but not evaluated due to site-specific factors which eliminated the alternative from further analysis are also listed, if applicable.

3.1 Cleanup Alternatives Evaluated

The following removal action alternatives were considered as part of this evaluation.

- Alternative 1: **No Action**
- Alternative 2: **LBP Interim Controls, Specialized Cleaning Implement Operations and Maintenance.**
- Alternative 3: **Abatement Deteriorated LBP, LBP Friction Point And LBP Soil by a Combination of Removal, Replacement, Enclosure and Encapsulation.**

4.0 COMPARATIVE ANALYSIS OF CLEANUP ALTERNATIVES

The potential cleanup alternatives for the Site were evaluated using the evaluation criteria described in Section 2. General descriptions of the conceptual design of each alternative are described below. Discussions of the pros and cons of each alternative are presented in the following subsections. Final design specifications and features of the actual remedy may differ from the conceptual design described herein.

Alternative 1: (No Action) The No Action alternative would involve leaving the Site in its current state. There would be no removal, containment, engineering control (EC), or institutional control (IC) actions implemented. The No Action alternative provides a baseline against which other alternatives can be compared. A consideration of risk is taken into account if no action is taken as opposed to implementing a cleanup action.

Alternative 2: Interim Controls Specialized Cleaning Implement Operations and Maintenance Plan. The deteriorated lead-based paint (LBP) in the house was found in the laundry room. The areas with the deteriorated LBP would be wet scrape, primed and painted with quality paint (interim controls). The entire facility would undergo specialized cleaning to reduce the amount of LBP dust on the floors. The development and implementation of an Operations and Maintenance (O&M) Plan for LBP would result in LBP left in place in this alternative.

Alternative 3: Abatement LBP by a Combination of Removal, Replacement, Enclosure and Encapsulation. The deteriorated lead-based paint (LBP) in the building was found in the laundry room. The areas with the deteriorated LBP would be wet scrape, primed and painted with elastomeric LBP encapsulant paint. The entire facility would undergo specialized cleaning to reduce the amount of LBP dust on the floors. The high soil lead level would be abated and other bare soil would be covered with sod. The development and implementation of an Operations and Maintenance (O&M) Plan for LBP left in place for this alternative.

4.1 Compliance

Alternative 1 (No Action) would not be compliant with Tribal and/or federal regulations for the Site in its current condition due to the presence and deteriorated condition of the known COCs. The areas with asbestos and LBP damage should have very limited access. Personnel entering these areas should have awareness training at a minimum. This alternative will increase ongoing maintenance.

Alternative 2 Interim Control, Specialized Cleaning, Implement Operations and Maintenance Plan. The deteriorated lead-based paint (LBP) in the house was found in the

laundry room. The areas with the deteriorated LBP would be wet scrape, primed and painted with quality paint (interim controls). The entire facility would undergo specialized cleaning to reduce the amount of LBP dust on the floors. The development and implementation of an Operations and Maintenance (O&M) Plan for LBP would result in LBP left in place and does not fulfill the long-term requirement by CNO Policy. Federal regulations do not require the LBP need to be removed. The conditions of the material impact or friction areas are required to be in good condition to eliminate asbestos fiber release and LBP dust in occupied areas. Therefore, Alternative 2 follows Tribal and federal regulations for LBP.

Alternative 3 Removal of All ACM and Abatement LBP by a Combination of Removal, Replacement, Enclosure and Encapsulation. The LBP abatement will follow all federal, local regulations. The abatement does not remove all LBP but does remove and encapsulate deteriorated LBP. This alternative manages the intact LBP according to the LBP O&M Plan. Therefore, Alternative 3 is in compliance with CNO LBP Policy, federal, local regulations for LBP.

4.2 Effectiveness

Alternative 1 (No Action) will not reduce the potential for exposure of human health and the environment to COCs or provide a reduction in the toxicity, mobility, or volume of contaminants as site conditions will deteriorate continually with time. The estimated risk from COCs to potential receptors would not be decreased in the short-term or long-term.

Alternative 2 Interim Control, Specialized Cleaning, Implement Operations and Maintenance Plan. Consists of wet scraping &painting deteriorated LBP which will reduce the potential for exposure of human health and the environment to COCs in the short term. Alternative 2 would **not** achieve the cleanup goals set for the Site in the long-term. This alternative does achieve a use outcome for the CNO.

Alternative 3 Abatement of LBP by a Combination of Removal, Replacement, Enclosure and Encapsulation will be effective in the short-term and long-term due to the removal or stabilization of the LBP. If implemented properly, encapsulation of LBP hazards and with an LBP O&M Plan, there will be no risk to human health or the environment remaining at the Site. This alternative is the only one that is the safest for occupancies and eliminates the chance of LBP potential for exposure to human health and the environment. This alternative will allow for the CNO cleanup goal to be achieved.

4.3 Difficulty of Implementation

Alternative 1 No Action is technically and administratively feasible. Maintenance or monitoring will be required. Changes in climate will not alter the risk associated with this alternative. Although implementation is possible, the "No Action" alternative would not meet the cleanup goal may expose current occupants to COCs.

Alternative 2 Interim Control, Specialized Cleaning, Implement Operations and Maintenance Plan. Consists of wet scraping and painting the deteriorated LBP components. An Operations and Maintenance (O&M) Plan for LBP left in place for this alternative will be developed and on-site maintenance personnel will be trained to implement the plans. This type of cleanup and stabilization is feasible and is standard practice on LBP projects. Difficulty to implement this plan is low to moderate. Coordination during interim control activities is anticipated with short-term low-level disturbances to the site.

Alternative 3: Abatement LBP by a Combination of Removal, Replacement, Enclosure and Encapsulation. Alternative 3 will be effective in the short-term and long-term due to the removal or stabilization of the LBP and LBP soil removal. An Operations and Maintenance (O&M) Plan for LBP left in place for this alternative will be develop and on-site maintenance personnel will be trained to implement the plans.

The difficulty level of implementing this plan is moderate. Coordination during cleanup activities is anticipated with short-term moderate disturbance to the site. THPO consultation would also be required and coordinated with EPA, SOI, and CNO would be required.

4.4 Cost

Costs incurred are evaluated on a scale of low, moderate, and high in relation to each of the other alternatives and based upon past experience with similar projects. Conceptual costs (not intended for budgetary estimates) were evaluated for time, effort, labor, and materials necessary.

Alternative 1 (No Action) has low costs associated with this option. Minimal amounts of time, effort, and labor would be required.

Alternative 2 Interim Control, Specialized Cleaning, Implement Operations and Maintenance Plan. This level of work will take similar time and effort as encapsulation, except encapsulation and soil removal will last a minimum of 20 years.

Alternative 3: Abatement LBP by a Combination of Removal, Replacement, Enclosure and Encapsulation. Alternative 3 will be effective in the short-term and long-term due to the removal or stabilization of the LBP and LBP soil removal. An Operations and Maintenance (O&M) Plan for LBP left in place for this alternative will be developed.

A summary of the cost comparison of each of the alternatives is presented in the following table, with the most expensive alternative listed as 3rd and the least expensive alternative listed as 1st.

4.5 Summary Comparison of Potential Alternatives

Comparisons are based on the four evaluation criteria previously discussed. A summary of the comparison of each of the alternatives is presented below along with status as to whether the alternative was retained for consideration as the preferred alternative selected.

Cleanup Alternative	Compliance	Effectiveness	Implementability	Cost	Comment
Alternative 1: No Action	Non-compliant	Not effective	Implementable	$0.0	This alternative does not satisfy the cleanup goals for this site. Cost to secure the building.
Alternative 2: LBP Interim Controls (IC) on Poor Condition Paint and LBP in Soils	Compliant	Effective	Implementable	$ 28,680	This alternative does satisfy the cleanup goals for this site and allows for continued current use of the property. This Alt is a short term fix and does not satisfy CNO objective to protect the children living in this house for the long term.
Alternative 3: LBP Abatement will be a Combination of Removal, Replacement, Enclosure and Encapsulation on Poor Condition Paint and on LBP in Soils	Compliant	Effective	Implementable	$ 39,500	This alternative satisfies the cleanup goal for the house and is the option that is long term on the deteriorated LBP and soils manages the LBP. However, it is the most expensive alternative but is the most compliant and effective option.

5.0 PERFERRED CLEANUP ALTERNATIVE

5.1 ACM REMOVAL AND LBP ABATEMENT

Of the three cleanup alternatives evaluated for selection at the Wheelock Academy located at 1377 Wheelock Road, Gavin, Oklahoma 74736, the preferred alternative recommended is:

Alternative 3: Abatement LBP by a Combination of Removal, Replacement, Enclosure and Encapsulation.

This alternative was selected based upon overall compliance with state and/or federal regulations, effectiveness in protecting human health and the environment in both the short-term and long-term, feasibility of implementation, and cost effectiveness. In addition, this alternative is the closest match to the detailed plans for reuse that have already been considered.

Presented below are the engineering costs to remediate the COCs at the Site. Engineering costs were determined based upon information obtained from the previous Choctaw Nation Environmental Lead-Based Paint Inspect, dated September 13, 2024, and an LBP Risk Assessment/Elevated Blood Lead Level (EBLL) Investigation, dated September 11, 2024, and past experience on similar projects. Actual bids from companies to perform the work may vary from this estimate depending on local conditions and other factors outside of the assessor's knowledge. Final design specifications, features, and cost of the actual remedy may differ from the conceptual design presented.

6.0 SPECIFICATIONS FOR REPORT USE AND RELIANCE

6.1 Special Terms and Conditions

This document has been prepared for the Choctaw Nation for the use and benefit of the Choctaw Nation. Any use of this document or information herein by persons or entities other than Choctaw Nation without the express written consent will be at the sole risk and liability of said person or entity. It is understood that this document may not include all information pertaining to the described site.

6.2 Disclaimers

The cost estimate in this report is based upon the Choctaw Nation Environmental Lead-Based Paint Inspect and an LBP Risk Assessment/Elevated Blood Lead Level (EBLL) Investigation which were in general conformance with the scope and limitations of Title IV of the Toxic Substances Control Act (TSCA), as well as other authorities in the Residential Lead-Based Paint Hazard Reduction Act of 1992, CFR 745 and HUD LBP Guidelines for the Evaluation and Control of LBP hazards in Housing, Chapter 7. The cost estimate presented herein is based on costs from engineering estimate past experience on similar projects as selected alternative presented in this document. Professional opinions are based solely on data collected during the assessment and/or interpretation of information and past data provided for review. Crystal Creek

LLC does not warrant or guarantee information obtained from third parties used for this assessment are correct, complete, and/or current.

7.0 REFERENCES

Oklahoma Department of Labor, Oklahoma Asbestos Control Act 40 O.S. § 450, et seq. Abatement of Friable Asbestos Materials Rules OAC 380:50

Asbestos NESHAP is found in 40 CFR Part 61, Subpart M and DEQ has the delegated responsibility to regulate this NESHAP in Oklahoma.

American Society for Testing and Materials (ASTM), 2021. E1903-19, *Standard Practice for Environmental Site Assessments: Phase II Environmental Site Assessment Process.*

EPA, 1988. *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA*. (EPA/540/G-89/004).

HUD LBP Guidelines for the Evaluation and Control of LBP hazards in Housing, Chapter 7

Choctaw Nation Environmental Lead-Based Paint Inspect (2024)

Choctaw Nation Environmental LBP Risk Assessment/Elevated Blood Lead Level (EBLL) Investigation (2024)

Phase I Environmental Site Assessment (2020), A & M Engineering and Environmental Services, Inc.

Phase II Environmental Site Assessment (2024), Crystal Creek LLC

DRAFT ANALYSIS OF BROWNFIELDS CLEANUP ALTERNATIVES
FOR
WHEELOCK ACADAMEY CAMPUS - MUSEUM

GARVIN, MCCURTAIN COUNTY, OKLAHOMA

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LIST OF FIGURES (SELECT FROM PHASE II ESA)

LIST OF APPENDICES

LIST OF ACRONYMS

ACBA	Analysis of Brownfields Cleanup Alternatives
ACM	asbestos-containing material
AL	action level
AQCC	Air Quality Control Commission
AHERA	Asbestos Hazard Emergency Response Act
APCD	Air Pollution Control Division
ASTM	American Society for Testing and Materials
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CH	Chrysotile
COC	contaminant of concern
CPSC	Consumer Product Safety Commission
EC	engineering control
EPA	United States Environmental Protection Agency
ESA	environmental site assessment
f/cc	fibers per cubic centimeter
HMWMD	Hazardous Material and Waste Management Division
IC	institutional control
ID	identification
LBP	lead-based paint
LF	linear feet
N/A	Not Applicable
O&M	Operations and Maintenance
ODOL	Oklahoma Department of Labor
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Limit
P.G.	Professional Geologist
PLM	polarized light microscopy
RACM	regulated asbestos-containing material
sq. ft.	square feet
START	Superfund Technical Assessment and Response Team
SOO	Statement of Objectives
TDD	Technical Direction Document
TSI	thermal system insulation

SUMMARY

Crystal Creek LLC was tasked to conduct a brownfield cleanup alternatives analysis at the Wheelock Academy Campus. The site is located at 1377 Wheelock Road, Garvin, Oklahoma 74736. Previous ACM and LBP testing was previously conducted at the Wheelock Academy Campus including the Mission Church by Crystal Creek, LLC, an Oklahoma licensed engineer firm, for the Choctaw Nation and completed in July 2024. The *Phase II Environmental Site Assessment* for Wheelock Academy Campus – *Museum Building, Garvin, Oklahoma,* details the work performed, methods used, information and data acquired, and evaluation and interpretation of results as part of the Phase II ESA. This draft Analysis of Brownfields Cleanup Alternatives is based upon the information presented in the Brownfields Pilot Project, Phase II ESA report, TEM Air Report, Asbestos Soil Sample Report, Wheelock Academy Limited Soil Screening and is for the Museum Building only.

SCOPE OF CLEANUP

Based upon the results of the Phase II ESA, TEM Air Report, Asbestos Soil Sample Report, Wheelock Academy and Limited Soil Screening conducted, the specific concerns addressed in this conceptual cleanup alternatives analysis for the Site include:

A. Asbestos-containing materials (ACM) identified at the Site
B. Lead-Based Paint components (LBP) identified at Site.
C. Lead in soil identified at the Site.
D. Asbestos in soil identified at the Site.

EVALUATION CRITERIA

Cleanup alternatives considered as part of this analysis were evaluated against the following criteria:

- Compliance;
- Effectiveness;
- Difficulty of Implementation;
- Cost.

PREFERRED ALTERNATIVE SELECTED

Of the three cleanup alternatives evaluated for selection at the Wheelock Academy located at 1377 Wheelock Road, Gavin, Oklahoma 74736, the preferred alternative recommended is:

Alternative 3: Removal of All ACM, Asbestos in Soil, Abatement of LBP, and Lead in Soil by a Combination of Removal, Replacement, Enclosure and Encapsulation

This alternative was selected based upon overall compliance with tribal and federal regulations, effectiveness in protecting human health and the environment in both the short-term and long-term, feasibility of implementation, and cost effectiveness. In addition, this alternative is the closest match to the detailed plans for reuse that have already been considered.

Presented below are the engineering costs to remediate the COCs at the Site. Engineering costs were determined based upon information obtained from the previous Phase I & Phase II ESA (2024), additional sampling and past experience on similar projects. Actual bids from companies to perform the work may vary from this estimate depending on local conditions and other factors outside of the assessor's knowledge. Final design specifications, features, and cost of the actual remedy may differ from the conceptual design presented.

Actual bids from companies to perform the work may vary from this estimate depending on local conditions and other factors outside of the assessor's knowledge. Final design specifications, features, and cost of the actual remedy may differ from the conceptual design presented. A detailed conceptual cost estimate breakdown for the total shown below is presented on Table 1.

Remediation Task	Remediation Cost
Removal of All ACM and Abatement LBP	$ 38,445
Total	**$ 38,445**

This summary is a general description of the cleanup alternatives analysis for the Site. This section is not intended to be used alone and does not include the basis of all conclusions presented. The report should be read and used in its entirety and in conjunction with the Brownfields Pilot Project and Phase II ESA report. Information included in this section is subject to the scope of services and limitations noted in the full ABCA, Brownfields Pilot Project and Phase II ESA reports.

1.0 INTRODUCTION

Crystal Creek LLC was tasked to conduct a Phase II Environmental Site Assessment (ESA) and Analysis of Brownfields Cleanup Alternatives at Wheelock Academy and Wheelock Mission Church. The site is located at 1377 Wheelock Road, Gavin, Oklahoma 74736 (Site). The Phase II ESA report, for Wheelock Academy and Wheelock Mission Church Properties, McCurtain County, Oklahoma, details the work performed, methods used, information and data acquired, and evaluation and interpretation of results. This Analysis of Brownfields Cleanup Alternatives is based upon the information presented in the Crystal Creek, LLC's, Phase II Environmental Site Assessment (ESA) dated July, 2024 and the Stronghold Asbestos Soil Report dated September 26, 2024. This draft Analysis of Brownfields Cleanup Alternatives is based upon the information presented in the Phase II ESA report, and Asbestos Soil Report is for the Museum (McCurtain Hall) only.

1.1 Background-History

The original school at Wheelock was a small "day" school, established in 1833 in conjunction with a nearby Christian mission. This marked the beginning of formal education at the site. In 1842, with the establishment of the Choctaw National School System, the institution began receiving financial support from treaty funds secured by the Choctaw Nation from the U.S. Government and was designated as a women's seminary and managed by missionaries with a board of trustees.

Wheelock Seminary was closed in 1861 at the onset of the Civil War. The original structure was destroyed by fire at the close of the Civil War. In the early 1880s Choctaw national leaders decided to rebuild the school on a new site a few hundred yards northeast of the old mission station, school, and church. The present Wheelock Academy building (Pushmataha Hall) was constructed, and a Choctaw orphanage was opened there in September 1884. Over the following seventy years, the Academy flourished as a center of learning for Choctaw girls and young women, ultimately ceasing operations in 1955. The U.S. government assumed jurisdiction over the school in 1910 and full control as well as funding in 1932. After 1955 the facility remained virtually abandoned until later returned to ownership of the Choctaw Nation.

Wheelock Academy served as a model for educational institutions operated by the Five Civilized Tribes and although it played a significant role in advancing indigenous education in Indian Territory it has a complicated history for the Choctaw people, as many boarding schools do. Recognizing its historical and cultural significance, whether positive or negative, Wheelock Academy was later designated a National Historic Landmark by the Secretary of Interior. Today, several of its remaining buildings, along with an on-site museum, preserve and interpret the history of the school and the Choctaw Nation's dedication to education.

In 2001, a report to Congress titled *National Historic Landmarks at the Millennium* identified Wheelock Academy as one of America's "Threatened Landmarks," underscoring the need for continued preservation efforts.

The Wheelock Academy Campus consists of approximately 47 acres and nine (9) Structures located approximately 2 miles north of Highway 70 and approximately 2.5 miles east of Millerton, Oklahoma. The Wheelock Academy Property contains the requested eight (8) buildings which were included in the Phase II which have LBP, lead in soil and/or Asbestos material which need attention. The buildings requested are as follows:

1. McCurtain Hall
2. Caretaker Cottage
3. Superintendent's Office
4. Pushmataha Hall
5. Willson Hall
6. Wheelock Mission Church
7. Boiler House
8. Bathhouse
9. Well House (no regulated material)

ACM and LBP and lead-in-soil testing was conducted in all Wheelock Academy Buildings by Crystal Creek, LLC for a Phase II except the Groundskeepers Cottage which was tested by Choctaw Nation LBP Risk Assessors. Crystal Creek, LLC's, Phase II Environmental Site Assessment (ESA) dated July, 2024 and the Stronghold Asbestos Soil Report dated September 26, 2024, for ACMs and LBP which was identified on/in pipes (ACM), soil (ACM & LBP) walls (LBP), ceilings (LBP) and a basement door (LBP).

The museum (McCurtain Hall) was constructed in 1944 is approximately 6,400 sq ft and is occupied. It was originally used as and is currently used as the Museum. The interior structure is mostly in very good conditions. The visual inspection determined the building surfaces were mostly intact with the only area in dilapidated condition were bathrooms on second floor that are currently not in use.

The ground surface at the site slopes to the east. Groundcover consists primarily of grasses, trees, landscaped areas, paved parking areas, and concrete sidewalks. The property can be accessed from Wheelock Road approximately 1.5 miles east of the intersection of Main Street and Highway 70, Millerton, Oklahoma

1.2 Summary of Phase II ESA Results

The Phase II ESA was conducted in accordance with *ASTM International – Standard Practice for Environmental Site Assessments: Phase II Environmental Site Assessment Process E1903-19.* The results of the Phase II ESA confirmed the presence of contaminants of concern (COCs) at the Site.

The following list is a summary of the conclusions regarding COCs and associated media identified at the Site that are addressed in this cost estimate:

ACM: Of the samples submitted for laboratory analysis, fourteen samples were reported as "positive" (>1% asbestos) for asbestos. Asbestos was identified in most Buildings of the Wheelock Academy. ACM is considered to be a contaminant of concern (COC) in relation to the Site. The asbestos pipe insulation (TSI) was found in two areas of the Museum Building. The following table indicates the location and estimated extent of ACM identified at the Site.

TABLE 2: SUMMARY OF POSITVE SAMPLING AREAS MUSEUM (MCCURTAIN HALL)

HA #	HOMOGENEOUS MATERIAL DESCRIPTION	HOMOGENEOUS MATERIAL LOCATION	FRIABILITY (F/NF)	% ASBESTOS*	# OF SAMPLES COLLECTED	CONDITION	APPROXIMATE QUANTITY
TSI-01	*Pipe- Thermal System Insulation Joint*	*Basement*	*F*	*10%C*	*3*	*SD*	*~4 Joint/Elbows (Run-Cut)*
TSI-02	*Pipe- Thermal System Insulation Joint*	*Crawlspace*	*F*	*10% C*	*3*	*SD*	*~3 Joints/Elbow (Run- Cut) & Debris ~15 SF*

NA= Not Applicable ND= None Detected MAS= Mastic CT= Ceiling Tile C= Chrysotile NIS= Not in Scope of Work DW= Drywall JC= Joint Compound TXT= Texturing V= Vermiculite SD= Significantly Damaged D= Damaged

Notes:
LF – linear feet
SF – square feet
CH – Chrysotile

LBP - The inspection of Museum Building was conducted following the U.S. Department of Housing and Urban Development (HUD) Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing with the 1997 revision. The standard for lead-based paint as per HUD/EPA standard of 1.0 mg/cm^2 was followed. All requirements for the NITON XRF usage contained in the Performance Characteristics Sheet for the specific XRF were followed. LBP was identified throughout the Museum Building. LBP is considered to be a contaminant of concern (COC) in relation to the Site.

Interior Materials Museum Building

The following tested painted components were found to contain lead in a concentration greater than the federal threshold of 1.0 mg/cm^2 of surface as measured by an XRF.

Floor	Room	Side	Component	Substrate	Color	Condition
2nd Floor	RM 4	C	Wall	Plaster	White	Intact
2nd Floor	RM 4	D	Wall	Plaster	White	Intact
2nd Floor	RM 8	A	Wall	Plaster	White	Poor
2nd Floor	RM 8	B	Wall	Plaster	White	Poor
2nd Floor	RM 8	C	Wall	Plaster	White	Poor
2nd Floor	RM 8	D	Wall	Plaster	White	Poor
2nd Floor	RM 8	D	Ceiling	Plaster	White	Poor
2nd Floor	RM 10	A	Ceiling	Plaster	White	Poor
2nd Floor	RM 10	A	Wall	Plaster	White	Poor
2nd Floor	RM 10	B	Wall	Plaster	White	Poor
2nd Floor	RM 10	C	Wall	Plaster	White	Poor
2nd Floor	RM 10	D	Wall	Plaster	White	Poor
2nd Floor	RM 11	A	Wall	Plaster	White	Poor
2nd Floor	RM 11	B	Wall	Plaster	White	Poor

2nd Floor	RM 11	C	Wall	Plaster	White	Poor
2nd Floor	RM 11	D	Wall	Plaster	White	Poor
2nd Floor	RM 11	D	Ceiling	Plaster	White	Intact
2nd Floor	RM 13	A	Wall	Plaster	White	Intact
2nd Floor	RM 13	B	Wall	Plaster	White	Intact
2nd Floor	RM 13	C	Wall	Plaster	White	Intact
2nd Floor	RM 13	D	Wall	Plaster	White	Intact
2nd Floor	RM 14	A	Wall	Plaster	White	Intact
2nd Floor	RM 14	B	Wall	Plaster	White	Intact
2nd Floor	RM 14	C	Wall	Plaster	White	Intact
2nd Floor	RM 14	D	Wall	Plaster	White	Intact
2nd Floor	RM 15	A	Wall	Plaster	White	Intact
2nd Floor	RM 15	B	Wall	Plaster	White	Intact
2nd Floor	RM 15	C	Wall	Plaster	White	Intact
2nd Floor	RM 15	D	Wall	Plaster	White	Intact

2nd Floor	RM 16	D	Ceiling	Plaster	White	Intact
2nd Floor	RM 16	A	Wall	Plaster	White	Intact
2nd Floor	RM 16	B	Wall	Plaster	White	Intact
2nd Floor	RM 16	C	Wall	Plaster	White	Intact
2nd Floor	RM 16	D	Wall	Plaster	White	Intact
2nd Floor	RM 17	A	Wall	Plaster	White	Intact
2nd Floor	RM 17	B	Wall	Plaster	White	Intact
2nd Floor	RM 17	C	Wall	Plaster	White	Intact
2nd Floor	RM 17	D	Wall	Plaster	White	Intact
2nd Floor	RM 17	D	Ceiling	Plaster	White	Intact
2nd Floor	RM 18	D	Ceiling	Plaster	White	Intact
2nd Floor	RM 18	A	Wall	Plaster	White	Intact
2nd Floor	RM 18	B	Wall	Plaster	White	Intact
2nd Floor	RM 18	C	Wall	Plaster	White	Intact
2nd Floor	RM 18	D	Wall	Plaster	White	Intact

1st Floor	RM 4	D	Ceiling	Plaster	White	Intact
1st Floor	RM 4	B	Wall	Plaster	White	Intact
1st Floor	RM 4	A	Wall	Plaster	White	Intact
1st Floor	RM 4	C	Wall	Plaster	White	Intact
1st Floor	RM 4	D	Wall	Plaster	White	Intact
1st Floor	RM 5	A	Wall	Plaster	White	Intact
1st Floor	RM 5	B	Wall	Plaster	White	Intact
1st Floor	RM 5	C	Wall	Plaster	White	Intact
1st Floor	RM 5	D	Wall	Plaster	White	Intact
1st Floor	RM 5	D	Ceiling	Plaster	White	Intact
1st Floor	RM 6	A	Wall	Plaster	White	Intact
1st Floor	RM 6	B	Wall	Plaster	White	Intact
1st Floor	RM 6	C	Wall	Plaster	White	Intact
1st Floor	RM 6	D	Wall	Plaster	White	Intact
1st Floor	RM 6	D	Ceiling	Plaster	White	Intact

1st Floor	RM 9	D	Ceiling	Plaster	White	Intact
1st Floor	RM 9	A	Wall	Plaster	White	Intact
1st Floor	RM 9	B	Wall	Plaster	White	Intact
1st Floor	RM 9	C	Wall	Plaster	White	Intact
1st Floor	RM 9	D	Wall	Plaster	White	Intact
1st Floor	RM 14	D	Ceiling	Plaster	White	Intact
1st Floor	RM 14	A	Wall	Plaster	White	Intact
1st Floor	RM 14	C	Wall	Plaster	White	Intact
1st Floor	RM 17	A	Wall	Plaster	White	Intact
1st Floor	RM 17	B	Wall	Plaster	White	Intact
1st Floor	RM 17	C	Wall	Plaster	White	Intact
1st Floor	RM 17	D	Wall	Plaster	White	Intact
1st Floor	RM 17	D	Ceiling	Plaster	White	Intact
1st Floor	RM 19	D	Ceiling	Plaster	White	Intact
1st Floor	RM 19	D	Wall	Plaster	White	Intact

1st Floor	RM 19	A	Wall	Plaster	White	Intact
1st Floor	RM 19	B	Wall	Plaster	White	Intact
1st Floor	RM 19	C	Wall	Plaster	White	Intact
Basement	Staircase	B	Wall	Concrete	White	Intact
Basement	Staircase	A	Wall	Concrete	White	Intact
Basement	Staircase	D	Wall	Concrete	White	Intact
Basement	Staircase	C	Beam	Metal	White	Intact
Basement	Basement	A	Wall	Concrete	White	Intact
Basement	Basement	B	Wall	Concrete	White	Intact
Basement	Basement	C	Wall	Concrete	White	Intact
Basement	Basement	D	Wall	Concrete	White	Intact
Basement	Basement	D	Column	Concrete	White	Intact
Basement	Basement	D	Door	Wood	White	Intact
Basement	Basement	D	Door	Wood	White	Intact

Exterior Materials – Museum Building

No exterior painted surfaces tested (homogeneous areas) were found to contain lead in a concentration greater than the federal threshold of 1.0 mg/cm^2 of surface as measured by the XRF.

1.3 Project Goals / Site Reuse Plan

Based on information that the Choctaw Nation Brownfields Program, the current site reuse plan will be determined and finalized by the Choctaw Nation Tribal Council. However, at this time of this ABCA document there were six reuse plans being considered and drafted which include expansion of the current museum, an interpretive center, retreat center, historic tourism, recreation, tribal education, college or training center. Any finalized reuse plans shall be finalized by the decision of the Tribal Council and the Chief of the Choctaw Nation of Oklahoma.

1.4 Cleanup Scope and Goals

Based upon the results of the Phase II ESA conducted, the specific concerns addressed in this conceptual cleanup alternatives analysis for the Site include:

A. ACM, asbestos in soil, LBP and lead in soil identified at the Site

The overall purpose of a cleanup at the Site is to allow the property to be redeveloped while mitigating the risk that COCs currently present at the Site pose to human health and the environment. The cleanup goal(s) for the Site are listed below:

- Remove and dispose of COCs to allow for redevelopment of the property;
- Conduct cleanup operations that are compliant with applicable local, Tribal, and federal standards that will protect human health and the environment;
- Implement cleanup alternative(s) that are practical and effective in mitigating COCs to protect human health and the environment in both the short-term and long-term.

2.0 EVALUATION CRITERIA FOR ALTERNATIVES

Each of the potential cleanup alternatives is evaluated against the following set of four criteria:

2.1 Compliance

Compliance with applicable state, federal and tribal regulations.

2.1.a Cleanup Oversight Responsibility

The cleanup will be overseen by the Tribal Environmental Department in consultation with EPA. In addition, all documents prepared for this site are submitted to the Tribal environmental department under CNO Tracking Number MCTTT01116 and to EPA

under ACRES site number 244077. It is recommended that the following regulations be followed: The Small Business Relief and Brownfields Revitalization Act, Occupational Safety and Health Act, and any applicable provisions of the Clean Air Act, Resource Conservation and Recovery Act, the Toxic Substance Control Act, and Comprehensive Environmental Response, Comprehensive, and Liability Act where they pertain to remediation and disposal of lead in soil. Applicable sections of the CNO Environmental Codes and the CNO LBP/Asbestos Policies will be followed. Also, the following qualifications should be held by the remedial contractor(s) selected to oversee and/or implement the following remediation tasks and activities:

ACM Remediation

All aspects of ACM Cleanup Oversight must be conducted in accordance with the CNO Asbestos Policy, Occupational Safety and Health Administration (OSHA) 1926.1101, Asbestos NESHAP found in 40 CFR Part 61, Subpart M and DEQ has the delegated responsibility to regulate this NESHAP in Oklahoma. When selecting firm(s) and/or individuals to utilize, it is recommended that the following certifications be verified, at a minimum:

1) State of Oklahoma licensed Asbestos Management Planner to perform:
   - Development of asbestos project designs;
   - Air monitoring for asbestos fibers;

2) State of Oklahoma licensed Asbestos Abatement Contractor.

3) Abatement required air monitoring shall be overseen by a licensed third-party contractor. All clearance will be overseen by that same third-party contractor. So that the abatement activities and clearance activities are overseen by two different contractors.

LBP Abatement

All aspects of LBP Cleanup Oversight must be conducted in accordance with OSHA Lead in Construction Standard found in 29 CFR Part 1926, 40 CFR Part 745 and TSCA Title IV 402/404. When selecting firm(s) and/or individuals to utilize, it is recommended that the following certifications be verified, at a minimum:

4) State of Oklahoma license Lead-Based Paint Firm to perform:
   - Development of LBP abatement plan;

5) State of Oklahoma licensed LBP Abatement Workers.

6) Clearance testing by a state/federal licensed LBP Risk Assessor

2.1.b Cleanup Standards for Contaminants

The following standards are recommended to be met during the remediation tasks and activities:

ACM Remediation

Cleanup levels for ACM remediation must meet standards in accordance with 40 CFR Part 61, Subpart M and DEQ has the delegated responsibility to regulate this NESHAP in Oklahoma. Occupational Safety and Health Administration (OSHA) 1926.1101. Examples of applicable standards include:

Asbestos Action Levels		
Asbestos Sample	**Regulatory Action Level**	**Source of Regulation**
Regulated Asbestos-Containing Material (RACM) – Bulk Materials	>1% asbestos	Asbestos Hazard Emergency Response Act (AHERA)
Asbestos Air Monitoring - Workers	0.1 fibers/cubic centimeter (f/cc) (action level [AL])	Occupational Safety and Health Administration (OSHA) 1926.1101
	0.2 f/cc (Permissible Exposure Level [PEL])	OSHA 1926.1101
Asbestos Air Monitoring – Final Clearance	0.01 f/cc	EPA AHERA

A list of solid waste landfills approved to accept friable asbestos waste is provided in Appendix A.

LBP Remediation

Cleanup levels for LBP remediation must meet standards in accordance with OSHA Lead in Construction Standard found in 29 CFR Part 1926.62. Examples of applicable standards include:

LBP Action Levels		
LBP Sample	**Regulatory Action Level**	**Source of Regulation**
Lead-Based Paint	1.0 mg/cm2	EPA, 40 CFR Part 745
Lead in Air Monitoring - Workers	30 µg/m^3 (action level [AL])	Occupational Safety and Health Administration (OSHA) 29 CFR Part 1926.62
	50 µg/m^3 (Permissible Exposure Level [PEL])	OSHA 29 CFR Part 1926.62

2.1.c Laws & Regulations Applicable to Cleanup

The following laws and regulations are mandatory and/or recommended to be followed during the cleanup tasks and activities:

ACM Abatement

- Occupational Safety and Health Administration (OSHA) 1926.1101
- Asbestos NESHAP is found in 40 CFR Part 61, Subpart M and DEQ has the delegated responsibility to regulate this NESHAP in Oklahoma – Governs the disposal of asbestos waste and the management of asbestos contamination.

LBP Abatement

- Oklahoma Department of Environmental Quality, OAC 252:110 Lead-Based Paint Management, which implements the OK Lead-Based Paint Management Act – Governs LBP abatement on child occupied housing in Oklahoma.
- OSHA Lead in Construction Standard found in 29 CFR Part 1926.62 – Governs the lead in air for abatement and construction.

2.2 Effectiveness

- Protection of human health and the environment, including workers during implementation;
- Feasibility for mitigation of risk in the short-term and long-term effectiveness;
- Complete removal of contaminants;
- Achievability of the cleanup goals;

2.3 Difficulty of Implementation

- Technical feasibility;
- Availability of work force, materials, and equipment;
- Administrative ability;
- Construction feasibility;
- Maintenance and monitoring requirements.

2.4 Cost (Conceptual costs for comparative analysis only)

- Time requirements, materials, equipment, labor and waste disposal locations.

The selection of "effectiveness", "feasibility", and "cost" as evaluation criteria is based upon the EPA's *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA* (EPA, 1988). In addition, the selection of "compliance" as an evaluation criterion is used consider variations between federal, state, and/or local regulations, if applicable, on a site-by-site basis.

3.0 CLEANUP ALTERNATIVES FOR EVALUATION

Listed below are the specific cleanup alternatives evaluated based upon the results of the Phase II ESA conducted at the Site. In addition, alternatives considered, but not evaluated due to site-specific factors which eliminated the alternative from further analysis are also listed, if applicable.

3.1 Cleanup Alternatives Evaluated

The following removal action alternatives were considered as part of this evaluation.

- Alternative 1: **No Action**
- Alternative 2: **Contain and/or Encapsulate Damage Friable ACM, Implement Operations and Maintenance. Specialized Cleaning and Painting**
- Alternative 3: **Removal of All ACM and Abatement LBP by a Combination of Removal, Replacement, Enclosure and Encapsulation**

4.0 COMPARATIVE ANALYSIS OF CLEANUP ALTERNATIVES

The potential cleanup alternatives for the Site were evaluated using the evaluation criteria described in Section 2. General descriptions of the conceptual design of each alternative are described below. Discussions of the pros and cons of each alternative are presented in the following subsections. Final design specifications and features of the actual remedy may differ from the conceptual design described herein.

Alternative 1: (No Action) The No Action alternative would involve leaving the Site in its current state. There would be no removal, containment, engineering control (EC), or institutional control (IC) actions implemented. The No Action alternative provides a baseline against which other alternatives can be compared. A consideration of risk is taken into account if no action is taken as opposed to implementing a cleanup action.

Alternative 2: Contain and/or Encapsulate Damaged Friable Asbestos, Implement Operations and Maintenance Plan, Specialized Cleaning and Painting as Interim Controls Consists of containing/encapsulating the deteriorated asbestos-containing material (ACM). This would include applying a lap cloth, CP 11 or a bridging encapsulant to damaged ACM. The deteriorated lead-based paint (LBP) in the building with deteriorated was found in bathrooms on second floor that are currently not in use. The areas with the deteriorated LBP would be wet scrape, primed and painted with quality paint (interim controls). The entire facility would undergo specialized cleaning to reduce the amount of LBP dust on the floors. The development and implementation of an Operations and Maintenance (O&M) Plan for ACM and LBP would result in LBP/ACM left in place in this alternative.

Alternative 3: Removal of All ACM and Abatement LBP by a Combination of Removal, Replacement, Enclosure and Encapsulation. Alternative 3 consists of removing and disposing of all ACM. The abatement will follow the Project Design developed by a licensed Project Designer. The asbestos abatement will also follow all federal regulations and be completed by a licensed asbestos abatement contractor. The deteriorated lead-based paint (LBP) in the building was found in bathrooms on second floor that are currently not in use. The areas with the deteriorated LBP would be wet scrape, primed and painted with elastomeric LBP encapsulant paint. The entire facility would undergo specialized cleaning to reduce the amount of LBP dust on the floors. The development and implementation of an Operations and Maintenance (O&M) Plan for LBP left in place for this alternative.

4.1 Compliance

Alternative 1 (No Action) would not be compliant with Tribal and/or federal regulations for the Site in its current condition due to the presence and deteriorated condition of the known COCs. The areas with asbestos and LBP damage should have very limited access. Personnel entering

these areas should have awareness training at a minimum. This alternative will increase ongoing maintenance.

Alternative 2 Contain and/or Encapsulate Damage Friable Asbestos, Implement Operations and Maintenance Plan, Specialized Cleaning and Painting as Interim Controls. Alternative 2 consists of containing/encapsulating the deteriorated asbestos containing material. This would include applying a lap cloth, CP 11 or a bridging encapsulant to damage asbestos containing material (ACM). The deteriorated lead-based paint (LBP) in the building was found in bathrooms on second floor that are currently not in use. The areas with the deteriorated lead-based paint (LBP) would be wet scraped, primed and painted with quality paint (interim controls). The entire facility would undergo specialized cleaning to reduce the amount of LBP dust on the floors. The development and implementation of an Operations and Maintenance (O&M) Plan for ACM and LBP left in place for this alternative is required by CNO Policy. Federal regulations do not require the asbestos & LBP need to be removed. The conditions of the material impact or friction areas are required to be in good condition to eliminate asbestos fiber release and LBP dust in occupied areas. Therefore, Alternative 2 follows Tribal and federal regulations for ACM and LBP.

Alternative 3 Removal of All ACM and Abatement LBP by a Combination of Removal, Replacement, Enclosure and Encapsulation. Alternative 3 consists of removing and disposing of all ACM according to all federal, state and local regulations. The LBP abatement will follow all federal, local regulations. The abatement does not remove all LBP but does manage the intact LBP according to the LBP O&M Plan. Therefore, Alternative 3 is in compliance with federal, local regulations for ACM and LBP.

4.2 Effectiveness

Alternative 1 (No Action) will not reduce the potential for exposure of human health and the environment to COCs or provide a reduction in the toxicity, mobility, or volume of contaminants as site conditions will deteriorate continually with time. The estimated risk from COCs to potential receptors would not be decreased in the short-term or long-term.

Alternative 2 Contain and/or Encapsulate Damaged Friable Asbestos, Implement Operations and Maintenance Plan, Specialized Cleaning and Painting (Interim Controls) consists of containing/encapsulating the deteriorated asbestos containing material and deteriorated LBP which will reduce the potential for exposure of human health and the environment to COCs or provide a reduction in the toxicity, mobility, or volume of contaminants as site. The estimated

risk from COCs to potential receptors would be decreased in the short term and long-term. Changes in climate will not alter the risk associated with this alternative. Climate change for this area predicts more violent and frequent storms which will not cause further deterioration of the facility and COC's. Alternative 2 would **not** achieve the cleanup goals set for the Site in the short-term or long-term. This alternative does achieve a use outcome for the property.

Alternative 3 Removal of All ACM and Abatement LBP by a Combination of Removal, Replacement, Enclosure and Encapsulation will be effective in the short-term and long-term due to the removal of all or stabilization of the COCs. If implemented properly, due to no asbestos contaminants left on-site and stabilization of LBP hazards and with an LBP O&M Plan, there will be no risk to human health or the environment remaining at the Site. This alternative is the only one that is the safest for workers and eliminates the chance of asbestos and LBP potential for exposure to human health and the environment. This alternative will allow for the cleanup goal to be achieved and use of the Site.

4.3 Difficulty of Implementation

Alternative 1 No Action is technically and administratively feasible. Maintenance or monitoring will be required. Changes in climate will not alter the risk associated with this alternative. Although implementation is possible, the "No Action" alternative would not meet the cleanup goal may expose current occupants to COCs.

Alternative 2 Contain and/or Encapsulate Damage Friable Asbestos, Implement Operations and Maintenance Plan, Specialized Cleaning and Painting (Interim Controls) consists of containing/encapsulating the deteriorated asbestos containing material. An Operations and Maintenance (O&M) Plan for ACM and LBP left in place for this alternative will be developed and on-site maintenance personnel will be trained to implement the plans. This type of cleanup and stabilization is feasible and is standard practice of asbestos and LBP projects. Difficulty to implement this plan is low to moderate. Coordination during interim control activities is anticipated with short-term low-level disturbances to the site. This alternative would also require an Asbestos Management Plan and continued quarterly and annual monitoring.

Alternative 3: Removal of All ACM and Abatement LBP by a Combination of Removal, Replacement, Enclosure and Encapsulation. Alternative 3 consists of removing and disposing of all ACM. The abatement will follow the Project Design developed by a licensed Project Designer. An Operations and Maintenance (O&M) Plan for LBP left in place for this alternative will be develop and on-site maintenance personnel will be trained to implement the plans.

The difficulty level of implementing this plan is moderate. Coordination during cleanup activities is anticipated with short-term moderate disturbance to the site. THPO consultation would also be required and coordinated with EPA, SOI, and CNO would be required.

Access to the Site is currently available and no areas are inaccessible by passenger vehicles. No road improvements would be required to provide access for construction equipment and personnel.

4.4 Cost

Costs incurred are evaluated on a scale of low, moderate, and high in relation to each of the other alternatives and based upon past experience with similar projects. Conceptual costs (not intended for budgetary estimates) were evaluated for time, effort, labor, and materials necessary.

Alternative 1 (No Action) has low costs associated with this option. Minimal amounts of time, effort, and labor would be required.

Alternative 2 Alternative 2 Contain and/or Encapsulate Damage Friable Asbestos, Implement Operations and Maintenance Plan, Specialized Cleaning and Painting (Interim Controls). This level of work will take similar time and effort as removal, except asbestos materials are left in place and will require monitoring.

Alternative 3: Removal of All ACM and Abatement LBP by a Combination of Removal, Replacement, Enclosure and Encapsulation consists of removing and disposing of all ACM. An Operations and Maintenance (O&M) Plan for LBP left in place for this alternative will be developed.

A summary of the cost comparison of each of the alternatives is presented in the following table, with the most expensive alternative listed as 3rd and the least expensive alternative listed as 1st.

4.5 Summary Comparison of Potential Alternatives

Comparisons are based on the four evaluation criteria previously discussed. A summary of the comparison of each of the alternatives is presented below along with status as to whether the alternative was retained for consideration as the preferred alternative selected.

Cleanup Alternative	Compliance	Effectiveness	Implementability	Cost[(1)]	Comment
Alternative 1: No Action	Non-compliant	Not effective	Implementable	$2000-$12,000	This alternative does not satisfy the cleanup goals for this site. Cost to secure the building.

Cleanup Alternative	Compliance	Effectiveness	Implementability	Cost[(1)]	Comment
Alternative 2: Encapsulation of Friable ACM - RACM and LBP Interim Controls (IC) on Poor Condition Paint and LBP in Soils	Compliant	Effective	Implementable	$ 32,480	This alternative does satisfy the cleanup goals for this site and allows for continued current use of the property. It leaves the asbestos in the basement and crawl space that will require monitoring and needs to be removed in future if utilities are upgraded.
Alternative 3: Abatement of All ACM and LBP Abatement will be a Combination of Removal, Replacement, Enclosure and Encapsulation on Poor Condition Paint and on LBP in Soils	Compliant	Effective	Implementable	$ 38,445	This alternative satisfies the cleanup goal for the building and is the option that permanently mitigates the asbestos and manages the LBP. However, it is the most expensive alternative but is the most compliant and effective option.

5.0 PERFERRED CLEANUP ALTERNATIVE

5.1 ACM REMOVAL AND LBP ABATEMENT

Of the three cleanup alternatives evaluated for selection at the Wheelock Academy located at 1377 Wheelock Road, Gavin, Oklahoma 74736, the preferred alternative recommended is:

Alternative 3: Removal of All ACM and Abatement LBP by a Combination of Removal, Replacement, Enclosure and Encapsulation

This alternative was selected based upon overall compliance with state and/or federal regulations, effectiveness in protecting human health and the environment in both the short-term and long-term, feasibility of implementation, and cost effectiveness. In addition, this alternative is the closest match to the detailed plans for reuse that have already been considered.

Presented below are the engineering costs to remediate the COCs at the Site. Engineering costs were determined based upon information obtained from the previous Phase I & Phase II ESA (2024), and past experience on similar projects. Actual bids from companies to perform the work may vary from this estimate depending on local conditions and other factors outside of the assessor's knowledge. Final design specifications, features, and cost of the actual remedy may differ from the conceptual design presented.

6.0 SPECIFICATIONS FOR REPORT USE AND RELIANCE

6.1 Special Terms and Conditions

This document has been prepared for the Choctaw Nation for the use and benefit of the Choctaw Nation. Any use of this document or information herein by persons or entities other than Choctaw Nation without the express written consent will be at the sole risk and liability of said person or entity. It is understood that this document may not include all information pertaining to the described site.

6.2 Disclaimers

The cost estimate in this report is based upon the Phase II Environmental Site Assessment (ESA0 (2024) by Crystal Creek LLC, Inc. Phase II Environmental Site Assessment (ESA) which were in general conformance with the scope and limitations of ASTM E1903-19. The cost estimate presented herein is based on costs from engineering estimate past experience on similar projects as selected alternative presented in this document. Professional opinions are based solely on data collected during the assessment and/or interpretation of information and past data provided for review. Crystal Creek LLC does not warrant or guarantee information obtained from third parties used for this assessment are correct, complete, and/or current.

7.0 REFERENCES

Oklahoma Department of Labor, Oklahoma Asbestos Control Act 40 O.S. § 450, et seq. Abatement of Friable Asbestos Materials Rules OAC 380:50

Asbestos NESHAP is found in 40 CFR Part 61, Subpart M and DEQ has the delegated responsibility to regulate this NESHAP in Oklahoma.

American Society for Testing and Materials (ASTM), 2021. E1903-19, *Standard Practice for Environmental Site Assessments: Phase II Environmental Site Assessment Process.*

EPA, 1988. *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA*. (EPA/540/G-89/004).

Phase I Environmental Site Assessment (2020), A & M Engineering and Environmental Services, Inc.

Phase II Environmental Site Assessment (2024), Crystal Creek LLC

FIGURES

Soil Sample Legend

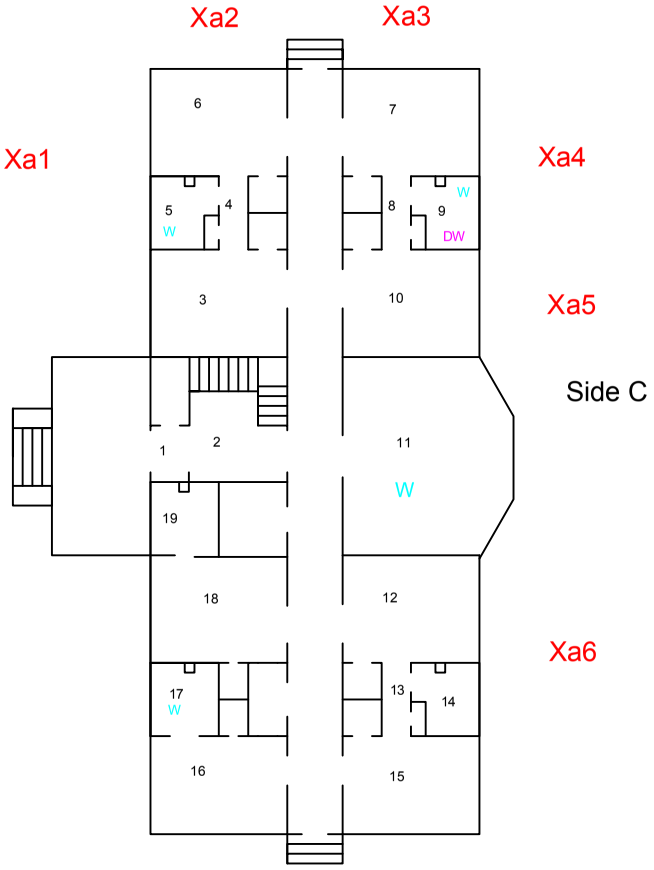
Side A
Xa1-6

Side B
N/A

Side C
N/A

Side D
N/A

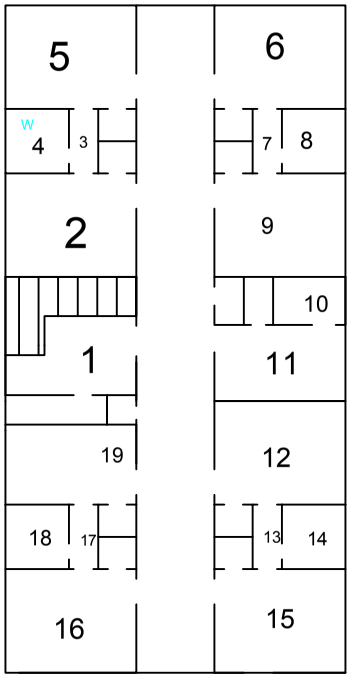
1st Floor



Water Sample Legend

Water Samples
Blue W

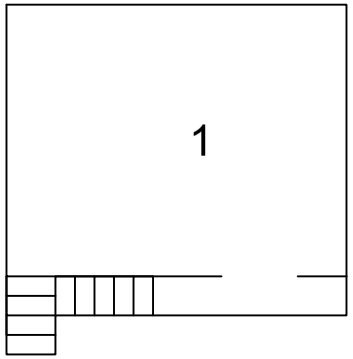
2nd Floor



Dust Wipe Sample Legend

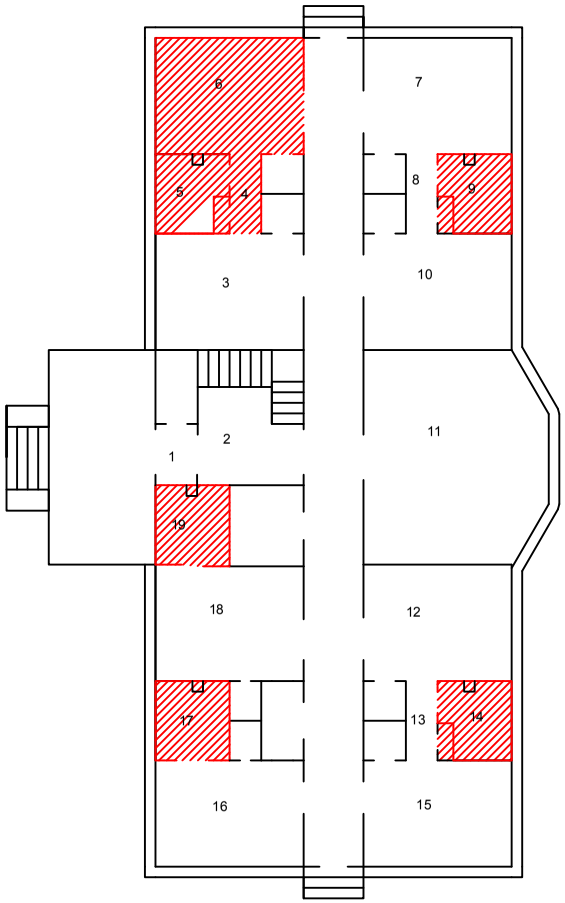
Dust Samples
Pink DW

Basement



1st Floor

Side B

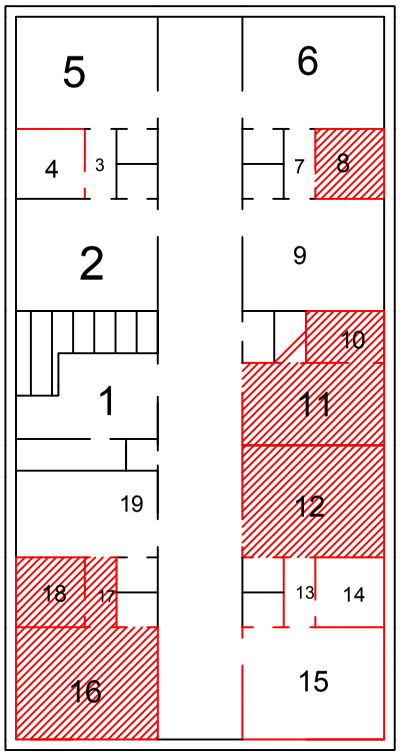


Side A

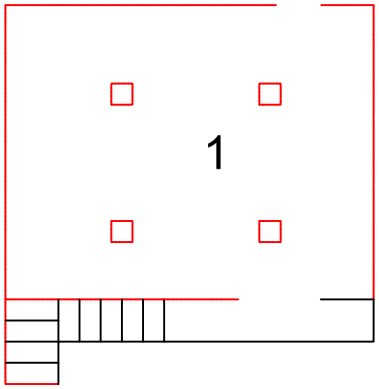
Side C

Side D

2nd Floor



Basement



Lead Sample Legend
Red Solid Lines Walls, windows, and doors

Red Hatches Ceilings

APPENDIX A
SOLID WASTE LANDFILLS APPROVED TO ACCEPT FRIABLE ASBESTOS WASTE

Oklahoma Department of Environmental Quality
Oklahoma Landfills Accepting Regulated Asbestos Waste

OAC 252:515-19-31 states that the disposal of friable asbestos waste at a solid waste disposal facility is prohibited unless the facility is a municipal solid waste landfill (MSWLF) or non-hazardous industrial waste (NHIW) landfill specifically authorized by the permit to accept such waste. Disposal practices for asbestos and materials containing asbestos must be in compliance with appropriate regulations as set forth in OAC 252:100-40-5.

COUNTY	SOLID WASTE PERMIT NO.	FACILITY
Permitted to Accept Friable and Non-Friable Asbestos		
BECKHAM	3505009	Elk City Municipal Landfill (580) 225-3230
BECKHAM	3505011	Sayre Municipal Landfill (580) 928-2260
CANADIAN	3509005	Oklahoma Environmental Authority Landfill (405) 483-5402
GARVIN	3525012	Pauls Valley Landfill 405-495-0800
GRADY	3526013	Southern Plains Landfill (405) 224-3680
JACKSON	3533005	City of Altus Landfill (580) 477-1950
MAJOR	3547002	Red Carpet Landfill (580) 776-2255
MUSKOGEE	3551020	Muskogee Community RDF (918) 682-7284
OKLAHOMA	3555018	Oklahoma Landfill (405) 745-3091
OKLAHOMA	3555028	SE Oklahoma City Landfill (405) 745-4141
OKLAHOMA	3555036	East Oak Sanitary Landfill (405) 427-1112
OSAGE	3557021	American Environmental Landfill (918)245-7786
OSAGE	3557025	Osage Landfill (918) 336-3159
PAYNE	3560010	Stillwater Landfill (405) 372-6628
PONTOTOC	3562006	City of Ada Municipal Sanitary LF (580) 436-1403
PUSHMATAHA	3564004	Clinton Lewis Construction Co. Landfill (580) 298-3729
SEMINOLE	3567020	Sooner Land Management Landfill (405) 257-6108
SEQUOYAH	3568008	Sallisaw Solid Waste Disposal Facility (918)775-6241
TULSA	3572042	Quarry Landfill (918) 437-7773