Analysis of Brownfield Cleanup Alternatives

Lincoln School
550 North Court Avenue
Burns, Oregon
ECSI 6562
EPA Cooperative Agreement # 4B-02J52001

Prepared for:

Oregon Department of Environmental Quality and Harney County

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The material and data in this report were prepared under the supervision and direction of the undersigned.

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EXPIRES: 12/31/2025
This digital seal certifies the signatory and document content.

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Contents

Limitations

Figures

Following the Report

Tables

In the Text

Abbreviations

ABCA	Analysis of Brownfield Cleanup Alternatives
ACM	asbestos-containing materials
AHERA	Asbestos Hazard Emergency Response Act
AST	aboveground storage tank
DEQ	Oregon Department of Environmental Quality
CFR	Code of Federal Regulations
the County	Harney County
EPA	U.S. Environmental Protection Agency
ESA	environmental site assessment
Grant	Brownfields Cleanup Grant CA# 4B-02J52001
HOT	heating oil tank
LBP	lead-based paint
MFA	Maul Foster & Alongi, Inc.
NESHAP	National Emission Standards for Hazardous Air Pollutants
OAR	Oregon Administrative Rules
O&M	operations and maintenance
OSHA	Occupational Safety and Health Administration
PCM	phase contrast microscopy
the Site	Lincoln School, 550 North Court Avenue, Burns, Harney County, Oregon
TCLP	Toxicity Characteristic Leachate Procedure
TSCA	Toxics Substances and Control Act
TSI	thermal system insulation

1 Introduction

Maul Foster & Alongi, Inc. (MFA) has prepared this Analysis of Brownfield Cleanup Alternatives (ABCA) for the Lincoln School located at 550 North Court Avenue in Burns, Harney County, Oregon (the Site) (see Figure 1-1). The Site comprises the Lincoln School Building, Boiler Room, Lincoln School Shop, and Playground (see Figure 1-2). This ABCA is an update to the draft ABCA prepared for the Site (Cardno 2022b).

In 2021, Harney County (the County) received United States Environmental Protection Agency (EPA) Brownfields Assessment Grant BF-01J86601-0 to investigate the Site. Using this funding, a Phase I environmental site assessment (ESA) and asbestos-containing material (ACM) and lead-based paint (LBP) survey were completed. These assessments identified environmental impacts and liabilities associated with hazardous substances, regulated materials, and petroleum products on or near the Site. The draft ABCA was prepared under the County's Brownfields Assessment Grant in October 2022.

In November 2023, the County was awarded an EPA Brownfields Cleanup Grant CA# 4B-02J52001 (the Grant) that will be used to properly and safely remove hazardous building materials and an aboveground storage tank (AST) at the former Lincoln School prior to redevelopment of the Site. the County intends to redevelop the Site for use as a Justice Center. In December 2023, the County and Oregon Department of Environmental Quality (DEQ) executed an intergovernmental agreement for DEQ to act as the County's qualified environmental professional. The draft ABCA is being updated and finalized by DEQ and their environmental contractor, on behalf of the County.

1.1 Regulatory Background

Consistent with the requirements of the Grant, MFA prepared this ABCA to evaluate appropriate cleanup methods and recommend a cleanup alternative to be applied at the Site. In addition to satisfying EPA requirements, this ABCA was designed to:

- Remove ACM and LBP to achieve the standards and requirements outlined in EPA's National Emission Standards for Hazardous Air Pollutants (NESHAP), Occupational Safety and Health Administration (OSHA), and Toxic Substances Control Act (TSCA).
- Decommission and remove the AST containing heating oil (hereafter referred to as a heating oil tank [HOT]) in the west side of the Boiler Room at the Site. HOT work must be completed in accordance with State Fire Marshall, DEQ, and EPA regulations.

1.2 Purpose and Objective

The purpose of the ABCA and recommended cleanup alternative is to address contamination to levels protective of human health and the environment while preparing the Site for future redevelopment. As required by the Grant, public notice was given, and all required documents will be available for public review on the County's project website and upon request.

This ABCA provides:

- Site information, identification and delineation of hazardous and/or regulated materials, an exposure analysis describing contaminant sources and exposure pathways, cleanup objectives, applicable cleanup standards and regulations, and the proposed cleanup alternative.
- An analysis of each alternative (including no action) with a description of the technology, feasibility, effectiveness, and cost.
- The recommended cleanup alternative based on an evaluation of each alternative.

Cleanup alternatives are provided for the following environmental impacts:

- The aboveground HOT within the Boiler Room at the Site.
- ACM present in buildings at the Site.
- LBP present in buildings at the Site.

The locations of these environmental impacts are shown in Figure 1-2.

1.3 Report Organization

This ABCA is organized into the following sections:

- Section 2 includes Site background.
- Section 3 describes the geology and hydrogeology at the Site.
- Section 4 summarizes previous assessment activities at the Site.
- Section 5 provides an exposure analysis.
- Section 6 introduces applicable cleanup standards and regulations.
- Section 7 is an evaluation of cleanup alternatives for each environmental impact.
- Section 8 describes the recommended alternative.

2 Background

The approximately 2-acre Site is located in downtown Burns, Oregon; is roughly 0.2 miles west of Route 395 between West A Street and West B Street; and consists of one parcel (23S31E07CB05500) (see Figures 1-1 and 1-2). The Site is owned by the County, is developed with a former school building, and is generally situated in a residential area. The Site is a former junior high school that is currently vacant. Recently, the Site was used by the Harney County School District as temporary administrative space. The Site was undeveloped prior to construction of the former school in 1928 (Cardno 2022b).

- The following items pose a potential risk to human health and the environment: Aboveground HOT
- ACM in building materials

- LBP on building surfaces

3 Physical Setting

3.1 Geology

Site topography is relatively flat with a slight slope to the southeast and an elevation of approximately 4,204 feet above mean sea level (Cardno 2022b).

According to a Phase I ESA, surface soils at the Site are predominantly Fury silt loam underlain by late Miocene to early Pliocene silicic ash-flow tuff associated with pumiceous air-fall tuff of rhyolitic and rhyodactic composition (Cardno 2022a).

3.2 Hydrogeology

The inferred primary direction of groundwater flow near the Site is generally to the southeast, though localized variations in groundwater flow may exist (Cardo 2022b). Site-specific investigations would be required to confirm groundwater flow direction. Site surface water is anticipated to flow towards Silvies River, located approximately 1 mile east of the Site, and into the Whiting Slough/Heifer Canyon area (if not intercepted by the municipal stormwater system) (Cardno 2022b).

4 Previous Assessment Activities

This section summarizes previous assessments at the Site, as described in the draft ACBA (Cardno 2022b).

4.1 AHERA Operations and Maintenance 3-Year Reinspection

In 2021, an environmental consultant completed an Asbestos Hazard Emergency Response Act (AHERA)-required 3-year inspection for the school buildings. The required AHERA 3-year reinspection report identified suspected ACM and evaluated the condition, quantity, and potential need for remediation. The report identified multiple ACM in good condition and thermal systems insulation (TSI) that was loose and significantly damaged in the Boiler Room.

4.2 Phase I Environmental Site Assessment

Between August 2021 and August 2022, Cardno completed and updated a Phase I ESA at the Site (Cardno 2022a). The Phase I ESA did not identify any recognized environmental conditions at the Site, but did identify *de minimis* conditions and out-of-scope items requiring future action, including:

- The aboveground HOT in the Boiler Room. Cardno assumed the aboveground HOT to be in good condition with no observed leaks. The approximate location of the aboveground HOT is shown in Figure 1-2.
- The Lincoln School Building was constructed in 1928 and contains known ACM including TSI, resilient floor coverings, drywall system materials, and exterior window caulk. Additional discussion is provided in Section 4.3.
- The Lincoln School Building was constructed well before LBP was discontinued in the construction industry in 1978. Based on paint sample analytical results, LBP is present in some painted surfacing materials. Additional discussion is provided in Section 4.3.

4.3 Asbestos and Lead-Based Paint Survey

In August 2021, Cardno completed an ACM and LBP survey in and around two buildings on the Site (Cardno 2021). Cardno made the following observations.

4.3.1 Asbestos-Containing Materials

Lincoln School Building (all quantities are approximate):

- 3,800 square feet of various vinyl floor tile and black mastic.
- 50 linear feet of roof penetration mastic.
- 19,000 square feet of non-asbestos drywall with 2% asbestos-containing white joint compound.
- 100 square feet of boiler TSI (significantly degraded in some areas, including the Boiler Room).
- 950 linear feet of variously sized TSI piping.
- 900 linear feet of exterior window caulk.
- 500 square feet of linoleum.

Lincoln School Shop:

- No ACM identified.

4.3.2 Lead-Based Paint

Lincoln School Building (all quantities are approximate):

- 1,000 square feet of light gray paint on the interior walls of room 201.
- 1,200 square feet of gray paint on the interior walls of the auditorium.

Lincoln School Shop:

- No LBP identified.

Sample locations of the identified ACM and LBP in the Lincoln School Building are shown on Figures 4a through 4d of the survey report (Cardno 2021). Cardno made the following recommendations to address ACM and LBP:

- The identified ACM generally appeared to be in good condition but noted the following:
  - Prior to any renovation or demolition that may cause the ACM to become friable and/or release airborne fibers, these materials should be removed or abated by a DEQ-licensed asbestos abatement contractor in compliance with federal, state, and local regulations. If the ACM is to be left in place, an operations and maintenance (O&M) plan should be implemented regarding the handling of the identified ACM.
- The identified LBP appeared to be in generally good condition but noted the following:
  - The building is currently not considered a child-occupied facility; therefore, the identified LBP can be left intact unless disturbed during renovation or demolition.
- For the purposes of demolition or renovation, if the paint is well adhered to the substrate and will not be cut, sanded, or abraded by mechanical means for sizing then it can be disposed of along with the construction and demolition debris. Loose and flaking lead-containing paint should be removed and containerized as a waste stream for disposal purposes. Once all paint materials are collected for disposal, a waste profile sample should be collected to determine if the waste is hazardous. Hazardous materials must be properly containerized, transported, and disposed of in accordance with Resource Conservation and Recovery Act standards and DEQ regulations.

4.4 Data Gaps Investigation

On February 12, 2024, MFA performed additional asbestos sampling to assess asbestos survey data gaps. Chris Clough, an AHERA accredited inspector from MFA collected samples from materials within the Lincoln School Building that DEQ and MFA agreed had not been previously assessed. A total of 8 samples were collected, comprised of 14 sample layers. The samples were submitted to Pace Analytical, under a State of Oregon price agreement. The samples were then subcontracted by Pace Analytical and analyzed by Aerobiology Laboratory Associates, Inc., A Pace Analytical Laboratory. This laboratory participates in the National Voluntary Laboratory Accreditation Program Laboratory Accreditation Program-accredited program. The samples were analyzed for:

- Asbestos in Bulk Building Materials by EPA Method 600/R-93/116
- The analytical results (samples 01-MISC-LJH-01 and 01-MISC-LJH-02) indicate that ACM is present in vinyl flooring (25% chrysotile asbestos) in the restrooms on the second floor of the Lincoln School Building. Approximately 450 square feet of vinyl flooring is present.

The additional vinyl flooring ACM are also addressed by the cleanup alternative discussion below and the survey information is included in the in-progress Cleanup Work Plan

5 Exposure Analysis

5.1 Evaluation

This ABCA presents an evaluation of remedial action alternatives and their respective costs, though other types of corrective actions, such as institutional controls, exist. Excess public risk requires four factors, all of which must be present to yield excess risk from environmental impacts at the Site:

- A chemical with sufficient toxicity to induce acute or chronic harm.
- A chemical in sufficient quantity to be toxic and induce harm.
- A receptor upon which to induce harm.
- A pathway along which a chemical of sufficient toxicity and quantity can reach and thereby harm a receptor.

Actions to remediate impacted areas rarely eliminate all chemicals, hazardous substances, or regulated building materials. Instead, it is often the goal to reduce the risk to human health and the environment to an acceptable threshold through removal/abatement, treatment, or immobilization/encapsulation of impacted media or materials. The degree of acceptable risk is determined through legislation and regulatory processes. For the Site, this has been accomplished through the development and implementation of federal, state, and local rules and regulations.

5.2 Potential Exposure Sources, Pathways, and Receptors

For constituents of concern to harm public health or the environment, the point of exposure must be accessible by the at-risk population. Incomplete exposure pathways (presently or in the future) do not represent a probable condition of elevated risk.

At the Site, four potential receptor populations were evaluated for the draft ABCA:

- Employees of the future redeveloped Lincoln School.
- Occupants of the future redeveloped Lincoln School.
- Residential populations living near the Site.
- Construction workers working on the redevelopment project.

During the previous assessment activities described in Section 4, an aboveground HOT was identified in the Boiler Room. Fuel oil constituents potentially within the concrete slab and underlying soil are a possible exposure source. Further, ACM and LBP were identified during prior assessments in building materials and, if not properly managed, are possible exposure sources.

At the Site, ACM and LBP within the Lincoln School Building were confirmed and fuel oil impacts are suspected in the Boiler Room. For each of the four potential receptors listed above, the primary exposure pathway of concern is direct contact with fuel oil-impacted soil or building materials and asbestos- and lead-impacted building materials via incidental ingestion or inhalation of particulate matter.

6 Cleanup Standards and Regulations

6.1 Cleanup Standards

6.1.1 Aboveground HOT and Impacted Material Removal

In Oregon, the Office of the State Fire Marshall is primarily responsible for regulating and tracking ASTs. The applicable protocol for spills associated with fuel oil tanks is the DEQ Emergency Response Program Chapter 340, Division 141 – Oil Spill Contingency Planning and Fees. EPA regulations regarding AST removal and spill response and cleanup and Oregon Administrative Rules (OAR) 340-122 must also be followed.

6.1.2 Asbestos-Containing Material

As required by DEQ's asbestos rules in Chapter 340, Division 248, the asbestos cleanup standard is removal of all ACM that may become friable when disturbed during demolition or renovation activities at the Site. All ACM must be properly removed by a DEQ-licensed asbestos abatement contractor and then an inspection by an asbestos building inspector or abatement supervisor must be performed to obtain visual clearance. Once clearance is obtained, air samples will be collected according to the methods described in OAR 340-248-0270(8)(k) and compared against the clearance criteria of 0.01 fibers per cubic centimeter of analyzed air using National Institute for Occupational Safety and Health 7400 method, phase contrast microscopy (PCM).

6.1.3 Lead-Based Paint

The LBP cleanup standards in 24 Code of Federal Regulations (CFR) 35.1340, is visual confirmation of removal or encapsulation of all painted materials, all pre-existing dust, and all dust generated during LBP removal. Generally, LBP removal in residential or child-occupied facilities require additional regulations to confirm removal and receive clearance of the abated area.

TSCA regulations and environmental product declaration rules establish clearance procedures for all lead abatement projects within residential or child-occupied buildings by a certified inspector or lead risk assessor. Wipe samples are to be collected with results compared against the following 2021 finalized clearance standards, however, if the 2023 proposed clearance standards are finalized prior to the implementation of the work, these levels will be updated accordingly:

- 40 micrograms of lead in dust per square foot of flooring.
- 250 micrograms of lead in dust per square foot on interior windowsills.
- 400 micrograms of lead in dust per square foot in window troughs.
- 800 micrograms of lead in dust per square foot on exterior concrete.

6.2 Applicable Regulations

6.2.1 Aboveground HOT and Impacted Material Removal

Applicable regulations are described in Section 6.1.1. Further, federal and/or local regulations containing stricter criteria or additional laws, standards, or restrictions must be followed.

6.2.2 Asbestos Laws and Regulations

Asbestos is regulated by AHERA, TSCA, the Clean Air Act, and Oregon Administrative Rule 340-248. Asbestos abatement work must be performed in accordance with Oregon OSHA asbestos regulations Chapter 437, Division 3, Subdivision Z and 29 CFR 1926.1101 to ensure protection of asbestos abatement workers. Although cancer risk from asbestos exposure is appropriately identified as a chronic concern, OSHA's permissible exposure limits set short-term standards to limit worker exposure to asbestos:

- Short-term exposure limit: 1.0 fibers per cubic centimeter analyzed by PCM.
- 8-hour time weighted average: 0.1 fibers per cubic centimeter analyzed by PCM.

ACM demolition or renovation activities should include the following work practices:

- An EPA-certified Asbestos Designer should prepare abatement specifications based on project size (i.e., quantity of ACM to be removed), when applicable.
- Remove or abate all ACM prior to disruptive activities associated with building demolition or renovation.
- Follow approved guidance for handling and disposal of ACM (EPA 1990).
- Monitoring of asbestos abatement activities by a DEQ-certified Asbestos Abatement Supervisor.
- Performing air clearance testing upon ACM abatement completion.
- Preparation of an asbestos abatement completion report.

6.2.3 Lead-Based Paint Laws and Regulations

LBP in use prior to 1978 in housing and child-occupied buildings is regulated under TSCA 15 U.S.C. 2601 et seq. and amended by the Residential LBP Hazard Reduction Act of 1992. Collectively, this is generally referred to as Title X of the Housing and Community Act of 1992. Title X governs the training, certification, and licensing of LBP abatement contractors, inspectors, and risk assessors. Further, Title X covers the training and certification of abatement workers and abatement project designers. The relevant portions of Title X only apply to residential buildings and/or child-occupied facilities.

In Oregon, the Construction Contractors Board and Oregon Health Authority regulate and license LBP workers for work in residential and child-occupied facilities. At the Site, lead-containing debris shall be managed and handled in accordance with EPA Resource Conservation and Recovery Act Hazardous Waste Regulations (40 CFR Parts 260-274) and transported consistent with applicable Department of Transportation regulations.

OSHA (29 CFR Part 1910) published General Industry regulations promoting worker safety during LBP abatement activities. OSHA's Construction Standards (29 CFR Part 1926) promulgate a

permissible exposure limit for lead construction workers, including work performed during demolition, salvage, or renovation. 29 CFR Part 1926.62(c)(1) states that the employer shall assure that no employee is exposed to lead at concentrations greater than fifty micrograms per cubic meter of air averaged over an 8-hour period. Additional regulations under these chapters address other aspects of worker safety, such as respirator programs, work practices, and medical monitoring. LBP debris may be classified as hazardous waste if lead concentrations exceed the Toxicity Characteristic Rule limit of 5 milligrams per liter (40 CFR Part 261.24 and 40 CFR Part 262.11) in sample extract prepared according to the Toxicity Characteristic Leaching Procedure (TCLP) (EPA 1992).

6.3 Davis-Bacon Act

All Grant-funded corrective action work, including cost estimates and future budgets and schedules, must comply with the Davis-Bacon and Related Acts and Reorganization Plan No. 14 of 1950, which requires prevailing wage payment for cleanup activities.

7 Evaluation of Cleanup Alternatives

The following cleanup alternatives were identified by Cardno in the draft ABCA (Cardno 2022b).

7.1 HOT and Impacted Material Removal

7.1.1 Alternative 1—No Action

This alternative is included solely as a baseline for comparison. This alternative assumes that exposure and risk to public health and the environment are possible because no actions are taken to address the environmental impacts at the Site. Alternative 1 does not meet the cleanup action objectives.

- Feasibility: Alternative 1 is technically feasible.
- Effectiveness: Alternative 1 is not effective.
- Cost: Alternative 1 has no cost.

7.1.2 Alternative 2—Engineering Controls

Alternative 2 employs engineering controls to manage and mitigate ongoing or future releases from the aboveground HOT, including removal of remaining fuel oil (if any) and associated piping and cleaning the Boiler Room building materials. Alternative 2 does not investigate or remediate subsurface environmental media beneath the HOT.

- Feasibility: Alternative 2 is feasible, though the potential exists for ongoing environmental impacts in areas not fully investigated or remediated.
- Effectiveness: Alternative 2 is considered effective in controlling future releases but does not address potentially existing contamination that may impact human health or the environment.

- Cost: The estimated cost to complete Alternative 2 is between $65,000 and $95,000. Actual costs will be based on final site design and contractor bids.

7.1.3 Alternative 3—HOT Removal and Full Cleanup

Alternative 3 includes HOT removal and remediation of impacted areas. In this alternative, the HOT would be decommissioned via removal, residual impacts to environmental media would be investigated and remediated, and confirmation sampling would be completed post-remedial action to ensure contamination is adequately addressed.

Residual contents of the 10,000-gallon aboveground HOT would be drained before cutting the tank to remove it from the Boiler Room without demolishing any existing walls or structures (including the separation wall between the Lincoln School Building and Boiler Room. Impacted concrete will be cleaned. Core samples to investigate potential impacts to underlying soils will be collected for analysis. Concrete and soil removal will proceed until contamination is addressed to achieve closure status under DEQ regulatory oversight. For cost estimating purposes, it is assumed that 100 cubic yards of impacted concrete and contaminated soil will be removed and properly disposed off-Site.

- Feasibility: Alternative 3 is technically feasible.
- Effectiveness: Alternative 3 is highly effective because HOT decommissioning via removal and removal of potentially impacted environmental media constitutes a permanent remedial action employed to the maximum extent practicable, mitigating future impacts to human health or the environment.
- Cost: The estimated cost to complete Alternative 3 is between $95,000 and $120,000. Actual costs will be based on the extent of cleanup and removal of impacted materials, site restoration, and final contractor bids.

7.2 Asbestos-Containing Material

7.2.1 Alternative 1—No Action

This alternative is included solely as a baseline for comparison. This alternative assumes that exposure and risk to public health and the environment are possible because no actions are taken to address the environmental impacts at the Site. Alternative 1 does not meet the cleanup action objectives.

- Feasibility: Alternative 1 is technically feasible but would limit reuse of the Site.
- Effectiveness: Alternative 1 is not effective.
- Cost: Alternative 1 has no cost.

7.2.2 Alternative 2—Encapsulation and Enclosure

Alternative 2 includes complete encapsulation of ACM with a fiber-locking substance to prevent fiber release. Further, enclosures will be employed to prevent access to ACM, where possible. An O&M plan will be prepared and implemented to monitor remaining ACM and corrective action effectiveness following encapsulation and enclosure.

- Feasibility: Alternative 2 is technically feasible.

- Effectiveness: Alternative 2 is not an effective approach because it ultimately leaves regulated carcinogenic material at the Site, which presents unacceptable human health risks even with encapsulation and enclosure.
- Cost: Because Alternative 2 is not effective, cost estimates were not developed.

7.2.3 Alternative 3—Full Abatement

Alternative 3 is full abatement, which includes removal of all ACM in the building shown on Figure 1-2 and specific areas described in Cardno 2021, in accordance with applicable federal, state, and local regulations.

- Feasibility: Alternative 3 is technically feasible.
- Effectiveness: Alternative 3 is highly effective, because full removal of ACM from the Site constitutes a permanent remedial action employed to the maximum extent practicable, mitigating future impacts to human health or the environment.
- Cost: ACM is present throughout the Lincoln School Building. In some areas, significantly degraded TSI is present, which requires a higher degree of care to manage and clean up. The estimated cost for ACM abatement ranges from $170,000 to $215,000. Actual costs will be based on final contractor bids.

7.3 Lead-Based Paint

7.3.1 Alternative 1—No Action

This alternative is included solely as a baseline for comparison. This alternative assumes that exposure and risk to public health and the environment are possible because no actions are taken to address the environmental impacts at the Site. Alternative 1 does not meet the cleanup action objectives.

- Feasibility: Alternative 1 is technically feasible but would limit reuse of the Site.
- Effectiveness: Alternative 1 is not effective.
- Cost: Alternative 1 has no cost.

7.3.2 Alternative 2—Encapsulation

Alternative 2 includes encapsulating LBP with paint and/or sealant to prevent access. An O&M plan would be prepared and implemented to monitor encapsulation effectiveness.

- Feasibility: Alternative 2 is technically feasible.
- Effectiveness: Alternative 2 is effective even though it leaves regulated materials at the Site. The Site is not a residential dwelling and future development plans do not indicate it will be used as a child-occupied building (per definition by Housing and Urban Development).
- Cost: The estimated cost to implement Alternative 2 ranges from $10,000 to $15,000. Actual costs will be based on final contractor bids.

7.3.3 Alternative 3—Full Removal

Alternative 3 includes full removal of all LBP in accordance with applicable federal, state, and local regulations. According to Cardno (Cardno 2021, 2022b), approximately 2,200 square feet of LBP is present in the Lincoln School Building.

- Feasibility: Alternative 3 is technically feasible.
- Effectiveness: Alternative 3 is highly effective because full removal from the Site constitutes a permanent remedial action employed to the maximum extent practicable, mitigating future impacts to human health or the environment.
- Cost: The estimated cost to implement Alternative 3 ranges from $45,000 to $55,000. Actual costs will be based on site restoration and final contractor bids.

7.3.4 Alternative 4—Mixed Removal and Encapsulation

Alternative 4 is a hybrid approach utilizing removal (see Alternative 3) in some areas and encapsulation (see Alternative 2) in others, in accordance with applicable federal, state, and local regulations. Of the approximately 2,200 square feet of LBP present in the Lincoln School Building (Cardno 2021, 2022b), approximately half is soft material (e.g., drywall) that can easily be removed. The remaining half is coating concrete and/or exterior walls that will not be removed.

- Feasibility: Alternative 4 is technically feasible.
- Effectiveness: Alternative 4 is effective, though judged less effective than Alternative 3. Removal from the Site constitutes a permanent remedial action employed to the maximum extent practicable. However, some LBP cannot be easily removed (e.g., concrete and/or exterior walls), and encapsulation would be employed in these areas.
- Cost: The estimated cost to implement Alternative 4 ranges from $25,000 to $35,000. Actual costs will be based on site restoration and final contractor bids.

8 Recommended Alternative

The recommended cleanup alternative is based on future redevelopment plans to renovate the Site for use as a municipal building, courthouse, and offices.

8.1 HOT and Impacted Material Removal

Recommended Alternative: Alternative 3 — HOT Removal and Full Cleanup

Alternative 3 includes closure and draining the aboveground HOT of its residual contents; cleaning, removal (via cutting to avoid demolishing walls or the roof of the Boiler Room); cleaning residual impacts; and confirmation sampling post-remedy implementation. Impacted concrete will be cleaned (where possible) and soil samples will be collected for analysis of impacts to underlying soil. Concrete and soil removal will proceed as necessary to achieve unconditional closure status. For

cost estimating purposes, it is assumed that 100 cubic yards of impacted concrete and contaminated soil may be removed and properly disposed off-Site.

Alternative 3 is feasible and constitutes a permanent remedial action employed to the maximum extent practicable, mitigating future impacts to human health or the environment. The estimated cost to implement Alternative 3 is between $95,000 to $120,000, where actual costs will be based on the extent of cleanup and removal of impacted materials, site restoration, and final contractor bids.

8.2 Asbestos-Containing Material

Recommended Alternative: Alternative 3 — Full Abatement

This alternative includes removal of all ACM in accordance with applicable federal, state, and local regulations. Alternative 3 is the most feasible and effective alternative for long-term protection of human health and the environment.

ACM is present throughout the Lincoln School Building (Cardno 2021). The estimated cost of full ACM abatement is between $170,000 and $215,000, where actual costs will be based on final contractor bids.

8.3 Lead-Based Paint

Recommended Alternative: Alternative 4 — Mixed Removal and Encapsulation

Alternative 4 (mixed removal and encapsulation of all LBP) in accordance with applicable regulations is considered a feasible approach at the Site. Removal of LBP is the most effective alternative for long-term protection of human health and the environment. However, some materials cannot be easily removed (e.g., concrete and/or exterior walls) but can be effectively encapsulated. Of the 2,200 square feet of LBP present in the Lincoln School Building, approximately half are soft materials that can be systematically removed from the Site. LBP removed from the Site will be abated by a licensed lead removal firm in accordance with applicable EPA and OSHA regulations. TCLP lead tests must be performed on LBP-coated building materials to determine appropriate off-Site disposal methods. The remaining half are hard materials that cannot be easily removed and will therefore be encapsulated with an approved LBP encapsulant.

The estimated cost to implement Alternative 4 is approximately $25,000 to $35,000, where actual costs will be based on site restoration and final contractor bids.

8.4 Remedial Cost Analysis

The goal of the project is to prepare the Site for redevelopment by addressing the areas that present unacceptable risks to human health and the environment associated with the aboveground HOT, ACM, and LBP. The table below presents a summary of estimated costs for the recommended alternative.

Table Summary of Recommended Alternative Costs

Task	Estimated Quantity	Range of Cost	Maximum Cost Estimate
HOT Removal and Cleanup	10,000-gallon aboveground HOT	$95,000 to $120,000	$120,000
Full ACM Abatement	24,700 square feet 1,100 linear feet	$175,000 to $220,000	$215,000
Mixed LBP Removal and Encapsulation	2,200 square feet	$20,000 to $30,000	$35,000
Engineering Design, Project Monitoring, Programmatic Management, Completion Reports	75 business days	$115,000 to $130,000	$130,000
		Total:	$500,000

Notes
ACM = asbestos-containing material.
HOT = heating oil tank.
LBP = lead-based paint.

References

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Limitations

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Figures

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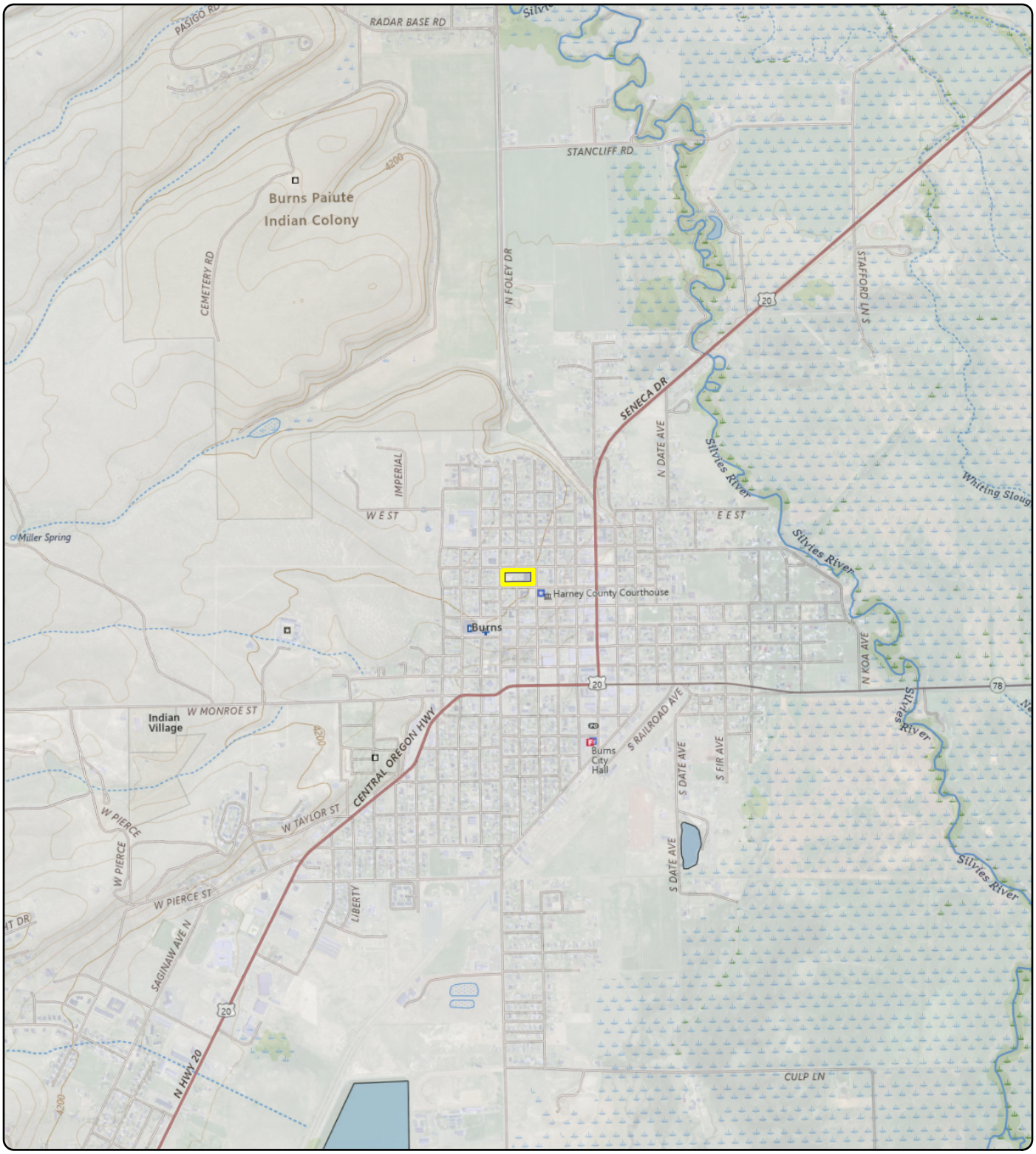

Notes
U.S. Geological Survey 7.5-minute topographic quadrangle (2020): Burns.
Township 23 south, range 31 east, section 7.

Data Source
Site boundary obtained from Harney County.

Legend

Site Boundary

Figure 1-1
Site Location

Analysis of Brownfield Cleanup Alternatives
Lincoln School
550 North Court Avenue
Burns, Oregon

0 1,000 2,000
Feet

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Path: X:\O_MFA_Projects\M0785\28\001\Pro\M0785_28_001_004.aprx\Fig 1-1 Site Location
Print Date: 4/30/2024
Reviewed By: jhansen
Produced By: sturner
Project: M0785.28.001-004

Figure 1-2
Site Overview and Features

Analysis of Brownfield Cleanup Alternatives
Lincoln School
550 North Court Avenue
Burns, Oregon

Legend

- HOT
- ACM and LBP Abatement Areas
- Site Boundary
- Tax Parcels

Note
ACM = asbestos-containing materials.
HOT = aboveground heating oil tank.
LBP = lead-based paint.

0 50
Feet

Data Sources
Aerial photograph obtained from Bing; tax lot data obtained from Harney County.

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