

**ANALYSIS OF BROWNFIELDS CLEANUP ALTERNATIVES
AND CONCEPTUAL REMEDIAL ACTION PLAN
CARIBOU POWER STEAM PLANT
142 LOWER LYNDON STREET
CARIBOU, MAINE**

Prepared for

CITY OF CARIBOU
25 High Street
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ANALYSIS OF BROWNFIELDS CLEANUP ALTERNATIVES, REV. 1
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1.0 INTRODUCTION AND BACKGROUND

Sevee & Maher Engineers, Inc. (SME) prepared this Analysis of Brownfields Cleanup Alternatives (ABCA) to evaluate remedial alternatives to manage previously identified adverse environmental conditions at the Caribou Power Steam Plant located at 142 Lower Lyndon Street, City of Caribou, Aroostook County, Maine (the “Site”). The Site is a portion of the Caribou Power Plant facility, which is referenced as REM03256 in the Maine Department of Environmental Protection (MEDEP) sites database. This report summarizes an evaluation of remedial alternatives for the Site and includes an analysis of estimated cost, the degree of effectiveness and ease of implementation for each remedial alternative, and the resilience of each option from extreme weather (i.e., flooding, rain events, etc.). This report also contains a Remedial Action Plan (RAP) with a discussion of the implementation of the recommended remedial alternative for the Site. This report was prepared on the behalf of the current owner, the City of Caribou, using a United States Environmental Protection Agency (EPA) Brownfields Cleanup Grant No. 00A01956. A draft ABCA was completed in 2025 by SME to assist the City with their U.S. EPA Brownfields cleanup grant application.

1.1 Purpose and Scope

The purpose of this ABCA is to evaluate potential remedial alternatives to mitigate hazardous building materials and hazardous substances and petroleum products (HSPP) associated with the Steam Plant and select the most appropriate cleanup option. Based on the information obtained during previous environmental investigations (summarized in Section 2.0), three remedial options were considered for the Site and evaluated. Key consideration was given to eliminating or reducing, to the extent possible, the risk of exposure for existing and future Site occupants and workers to the identified hazardous building materials and HSPP at the Site. The overall objectives of this ABCA include the following:

- Identifying potential remedial alternatives and evaluating those remedial alternatives against specific criteria, including overall protection of human health and the environment; technical practicality; ability to implement; reduction of toxicity, mobility, and volume of contaminants; time required until remedial action objectives are attained; costs; and resiliency to extreme weather conditions (i.e., flooding, rain events, etc.);
- Selecting the remedial alternative that best meets the objectives and considerations of the project; and
- Presenting a conceptual RAP for implementing the selected remedial alternative.

Remediation alternatives evaluated in this ABCA include: 1) a “No Action” alternative; 2) a “No Demolition - Targeted Cleanup with Partial Management In-Place” alternative; and 3) a “Demolition & Full Cleanup” alternative. The Evaluation of Remediation Alternatives (Section 5.0) discusses the requirements for each alternative. The alternatives were evaluated on the previously mentioned criteria, and one alternative was recommended for implementation at the Site.

1.2 Site Description and Surrounding Land Use

The Steam Plant (the “Site”) at the former Caribou Power Plant operated as a fossil fuel electric power generation facility from its construction in 1949 until the power plant closed in 2012. The Steam Plant is a 10,700 square-foot, five-story building with a leaking roof and failing building envelope. The Site has remained vacant since closure and the Steam Plant building is deteriorating and has become a target for trespassing, theft, and vandalism.

The 0.74-acre site is part of the Caribou Power Plant property, which is identified as Lot 149-AA on the City of Caribou’s Tax Map 25. The parcel boundaries of the entire Caribou Power Plant site are shown as a black line and the Steam Plant building is shown as a red square on Figure 1. The Steam Plant is bordered by the Aroostook River on the east and located within its floodplain; an abandoned railbed and Lower Lyndon Street to the west (beyond which is the bulk oil tank farm); wooded/overgrown vegetated portions of the Caribou Power Plant property to the south; and remaining portions of the Caribou Power Plant property that are improved with the Diesel Plant building and outbuildings to the north (some of which are in the process of being cleaned up and demolished). Topography at the Site is flat with a steep embankment to the Aroostook River.

Please refer to Figure 1 (Site Location Map) and Figure 2 (Site Plan) for information pertaining to the Steam Plant building and pertinent Site features.

1.3 Potential Future Site Use

The reuse plan for the Site is to demolish the dilapidated Steam Plant to facilitate redevelopment of the overall former Caribou Power Plant property, including the Steam Plant footprint as a riverfront greenspace/park. As there is a walking trail nearby and the Site is on the Aroostook River, the Site will serve as an ideal locale for public recreation and riverfront access for a community in need of such amenities, including improved access to the public boat launch located to the south of the Site. This planned park is aligned not only with its location in a federally-designated floodplain, but also with community goals, future visions, and adjacent land use.

2.0 PREVIOUS ENVIRONMENTAL INVESTIGATIONS

On August 5, 2021, County Environmental Engineering, Inc. (County) completed a Phase I ESA at the Caribou Power Plant site, which was inclusive of the Steam Plant, in accordance with ASTM International Standard Practice E 1527-13 and U.S. EPA All Appropriate Inquiry (AAI), 40 CFR Part 312. The Phase I ESA identified Recognized Environmental Conditions (RECs) associated with documented and potential unknown/unreported releases of HSPP at the Caribou Power Plant site, including the Steam Plant. Based on the findings of their Phase I ESA, County recommended that a Phase II ESA be completed to confirm or dismiss their RECs. County also observed potential hazardous building materials, including asbestos-containing materials, lead and mercury-containing components, and universal wastes throughout the Steam Plant and recommended a Hazardous Building Materials Survey (HBMS) to identify and quantify those hazardous building materials.

On May 8, 2022, County completed a HBMS for the Caribou Power Plant, including the Steam Plant, to identify and quantify hazardous and/or regulated building materials in/on the building. County's HBMS identified approximately 2 miles of asbestos-wrapped steam and water pipes; 1,600 square-feet of asbestos-containing transite electrical boards and panels; 14,000 square-feet of asbestos-coated condensers, ducts, vents, tanks, point heaters, steam headers, and vessels; two massive boilers coated with 8,200 square-feet of asbestos; 400 square feet of asbestos-containing floor tile and mastic; thousands of asbestos-containing piping gaskets; miles of asbestos-coated electrical wiring; 2,000 square-feet of asbestos-containing window glazing and caulking; and the entire roof (tar and gravel) is contaminated with asbestos.

On May 14, 2022, County completed a Phase II ESA for the Caribou Power Plant, including the Steam Plant, in accordance with ASTM E1903-19. Results of the Phase II ESA identified HSPP-impacted soil and groundwater at the Caribou Power Plant; however, the contaminant concentrations detected in soil and groundwater at the Site did not exceed their respective federal or state cleanup standards/guidelines. Therefore, soil and groundwater remediation at the Site was not required nor recommended.

From July 2023 to December 2024, the EPA completed a Time Critical Removal Action (TCRA) to abate and properly dispose of asbestos-containing materials in/on the Steam Plant that were determined to pose an immediate threat to human health and/or the environment. At the completion of EPA's TCRA, GZA Geoenvironmental, Inc. (GZA), a subcontractor to EPA's TRCA consultant, Weston Solutions, Inc., conducted supplemental hazardous building materials inventories to quantify remaining hazardous building materials inside the Steam Plant building. GZA also discussed the off-site fuel oil off-loading platform and fuel oil piping network with aboveground and underground fuel oil conveyance piping at the Site that extends onto the western adjoining properties, Maine Department of Transportation's (MDOT) railroad corridor and Merlin One's bulk tank farm.

GZA prepared a "Deconstruction Engineering Plan" and "Decommissioning Opinion of Probable Costs" document for the EPA. The purpose of GZA's work was to identify additional cleanup activities that will be required to fully remediate the Steam Plant, and to provide estimated costs to abate and remove

remaining asbestos-containing materials and hazardous building materials (i.e., universal wastes, lead-based paint, PCBs, etc.) identified in/on the Steam Plant, and to remediate impacts associated with the fuel oil piping platform and aboveground and underground petroleum piping systems located exterior to the Steam Plant.

3.0 SITE CHARACTERIZATION AND CLEANUP GOALS

Previous environmental investigations completed at the Site identified hazardous building materials in/on the Steam Plant building, as well as piping, tanks, and HSPP-containing equipment, as described below .

The overall cleanup goal for the Site is to minimize the potential for human exposure and to prevent further environmental releases of hazardous building materials and HSPP during proposed demolition and future Site reuse activities. Based on the results of prior investigations, cleanup of soil, groundwater, and soil vapor are not necessary at this time. Cleanup actions (i.e., removal and proper disposal) of hazardous building materials and HSPP remaining at the Site must be completed in accordance with EPA and MEDEP regulatory requirements, as summarized below.

3.1 Asbestos-Containing Materials

Prior to EPA's TCRA, the Steam Plant building reportedly contained over 2 miles of asbestos-wrapped steam and water pipes; 1,600 square-feet of asbestos-containing transite electrical boards and panels; 14,000 square-feet of asbestos-coated condensers, ducts, vents, tanks, point heaters, steam headers, and vessels; two massive boilers coated with 8,200 square-feet of asbestos; 400 square feet of asbestos-containing floor tile and mastic; thousands of asbestos-containing piping gaskets; miles of asbestos-coated electrical wiring; 2,000 square-feet of asbestos-containing window glazing and caulking; and the entire roof (tar and gravel) is contaminated with asbestos. The asbestos-wrapped piping, condensers, ducts, tanks, vessels, and two boilers are double-wrapped in steel-mesh jacketing. Additional suspect or hidden materials that could not be observed may also be present. Its unknown exactly how much asbestos was remediated during EPA's TCRA since remediation drawings and/or disposal documentation has not been provided at the time this ABCA was prepared.

Materials which contain ACM at concentrations greater than 1 percent have the potential to pose an exposure risk to current and future visitors and/or construction workers, in the case of disturbance or other airborne fiber release. These items will require abatement and/or appropriate management prior to and/or during demolition activities. The cleanup goal for ACM will be based on visual and air clearances.

3.2 Lead or Chromium-Containing Paint & Equipment

Prior assessment of the Steam Plant included analytical results of painted building samples for lead and chromium analysis. Based on the laboratory results, paint on some building materials and/or the building materials themselves, would classify as hazardous waste. Therefore, some painted building materials in the Steam Plant will require off-site disposal in accordance with EPA and MEDEP regulatory requirements. Additionally, the steam turbines in the building are equipped with lead diaphragms, which require proper off-site disposal in accordance with EPA and MEDEP regulatory requirements.

3.3 Polychlorinated Biphenyls (PCBs)

Prior investigations identified limited areas of expansion joint caulking on concrete flooring and black paint on metal stairs containing PCBs at concentrations greater than 50 ppm. Therefore, PCB-containing expansion joint caulking, black-painted metal stairs, and potentially-impacted concrete associated with these PCB sources will require removal under the U.S.EPA Toxic Substance Control Act (TSCA) 40 CFR 761.61. Prior investigations have also identified painted surfaces in the Steam Plant to be impacted by low level concentrations of PCBs (greater than 1 ppm but less than 50 ppm). Therefore, these materials are anticipated to be categorized and disposed off-site as Excluded PCB Products under 40 CFR Part 761.3.

3.4 Universal Wastes

Various universal wastes were identified at the Steam Plant during hazardous building materials investigations. Universal waste is required to be removed prior to building demolition in accordance with the requirements of MEDEP Chapter 850, Universal Waste Rules.

3.5 Hazardous Substances and/or Petroleum Products

According to County and GZA, HSPP were identified on-site in a variety of quantities. Over 5,000 gallons of waste oil reportedly remain in boiler day tanks, separation tanks, turbine reservoirs, and transfer pumps in the Steam Plant. Also, exterior, aboveground railroad off-loading piping and underground fuel oil conveyance piping reportedly connects the Steam Plant to the off-site bulk oil tank farm (currently owned by Merlin One). This piping may potentially contain residual No. 6 fuel oil. However, the piping may be considered “off-site” since the extends on/beneath property owned and controlled by MDOT and Merlin One. Therefore, if access is not granted from the adjacent property owners; the exterior piping, detailed below, may not be removed from the ground under the City’s Brownfields Cleanup Grant for the Steam Plant:

- Approximately 150 linear feet of aboveground and underground railroad off-loading piping potentially containing an unknown quantity of residual No. 6 fuel oil; and
- Approximately 70 linear feet of underground No. 6 fuel oil conveyance piping potentially containing an unknown quantity of residual No. 6 fuel oil.

Cleanup actions must be completed in accordance with EPA and MEDEP regulatory requirements, which includes removal and proper off-site disposal of HSPP in equipment tanks and reservoirs and anticipated cleaning/decommissioning of petroleum piping and removal and/or capping of the piping, depending on access to aboveground and underground piping, as discussed in Section 5.1.

4.0 DESCRIPTION OF EVALUATION CRITERIA

The comparison of the remediation alternatives was conducted using the evaluation and threshold criteria described below.

4.1 Overall Protection of Human Health and the Environment

Alternatives must pass this threshold criterion to be considered for implementation as the recommended alternative. The goal of this criterion is to determine whether a remediation alternative provides adequate protection of human health and the environment. It also addresses how identified risks are eliminated, reduced, or controlled. Protection of human health and the environment is assessed by evaluating how Site risks from each exposure route are eliminated, reduced, or controlled through the specific alternative.

4.2 Technical Practicality

The focus of this evaluation criterion is to determine technical practicality of instituting the specific alternative. This criterion evaluates the likelihood that the alternative will meet project specifications, Site redevelopment goals, and appropriate regulatory requirements.

4.3 Ability to Implement

This criterion analyzes technical feasibility of the remedial alternative and the availability of services and materials. Technical feasibility assesses the ability to logistically implement the remedial alternative, and to monitor the effectiveness of the alternative. Availability of services and materials evaluates the need for off-site treatment, storage or disposal services and the availability of such services. Necessary equipment, specialists, and additional resources are also evaluated.

4.4 Reduction of Toxicity, Mobility, and Volume

This criterion evaluates the effectiveness of the remediation alternative to significantly reduce the toxicity, mobility, and volume of hazardous building materials and petroleum products present at the Site. This analysis evaluates the quantity of hazardous building materials and petroleum products to be removed, the degree of expected reduction in toxicity, and the way the principal threat is addressed through the remediation alternative.

4.5 Short Term Effectiveness

This criterion addresses the period of time needed to complete the remediation, potential adverse impacts on human health and the environment that may exist until the cleanup goals are achieved, and the timeframe for accomplishing the associated reduction in the identified environmental conditions.

4.6 Resiliency to Environmental Conditions and Extreme Weather

This criterion evaluates the resilience of the remediation alternative to reasonably foreseeable environmental conditions, such as: increasing/decreasing temperatures; increasing/decreasing precipitation; extreme weather events; rising sea level; changing flood zones; and higher/lower groundwater tables, among others.

4.7 Preliminary Cost

The preliminary cost criterion for the remediation alternatives evaluates the estimated capital, operation, and maintenance costs of each alternative. Capital costs include direct capital costs, such as materials and equipment, and indirect capital costs, such as engineering, sampling contingencies, and licenses. Costs were developed as a balancing criterion for the remedial alternatives and should not be construed as bid costs or engineer's cost estimates. Cost may be used as a distinguishing factor in the selection of the remedial action. The preliminary costs developed should in no way be construed as a cost proposal, but rather a guide for selecting a remedial action.

5.0 EVALUATION OF REMEDIATION ALTERNATIVES

Based on the evaluation criteria outlined in the previous section and the potential exposure pathways for hazardous building materials and HSPP at the Site, the remedial actions selected for the Site should accomplish the following objectives:

- Minimize the potential for human exposure to hazardous building materials and HSPP at the Site;
- Reduce the toxicity, mobility, and volume of hazardous building materials and HSPP at the Site;
- Facilitate and support proposed Site reuse; and
- Conduct the remedial action in a feasible, resilient, expedient, and cost-effective way.

Three remedial alternatives were considered to address identified hazardous building materials in the Steam Plant, including: 1) a “No Action” alternative; 2) a “No Demolition/Building Repair - Targeted Cleanup with Partial Management In-Place” alternative; and 3) a “Demolition & Full Cleanup” alternative. These alternatives were evaluated using the criteria described in Section 4.0 and are summarized below. The attached Table 1 includes a Summary of the Evaluation and Comparison of the Remedial Alternatives.

5.1 Remedial Actions Conducted Regardless of Alternative

The following remedial actions are proposed to be completed at the Site, regardless of the remedial alternative selected for the Site:

- In conjunction with proposed cleanup activities, the entire Caribou Power Plant site, including the Steam Plant, will be enrolled in the MEDEP’s Voluntary Response Action Program (VRAP) for review of environmental conditions and proposed remedial actions. Cleanup completion reports will be submitted to the MEDEP for the Steam Plant site by SME and a cleanup completion report will be submitted for the Diesel Plant by County, the QEP for the Brownfields-funded cleanup for that building. The cleanup completion reports will include a description of the remedial actions and field methods implemented for the projects. Upon submittal and approval of the completion documentation, the MEDEP VRAP will issue a decision letter, afford liability protection provided by 38 M.R.S. §343-E.1, and will take no action against the City of Caribou for cleanup activities completed at the Steam Plant, identified in 38 M.R.S. §343-E.6.
- Removal of waste or residual HSPP will be completed at the Steam Plant site. This task includes properly draining/cleaning and disposal of waste or residual HSPP from equipment piping, tanks, reservoirs, and transfer pumps in the Steam Plant prior to its demolition. Additionally, aboveground and underground piping that may contain residual No. 6 fuel oil will be properly cleaned/decommissioned and potentially removed from the ground, which is dependent on access from the adjacent property owners (MDOT) and Merlin One since aboveground and/or underground fuel oil conveyance piping extends beneath their properties.

5.2 No Action Alternative

A No Action Alternative signifies that no Site remediation activities would be conducted, including the remedial activities identified in Section 5.1, above.

The No Action Alternative is not protective of human health and does not include a means for mitigating exposure to hazardous building materials or HSPP on-site; therefore, the potential for human exposure continues to exist for current trespassers and Site workers, and for future Site occupants, workers, and/or trespassers.

The No Action Alternative is not protective of the environment and does not achieve reduction of the toxicity, mobility, or volume of hazardous building materials or HSPP present at the Site. Hazardous building materials and HSPP would still have the potential to migrate off-site through stormwater runoff or dust.

Additionally, the No Action Alternative would not allow for future Site redevelopment, and is not in compliance with current regulatory requirements. The No Action Alternative was not selected for implementation or further consideration.

5.3 No Demolition/Building Repair & Targeted Cleanup with Partial Management In-Place Alternative

The second remediation alternative evaluated in this ABCA is the “No Demolition/Building Repair & Targeted Cleanup with Partial Management In-Place” alternative. As part of this alternative, abatement and removal would only occur for hazardous building materials that would be disturbed to renovate the Steam Plant and the remaining hazardous building materials would be maintained under an Operation & Maintenance (O&M) program. The O&M program would require periodic surveillance of materials and outline best work practices that must be followed during future renovation/disturbance..

The “No Demolition/Building Repair & Targeted Cleanup with Partial Management In-Place” alternative partially fulfills the evaluation criteria, as discussed below.

5.3.1 Overall Protection of Human Health and the Environment

This alternative provides adequate short-term protection of human health by reducing the potential risk of exposure to future Site visitors and/or occupants through the management of hazardous building materials under an O&M program. If materials were disturbed during future demolition or redevelopment activities, they would be abated/removed by licensed contractors.

5.3.2 Technical Practicality

O&M programs similar to the one proposed are relatively common and can be readily prepared and implemented; however, the ongoing maintenance and repair of hazardous building materials can be

challenging, especially in the current dilapidated state of the Steam Plant. Additionally, this alternative also does not allow for the demolition of the dilapidated/unsafe building, and the Site's reuse as a riverfront park.

5.3.3 Ability to Implement

This alternative is technically feasible and is an effective action for reducing the risk of human exposure. Services and materials necessary to conduct this alternative are readily available. However, long-term maintenance of hazardous building materials would be extremely challenging. As the conditions of the Steam Plant continue to worsen the more difficult it would be to implement the O&M program.

5.3.4 Reduction of Toxicity, Mobility, and Volume

The implementation of an O&M program would not reduce the toxicity, mobility or volume of hazardous building materials on-site. Abatement of hazardous building materials would reduce the toxicity, mobility and volume of these materials by removing them from Site, if/when they are encountered during demolition and/or redevelopment activities in the future. Additionally, the condition of the Steam Plant will continue to worsen and more hazardous building materials may become exposed with time.

5.3.5 Short-Term Effectiveness

The remedial action objectives associated with reducing human exposure and reducing the toxicity, mobility and volume of hazardous building materials would be attained upon completion and implementation of an approved O&M program. However, the remedial objective associated with supporting Site reuse (building demolition and riverfront park redevelopment) would not be attained. Long-term maintenance of hazardous building materials would occur for the remaining life of the Steam Plant.

5.3.6 Resiliency to Extreme Weather Conditions

Due to the Site's proximity to the Aroostook River, effects from extreme weather and changing flood zones may represent a threat to the Site. Since hazardous building materials would remain on-site, this remedial alternative does not eliminate the potential for these materials to come into contact with rising water and mobilizing off-site; as such, this remedial approach is not resilient to extreme weather conditions.

5.3.7 Preliminary Cost

The estimated costs associated with this remedial alternative are outlined in the attached Table 2 – Summary of Estimated Remediation Costs for “No Demolition/Building Repair & Targeted Cleanup with Partial Management In-Place” alternative. Capital costs include direct capital costs, such as materials and equipment, and indirect capital costs, such as engineering and sampling contingencies. The preliminary

cost provided were developed to compare alternatives and should not be considered engineering cost estimates.

5.4 Demolition & Full Cleanup Alternative

The third remediation alternative evaluated in this ABCA is the “Demolition & Full Cleanup” alternative. This alternative involves the removal, transport, and off-site disposal of hazardous building materials in conjunction with demolition of the Steam Plant.

The “Demolition & Full Cleanup” alternative fulfills the evaluation criteria, as discussed below.

5.4.1 Overall Protection of Human Health and the Environment

This alternative provides protection of human health by removing the risk of human exposure to hazardous building materials. As part of this alternative, hazardous building materials would be properly removed by licensed contractors prior to and/or after demolition of the Steam Plant. The goal of reducing or eliminating the risk of human exposure to hazardous building materials on-site would be achieved through this alternative.

5.4.2 Technical Practicality

Abatement and demolition activities are common construction practices. Contractors with this type of experience are readily available in Maine. This alternative supports the redevelopment of the Site and allows for the overall goal for the cleanup of the Steam Plant site. Therefore, this alternative is technically practical.

5.4.3 Ability to Implement

This cleanup alternative is technically feasible and is a common approach for reducing/eliminating human health exposure risks associated with hazardous building materials. Services and materials for this work are readily available in Maine.

5.4.4 Reduction of Toxicity, Mobility, and Volume

The removal of hazardous building materials prior to, and concurrent with building demolition would reduce the toxicity, mobility and volume of these materials by removing them from the Site.

5.4.5 Short-Term Effectiveness

The risk of exposure to hazardous building materials would be eliminated upon abatement and removal activities. The work described under this alternative could be performed on a relatively short timeframe, likely within a few months after mobilizing contractors. No long-term maintenance or monitoring would be required as part of this alternative.

5.4.6 Resiliency to Extreme Weather Conditions

Due to the Site's proximity to the Aroostook River, effects from extreme weather and changing flood zones may represent a threat to the Site. Since hazardous building materials will be removed from the Site, this remedial alternative eliminates the potential for these materials to come into contact with rising water and mobilizing off-site; as such, this remedial approach is resilient to extreme weather conditions.

5.4.7 Preliminary Cost

The estimated costs associated with this remedial alternative are outlined in the attached Table 3 – Summary of Estimated Remediation Costs for “Demolition & Full Cleanup” alternative. Capital costs include direct capital costs, such as materials and equipment, and indirect capital costs, such as engineering and sampling contingencies. The preliminary cost provided were developed to compare alternatives and should not be considered engineering cost estimates.

5.5 Selection of Proposed Remediation Alternative

Based on the results of the initial screening of each alternative as shown on Table 1 and discussed above, Alternative 3: “Demolition & Full Cleanup” alternative has been selected as the preferred remediation alternative. See Section 6.0 for a conceptual Remedial Action Plan that has additional information on the implementation of the Demolition & Full Cleanup alternative at the Site.

6.0 CONCEPTUAL REMEDIAL ACTION PLAN

The “Demolition & Full Cleanup” alternative was evaluated against the remedial objectives outlined in Section 5.0 and was determined to best fit the ranking alternatives outlined in Section 4.0 to promote redevelopment of the Site. Because this alternative meets the evaluation criteria and is not cost-prohibitive, this alternative has been selected for implementation at the Site for abatement of on-site hazardous building materials. Remedial tasks proposed for completion at the Site are discussed below.

6.1 Asbestos Abatement/Removal

As part of the proposed cleanup, hazardous building materials remaining in the Steam Plant would be removed and properly disposed off-site concurrent with demolition of the building.

Airborne asbestos fibers represent a potential human health hazard. Current regulations require that ACM (i.e., materials which contain asbestos at values equal to or greater than one percent) be removed if they are disturbed by renovation, demolition, or other building maintenance activities. Since the Steam Plant is proposed to be demolished, ACM identified within interior and exterior portions will require removal and off-site disposal prior to and/or concurrent with building demolition activities. All work operations which would impact this ACM need to be performed in compliance with the asbestos regulations, as set forth in OSHA 29 CFR Part 1926.1101; U.S.EPA Title 40 - CFR, Part 61 NESHAP, Subparts A and M (General Provisions and Asbestos Standards, respectively); and MEDEP Regulations, Chapter 425, effective 4-3-2011. Additionally, materials which contain less than 1 percent asbestos must be managed in accordance with OSHA regulatory requirements that apply to worker safety during demolition activities. The materials at the Site which contain greater than (>) 1 percent asbestos include the materials associated with the Steam Plant as outlined in section 3.1.

Asbestos-containing friable material will require proper removal by a licensed asbestos abatement contractor utilizing accredited asbestos workers prior to any building renovation/demolition actions that would cause disturbance. A MEDEP Asbestos Abatement Design Plan, Asbestos Abatement Project Notification permitting and fees to the MEDEP, and Independent Visual Inspections and Air Clearance Sampling for release of established work areas will be required. The methods for handling and abatement of asbestos-containing non-friable Category I material would be dependent on the demolition methods; however, regardless of demolition procedures, this asbestos is subject to OSHA regulations for direct impact/handling by personnel, and abatement wastes will have to be disposed at a facility licensed to accept asbestos. These demolition waste materials are not allowed to go to any facility that would sand, grind, cut, or abrade the non-Regulated Asbestos-Containing Material (RACM) waste or otherwise turn it into RACM waste (such as cement recycling facilities).

Materials identified at the site containing less than one percent asbestos content can remain in the structures during large equipment demolition, are not classified as RACM, and are not subject to any

special waste disposal requirements. However, certain components of the OSHA Construction Asbestos Standard, 29 CFR 1926.1101, would still apply, and must be followed by any demolition or construction contractor which works at the Site.

6.2 Management of Lead- and Chromium-Containing Paint & Excluded PCB Products

Demolition activities will occur concurrently with asbestos abatement activities, as required. During demolition, erosion control measures will be implemented and maintained in accordance with the Maine Erosion and Sediment Control Best Management Practices (BMPs). Dust control measures will be implemented in accordance with best management and construction practices. Demolition byproducts would be recycled and managed in accordance with State of Maine Solid Waste Disposal Regulations, including off-site disposal of lead- and chromium-impacted paint and Excluded PCB Products identified in the Steam Plant.

6.3 Management of PCB Bulk Product Waste & Potential PCB Remediation Waste

Building materials impacted with PCBs at concentrations greater than 50 mg/kg and any impacted substrates/equipment (PCB Remediation Waste) in the Steam Plant, are required to be removed from the Site under the U.S.EPA Toxic Substance Control Act (TSCA) 40 CFR 761.61.

6.4 Universal Waste Disposal

Universal wastes will be properly characterized, handled, transported, and disposed off-site in accordance with MEDEP regulations. Trained individuals will package the waste in appropriate containers with proper labeling. Shipment of waste will be conducted in accordance with established Maine Department of Transportation protocol, and documentation of proper disposal shall be provided to the Qualified Environmental Professional (QEP).

6.5 HSPP Removal

Tanks, piping, reservoirs, transfer pumps, and equipment containing waste or residual HSPP will be properly drained/cleaned and disposed off-site prior to demolition of the Steam Plant. Additionally, exterior, aboveground and underground piping that may contain residual No. 6 fuel oil will be properly decommissioned concurrent with and/or after demolition of the Steam Plant in accordance with EPA and/or MEDEP regulations if access is provided by the adjacent property owners (MDOT) and Merlin One since aboveground and/or underground fuel oil conveyance piping extends beneath their properties.

6.6 Project Oversight

The remedial actions proposed in this plan will be coordinated with and conducted under the oversight of a QEP (the City of Caribou has contracted with SME for this work). SME will develop a final cleanup design and develop a bid package which will include our remediation design, details, bid specifications, Davis-Bacon requirements, energy efficient measures, and detailed information on specified materials and products. A cleanup contractor will be selected through a competitive bid process.

Once a Contractor has been selected, SME will oversee the cleanup activities and conduct Site observations to monitor the cleanup contractor and document that work is conducted in accordance with the design plans and applicable regulations and requirements. At the completion of the cleanup activities, SME will prepare a summary report detailing the remedial activities that occurred at the Site.

6.7 Green and Sustainable Remediation

Green and sustainable remediation (GSR) guidance focuses on minimizing the environmental footprint of site cleanups while maximizing social and economic benefits, such as reduced energy/water use, lower emissions, and improved land reuse. Key strategies include utilizing renewable energy, implementing Best Management Practices (BMPs) for equipment and reducing waste to ensure long-term resilience. For this project, we will incorporate GSR guidance into the engineering and cleanup process, as feasible.

7.0 SIGNATURE(S) OF ENVIRONMENTAL PROFESSIONAL(S)

The following SME personnel possess the sufficient training and experience necessary to conduct an Analysis of Brownfields Cleanup Alternatives, and from the information generated by such activities, have the ability to develop opinions and conclusions regarding remediation alternatives and a Conceptual Remedial Action Plan, as presented herein, for the Site.



Aaron R. Martin, L.G.
Senior Geologist

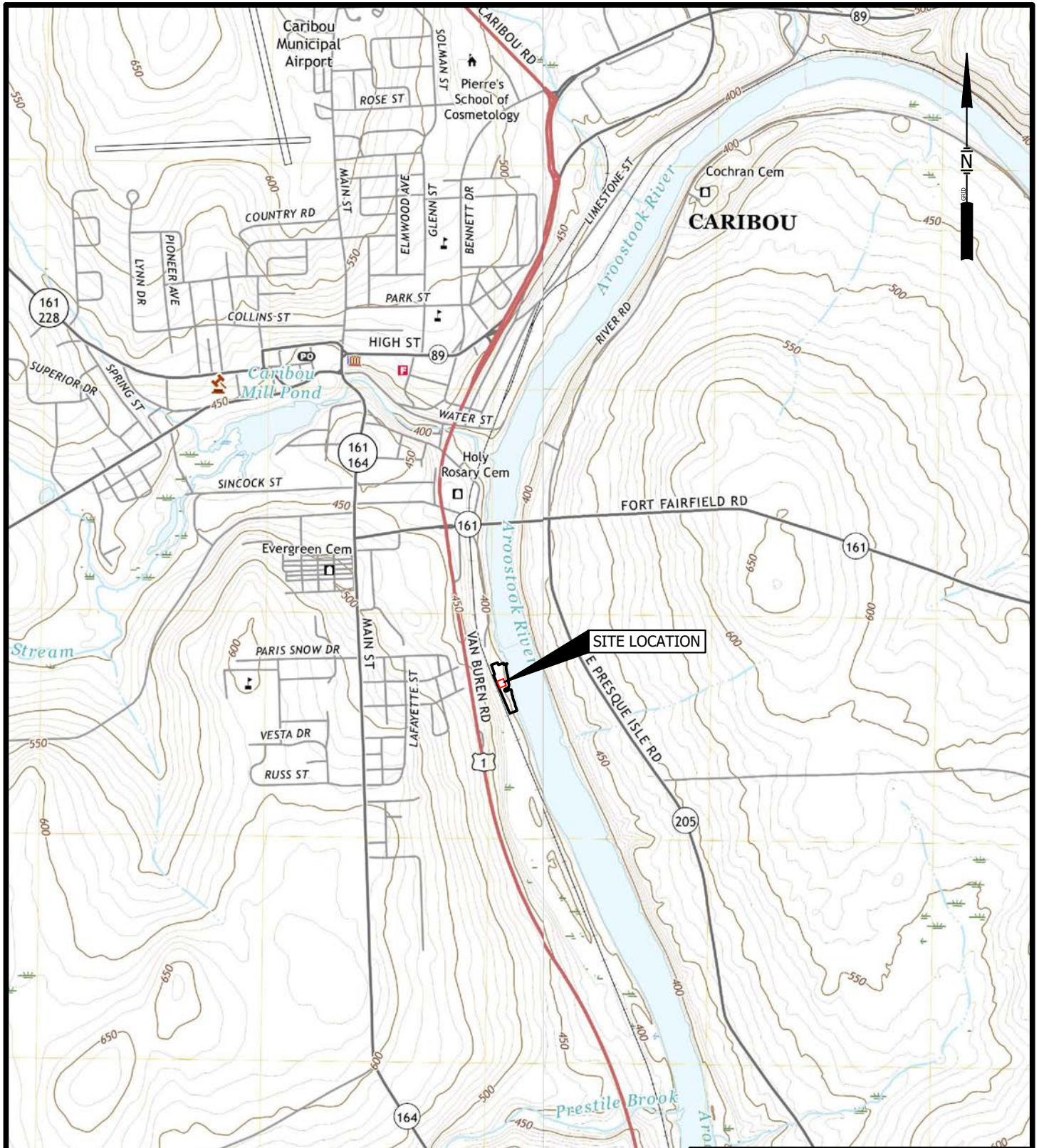


Jaime L. Madore, P.E.
Senior Engineer



Nicholas O. Sabatine, P.G.
Brownfields Program Manager

FIGURES

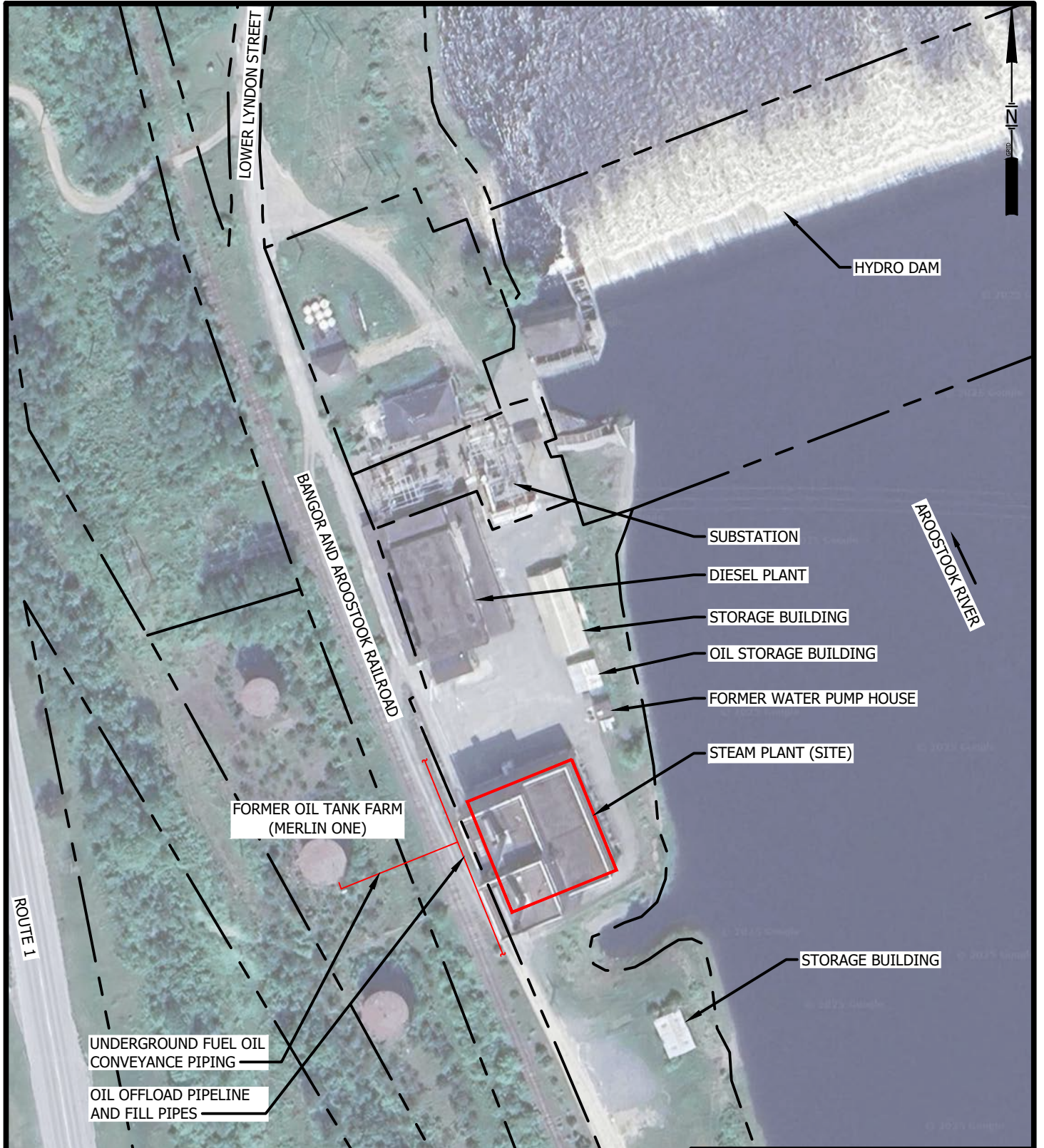


BASEMAP ADAPTED FROM 7.5 MIN USGS TOPO QUADS
 CARIBOU, MAINE - 2021
 GOODWIN, MAINE - 2021



FIGURE 1
 SITE LOCATION MAP
 CARIBOU STEAM POWER PLANT
 142 LOWER LYNDON STREET
 CARIBOU, MAINE





NOTES:

1. AERIAL IMAGE FROM GOOGLE EARTH DATED 6/4/2025.
2. PARCEL BOUNDARIES FROM MAINE GIS DATA CATALOG.



FIGURE 2
SITE PLAN
CARIBOU STEAM POWER PLANT
142 LOWER LYNDON STREET
CARIBOU, MAINE



TABLES

**TABLE 1 – SUMMARY OF THE EVALUATION AND COMPARISON OF REMEDIAL ALTERNATIVES
CARIBOU POWER STEAM PLANT
142 LOWER LYNDON STREET
CARIBOU, MAINE**

Remedial Action Alternative (RAA)	Overall Protection of Human Health and the Environment	Technical Practicality	Ability to Implement	Reduction of Toxicity, Mobility and Volume	Short Term Effectiveness	Resiliency to Extreme Weather Conditions	Estimated Cost	Notes
1) No Action	<ul style="list-style-type: none"> Not protective of human health and the environment 	<ul style="list-style-type: none"> Does not meet the threshold criteria, nor does it allow for Site redevelopment. It is not in compliance with current regulatory requirements. 	<ul style="list-style-type: none"> Not Applicable 	<ul style="list-style-type: none"> No reduction of toxicity, mobility or volume 	<ul style="list-style-type: none"> Not Applicable 	<ul style="list-style-type: none"> Not Applicable 	<ul style="list-style-type: none"> Not Applicable 	<ul style="list-style-type: none"> Does not include remedial actions to occur regardless of chosen alternative as described in Section 5.1.
2) No Demolition/Building Repair - Targeted Cleanup & Management In-Place Alternative	<ul style="list-style-type: none"> This alternative provides partial protection of human health by reducing the potential risk of exposure to site workers and trespassers through the management of hazardous building materials and hazardous substances or petroleum products (HSPP) under an Operations and Maintenance (O&M) program. If materials were disturbed during future demolition activities, they would be abated by licensed contractors. This alternative provides partial protection of the environment by ensuring hazardous building materials and tanks/piping/equipment containing HSPP are maintained in good conditions through the implementation of an O&M Program. 	<ul style="list-style-type: none"> Does not allow for Site redevelopment, but actually prevents redevelopment. 	<ul style="list-style-type: none"> The implementation of an O&M program is technically feasible and is an effective action for reducing the risk of human exposure. Long-term maintenance of hazardous building materials and tanks/piping/equipment containing HSPP would be extremely challenging with the current dilapidated condition of the Steam Plant. O&M programs similar to the one proposed are relatively common and can be readily prepared and implemented; however, the ongoing maintenance and repair of hazardous building materials and tanks/piping/equipment containing HSPP can be challenging, especially with the current dilapidated condition of the Steam Plant. 	<ul style="list-style-type: none"> The implementation of an O&M Plan would not reduce the toxicity, mobility or volume of hazardous building materials or HSPP onsite. The abatement of hazardous building materials and removal of HSPP during future building projects would reduce the toxicity, mobility and volume of these materials by removing them from Site, if/when they are encountered during future renovation and/or demolition activities. 	<ul style="list-style-type: none"> The remedial action objectives offer no short term effectiveness. The remedial action would be attained upon completion and implementation of an approved O&M program and through long-term maintenance of building materials and tanks/piping/equipment containing HSPP. 	<ul style="list-style-type: none"> Due to the Site's proximity to the Aroostook River, climate change effects from changing flood levels are anticipated to represent a threat. If extreme weather or flooding were to occur remaining hazardous building materials and HSPP could potentially mobilize and impact surrounding environment. 	<ul style="list-style-type: none"> The estimated cost associated with this alternative is approximately \$7,800,000, which includes maintenance of hazardous building materials and HSPP under an O&M Program for 20 years. Capital costs include direct capital costs, such as materials and equipment and maintenance; indirect capital costs include engineering and sampling. These cost estimates are for budgetary purposes only and in no way should be construed as a cost proposal. 	<ul style="list-style-type: none"> Includes remedial actions to occur regardless of chosen alternative as described in Section 5.1.
3) Demolition & Full Cleanup Alternative	<ul style="list-style-type: none"> Provides protection of human health by mitigating or eliminating the risk of human exposure to the hazardous building materials and HSPP identified at the Site. These materials would be properly removed and abated by licensed contractors prior to, concurrent, or after demolition. Provides protection of environmental health by mitigating or eliminating the risk of environmental exposure to hazardous building materials and HSPP by removing them from the Site. 	<ul style="list-style-type: none"> This alternative supports the redevelopment of the Site. 	<ul style="list-style-type: none"> This cleanup alternative is technically feasible and is a common approach for reducing/eliminating human health exposure risks associated with hazardous building materials and HSPP. Services and materials for this work are readily available in Maine. Abatement and demolition activities are regularly utilized in buildings known to be impacted by asbestos. Contractors with this type of experience are readily available in Maine. 	<ul style="list-style-type: none"> The toxicity, mobility, and volume of hazardous building materials and HSPP would be eliminated by removing the materials from the Site and transporting them to a licensed facility for proper disposal. 	<ul style="list-style-type: none"> The risk of exposure to hazardous building materials and HSPP would be eliminated upon abatement and removal activities. The work described under this alternative could be performed on a relatively short timeframe, likely within a few months after mobilizing contractors. 	<ul style="list-style-type: none"> Due to the Site's proximity to the Aroostook River, extreme weather and effects from floods are anticipated to represent a major threat. By removing hazardous building materials and HSPP it eliminates the potential for these materials to come into contact with rising water and water mobilizing offsite. 	<ul style="list-style-type: none"> The estimated cost associated with this alternative is approximately \$5,500,000. Capital costs include direct capital costs, such as materials and equipment, and indirect capital costs such as engineering and sampling. These cost estimates are for budgetary purposes only and in no way should be construed as a cost proposal. 	<ul style="list-style-type: none"> Includes remedial actions to occur regardless of chosen alternative as described in Section 5.1.

Table 2: Summary of Estimated Remediation Costs
No Demolition/Building Repair- Targeted Cleanup and Partial Management In-Place Alternative
Steam Plant- Former Caribou Power Plant
142 Lower Lyndon Street
Caribou, Maine

No Demolition/Building Repair - Targeted Cleanup & Partial Management In-Place Alternative	Number	Units	Unit Cost¹	Total
Abatement of Hazardous Building Materials				
Site Security & Erosion/Sedimentation Controls	1	LS	\$20,000	\$20,000
Partial Hazardous Building Materials Abatement	1	LS	\$3,000,000	\$3,000,000
Asbestos Roof Removal/Roof Replacement	1	LS	\$1,475,040	\$1,475,040
Lead & Chromium Paint Stabilization	1	LS	\$500,000	\$500,000
Universal Waste Removal	1	LS	\$50,000	\$50,000
Excluded PCB Product Removal	1	LS	\$25,000	\$25,000
PCB Bulk Product Removal	1	LS	\$75,000	\$75,000
Waste Oil/Residual Petroleum Products- Piping/Tanks/Equipment Removal	1	LS	\$600,000	\$600,000
Operations and Management Plan & Long-Term Oversight	20	Years	\$15,000	\$300,000
Remediation Engineering Design/Oversight/Closure Report				
MEDEP VRAP Application	1	LS	\$5,000	\$5,000
Cooperative Agreement	1	LS	\$20,000	\$20,000
Community Relations Plan & Public Meetings	1	LS	\$8,000	\$8,000
Design, Bidding Documents & Cleanup Planning	1	LS	\$50,000	\$50,000
Cleanup Oversight ²	1000	Hrs	\$150	\$150,000
Closure Reporting & Grant Closesout	1	LS	\$30,000	\$30,000
Subtotal				\$6,308,040
Contingency 25% ³				\$1,511,260
TOTAL				\$7,819,300

Assumptions and Footnotes:

MEDEP= Maine Department of Environmental Protection; VRAP= Voluntary Response Action Program

LS= Lump Sum; PCB= polychlorinated biphenyls; Hrs= Hours

1 - Engineering costs based on recent projects in Maine and estimates included in GZA's "Decommissioning Opinion of Probable Costs," dated April 23, 2025.

2 - Assumes average billing rate of \$150.

3 - Contingency does not include costs associated with Remediation Engineering Design/Oversight/Closure Report.

Table 3: Summary of Estimated Remediation Costs
Building Demolition- Full Cleanup Alternative
Steam Plant- Former Caribou Power Plant
142 Lower Lyndon Street
Caribou, Maine

Building Demolition - Full Cleanup Alternative	Number	Units	Unit Cost¹	Total
Abatement of Hazardous Building Materials				
Site Security & Erosion/Sedimentation Controls	1	LS	\$20,000	\$20,000
Integral Abatement of Hazardous Building Materials and Demolition	1	LS	\$3,265,040	\$3,265,040
Lead & Chromium Paint Removal	1	LS	\$100,000	\$100,000
Universal Waste Removal	1	LS	\$50,000	\$50,000
Excluded PCB Product Removal	1	LS	\$25,000	\$25,000
PCB Bulk Product Removal	1	LS	\$75,000	\$75,000
Waste Oil/Residual Petroleum Products- Piping/Tanks/Equipment Removal	1	LS	\$600,000	\$600,000
Site Stabilization	1	LS	\$10,000	\$10,000
Remediation Engineering Design/Oversight/Closure Report				
VRAP Application	1	LS	\$5,000	\$5,000
Cooperative Agreement	1	LS	\$20,000	\$20,000
Community Relations Plan & Public Meetings	1	LS	\$8,000	\$8,000
Design, Bidding Documents & Cleanup Planning	1	LS	\$50,000	\$50,000
Cleanup Oversight ²	1500	Hrs	\$150	\$225,000
Closure Reporting & Grant Closesout	1	LS	\$30,000	\$30,000
Subtotal				\$4,483,040
Contingency 25% ³				\$1,036,260
TOTAL				\$5,519,300

Assumptions and Footnotes:

MEDEP= Maine Department of Environmental Protection; VRAP= Voluntary Response Action Program

LS= Lump Sum; PCB= polychlorinated biphenyls; Hrs= Hours

1 - Engineering costs based on recent projects in Maine and estimates included in GZA's "Decommissioning Opinion of Probable Costs," dated April 23, 2025.

2 - Assumes average billing rate of \$150.

3 - Contingency does not include costs associated with Remediation Engineering Design/Oversight/Closure Report.