Analysis of Brownfield Cleanup Alternatives

Sacred Heart Catholic Church

5015 U.S. Highway 2

Harlem, Montana 59526

Prepared For:
Fort Belknap Indian Community
Environmental Protection Department
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Harlem, MT 59526

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GRANITE PEAK
ENVIRONMENTAL

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1.0 Introduction

Granite Peak Environmental, LLC (Granite Peak) prepared this Analysis of Brownfields Cleanup Alternatives (ABCA) in anticipation of cleanup at the Sacred Heart Catholic Church (Site) in Harlem, Montana (**Figure 1**). The Fort Belknap Indian Community (FBIC) was awarded a U.S. Environmental Protection Agency (EPA) Brownfields Cleanup Grant to remediate brownfields sites on the Fort Belknap Reservation. A Phase II Environmental Site Assessment (ESA) completed in 2020 revealed asbestos-containing building materials (ACBM) and lead-based paint (LBP) in the on-site structure, but abatement has not been completed to-date. This ABCA was prepared to facilitate the cleanup of hazardous building materials at the Site to allow for redevelopment by the FBIC.

2.0 Site Background

The Site is located at 5015 U.S. Highway 2 in Harlem, Montana on the Fort Belknap Indian Reservation. The on-site two-story building was constructed in 1931 to serve as a Native American Mission Church which operated until the mid-1960s. The building is currently vacant and is owned by FBIC.

A Phase II ESA was completed by Weston Solutions (Weston) in 2020. This investigation revealed ACBM on the boiler jacket located in the basement as well as LBP on exterior building components such as the front door, front door jamb, and windows. Weston did not collect soil samples beneath exterior LBP features due to the presence of snow and frozen ground. However, Granite Peak assumes that soil below the identified exterior LBP contains lead which will require abatement. Weston also noted pigeon guano present in the building on non-ACBM.

To-date, no abatement efforts have been completed at the Site. When left intact and undisturbed, ACBM does not pose a significant health risk to people working or living in buildings or homes. However, if ACBM deteriorates or is disturbed by renovation or demolition activities, asbestos fibers may be released into the air and cause significant health concerns for building occupants by inhalation of asbestos fibers. Inhaled fibers can become entrapped in the lungs and cause diseases such as asbestosis, lung cancer, and mesothelioma. Potential human exposure pathways for LBP and lead in soil include inhalation of lead in dust or ingestion of lead in dust, soil, or groundwater. Furthermore, exposure to bat or bird guano has been linked to human diseases such as cryptococcosis and histoplasmosis. According to the CDC, bird roosts accumulating for three or more years should be suspected to contain fungus. Therefore, the guano at the church is considered a biological hazard and must be disposed of at a Class II Landfill.

FBIC would like to restore and preserve the Site as a historically significant site. The Tribe's current plans are to restore the building and enclose the building entryway in plexiglass to offer views into the church while restricting access to the rest of the buildings. The wastes described above will require abatement to allow full restoration of the building.

3.0 Cleanup Standards

The cleanup requirements for asbestos on a structure located within a federally recognized reservation are found in 40 Code of Federal Regulations (CFR) 61.140-157, also known as the EPA National Emission Standards for Hazardous Air Pollutants (NESHAP). In general, a building material containing >1% asbestos on a commercial building must be abated, if the material is in

a friable state or if it is to be disturbed making it friable. Lead-based paint must be remediated in accordance with the Resource Conservation and Recovery Act (RCRA). In general, substrates having lead concentrations of 0.5% by weight or 5,000 milligrams per kilogram (not risk based) identifies LBP. Waste materials generated during lead abatement containing leachable lead above the RCRA TCLP limit of 5.0 mg/L may also be a hazardous waste, requiring special waste handling. However, if a building is demolished, the Montana Department of Environmental Quality (DEQ) Solid Waste Division and EPA has determined an entire building can be disposed of in a Class II landfill even while containing LBP components. EPA has determined that components coated with LBP for a whole building demolition are less likely to be hazardous due to the ration of LBP to the total mass of the waste stream (**Appendix A**).

3.1 Applicable Laws

This section summarizes the laws and regulations that are applicable to the proposed cleanup.

3.1.1 Asbestos

Applicable codes, regulations, and laws that govern asbestos remediation/cleanup work and transport/disposal of lead-contaminated wastes include the following:

- CFR Publications:
  - OSHA 29 CFR 1926.1101 Construction Industry Standard (1994)
  - OSHA 29 CFR 1926.500 Guardrails, Handrails, and Covers
  - OSHA 29 CFR 1910.134 Respiratory Protection
  - OSHA 29 CFR 1910.145 Specifications for Accident Prevention Signs and Tags
  - EPA 40 CFR 61 Subpart A, General Provisions
  - EPA 40 CFR 61 Subpart M, National Emission Standard for Hazardous Air Pollutants
  - EPA 40 CFR 763.120, 121 Asbestos Abatement Projects
  - EPA 40 CFR 763 Subpart E, Asbestos Hazard Emergency Response Act Asbestos-Containing Materials in Schools
- ANSI Publications:
  - Z9.2-1979 Fundamentals Governing the Design and Operations of Local Exhaust Systems
  - Z88.2-1980 Practices for Respiratory Protection NIOSH Revised Recommended Asbestos Standard
- EPA:
  - 560/5-85-024 Guidance for Controlling Friable Asbestos-Containing Materials in Buildings
- State Requirements:
  - Chapter 74 Administrative Rules of Montana
  - Applicable sections of the Asbestos Work Practices and Procedures Manual, (2005)

3.1.2 Lead

Applicable codes, regulations, and laws that govern lead remediation/cleanup work and transport/disposal of lead-contaminated wastes include the following:

- CFR Publications
  - Occupational Safety and Health Administration (OSHA 29 CFR 1926.62 Construction Industry Standard (1994)

  - OSHA 29 CFR 1926.500 Guardrails, Handrails, and Covers
  - OSHA 29 CFR 1910.134 Respiratory Protection
  - OSHA 29 CFR 1910.145 Specifications for Accident Prevention Signs and Tags
  - OSHA 29 CFR 1917.152 Hot Work
- American National Standard Institute (ANSI) Publications:
  - Z88.2-1980 Practices for Respiratory Protection National Institute for Occupational Safety and Health (NIOSH)
- Montana Department of Environmental Quality – Solid Waste Program
  - Lead-Based Paint Disposal Guidance (**Appendix A**)

4.0 Cleanup Alternatives

Granite Peak has determined there are three (3) cleanup alternatives for the Site, as follows:

Alternative 1 – No Action. Under this alternative no actions would be taken to abate the hazards at the site.

Alternative 2 – Abatement of ACBM, removal of pigeon guano, and repair and encapsulation of LBP on the door systems and window frames. Under this alternative, hazardous substances associated with the property will be addressed as follows:

- *Asbestos Containing Building Materials* – The ACBM identified in the boiler jacket in the basement would be abated.
- *Lead-based Paint* – LBP on the door and window systems would be repaired and painted with a lead-encapsulating paint.
- *Lead in Soil* – Soil containing elevated concentrations of lead around the perimeter of the church would be removed and disposed of at the local Class II Landfill. Prior to excavation of these soils, an 8-point composite surface soil sample (2 samples from each side of the building) from a depth of 0-6 inches around the building will be collected and analyzed for total lead by the Toxicity Characteristic Leaching Procedure (TCLP) Method (EPA Method 1311). When collecting the composite sample, a second subsample will be collected from each of the 8 locations and archived pending the TCLP result. The purpose of the sampling would be to demonstrate that the soil, if exhumed, would not be characterized as a hazardous waste. The TCLP result would be compared to the hazardous waste TCLP lead threshold of 5.0 mg/L. If the result is below this threshold, the soil can be disposed of at the local landfill as a non-hazardous waste. If the result exceeds this threshold, Granite Peak will work with the owner and the laboratory to determine if treatment of the soils using cement or other binding agents will allow for these soils to be disposed of at the local landfill. Disposal of the soils as a hazardous waste would be prohibitively expensive. Additional actions, should the initial TCLP limit be exceeded, would include analyzing the archived soil samples to narrow down the area that contains the highest concentrations of lead.
- *Animal Infestation* – Pigeon guano would be removed and disposed of at the Class II Landfill using wet methods to control dust generation. All guano would need to be wrapped with 6-mil plastic before transport to the landfill. If non-ACBM wood flooring has been contaminated with guano, floors may need to be cut out and containerized for disposal.

Alternative 3 – Management of asbestos in-place, encapsulation of LBP on door systems and window frames, and removal of pigeon guano. Under this alternative, hazardous substances associated with the property will be addressed as follows:

- *Asbestos Containing Building Materials* – The ACBM identified in the boiler jacket in the basement would be managed in place. If the Fort Belknap Tribe determines that the building would not be reoccupied and the basement and heating system would not be used, the boiler jacket does not present an immediate risk.
- *Lead-based Paint* – LBP on the door and window systems would be repaired and painted with a lead-encapsulating paint.
- *Lead in Soil* – This contaminant would be addressed in the same manner described in Alternative 2.
- *Animal Infestation* – This contaminant would be addressed in the same manner described in Alternative 2.

5.0 Evaluation of Alternatives

Each of the alternatives identified for the facility are evaluated in this section using three criteria: long-term human health risk reduction, implementability, and costs relative to human health risk reduction. **Table 1**, below, summarizes the evaluation and cost estimates for the action alternatives, which are also included in **Appendix B**.

Alternative 1 – While there would be no cost associated with this Alternative, the owner would not be able to move forward with redevelopment plans for the Site. Although this alternative is cost-effective and implementable, the risk of exposure to hazardous materials in the building would remain.

Alternative 2 – This Alternative is labor intensive and poses limited safety risks to workers abating materials in the buildings. It is effective as it would remove environmental concerns and eliminate human health risks associated with asbestos, lead, and animal wastes.

Alternative 3 – The primary benefit of Alternative 3 compared to Alternative 2 is cost. If FBIC chooses to redevelop the structure or use it in any way other than leaving it vacant, Alternative 3 would not be acceptable as asbestos and LBP hazards would remain on site.

Table 1 – Summary of Alternative Comparison

Alternative	Criteria		
	Risk Reduction	Implementability	Cost
Alternative 1 – No Action	None	Implementable	$0
Alternative 2 – Abatement of ACBM, removal of pigeon guano, and repair and encapsulation of LBP on the door systems and window frames	Removes future human health risks, slight risks during cleanup	Moderately Implementable	$72,914
Alternative 3 – Management of asbestos in-place, encapsulation of LBP on door systems and window frames, and removal of pigeon guano.	Future human health risks from asbestos and LBP remain on site, slight risks during cleanup	Moderately Implementable	$68,047

6.0 Preferred Alternative

The preferred action is Alternative 2. This Alternative presents the most effective option of risk reduction to all workers and future site users. The cost is higher than Alternative 3, but following the completion of this alternative, all ACBM would be removed from the building, thus giving FBIC the ability to renovate the structure without concern for ACBMs.

FBIC would seek cost estimates from abatement contractors capable of completing Alternative 2. A copy of the final clearance abatement report describing all abatement completed on the project would be transmitted to FBIC and EPA.

7.0 Climate Change and Severe Weather Events

The EPA requires a discussion of whether climate change could be impacted by the preferred alternative. According to the Montana Climate Assessment, climate changes predicted for Montana include:

- Increased mean annual air temperatures with winter and springs temperatures increasing the most
- Increased precipitation in winter, spring, and fall, with decreasing precipitation in summer
- Decreased snowpack with peak runoff occurring earlier
- Increased frequency of flooding
- Increased time of drought
- Increased frequency and longer season for wildfires
- Decreased carbon capturing forests

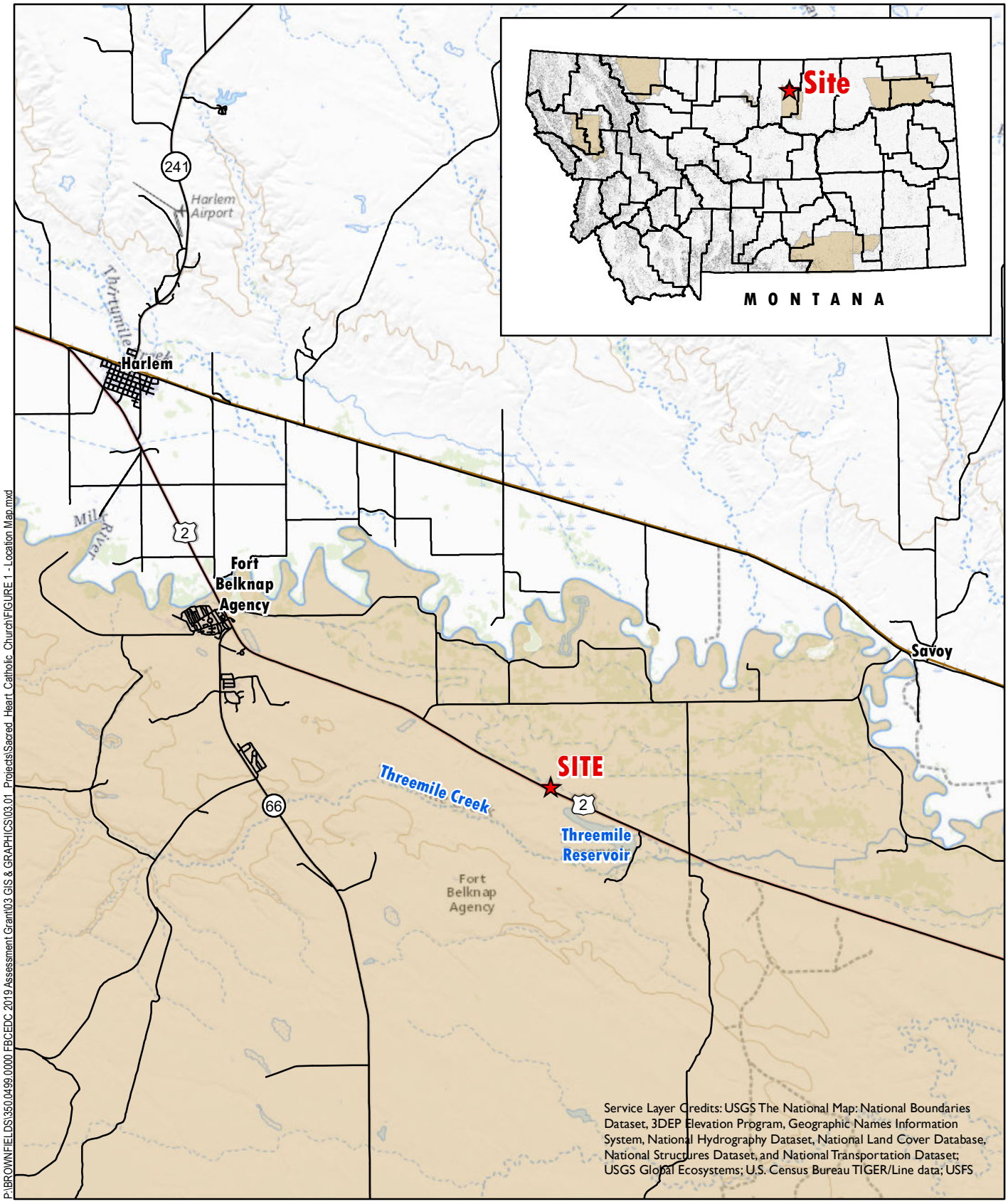
The proposed cleanup would not significantly impact the climatic changes described above, except for potentially increasing mean annual temperature through the burning of fossil fuels. The site is not in a floodplain and the preferred alternative would not increase the potential for flooding. It is recommended that equipment used for abatement be turned off when not in use.

8.0 References

NewFields Companies, LLC (NewFields), 2021. Analysis of Brownfields Cleanup Alternatives. Sacred Heart Catholic Church, 5015 US Highway 2, Harlem, MT 59526. Version 1. November.

Weston Solutions Inc., 2020. Phase II Environmental Site Assessment for Sacred Heart Catholic Church, Old Agency Water Treatment Plan, and Old Lodge Pole Elementary School. Fort Belknap Indian Reservation, Blaine County, Montana. Prepared for U.S. Environmental Protection Agency. March.

FIGURES



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Property Location

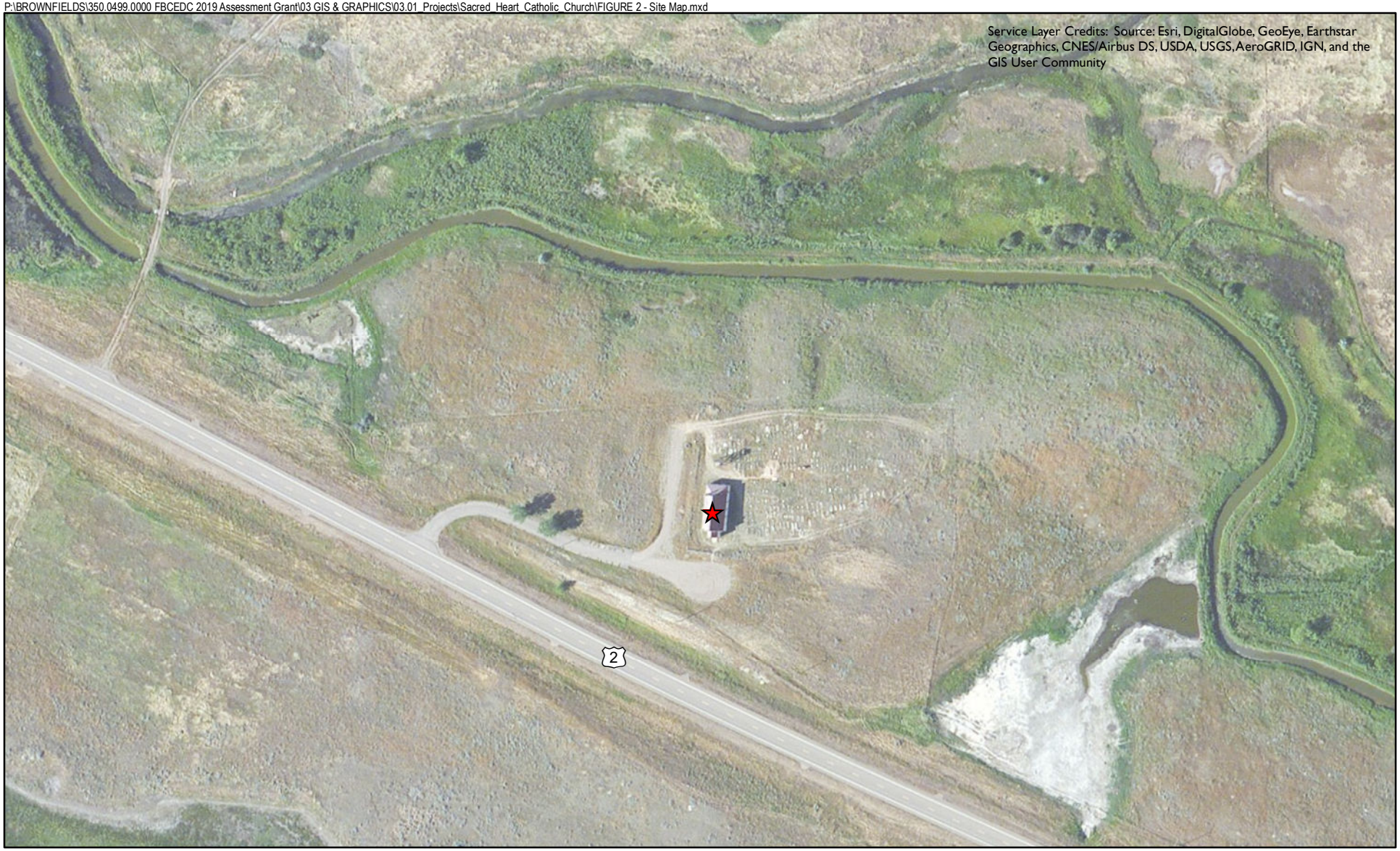
Roads

Fort Belknap Reservation

NewFields

Location Map
Sacred Heart Catholic Church
5015 US Highway 2, Harlem, Montana
FIGURE 1

P:\BROWNFIELDS\350.0499.0000 FBCEDC 2019 Assessment Grant\03 GIS & GRAPHICS\03.01_Projects\Sacred_Heart_Catholic_Church\FIGURE 2 - Site Map.mxd



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NewFields

★ Property Location

Site Map
Sacred Heart Catholic Church
5015 US Highway 2, Harlem, Montana
FIGURE 2

APPENDIX A
MONTANA DEQ LBP DISPOSAL GUIDANCE

RENOVATION & ABATEMENT

- Small-scale debris that is generated during renovation, maintenance, or abatement activities such as paint chips, vacuum debris and dust, waste wash water and sludge from chemical paint stripping is more likely to exceed the TCLP.

- Sampling may be appropriate for intermediate-volume renovation wastes such as window moldings, doors, etc.

- Core or sectional samples can be taken of representative waste items to determine whether each waste is hazardous.

    - Fewer samples could be taken by taking one or more core samples, compiling ratios of waste material surface area to mass for each type, and then comparing these to the surface area/mass ratio of the sample.
    -Sampling protocol should be used for each site.

- Individual waste materials should either:
    - Be sampled and analyzed by TCLP and then handled/disposed of accordingly; or
    - Be segregated from other large-scale debris and then managed as hazardous waste.

- Records of sampling procedures and analytical results must be kept for at least 3 years.

Montana Department of Environmental Quality
PO Box 200901
Helena, MT 59620-0901

DEQ
Montana Department of Environmental Quality

Solid Waste Program

Lead-Based Paint

Solid Waste Section
www.deq.mt.gov/Land/solidwaste
406-444-5300

Solid Waste Program (SWP)
deqswprogram@mt.gov
406-444-3463

LEAD-BASED PAINT (LBP)

Where do we find it?

- Prior to the 1950s, paints used for residential use contained up to 50% lead.
- Lead-based paint was used on buildings until 1978, when it was banned on residential structures by the consumer Products Safety Commission.
- Renovation, remodeling, demolition, and surface preparation for painting have the potential to produce hazardous wastes if LBP was involved.

How do we know it is there?

- Test the paint for lead to be certain of the presence of lead.
- Hazardous waste criterion for lead waste is established under the federal Resource Conservation and Recovery Act (RCRA), Subtitle C, as 5.0 mg/L measured with the Toxicity Characteristic Leaching Procedure (TCLP).

STRUCTURE DEMOLITION

Residential Structures

Household Hazardous Waste Exemption

- On June 18, 2003, the Environmental Protection Agency (EPA) published a rule under solid waste regulations to streamline LBP debris disposal.
  - LBP debris from households generated by homeowners or contractors may be disposed of at a municipal solid waste landfill or and construction and demolition waste landfill.

Non-residential Structures

Waste Determination and Management

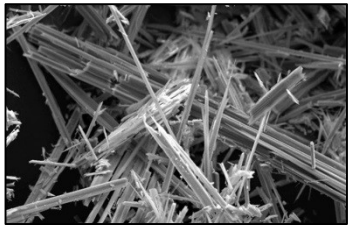
- LBP debris that comes from commercial or industrial sources, ***not households***, may be subject to state and federal hazardous waste rules.
- The generator of the waste must determine whether the debris fails the TCLP for lead.
- Two scenarios outlined for making the waste determination and then managing the LBP debris are:
  - Whole-Building Demolition
  - Renovation and Abatement

WHOLE-BUILDING DEMOLITION

- Whole-building demolitions debris is considered a non-hazardous waste with regard to lead.
  - EPA stated that solid architectural components coated with LBP are less likely to be hazardous because of the small ratio of lead paint to total waste mass.
  - The US Army conducted a study that concluded that whole-building demolition debris is not likely to exceed the toxicity characteristic standard for lead if it is handled as a single, whole waste stream and disposed of all together.

- No sampling or analysis of painted components for lead is required for disposal as a non-hazardous waste.

NOTE: Constituents other than LBP, including PCBs from light ballasts or asbestos containing materials, may require special handling and should be removed before demolition.



APPENDIX B
COST ESTIMATES

Alternative 2: Abatement of ACBM, removal of pigeon guano, and repair and encapsulation of LBP on the door systems and window frames
Cost Estimate
Sacred Heart Catholic Church, Harlem, MT

GRANITE PEAK ENVIRONMENTAL

Description	Quantity	Units	Hourly Rate	Total
Mobilization, Site Preparation, and Permit[1]				
Mobilization/Site Preparation	1	lump sum	$5,000	$5,000
Asbestos Project Permit	1	lump sum	$150	$150
			Mobilization, Site Preparation, and Permit Subtotal	**$5,150**
Asbestos Abatement				
Boiler jacket	250	square feet	$15	$3,750
			Asbestos Abatement Subtotal	**$3,750**
Lead-Based Paint Encapsulation[2]				
Encapsulation of window frames	12	each	$750	$9,000
Door system encapsulation	1	each	$1,000	$1,000
			Lead-Based Paint Encapsulation Subtotal	**$10,000**
Lead in Soil Removal[3]				
Excavation Contractor Mobilization	1	ls	$1,000	$1,000
Soil removal	110	ton	$30	$3,300
Transport and disposal	110	ton	$90	$9,900
Backfill material	110	ton	$25	$2,750
Backfill material placement and compaction	1	ls	$1,500	$1,500
Seeding	2,000	square feet	$0	$700
			Lead in Soil Removal Subtotal	**$19,150**
Pigeon Guano Cleanup, Removal, and Disposal				
Removal, clean up, and disposal of pigeon guano on non-ACBMs	1	lump sum	$18,975	$18,975
			Pigeon Guano Cleanup, Removal, and Disposal Subtotal	**$18,975**
TERO Fees				
Business license fee	2	each	$200	$400
Individual worker fee	5	each	$200	$1,000
Percentage fee	1	lump sum	4%	$2,337
			TERO Fees Subtotal	**$3,737**
			Total (All Tasks)	$60,762
			Contingency[4] (20%)	$12,152
			Total Estimated Cost	**$72,914**

Notes/Assumptions:

Waste volumes for building materials (asbestos and non-asbestos) are from Weston's Cost Estimate Report (February, 2020). Granite Peak has not verified these volumes in the field; and therefore, costs provided in this ABCA are for alternative comparative information and may not reflect the total cost for abatement.

[1]Abatement contractor mobilization includes travel, lodging, site preparation, labor to complete DEQ Asbestos Project Permit application, and incidentals (e.g. equipment, plastic sheeting, asbestos bags, Tyvek, etc.)

[2]The lead-based paint (LBP) work will include the encapsulation of 12 window frame systems and 1 door system.

[3]Lead in soil removal includes soil excavation, TCLP clearance sampling, and backfill.

Cost Estimate
Alternative 3: Management of asbestos in-place, encapsulation of LBP on door systems and window frames, and removal of pigeon guano
Sacred Heart Catholic Church, Harlem, MT

GRANITE PEAK ENVIRONMENTAL

Description	Quantity	Units	Hourly Rate	Total
Mobilization and Site Preparation[1]				
Mobilization/Site Preparation	1	lump sum	$5,000	$5,000
			Mobilization and Site Preparation Subtotal	**$5,000**
Asbestos Abatement - None				
Lead-based Paint Encapsulation[2]				
Encapsulation of window frames	12	each	$750	$9,000
Door system encapsulation	1	each	$1,000	$1,000
			Lead-based Paint Encapsulation Subtotal	**$10,000**
Lead in Soil Removal[3]				
Excavation Contractor Mobilization	1	ls	$1,000	$1,000
Soil removal	110	ton	$30	$3,300
Transport and disposal	110	ton	$90	$9,900
Backfill material	110	ton	$25	$2,750
Backfill material placement and compaction	1	ls	$1,500	$1,500
Seeding	2,000	square feet	$0.35	$700
			Lead in Soil Removal Subtotal	**$19,150**
Pigeon Guano Cleanup, Removal, and Disposal				
Removal, clean up, and disposal of pigeon guano on non-ACBMs	1	lump sum	$18,975	$18,975
			Pigeon Guano Cleanup, Removal, and Disposal Subtotal	**$18,975**
TERO Fees				
Business license fee	2	each	$200	$400
Individual worker fee	5	each	$200	$1,000
Percentage fee	1	lump sum	4%	$2,181
			TERO Fees Subtotal	**$3,581**
			Total (All Tasks)	$56,706
			Contingency[4] (20%)	$11,341
			Total Estimated Cost	**$68,047**

Notes/Assumptions:

Waste volumes for building materials (asbestos and non-asbestos) are from Weston's Cost Estimate Report (February, 2020). Granite Peak has not verified these volumes in the field; and therefore, costs provided in this ABCA are for alternative comparative information and may not reflect the total cost for abatement.

[1]Abatement contractor mobilization includes travel, lodging, site preparation, labor to complete all hazardous material removal, and incidentals (e.g. equipment, plastic sheeting, asbestos bags, Tyvek, etc.). The costs shown assume same contractor hired for Water Treatment Plant abatement would complete this work.

[2]The lead-based paint (LBP) work will include the encapsulation of 12 window frame systems and 1 door system.

[3]Lead in soil removal includes soil excavation, TCLP clearance sampling, and backfill.

[4]The abatement contingency is estimated at 20%, which reflects additions to the project that may be realized during abatement.