



# Analysis of Brownfields Cleanup Alternatives

Sacred Heart Catholic Church  
5015 US Highway 2  
Harlem, MT 59526

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## 1.0 INTRODUCTION AND SITE BACKGROUND

This document is an Analysis of Brownfields Cleanup Alternatives (ABCA) for the Sacred Heart Catholic Church located at 5015 US Highway 2, Harlem, Montana (**Figures 1 and 2**). Asbestos-containing building materials (ACBM) and lead-based paint (LBP) are present in the Church (Weston, 2020). This ABCA is required prior to cleanup of hazardous materials using US Environmental Protection Agency (EPA) Brownfields cleanup funds. This document was prepared using a Fort Belknap Community Economic Development Corporation (FBCEDC) Hazardous Substance EPA Grant.

### 1.1 SITE LOCATION, DESCRIPTION AND PREVIOUS USES

The site is located at 5015 US Highway 2 in Harlem, Montana, on the Fort Belknap Indian Reservation. The 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 the Fort Belknap Indian Community (FBIC) (Weston, 2020).

### 1.2 CONTAMINATION SUMMARY

As described in a Phase II Environmental Site Assessment (ESA) report (Weston, 2020) and shown in **Table 1**, Weston identified one confirmed asbestos-containing building material (ACBM) at the Sacred Heart Catholic Church. ACBM is defined as a building material having an asbestos content greater than 1% asbestos by weight).

**Table 1. ACBMs, Sacred Heart Catholic Church**

Material Description	Location	Qty	Regulatory Category
Boiler Jacket	Basement	250 sf	RACM

**Description of Regulatory Categories:**

1. RACM = Friable ACM; Category I material that has become friable; Category I material that will be subjected to sanding, grinding, cutting, or abrading; or Category II material with a high probability of becoming friable.

Paint is considered lead-based paint if results of on-site X-Ray Fluorescence (XRF) analysis indicate a measurement above 1.0 milligrams per square centimeter (1.0 mg/cm<sup>2</sup>). Weston confirmed the presence of lead-based paint on three church exterior building components. . Elevated lead concentrations were present on the front door system and window system. Surfaces containing lead-based paint are shown in **Table 2**.

**Table 2. Lead-Based Paint Sacred Heart Catholic Church**

Surface	Current Paint Color	Estimated Extent
Sacred Heart Church - Exterior		
Door Frame	Pink	50 LF
Door Jamb	Pink	15 LF
Window Frame System	Pink	12 Window Systems

Other wastes associated with the building include:

- **Pigeon guano:** Present on non-ACBM on both levels of the church.



Weston did not collect lead-in-soil samples due to the presence of snow and frozen ground (Weston, 2020). However, NewFields assumes that the soil below the identified exterior LBP contains lead which will require abatement.

### **1.3 THREATS TO PUBLIC HEALTH AND/OR THE ENVIRONMENT**

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.

LBP and lead in soil is a concern as a source of exposure to lead through ingestion in dust or soil and inhalation of lead in dust. In addition, lead in soil may pose a threat to groundwater quality.

Exposure to bat or bird guano has been linked to the human diseases cryptococcosis and histoplasmosis. In addition, according to the Centers for Disease Control and Prevention (CDC), bird roosts that have accumulated for three or more years should be suspected to contain fungus. Therefore, the guano at Sacred Heart Catholic Church is considered a biological hazard and must be disposed of at a Class II landfill. Furthermore, to protect worker health and safety, removal of guano from the church is necessary prior to abatement and renovation activities.

### **1.4 PROJECT GOAL**

The Fort Belknap Indian Community would like to restore and preserve the Sacred Heart Catholic Church 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 building. The wastes described above will require abatement to allow full restoration of the building.



## 2.0 CLEANUP REQUIREMENTS

### 2.1 CLEANUP OBJECTIVE

The objective of abatement/cleanup is to safely remove and properly dispose of the ACBMs, LBP, and pigeon guano associated with the building without unacceptable risk of exposure to abatement workers and the public.

### 2.2 APPLICABLE CLEANUP STANDARDS

The cleanup of the church property will comply with applicable federal and Montana laws. This includes EPA and OSHA regulations and federal and state prevailing wage rates. Abatement of asbestos will be completed in accordance with the Environmental Protection Agency (EPA) Asbestos National Emission Standards for Hazardous Air Pollutants (NESHAP), 40 Code of Federal Regulations (CFR) 61. Asbestos abatement oversight and final clearance air sampling services on this project will comply with EPA regulations for clearing asbestos abatement work areas. Consistent with EPA regulations, the cleanup standards for asbestos abatement on the project will be:

- 1% asbestos by weight. Materials containing a concentration above this standard will require abatement and
- 0.01 fibers per cubic centimeter of air (<0.01 f/cc). The indoor air of the building will be cleaned and cleared prior to re-occupancy. In accordance with the applicable regulation, this is accomplished when five (5) Phase Contrast Microscopy (PCM) air samples per abatement area are collected, analyzed, and pass the asbestos final clearance criteria.

The cleanup level for LBP is:

- 1.0 mg/cm<sup>3</sup> via XRF or a total lead analysis of 5.0 mg/kg. A paint containing a concentration above one of these limits must be abated via removal or encapsulation in accordance with the OSHA Lead Construction Standard 29 CFR 1926.62, EPA's Renovation, Repair, and Painting (RRP) Rule, and applicable provisions of Montana Department of Environmental Quality's (DEQ's) Solid Waste Program. Paint having a concentration of less than these limits is still regulated by OSHA for the protection of workers.

EPA cleanup levels for lead in soil are: 800 mg/kg for commercial direct contact exposure; 400 mg/kg, for residential direct contact exposure; and 140 mg/kg for the protection of groundwater.

Given the proposed use of the property as a historical landmark, NewFields recommends soils be remediated to the EPA commercial direct contact screening level of 800 mg/kg. The 140 mg/kg leaching-to-groundwater pathway screening level still applies. If confirmation samples collected after cleanup are below 800 mg/kg, but above 140 mg/kg, FBIC will complete leach testing and time of travel leach modeling to demonstrate the lead in the soil would not leach to groundwater. Visual inspections will be used to determine whether the pigeon guano has been abated. There is no established cleanup level for animal feces on building surfaces.

### 2.3 ENFORCEMENT ACTIVITIES

No environmental enforcement activities have been initiated on the property.



## **2.4 NEED FOR CLEANUP**

### **2.4.1 Asbestos**

If ACBM is not abated before renovations, workers may inhale asbestos fibers, and asbestos could be released into the building and inhaled by future occupants. Asbestos abatement to remove the ACBM can mitigate this concern and the general threat to public health and/or the environment.

### **2.4.2 Lead-Based Paint**

If the exterior lead-based paint is disturbed, the potential exists to generate lead-containing dust, and inhalation or ingestion of lead by occupants would be possible.

#### **2.4.1 Lead in Soils**

The lead assumed to be present in soils surrounding the church poses a risk of exposure through direct contact to lead in soil (dermal, inhalation, or ingestion) and/or via consumption of groundwater contaminated via leaching of lead.

#### **2.4.2 Pigeon Guano**

The building has an infestation of pigeons that have created hazardous conditions throughout the building. Left unabated, the pigeon guano is a biological hazard. Removal of these wastes will eliminate the biological hazard.



## 3.0 EVALUATION OF CLEANUP ALTERNATIVES

In consultation with the client, the site owner (Fort Belknap Indian Community), and the DEQ, NewFields identified three cleanup alternatives to address contamination at the Sacred Heart Catholic Church. These alternatives are listed below and discussed in more detail in the following sections. Per EPA and DEQ guidance, each was evaluated based on their comparative effectiveness as it relates to risk reduction, implementability, and cost.

- **Alternative 1:** No action.
- **Alternative 2:** Abatement of the ACBM, Removal of pigeon guano, and repair and encapsulation of LBP on the door systems and window frames.
- **Alternative 3:** Management of asbestos in-place, encapsulation of LBP on door systems and window frames, and removal of pigeon guano.

Additional evaluation concerning the potential for adverse impacts caused by the frequency and intensity of flooding extreme weather events, and the degree to which the alternatives decrease greenhouse gas discharges, energy use, and waste disposal; and employ recycling and reuse are discussed in **Section 3.5**.

### 3.1 ALTERNATIVE 1: NO ACTION

Under Alternative 1, no actions would be taken to address hazardous materials associated with the building. While there would be no cost associated with this alternative, the owner would not be able to move forward with its redevelopment plans for the site. Therefore, the risk of exposure to hazardous materials in the building would remain. The No Action Alternative is cost-effective and implementable but results in no environmental benefit and no reduction of human health risks.

- **Effectiveness:** Not effective - ACBM, LBP, lead in soils, and pigeon guano would remain.
- **Implementability:** Implementable - requires no effort or planning.
- **Cost:** \$0.

### 3.2 ALTERNATIVE 2

Alternative 2 addresses each of the hazardous substances associated with the property in the following way:

- **ACBM:** All ACBMs in the Sacred Heart Catholic Church (**Table 1**) would be abated.
- **LBP:** LBP on the door systems and window frames will 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 proposed sampling is to demonstrate that the soil, if exhumed, would not be defined 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 5.0 mg/L, the soil can be disposed of at the local landfill and the material would not be considered a characteristic



hazardous waste. If the result is above 5.0 mg/L, NewFields 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 will need to be wrapped with 6-mil plastic before transport to the landfill. When removing guano from flooring, there is the possibility that the contaminant has permeated the wood flooring. If so, the floors may need to be cut out and containerized for disposal.

Alternative 2 is labor-intensive but poses a limited risk to site workers. This alternative is effective as it would remove environmental concerns and eliminate human health risks associated with asbestos, lead, and animal wastes. An evaluation summary based on the primary criteria for Alternative 2 is shown below.

- **Effectiveness:** (Effective). Protective of environment and human health and prepares the site for redevelopment or renovation.
- **Implementability:** (Moderate).
- **Cost:** \$25,380 (See **Appendix A**).

### 3.3 ALTERNATIVE 3

Alternative 3 addresses each of the hazardous substances associated with the property in the following way:

- **ACBM:** Under this alternative, the ACBM 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.
- **LBP:** Under this alternative, all LBP-identified window and door systems would be repaired and painted with a lead-encapsulating paint.
- **Lead in soil:** In this alternative, lead in soil would be addressed in the same manner described in Alternative 2.
- **Animal infestation:** In this alternative, animal wastes would be addressed in the same manner described in Alternative 2.

The primary benefit of Alternative 3 compared to Alternative 2 would be cost. If FBIC chooses to redevelop the structure or use it in any way other than leaving it vacant, Alternative 2 would not be acceptable. An evaluation summary based on the primary criteria for Alternative 3 is shown below.

- **Effectiveness:** (Low). Asbestos and LBP hazards are managed in place and remain on site.
- **Implementability:** (Moderate).
- **Cost:** \$15,900.00 (See **Appendix A**).

### 3.4 CLIMATE CHANGE AND CLEAN REMEDIATION

The EPA requires a discussion of whether the alternatives might adversely impact the frequency and intensity of flooding, extreme weather events, and the degree to which the alternatives decrease





greenhouse gas discharges, energy use, and wastes disposal. They also require a discussion of how the alternatives vary in their employ of recycling and reuse. Each of these is described below.

### **3.4.1 Frequency and Intensity of Extreme Weather**

None of the alternatives considered for this project is expected to adversely impact the frequency and intensity of flooding or extreme weather events.

### **3.4.2 Waste Disposal and Recycling**

Under Alternative 1 (No Action), no waste is created, and no materials are recycled. Alternative 3 would generate less waste and dispose of less waste in the local landfill than Alternative 2.

### **3.4.3 Greenhouse Gas Discharges, Energy Use, and Climate Change**

According to the NOAA National Centers for Environmental Information, climate changes predicted for Montana include:

- Continued increases in mean annual air temperatures;
- Increased soil moisture loss during dry periods;
- Increased intensity of droughts;
- Fewer very cold days in the winter;
- Increased springtime precipitation that could result in severe flooding and
- Increased frequency of wildfire occurrence and severity.

If the No Action alternative were selected, there would be no energy used and no discharge of greenhouse gases realized on this project through the burning of fossil fuels in support vehicles. When comparing the other alternatives, Alternative 2 would involve burning slightly more fossil fuels as compared to Alternative 3 as there would be materials abated and an additional trip to a landfill. In general, there is no appreciable difference between Alternatives 2 and 3 with respect to greenhouse gas discharge or energy use. The proposed cleanup project would not significantly impact the climatic changes described above. In accordance with EPA's Clean Remediation Best Management Practices: Clean Fuel & Emission Technologies for Site Cleanup (EPA, 2010), the alternatives presented above can incorporate best practices in reducing fuel emissions. This may include combining mobilizations, hiring of a local abatement firm, and ensuring vehicles and equipment are well maintained to minimize excess fuel use and discharge of un-combusted fuel products. Landfills will be selected as close to the site as possible to minimize the use of fossil fuels during transport. Loads will be covered to prevent the disposition of waste and/or backfill soils along the trucking route (EPA, 2019).



## 4.0 PREFERRED ACTION

The preferred action for the Sacred Heart Catholic Church is Alternative 2. The alternative presents the most effective option of risk reduction to all workers. 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's environmental office, FBCEDC Brownfields Coordinator, and the US EPA.



## 5.0 ADMINISTRATIVE RECORD

For questions or administrative records regarding the proposed project, please contact:

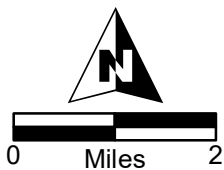
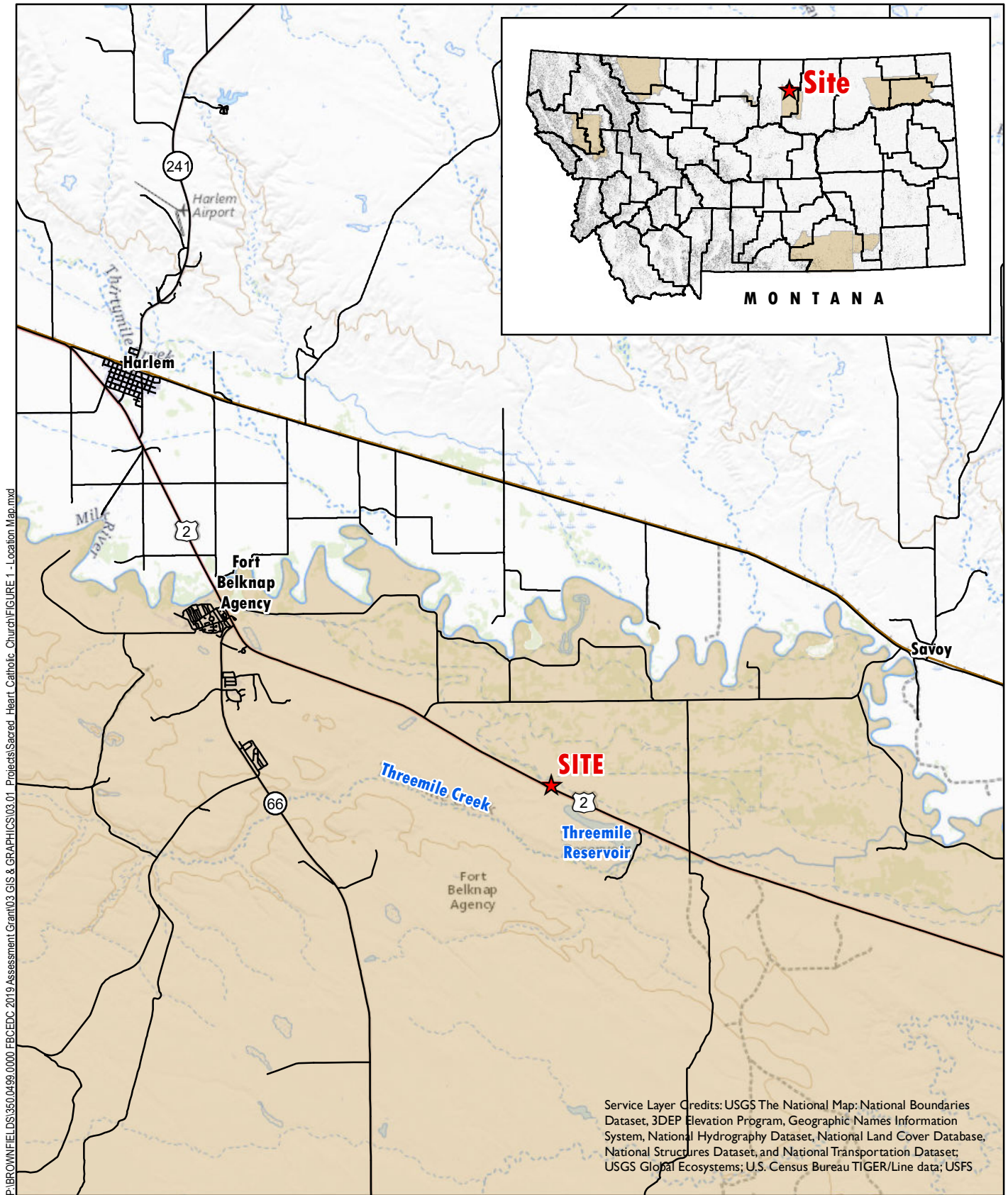
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## 6.0 REFERENCES

- EPA, 2010.** Green Remediation Best Management Practices: Clean Fuel & Emission Technologies for Site Cleanup. August 2010.
- EPA, 2019.** Green Remediation Best Management Practices: Excavation and Surface Restoration. August 2019.
- Weston, 2020.** Phase II Environmental Site Assessment Report. Sacred Heart Catholic Church. Prepared for US Environmental Protection Agency. March 2020.

## FIGURES



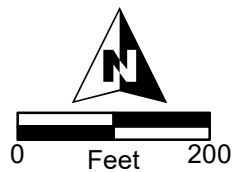
**NewFields**

- ★ Property Location
- Roads
- Fort Belknap Reservation

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



Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



★ Property Location

 **NewFields**

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

## APPENDIX A

### COST ESTIMATES FOR ALTERNATIVES



**Abatement Cost Estimate  
Alternative 2 (Preferred Remedial Approach)  
Sacred Heart Catholic Church  
Fort Belknap, MT**

Item No.	Bid Item	Location	Qty	Unit	Rate	Bid
<b>Mobilization, Site Preparation, and Permit<sup>1</sup></b>						
1	Mobilization/Site Preparation	Fort Belknap, Montana	1	LS	\$ 5,000.00	\$ 5,000.00
2	Asbestos Project Permit	Sacred Heart Catholic Church	1	LS	\$ 150.00	\$ 150.00
Subtotal (Mobilization and Site Preparation)						\$ 5,150.00
<b>Asbestos Abatement</b>						
3	Abate Boiler Jacket	Basement	250	SF	\$ 15.00	\$ 3,750.00
Subtotal (Asbestos Abatement)						\$ 3,750.00
<b>Lead-Based Paint Encapsulation<sup>2</sup></b>						
4	Encapsulation Window Frames	Throughout Building	12	EA	\$ 150.00	\$ 1,800.00
5	Door System Encapsulation	Front Entry	1	EA	\$ 150.00	\$ 150.00
Subtotal Total LBP Encapsulation Cost						\$ 1,950.00
<b>Lead in Soil Removal<sup>3</sup></b>						
6	Lead in Soil Removal	Surrounding Church	78	CY	\$ 100.00	\$ 7,800.00
Subtotal (Lead in Soil)						\$ 7,800.00
<b>Pigeon Guano Cleanup Removal and Disposal</b>						
7	Removal, clean up, and disposal of pigeon guano on non-ACBMs	Throughout Building	1	LS	\$ 2,500.00	\$ 2,500.00
Subtotal (Pigeon Guano Removal and Disposal)						\$ 2,500.00
8	Contingency <sup>4</sup>	Sacred Heart Catholic Church	1	LS	20%	\$ 4,230.00
<b>TOTAL PROJECT COST</b>						<b>\$ 25,380.00</b>

Notes and Assumptions:

Waste volumes for building materials (asbestos and non-asbestos) are from Weston's Cost Estimate Report, February 2020. NewFields has not field verified these volumes and therefore costs are provided in this ABCA are provided for alternative comparative information and may not reflect total cost for abatement.7

Abatement Contractor Mobilization includes travel, lodging, site prep., labor to complete DEQ Asbestos Project Permit application and incidentals (e.g. equipment, plastic sheeting, asbestos bags, Tyvek, etc.)

<sup>2</sup>The Lead-based paint (LBP) work will include the encapsulation of 12 window frame systems and 1 door system.

<sup>3</sup>Lead in Soil Removal includes soil excavation, TCLP Clearance Sampling and backfill

<sup>4</sup>The abatement contingency is estimated at 20%, which reflects additions to the project that may be realized during the abatement.

**Abatement Cost Estimate  
Alternative 3  
Sacred Heart Catholic Church  
Fort Belknap, MT**

Item No.	Bid Item	Location	Qty	Unit	Rate	Bid
Mobilization, Site Preparation, and Permit <sup>1</sup>						
1	Mobilization/Site Preparation	Fort Belknap, Montana	1	LS	\$ 1,000.00	\$ 1,000.00
Subtotal (Mobilization and Site Preparation)						\$ 1,000.00
Asbestos Abatement- None						
Lead-Based Paint Encapsulation <sup>2</sup>						
4	Encapsulation Window Frames	Throughout Building	12	EA	\$ 150.00	\$ 1,800.00
5	Door System Encapsulation	Front Entry	1	EA	\$ 150.00	\$ 150.00
Subtotal Total LBP Encapsulation Cost						\$ 1,950.00
Lead in Soil Removal <sup>3</sup>						
7	Lead in Soil Removal	Surrounding Church	78	CY	\$ 100.00	\$ 7,800.00
Subtotal (Lead in Soil)						\$ 7,800.00
Pigeon Guano Cleanup Removal and Disposal						
6	Removal, clean up, and disposal of pigeon guano on non-ACBM	Throughout Building	1	LS	\$ 2,500.00	\$ 2,500.00
Subtotal (Pigeon Guano Abatement)						\$ 2,500.00
7	Contingency <sup>4</sup>	Sacred Heart Catholic Church	1	LS	20%	\$ 2,650.00
TOTAL PROJECT COST						\$ 15,900.00

Notes and Assumptions:

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

<sup>1</sup>Abatement Contractor Mobilization includes travel, lodging, site prep., labor to complete all hazardous material removal (e.g. equipment, plastic sheeting, asbestos bags, Tyvek, etc.)

<sup>2</sup>The Lead-based paint (LBP) work will include the encapsulation of 12 window frame systems and 1 door system.

<sup>3</sup>Lead in Soil Removal includes soil excavation, TCLP testing, Clearance Sampling and backfill

<sup>4</sup>The abatement contingency is estimated at 20%, which reflects additions to the project that may be realized during the abatement.