Analysis of Brownfields Cleanup Alternatives
Former Acme Power Plant
165 Acme Road, Acme, Sheridan County, WY

Prepared for Sheridan County Conservation District

WWC ENGINEERING

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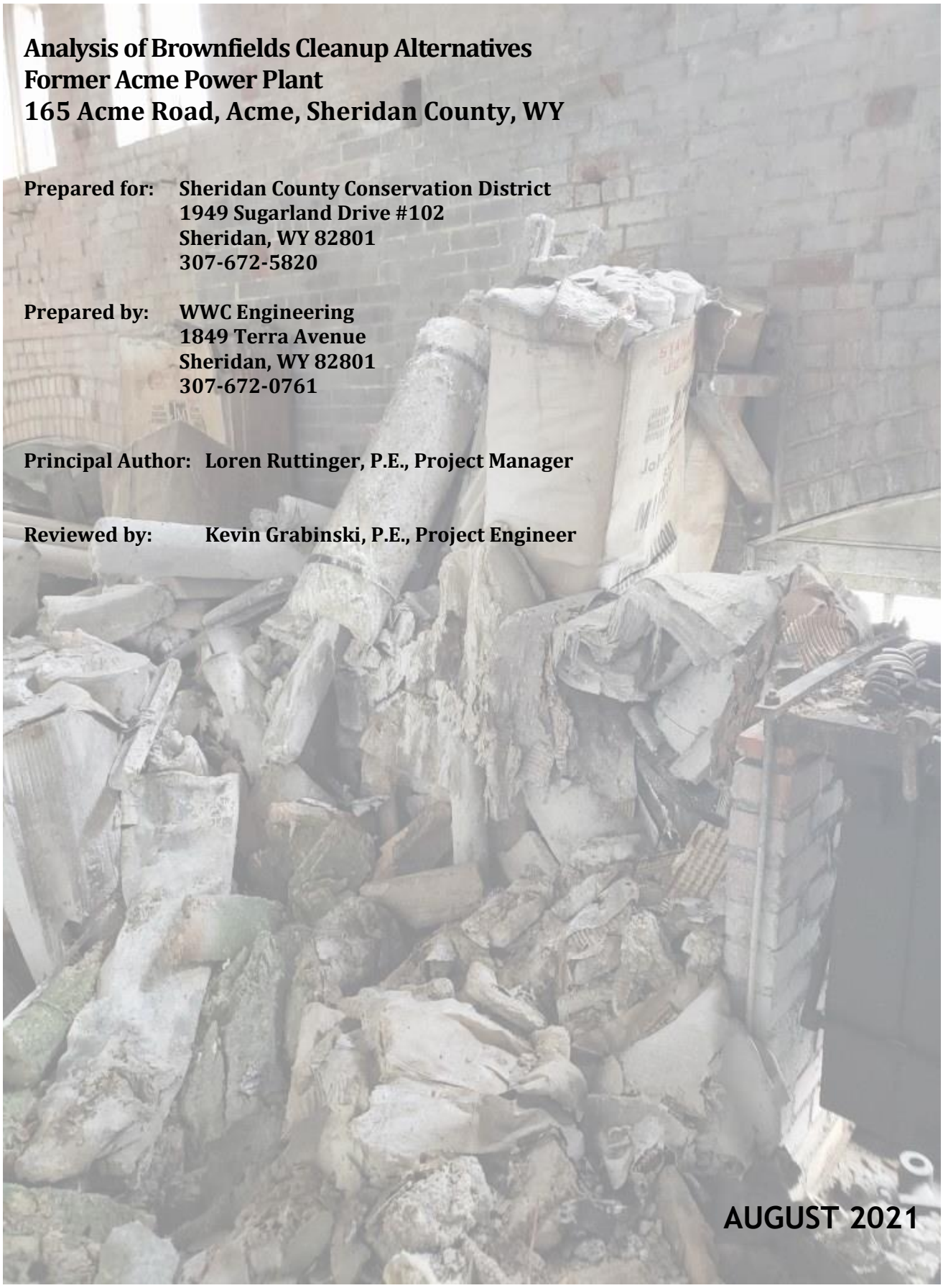

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1.0 INTRODUCTION AND BACKGROUND

1.1 Site Location

The Former Acme Power Plant site (the Site) is a 5.8-acre parcel of land located at 165 Acme Road in Acme, Sheridan County, Wyoming, approximately 10 miles north of Sheridan, Wyoming. The Site is owned by the Sheridan County Conservation District (the Owner). Figure 1 shows the location of the Site in relation to Sheridan. The Site is located in Township 57 North, Range 84 West, Section 15, North ½ of the Southwest ¼ (Sheridan County Parcel 57841530000333). The Tongue River passes through the northern portion of the Site. The Tongue River is a perennial tributary to the Yellowstone River. Adjacent lands are owned by the Padlock Ranch Company. Nearby lands are owned by Big Horn Coal Company (care of Lighthouse Resources, LLC), Black Gold Land Company, Sheridan-Johnson Rural Electrification Association, and the State of Wyoming. This Site layout and neighboring landowners are shown on Figure 2.

1.1.1 Forecasted Climate Conditions

According to the US Global Change Research Program (USGCRP) through NOAA National Centers for Environmental Information, the average annual temperature of Wyoming has increased approximately 2°F since the early 20th century. This increase is most evident in winter warming, which has been characterized by fewer very cold days since 1990. Under a higher emissions pathway, historically unprecedented warming is projected by the end of the 21st century.

Mountains and river systems in Wyoming provide critical water resources not only for Wyoming but also for other downstream states. Projected increases in spring precipitation may have both beneficial (increased water supplies) and negative (increased flooding) impacts.

Higher temperatures will increase the rate of soil moisture loss during dry spells, leading to an increase in the intensity of naturally occurring future droughts. The frequency of wildfire occurrence and severity is projected to increase in Wyoming.

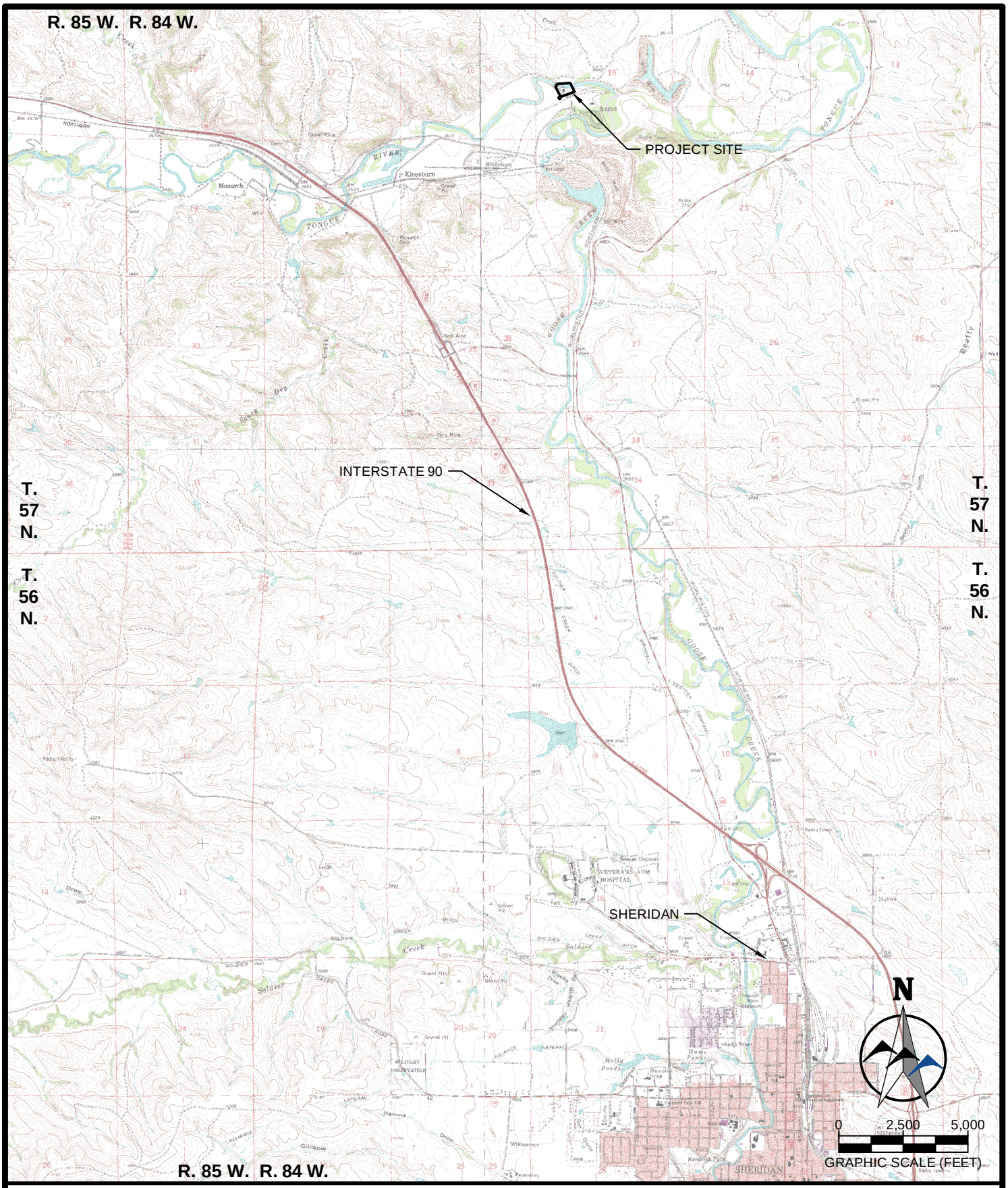

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FIGURE 1. PROJECT SITE IN RELATION TO SHERIDAN, WYOMING

IMAGE SOURCE: BING IMAGERY; IMAGE DATE: APPROX. SUMMER 2016

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FIGURE 2. MAIN STRUCTURES AND COMPONENTS OF THE SITE (AUGUST 2021)

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According to FEMA Flood Zone Map 56033C0400E (effective January 16, 2014), the Site is located within Zone A, which is the 100-year flood zone. An elevation certification and letter of map amendment (LOMA) would be required to determine the base flood elevation. Flooding of the Site is possible.

Since the Site is adjacent to the Tongue River, the Site could be impacted by flooding. The Site could also be impacted by wildland fires since the Site is located in a rural area surrounded by native rangeland. Cleanup, remediation, and redevelopment of the Site would provide greater protection to the environment. Flooding could provide a mechanism for contamination to be transported from the Site. Additionally, wildland fires could cause contaminants to become airborne, thus being transported from the Site.

1.2 Previous Site Use(s) and Any Previous Cleanup/Remediation

The Site was the location of the historical coal-fired Acme Power Plant (the Plant). The Plant was constructed in 1910 and operated from March 1911 to August 23, 1976. The Plant derived its coal from nearby mines and its water source from the Tongue River. As early as 1912, the Plant provided power to the neighboring mines and coal camps, the City of Sheridan, and the Sheridan Railway Company. The Sheridan County Electric Company owned and operated the Plant from 1910 until 1947, when it sold the Plant to Montana-Dakota Utilities (MDU). MDU upgraded the steam turbines in the Plant in 1947 and again in 1952. In 1973, the U.S. Environmental Protection Agency (EPA) informed MDU that the Plant did not meet air quality standards and would either need to be upgraded or shut down. MDU chose to shut down the Plant. EPA agreed to a slow-phase shutdown, and the Plant completed final operations on August 23, 1976.

MDU sold the Plant following final operations in 1976 to Carl Weissman and Sons for metal salvage. The Plant sat mostly idle until 1984 when Perkins Power purchased it with the intention of operating it again and using the Plant's steam to heat a 2-acre greenhouse for growing lettuce hydroponically. This planned use, along with several other proposed Plant use options, did not materialize during the 1980s and early 1990s. Several deed transfers occurred in the early 1990s. In 2000, salvage rights were assigned to a private individual, and ownership of the Plant was transferred to Diversified Resources. In 2008, the Site was approved for auto salvage operations and disposal by the Sheridan Board of County Commissioners. Between 2008 and 2015, a large quantity of vehicles was brought to the Site and parked outside the buildings. Salvage operations as well as battery recycling apparently occurred. In October 2015 through January 2017, the Sheridan Community Land Trust worked through issues involving property ownership of the Site. After applying to the EPA Targeted Brownfield Assessment Program in June 2016, the Sheridan County Conservation District assumed ownership of the Site in June 2017.

Currently, there are five buildings onsite: the Plant, the Maintenance Shop, the Barn, the Little House, and the Trailer (a single-wide trailer that was most recently inhabited). In addition to the five buildings, there are two loafing sheds and two dilapidated trailers in the southeast corner of the Site. The Site is littered with debris and garbage. The main structures and components of the Site are depicted on Figure 2.

The Owner has three goals as part of the project vision:

- Protect land and water quality
- Capture the historical importance
- Ensure public access and use

If possible, the Owner plans to reuse the Plant as a component of capturing the historical importance and plans to likely demolish or scrap the other buildings on the Site. A structural assessment of the Plant completed by American Engineering Testing (AET) in September and October 2020 revealed that the Plant is currently structurally competent if certain maintenance measures are completed. Such maintenance measures would include replacement of the roof membrane and repairs to portions of the walls (AET 2020).

A hazardous building materials inventory was completed by Weston Solutions, Inc. (Weston) in October 2017 as part of the Phase II Environmental Site Assessment (ESA) for Acme Power Plant Hazardous Building Materials (Weston 2017c). An asbestos inspection was performed as a component of the Phase II ESA for Hazardous Building Materials and identified the asbestos-containing materials (ACM) onsite (Weston 2017c). ACM onsite was identified as including both installed materials such as pipe wraps or boiler insulation, or bulk and loose materials in original packaging, boxes, and buckets. A lead-based paint (LBP) inspection was also performed as a component of the Phase II ESA for Hazardous Building Materials and determined that LBP is present onsite (Weston 2017c). LBP is primarily identified on door and window frames as well as some walls. Walls inside the Plant painted with LBP are typically brick masonry.

In 2018, WWC Engineering (WWC) contracted with Wyoming Department of Environmental Quality/Voluntary Remediation Program (WDEQ/VRP) to oversee site cleanup activities termed “Site Stabilization.” The purpose of Site Stabilization was to remove immediate hazards to future site assessment and cleanup activities. For example, Site Stabilization including removing drums and containers with unknown contents, removing bulk and loose ACM, and sampling of potential polychlorinated biphenyls (PCBs). As a portion of Site Stabilization, approximately 60 cubic yards of bulk and loose ACMs were removed from the Site and disposed at a landfill permitted

for ACM disposal. These materials that were removed were only bulk and loose materials, but ACM installed on pipes or boilers during operations remain (WWC 2019).

1.3 Site Assessment Findings

Site assessments have included a Phase I ESA (Weston 2017a), a Phase II ESA for media outside of the buildings (Weston 2017b), a Phase II ESA for hazardous building materials (Weston 2017c), supplementary sampling during Site Stabilization (WWC 2019), and additional site assessment by WWC in 2019-2021 under EPA Site Assessment Grant BF96845801 (WWC 2021). The ACM and LBP inspections were conducted as a component of the Phase II ESA for Hazardous Building Materials in May and June of 2017 by Weston (Weston 2017c). Results of the inspection confirmed the presence of contaminants of concern (COCs) at the Site. A component of site assessment by WWC included activity-based sampling (ABS) for asbestos in soils. ABS verified the presence of asbestos in soils at concentrations that are indicative of unacceptable risk (WWC 2021). The following summarizes the results and conclusions regarding the presence of ACM and LBP identified by Weston during the Phase II ESA for Hazardous Building Materials (Weston 2017c):

Asbestos-Containing Material (ACM): All five buildings were assessed for ACM. In addition to the buildings, exterior surface soils were sampled to determine if asbestos fibers have migrated from the buildings. A total of 111 potential ACM samples were submitted for analysis. Of the 111 samples, 75 samples were determined to be positive for asbestos, or greater than 1% asbestos. Table 1 summarizes the positive results and approximate quantities of asbestos at the Site. Based on the results of the ACM survey, asbestos is present in the buildings onsite and neighboring soils. ACM is considered a COC in relation to the Site.

Table 1. Asbestos-Containing Material

ACM	Quantity	Location	Removed During Site Stabilization (WWC 2019)
The Plant			
Boiler Insulation	150 sq ft	1952 Stoker Boiler	-
Brick Caulk	50 lf	1910 Heine Boiler	-
Brick Plaster	1,000 sq ft	1910 Heine Boiler	-
Door Insulation	5 sq ft	1947 Boiler	-
Electrical Panel	1 panel	1952 Turbine Room	-
Equipment Jackets	4,330 sq ft	Throughout	-
Fiberboard	1,500 sq ft	1952 Addition	-
Fire Brick	10 sq ft	2nd Level Catwalk	-
Fire Doors	3 doors	1952 Addition	-
Furnace Bricks/Cement	6,000 sq ft	Boilers	-
Insulation Debris	1,380 cf	Throughout	Approx. 1,000 cf
Pipe Flange Gaskets	200 gaskets	Throughout	-
Pipe Insulation	1,420 lf	Throughout	-
Pipe Joints	356 joints	Throughout	-
Plaster	5,850 sq ft	Turbine Rooms	-
Roofing Material	13,500 sq ft	Roof	-
Wire Insulation	50 lf	5th Level Catwalk	-
The Barn			
Fiberboard	80 sq ft	Loft	All
Manhole Gasket	14 rolls	Main Level	All
Pipe Insulation	2 boxes	Main Level and Loft	All
The Maintenance Shop			
Asbestoline and Firite	2 gallons	Loft	All
Brake Pad	3 pads	Main Level	All
Covering	5 lf	Main Level	All
Packing/Gasket	8 rolls/3 gaskets	Main Level	All
Roofing Material - Tar	110 lf	Roof	-
Little House			
Linoleum	80 sq ft	Main Level	-

Lead-Based Paint (LBP): All five buildings were assessed for LBP. A total of 96 x-ray fluorescence (XRF) readings were collected. Of the 96 readings, 31 readings were determined to be positive for LBP, or greater than 1 milligram per square centimeter [mg/cm^2]) for lead. Table 2 summarizes the locations and estimated extents of LBP at the Site for each building. Based on the results of the LBP survey, LBP is present in the buildings onsite. LBP is considered a COC in relation to the Site.

Table 2. Lead-Based Paint

LBP Location	Current Surface Paint Color	Estimated Extent
The Plant		
Exterior		
Door	Green	170 sq ft
Door Frame	Green	100 lf
Window Sash	Green	2,350 lf
Interior		
Door	Brown	50 sq ft
	Dark Green	100 sq ft
	Green	25 sq ft
	White	25 sq ft
Wall	Cream	1,200 sq ft
	Dark Brown	650 sq ft
	White	3,000 sq ft
Window Frame	White	1,000 lf
The Barn		
Exterior		
Door	Green	150 sf
Door Jamb	Green	30 lf
Interior		
Door	Green	230 sq ft
The Maintenance Shop		
Exterior		
Door	Green	150 sq ft
Trim	Green	60 lf
Window Sash	Green	720 lf
Interior		
Door	Green	230 sq ft
Trailer		
Exterior		
Wall	Dark Brown	60 sq ft
Little House		
Exterior		
Wall	White	150 sq ft

1.4 Project Goal

The initial goal of the project will be to remove the health hazard of ACMs onsite. In doing so, all ACM would be targeted for abatement. The bulk of ACM onsite is friable. Site assessment suggests that asbestos fibers are leaving the Plant through open windows and doorways. Soil samples and ABS for asbestos in soils have detected concentrations of asbestos. Concentrations of asbestos detected during ABS on sampling cassettes exceeded the OSHA permissible exposure limit (PEL) for asbestos. Additionally, the Excess Lifetime Cancer Risk (ELCR) calculations completed as a part of the ABS study indicate unacceptable risk to workers or those with lifetime exposure. Asbestos fibers could become airborne, leave the Site, and spread contamination to neighboring landowners. Asbestos abatement would protect human health through future phases of cleanup and remediation. Additionally, if public use and access can be achieved, ACM and LBP abatement would prepare the building for public access of the historical structure. The planned reuse and redevelopment of the Site would be multi-faceted. The Site would provide recreational access to the Tongue River. If the Plant is repurposed, the Plant could be a center for commercial/institutional uses such as a local history center, business space, offices, or similar.

2.0 APPLICABLE REGULATIONS AND CLEANUP STANDARDS

2.1 Cleanup Oversight Responsibility

The Owner applied to the WDEQ/VRP and the Site was accepted into the program on January 19, 2018 as VRP No. 58.220. The Owner has received assessment and Site Stabilization assistance through the WDEQ/VRP. Additionally, the WDEQ/VRP applied for EPA Site Assessment Grant BF96845801 and used the grant for site assessment on behalf of the Owner.

Cleanup of soils and groundwater at the Site will be completed under WDEQ/VRP oversight. Asbestos abatement will have additional oversight form the Wyoming Department of Environmental Quality/Air Quality Division (WDEQ/AQD) Asbestos Program. The WDEQ/AQD Asbestos Program will be the regulating entity providing all appropriate permits and approvals of the asbestos abatement work performed at the Site.

The Owner will advertise for a certified asbestos abatement contractor. The contractor will be required to comply with applicable Federal, state, and county rules, regulations, and codes applicable to the Site.

The certified asbestos abatement contractor will submit all asbestos abatement plans and notifications to the WDEQ/AQD Asbestos Program prior to commencing work. The notification must be submitted to the WDEQ/AQD Asbestos Program at least ten working days prior to the removal of asbestos. Notification will include the facility

description and information, information regarding sampling and procedures that determined asbestos is present, scheduled dates and work hours of asbestos removal, approximate quantities of ACM, descriptions of work practices, and waste disposal locations. WDEQ/AQD Asbestos Program may inspect the Site during abatement and removal operations. Oversight will include all necessary third-party clearance sampling confirming the abatement is complete. Once the abatement contractor has submitted their final abatement report, the Owner may request an audit to be performed by the WDEQ/AQD Asbestos Program. The WDEQ/AQD Asbestos Program will then review the final abatement report and confirm that the work plan was completed appropriately.

If LBP is included in cleanup, the Owner will advertise for a certified LBP abatement contractor. The contractor will be required to comply with applicable Federal, state, and county rules, regulations, and codes. LBP disposal will comply with the disposal facility's requirements.

2.2 Cleanup Standards for Major Contaminants

The Owner will follow all the Federal or state cleanup standards for proper remediation of the ACM and LBP. Any other hazardous material found on the Site may require proper handling, if encountered.

2.3 Laws & Regulations Applicable to the Cleanup

Laws and regulations that are applicable to this cleanup include the Federal Small Business Liability Relief and Brownfields Revitalization Act, the Federal Davis-Bacon Act, state environmental law, and Sheridan County regulations. Federal, state, and local laws regarding procurement of contractors to conduct the abatement will be followed.

In addition, all appropriate permits (e.g., WDEQ/AQD Asbestos Program notification, notify before you dig, ACM transport/disposal manifests) will be obtained.

3.0 EVALUATION OF CLEANUP ALTERNATIVES

3.1 Cleanup Alternatives Considered

To address ACM and LBP contamination at the Site, there are three different alternatives considered: Alternative #1: No Action, Alternative #2: Removal/Abatement of ACM, and Alternative #3: Removal/Abatement of ACM and LBP.

3.2 Evaluation of Cleanup Alternatives

To satisfy EPA requirements, the effectiveness, implementability, and cost of each alternative must be considered prior to selecting a recommended cleanup alternative.

Effectiveness – Including Climate Change Considerations

- Alternative #1: No Action is not effective in stopping the health risks from the identified COCs at the contaminated Site. Evidence from the Phase II ESA for Hazardous Building Materials (Weston 2017c) and ABS for asbestos in soils (WWC 2021) suggests that asbestos fibers have migrated from the Plant, can become airborne, and contaminate soils on the Site and adjacent properties.
- Alternative #2: Removal/abatement of all ACM from the buildings will eliminate migration of asbestos fibers from the buildings to exterior soils or offsite. Removal/abatement of all ACM will be effective at reducing critical health risks. If the Site was subjected to a wildland fire, asbestos fibers could be released from the Site and airborne fibers could travel further from the Site, possibly leading to a greater number of receptors.
- Alternative #3: Removal/abatement of all ACM and LBP will be the most effective by removing all known health risks and environmental hazards. Removal/abatement of ACM would occur as described in Alternative #2. In addition, LBP would be removed/abated. Removal would include transporting certain LBP components offsite for disposal such as doors and trim. In those locations where LBP is present on walls, the LBP would be stripped from the wall. This would be effective at eliminating the possibility of LBP contaminating exterior soils or being a human health hazard during repurposing of the buildings. Should flooding of the Site occur, flood waters could contact lead-contaminated soils. Removal of LBP would be most effective at preventing surface water from contacting lead contamination.

Implementability

- Alternative #1: No Action:
  - No actions will be conducted and is, therefore, simple to implement.
- Alternative #2: Removal/Abatement of ACM:
  - Based on the results of the asbestos inspection, standard protocols for removal of ACMs should be implemented. Standard abatement procedures for ACM are straightforward for properly trained contractors.
    - Contracting an accredited asbestos remediation company to address the ACM at the Site during the cleanup phase of redevelopment (e.g., abatement). ACM remediation is recommended prior to any repurpose of the Site.
    - ACM clearance sampling should be completed in accordance with an approved Sampling and Analysis Plan (SAP).
    - The Site could be accessed by standard contractors or members of the public following ACM clearance and by request of the Owner.

- Alternative #3: Removal/Abatement of ACM and LBP:
    - All ACM would be abated and removed from structures in the same manner as in Alternative #2.
    - All LBP would be removed or abated from the structures. Components such as doors would be removed from the structures and disposed offsite. Walls would be stripped of LBP. The LBP stripped from walls would be properly disposed offsite.

Cost

- Alternative #1: No Action necessitates no cost.
- Alternative #2: The total cost estimate for this alternative is $680,000.
- Alternative #3: The total cost estimate for this alternative is $900,000.

3.3 Recommended Cleanup Alternative

The recommended cleanup alternative is Alternative #2: Removal/Abatement of ACM from the Site. The alternative would target all ACM on the Site, the bulk of which is friable ACM. The Plant is an attraction for trespassers, transients, and possible drug use. Broken windows in the Plant provide pathways for asbestos fibers to be transported outside and offsite. ABS and sampling of soils have verified concentrations of asbestos fibers in soils. Alternative #2 would most effectively use a Brownfields cleanup grant in conjunction with the Owner's capabilities as a conservation district to provide a cost-share. Implementation of Alternative #2 first would allow further evaluation of LBP removal/encapsulation in portions of the structures instead of complete LBP removal and abatement. Doors and trim would likely be removed and LBP on walls could be encapsulated. This work could be evaluated in greater detail following ACM abatement. Abatement of LBP on some structures such as the Little House, the Trailer, or the Barn may be unnecessary for demolition or disposal offsite at certain permitted facilities. A toxicity characteristic leaching procedure (TCLP) test may be required of LBP contaminated debris prior to disposal at landfills. Since LBP removal, encapsulation, and offsite disposal may require more evaluation, Alternative #2 is the recommended alternative at this time.

4.0 GREEN AND SUSTAINABLE REMEDIATION MEASURES FOR SELECTED ALTERNATIVE

To make the selected alternative greener, or more sustainable, several techniques are planned. The most recent Best Management Practices (BMPs) issued under ASTM Standard E-2893: Standard Guide for Greener Cleanups will be used as a reference in this effort. The Owner will require the cleanup contractor to follow an idle-reduction policy and use heavy equipment with advanced emissions controls operated on ultra-low sulfur diesel. The number of mobilizations to the Site will be minimized and erosion control measures will be used to minimize runoff into environmentally sensitive areas.

5.0 REFERENCES

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