

**Bar U Ranch National Historic Site Building Refurbishment  
– Basic Environmental Impact Analysis (BIA)**

**September 2015**

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## **1. Project Information**

### ***Project Title***

Bar U Ranch National Historic Site – Building Refurbishment

### ***Proponent Information***

Parks Canada

### ***Functional Manager of Project (FMP)***

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### ***Proposed Project Dates***

Start in the late 3<sup>rd</sup> quarter of 2015 through to 2018.

### ***Internal Project File #***

WLNP-2015-FII766

### ***Project Location***

Bar U Ranch National Historic Site

## **2. Project Description**

Adjacent to the foothills of the Rocky Mountains, the Bar U Ranch National Historic Site (hereafter the Ranch) is a preserved working ranch that was a leading cattle and horse operation in Canada. At its peak, the Ranch extended over 65,000 ha with 30,000 cattle and 1000 Percheron horses. Although smaller today, the Ranch links visitors to Canada's ranching heritage and is rich in cultural and natural resources. Most buildings at the Ranch are designated "classified" and are governed by the *Federal Heritage Building Act* (FHB) and cannot be modified without prior approval from the Federal Heritage Building Review Office (FHBRO).

Between 2015 and 2018, the Ranch will complete refurbishment of four existing heritage buildings, demolition of a flood damaged cinder block building, and construction of a new workshop (collectively hereafter the Project).

Planned works include initial building inspections followed by recommendations for refurbishment or demolition activities that address: foundation; concrete; roofing and eaves; structural reinforcement or replacement; exterior clap board; electrical; plumbing; water lines; septic tie-in; and heat, ventilation and air-conditioning (HVAC). Current buildings identified in the Project include the Workhorse Barn, Machinery Shop, Self-feeder/Bunkhouse, Slaughter House, and Workshop (Figure 1). Other buildings or components may be added to the Project as building inspections are completed.

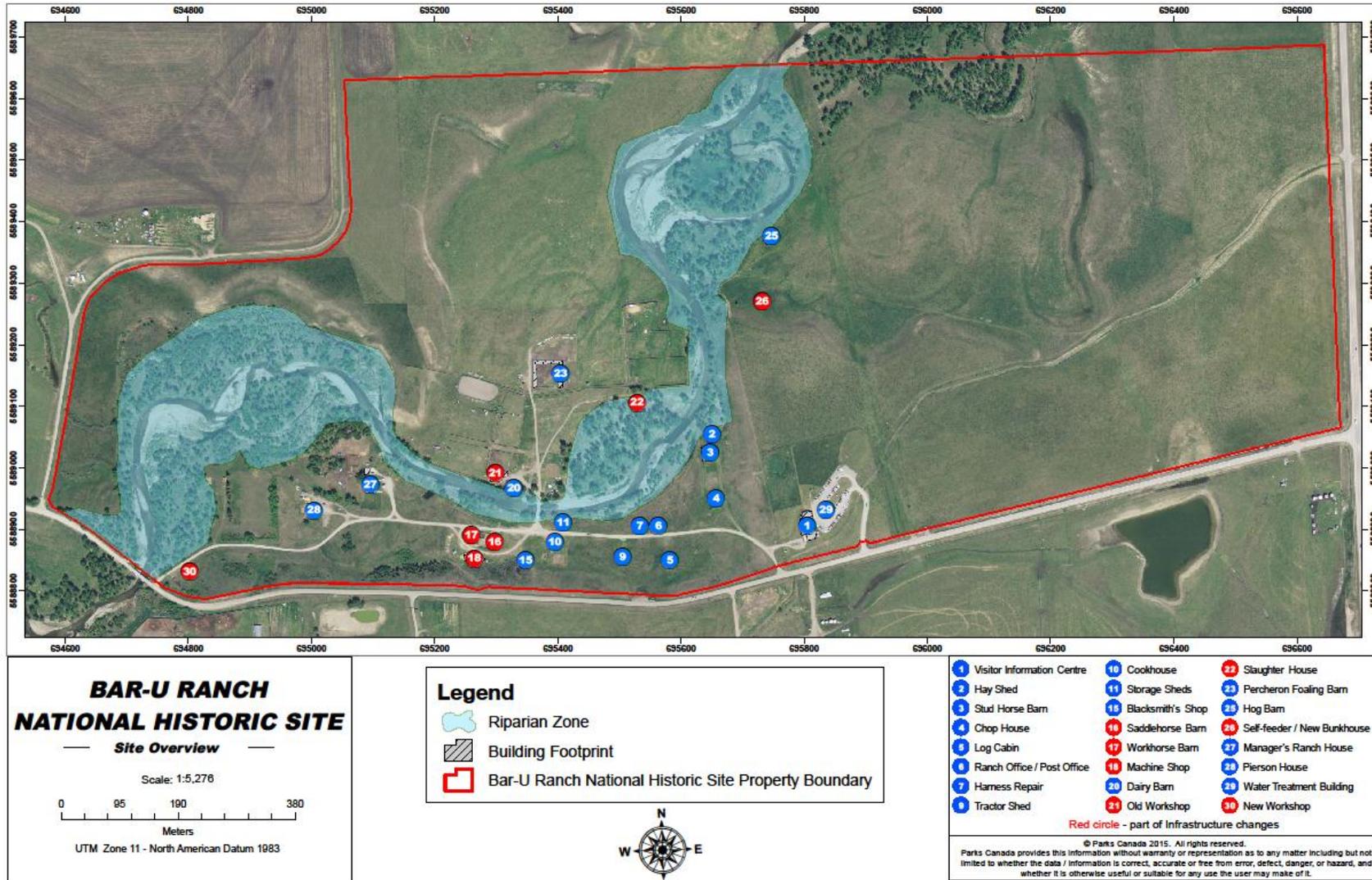


Figure 1: Site Overview

### **Workhorse Barn**

The Workhorse Barn stables Percheron horses that pull horse drawn carts at the Ranch. The Barn has fallen into disrepair due to age and flood damage. To sustain the building for horse and visitor usage, significant work is required. The foundation is slumping and requires inspection, excavation, and underpinning. The existing concrete floor is cracked and requires repair or replacement. The main building support beams require inspection and replacement. The second floor used for hay storage has heaved and needs to be inspected to determine if replacement is required.



*Figure 2: Workhorse Barn (#17)*

### **Machine Shop**

After refurbishment, the Machine Shop will be used to house various machines and/or carriages and be open for public viewing. The Machine Shop requires inspection to determine work requirements; however, the main areas of concern include the foundation, general structure, and roof.



*Figure 3: Machine Shop (#18)*

### **Slaughter House**

The Slaughter House is a one storey building that requires detailed inspection and refurbishment to enable safe public viewing. Inspection of the foundation and structure is required to determine work requirements.



*Figure 4: Slaughterhouse (#22)*

### ***Self-feeder/New Bunkhouse***

The self-feeder will be restored to its original purpose as a bunkhouse. The two storey building requires detailed inspection to determine structural integrity for converting back to a living accommodation and to move the building to a former location at the main building site between the Cookhouse (Figure 1, #10) and Tractor Shed (#9) buildings. To enable relocation, an adequate concrete spread footing for a foundation will be built. Planned refurbishment includes structural reinforcement, clap board, insulation and interior walls, electrical, plumbing, HVAC, and foundation work.



*Figure 5: Self-feeder / New Bunkhouse (#26)*

### ***Workshop***

The old cinderblock workshop sits in the floodplain adjacent to Pekisko Creek and was badly damaged in 2013 by flooding. The building is structurally unsafe, does not have FHB status, and is planned for demolition. Work includes electrical, water and sewage disconnect, building demolition, and ground restoration. To replace the function of this building, a new Workshop will be built on the southwest edge of the Ranch (Figure 1, #30). The new Workshop requires site preparation, utility hook-ups including the installation of a new water line, and construction.



*Figure 6: Old Workshop (#21)*

## **3. Assessment Scope**

The Project is within a National Historic Site and a *Cultural Resource Impact Analysis* will be completed as required for each location included in the Project. Appropriate mitigations, surveillance needs, and follow-up monitoring requirements for the Cultural Resources Valued Component (VC), including archaeological resources, will be addressed through this process. All project design and restoration work for FHB requires approval from FHBRO.

Other Valued Components (VC) with potential to be affected by the Project include a Riparian Ecosystem, Species at Risk, and Visitor Experience.

Refurbishment activities and additional buildings at the Ranch may be added to the Project as inspections are completed. Refurbishment activities similar nature to those outlined in the Project description are covered in the scope of this assessment; those that vary significantly in nature require a separate assessment (e.g., flood mitigation structures, bridge repair).

## 4. Methods

Parks Canada Biologists Kimberly Pearson, M.Sc. (Conservation and Restoration Project Manager) and Robin Steenweg, M.Sc., Ph.D. Candidate (Wildlife Biologist) completed a site visit on June 23, 2015. Environmental Assessment Scientist, Jennifer Carpenter, M.Sc., P.Biol. completed a follow-up visit on July 21, 2015. Additional information was collected from discussion with relevant experts and through an analysis of existing data sources and aerial imagery.

## 5. Valued Components (VC)

### **Riparian Zone Valued Component**

The Ranch lies within the Foothills Parkland and Foothills Fescue natural subregions of Alberta (AEP 2006). Pekisko Creek runs through the property and flows adjacent to both Ranch buildings and agricultural fields on the north-central portion of the property. Part of the Highwood Drainage, the Creek is a trout spawning stream and tributary to fly fishing rivers, however, trout populations are dominated by introduced species (SRD 2006). Species identified in previous fish inventories include Cutthroat Trout (*Oncorhynchus clarkii*), Mountain Whitefish (*Prosopium williamsoni*), Rainbow Trout (*Oncorhynchus mykiss*), and the federally Threatened Bull Trout (*Salvelinus confluentus*) (AEP 2015a).

The Riparian Zone around Pekisko Creek supports a Cottonwood (*Populus spp.*) forest community (Figure 1). Favouring moist floodplains, these forests create important wildlife habitat and movement corridors around the rivers and creeks of Alberta's prairie (ESRD 2012; Boukall *pers comm*). Due to cracks and hollows, old and mature stands of cottonwoods provide roosting and nesting habitat for cavity dependent birds and bats (Swystun *et al.* 2007). Maintaining cottonwood forests that contain a broad age structure requires continued flood events to support regeneration and suckering (Rood *et al.* 2007).

A diverse bird community, including many cavity dependent species, exists within the Riparian Zone of the Ranch (Davis *pers comm*). Migratory birds are an important component of Canadian biodiversity and most birds and their nests and eggs are protected under the *Migratory Birds Convention Act, 1994* (MBCA). The Ranch is located within the provincially designated Prairie Falcon, Golden Eagle and Bald Eagle sensitive nesting raptor range (AEP 2015b). No existing nests or stick nests were located during the site visit, however, Bald Eagle regularly use the valley, and congregate on the ranch (Davis, *pers comm*). Open farm buildings are frequently used as roost and nest sites for Great Horned Owl, with evidence of a roost within the Hog Barn (Figure 1 #25) adjacent to the Riparian Zone. Suitable alternate roost sites also exist along the riparian corridor.

A lek (dancing ground), where Sharp-tailed Grouse gather in spring to mate is located within 2 km of the Ranch (AEP 2015a), however, no leks are known from the Ranch (Davis *pers comm*). Recommended setbacks for visual and noise disturbance at Sharp-tailed Grouse leks generally range from 400 m to 1 km (EC 2009, ESRD 2011a, ESRD 2011b, SK MOE 2014). As the closest active lek is greater than 2 km from the Project, it is unlikely to be disturbed by construction activities and no timing mitigation is required; however, the Riparian Zone following Pekisko Creek likely provides suitable over-winter habitat for Sharp-tailed Grouse.

### **Species at Risk Valued Component**

**Bull Trout:** Bull Trout require clean, sediment-free, groundwater-fed streams for spawning. Alteration that causes erosion, increased silt, or changes in flow or temperature affects the number of trout that hatch and their ability to survive to maturity. Other components contributing to declines and lack of recovery for the species include stream fragmentation and loss of riparian cover (ESRD 2012).

**Bats:** Site visits found evidence that resident bats, including Little Brown Myotis (*Myotis lucifugus*), roost in several of the outbuildings on the Ranch. Little Brown Myotis are endangered under Schedule 1 of the *Species at Risk Act*. On June 19, 2008, greater than 560 individual bats were counted emerging from a Little Brown Myotis maternity colony in the Pierson House (Figure 1, #28), and Coleman (*pers comm*) estimates that ~800 adult females bred in the attic in 2008. Large numbers continue to roost in the Pierson House (Davis, *pers comm*). In addition to bat use of buildings, the Riparian Zone contains suitable natural roost and colony sites. During a 2 year research program in 2007 and 2008, 119 bats were captured at the Ranch and at least four species were confirmed to roost, forage, or use the Ranch: Big Brown Bat (*Eptesicus fuscus*), Little Brown Bat (*Myotis lucifugus*), Hoary Bat (*Lasiurus cinereus*) and Silver-haired Bat (*Lasionycteris noctivagans*). Often under-represented in capture data, Coleman (*pers comm*) also suggests that Long-eared Myotis (*Myotis evotis*) are likely present at the Ranch.

**Barn Swallow:** Because of large population declines from the mid to late 1980s across Canada, Barn Swallows (*Hirundo rustica*), an aerial insectivore, have been assessed as Threatened by COSEWIC (2011). Artificial nesting structures (e.g., barns, bridges) provide important nesting habitat and the species often does well in open, human-modified, rural landscapes such as the Ranch.

### **Visitor Experience Valued Component**

No direct impacts to Visitor Experience are anticipated beyond temporary closures that may be required at construction areas. In the short term, aesthetics of the site may be compromised in small areas until project works are complete and new vegetation is established.

## **6. Effects Analysis**

Several Valued Components (VC) have the potential to be affected by the Project however no significant or long-term effect is anticipated provided mitigations to protect Cultural and Ecological Resources are effectively implemented.

### **Cultural Resources**

A *Cultural Resource Impact Analysis* (CRIA) will be completed as required for each Project component with appropriate mitigations, surveillance needs, and follow-up monitoring requirements determined for each location. All project design or restoration work with FHB requires approval from FHBRO and all ground disturbance work requires an archaeological assessment.

### **Ecological Resources**

**Riparian Zone:** Best Management Practices (BMP) that maintain the integrity of the Riparian Zone and prevent sedimentation of Pekisko Creek will mitigate effects on:

- Bull Trout habitat and on fish communities in Pekisko Creek, including Bull Trout;
- habitat for sensitive wildlife species including raptors and Sharp-tailed Grouse;
- wildlife movement corridors; and
- the Cottonwood forest community that supports natural bird nest and bat roost sites.

**Sensitive Raptors:** If activities occur within the Riparian Zone (Figure 1), following provincial recommendations for raptor nest surveys (ESRD 2013), activity timing, and set-back distances from active nests (ESRD 2011a) will mitigate effects of construction on these species.

**Migratory Birds:** To comply with the MBCA and prevent residual effects on migratory birds requires protection of bird habitat, of birds themselves, and of nests and eggs. Nests can be inadvertently

harmful or disturbed as a result of many activities, including clearing vegetation and direct disturbance of active nests on buildings. Best Management Practices that prevent incidental take will mitigate effects on migratory birds and their habitat, including swallows that nest on buildings.

**Bats in Buildings:** To prevent residual effects of Project activities on Little Brown Myotis, for each building undergoing renovation, complete a bat use assessment that includes (1) local knowledge of bat use in the building (2) assess each building for suitable habitat, (3) searching for signs of bat use (guano, individuals), (4) determining what kind of use occurs at the site (day roost, night roost, maternity roost, hibernacula). Results of the assessment will be used to determine the appropriate site-specific mitigations and prevent any residual effects of Project activities on Little Brown Myotis or other bat species. Mitigations follow a hierarchical approach: (1) avoidance – using timing windows, (2) minimization – modify project activities to minimize risk for disturbance, and (3) compensatory mitigation – provide alternative habitat such as bat boxes.

## 7. Mitigation Measures

### **Responsibilities**

- The Functional Manager of the Project (FMP) is responsible for including all applicable mitigation measures and conditions in project permits and authorizations.
- A Parks Canada Surveillance Officer (SO) is available during the implementation of the project and will provide surveillance and guidance on the application of mitigations.

### **General Best Management Practice**

- Comply with mitigations, surveillance needs, and follow-up monitoring requirements as determined in the *Cultural Resource Impact Analysis*.
- Meet all requirements of the Federal Heritage Building Review Office.
- Implement Best Management Practices (BMP), outlined in the Buildings Model Class Screening Mitigations as applicable (Appendix 2). The Model Class Screening Mitigations have several requirements. To meet these requirements, additional mitigation and information is included below:

### **Environmental Briefing**

- Employees must attend a briefing with a SO or designate before beginning work at the site to review and explain the mitigations that are conditions of the project approvals. Information on species at risk, including bats will be included in contractor environmental briefings.
- Where applicable, the FMP will ensure that the Sediment and Erosion Control, Drilling, Emergency Response, and Spill Response Plans are submitted to the SO prior to initiation of the work.

### **Revegetation Mitigations**

- In areas requiring revegetation, proposed seed mixes must be submitted to the SO and approved by a Parks Canada vegetation ecologist and/or by the Ranch Manager.

### **Riparian Zone Mitigations**

- The Riparian Zone is a designated *wildlife habitat, sensitive area, sensitive resource, undisturbed land, natural area, high risk area, and undeveloped area* under the mitigations (Appendix 2).

- Cottonwood trees are designated as *sensitive resources* under the Mitigation documents.
  - Do not remove or cut down Cottonwood (*Populus* spp.) trees.
  - In reclamation areas and in the Riparian Zone, protect suckering cottonwoods from destruction by equipment activities, mowing, or other vegetation clearing.
- Ensure appropriate erosion control measures as required in the Mitigations are in place to protect aquatic habitat and Pekisko Creek from sedimentation, particularly during work at the Slaughter House (Figure 4), as it currently sits within the Riparian Zone, and demolition of the Old Workshop, which is adjacent to Pekisko Creek.
- For directional drilling operations, a drilling plan will be developed by the contractor, addressing mud systems and handling, and contingency measures for circulation losses or dewatering of excavations. All mud containment structures must be situated outside the Riparian Zone (Figure 1). All drill mud must be disposed of appropriately off site. Drill mud containment and frac-out response materials and equipment must be available on site during operations (e.g., vacuum truck, sandbags, spill response equipment).

### Wildlife Mitigations

- Vegetation clearing can negatively impact nesting birds and/or bats in spring and summer. Avoid all vegetation removal during this time. If vegetation removal is scheduled to occur between **April 1 and August 31**, contact the SO to schedule pre-work surveys for migratory birds and nesting raptors.
  - If a nest is found during the pre-work surveys, the vegetated area will be left intact with a suitable sized buffer around it until nesting is finished and the SO authorizes that work may begin. Size of buffer is species dependent, and will be determined by the SO in consultation with a qualified professional biologist or park ecologist.
  - Pre-work surveys must occur within 7 days of the planned activity.
- Avoid activities at buildings known to support Barn or Cliff Swallow nests between **April 1 and August 31**. If activities occur between **April 1 and August 31**, the structure must be checked for active swallow nests immediately prior to work initiation.
  - If active nests are found, a suitable sized “no work” buffer will be established until the birds have finished nesting. Buffer size is dependent on the work activity, and shall be determined by the SO in consultation with a qualified professional biologist or Parks Canada wildlife biologist.
- Complete an assessment of bat use at each building and determine type of use and appropriate mitigations for that building. Mitigations follow a hierarchical approach: (1) avoidance – using timing windows, (2) minimization – modify project activities to minimize risk for disturbance, and (3) compensatory mitigation – provide alternative habitat such as bat boxes.
  - Maternity Roosts - No disturbance to the roost from **May 1 – September 30**. If the SO or qualified wildlife biologist determines that bats are absent from the site prior to September 30, then project activities may proceed. If the SO or qualified wildlife biologist determines that project activities will not disturb the roost, then project activities may proceed during the restricted timing window.
  - If disturbance begins outside the restricted timing window but will extend past May 1, or if disturbance permanently removes a maternity colony (e.g., building demolition,

sealing access), alternative habitat, such as bat boxes, must be installed before May 1. Parks Canada will provide the bat boxes.

- *Hibernacula* – Hibernacula are not expected, however, if building inspections discover a hibernacula, a site-specific plan must be developed to find alternatives and mitigation measures that will prevent disturbance or destruction of this critical habitat.

## 8. Public/Stakeholder Engagement & Aboriginal consultation

**8 a)** Indicate whether public/stakeholder engagement was undertaken in relation to potential adverse effects of the proposed project:

- No
- Yes (describe the process to involve relevant parties and indicate how comments were taken into consideration).

**8 b)** Indicate whether Aboriginal consultation was undertaken in relation to potential adverse effects of the proposed project:

- No
- Yes (describe the process to involve relevant parties and how the results were taken into consideration).

## 9. Significance of Residual Adverse Effects

No adverse effects from this project are anticipated, provided all mitigation measures are implemented and executed as required.

Through the mitigations to assess bat use of buildings by a qualified professional biologist or Parks Canada wildlife biologist prior to renovation, this project will increase Parks Canada's understanding of bat roosts and benefit the long-term management of the endangered Little Brown Myotis at the Ranch.

Flooding is a natural process on Pekisko Creek and is required for recruitment of a healthy Cottonwood forest community. Moving Ranch operations and buildings, like the Workshop, away from flood-prone locations will benefit the riparian community by reducing potential for disturbance in the floodplain through operating heavy equipment, building dykes, or other emergency measures.

The Project will improve operations and Visitor Experience opportunities.

## 10. Surveillance

- Surveillance is not required
- Surveillance is required (provide details such as the proposed schedule and the focus of inspections)

Surveillance is required for the following areas:

- General – Site surveillance during construction; SO provides feedback on mitigation compliance to FMP; SO supports FMP through information and guidance on the effective application of mitigations.
- Riparian Zone (Figure 1) – Monitoring of sediment and erosion control during activities.
- Species at Risk – Pre-disturbance assessment of bat use in buildings. As required monitoring of project works involving potential or confirmed bat habitat and migratory bird nests.

- Timing windows – Pre-disturbance assessment for raptors and migratory breeding birds; surveys prior to vegetation disturbance and of buildings that may support breeding swallows (April 1 to August 31).

## **11. Follow-up Monitoring**

Follow-up monitoring is:

- not required
- legally required (e.g. under the *Species at Risk Act* or *Fisheries Act*)

## **12. SARA Notification**

Notification is:

- not required
- required under the *Species at Risk Act* (outline the nature of and response to any notification).

### 13. Experts Consulted

<b>Department/Agency/Institution:</b> Parks Canada Agency	<b>Date of Request:</b> 10/08/2015
<b>Robert A. Sissons, M.Sc.</b> Waterton Lakes Field Unit PO Box 200, Waterton Park, AB T0K 2M0 robert.sissons@pc.gc.ca Telephone: 403-859-5137	<b>Title:</b> Vegetation Ecologist
<b>Expertise Requested:</b> Knowledge of vegetation community within the Project area.	
<b>Response:</b>  The vegetation community at building sites is relatively disturbed and includes non-native species. Recommend limiting footprint and activities to disturbed areas. To prevent noxious weeds, any seed mixes used in revegetation shall be consistent with the surrounding vegetation community. Recommend consultation with Ranch Manager on appropriate seed mixes. Natural revegetation rather than reseeding may be appropriate at some locations with small disturbance.	

<b>Department/Agency/Institution:</b> Parks Canada Agency	<b>Date of Request:</b> 10/08/2015
<b>Patrick Davis</b> Bar U Ranch National Historic Site Box 168, Longview, AB T0L 1H0 Patrick.davis@pc.gc.ca Telephone: 403-395-2299	<b>Title:</b> Operations Manager
<b>Expertise Requested:</b> Local knowledge of ranch activities, wildlife and vegetation.	
<b>Response:</b>  Comments made during site visit on 21 July 2015 <ul style="list-style-type: none"> <li>• A unique and diverse bird community is found around Pekisko Creek.</li> <li>• High concentrations of bald eagles are found on the Ranch with close to 30 individuals seen in early March/April around the time of calving.</li> <li>• Bats or sign of bats can be found on multiple buildings on the ranch with the largest numbers likely found in the Pierson house.</li> <li>• Pekisko Creek is an important trout spawning habitat. Spawning areas were affected by recent flood events, but large fish are slowly returning to Ranch.</li> <li>• Swallows used to be present in much higher numbers in the regional area surrounding the ranch.</li> <li>• Bird nests on buildings include Cliff Swallow (typically closed gourd shaped nests) and Barn Swallow (typically cup-shaped).</li> <li>• Has not seen large numbers of swallows nesting under the Pekisko Creek bridges but they may have used the site in the past.</li> </ul>	

<b>Department/Agency/Institution:</b> Alberta Environment and Parks	<b>Date of Request:</b> 13/08/2015
<b>Jennifer Earle, P.Biol.</b> Box 1420, 2nd fl Provincial Building 213 - 1 Street West, Cochrane, AB, T4C 1B4 e-mail: Jennifer.Earle@gov.ab.ca Telephone: 403-851-2211	<b>Title:</b> Fisheries Biologist, South Saskatchewan Region
<b>Expertise Requested:</b> Setback guidelines for work near riparian areas.	
Response:  Follow guidelines as described in 3 resources – 1) Stepping Back from the Water (ESRD 2012a), 2) Bull Trout Conservation Management Plan (ESRD 2012), and 3) Code of Practice Maps (ESRD 2012c).	

<b>Department/Agency/Institution:</b> Alberta Environment and Parks	<b>Date of Request:</b> 06/08/2015
<b>Brett Boukall</b> Box 1420, 2nd fl Provincial Building 213 - 1 Street West, Cochrane, AB, T4C 1B4 Tel: 403-851-2147 Email: brett.boukall@gov.ab.ca	<b>Title:</b> Senior Wildlife Biologist, Resource Management Program
<b>Expertise Requested:</b> Setback guidelines and sensitive wildlife resources present on the Ranch.	
Response:  Brett Boukall provided FWMIS wildlife observation data and cautioned that little survey work has been conducted in this area. He indicated that the Ranch is on the eastern edge of Grizzly bear range and care should be taken with any projects to reduce attractants. It is also an area frequented by elk, mule deer, and white-tailed deer with a nearby Sharp-tailed Grouse lek.	

<b>Department/Agency/Institution:</b> National University of Singapore (formerly University of Calgary)	<b>Date of Request:</b> 22/07/2015
<b>Joanna Coleman, B.Sc., M.Sc., Ph.D.</b> Lecturer, Bachelor of Environmental Studies Programme Department of Biological Sciences, Faculty of Science 14 Science Drive 4, Singapore 117543 <a href="mailto:dbscmj@nus.edu.sg">dbscmj@nus.edu.sg</a>	<b>Title:</b> Wildlife and Fisheries Biologist
<b>Expertise Requested:</b> Specific details of studies with bats at the Bar U Ranch National Historic Site in 2007 and 2008.	
Response:  The <i>Myotis lucifugus</i> colony was in the attic of an old building which, in 2008, was being used for office purposes – it was west of the bridge over the creek, not very far from the paddock where the Percherons were. On 19-jun 2008, my field assistant and I counted 560 individuals emerging from 3 entrance holes, but we estimate that the colony contained at least 1.5 times as many adult females because there were additional entrance holes that we found, but from which we couldn't count all the emerging bats. Based on my knowledge of the site (numbers of captures 2007-2008) and the amount of guano in the attic, this roost had been used for years.	

Over 2 years, I captured a total of 119 bats, making this one of my most productive sites for captures, especially when you consider that I captured a total of 1 975 bats over 154 nights in 30 sites. It yielded more captures than Chain Lakes Provincial Park, the nearest site to the south. I set mist nets across the creek (both sides of bridge), around the old barn where the sharing circle and teepee were and in the grove of cottonwoods to the north of the creek.

Species captured included:

SPECIES	NO	TIMING
<i>Eptesicus fuscus</i>	1	
<i>Lasiurus cinereus</i>	8	Migration only
<i>Lasionycteris noctivagans</i>	10	Migration only
<i>Myotis lucifugus</i>	100	

Acoustic data reveal that Bar U Ranch had the highest level of bat activity (passes/hr), taking date into account, of any of my sites outside the city of Calgary, except for one night in Chain Lakes, when I recorded more bats. They also revealed:

1. Even though I only captured migratory species during migration, the site was used by *Lasiurus cinereus* in the latter part of June (25-june), well before the onset of migration.
2. Bearing in mind that I could not distinguish between calls of *Eptesicus fuscus* and *Lasionycteris noctivagans*, the site is more important to this species complex than the capture data indicate.
3. The site is also used by *Lasiurus borealis* during migration
4. Bats are foraging in the site.
5. The site may also be used by *Myotis evotis*, but I couldn't distinguish among species of *Myotis*. I did capture *M. evotis* at Chain Lakes though, but in my experience, they are harder to capture than *M. lucifugus*.

Department/Agency/Institution: Parks Canada Agency	Date of Request: 23/07/2015
Expert's Name & Contact Information: Robin Steenweg, M.Sc. Ph.D. Candidate A/Wildlife Biologist Waterton Lakes National Park, Parks Canada Box 200, Waterton Park AB, T0K 2M0 robin.steenweg@pc.gc.ca Telephone   Téléphone 403-859-5182	Title: Wildlife and Fisheries Biologist
Expertise Requested: Site visit and knowledge of wildlife community within the Project area. Knowledge of species at risk management. Input for SARA review of Project activities.	
Response:  Provided details on wildlife use of the Ranch including species that use buildings such as swallows and bats. Assisted in developing potential mitigation strategies specific to buildings including information on bat life history, monitoring methods, timing of bat movements, efficacy of bat houses as alternative habitat and types of roosts present on the Ranch. Completed site visits and assisted in developing monitoring plan for buildings on the Ranch.	

<b>Department/Agency/Institution:</b> Parks Canada Agency	<b>Date of Request: :</b> 23/07/2015
<b>Expert's Name &amp; Contact Information:</b> Kimberly Pearson, M.Sc. Waterton Lakes Field Unit PO Box 200, Waterton Park, AB T0K 2M0 kimberly.pearson@pc.gc.ca Telephone 403.859.5123	<b>Title:</b> Conservation and Restoration Project Manager
<b>Expertise Requested:</b> Site visit and knowledge of wildlife and vegetation community within the Project area. Knowledge of species at risk management.	
<b>Response:</b>  Provided details on wildlife use of the Ranch including species that use buildings such as swallows and bats. Assisted in developing potential mitigation strategies specific to buildings including information on bat life history, monitoring methods, timing of bat movements, efficacy of bat houses as alternative habitat and types of roosts present on the Ranch. Completed site visits and assisted in developing monitoring plan for buildings on the Ranch.	

<b>Department/Agency/Institution:</b> Alberta Environment and Parks	<b>Date of Request:</b> 10/08/2015
<b>Expert's Name &amp; Contact Information:</b> ACIMS Database Search completed online by Jennifer Carpenter, Parks Canada Environmental Assessment	<b>Title:</b> ACIMS Search
<b>Expertise Requested:</b> Used online search tool to determine Element Occurrence within Bar U Ranch National Historic Site.	
<b>Response:</b>  No Element Occurrence for a species of management concern is reported within Bar U Ranch National Historic Site.	

## 14. Decision

Taking into account implementation of mitigation measures outlined in the analysis, the project is:

- not likely to cause significant adverse environmental effects.
- likely to cause significant adverse environmental effects.

*NOTE: If the project is identified as likely to cause significant adverse effects, CEAA 2012 prohibits approval of the project unless the Governor in Council (Cabinet) determines that the effects are justified in the circumstances. A finding of significant effects therefore means the project CANNOT go ahead as proposed.*

### FOR SARA REQUIREMENTS:

- There are no residual adverse effects to species at risk and therefore the SARA-Compliant Authorization Decision Tool was not required

**OR**, the SARA-Compliant Authorization Decision Tool ([Appendix 2](#)) was used and determined:

- There is no contravention of SARA prohibitions
- Project activities contravene a SARA prohibition and CAN be authorized under SARA
- Project activities contravene a SARA prohibition and CANNOT be authorized

## 15. Recommendation and Approval

<b>Prepared by:</b> EIA Author: Jennifer Carpenter, Environmental Assessment Coordinator, Waterton Lakes Field Unit	Date: 15/09/2015
<b>Recommended by:</b> Functional Manager of the Project: Michael Houldin, Project Manager, Waterton Lakes Field Unit	Date: 15/09/2015
<b>Recommended by:</b> Ranch Manager: Travis Weber, Bar U Ranch National Historic Site	Date: 24/09/2015
<b>Approved by:</b> Field Unit Superintendent: Joe Fontoura acting for Ifan Thomas, Waterton Lakes Field Unit	Date: 29/09/2015
Signature:  <i>&lt;original signed&gt;</i>	

## 16. National Impact Assessment Tracking System

- Project registered in [tracking system](#)
- Not yet registered (*CEAA 2012 requires PCA submit a report to Parliament annually. EIAs must be entered in the tracking system **by the end of April** to enable reporting.*)

**\*\*\*Ensure that all required mitigation measures and conditions (e.g. follow-up monitoring requirements) are included in project permits and authorizations\*\*\***

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**Appendix 1 Environmental Impact Analysis Tools: Effects Identification Matrix**

*Section A focuses on direct effects of the project and Section B on indirect effects that are caused by changes to the environment. Cultural Resources are not addressed in this matrix.*

A. Direct Effects		Natural Resources potentially directly affected by the proposed project				
Potential Effects if No Consideration or Mitigations are Applied.		Riparian Zone (including natural nests and roosts)	Species At Risk – Bull Trout	Species At Risk – Little Brown Myotis (Building Roosts)	Species At Risk – Barn Swallow (Nests on Buildings)	
		<b>Project Components</b>	Preparation / Construction / Operation / Decommissioning	Storage/laydown of materials & equipment	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Vegetation clearing, site prep	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Equipment access	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Structure demolition	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Disposal of waste/debris	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Drainage, de-watering	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Excavation	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Excavated materials storage	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Excavated materials transport	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Grading/contouring	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Backfilling	<input checked="" type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Operation of heavy equipment	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Transport of equipment / site access	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Use of Chemicals (e.g., paint, solvents, concrete work)	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Set up of temporary facilities	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Disturbance to exterior of buildings	<input type="checkbox"/>			<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Disturbance to roof/attic of buildings	<input type="checkbox"/>			<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Waste and debris disposal	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wastewater disposal	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Maintenance	<input type="checkbox"/>			<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Facility use (post construction)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Use/removal of temporary facilities	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Site clean-up	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		



	Re-vegetation	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Vehicle access	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Directional Drilling	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**B. Indirect Effects (all phases)**

Potential Effects if No Consideration or Mitigations are Applied.	Impacts as a result of changes to the environment					
	With respect to non-Aboriginal peoples:	With respect to Aboriginal peoples:		With respect to visitor experience		
	Health and socio-economic conditions	Health & socio-economic conditions	Current use of lands and resources for traditional purposes	Access & services	Recreation & accommodations	Safety
Could impacts to <u>Riparian Zone</u> lead to adverse effects on...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Could impacts to <u>species at risk</u> lead to adverse effects on...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>



**Appendix 2: Best Management Practices  
Model Class Screening Mitigations**

**Sub-Class 2: Buildings: Mitigations for reducing impacts of service line projects. Adapted for the Bar U Ranch National Historic Site.**



<b>All Activities</b>	
<p>Site Specific Notes &amp; Requirements</p> <p>These site specific requirements apply to all Project phases.</p>	<p><b>Phone Numbers</b></p> <ol style="list-style-type: none"> <li>1. Emergency phone numbers and project contact numbers will be included in all contractor safety plans. The Functional Manager of the Project (FMP) will provide current Parks Canada contact information to contractors prior to project activities.</li> </ol> <p><b>Responsibilities</b></p> <ol style="list-style-type: none"> <li>2. The FMP is responsible for including all applicable mitigation measures and conditions in project permits and authorizations.</li> <li>3. A Parks Canada Surveillance Officer (SO) is available during the implementation of the project and will provide surveillance and guidance on the application of mitigations.</li> </ol> <p><b>General Best Management Practice</b></p> <ol style="list-style-type: none"> <li>4. Comply with mitigations, surveillance needs, and follow-up monitoring requirements as determined in Cultural Resource Impact Analysis.</li> <li>5. Meet all requirements of the Federal Heritage Building Review Office.</li> <li>6. Comply with all mitigations, surveillance needs, and follow-up monitoring requirements as determined in the Archaeological Assessment.</li> </ol> <p><b>Environmental Briefing</b></p> <ol style="list-style-type: none"> <li>7. Employees must attend a briefing with a SO or designate before beginning work at the site to review and explain the mitigations that are conditions of the project approvals. Information on species at risk, including bats will be included in contractor environmental briefings.</li> <li>8. Where applicable, the FMP will ensure that the Sediment and Erosion Control, Drilling, Emergency Response, and Spill Response Plans are submitted to the SO prior to initiation of the work.</li> </ol> <p><b>Revegetation Mitigations</b></p> <ol style="list-style-type: none"> <li>9. In areas requiring revegetation, proposed seed mixes must be submitted to the SO and approved by a Parks Canada vegetation ecologist and/or by the Ranch Manager.</li> </ol> <p><b>Riparian Zone Mitigations</b></p> <ol style="list-style-type: none"> <li>10. The Riparian Zone (Figure 1) is a designated wildlife habitat, sensitive area, sensitive resource, undisturbed land, natural area, high risk area, and undeveloped area under the Mitigations.</li> <li>11. Cottonwood trees are designated as sensitive resources under the Mitigation documents.             <ol style="list-style-type: none"> <li>a. Do not remove or cut down Cottonwood (<i>Populus spp.</i>) trees.</li> <li>b. In reclamation areas and in the Riparian Zone, protect suckering cottonwoods from destruction by equipment activities, mowing, or other vegetation clearing.</li> </ol> </li> <li>12. Ensure appropriate erosion control measures as required in the Mitigations are in place to protect aquatic habitat and Pekisko Creek from sedimentation, particularly during work at the Slaughter House (Figure 4), as it currently sits within the Riparian Zone, and demolition of the Old Workshop, which is adjacent to Pekisko Creek.</li> <li>13. For directional drilling operations, a drilling plan will be developed by the contractor, addressing mud systems and handling, and contingency measures for circulation losses or dewatering of excavations. All mud containment structures must be situated outside the Riparian Zone (Figure 1). All drill mud must be disposed of appropriately off site. Drill mud containment and frac-out response materials and equipment must be available on site during operations (e.g., vacuum truck, sandbags, spill response equipment).</li> </ol>



**Sub-Class 2: Buildings: Mitigations for reducing impacts of service line projects. Adapted for the Bar U Ranch National Historic Site.**

<b>All Activities cont.</b>	
<p>Site Specific Notes &amp; Requirements</p> <p>These site specific requirements apply to all Project phases.</p>	<p><b>Wildlife Mitigations</b></p> <p>14. Vegetation clearing can negatively impact nesting birds and/or bats in spring and summer. Avoid all vegetation removal during this time. If vegetation removal is scheduled to occur between <b>April 1 and August 31</b>, contact the SO to schedule pre-work surveys for migratory birds and nesting raptors.</p> <ol style="list-style-type: none"> <li>a. If a nest is found during the pre-work surveys, the vegetated area will be left intact with a suitable sized buffer around it until nesting is finished and the SO authorizes that work may begin. Size of buffer is species dependent, and will be determined by the SO in consultation with a qualified professional biologist or park biologist.</li> <li>b. Pre-work nesting surveys must occur within 7 days of the planned activity.</li> </ol> <p>15. Avoid activities at buildings known to support Barn or Cliff Swallow nests between <b>April 1 and August 31</b>. If activities occur between April 1 and August 31, the structure must be checked for active swallow nests immediately prior to work initiation.</p> <ol style="list-style-type: none"> <li>a. If active nests are found, a suitable sized “no work” buffer will be established until the birds have finished nesting. Buffer size is dependent on the work activity, and shall be determined by the SO in consultation with a qualified professional biologist or park biologist.</li> </ol> <p>16. Complete an assessment of bat use at each building and determine type of use and appropriate mitigations for that building. Mitigations follow a hierarchical approach: (1) avoidance – using timing windows, (2) minimization – modify project activities to minimize risk for disturbance, and (3) compensatory mitigation – provide alternative habitat such as bat boxes.</p> <ol style="list-style-type: none"> <li>a. <u>Maternity Roosts</u> - No disturbance to the roost from <b>May 1 – September 30</b>. If the SO or qualified wildlife biologist determines that bats are absent from the site prior to September 30, then project activities may proceed. If the SO or qualified wildlife biologist determines that project activities will not disturb the roost, then project activities may proceed during the restricted timing window.</li> <li>b. If disturbance begins outside the restricted timing window but will extend past May 1, or if disturbance permanently removes a maternity colony (i.e., building demolition), alternative habitat, such as bat boxes, must be installed before May 1. Parks Canada will provide the bat boxes.</li> <li>c. <u>Hibernacula</u> – Hibernacula are not expected, however, if bat assessments discover a hibernacula, a site-specific plan must be developed to find alternatives and mitigation measures that will prevent disturbance or destruction of this critical habitat.</li> </ol>



**Sub-Class 2: Buildings: Mitigations for reducing impacts of service line projects. Adapted for the Bar U Ranch National Historic Site.**

Activity	Potential Impacts	Mitigation Measures
<b>General Activities</b>		
Materials handling / storage	Dust production	1. Wet down dry, exposed soils or cover with tarps. Do not use oil based dust suppressants. 2. Ensure materials being stored or transported are covered with tarps or equivalent material (e.g., polyethylene sheeting, tarps, vegetation).
	Damage to adjacent vegetation	3. Protect undisturbed land by only stockpiling materials on heavy canvas or polypropylene tarpaulins to protect native vegetation (e.g., canvas, fabric cloth). Excavated material will not be permitted to damage or bury plant material that is to be retained on the construction site or in adjacent areas.
	Decreased aesthetics (visual) and public safety	4. Materials will be stored within the delineated confines of the work site.
	Contamination of soil and water from accidental spill	5. Prepare an appropriate Spill Response Plan. In the event of emergency operations (as defined in Section 8.11 of the MCSR), call Emergency Services and/or Parks Canada at the phone numbers indicated on Site Specific Notes. All spills must be reported to Parks Canada. 6. Avoid work in high risk areas, particularly in areas of high water table, steep slopes or in close proximity to streams. 7. Have spill containment equipment on-hand and ensure that all personnel are trained in their use. 8. Ensure all construction equipment is free of leaks from oil, fuel or hydraulic fuels. 9. The crossing of any waterbody (including wetlands) by construction equipment, or the use of such equipment within waterbodies is strictly prohibited unless prior approval has been confirmed. 10. Designate refuelling areas at least 100 m away from any water body. Stationary stores of fuel will be bermed with an impermeable liner to contain 125% of the anticipated fuel quantity. Any contaminated rainwater will be moved out of the park. 11. Refuelling activities should not be conducted where run-off could carry contaminants into drainage pathways (including storm sewers). 12. Equipment will be fuelled on hardened surfaces. 13. Dispose contaminated materials at provincially certified disposal sites outside of the site. No treatment of contaminated soils (e.g., bioremediation) is allowed in the site. All applicable documentation demonstrating proper disposal will be provided to Parks Canada.

**Sub-Class 2: Buildings: Mitigations for reducing impacts of service line projects. Adapted for the Bar U Ranch National Historic Site.**



Activity	Potential Impacts	Mitigation Measures
<b>General Activities</b>		
	Damage to adjacent vegetation	Undeveloped areas adjacent to development site: 14. Careful machine operation is required to ensure that damage to surrounding vegetation does not occur. 15. Excavated material must not be permitted to bury plant material that is to be retained. Fences (e.g., silt, snow) may be used to prevent excavated material escaping into the surrounding vegetation. 16. Fencing around trees to be retained must be installed beyond the tree's drip line prior to commencement of site work.
Equipment operation and maintenance cont.	Weed invasion	17. All construction equipment from outside a park will be steam cleaned (or if not available use high pressure wash) prior to arrival to minimize the risk of introducing weeds. Equipment will be free of organic material (e.g., soil, weeds). 18. Construction equipment from outside the site will not be washed while on site.
	Sensory disturbance to wildlife	19. Use existing roadways, pathways and previously disturbed areas for site access and travel within the site. 20. Educate workers not to enter wildlife corridors. 21. Confine "noise" activities to hours set out in Site Specific Notes.
	Aesthetics	22. All heavy equipment operating on paved surfaces should be equipped with street pads. Damage to paved surfaces will be restored to original conditions.
	Increased traffic levels	23. Time construction activities to minimize vehicle conflicts on access roads and/or use flagging personnel.
Waste management (general)	Contamination of soil and water from accidental spill or improper disposal	24. No rock, silt, cement, grout, asphalt, petroleum product, lumber, vegetation, domestic waste, or any deleterious substance shall be placed or allowed to disperse into any stream, river, pond, sewer, or other water course. Excess material will not be disposed of on or adjacent to the site. 25. The crossing of any waterbody by construction equipment is strictly prohibited unless prior written approval from the SO is obtained.
	Aesthetics (visual and smell)	26. Collect all waste, store appropriately and dispose trade waste and garbage at designated locations. 27. All garbage and food must be stored in bear-proof bins. 28. Keep site maintained in a tidy condition, free from the accumulation of waste products, debris and litter. 29. Construction sites must undergo thorough clean-up, including removal of general litter, survey stakes and flagging tape at project completion.

Sub-Class 2: Buildings: Mitigations for reducing impacts of service line projects. Adapted for the Bar U Ranch National Historic Site.



Activity	Potential Impacts	Mitigation Measures
<b>General Activities</b> cont.		
Hazardous materials collection and handling	Contamination of soil or water	<p>30. Prepare an appropriate Spill Response Plan. In the event of emergency operations (as defined in Section 8.11 of the MCSR), call Emergency Services and/or Parks Canada at the phone numbers indicated in the Site Specific Notes. All spills of any volume must be reported to Parks Canada.</p> <p>31. If any hazardous waste is uncovered during excavation/construction it must be investigated, source identified, properly removed and disposed to an approved landfill.</p> <p>32. All toxic/hazardous materials will be identified during demolition and will be handled as required under the Canadian Environmental Protection Act, Transportation of Dangerous Goods Act and Workplace Hazardous Materials Information Service.</p>
Hazardous materials collection and handling cont.	Contamination of soil or water	<p>33. Dispose of contaminated materials at provincially certified disposal sites outside of a park. No treatment of contaminated soils (e.g., bioremediation) is allowed in the park. All applicable documentation demonstrating proper disposal must be provided to Parks Canada.</p> <p>34. All hazardous materials and wastes will be clearly labelled with WHMIS labels and information.</p> <p>35. Spill contingency plans, equipment and supplies (to clean up 110% of the site's largest possible fuel/chemical spill) will be present on-site at all times and employees trained in their use.</p> <p>36. All fuels, oils, lubricants and other petrochemical products will not be stored within 100 meters of any waterbody (including wetlands).</p> <p>37. Do not store fuels, lubricants, solvents, paints, and other chemicals on site overnight except within enclosed locations secured with lock and key. Storage should be on a bermed, impervious site (secondary containment). An additional permit may be necessary.</p> <p>38. No rock, silt, cement, grout, asphalt, petroleum product, lumber, vegetation, domestic waste, or any deleterious substance shall be placed or allowed to disperse into any stream, river, pond, storm or sanitary sewer, or other water course.</p> <p>39. All construction sites will be equipped with containers suitable for the secure, temporary storage of hazardous wastes. Hazardous wastes will be separated by type. Follow all applicable regulations and codes for the management and handling of hazardous wastes.</p>
All Activities	Public safety	<p>40. If equipment infringes on driving lane, flag persons are required.</p> <p>41. All roadway signage must be in accordance with provincial standards. Signs must be bilingual or symbolic.</p> <p>42. The contractor is responsible for site security at all times.</p>



**Sub-Class 2: Buildings: Mitigations for reducing impacts of service line projects. Adapted for the Bar U Ranch National Historic Site.**

Activity	Potential Impacts	Mitigation Measures
<b>Pre-planning</b>		
Site investigation, including geotechnical investigation	Sensory disturbance, disturbance of archaeological resources, slope failure, sedimentation	43. Conduct Phase I Environmental Site Assessment, if not already completed for the site, and additional site surveys, test pits, bore holes etc. if necessary. 44. Minimize the time boreholes remain open to reduce small terrestrial wildlife mortality. Properly seal boreholes and fit PVC pipes as per provincial/federal standards. 45. Use existing roadways or disturbed areas for site access and travel within the site. 46. Follow appropriate excavation mitigation measures for geotechnical investigation (see mitigations for “Trenching”). 47. All wells must be registered as per provincial standards. 48. Drilling shields must be environmentally friendly. 49. Unsuccessful drill holes must be properly sealed and capped as per the provincial standards. 50. Collection containers are required for all drill cuttings. Drilling mud will not be disposed of in the park. 51. A copy of the drilling log will be submitted to Parks Canada Environmental Assessment Office when complete.
General planning activities specific to all building projects.	Runoff / sedimentation; soil contamination	52. Prepare an Emergency Response Plan for the worst case, i.e., heavy rainfall and runoff events, high winds, spills, fires, etc. 53. In the event of emergency operations (as defined in Section 8.11 of the MCSR), call Emergency Services and/or Parks Canada. 54. Ensure all activities are conducted at least 30 m from waterbodies and outside the Riparian Zone. 55. Project activities inside the Riparian Zone require on-site surveillance by the SO or designate.
	Dust production	56. Have a water source available to wet down exposed soil and dry areas.
	Wind and water erosion	57. Prepare a satisfactory Sediment and Erosion Control Plan covering all construction and restoration periods. 58. Acquire necessary sediment control equipment (i.e., landscaping fabric, sediment fences, etc.) and install prior to construction. 59. Extra planning should be used for areas with silty deposits and sloped areas with sandy deposits.
	Compaction of soils	60. Identify soils susceptible to compaction (fine textured and organic soils). 61. In sensitive areas, use equipment of low bearing weight, low PSI tires, or tracked vehicles. 62. Building material storage must be contained in one area of the site and clearly flagged to prevent soil compaction and reduce area of disturbance.



**Sub-Class 2: Buildings: Mitigations for reducing impacts of service line projects. Adapted for the Bar U Ranch National Historic Site.**

Activity	Potential Impacts	Mitigation Measures
<b>Pre-planning cont.</b>		
General planning activities specific to all building projects.	Slope failure	<p>63. Assess slope stability (based on slope length, soil texture, steepness, soil depth) and adjust activities to avoid these areas if possible. Use appropriate setbacks.</p> <p>64. Pay particular attention when planning for slopes of Class 6 (15-30%) or greater, especially where soils are shallow and likely to move with disturbance.</p>
	Habitat loss and fragmentation; or encroachment on wildlife movement corridor	<p>65. Identify wildlife habitat that may be impacted by activities and avoid sensitive areas, including wetlands.</p> <p>66. Ensure only necessary vegetation is removed and delineate areas to be avoided with biodegradable flagging tape and/or temporary fences.</p>
	Sensory disturbance and mortality of wildlife	<p>When working adjacent to natural areas (Riparian Zone):</p> <p>67. According to the wildlife that may be present, schedule high noise level activities and other intrusive construction activities to avoid critical life stages (breeding, nesting, rearing, migration). Additional wildlife concerns are discussed in Site-Specific mitigations section. Consult with Parks Canada to discuss any localized wildlife concerns.</p> <p>68. Consider posting wildlife signs to reduce vehicle speeds and increase driver awareness near construction areas where wildlife mortality has or is likely to occur.</p> <p>69. Educate workers that feeding or harassing wildlife is not permitted. Keep the site free of food scraps, and dispose of garbage in bear proof containers.</p>
	Disturbance of archaeological resources	<p>70. All mitigations determined through Archaeological Overview Assessment will apply. In all cases, if cultural resources are found, stop work and report finding to Parks Canada.</p>
	Increased water and energy consumption	<p>71. Identify water and energy conservation opportunities for building design (e.g., low flow fixtures, low energy heating and lighting) and outdoor requirements (e.g., yard lighting, drip irrigation systems).</p>
	Public safety	<p>72. Outline traffic control measures and assess the need for flagging personnel.</p> <p>73. Call utility line companies to identify infrastructure locations.</p>
	Reduced aesthetics (noise and visual)	<p>74. Evaluate the site layout, access routes and construction activities to minimize their visual impact.</p> <p>75. Plan work to confine “noise” activities to the approved work schedule.</p>



**Sub-Class 2: Buildings: Mitigations for reducing impacts of service line projects. Adapted for the Bar U Ranch National Historic Site.**

Activity	Potential Impacts	Mitigation Measures
<b>Site Preparation</b>		
General planning activities specific to all building projects.	Dust production	76. Wet down dry, exposed soils, particularly during windy periods. 77. Ensure materials being stored or transported are covered with tarps or equivalent material. 78. Minimize grading and excavation on windy days to limit dust production.
	Runoff / sedimentation	79. Halt construction activity on exposed soil during events of high rainfall intensity and runoff and refer to the Sediment and Erosion Control Plan. Periodically inspect and repair, if necessary, erosion control structures. 80. All excavations will remain free of water (see mitigations for “Dewatering”). 81. Cover stockpiles of soil with polyethylene sheeting, tarps, or vegetative cover. Sites close to waterbodies, but not closer than 30 m: 82. To ensure site run-off is minimized, control overland flow up and down gradient of excavated areas by use of effective diversion ditches, bales, vegetation filter strips, or sediment traps.
	Wind and water erosion (particularly in areas with silty deposits or sloped areas)	83. Minimize grubbing. 84. Protect exposed soils with coarse granular materials, mulches, straw, or landscaping fabric along drainage pathways. 85. Cover stockpiles of soil with polyethylene sheeting, tarps, or vegetative cover.
	Damage to adjacent vegetation, loss of native vegetation	86. Minimize area cleared. Clearly mark area to be cleared with biodegradable flagging tape and/or temporary fences. 87. Retain vegetation barriers where possible, especially trees and shrubbery. 88. Ensure sensitive resources identified in the Site Specific Notes of the mitigations are protected (e.g., Cottonwood Trees). 89. See the Site Specific Notes for revegetation mitigations. 90. Fencing around trees to be retained must be installed beyond the tree’s drip line before starting work on site. 91. Where required obtain permit before removing any trees. See Site Specific Notes for additional vegetation clearing mitigations. 92. Ensure excavated material does not damage or bury plant material that is to be retained on the site or in adjacent areas. 93. Trees are to be cut so they fall inside the cleared perimeters. 94. Care must be taken during grubbing and stripping to ensure trees and roots on the edge of the cleared area are not disturbed. 95. Grubbing and stripping may not be permitted on steep slopes to reduce the potential for erosion.



**Sub-Class 2: Buildings: Mitigations for reducing impacts of service line projects. Adapted for the Bar U Ranch National Historic Site.**

<b>Activity</b>	<b>Potential Impacts</b>	<b>Mitigation Measures</b>
<b>Site Preparation cont.</b>		
General planning activities specific to all building projects. cont	Loss of topsoil and/or topsoil subsoil mixing	96. Topsoil separation is required. 97. Topsoil will be stored away from any slopes, subsoils, spoil material, construction activities and day-to-day operations.
	Slope failure	98. Avoid work on steep slopes unless absolutely necessary. 99. In areas with slopes of Class 6 (15-30%) or greater, especially where shallow soils overlie bedrock use appropriate geo-technical control measures to stabilize slopes. Consult occupational health and safety guidelines.
	Waste management	100. Large timber (trees larger than 10 cm DBH) shall be cut into blocks not to exceed 35 cm and stockpiled for re-use as firewood. All tree removal requires permits. Cottonwood trees 101. Smaller trees and other woody material should be disposed of as indicated in Site Specific Notes. 102. Dispose of trade waste at an appropriate landfill. 103. Where available, construction waste will be separated to maximize recycling opportunities. 104. Ensure cleared vegetation being stored or transported is covered with tarps or equivalent material. 105. Excess fill will be removed to a designated site.
	Reduced aesthetics (visual)	106. Minimize the time cleared vegetation remains at the work site. 107. Burning or burial of waste is not permitted.
	Other	108. Any trench/pit left over night will be fenced and signed to restrict access by people and/or wildlife. 109. Location of service lines will be identified before excavation begins. 110. Should cultural artefacts be discovered during excavation, work will stop and notify Parks Canada. All mitigations identified in Archaeological or Cultural assessments will be followed.
<b>Construction</b>		
Dewatering	Sedimentation; Erosion; Damage to vegetation	111. Dewatering is not permitted into any waterbody. Dewater is permitted across previously disturbed vegetation or natural vegetation if the following conditions are met: 112. Sediment controls are used (i.e., silt fences, silt bags, etc.). 113. Water velocity is controlled to dissipate energy, prevent soil erosion and allow for infiltration. 114. Dewatering structures are continuously monitored to ensure no damage is being done to soil or vegetation. 115. Dewatering into the sanitary or stormwater system is restricted as indicated in Site Specific Notes. 116. Sediment from the traps may be used as fill on the construction site.
	Damage to adjacent vegetation	117. For undeveloped areas adjacent to development site, ensure water and sediment is directed away from natural areas.



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Activity	Potential Impacts	Mitigation Measures
<b>Construction cont.</b>		
Construction (sandblasting)	Sensory disturbance and mortality of wildlife	118. When working adjacent to natural areas: 119. According to the wildlife that may be present, schedule, high noise level activities and other intrusive construction activities to avoid critical life stages (breeding, nesting, rearing, migration). Additional wildlife concerns are discussed in Mitigations section of the BIA. Consult with Parks Canada to discuss any localized wildlife concerns. 120. Confine “noise” activities to hours set out in Site Specific Notes. 121. Consider posting wildlife signs to reduce vehicle speeds and increase driver awareness near construction areas where wildlife mortality has or is likely to occur. 122. Educate workers that feeding or harassing wildlife is not permitted.
	Dust production (sand blasting)	123. Minimize sandblasting. Sandblasting should only remove loose paint to provide a clean surface for the new paint to adhere to. 124. Confine activity to days with little or no wind and use physical barriers (e.g., shrouds, scaffold canopies) to contain dust.
Construction (painting and paint stripping)	Contamination of soil and water from accidental spill of paint, stripping compounds, or thinner	125. Prepare an appropriate Spill Response Plan and ensure that spill contingency equipment and measures are in place before work begins. 126. Ensure paint is stored appropriately to prevent spillage. 127. In the event of emergency operations (as defined in Section 8.11 of the MCSR), call Emergency Services and/or Parks Canada at the phone numbers indicated on Site Specific Notes. 128. Waste oil based paints must be transported out of the Park in accordance with the Federal and Provincial <i>Transportation of Dangerous Goods Act</i> and Regulations. 129. Dispose of contaminated materials at provincially certified disposal sites outside of the park. No treatment of contaminated soils (e.g., bioremediation) is allowed in the park. All applicable documentation demonstrating proper disposal must be provided to Parks Canada.
<b>Site Servicing (Subsurface)</b>		
	Thawing	130. Only use ground thawing measures in emergency situations. 131. Minimize use of propane for thawing by scheduling to avoid mid-winter frozen conditions.
Trenching, Utilities excavation and removal	Runoff / sedimentation	132. To ensure site run-off is minimized at times of heavy rainfall, control overland flow up and down gradient of exposed areas by use of effective diversion ditches, bales, vegetation filter strips, or sediment traps.
	Wind and water erosion	Particularly in areas with silty deposits and sloped areas with sandy deposits: 133. Use interceptor ditches or berms (bales) up-gradient of excavation to divert overland flow around exposed soils 134. Line steep ditches with filter fabric, rock or polyethylene lining to prevent channel erosion.
	Wildlife mortality	135. All trenches or excavations to be left unattended overnight must be fenced.



**Sub-Class 2: Buildings: Mitigations for reducing impacts of service line projects. Adapted for the Bar U Ranch National Historic Site.**

Activity	Potential Impacts	Mitigation Measures
<b>Site Servicing (Subsurface) cont.</b>		
	Loss of topsoil and/or topsoil subsoil mixing	136. Topsoil separation is required. Disturbed areas should be reclaimed with stockpiled topsoil. 137. Minimize the amount of time the trench remains open. 138. Top soils will be stored away from any steep slopes, subsoils, spoil material, construction activities and day-to-day operations. 139. Roach piles on reclaimed linear disturbances will be minimized to the extent possible. 140. Backfilling should allow for settling to prevent depressions.
	Slope failure	141. Avoid work on steep slopes unless absolutely necessary. 142. In areas with slopes of Class 6 (15-30%) or greater, especially where soils are shallow, use appropriate geo-technical control measures to stabilize slopes. Consult occupational health and safety guidelines.
<b>Decommissioning and Abandonment</b>		
Demolition activities / foundation removal	Dust production	143. Wet down dry, exposed soils. 144. Ensure fine materials being stored or transported are covered with tarps or equivalent material.
	Discovery of existing soil contamination	145. If any contamination is found, cease work immediately. Inform the building site supervisor and, if necessary, implement Emergency Response Plan.
	Loss of topsoil and/or topsoil subsoil mixing	146. Topsoil separation is required. Disturbed areas should be reclaimed with stockpiled topsoil. 147. Top soils will be stored away from any grades, subsoils, spoil material, construction activities and day-to-day operations.



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<b>Activity</b>	<b>Potential Impacts</b>	<b>Mitigation Measures</b>
<b>Site Reclamation or Restoration</b>		
Grading	Dust production	148. Wet down dry, exposed soils. 149. Ensure materials being stored or transported are covered with tarps or equivalent material.
	Runoff / sedimentation	150. Halt grading on exposed soil during events of high rainfall intensity and runoff. Consult the Sediment and Erosion Control Plan. 151. Cover stockpiles of soil with polyethylene sheeting, tarps, or vegetative cover. Establish containment structures to trap runoff.
	Wind and water erosion	Particularly in areas with silty deposits and sloped areas with sandy deposits: 152. Protect exposed soils with coarse granular materials, mulches, or straw along drainage pathways. 153. Recontour slopes to pre-disturbance conditions.
Revegetation	Runoff / sedimentation / erosion	154. Initiate replanting of disturbed areas immediately after construction is completed. 155. Use stockpiled topsoil to facilitate reclamation.
	Compaction of soils	156. Cultivate affected areas before reclaiming, especially areas with fine textured or organic soils.
	Weed invasion	157. Revegetate exposed areas at first opportunity. 158. Ensure topsoil is clean and weed free. If clean fill is unavailable, monitor the site, and treat as needed, to ensure appropriate weed control for 3 years following landscaping (applicable to construction crews only). 159. Revegetation mitigations are outlined in the Site Specific Notes. 160. An approved current integrated pest management plan must be in place.
Herbicide/ fertilizer use	Contamination of soil or water	161. Accurately assess the need for chemicals during site revegetation. An approved current integrated pest management plan must be in place. 162. Do not use fertilizers and herbicides in areas where residue or run-off may enter a waterbody or drainage pathway. 163. Do not over water.
Paving	Dust production	164. Wet down dry, exposed soils. 165. Ensure fine materials being stored or transported are covered with tarps or equivalent material.
	Contamination of soil or water	166. Prepare an appropriate Spill Response Plan. In the event of emergency operations (as defined in Section 8.11 of the MCSR), call Emergency Services and/or Parks Canada at the phone numbers indicated on Site Specific Notes. 167. Use an environmentally friendly tack coat and do not apply if rain is in the forecast.
	Noise disturbance and mortality of wildlife due to increased traffic	168. According to the wildlife that may be present, schedule high noise level activities and other intrusive construction activities to avoid critical life stages (breeding, nesting, rearing, and migration). Additional wildlife concerns are discussed in Site Specific Notes. Consult with Parks Canada to discuss any localized wildlife concerns. 169. If wildlife mortality is likely to increase due to traffic, post signs to reduce vehicle speeds and increase driver awareness. 170. Educate workers that feeding or harassing wildlife is not permitted.



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<b>Underground Services</b>		
<b><i>Installation, Maintenance and Repair</i></b>		
Trenching, backfilling, compacting, grading	Dust production / aesthetics	<p>171. Minimize the amount of open trench at any given time.</p> <p>172. Cover stockpiles of soil with polyethylene sheeting, tarps, or vegetative cover.</p> <p>173. Wet down dry, exposed soils, particularly during windy periods.</p> <p>174. Minimize trenching, backfilling and compacting on windy days.</p>
	Runoff / sedimentation	<p>175. Assess slopes stability (based on slope length, soil texture, steepness, soil depth).</p> <p>176. Use appropriate geo-technical control measures to stabilize slopes.</p> <p>177. All excavations will remain free of water (see mitigations for “Dewatering”).</p> <p>Sites close to waterbodies, but not closer than 30 m:</p> <p>178. To ensure site runoff is minimized, control overland flow up and down gradient of excavated areas by use of effective diversion ditches, bales, vegetation filter strips, or sediment traps.</p> <p>179. Stockpiles related to excavations will be stored a minimum of 2 m from embankments, slumps, water bodies and containment sources to prevent material loss or degradation.</p> <p>180. Following excavations, lightly tamp disturbed areas to minimize slumping and potential pooling or water.</p>
	Non-point source hydrocarbon contamination	<p>181. When constructing and upgrading storm sewers, install oil sumps.</p>
	Erosion (wind and water)	<p>182. Install trench breakers of impervious material to direct groundwater seepage to the surface.</p> <p>183. Minimize the length of exposed trench and the time of excavated soil exposure.</p> <p>184. Use interceptor ditches or berms (bales) upgradient of construction to divert overland flow around exposed soil surfaces.</p> <p>185. Line steep ditches with filter fabric, rock or polyethylene lining to prevent channel erosion.</p>
	Trench collapse	<p>186. Delay trenching until just prior to lowering-in pipeline.</p> <p>187. Use trench reinforcement device (i.e. cage), if possible.</p>
	Compaction	<p>188. Compact soil to approximate preconstruction conditions while allowing for settling.</p>
	Habitat loss, fragmentation, wildlife mortality	<p>189. Minimize the length of open trench, and the time a trench is open to reduce its affect as a barrier or trap for terrestrial wildlife.</p> <p>190. Fence trench if it is to be left unattended overnight.</p>



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<b>Aboveground Services</b>		
<b><i>Installation, Maintenance and Repair</i></b>		
<b>Activity</b>	<b>Potential Impacts</b>	<b>Mitigation Measures</b>
Removal of poles and lines	Compaction	191. Compact soil to approximate precondition conditions while allowing for settling. 192. Select appropriate equipment, especially in erosion/slump prone areas. If possible, use wide tracked equipment, rubber tired vehicles and low bearing pressure weight equipment in sensitive areas.
Digging holes for poles	Slope failure	193. Assess slopes stability (based on slope length, soil texture, steepness, soil depth). 194. Use appropriate geo-technical control measures to stabilize slopes.
	Loss of or damage to vegetation, weed invasion	195. Protect undisturbed land by only stockpiling materials on heavy canvas or polypropylene tarpaulins to protect native vegetation. Excavated material should not be permitted to damage or bury plant material that is to be retained on the RoW or in adjacent areas.
Planting poles and stringing , decommissioning poles	Heavy equipment and excavation activities may result in soil compaction, loss of organic matter, erosion and loss of topsoil	196. Soil that has been temporarily moved away from poles and placed on tarps will be shovelled back against the pole and lightly tamped to prevent slumping or pooling of water.