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# Basic Impact Analysis

Highway 263 Paving

Prince Albert National Park

May 2015



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Canada

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Canada



**1. PROJECT TITLE**

Highway 263 Pavement Rehabilitation

**2. PROJECT LOCATION**

Prince Albert National Park, Saskatchewan

**3. PROJECT SITE(S)**

Highway 263, from Waskesiu to the south park boundary. ( See Map 1 )

**4. PROPONENT**

Michael Caswell

**5. PROPONENT CONTACT INFORMATION**

Michael Caswell

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**6. PROJECT DATES**

Commencement: 2014-12-12

Completion: 2019

**7. INTERNAL PROJECT FILE #**

PANP-001186

**8. PROJECT DESCRIPTION**

Prince Albert National Park is proposing to repair Highway 263, from Waskesiu town site to the south park boundary. The project is expected to take place over five years and be completed during the frost-free period. The main benefits to maintaining this existing highway are increased safety and access for visitors and staff. Work will mostly occur within the existing footprint of the highway, with some work occurring in the ditches and off the highway, and will consist primarily of:

- Overlay paving;
- Repairing the road base where required;
- Milling for asphalt tie-ins and rumble strips;
- Lane marking;
- Culvert cleaning;
- Culvert replacement;
- Culvert repairs;
- Culvert extension;
- Clearing, brushing and grubbing;
- Sign replacement, repairs and installations;
- Guardrail replacement, repairs and installations.

**Secondary work items typically included for asphalt overlay projects:**

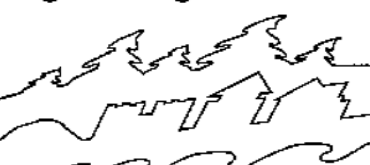
- Excavate, load, haul, crush and stockpiled aggregate materials (included for pit investigation, bulk extraction is not intended for this contract)
- Relocation, repair or removal and disposal of existing guardrail and other miscellaneous items
- Shoulder gravelling (outside asphalt paving areas)
- Crack filling
- Pot hole patching
- Repairing or replacing culverts as required



- Additional road structure repairs
- Removing and re-installing existing and/or new barriers or guardrails
- Earthwork and/or slope stabilization.
- Supply and installation of culverts and additional drainage
- Supply and installation of geotextiles
- Supply and installation of rip rap
- Supply and installation of permanent signs (not construction signs)
- Supply and installation of raised reflective road markers and barrier reflectors
- Supply and installation of guide posts
- Supply and installation of additional pavement markings
- Additional survey resulting from changes made by Departmental Representative
- Additional stripping excavation and disposal of waste materials as directed by Departmental Representative
- Remediation or removal and replacement of unsuitable or contaminated soils not described in the contract documents
- Grass seeding of reshaped ditch areas as directed by the Departmental Representative
- Provision of facilities for Owner (office or Lab Trailer)
- Supply and installation of landscaping as directed by the Departmental Representative

#### Other:

- Project works for the initial year are scheduled to take place between July 6<sup>th</sup> and November 7<sup>th</sup>, 2015 due to existing Road Drainage Repair Contract already awarded and in place. In subsequent years the construction season will be from spring thaw to winter freeze-up (approximately May – October).
- Contractor will be permitted to set up a temporary camp for construction staff at a designated location in PANP (limitations provided in contract specification)
- Contractor will be permitted to set up an asphalt plant at the former South Gate Warden station (limitations provided in contract specification)
- Full road closures to the public are anticipated along localized construction areas on Hwy 263
- Contractor will be permitted to extract water from Sandy Lake. Water removal will require a permit from DFO and Parks Canada Vice President.
- Contractor will be required to supply their own power
- Crew size will range from 5-12 depending on the contractor's work plan
- Standard paving equipment will be used which typically includes dump trucks, paving screeds, various compaction equipment, skid steers, etc.
- The hazardous materials expected would be those used in standard paving operations which include but are not limited to asphalt oil products, fuels and lane marking paint
- Test pitting at gravel pits or areas identified as potential gravel pits. This work would include clearing, grubbing, and brushing for access, and digging and replacing material to determine suitability.
- Camp 10 gravel pit may be used as a source of gravel if it is deemed suitable. Geotechnical drilling will be carried out to determine suitability and extent of gravel deposit. If deemed suitable, excavation and expansion of the gravel pit will be required along with extraction and crushing of rock. Camp 10 gravel pit will undergo site reclamation as part of the project. A reclamation plan will be developed as part of the project. Heavy equipment that will be required to mine the gravel include: loaders, excavators, gravel crushers and trucks. Using the existing gravel pit within the park is the preferred option because acquiring gravel from other sources outside the park is more expensive and requires long hauling distances. To provide best value to Parks Canada Agency, other existing gravel





pits within close proximity to Highway 263, will be explored for sourcing necessary aggregates needed for this project.

## 9. ENVIRONMENTAL COMPONENTS LIKELY TO BE AFFECTED

### Potential Key Effects:

Water Resources  
Soil/Land Resources  
Air Quality  
Flora and Fauna  
Visitor Experience

## 10. IMPORTANT EFFECTS IDENTIFIED

### Water Resources:

- Adverse modification to surface drainage patterns.
- Potential runoff, erosion, sedimentation, and altered drainage.
- Reduced water quality due to increased erosion, sedimentation, transportation of debris and contamination (i.e. from leaks and accidental spills, etc.)
- Water removal from Sandy Lake may disturb inshore aquatic species.

### Soil/Land Resources:

- Soil compaction and rutting
- Slope instability, due to increased soil exposure and improper excavation and storage
- Soil contamination
- Gravel extraction activities

### Air Quality:

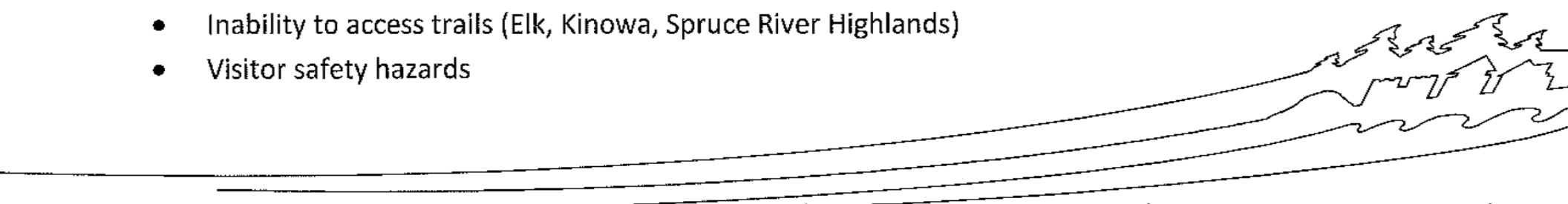
- Decreased ambient air quality (i.e. from dust, emissions, etc.) in the area of the paving and the asphalt plant over the 5 years (frost free period) of the project
- Increased ambient noise levels
- Increased levels of CO<sub>2</sub> and other pollutants
- Increased localized temperatures because of new paving and equipment operation

### Flora and Fauna

- Damage to and/or removal of vegetation in immediate or adjacent areas
- Introduction of invasive species via equipment and vehicles carrying seeds and vegetation from other sites on tires and undercarriages
- Sensory disturbance of wildlife causing displacement/habitat avoidance
- Wildlife habituation/attraction to unnatural food sources
- Impeded/altered wildlife movement
- Damage to nests/disruption of nesting birds
- Mortality from project activities (i.e. MVA's)

### Visitor Experience

- Road closure during peak season for the 5 consecutive years of the project
- Campground closures (Sandy Lake, Namekus Lake)
- Inability to access trails (Elk, Kinowa, Spruce River Highlands)
- Visitor safety hazards





- Potential for negative visitor experience at the work site
- Construction and heavy truck traffic through park area to the construction site
- Water removal activities at Sandy Lake will impact visitors fishing, boating or swimming at Sandy Lake.

#### Park Operations

- Road closure may impact forest fire operations in terms of ability to access fire or travel to fire location.
- Use of Camp 10 gravel pit (potential) will prevent the traditional use of this site for wildlife carcass disposal by resource conservation staff.
- Use of South End station for asphalt plant and staging area may interfere with plans for South End Gravel Pit restoration.

## 11. MITIGATION MEASURES

### General Mitigation Measures:

In addition to the mitigation measures described below, the Contractor and subcontractors are expected to comply with any park regulations, policies, guidelines, travel restrictions, area closures, established reservation systems or other directives issued by Parks Canada for the purpose of mitigating environmental effects or ensuring public/visitor safety.

The Contractor and sub-contractors are expected to act as stewards, set proper examples, educate workers on the importance of keeping areas natural, monitor worker actions and ensure that minimal impact practices are implemented.

Failure to comply with or observe environmental protection measures as identified in these environmental procedures may result in the work being suspended pending rectification of the problems.

Should the contractor require/request a water source, the Departmental Representative, in consultation with the Environmental Site Officer (ESO) designated by Parks Canada, may give direction as to a location to be used. Specific intake measures and approval from DFO is required when water is approved to be withdrawn from open watercourses.

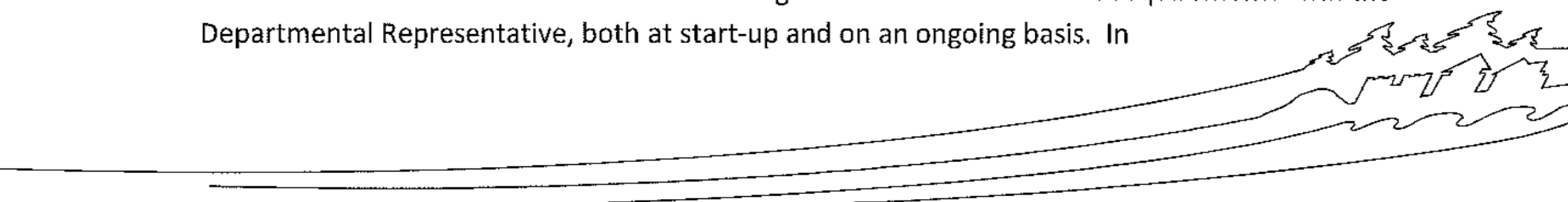
### Public Safety:

Highway 263 will be paved in sections each year for each of 5 years. Each section of road being actively paved will be closed to the public during the construction season; the remainder of the road network will be open to the public. Communication of road closures to the public must be delivered well in advance of the construction start date and widespread through various types of media, including newspapers, radio, PANP website and posters. All roadway signage must be in accordance with provincial standards. Signs must be bilingual or symbolic. The road closures will still be passable by Parks operational crews and emergency vehicles, however speed restrictions will be in place. A plan to allow operational and emergency vehicles through the construction area will be developed by the contractor before construction work begins.

The Contractor is responsible for site security at all times.

## WORK SITE ACCESS AND PARKING

- The contractor shall review both short and long term construction access requirements with the Departmental Representative, both at start-up and on an ongoing basis. In





consultation with the Departmental Representative, the Contractor shall formulate an agreement for worker transportation to and from the work sites and where workers shall park their private vehicles.

- Generally, personal vehicles shall be parked at least 10 metres distance from any watercourse.
- The contractor shall ensure that the environment beyond the work limits is not negatively impacted or damaged by workers' vehicles or machinery and shall instruct workers so that the "footprint" of the project is kept within defined boundaries.
- If equipment needs to be parked in place overnight, it will do so at a site where there is no potential for spills into waterways and will employ adequate spill containment and safety measures.

#### **PROTECTION OF WORK LIMITS**

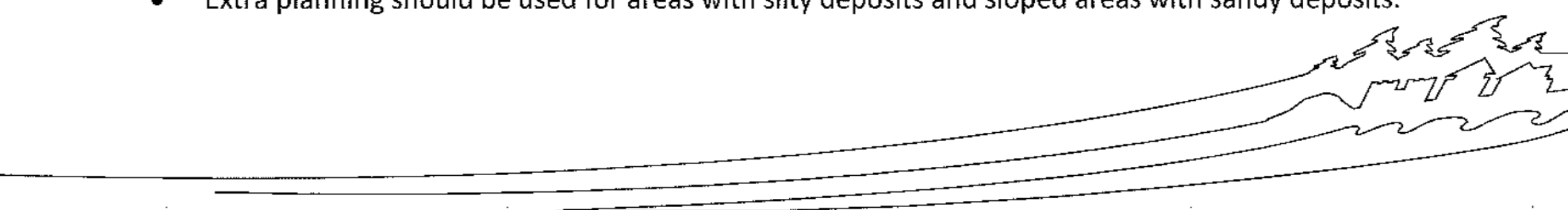
- The contractor shall ensure that workers and equipment do not trespass outside the project limits to the satisfaction of the Departmental Representative and the ESO.
- A new lay down area (an area used for the staging and storage of construction related equipment or material) requires approval of the ESO and the Departmental Representative. The lay down area will be cleaned up at the end of each season and fully restored at the end of the project through decompaction and reseedling.

#### **Establishment of temporary work camp and staging area**

- The establishment, maintenance, and decommissioning of a temporary work camp and staging area will be done so according to the Best Management Practice for Temporary Work Camps/Staging Areas (Attachment 5).

#### **EROSION CONTROL**

- Erosion control measures that prevent sediment from entering any waterway, water body or wetland in the vicinity of the work site are a critical element of the project and shall be implemented by the Contractor.
- On-site sediment control measures shall be constructed and functional prior to initiating activities associated with the asphalt plant and the paving.
- Minimize vegetation cover removal.
- Filter or settle out sediment before the water enters any drainage pathway.
- Control overland flow up and down gradient of exposed areas by use of diversion ditches, bales, vegetative filter strips and/or sediment traps.
- Protect exposed soils with coarse granular materials, mulches, or straw along drainage pathways.
- Cover fills or stockpiles with polyethylene sheeting, tarps or vegetative cover whenever feasible. If large piles too big to cover are established near a water body, install silt protection adjacent to the stockpile.
- Line steep ditches with filter fabric, rock or polyethylene lining to prevent channel erosion.
- The regular monitoring and maintenance of all erosion control measures shall be the responsibility of the Contractor. If the design of the control measures is not functioning effectively they are to be repaired. The Departmental Representative and ESO will also monitor erosion control performance.
- The site will be secured against erosion during any periods of project inactivity or shutdown.
- **Wind and water erosion:**
- Acquire necessary sediment control equipment, (i.e. straw bales, landscaping fabric, sediment fences, etc.) and install prior to construction.
- Extra planning should be used for areas with silty deposits and sloped areas with sandy deposits.





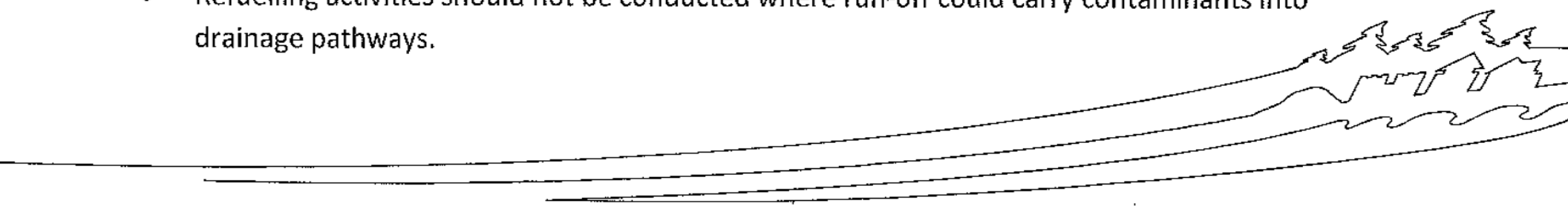
- **Runoff/sedimentation; soil contamination:**
- Prepare an Emergency Response Plan for the worst case i.e. heavy rainfall and runoff events, high winds, spills, fires, etc.
- In the event of emergency operations, call Emergency Services and/or Parks Canada at the phone numbers indicated on Attachment 1.
- Ensure all activities are conducted at least 30 m from water bodies (exceptions being when paving up to and over bridges.)

#### **SPECIFIC CONCERNS RELATIVE TO EROSION CONTROL AND SEDIMENTATION**

- The Contractor shall prepare an Erosion and Sedimentation Management Plan for the components of this contract that are undertaken in proximity to watercourses, wetlands or riparian environments. This plan shall be to the satisfaction of the Departmental Representative and ESO. If sediment ponds are required, they shall be designed to settle all sediment particles 0.02mm or larger. The ponds shall also be designed to handle 1:5 year storm events, with overflow spill capacity for 1:10 year storm events and emergency spillway capacity for 1:100 year storm events.
- An important desired end result is to allow no release into watercourses of sediments in levels that are deleterious to fish or that would harmfully alter, disrupt or destroy fish habitat. Similarly there is to be no sediment release into areas of vegetation growth or sensitive areas, of sediments in levels that would adversely alter growing or hydraulic conditions. The target is 0 mg/L of TSS over background levels. The threshold is a maximum instantaneous increase of 25 mg/L over background levels when background levels are <250mg/L. This threshold shall not be exceeded.

#### **POLLUTION CONTROL**

- The contractor shall prevent any deleterious and objectionable materials from entering streams, rivers, wetlands, water bodies or watercourses that would result in damage to aquatic and riparian habitat. Generally, hazardous or toxic products shall be stored no closer than 100 metres from water.
- A Spill Response Plan shall be prepared by the Contractor and shall detail the containment and storage, security, handling, use and disposal of empty containers, surplus product or waste generated in the application of these products, to the satisfaction of the Departmental Representative and the ESO and in accordance with all applicable federal and provincial legislation. The Plan shall include a list of products and materials to be used or brought to the work site that are considered or defined as hazardous or toxic to the environment. Such products include, but are not limited to, waterproofing agents, grout, cement, concrete finishing agents, hot poured rubber membrane materials, asphalt cement and sand blasting agents.
- The containment, storage, security, handling, use, unique spill response requirements and disposal of empty containers, surplus product or waste generated in the use of any hazardous or toxic products shall be in accordance with all applicable federal and provincial legislation. Generally, hazardous or toxic products shall be stored no closer than 100 metres from streams, wetlands, water bodies or waterways.
- An impervious berm shall be constructed around fuel tanks and any other potential spill area. The berms shall be capable of holding 110% of tank storage volumes and shall be to the satisfaction of the Departmental Representative and the ESO before start-up. Measures such as collection/drip trays and berms lined with occlusive material such as plastic and a layer of sand, and double-lined fuel tanks can prevent spills into the environment. Any contaminated rainwater will be moved out of the park.
- Refuelling activities should not be conducted where run-off could carry contaminants into drainage pathways.



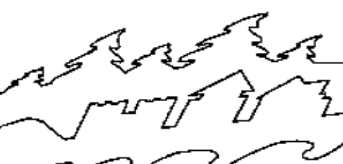




- The contractor shall prevent blowing dust and debris by covering and/or providing dust control for temporary roads and on-site work by methods that are approved by the Departmental Representative and ESO, such as wetting down with water. Dust control measures for temporary access roads may also have to be initiated.
- All fuels, oils, lubricants and other petrochemical products will not be stored within 100 metres of any water body (including wetlands).
- Do not store fuels, lubricants, solvents, paints and other chemicals overnight except within construction trailers secured with lock and key. Storage should be on a bermed, impervious site (secondary containment).
- All construction sites will be equipped with containers suitable for the secure, temporary storage of hazardous wastes. Hazardous wastes shall be separated by type. Follow all applicable regulations and codes for the management and handling of hazardous wastes.
- The Contractor shall provide spill kits at re-fuelling, lubrication, and repair locations that will be capable of dealing with 110% of the largest potential spill and shall be maintained in good working order on the construction site. The ESO and Departmental Representative prior to project start-up must approve these spill kits. The Contractor and site staff shall be informed of the location of the spill response kit(s) and be trained in its use.
- Timely and effective action shall be taken to stop, contain and clean up all spills as long as the site is safe to enter. The Departmental Representative and the ESO shall be notified immediately of any spill. In the event of a major spill, all other work shall be stopped and all personnel devoted to spill containment and clean-up.
- The costs involved in a spill incident (the control, clean up, disposal of contaminants and site remediation to pre-spill conditions), shall be the responsibility of the Contractor. The site will be inspected to ensure completion to the expected standard and to the satisfaction of the Departmental Representative and the ESO.
- 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 will be provided to Parks Canada.
- In-stream crossing of any water body (including wetlands) by construction equipment or the use of such equipment within water bodies is strictly prohibited unless prior approval has been confirmed by Parks Canada.

#### **EQUIPMENT MAINTENANCE, FUELLING AND OPERATION**

- The Contractor shall ensure that all soil, seeds and any debris attached to equipment or machinery to be used on the project site shall be removed (e.g. power washed) outside the National Park before delivery to the work site.
- Equipment fuelling sites will be identified by the Contractor and approved by the Departmental Representative and the ESO. Equipment will be fueled on hardened surfaces. Except for chain saws, no refuelling shall take place within 100 metres of streams, wetlands, water bodies, or waterways.
- Diesel and gasoline delivery vehicles, including bulk tankers shall be parked more than 100m from streams, wetlands, water bodies or waterways. Gravity fed fuel systems are not allowed. Manual or electric pump delivery systems shall be used. Fuelling personnel shall maintain presence at and immediate attention to the fuelling operations.
- Mobile fuel containers (e.g. slip tanks, small fuel carboys) shall remain in the service vehicle at all times. Protection and containment of approved fuel storage sites is addressed in the Pollution Control section above.







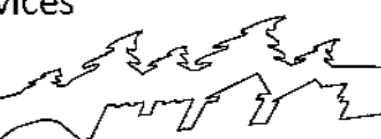
- Equipment used on the project shall be fuelled with E10, and low sulphur diesel fuels and shall conform to local emission requirements. The Contractor is to ensure that unnecessary idling of vehicles is avoided.
- Oil changes, lubricant changes, greasing and machinery repairs shall be performed at locations approved by the ESO or the Departmental Representative. Waste lubrication products (e.g. oil filters, used containers, used oil, etc.) shall be secured in spill-proof containers and properly recycled or disposed of at an approved facility. No waste petroleum, lubricant products or related materials are to be discarded, buried or disposed of in borrow pits, turnouts, picnic areas, viewpoints, etc. anywhere in the National Park.
- The Contractor shall ensure that all equipment is properly tuned, inspected daily for fluid/fuel leaks, fitted with standard emission control devices and maintained in good working order.
- Fuel containers and lubricant products shall be stored only in secure locations specified by the Departmental Representative. Fuel tanks or other potentially deleterious substance containers shall be secured to ensure they are tamperproof and cannot be drained by vandals when left overnight in the National Park. Alternatively, the Contractor may hire a security person employed to prevent vandalism.

#### **OPERATION OF EQUIPMENT**

- Equipment movements shall be restricted to the 'footprint' of the work area which is defined as the asphalt plant to be developed at the former South End Warden Station, Highway 263 and the designated construction camp. The work limits shall be identified by stake and ribbon or other methods approved by the Departmental Representative. Unless authorized by the Departmental Representative, activities beyond the work limits are not permitted. No machinery will enter, work in or cross over streams, rivers, wetlands, water bodies or watercourses, nor damage aquatic and riparian habitat or trees and plant communities. Some of the project activities shall require working close to creeks and other watercourses or water bodies. In these instances, the Contractor is to describe measures to be employed to ensure fugitive materials (e.g. rocks, soil, branches) and especially deleterious substances (e.g. chemicals) do not enter any watercourses, to the satisfaction of the Departmental Representative and the ESO.
- The Contractor shall instruct workers to prevent pushing, placement, raveling, storage or stockpiling of any materials (e.g. slash, rock, fill or topsoil) in the trees bordering the right of way or into watercourses or water bodies.
- When, in the opinion of Parks Canada, negligence on the part of the Contractor results in damage or destruction of vegetation, or other environmental or aesthetic features beyond the designated work area, the Contractor shall be responsible, at his or her expense, for complete restoration including the replacement of trees, shrubs, topsoil, grass, etc. to the satisfaction of the Departmental Representative and the ESO.
- Restrict vehicle movements to work limits.
- Workers private vehicles are to remain within the construction footprint.

#### **FIRE PREVENTION AND CONTROL**

- A fire extinguisher shall be carried and available for use on each machine and at locations within the asphalt plant in the event of fire. Basic firefighting equipment recommended (e.g. a water truck; minimum 500 Imperial gallons with 500 feet of fire hose and a pump capable of producing 45 psi water pressure at the nozzle; three shovels, two Pulaskis, and two five gallon backpack pumps) shall be maintained at the construction site at a location known and easily accessible to all the Contractor's staff. Contractor's staff shall receive basic training in early response to wildfire events during the "environmental briefing".
- Equipment shall be operated in a manner and with all original manufacturers' safety devices to prevent ignition of flammable materials in the area.





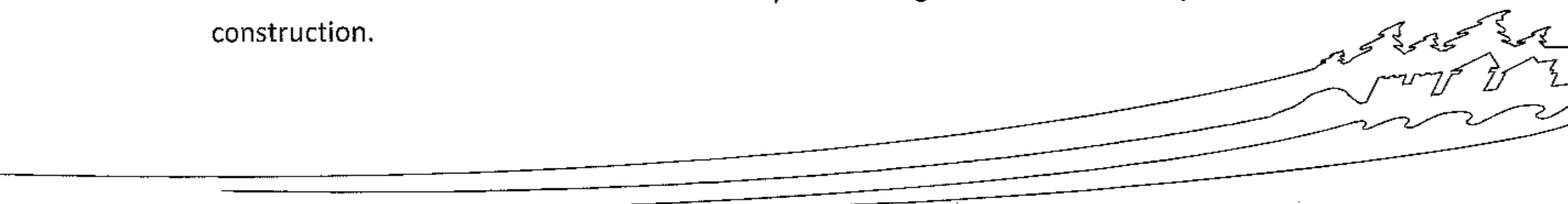
- Care shall be taken while smoking on the work site to ensure that the accidental ignition of any flammable material is prevented. Fires or burning of waste materials is not permitted.

## WILDLIFE

- During the Environmental Briefing all personnel shall be instructed by the ESO on procedures to follow in the event of wildlife appearances near or within the work site and any other wildlife concerns.
  - 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). Consult with Parks Canada to discuss any localized wildlife concerns. Confine “noise” activities to daylight hours.
  - Educate workers to not attract or harass wildlife, keep the site free of food scraps, and dispose of garbage in bear proof containers.
  - Consider posting wildlife signs to reduce vehicle speeds and increase driver awareness near construction areas.
  - Debris and equipment shall not block any wildlife trails or movement corridors.
  - Avoid or terminate activities on site that attract or disturb wildlife and vacate the area and stay away from the immediate location if bears, cougars, wolves, elk or moose display aggressive behaviour or persistent intrusion. Extra care to control materials that might attract wildlife (e.g. lunches and food scraps) must be exercised at all times. Any incident at the construction site involving wildlife such as bears, wolves, cougars or ungulates shall be immediately reported to the ESO or duty officer via Jasper Dispatch (after hours).
  - If a bear or other wildlife lingers in the work area, call the ESO to receive guidance and assistance. After the animal has cleared the work area, identify and rectify what aspect of the work site attracted and enticed the animal to linger, so as to prevent future wildlife attraction and lingering.
  - All efforts to prevent wildlife from obtaining food, garbage or other domestic wastes shall be made by the Contractor and contractor’s staff while undertaking their work. Such wildlife attractants shall not be stored at the work site overnight. Lunches, coolers and food products, including waste food products, shall be securely stored away from access by animals. Daily removal of food scraps, food wrappers, pop cans or other attractive products to bear proof containers is mandatory.
  - Notify the ESO and Departmental Representative immediately about dens, litters, nests, carcasses, road kills, bear activity or encounters on or around the site or crew accommodation. Other wildlife-related encounters are to be reported within 24 hours.
  - If an active bird nesting colony or a migration staging area is within the construction area the Environmental Site officer (ESO) and the Departmental Representative must be on site during active construction in that area.
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- **Habitat loss and fragmentation or encroachment on wildlife movement corridor:**
  - Identify wildlife habitat that may be impacted by activities and avoid sensitive areas.
  - Identify and avoid wetlands.
  - Ensure only necessary vegetation is removed and delineate areas to be avoided with biodegradable flagging tape and/or temporary fences.

## CULTURAL AND HISTORICAL ARTIFACTS

- The ESO will determine whether there are any archaeological sites in the area prior to the start of construction.





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- Consult with Parks Canada if sites are identified.
- If potential archaeological sites may be subject to ground disturbance, then activities should be adapted to avoid them.
- All historical or archaeological objects found in National Parks are protected under the National Parks Act and Regulations and are the property of Parks Canada. The Contractor and workers shall protect any articles found. Workers must stop work immediately upon finding artifacts and contact Parks Canada.

#### **WASTE MATERIALS STORAGE AND REMOVAL**

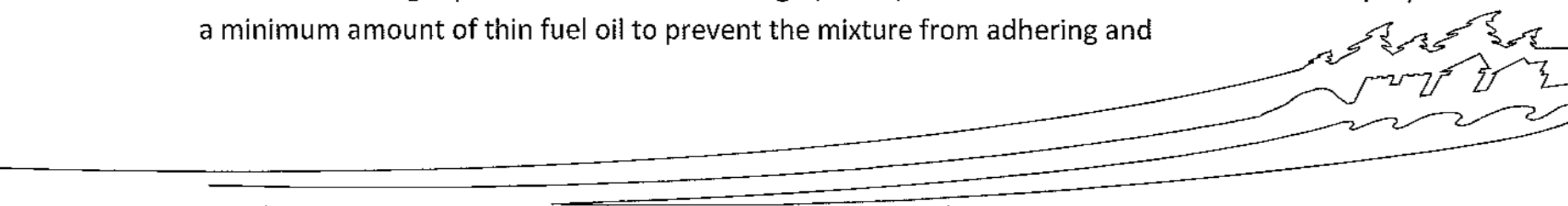
- The Contractor and workers shall dispose of hazardous wastes in conformance with the Canadian Environmental Protection Act and applicable provincial regulations while observing the Code of Good Practice for Management of Hazardous Wastes at Federal Establishments.
- All wastes originating from construction, trade, hazardous and domestic sources will be kept separate.
- Construction, trade, hazardous waste and domestic waste materials shall not be burned, buried or discarded at the work site or elsewhere in National Parks. These wastes shall be contained and removed by the Contractor and workers in a timely and approved manner and disposed of at an appropriate waste landfill site located outside the park. Construction waste storage containers, provided by the contractor shall be emptied by the Contractor when 90% full. Waste containers will have lids, and waste loads shall be covered while being transported.
- A concerted effort shall be made by the Contractor and workers to reduce, reuse and recycle materials.
- All efforts to prevent wildlife from obtaining food, garbage or other domestic wastes shall be made by the Contractor and contract staff while undertaking their work in Prince Albert National Park. Such wildlife attractants shall not be stored at the work site overnight. Lunches, coolers and food products, including waste food products, shall be securely stored away from access by animals. Daily removal of food scraps, food wrappers, pop cans or other attractive products to bear proof containers is mandatory. It is incumbent on the Contractor to notify Parks Canada and make specific arrangements to have garbage collected by Parks Canada when using existing Parks Canada receptacles.
- The Contractor and workers shall immediately report any circumstances related to food/garbage (e.g. overflowing container or strong smell) and wildlife to the ESO or the Departmental Representative.
- Sanitary facilities, such as a portable container toilet, shall be provided by the Contractor and maintained in a clean condition. These facilities shall not be used for the disposal of anything but human body wastes.
- All hazardous materials and wastes will be clearly labelled with WHMIS labels and information.
- 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, or any other watercourse. Excess material will not be disposed of on or adjacent to the site.
- Construction sites must undergo thorough clean-up, including removal of general litter, survey stakes and flagging tape at project completion.

#### **MISCELLANEOUS SITE MANAGEMENT CONTINGENCIES**

- Security services at the work site may be desirable or necessary during the contract, especially during quiet times. Fuel tanks or other potentially deleterious substance containers must be secured by the Contractor, at his own cost, to ensure they are tamperproof and cannot be drained by vandals.
- Pets shall not be brought or maintained at the construction site.

#### **ASPHALT PLANT OPERATION AND PAVING**

- Trucks for hauling asphalt mixture shall have tight, clean, smooth metal beds that have been sprayed with a minimum amount of thin fuel oil to prevent the mixture from adhering and





causing waste asphalt. The vehicle covers shall be securely fastened. Excess truck box lubricants such as light oil, detergent or lime solutions shall not be allowed to contaminate the mix, and shall be disposed of in an environmentally acceptable manner. Truck box lubricant application shall be carried out in a containment berm.

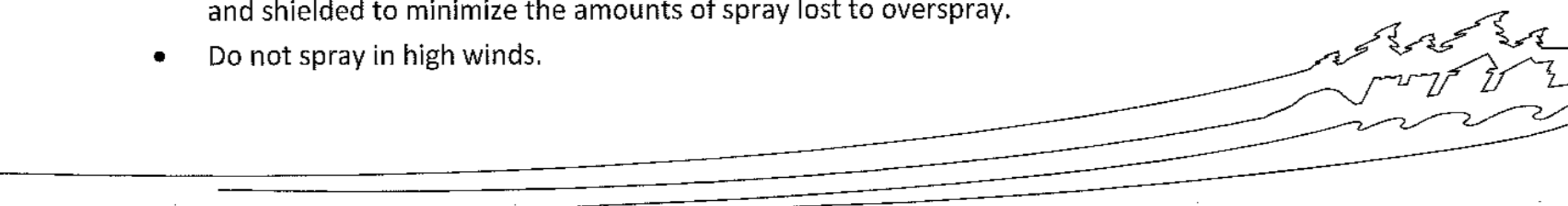
- Asphalt plant operation must comply with all environmental pollution control regulations applicable in the plant area, including Environmental Guideline for Saskatchewan Asphalt Plants (Attachment 2).
- Ground asphalt material shall be removed, recycled or properly stored at a location approved by the Departmental Representative or ESO.
- The Contractor shall ensure that there is enough room between the stockpiles and the asphalt plant for a loader in the event of a spill at the asphalt plant. A containment berm with an associated liner made of occlusive material (e.g. plastic of a thickness approved by the Departmental Representative) and covered with absorbent sand or clay shall be installed under the asphalt storage tank to ensure containment of 110% of the tank's capacity.
- The Contractor may wish to protect containment/catchment areas and drip trays at the asphalt plant from rainfall, since if contaminated, all of the collected water will have to be disposed of at the expense of the Contractor at an approved disposal facility.
- Only apply seal coat to dry surface and not prior to (within 24 hrs.) or during rainfall.
- Sites from which materials have been removed shall be restored to a neat and presentable condition upon the completion of the work.

#### **MATERIAL LOADING, HAULING, PLACEMENT AND GRADE BUILDING**

- During grade construction conducted close to any watercourse, water body or wetland, methods shall be employed to ensure materials are not pushed, fall or are eroded into the water or wetlands. Generally, work within a 30 metre buffer from the high water mark of water ways or wetlands requires the close oversight of the ESO and the Departmental Representative.
- No grade building shall occur outside of the designated area or within 1 metre of the drip line of existing forest. Any material inadvertently falling outside the work limits is to be removed promptly in a manner that does not damage trees or vegetation at that location. Materials shall be placed at storage sites or on the grade without spillage outside the working limits.
- Ensure excavated material does not damage or bury plant material that is to be retained on the site or in adjacent areas.
- Ensure materials being stored or transported are covered with tarps or equivalent material.
- Wet down or cover stockpiles with polyethylene sheeting, tarps or vegetative cover.

#### **PAVEMENT MARKING AND GUARDRAIL PLACEMENT**

- Pavement marking shall be undertaken pursuant to standard methods applied in National Parks for control of paint products, both in transport and handling. The Contractor shall present a description of methods to be employed for transporting and controlling paint and hazardous products, application of paint, cleaning of equipment, containment and disposal of waste paint and cleaning products, etc. to the satisfaction of the Departmental Representative.
- Spill contingency plans, equipment and supplies will be present on-site at all times and employees trained in their use.
- Paints should be selected that have minimal amounts of potentially harmful substances, particularly water soluble organic chemicals, lead and other metals. Rust inhibiting paints should be chosen over barrier types of paints to reduce the total volume of paint required over the long term.
- Hand painting is preferred over spray painting. Where sprayers are used, they must be properly adjusted and shielded to minimize the amounts of spray lost to overspray.
- Do not spray in high winds.





- Where concrete barriers or guard rails are temporarily removed, for highway improvements, temporary glow posts shall be installed, at 20 m intervals on straight sections and at 10 m intervals on curves and shall remain in place until permanent barrier system has been installed.
- **CLEARING AND GRUBBING**
- The Contractor shall take all measures to ensure that trees do not fall into streams, rivers, wetlands or water bodies or outside the clearing limits as marked by coloured flagging. Generally, work within a 30 metre buffer from the high water mark of watercourses, water bodies or wetlands requires the close oversight of the ESO or the Departmental Representative.
- Trees inadvertently felled into streams, rivers, watercourses or outside the clearing limits shall be removed by means (e.g. winch) so as not to damage the substrate or any standing trees left outside the clearing limits. Machinery shall not go outside the clearing limits, or into streams, rivers watercourses or water bodies to remove felled trees.
- Trees are to be cut so they fall inside the cleared perimeters.
- Logs and other salvage materials are to be conveyed to and placed at the storage site (Beartrap) without spread of debris or damage to other standing trees or landscape resources outside the marked clearing or storage limits. They shall not be skidded through wetlands, waterways or water bodies.
- During the grubbing component, stumps, roots, imbedded logs and other non-soil debris shall be pulled and shaken free of loose soil and rocks before transport to the designated pit.
- Ensure excavated material does not damage or bury plant material that is to be retained on the site or in adjacent areas.
- Care must be taken during grubbing and stripping to ensure trees and roots on the edge of the cleared area are not disturbed.
- No slash clearing, pickup or grubbing shall occur outside of the designated area or within 1 metre of the drip line of the existing forest.
- Existing areas of vegetation disturbed as a result of this contract shall be rehabilitated using approved topsoil and a native grass seed mix as specified in Attachment 3.
- The nesting bird window is between early May and the first week of July. No brushing or tree removal can occur during this time unless a nesting bird survey of the area has been completed by a park biologist.

## CULVERT INSTALLATION

All culverts will be installed using Best Management Practices for Culvert Installations and Replacements (Attachment 4) and will be timed to respect the restricted activity timing windows identified by DFO to protect fish, including their eggs, juveniles, spawning adults and/or the organisms upon which they feed.

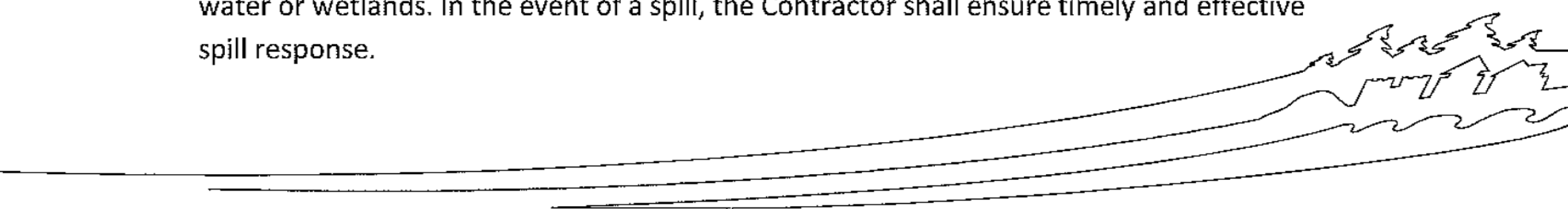
For Prince Albert National Park, In-stream work must be avoided from April 16<sup>th</sup> to June 30<sup>th</sup> in order to protect spring spawning fish and developing eggs/fry.

In-stream work for waterways with lake trout present should be avoided from September 15<sup>th</sup> to June 30<sup>th</sup> to protect fall/winter spawning fish and developing eggs/fry.

In-stream work for waterways with no lake trout should be avoided from October 1<sup>st</sup> to June 30<sup>th</sup> to protect fall/winter spawning fish and developing eggs/fry.

## CRUSHING

- The Contractor shall be prepared for potential spills of fuels, lubricants or hydraulic fluid from the crusher, using containment berms with associated occlusive liner of adequate thickness to ensure that these materials do not penetrate underlying soil materials down to the water table and into streams, running water or wetlands. In the event of a spill, the Contractor shall ensure timely and effective spill response.







- The Contractor shall provide drip and spill containment for the crusher, cone, generators and other components where spills may occur (e.g. plastic lined dirt berms, collection/drip trays, and double-walled fuel tanks). Spill response in a timely and effective manner in the event of a spill is mandatory. The measure chosen by the Contractor shall ensure containment of 110% of the capacity of the fuel tank, crankcase, etc.
- Excavation, hauling and placing materials associated with a crushing operation shall be conducted within the approved footprint of the total crushing operation. Crushed materials shall be placed at the designated storage site as identified by the Departmental Representative without spillage or raveling outside the limits of this location. Any material inadvertently falling outside the work limits is to be moved promptly to within the storage limits. Repair of damage outside the work limits will be at the complete expense of the Contractor.

#### **FINE GRADING, TOPSOIL PLACEMENT AND SEEDING**

- Re-vegetate exposed areas at first opportunity.
- Ensure topsoil is clean and weed free.
- Re-vegetate with a native seed mix as directed by Departmental Representative.
- Protect exposed soils with coarse granular materials, mulches, or straw along drainage pathways.
- Cultivate affected areas before reclaiming, especially areas with fine textured or organic soils.
- Do not use fertilizers and herbicides in areas where residue or run-off may enter a water body or drainage pathway.
- This contract involves the final shaping of cut slopes, fills and landscapes disturbed in the construction project. These slopes will be covered by stripped soil and chip compost materials and seeded with a natural seed mix as specified by the Departmental Representative. Environmental concerns related to these activities largely focus on erosion prevention and sediment control. The Contractor is to present a plan for placement, spreading and stabilization of reclamation materials that controls erosion and prevents sedimentation, to the satisfaction of the Departmental Representative and the ESO.

#### **12. IMPACT SIGNIFICANCE**

The environmental impacts associated with the Highway 263 upgrades will be minimal, short term and reversible. With implementation of mitigation measures described in this document, and because the road's pavement rehabilitation activities are short term, no significant impacts to the environment are anticipated.

#### **13. SITE INSPECTION**

☐ Site inspection not required

☒ Site inspection required

#### **14. EXPERTS CONSULTED (Including PC Experts)**

Department/Agency/Institution:

Parks Canada, Prince Albert National Park

Contact Information:

Dustin Guedo

Vegetation Management Specialist,

Prince Albert National Park





(306) 663-4544  
Email: dustin.guedo@pc.gc.ca

Date of Request: 2014-12-12

Expertise Requested: Advice with regards to use of gravel deposits on grasslands and restoration requirements for grasslands after gravel has been removed.

Response: If required only use of already disturbed or impacted gravel deposits is permitted.

**15. PUBLIC PARTICIPATION**

Public participation required:

☒ No ☐ Yes

**16. 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.

**SIGNATURES AND APPROVAL**

**EA Author**

Name: Fiona Moreland

Title: Acting Environmental Coordinator

Signature

Date:

June 12, 2015

**DECISION APPROVAL**

Name: Alan Fehr

Title: Field Unit Superintendent

Signature

Date:

June 15, 2015

**17. REFERENCE LIST**

Dustin Guedo, Vegetation Management Specialist, Prince Albert National Park (pers. comm.)

Richard Singer, EIT, Project Inspector, McElhanney Consulting Services Ltd. (pers. comm.)

**18. ATTACHMENTS LIST**

Attachment 1. Emergency Contacts and Spill Reporting

Attachment 2. Environmental Guidelines for Saskatchewan Asphalt Plants

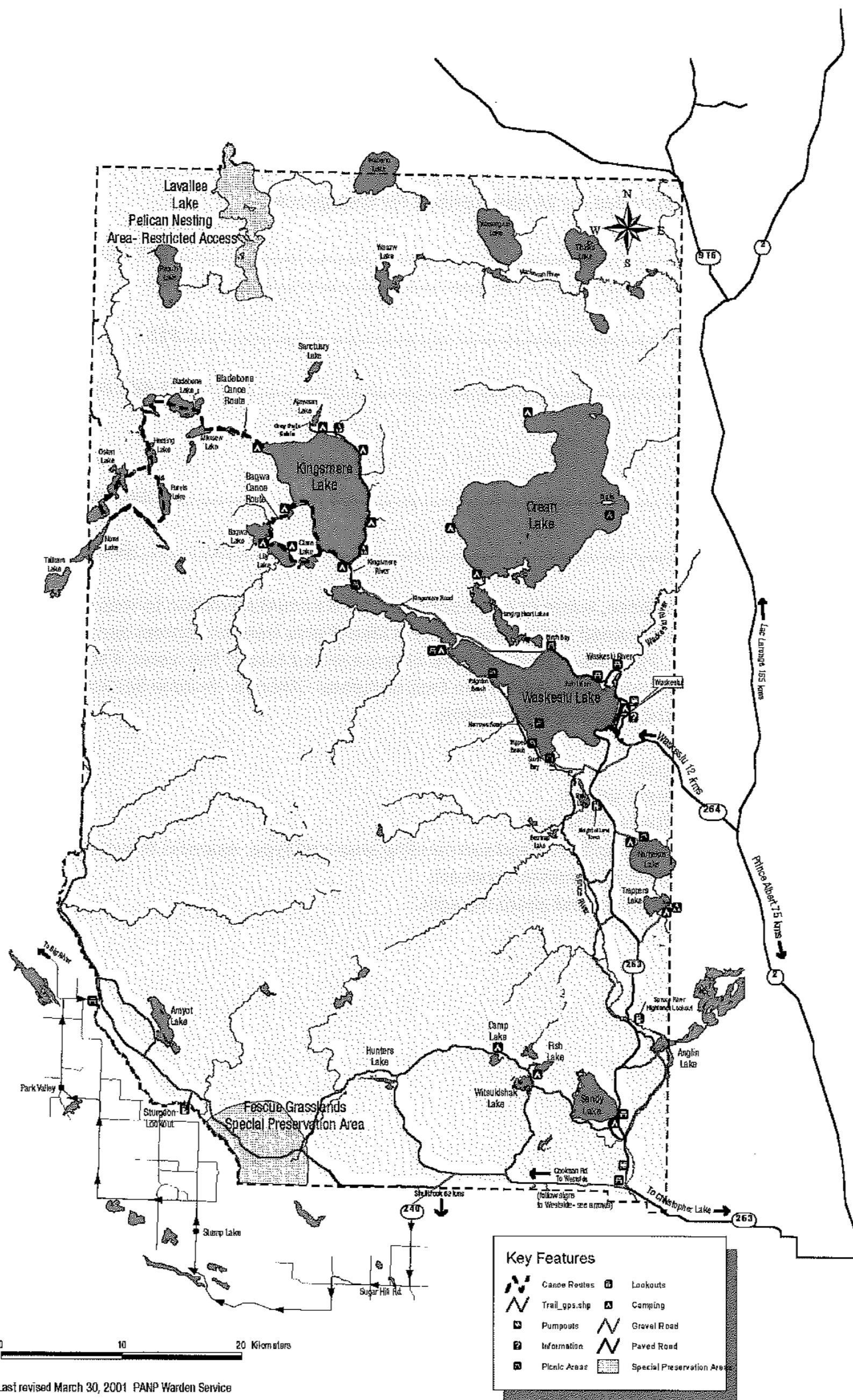
Attachment 3. Native Seed Mix for Reclamation – Prince Albert National Park

Attachment 4. Best Management Practices for Culvert Installations and Replacements









Map 1. Prince Albert National Park



# Attachment 1. Emergency Contacts and Spill Reporting

The following phone numbers are provided for **24 hour contact for Emergencies.**

Jasper Dispatch.....	1-877-852-3100
Waskesiu Lake Fire Department.....	911
Waskesiu Lake RCMP Detachment.....	911
Spill Reporting.....	1-800-667-7525

Non-emergency contact numbers

PANP Duty Officer.....	(306) 960-9315
PANP Environmental Officer.....	(306) 663-4535

In case of a spill of a hazardous substance, waste or other pollutant, take immediate action to stop the spill and contain the substance only if you are trained and the substance is identifiable from an appropriate distance. If you are not trained, use rule of thumb. Place your thumb in front of one eye and look at the scene; if the scene spreads outside your thumb, you are too close. Advise the Environmental Officer or Warden Service immediately. Record and be prepared to report the following information:

- 1. Location and time of the spill.
- 2. Type and quantity of pollutant spilled.
- 3. The cause and potential effects of the spill.
- 4. A description of the immediate spill area and surrounding area (soil type, nearness to water sources, distance to dwellings, location of domestic services).
- 5. Details of actions taken to contain and abate the spill.





## **Attachment 2. Environmental Guideline for Saskatchewan Asphalt Plants**

**For enquiries or reporting, please contact:**

Government of Saskatchewan

Environmental Protection Branch, Saskatchewan Ministry of Environment

102-112 Research Drive

Saskatoon, SK S7N 3R3

Phone: (306) 933-7940

Fax: (306) 933-8442





## OVERVIEW

This Guideline applies to all stationary and mobile asphalt plants located in Saskatchewan. This Guideline does not apply to hot-in-place asphalt recycling equipment. This Guideline replaces the ministry's Asphalt Plant Policy/Guideline of 2003.

In the past, permits to operate were issued for stationary asphalt plants under the authority of *The Clean Air Act* and *The Clean Air Regulations*. This is no longer the case due to the lower environmental risks associated with asphalt plants when appropriate management practices are followed, such as those outlined in the Canadian Construction Association's (CCA) Environmental Best Practices Guide for Hot Mix Asphalt Plants (CCA83 - 2004). The CCA Guide provides owners and operators of hot mix asphalt plants with information and guidance related to the management of their plant assets in a more sustainable and environmentally-friendly fashion. The guide contains checklists that owners can use to improve their plant's environmental performance. This document is available free of charge for CCA members.

Asphalt plants can still be investigated by the ministry under the authority of *The Clean Air Act* and *The Clean Air Regulations*. Should there be an adverse effect to the environment, due to the operation of a stationary or mobile asphalt plant, the ministry can conduct compliance investigations and, if required, issue Control Orders under the authority of *The Clean Air Act* to instruct the owner of the plant to rectify problems in a reasonable manner and within an acceptable timeframe.

Proponents should also consider the potential applicability of *The Environmental Assessment Act* for asphalt facilities. When project proposals are received by the Environmental Assessment Branch (EAB), they are screened against criteria which assess the significance of potential environmental impacts of an activity and determine whether the project constitutes a "development", which is required to undergo an environmental impact assessment prior to proceeding. For more information on the criteria that define a "development" and to determine whether a project may warrant review by the EAB, proponents should review information regarding the Proponent Self-Assessment process located on the Environmental Assessment Branch website at

<http://www.environment.gov.sk.ca/EnvironmentalAssessment>.

The purpose of this Guideline is to eliminate the ministry's former requirement of companies having to obtain permits/approvals for the construction and operation of stationary or mobile asphalt facilities, and to clarify minimum siting and operational requirements for stationary and mobile asphalt plants. It is the responsibility of asphalt plant owners and operators to ensure that the requirements of this Guideline are met. Isolation distance requirements for mobile plants and emission requirements for stationary asphalt plants are outlined below.





## DEFINITIONS

**Air pollution control system** means an engineered air pollution control device(s) such as baghouses, scrubbers and cyclones, designed to collect particulate emissions.

**Asphalt plant** means any stationary or mobile facility in which asphalt concrete is produced by heating and drying aggregate and the mixing of dried aggregate with asphalt cement.

**Control Order** means a control order issued pursuant to Sections 14 or 16 of *The Clean Air Act*.

**EMPA 2002** means *The Environmental Management and Protection Act, 2002*.

**Environmental Protection Order** means an environmental protection order issued pursuant to Section 47 of *EMPA 2002*.

**Fugitive dust emissions** means the presence in the ambient air of any particulate matter from sources other than pollution control equipment. Fugitive dust emissions may be generated from the delivery, storage and handling of aggregates or from general plant and yard activities.

**Ministry** means the Saskatchewan Ministry of Environment.

**Total particulate matter** means dust and grit with a diameter less than 100 microns.





## GENERAL REQUIREMENTS FOR STATIONARY AND MOBILE ASPHALT PLANTS

1. Asphalt plants shall follow appropriate measures to prevent pollution and to ensure that:
  - a) the air pollution control system is serviced on regularly scheduled basis per manufacturer's specifications and upgraded, if necessary, in order to meet minimum particulate emission criteria levels;
  - b) the air pollution control system is operating to its normal efficiency rating when the associated process equipment is operational; and
  - c) the proper operational procedures, equipment maintenance and operator training are provided to ensure efficient performance of the equipment.
2. Companies shall not cause or create excessive emissions and odours, which may be injurious or damaging to property or the environment as defined in Section 2(b) of *The Clean Air Act*.
3. Excessive emissions of fugitive dust and/or odours from any part of the operation, which cause complaints, may necessitate in-stack and/or ambient air monitoring, and/or the installation of additional air pollution control equipment, or a Control Order being issued by the ministry under the authority of Sections 14 or 16 of *The Clean Air Act*.
4. The use of waste oil as supplementary fuel in the process is allowed if the burner unit was designed for it. Please refer to the ministry's Waste Oil Burning Equipment Guideline (EPB-61) which is intended to assist in the installation, construction and operation of waste oil burning equipment.
5. On-site storage of hazardous substances and/or waste dangerous goods (e.g. diesel, asphalt, waste oil) may be subject to regulation under *The Hazardous Substances and Waste Dangerous Goods Regulations*, administrated by the ministry.
6. Companies shall not discharge or allow the discharge of a substance into the environment that may cause an adverse effect as defined in Sections 4 and 35 of *EMPA 2002*. A substance that may cause an adverse effect can be solid, liquid, particulate or gas, and includes seepage, rainwater or storm water that is inadvertently contaminated by the substance. Companies are encouraged to implement a wastewater and storm water management plan when deemed necessary. Unauthorized discharges must be reported and cleaned up in accordance with *EMPA 2002*.
7. Spills of hazardous substances and waste dangerous goods must be reported and cleaned up in accordance with *The Spill Control Regulations*.
8. All wastes must be disposed of in a manner acceptable to the ministry. No wastes shall be buried or burned on-site.
9. Companies are obliged to ensure all practical measures are taken to clean and/or remediate all equipment and property that may have been impacted by the plant's operation.







10. Ministry staff may visit the plant site at any reasonable time to inspect and assess the facility's operation.

11. Nuisance complaints may result in an investigation of the facility's operation, at the discretion of the ministry. If corrective actions taken by the owner or operator of the facility to remedy a concern are not to the satisfaction of the ministry, a Control Order may be issued by the ministry under the authority of Sections 14 or 16 of *The Clean Air Act*.

12. The owner or operator of the facility must ensure compliance with *The Clean Air Act*, *The Clean Air Regulations*, *EPMA 2002*, or any other applicable legislation such as the Saskatchewan Ministry of Labour Relations and Workplace Safety's *Occupational Health and Safety Act/Regulations*.

13. All applicable federal, provincial and local permits and approvals should be obtained and adhered to. It is incumbent upon the plant operator to ensure that all necessary written documentation is obtained from local jurisdictions (Cities, Towns, Villages and Rural Municipalities) prior to set up and commencement of operations.

14. Asphalt plant operators are encouraged to maintain operational logs, which may include:

- a) Hours of plant operation
- b) Air pollution control system operation and maintenance
- c) Plant and process upsets, including upset duration, time of upset, wind direction, etc.
- d) Amount and type of fuel(s) burned
- e) Storm water and wastewater management
- f) Spill reporting and clean-up activities
- g) Hazardous substances and waste storage
- h) Mobile plant location and local authorization
- i) Log of nuisance complaints and complaint follow-up
- j) Control of on-site fugitive emissions
- k) Decommissioning and reclamation activities
- l) Stack testing results, if applicable
- m) Air dispersion modeling results, if applicable
- n) Membership in an air zone, if applicable
- o) Other applicable operating details

15. All recorded information regarding the above requirements shall be kept by the owner or operator of the facility for at least 3 years and made readily available for the use of ministry staff during compliance investigations or nuisance complaints.

16. Reclamation shall be carried out in a manner acceptable to the ministry when stationary and mobile asphalt plants are decommissioned or re-located. Failure to do so may result in the ministry issuing an Environmental Protection Order under the authority of Section 47 of





*EMPA 2002* to the owner or operator. Please refer to the ministry's Risk-Based Corrective Actions for Petroleum Hydrocarbon Impacted Sites (EPB 344).





## MOBILE ASPHALT PLANTS

1. Mobile plant operators are required to choose remote locations from Villages, Towns and Cities. Isolation distance requirements for mobile plants are:

- a) 4.8 kilometres or more from the boundary of any City;
- b) 3 kilometres or more from the developed area of any recreational park;
- c) 1.5 kilometres or more from the boundary of any Town, Village, or Hamlet;
- d) 1 kilometre or more from any residence or business; and
- e) 100 metres from any water course, unless otherwise approved.

2. Prior ministry approval of a mobile plant's location is not required, notwithstanding the environmental assessment screening process and determination of a development as described in the Overview section.

3. Operating approvals for mobile plants are not required to be obtained from the ministry.

4. At a minimum, mobile asphalt plants shall be equipped with cyclones to capture particulate emissions.





## STATIONARY ASPHALT PLANTS

1. Asphalt plants sited in sensitive areas (e.g. native grasslands, near wetlands, etc.) have the potential to cause adverse environmental impacts. It is recommended that proponents review the Self-Assessment Checklist in Appendix A of the Technical Proposal Guidelines (<http://www.environment.gov.sk.ca/EATEchnicalProposalGuidelines>) when considering whether their project warrants review by the Environmental Assessment Branch.
2. Construction and operating approvals are not required to be obtained from the ministry, notwithstanding the environmental assessment screening process and determination of a development as described in the Overview section.
3. Minimum operating criteria that stationary asphalt plants must meet:
  - a) emissions of total particulate matter from dry exhaust stacks do not exceed a concentration of 0.25 grams per standard cubic meter, measured on a dry and undiluted basis; and
  - b) fugitive emissions of particulate matter at the facility are to be minimized.
4. All stationary asphalt plants must meet minimum criteria. Particulate emission control technology such as baghouses, wet scrubbers and cyclones can be employed to ensure minimum criteria are met.
5. Annual stack testing shall be performed under normal operating conditions to ensure the plant's total particulate matter emissions from each dry exhaust stack does not exceed a concentration of 0.25 grams per standard cubic meter.
6. Stack testing shall be conducted following approved Environment Canada or U.S. Environmental Protection Agency Reference Methodologies, or by such other method as approved by the ministry. A stack sampling survey shall consist of three separate tests.
7. Concentration exceedences of 0.25 grams per standard cubic meter are to be reported to the ministry within 10 working days with a plan to reduce emissions to meet the 0.25 grams per standard cubic meter requirement.





## Attachment 3. Native Seed Mix for Reclamation – Prince Albert National Park

A typical native seed mix that would be a good growing mix for the reclamation of bare soil is as follows:

Content by weight:

- 30% Slender Wheatgrass (*Elymus trachycaulus*)
- 34% Western Wheatgrass (*Pascopyrum smithii*)
- 24% Northern Wheatgrass (*Elymus lanceolatus*)
- 10% Canada Wild rye (*Elymus canadensis*)
- 2% June Grass (*Koeleria macrantha*)

This mixture contains a mix of fast growing bunch grasses for initial stabilization of the bare soil area, followed by the colonization of slower growing sod-forming grasses for long-term stability. This mixture can be purchased by seed vendors within Saskatchewan. We insist on a native grass blend or a native grass/ECOVAR blend in order to keep the park free from cultivated and/or introduced grass and forb species. Seed has previously been purchased from grass species devised from Native Plant Solutions (A subsidiary of Ducks Unlimited) which specialized in the production and selling of native grass seed for reclamation purposes. Seed can now be purchased locally from suppliers:

Brett Young – seed production and distribution

<http://www.brettyoung.ca/html/reclamation/index.cfm>

Early's Farm & Garden Centre

<http://www.earlysgarden.com/Forage.html>

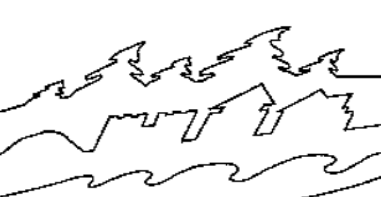
Native Plant Society of Saskatchewan – Native Plant Sources:

<http://www.npss.sk.ca/?s=4>

[http://www.npss.sk.ca/docs/2\\_pdf/Native\\_Plant\\_Source\\_List\\_2013\\_-\\_revised.pdf](http://www.npss.sk.ca/docs/2_pdf/Native_Plant_Source_List_2013_-_revised.pdf)

**Here is a list of grasses and forbs that are acceptable in PANP:**

- Green Needle Grass (*Stipa viridula*)
- Northern Wheatgrass (*Elymus lanceolatus*)
- Western Wheatgrass (*Pascopyrum smithii*)
- Slender Wheatgrass (*Elymus trachycaulus*)
- Awned Wheatgrass (*Elymus trachycaulus* ssp. *subsecundus*)
- Plains Rough Fescue (*Festuca scabrella*)
- June Grass (*Koeleria macrantha*)
- Northern Porcupine Grass (*Stipa curtiseta*)
- Needle and Thread Grass (*Stipa comata*)
- Canada Wildrye (*Elymus canadensis*)
- Hooker's Oatgrass (*Helictotrichon hookerii*)
- Wild or Timber Oatgrass (*Danthonia intermedia*)
- Tufted Hair Grass (*Deschampsia caespitosa*)
- Fringed Brome (*Bromus ciliatus*)
- Nodding Brome (*Bromus anomalus*)
- American Hedysarum (*Hedysarum alpinum* var. *americanum*)
- Purple Prairie Clover (*Petalostemon purpureum*)





# Attachment 4. Best Management Practices for Culvert Installations and Replacements

Title	Culvert Installations and Replacements
Scope of Application	<p>This BMP refers to the installation of new culverts and the replacement of degraded culverts where water flow is causing or will cause damage to infrastructure or a threat to public safety. This BMP includes culvert installation and replacement in fish-bearing and non-fish-bearing streams using heavy machinery from shoreline areas only. The following activities are included in this BMP:</p> <ul style="list-style-type: none"><li>• Sedimentation and erosion control activities.</li><li>• In-stream isolation activities.</li><li>• Trail and roadway excavation for a pipe trench</li><li>• Culvert and culvert materials removal and disposal.</li><li>• Culvert installation.</li><li>• Trail and roadway backfilling.</li><li>• Post-installation sedimentation and erosion control activities.</li></ul>
Exceptions	<p>Works and activities that are NOT covered by this BMP and which will require a separate environmental impact analysis:</p> <ul style="list-style-type: none"><li>• Removal of beaver dams or culvert blockages; for BMPs associated with these activities, see the <i>Beaver Dam Removal BMP</i> and the <i>Culvert Clearing BMP</i>, respectively.</li><li>• Removal of beavers or beaver lodges. Beaver lodges refer to the permanent habitat established by beavers in a pond or wetland area. This BMP does NOT cover destruction of beavers or beaver lodges. If beaver activity is a recurrent problem, consult the park <i>Beaver Management Plan</i> for appropriate action.</li><li>• The use of heavy machinery in water courses. If culvert installation cannot be effectively conducted using heavy machinery from the shoreline a separate EIA will be required.</li></ul> <p><b>Note:</b> The Superintendent or designate may determine that a BMP alone is not sufficient to detect or prevent adverse environmental effects and recommend a separate EIA be conducted instead. Conversely, under certain circumstances, the use of this BMP may be applied to activities outside of the scope of application if it is determined that in the specific instance the BMP is sufficient to address all potential adverse environmental effects alone or in combination with another BMP.</p>
Approved Geographic Area of Application	<p>Existing or potential culvert crossings within the Northern Prairies Field Unit (Prince Albert and Elk Island National Parks), where water flow is causing or will cause damage to infrastructure or a threat to public safety.</p>

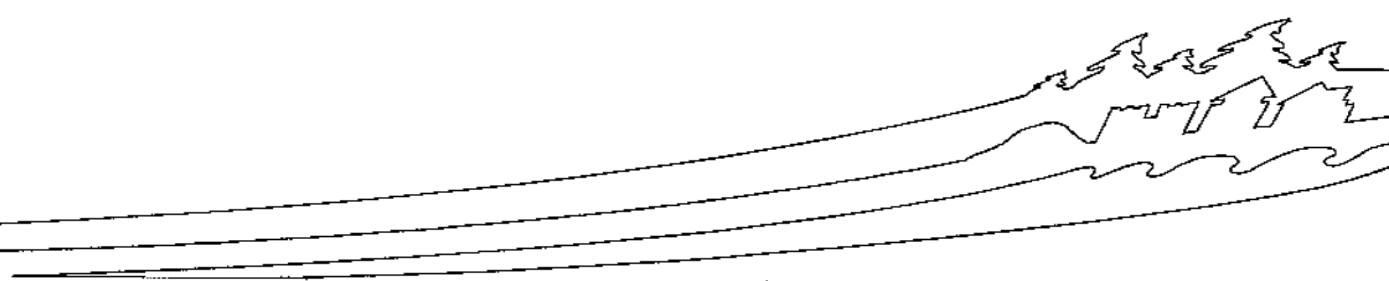
## Potential Key Effects





	<b><i>Ecological Effects</i></b> <i>Vegetation, Soil, Sediment, Water and Air Quality, Fish and Fish Habitat</i>
	<ul style="list-style-type: none"><li>• <b><i>Riparian Vegetation:</i></b> Disturbance and destruction of riparian and aquatic vegetation during installation and replacement activities may occur.</li><li>• <b><i>Soils:</i></b> Soil compaction, disturbance and the erosion of shorelines may occur during installation or replacement activities. Disturbed areas may become prone to bank erosion, which leads to increased sedimentation in streams and can facilitate the establishment of non-native seeds.</li><li>• <b><i>Sediment and Water Quality:</i></b> Sediment may be introduced from banks or disturbed from stream bottoms during installation or replacement activities, resulting in reduced water quality.</li><li>• <b><i>Fish and Fish Habitat:</i></b> Removal and destruction of riparian vegetation and shoreline woody debris may alter cover, food production, movement patterns and the structure of fish habitat. Sedimentation may directly affect fish health and destroy fish habitat, including sensitive spawning areas.</li><li>• <b><i>Soil, Water and Air Quality:</i></b> Fluid leaks from machinery and fuel spills during machinery refuelling could decrease soil, water, and air quality, and unclean machinery could introduce contaminants to the area.</li></ul>
	<b><i>Visitor Safety and Experience</i></b>
	<ul style="list-style-type: none"><li>• Heavy machinery activities and excavation of roadways and trails may pose a risk to visitors if removal activities occur along public access routes.</li><li>• Culvert replacement and in-stream work might temporarily have a negative impact on the appearance of streams in which the work is being done.</li></ul>
	<b><i>Cultural Resources</i></b>
	<ul style="list-style-type: none"><li>• The likelihood of disturbing archeological artifacts during this activity is low due to the previously disturbed nature of all culvert replacement and installation locations.</li></ul>
	<b><i>Species at Risk</i></b>
	<ul style="list-style-type: none"><li>• There are no effects anticipated for Species at Risk.</li></ul>
	<b><i>Residual and Cumulative Effects</i></b>
	<ul style="list-style-type: none"><li>• Installation of culverts may result in persistently lower upstream water levels. Culvert installations will only be considered where high water levels pose a threat to infrastructure or human safety and are therefore not considered to have a significant adverse effect on the park ecosystem.</li></ul>

<b>Mitigation Measures</b>	
	<b><i>Timing</i></b>
	<ul style="list-style-type: none"><li><input type="checkbox"/> Non-critical in-stream must be timed to respect the restricted activity timing windows identified by DFO to protect fish, including their eggs, juveniles, spawning adults and/or the organisms upon which they feed. Specifically:</li><li><input type="checkbox"/> <b>Prince Albert National Park:</b><ul style="list-style-type: none"><li><input type="checkbox"/> In-stream work must be avoided from April 16<sup>th</sup> to June 30<sup>th</sup> in order to protect spring spawning fish and developing eggs/fry.</li></ul></li></ul>







- ☐ In-stream work for waterways with lake trout present should be avoided from September 15<sup>th</sup> to June 30<sup>th</sup> to protect fall/winter spawning fish and developing eggs/fry.
- ☐ In-stream work for waterways with no lake trout should be avoided from October 1<sup>st</sup> to June 30<sup>th</sup> to protect fall/winter spawning fish and developing eggs/fry.
- ☐ For a full list of streams with spring and/or fall/winter spawning fish, see Appendix A.
- ☐ **Elk Island National Park:**
  - ☐ Wherever possible, culvert work should be conducted during the June 30<sup>th</sup>- September 1<sup>st</sup> time period to protect aquatic organisms and prevent water levels from dropping just prior to the over-winter period. No DFO restricted activity timing windows apply.
- ☐ Maintenance activities to prevent flooding or damage to infrastructure and work conducted in the event of an emergency, specified as **imminent** damage to park infrastructure or threat to public safety, may occur at any time. All other mitigation measures must be adhered to and restoration measures may be required in the event damage is incurred. In areas requiring repeated clearing of a culvert, alternative water management options or designs should be considered.
- ☐ The duration of in-water work must be minimized.
- ☐ All in-water activities, or in-water structures, must not interfere with fish passage, constrict the channel width, or reduce flows.
- ☐ In-stream work should be planned during periods of low-flow to reduce the risk to fish and their habitat and to allow work in water to be more easily isolated from flows.
- ☐ Work should be scheduled to avoid wet, windy and rainy periods that may increase erosion and sedimentation.

### ***Erosion and Sediment Control***



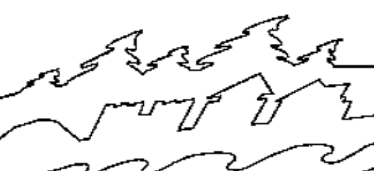


### *Shoreline Protection*

- ☐ Prior to any culvert installation or replacement work, effective erosion and sediment control measures must be established and maintained for the duration of construction.
- ☐ Silt fencing must be erected around the entire work area, parallel to the road or trail and a minimum of 10-m on either side of the stream crossing on both the upstream and downstream sides of the water body in order to catch falling road debris during excavation.
- ☐ Every effort must be made to minimize the introduction of sediment and the disturbance of sediment and debris during in-water work activities.
- ☐ Clearing of and disturbance to riparian vegetation must be kept to a minimum. If select vegetation clearing is required, refer to the *Riparian Vegetation Clearing BMP*.

### *Isolation Techniques*

- ☐ Roads and trails requiring excavation for culvert installation or replacement must be isolated, defined as segregating the work area from surrounding standing or flowing water and maintaining it in a dewatered dry state, to enable effective culvert installation in dry conditions.
- ☐ To isolate flows, up- and down-stream dams made of non-earthen material, such as water inflated portable dams, pea gravel bags, concrete blocks, steel or untreated wood walls should be used and must effectively create a dry, separated work site from flowing water.
  - ☐ If granular material is used to build dams, clean material that is adequately sized (i.e., moderately sized rock and not sand or gravel) must be used to withstand anticipated flows during the construction.
  - ☐ If necessary, the outside faces of dams should be lined with heavy poly-plastic to make them impermeable to water.
  - ☐ Material to build dams must not be taken from below the high water mark (See Appendix B) of any water body.
  - ☐ Dams must be designed to accommodate any expected high flows of the watercourse during the construction period.
- ☐ If fish are present in the stream or feed into water bodies reliant on fish from the stream as food sources, construction work must proceed in a manner that ensures 100% of downstream flows are maintained at all times. See Appendix A for details on streams requiring flow maintenance.
- ☐ Downstream flows may be maintained using pumps or diversions.
  - ☐ Diversions must be excavated in isolation of stream flows and have bottom and trench side lining that will reduce sediment transport from the trench into the downstream area.
  - ☐ Any pumps must be operated in a manner that prevents streambed disturbance and fish mortality. Guidelines to determine the appropriate mesh size for intake screens may be obtained from DFO (e.g., *Freshwater Intake End-of-Pipe Fish Screen Guideline* (1995),





available at [www.dfo-mpo.gc.ca/Library/ 223669.pdf](http://www.dfo-mpo.gc.ca/Library/223669.pdf) (PDF Version, 2.93 Mb)).

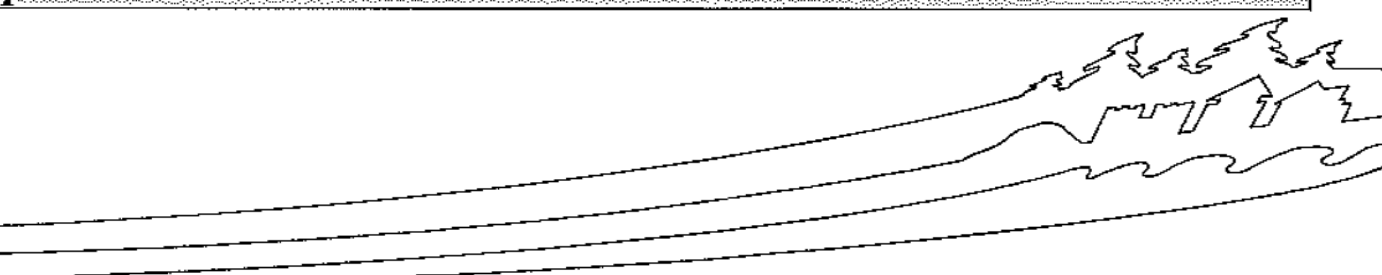
- ☐ The pumping system must be sized to accommodate any expected high flows of the watercourse during the construction period.
- ☐ Pumps must be monitored **at all times**, and back-up pumps should be readily available **on-site** in case of pump failure.
- ☐ Pump discharge area(s) should be protected using an energy-dissipating material, such as large rocks, to prevent erosion and the release of suspended sediments downstream. All material must be removed when the work has been completed.
- ☐ Once isolation dams have been erected and downstream flows established, if required, the isolated area should be slowly dewatered, ensuring any trapped fish are rescued from within the isolated area and returned safely immediately downstream of the worksite.
- ☐ Dewatering discharge from the isolation area must be pumped into an upland vegetated area or settling basin to reduce sedimentation of the water course. **Do not pump water from the isolation area back into the stream.**
- ☐ Do not commence any road or trail excavation until isolation and downstream flow maintenance has been established and tested.

#### ***Culvert Installation or Replacement***

- ☐ Culvert installation must conform to the guidelines of the *Land Development Guidelines for the Protection of Aquatic Habitat* (DFO 1993) available at: <http://www.dfo-mpo.gc.ca/Library/165353.pdf>, including:
  - ☐ Culverts on fish bearing streams must have a minimum diameter of 0.45m.
  - ☐ Culverts must not be hanging and must conform to the natural stream gradient, with no area having less than 0.23m of water in the base of the culvert.
  - ☐ Culvert slopes must not exceed 0.5% for culverts >24m or 1% for culverts <24m.
- ☐ Once isolation has been established, road or trail beds should be excavated slowly, from the downstream side first.
- ☐ All road and trail material must be stored and secured within the existing disturbed footprint, above the high water mark of the stream, and used to back-fill the excavation following culvert installation.
- ☐ Any excess road or trail material must be handled in accordance with the *Construction Wastes* Section of the *General Measures BMP*.
- ☐ Old culverts must be removed from the trench and secured above the high water mark for disposal at an appropriate location; see the *Construction Wastes* Section of the *General Measures BMP*.
- ☐ The new culvert should be laid at the outlet end first, continuing up-slope. Proper bedding at each joint should occur as installation proceeds. Pipe joints should be wrapped 1-1/2 times around with geo-textile filter fabric.
- ☐ Once the culvert is installed and secured in place, road or trail material should be backfilled and compacted around the culvert.



	<ul style="list-style-type: none"><li>□ All in-stream shoreline stabilization activities should commence prior to removing the isolation dams.</li></ul>
	<b><i>Shoreline Re-vegetation and Stabilization</i></b>
	<ul style="list-style-type: none"><li>□ If replacement rock reinforcement/armouring is required to stabilize eroding inlets and outlets, the following measures must be incorporated:<ul style="list-style-type: none"><li>□ Appropriately-sized, clean rocks should be placed into the eroding area at a similar slope to surrounding banks to maintain a uniform stream bank and natural stream alignment.</li><li>□ Rock must not interfere with fish passage or constrict the channel width.</li><li>□ Any rock/cobble used in-stream must be obtained from off-site and not from below the high water level of any watercourse or water body.</li><li>□ The use of rock that is acid-generating must be avoided. Rock that fractures and breaks down quickly when exposed to the elements should not be used.</li></ul></li><li>□ Disturbed shoreline areas must be re-contoured and re-vegetated with an approved native seed mixture (refer to Appendix C) and installation of appropriate erosion control measures (e.g. Nilex or coconut matting) must be implemented and maintained until vegetation establishes.</li></ul>
	<b><i>Re-establishing Flow</i></b>
	<ul style="list-style-type: none"><li>□ Once the road or trail material has been backfilled around the culvert and in-stream stabilization measures are established, isolation dams should be removed from the downstream side of the culvert first, continuing to pump water around the isolation area.</li><li>□ The upstream isolation dam should be removed very slowly following removal of the downstream dam to enable water to divert through the culvert with as little sedimentation as possible.</li><li>□ Once full flow has been re-established through the culvert, the diversion may be backfilled or the pumping stopped.</li></ul>
	<b><i>Use of Heavy Machinery Near Water Courses</i></b>
	<ul style="list-style-type: none"><li>□ Machinery must be operated from shoreline areas only and may not enter the watercourse.</li><li>□ Heavy machinery must not be operated closer than two feet from the culvert.</li><li>□ Existing trails, roads or cut lines must be used wherever possible to avoid disturbance to the riparian vegetation and prevent soil compaction.</li><li>□ Appropriate shoreline footing must be established and silt fencing must be erected to catch eroding shoreline material prior to entering the waterway.</li><li>□ All maintenance and servicing activities must be conducted at least 100 m away from water courses and machinery must have a spill kit capable of containing 110% of on-site fuel.</li><li>□ All other measures in the to the <i>Use of Heavy Machinery</i> Section of the <i>General Measures BMP</i> and the <i>Fuel Storage, Handling and Disposal BMP</i> must be adhered to.</li></ul>
	<b><i>Visitor Safety and Experience</i></b>





	<ul style="list-style-type: none"><li><input type="checkbox"/> In high visitor use areas, work should be planned during low visitation times, whenever possible.</li><li><input type="checkbox"/> Proper signage and control must be established around the work area on any roads or trails.</li><li><input type="checkbox"/> Where visitor access is possible, appropriate access restrictions must be maintained for the duration of the work.</li><li><input type="checkbox"/> Closures and detours on all access roads must be established and effectively signed in both official languages for the duration of any road work.</li></ul>
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Development and Review		
Date	Name, Position	Summary
08-08-2014	Moriah Tanguay, Student Aisha Uduman, Student Heather McPhee, Ecology Team Leader Christine Hamilton, Technical Services Officer PANP Mark McIntyre, Technical Services Officer EINP Brent McDougall, Resource Management Officer EINP	BMP development and review

#### Referenced BMPs:

Beaver Dam Removal BMP

Culvert Clearing BMP

General Measures BMP

Fuel Storage, Handling & Disposal BMP

Riparian Vegetation Clearing BMP

#### References:

Department of Fisheries and Oceans. 2013. Saskatchewan Restricted Activity Timing Windows for the Protection of Fish and Fish Habitat. Accessed June 31, 2014: <http://www.dfo-mpo.gc.ca/pnw-ppe/timing-periodes/sk-eng.html>

United States Environmental Protection Agency. 2003. Recommended Practices Manual: A Guideline for Maintenance and Service of Unpaved Roads. Guidance document. Accessed June 31, 2014:

[http://water.epa.gov/polwaste/nps/urban/upload/2003\\_07\\_24\\_NPS\\_unpavedroads\\_ch3.pdf](http://water.epa.gov/polwaste/nps/urban/upload/2003_07_24_NPS_unpavedroads_ch3.pdf)

Department of Fisheries and Oceans Canada. 1993. Land Development Guidelines for the Protection of Aquatic Habitat. Government document. Accessed June 31, 2014: <http://www.dfo-mpo.gc.ca/Library/165353.pdf>

