

PESÂKÂSTÊW SOLAR PROJECT TECHNICAL PROPOSAL

MAY 2020



PESÂKÂSTÊW SOLAR PROJECT

TECHNICAL PROPOSAL

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DATE: MAY 04, 2020

**PESÂKÂSTÊW SOLAR LIMITED
PARTNERSHIP**



May 01, 2020

Saskatchewan Ministry of Environment
3211 Albert Street
Regina, SK S4S 5W6

Attention: Environmental Assessment and Stewardship Branch

Dear Madam/Sir:

Subject: Pesâkâstêw Solar Project Technical Proposal

Natural Forces respectfully submits this Technical Proposal for review of the proposed Pesâkâstêw Solar Project. We are confident that this document will sufficiently address the requirements of the Environmental Assessment and Stewardship Branch.

The Government of Saskatchewan *Technical Proposal Guidelines* have been followed in the development of this Technical Proposal. Provincial regulators as well as Planners from the Rural Municipality (RM) of Weyburn have been further consulted for guidance. Natural Forces acknowledges that additional information will be required and submitted for review as it becomes available.

Natural Forces Developments Limited Partnership is submitting the assessment on behalf of Pesâkâstêw Solar Limited Partnership (PSLP) and is eager to work with Provincial regulators to provide any additional information about the Pesâkâstêw Solar Project that may be requested.

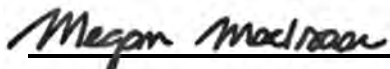
Should there be any questions, please do not hesitate to contact me at (902) 422-9663 or via email at apellerin@naturalforges.ca. As well, Natural Forces would welcome and appreciate the opportunity to meet and further discuss the comments and responses with reviewers at a set time and date at their convenience. We are able to accommodate online meetings at this time and will welcome face-to-face meetings when it has been deemed safe to do so.

Yours truly,

Amy Pellerin
Senior Development Manager
Natural Forces, on behalf of
Pesâkâstêw Solar Partnership Limited

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May 4th 2020

Date

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May 4th 2020

Date

The content and opinions contained in the present report are based on the observations and/or information available to Pesâkâstêw Solar Limited Partnership at the time of preparation. If a third party makes use of, relies on, or makes decisions in accordance with this report, said third party is solely responsible for such use, reliance or decisions. Pesâkâstêw Solar Limited Partnership does not accept responsibility for damages, if any, suffered by any third party as a result of decisions made or actions taken by said third party based on this report. This limitations statement is considered an integral part of this report.

¹ Approval of this document is an administrative function indicating readiness for release and does not impart legal liability on to the Approver for any technical content contained herein. Technical accuracy and fit-for-purpose of this content is obtained through the review process. The Approver shall ensure the applicable review process has occurred prior to signing the document.

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1 EXECUTIVE SUMMARY

INTRODUCTION

Pesâkâstêw Solar Limited Partnership (PSLP) is proposing to construct and operate a new 10 MW solar energy facility near Weyburn, Saskatchewan. The Pesâkâstêw Solar Project (the Project) will contribute to meeting Saskatchewan's greenhouse reduction targets and SaskPower's goal of reaching 50% renewable energy production by 2030. The Project will include the installation of photovoltaic solar panels, inverters, transformers, and an access road. The Project will be situated on 35.8 ha of land that has been cultivated for several generations and is located adjacent to an existing substation. Pre-construction preparatory activities are scheduled to begin in fall 2020 and construction will begin in spring 2021.

Natural Forces Development Limited Partnership (Natural Forces) has prepared this Technical Proposal on behalf of the proponent, PSLP. The purpose of this document is to describe the Project, existing environment, potential effects of the Project on Valued Ecosystem Components (VECs), and mitigation measures. Natural Forces is submitting the assessment on behalf of PSLP and is committed to working with the Ministry of Environment to ensure the Project is compliant with regulatory requirements and commitments made in this Technical Proposal.

PROJECT PROPONENT

The proponent is Pesâkâstêw Solar Limited Partnership (PSLP), a partnership between Natural Forces Developments LP (Natural Forces), Red Dog Holdings Limited (RDHL), and George Gordon Developments Limited (GGDL). Natural Forces is a privately-owned renewable energy company with its head office in Halifax, Nova Scotia, and has been in business since 2001 with projects spanning from coast to coast across Canada. RDHL is the economic development corporation of Star Blanket Cree Nation, which has identified renewable energy as a strategic priority. GGDL is the economic development corporation of George Gordon First Nation and is a regional First Nations leader in business development. Together RDHL and GGDL will have a combined ownership of 51% of the Project. The First Nations Power Authority selected PSLP as one of their project participants under the First Nations Opportunity Assessment 10 MW Qualification Review.

PROJECT DETAILS

The Project is located in the Rural Municipality of Weyburn, approximately 4 km southwest of the City of Weyburn, on privately held lands. The Project will consist of approximately 32,700 bi-facial photovoltaic panels on single axis trackers, three inverters, one transformer per inverter, one main access road, and several smaller corridors between panel rows for maintenance purposes. The Project will connect to the existing SaskPower electrical grid. PSLP is currently in discussions with SaskPower regarding the best solution for interconnection.

Pre-construction preparation will include the removal of stubble remaining from agricultural harvest activities, levelling and grading the site. Construction activities will include development of foundation (pile system); installation of racking system, solar panels, collection lines, inverters, and transformers; excavation of trenches for collector lines; construction of an access road, perimeter fencing, lighting, control building and maintenance building; and grid connection and commissioning. Operation and maintenance activities may include vegetation management, snow removal, and remote monitoring systems.

Site preparation in advance of construction will begin after harvest in fall 2020. Construction is anticipated to begin in spring 2021. The Project will be commissioned and in operation by the end of 2021. The operational phase of the Project is expected to be approximately 20 years. Decommissioning and reclamation will be completed thereafter in accordance with a decommissioning plan.

SITING CONSIDERATIONS

PSLP considered technical factors, environment, heritage resources, land use, and planning while determining the Project site. PSLP specifically selected the Project Area to avoid sensitive, rare or native habitats while providing relatively flat topography, limited sources of shading, and sufficient solar resource. The Project has been intentionally sited to avoid native grasslands which have experienced large-scale, historic and ongoing habitat loss. The Project Area is predominantly agricultural and has been cultivated for multiple generations. The land is privately held and the landowner is amenable to a lease allowing the construction and operation of the Project.

EXISTING ENVIRONMENT

Baseline physical, biological and socio-economic information were collected for the Project from 2018 to the present through desktop studies, biophysical surveys, and engagement activities. Qualified third-party consultants were hired to complete geotechnical and biological studies.

The Project is located within the Mixed Moist Grassland Ecoregion and Dark Brown Soil Zone of the Canadian prairies. The climate in the area is typical of the Canadian prairies with cold winters and hot, dry summers. The land cover types present in the Project Area include cultivated, Class I tilled wetland, Class II tilled wetland, human-made drainage, and intermittent stream. The area lacks potentially fish-bearing waters. No plant species of conservation concern (SOCC) were observed; however, five noxious and one nuisance weed were identified in the Project Area. Targeted avian surveys did not detect raptor stick nests, sharp-tailed grouse leks, or short-eared owls in the Local Assessment Area. Six avian SOCC were observed flying over the Local Assessment Area during spring migration surveys in 2019. However, the results of the grassland bird surveys and spring and fall bird migration surveys indicate the Local Assessment Area does not provide unique or well-used habitat for birds. Amphibian auditory surveys detected very low numbers of wood frogs (*Lithobates sylvaticus*) and boreal chorus frogs (*Pseudacris maculate*) in the Local Assessment Area. Incidental wildlife observations included three SOCC: American badger (*Taxidea taxus*), barn swallow (*Hirundo rustica*), and Sprague's pipit (*Anthus spragueii*).

Heritage resource screening using the Ministry of Parks, Culture and Sport's Online Developers' Screening Tool indicated the Project Area is not heritage sensitive. The Project does not encroach upon any Crown, Indigenous, or protected lands. The nearest Indigenous communities are Ocean Man First Nation and Piapot First Nation.

Land within the Regional Assessment Area is rural and urban (City of Weyburn). Noise in the area is produced by farm equipment operating on nearby lands, homestead activities, vehicles travelling on local roads and highways, and the adjacent substation. The nearest occupied residence is located approximately 600 m from the Project Area.

Weyburn is the tenth largest city in Saskatchewan with a population of around 11,000 people. It is the largest inland grain gathering point in Canada. Major components of the local economy have been oil and gas exploration and development.

PSLP will hire local contractors and workers, such as general labourers, road builders, excavators, masonry workers, and electricians, where possible. The Project will bring revenue to many local businesses as Project workers purchase meals, supplies, lodgings, and other goods and services.

VECS, POTENTIAL EFFECTS AND MITIGATION

The Project will provide benefits to atmospheric conditions by offsetting the production of greenhouse gas emissions. The Project will also provide benefits to the community through local employment, contractor opportunities, and contributions to the local economy.

Key mitigation measures for the Project include siting, development and implementation of an Environmental Protection Plan, and monitoring. With the implementation of mitigation measures, no residual effects from the Project are anticipated for soils, terrain and geophysical; heritage resources; land use and property value; or public health and safety.

Noise levels are not expected to exceed permissible sound levels during construction, operation and maintenance, or decommissioning and reclamation. During operation, solar panels themselves make no noise; however, the inverters do emit an audible hum while converting DC from the panels to AC for transport through the power lines. At 200 m from the Project, the hum will drop to the same level as a whisper. Residual effects of noise on humans and wildlife are predicted to not be significant.

Photovoltaic solar panels may cause glare or glint, resulting in changes in visual sensory conditions or danger to motorists or residents. After implementation of mitigation measures such as adjusting the angle of panels to reduce glare, potential residual effects from glare or glint are expected to be not significant.

Potential Project effects on vegetation and land cover include the introduction or spread of weed species. Industry standard mitigations and site-specific measures will reduce or avoid these effects on vegetation and land cover; thus, any potential residual effects are considered minor and not significant.

The Project has the potential to affect wildlife and wildlife habitat through increased risk of mortality for wildlife, habitat loss and/or alteration, and wildlife displacement through sensory disturbances and/or disruption of wildlife movement. For photovoltaic solar projects, the main risk of wildlife mortality results from collisions with vehicles, equipment, or infrastructure. Studies have documented wildlife mortality at solar projects (e.g., Walston et al., 2016; Kagan et al., 2014; Montag et al., 2016; Visser et al., 2019). The mortality risk for collisions is greatest for birds; however, the potential number of birds impacted by collisions and stranding from solar projects is much lower than for other anthropogenic sources of avian mortality (Erickson et al., 2005). PSLP is committed to completing one year of post-construction wildlife monitoring to assess impacts of the Project on wildlife. Adaptations will be implemented as needed to attempt to decrease mortality. It is expected that residual effects from the risk of mortality are not likely to result in a significant change to wildlife and wildlife habitat. Given that the Project is sited on a cultivated field where weed growth is already common, the Project is unlikely to contribute to significant residual effects on wildlife and wildlife habitat with the implementation of standard and site-specific mitigation measures. Wildlife may be displaced as a result of sensory disturbances from the Project including light and noise. Mitigation measures will effectively reduce impacts to wildlife due to sensory disturbances. Disruptions to wildlife movements, such as increased traffic and attractants, can also be managed with appropriate mitigation. Residual effects from wildlife displacement are anticipated to not be significant.

PSLP will conduct regulatory compliance monitoring, post-construction wildlife monitoring, and risk management monitoring. Adaptive management principles will be applied.

ENGAGEMENT

PSLP has engaged regulatory agencies, municipalities, targeted stakeholders, Indigenous communities, and the public to provide input on the Project. Concerns raised were effectively addressed through conversations and the provision of additional information regarding Project plans, studies, and mitigation measures. The majority of those engaged are supportive of the Project and understand the benefits of solar projects. No major concerns were identified. Engagement activities will continue throughout the life cycle of the Project.

CONCLUSION

The Project will be constructed, owned, operated and maintained by PLSP. The Project will help Saskatchewan meet its lower greenhouse gas emissions targets, as well as SaskPower to reach their goal of 50% renewable energy production by 2030. The Project will offset a projected 18,860 tonnes of CO₂ while powering homes in the area. The Project will also provide benefits to the community through employment of local workers and contributions to the local economy throughout the Project life cycle.

The Project has been sited to avoid or reduce adverse interactions with VECs. PSLP is committed to the incorporation of industry standard and site-specific mitigation measures into the Project. Based on the assessment, no significant adverse effects on VECs are anticipated as a result of the Project. Cumulative effects assessments determined Project contributions to cumulative effects on VECs in the Regional Assessment Area are not predicted to be significant. Engagement results indicate support for the Project and no major concerns have been identified.

PSLP is committed to the protection of the environment and the production of cleaner energy for the people of Saskatchewan. PSLP is also committed to ensuring the Project complies with regulatory requirements and commitments made in this Technical Proposal.

2 PROPONENT INFORMATION

2.1 PROPONENT

The proponent for the project is the Pesâkâstêw Solar Limited Partnership (PSLP), a partnership between Natural Forces Developments LP (Natural Forces), Red Dog Holdings Limited (RDHL), and George Gordon Developments Limited (GGDL). Natural Forces is submitting this Technical Proposal and acting as developer on behalf of the Proponent.

Proponent	Pesâkâstêw Solar Limited Partnership
Address	1801 Hollis Street, Suite 1205, Halifax, NS, B3j 3N4
Principle Contact Person	Amy Pellerin Senior Development Manager at Natural Forces Email: apellerin@naturalforges.ca Phone: (902) 422-9663

2.2 PARTNERS

2.2.1 NATURAL FORCES

Natural Forces is a privately-owned renewable energy company with its head office in Halifax, Nova Scotia with regional offices in Quispamsis, New Brunswick, and Dublin, Ireland. Natural Forces has been in business since 2001 with projects spanning from coast to coast across Canada

Our vision is to develop clean renewable energy projects across Canada in partnership with local communities, local businesses and First Nations. The partnership objective of our vision enables our team to promote and implement projects that deliver real ownership of energy assets in Canada to local economies, communities and people. We believe local participation creates local economic benefits and community pride, improving the likelihood of developing and operating successful clean and renewable energy projects. We believe our vision and successful experience with First Nations and community partnerships brings something unique to our partners, the First Nations Power Authority (FNPA), and the Saskatchewan renewable energy market.

2.2.2 RED DOG HOLDINGS LIMITED – STAR BLANKET CREE NATION

Star Blanket Cree Nation has a population of approximately 703 registered members located on and off reserve and is led by Chief Michael Starr and four councilors. The Nation is located on over 7,500 hectares of reserve land in the Fort Qu'Appelle area of Saskatchewan.

RDHL is the economic development corporation of Star Blanket Cree Nation. Together with GGDL, they will have a combined ownership of 51% of PSLP. RDHL aims to develop long term partnerships with companies with shared values and goals, and to provide opportunities for sustainable employment, training, wealth creation and community development.

Star Blanket Cree Nation has identified Renewable Energy as a strategic priority in their 2012 strategic plan. Star Blanket Cree Nation believes renewable energy investment coincides with the values of respect and protection of “Mother Earth” and the environment, this project would put words into action. Our inherent

and treaty rights are the basis for our social, cultural, political and economic systems. From generation to generation we will continue to exercise our inherent and Treaty rights and sacred obligations given to us by our Creator.

2.2.3 GEORGE GORDON DEVELOPMENTS LTD. – GEORGE GORDON FIRST NATION

George Gordon First Nation has a population of approximately 3,710 registered members located on and off reserve. The Nation is led by Chief John McNabb and eight councillors and is located near the village of Punnichy, Saskatchewan on approximately 15,000 hectares of reserve land.

GGDL has been the economic development arm of the George Gordon First Nation since 2011. They will share 51% ownership of PSLP with RDHL. Establishing important business partnerships with industry leaders, GGDL has already become a regional First Nations leader in business development. Through its partnerships, GGDL has assembled the capacity and capability to successfully put forward high quality bids on any major projects relating to resource development with North American companies that are best in class.

2.3 FIRST NATIONS POWER AUTHORITY

The FNPA was established as a not-for-profit organization to create circumstances favorable to Indigenous inclusion in the power sector. Created in 2011, the FNPA was mandated to facilitate the development of First Nations-led power projects and promote Indigenous participation in procurement Technical attributes opportunities with the crown utility in Saskatchewan, SaskPower.

In order to facilitate this mandate, FNPA successfully negotiated a mutually beneficial, long-term Master Agreement with the crown utility, SaskPower. This one-of-a kind contract with a North American power utility is a 10-year agreement and provides guidance to how the FNPA and SaskPower will work together to share information and identify opportunities.

The FNPA released a First Nations Opportunity Assessment (FNOA) Qualification Review (QR) to the FNPA's general membership in June of 2018. The QR was released to assess the capacity of project participants to successfully develop, permit, finance, construct and bring to commercial operation a 10 MW greenfield solar generation project. At that time, evaluation criteria were identified as:

- Development experience
- Total indigenous project benefits, including equity participation, direct benefits and other spin-off benefits
- Commercial viability
- Financing capacity

George Gordon First Nation and Star Blanket Cree Nation are both general members of the FNPA. George Gordon First Nation's economic development entity is GGDL. Star Blanket Cree Nation's economic development entity is RDHL.

Natural Forces Developments LP, a member of Natural Forces group of companies (collectively, Natural Forces) is an industry member of the FNPA.

As members of the FNPA, the FNPA facilitated introductions between George Gordon First Nation, Star Blanket Cree Nation and Natural Forces Developments LP. Over the course of many months, GGDL, RDHL

and Natural Forces Developments LP formed a partnership to develop renewable energy projects together. The first opportunity for this partnership arose through the FNPA's FNOA 10 MW Solar QR process.

Pesâkâstêw Solar Limited Partnership (PSLP, Pesâkâstêw Solar LP, the Partnership, the Proponent, or the Project Participant) was formed in July 2018 in anticipation of the FNPA's FNOA QR and in preparation of a response. In September of 2018, the FNPA advised the Pesâkâstêw Solar LP that it had been selected as one of the Project Participants under the FNOA 10 MW Solar QR.

2.4 THIRD-PARTY CONSULTANTS

The Proponent engaged third party consultants to complete geotechnical and biophysical surveys and support engagement activities. WSP Canada Inc. (WSP) conducted desktop environmental screenings and led biophysical studies for the Project. WSP is one of the largest professional service firms in Canada with expertise in six main business lines: Environment, Geomatics, Transportation, Buildings, Municipal Infrastructure, and EIR (Energy, Resources and Industry). Staff in the WSP Saskatchewan offices contributed to the Project. Wicehtowak Limnos Consulting Services LP (WLCS) provided field assistants to support WSP in completion of field studies in 2019. WLCS is a Regina-based full services environmental consulting firm that is wholly owned by GGDL. The Cree word "Wicehtowak" has no direct English translation, but means partnership with a purpose. Work on the Project was conducted in this spirit.

3 PROJECT DESCRIPTION

The Pesâkâstêw Solar Project (the Project) will be constructed, owned, operated and maintained by the Proponent, PSLP. The Project was named Pesâkâstêw meaning Rising Sun in the Cree language.

3.1 PROJECT NEED

SaskPower has set a clear goal of reaching 50% renewable energy production by 2030 (SaskPower, 2017). The Project will contribute to renewable energy sources on the SaskPower grid to help reach this goal. The Project also aims to promote Indigenous owned and operated energy projects to inspire further projects of a similar nature.

The Project is located near the City of Weyburn and other rural communities including Colgate, McTaggart, Halbrite, and Cedoux. There is a need for additional safe, clean energy sources to help offset greenhouse gas emissions and meet increasing energy demands in these communities. These demands include powering town centers, industrial activities and populated residential areas.

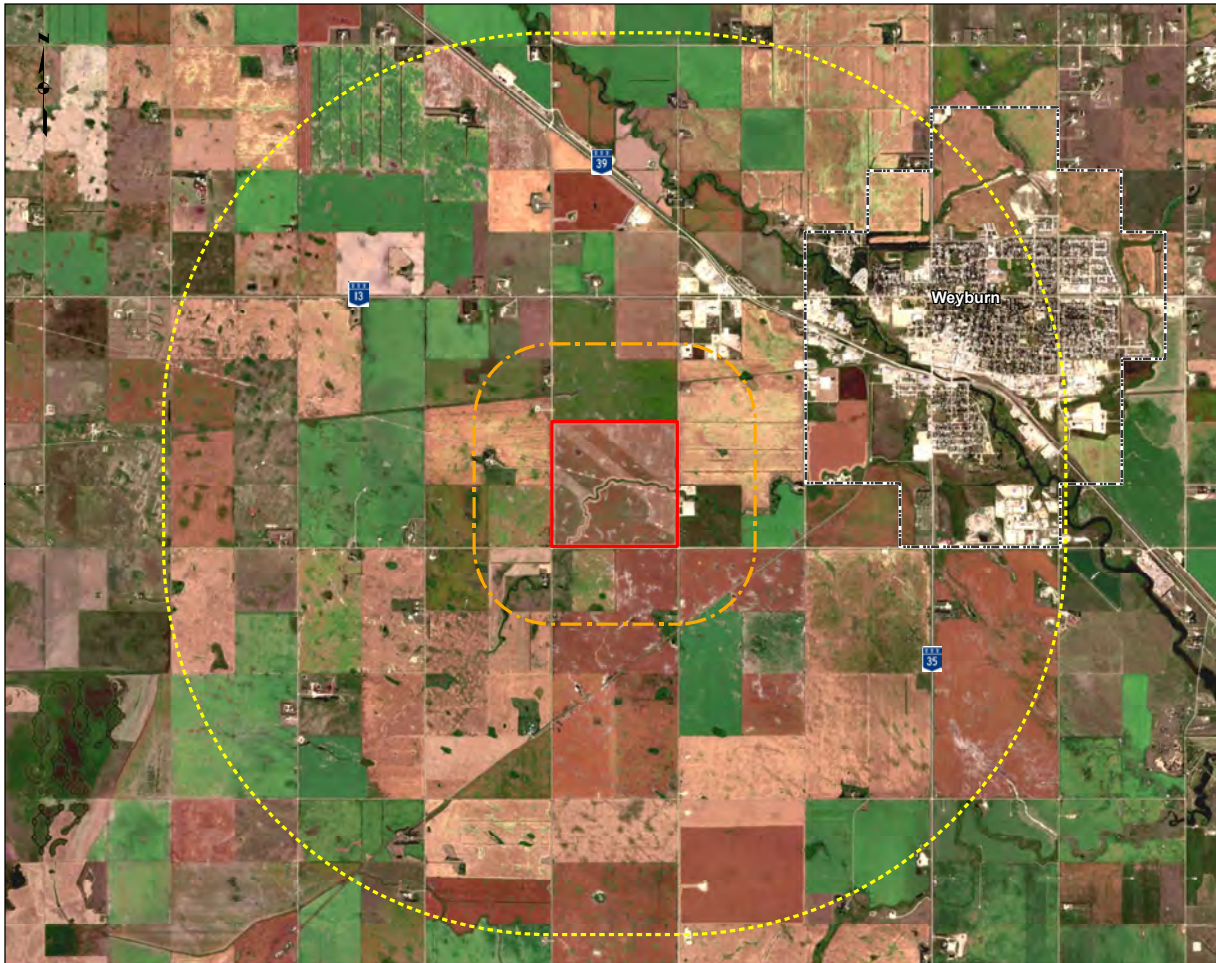
A recent report by the International Panel on Climate Change (IPCC, 2014) states the following:

- energy accounts for a significant 25% of global greenhouse gas emissions
- continued emissions of greenhouse gasses will amplify existing risks and create new risks for natural and human systems
- the risk of abrupt irreversible changes increases as the magnitude of warming increases
- mitigation measures must be used to reduce the greenhouse gas intensity
- measures such as reducing energy usage and moving towards decarbonized energy supply should be taken to move towards achieving these goals

3.2 PROJECT DETAILS

The Project is a solar energy project that will deliver 10 MW of electricity to the existing SaskPower electrical grid. The Project lands are owned in fee simple by a private landowner. The Proponent has executed an Option and Lease with the landowner and will enter into a lease upon construction of the Project. The Project will connect to an existing SaskPower substation located adjacent to the quarters section containing the Project. The substation is located approximately 400 m from the proposed infrastructure, as shown in Figure 1.

Based on site specific solar resource, panel availability, and the capacity available on the grid, an appropriate panel technology was chosen. The proposed Project will consist of approximately 32,700 bi-facial photovoltaic (PV) panels on single axis trackers, requiring approximately 35.8 hectares of land. It is anticipated that the Project will require three inverters and a transformer per inverter to step up the energy produced from 600V to 24.9 kV to be distributed onto the grid. The site will have one main access road with many smaller corridors between panels for maintenance purposes (Figure 2).



Legend

- Project Area
- Local Assessment Area
- Regional Assessment Area
- City Limit

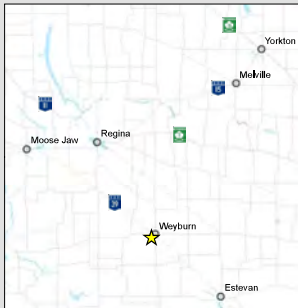


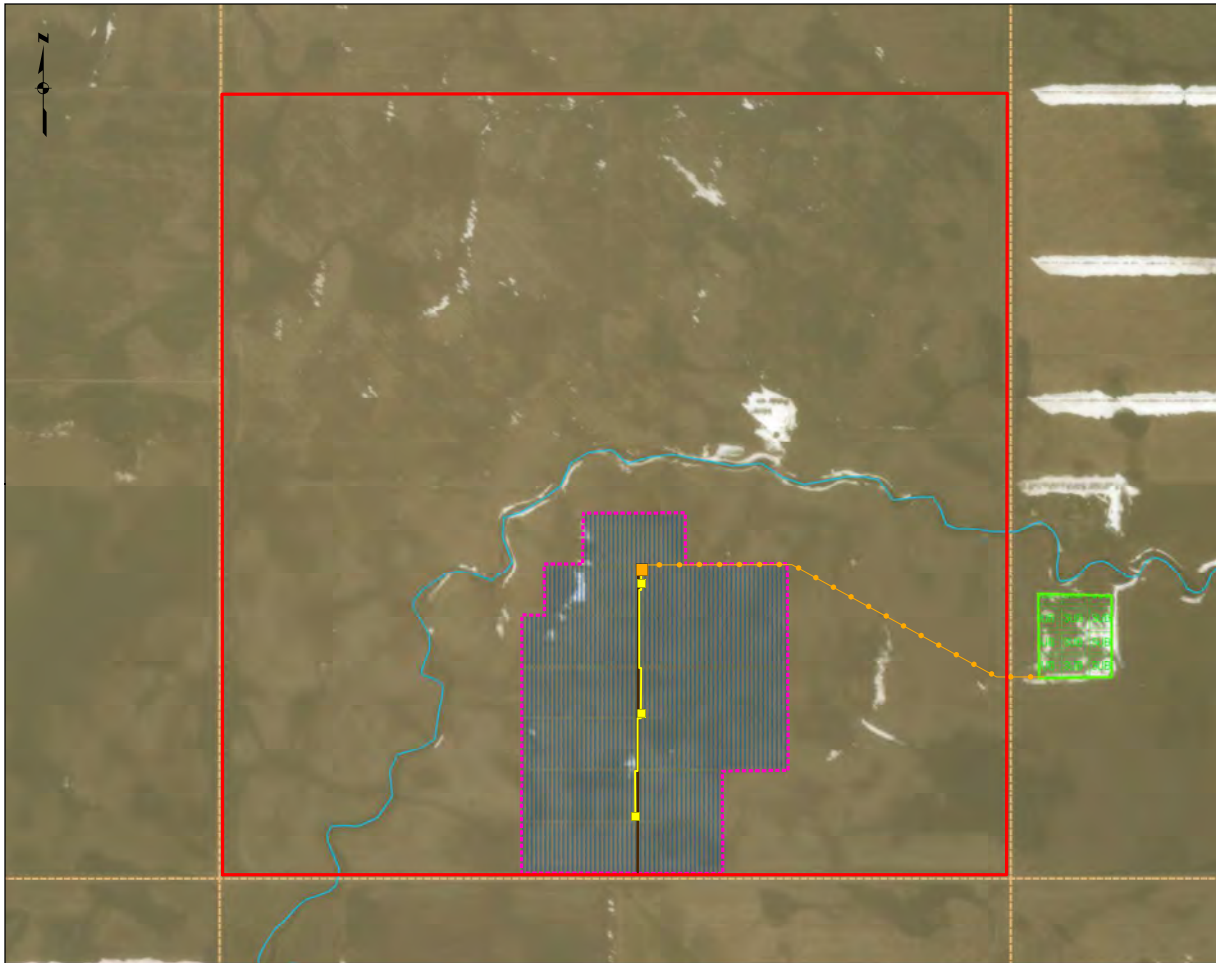
Figure 1
Project Location and Assessment Areas

Pesākāstēw Solar Project



Scale: 1:75,000
Universal Transverse Mercator (Zone 13)
North American Datum (1983)

BaseLayer Source: Sandwell-2, Sept 22, 2019	Report By: JLF Drawn by: JLF Reviewed By: JFW	WSP Job #: 191-01834-00 Date: April 22, 2020 Office: Saskatoon
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- Legend**
- Project Area
 - Existing Grid Road
 - Temporary Stream
 - Existing Substation
 - Project Footprint
 - Inverters
 - Collector Line
 - Medium Voltage Station
 - Distribution Line
 - Solar Panels
 - Access Road
 - Fence

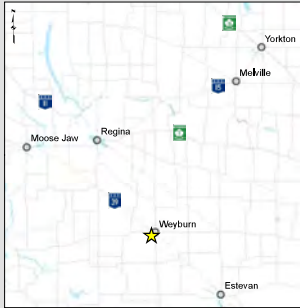


Figure 2
Preliminary Design and Interconnection Location

Pesakastew Solar Project

Scale: 1:12,000

0 75 150 300 450 600
 m

Universal Transverse Mercator (Zone 13)
 North American Datum (1983)

3.2.1 PHYSICAL COMPONENTS AND DIMENSIONS

The Project layout and panel design is in the detailed design phase. Micro-siting activities are occurring to identify the most efficient and effective design for capturing the solar resource.

3.2.1.1 SOLAR PANELS

Though some details are yet to be finalized, the Project will use bi-facial solar panels which expose the front and back of the solar cells to irradiance. The panels will be single-axis meaning the angle can be changed along one axis (i.e., tilt up and down) with a 60-degree range of motion. Equipment selected will meet Canadian standards.

3.2.1.2 PANEL RACKING

Different panel racking designs and manufacturers are being considered. The final design will choose the racking system best suited in terms of the materials used, the constructability, and the value-added services that are offered.

3.2.1.3 INTERCONNECTION COMPONENTS

The Project will connect to the existing SaskPower electrical grid. The Proponent has been in discussions with SaskPower to determine the best solution for interconnection. Additional facility studies will be conducted to facilitate discussions.

Based on the Proponent's experience, it is anticipated that a simple line tap will be required to the existing distribution lines adjacent to the Project lands. This line tap will require a switchgear, a meter, and a few additional poles for the equipment. Another possibility is to connect directly to the Weyburn substation, which is located approximately 400 m from the Project infrastructure. In this situation, cabling on top of distribution poles would be required to cross the road and access the substation, at which point the Project would be connected to an open bay.

3.2.1.4 ACCESS ROADS

One main access road will be required through the approximate center of the Project footprint to provide access to the site for construction and maintenance. The road will be built to accommodate equipment delivery during construction, to provide general access to each row of panels, and to allow maintenance equipment access throughout the Project lifetime. The main access road will be directly connected to the gravel road to the east of the Project footprint.

Additional roads may be required to access each panel row, depending on the final Project design. It is more likely that smaller access paths will run in between the rows of panels in order to gain access to the entire Project. The access roads throughout the Project will be designed to help reduce the impact of the Project, where appropriate.

3.2.2 CONSTRUCTION

Site preparation in advance of construction is expected to start in the fall of 2020. Construction will likely begin in the spring of 2021 (Table 1). The following main construction activities will occur for the Project:

- site clearing (e.g., removal of stubble remaining from agricultural harvest activities)
- levelling and grading

- pile system preparation
- installing a racking system and solar panels
- excavation of trenches for the collector lines and installation of the collection system
- installation of inverter stations
- construction of access road(s), perimeter fencing and lighting
- construction of a control building and maintenance building
- construction of a transmission line
- grid connection and commissioning

Table 1 High Level Construction Timeline for the Project

Construction Activity	Estimated Timeline
Pre-Construction Preparation (e.g., clearing)	Q3 2020
Access Road Construction	Q3 2020
Perimeter Fencing and Inverter Station Installation	Q3 2020
Trench Excavation	Q3 2020
Ground levelling and Grading	Q2 2021
Pile system preparation	Q2 2021
Installation of Racking System and Solar Panels	Q2 2021
Removal of Temporary Works and Clean Up	Q3 2021

3.2.3 OPERATIONS

The Project will operate for 20 years, which is consistent with the duration of the Power Purchase Agreement (PPA) with SaskPower to purchase electricity generated by this project as well as the general life expectancy of the panel technology.

Throughout operation the Project is anticipated to produce approximately 22 to 25 MWh of electricity per year for the Municipality of Weyburn and surrounding communities.

3.2.3.1 TRAFFIC

Once the solar project is operational, minimal vehicle activity will be required. The internal site roads will be used for periodic maintenance and safety checks.

3.2.3.2 PROJECT SAFETY SIGNS

A Project sign will be located at the entrance to the site. This sign will provide essential safety information such as emergency contacts and telephone numbers. As well, the sign will provide information about the solar project and the companies involved in the Project. Safety signs and information will also be installed around the Project site as required. These signs will be maintained throughout the operational life of the solar project.

3.2.3.3 MAINTENANCE PLANS

Scheduled maintenance work and routine site visits will be carried out several times each year throughout the operational phase. This maintenance will depend on the finalized Project design, but may include snow removal, vegetation management, as well as a SCADA remote monitoring system. This monitoring system will inform the Proponent if there are any unforeseen maintenance issues. Regular site inspections will

occur, and land inspections will be completed to monitor site drainage, erosion, and grass fire risk. A maintenance plan has been developed and attached in Appendix A to address seasonal impacts on the solar development.

3.2.4 DECOMMISSIONING

The Project will be in operation for approximately 20 years. The decommissioning and reclamation of the Project lands will follow a decommissioning plan, in addition to the Project’s environmental and mitigation measures. Decommissioning of the Project will comply with all applicable federal and provincial regulatory requirements.

Alternatively, the Project could be repowered with new, upgraded technology to extend the life of the Project. The end of life outcome of the Project is dependent on the technology that evolves and becomes available in the next 20 years or so. Further decommissioning plans are detailed in Section 10.

3.2.5 FUTURE MODIFICATIONS OR EXTENSIONS

Various designs have been drafted and panel designs will be micro-sited to determine most effective layout for capturing the solar resource while minimizing and avoiding environmental impacts to the extent possible.

The land secured for the Project can support various expansion scenarios that may be contemplated in the future. Additional notice and information will be provided to the Ministry of Environment (MOE) for review should these expansions be deemed feasible.

3.2.6 PROJECT SCHEDULE

The Proponent is currently finalizing the Project design. Site preparation is expected to begin post-harvest in the fall of 2020. Construction is anticipated to begin in the spring of 2021. The Project will be commissioned by the end of 2021 and will have an operational phase of 20 years. Decommissioning and reclamation are expected to be completed in approximately six months. The proposed Project schedule is provided in Table 2.

Table 2 Proposed Project Schedule

Project Activity	Anticipated Start Date	Anticipated Duration
Site Preparation	Q3 2020	2 months
Construction	Q2 2021	6 months
Operations and Maintenance	Q4 2021	20 years
Decommissioning and Reclamation	2046	6 months

3.3 PROJECT LOCATION

The Project is located approximately 4 km southwest of the City of Weyburn, Saskatchewan. The coordinates of the Project’s centroid are Zone 13U 578436.13 m E, 5499540.70 m N. The Project is located on agricultural land in section 13-18-15 W2M. Figure 1 illustrates the Local Assessment Area and Regional Assessment Area of the Project. Figure 2 provides the preliminary design and interconnection location.

The Project location was specifically selected because the panels will reside on land that has been used for agricultural purposes for multiple generations. The consistent cultivation and land use have resulted in chronic disturbance. The Proponent can transform these lands into a site that will provide an

environmentally friendly, productive source of energy for the local communities without impacting native, sensitive and/or rare habitats.

3.3.1 SITING CONSIDERATIONS

The Proponent has extensive knowledge with respect to site identification and development of community-based renewable energy projects. There are many considerations to take into account while developing these types of projects, and a detailed assessment of these considerations have led the Proponent to determine the location of the Project, which presents the best opportunity to provide efficient renewable energy to the local community with the least adverse impacts to the community and surrounding environment.

As a result of the relatively flat topography, limited sources of shading on the Project lands, and sufficient solar resource, the Project site provides an attractive solar resource for a solar energy project. The Project is an attractive site due to the solar resource, distance from dwellings and environmentally sensitive features, proximity to the SaskPower substation, and previously disturbed ground conditions.

The following is a list of factors that have been considered during the site identification and design process:

- Technical Considerations
- Environment
- Heritage Resources
- Land Use
- Planning

3.3.1.1 TECHNICAL CONSIDERATIONS

Technical considerations during the Project siting and design phase include the solar resource, proximity to the SaskPower substation, type of solar panel technology, and geotechnical conditions. The site selected for Project is located directly across the road from the SaskPower substation. The substation is approximately 400 m from the proposed infrastructure (Figure 2).

Natural Forces has been in discussion with SaskPower regarding interconnection of the Project. Appropriate inverters with transform the energy from DC to AC and a transformer will step the energy up from 600V to 24.9 kV when it will then be distributed onto the SaskPower grid and be directed to the substation.

The Proponent hired a qualified third-party consultant, Ground Engineering Consultants Ltd., to conduct a geotechnical investigation in 2019 to determine geophysical conditions which impacts panel design and construction. Additional testing will be completed in Q2 2020 to complete the entire scope and finalize the design and components used for construction.

3.3.1.2 ENVIRONMENT

Many environmental impacts associated with the construction and operation of a solar project can be reduced or avoided through proper siting. The Proponent has engaged with regulators and conducted desktop and field studies to locate wetlands, watercourses, sensitive habitats, and species of management concerns to support siting the Project to avoid as many of these sensitive features as possible. Environmental considerations for the Project included proximity to wetlands; presence of species of management concern and/or suitable habitats; proximity to residential dwellings or other noise sensitive

Proponent took the *Wildlife Siting Guidelines for Saskatchewan Wind Energy Projects* (MOE 2016) into account while siting the Project.

The Project footprint is approximated located the following distances from identified sensitive features:

- 615 m north of the nearest non-tilled, natural wetland
- 30 m from the intermittent natural drainage channel that passes through the Project Area
- 680 m from the nearest residential dwellings
- 50 m from the nearest element occurrence as identified by the Hunting, Angling and Biodiversity Information of Saskatchewan (HABISask) online database as of April 1, 2020. However, that observation of a Sprague's pipit (*Anthus spragueii*) was made during Project surveys in 2019. The bird was flying over during migration and did not use habitat near the site
- 8.5 km to the nearest observation of native grassland vegetation (as determined using Google Earth™ satellite imagery, which may or may not be accurate)
- 35 km to the nearest Important Bird Area (IBA at Colgate)
- 86 km to the nearest provincial park (Moose Mountain Provincial Park)
- 126 km to the nearest national park (Motherwell Homestead National Historic Park)
- 6 km to the nearest Migratory Bird Concentration Site (Tatagwa Lake).

3.3.1.3 HERITAGE RESOURCES

Saskatchewan is home to many archaeological sites and features. During the siting and design phase, the Project Area was screened for heritage resources using the Ministry of Parks, Culture and Sport's Developers' Online Screening Tool. The Project Area was determined not to be heritage sensitive, likely because this land has been tilled and farmed for many years. No further archaeological work was completed for the Project.

The results of the heritage resources screening are presented in Appendix A.

3.3.1.4 LAND USE

The Proponent considered land use and habitat types to be critical considerations during the siting and design phase of the Project. Land use considerations include available access to the land; current land use; future land use plans; and proximity to residential properties, communities, and towns.

The Project Area is owned by an amenable landowner and access has been obtained. The Project lands are predominantly agricultural and has been cultivated for multiple generations. Care will be taken to minimize disturbance to adjacent lands such that agricultural use may continue unimpeded. After decommissioning of the Project, the land will be restored to agricultural use.

The Project is located in the Rural Municipality (RM) of Weyburn and approximately 4 km from the City of Weyburn. The nearest aerodrome is over 8 km away.

3.3.1.5 PLANNING

The Proponent has engaged with Planners from the RM of Weyburn to help develop and provide recommendations for a new solar energy bylaw as there were no current such bylaws in place at the start of the Project's development. Further engagement with the appropriate planning body will occur throughout

development and construction of the Project. A Development Permit will be obtained prior to construction, as required.

3.4 SOCIOECONOMICS

The Project will be majority owned by the First Nations partners, GGD and RDHL. This will provide both Nations with a stable revenue source created and staying within Saskatchewan for the duration of the Project's operation.

It is anticipated the Project will create a variety of local jobs throughout the Project life cycle, while contributing to community economic development. Service, skills and trades required for the Project may include:

- Environmental consulting and monitoring
- Civil engineering and surveying
- Electrical engineering (BoP)
- Geotechnical engineering
- Road and road pad building
- Blasting and aggregate supply
- Pile system preparation and installation
- PCT deliveries
- Crane support
- General labourers
- Installation crews
- Panel and site electrical workers
- Office/toilet rental/waste removal
- Solar array maintenance
- Asset management
- Ancillary services, such as snow clearing, civil maintenance, electrical maintenance
- Professional services, such as accounting and legal

The Project is predicted to bring revenue to many local businesses as Project workers purchase meals and supplies, and expense accommodations to conduct work on site.

3.5 ALTERNATIVES

Initially the Proponent considered locating the Project in central Saskatchewan in an area with a mosaic of cultivated land, hay land, and tame pastureland. However, studies showed the location near Weyburn was more desirable due to the prevalence of cultivated land in the area and the proximity to the SaskPower substation. Additionally, the landowner of the Project Area is willing to lease the property to the Proponent.

Solar energy projects provide direct contributions globally to reducing harmful greenhouse gases associated with traditional carbon-based energy sources. SaskPower, the main energy provider in Saskatchewan, has committed to increase renewable energy production to 50% of the total energy

produced by SaskPower. The Project will help contribute directly to this goal; therefore, other forms of energy generation were not considered as alternatives to the Project.

3.6 ANCILLARY PROJECTS

The Project will most likely connect to the existing SaskPower substation. The details of this connection have yet to be finalized. Should the connection differ from the scenarios introduced in Section 3.2.1.5, it will be as a result of discussions and studies conducted between SaskPower and PLSP. It is not anticipated that the changes would be material to the scope of the Technical Proposal.

4 REGULATORY CONTEXT

The Project will comply with applicable regulatory requirements, including legislation, regulations, directives, policies, guidelines, and permits for solar projects in Saskatchewan. Requirements for development are generally dependent upon the project location, environmental features, land use, and proximity to municipalities or existing infrastructure.

Project siting is often the most important regulatory consideration. Regulatory requirements for siting tend to relate to existing land uses, environmentally sensitive areas (e.g., grasslands, wetlands, wildlife dens, nests, or critical/important habitats, etc.), and proximity to residences, airports and other valued ecosystem components.

Regulatory requirements related to construction generally relate to construction monitoring, applicable setback distances, environmental timing restrictions, contamination prevention and treatment, and waste management. Regulatory requirements and guidelines related to operation of solar projects may include post-construction monitoring, waste management, and reporting. Decommissioning and reclamation requirements and guidelines apply to most development projects and likely include the submission of As-built reports post-reclamation. The MOE must approve an Environmental Protection Plan (EPP) to be adhered to during construction, operation, decommissioning and reclamation for renewable energy projects.

The following subsections discuss relevant requirements at the federal, provincial and municipal levels that may apply to the Project.

4.1 FEDERAL

4.1.1 IMPACT ASSESSMENT ACT OF CANADA

On August 28, 2019, the *Impact Assessment Act* came into effect, along with related regulations. The *Act* repeals the former *Canadian Environmental Assessment Act, 2012*. The *Impact Assessment Act* sets out the purpose, required steps and participants, and timelines for impact assessment of proposed projects in Canada that are included in the *Physical Activities Regulations*.

The *Physical Activities Regulations* set out the types of projects that are ‘designated projects’ and may require an impact assessment under the *Act*. The Proponent completed a review of the *Regulations* and determined a solar project could be a ‘designated project’ if the Project meets any of the following criteria:

- Project were to be sited in a wildlife area, as per section 1 of the *Regulation* which states, “The construction, operation, decommissioning and abandonment in a *wildlife area*, as defined in section 2 of the *Wildlife Area Regulations*, a *migratory bird sanctuary*, as defined in subsection 2(1) of the *Migratory Bird Sanctuary Regulations* or a protected marine area established under subsection 4.1(1) of the *Canada Wildlife Act*”
- Construction was to occur on land that is managed or administered by the Parks Canada Agency, if the construction is “contrary to the management plan for that land that is tabled in each House of Parliament under subsection 32(1) of the *Parks Canada Agency Act*, subsection 11(1) of the *Canada National Parks Act*, or subsection 9(1) of the *Rouge National Urban Park Act*, or to a similar plan for the land that is approved by the Minister responsible for the Parks Canada Agency”; or is contrary to

specific guidelines published by the Parks Canada Agency for the Marmot Basin, Mount Norquay, Lake Louise, or Sunshine Village Ski Resorts/Areas

- Project was considered under Ministerial Discretion by the Minister to potentially cause adverse effects within federal jurisdiction or adverse direct or incidental effects, or public concerns related to those effects warrant the designation

Based on current Project information (e.g., nameplate capacity, proposed location), the Proponent has determined the Project will not require an assessment or review under the federal *Impact Assessment Act* and subsequent *Physical Activities Regulation* because the Project location does not occur in a federal wildlife area or on lands administered by Parks Canada Agency, and a 10 MW solar project is not likely to be considered by the Minister under Ministerial Discretion if siting can avoid sensitive areas. Therefore, the Project will not consider the *Impact Assessment Act* any further.

4.1.2 SPECIES AT RISK ACT

The *Species at Risk Act* (SARA) provides for the legal protection of wildlife species and the conservation of their biological diversity. The key purposes of SARA include prevention of Canadian indigenous species, subspecies, and distinct populations from becoming extirpated or extinct, provision for the recovery of Endangered or Threatened species, and encouragement of management of other species to prevent them from becoming at risk. All species classified as being at risk (i.e., Extirpated, Endangered, Threatened and of Special Concern) by the Committee on the Status of Endangered Wildlife in Canada are addressed under SARA. However, only species listed on Schedule 1 of SARA are protected.

No SARA listed species were observed to inhabit the Project Area. If any species listed by SARA are found on the Project site during any development phase, measures will be taken to mitigate any potential harm to those species.

4.1.3 FISHERIES ACT

On June 21, 2019, the modernized federal *Fisheries Act* received royal assent and became law and on August 28, 2019 the new regulations came into force. The modernized *Fisheries Act* includes the fisheries protection prohibition against causing death to fish, or the harmful alteration, disruption or destruction (HADD) of fish habitat. Projects that will result in the death of fish or a HADD, require Authorization under sections 34.4(2)(b) and 35(2)(b) of the *Fisheries Act*. Fisheries and Oceans Canada (DFO) interprets HADD as “any temporary or permanent change to fish habitat that directly or indirectly impairs the habitat’s capacity to support one or more life processes of fish.”

Fish, as defined in the *Fisheries Act* (section 2), includes “shellfish, crustaceans, marine animals, the eggs, sperm, spat and juvenile stages of fish, shellfish, crustaceans, and marine animals.” Fish habitat is defined (subsection 2[1]) as “all waters frequented by fish and any other areas upon which fish depend directly or indirectly to carry out their life processes. This includes spawning grounds and nursery, rearing, food supply and migration areas.”

Solar developments sited near fish-bearing waters have the potential to affect fish and fish habitat during construction, operation, decommission and reclamation. Studies confirm the Project location does not contain and is not adjacent to potentially fish-bearing waters. Therefore, the Project will not consider the *Fisheries Act* any further.

4.1.4 MIGRATORY BIRDS CONVENTION ACT

The *Migratory Birds Convention Act* aims to protect migratory birds, their nests and eggs. The *Act* is applicable on all lands and waterbodies in Canada and to all activities associated with organizations, industries and individuals. Under section 2 of the *Act*, “migratory bird” means a migratory bird referred to in the Convention, and includes the sperm, eggs, embryos, tissue cultures and parts of the bird. Under Article V of the *Act*, “the taking of nests or eggs of migratory game or insectivorous or nongame birds shall be prohibited, except for scientific or propagating purposes under such laws or regulations as the High Contracting Powers may severally deem appropriate.” The taking of nests or eggs includes loss through the removal of trees or vegetation from a site during the avian breeding season, generally from April 14 to August 24 in the proposed potential project areas (Breeding Bird Zone B4; ECCO, 2018). Note that breeding bird nests identified outside of the breeding season are still protected under the *Act*. Qualified environmental personnel should evaluate projects against the location and season regarding mitigation for breeding birds.

The *Migratory Birds Convention Act* applies to the Project, including the following activities:

- land disturbance (i.e., clearing vegetation, grubbing, stripping, road building)
- infrastructure rehabilitation and decommissioning disturbances (i.e. bridge replacement, building removal)
- sensory disturbance (i.e., noises, lights, and other human activities)
- emergency incidents (i.e., fires, spills, hazardous materials)

These Project activities may take place during the breeding bird season after a qualified biologist has completed a migratory bird nesting survey within the Project Area and suitable setback distances, and established disturbance-free protective setbacks around observed nests or young. The nesting survey must be completed within 7 days prior to the commencement of Project activities.

4.1.5 TRANSPORT CANADA

4.1.5.1 AERODROMES AND SOLAR PROJECTS

Developments near aerodromes have the potential to adversely impact safety at the aerodrome and on the local community. Although Transport Canada does not have the regulatory authority for the designation and use of lands located outside aerodromes, Transport Canada has issued guidance document TP 1247E *Land Use in the Vicinity of Aerodromes*. This document helps planners and proponents understand the potential impact of a development around an aerodrome. Part VIII of TP 1247E specifically addresses solar array installations (Transport Canada, 2013/14).

The guidelines indicate that PV solar projects located near aerodromes may cause the following concerns:

- Glare to pilots of aircraft approaching to or departing from the aerodrome or glare to air traffic control staff
- Interference with electronic navigational aids
- Penetration through transitional or approach/departure surfaces

A glint and glare assessment is currently underway. Results will be provided to the MOE, if required.

4.1.5.2 CANADIAN NAVIGABLE WATERS ACT

On August 28, 2019, the former *Navigation Protection Act* was amended and renamed the *Canadian Navigable Waters Act*. Transport Canada administers the *Act* under the Navigation Protection Program.

The *Canadian Navigable Waters Act* aims to protect water on which the public has a right to travel. This *Act* requires an application for approval for projects that:

- occur on waters on the List of Scheduled Waters
- include major works or obstructions on navigable waters, even those not listed on the List of Scheduled Waters

The *Act* prohibits the throwing or depositing of sawdust, slabs, bark, edging or any like rubbish into navigable waters that may interfere with navigation in any water. Additionally, no stone, gravel, earth, or other material that may sink to the bottom in any water may be thrown or deposited in navigable waters or flows into navigable waters where there is not a depth of at least 36 metres. The *Act* also prohibits dewatering of navigable waters that may result in the loss of ability to navigate for all vessels that are likely to navigate those waters. Violations may result in monetary penalties.

The proposed Project is not sited on or adjacent to a water listed in the Schedule, and the Project will not include activities that would be considered major works under the *Act*. Therefore, approval under the *Act* is not required for the Project.

4.1.5.3 CANADIAN ENVIRONMENTAL PROTECTION ACT

The *Canadian Environmental Protection Act, 1999* addresses pollution prevention and the protection of the environment and human health to contribute to sustainable development. The *Act* lays out environmental protections, air pollution and water pollution prevention, toxic substance controls, hazardous waste management, and offences and punishments.

The *Canadian Environmental Protection Act, 1999* requirements are typically met by projects in all project phases by adhering to industry best practices and proven mitigation measures. No approvals or applications for the Project are required; however, the *Act* still applies.

4.2 PROVINCIAL

4.2.1 THE ENVIRONMENTAL ASSESSMENT ACT

The Saskatchewan *Environmental Assessment Act* prescribes the environmental assessment process and aims to ensure that development within the province proceeds with appropriate environmental protections and in a manner understood and accepted by the public. The Environmental Assessment and Stewardship Branch (EASB) of MOE administers and enforces the *Act*. The provincial environmental assessment (EA) process is a results-based regulatory approach that enables development in balance with the conservation and sustainable use of natural resources. The Saskatchewan EA process involves three primary steps to guide projects through the approval process:

- Environmental Self-assessment
- Technical Proposal
- Environmental Impact Assessment

This report fulfills the requirement of the Technical Proposal to allow the Minister of Environment to determine whether the Project is likely to be considered a 'development' under section 2(d) of the *Act*.

4.2.2 THE ENVIRONMENTAL MANAGEMENT AND PROTECTION ACT, 2010

The Environmental Management and Protection Act, 2010 protects the air, land and water resources of the province through regulating and controlling potentially harmful activities and substances. The *Act* makes provisions for water pollution control, industrial effluent works, sewage works, waterworks, and regulations of all matters concerning water quality.

An Aquatic Habitat Protection Permit (AHPP) is required for alteration or development in or around the bed, bank or boundary of watercourses, waterbodies, or wetlands; or for any discharge with potential adverse effects on water. The Project Area contains an intermittent stream, human-made drainages, and Class IT and IIT wetlands. A 30 m setback has been applied to the intermittent stream. Therefore, the Project will most likely not require an AHPP.

Drainage approvals for changes to drainage patterns in the landscape; changes to the natural storage capacity of wetlands, or the conveyance of surface water are required from the Water Security Agency (WSA) and fall under this *Act*. Drainage approvals for the Project will be required if site preparation requires alteration to current drainage.

Waste management, hazardous materials storage, and industrial works are also authorized and permitted under this *Act*. If the Project will store hazardous materials or dangerous waste as designated in *the Hazardous Materials and Waste Dangerous Goods Regulations* under the *Act*, an Application to Construct or Upgrade and Operate a Storage Facility to MOE is required.

4.2.3 THE HERITAGE PROPERTY ACT

The Heritage Property Act is the governing legislation to "provide for the Preservation, Interpretation and Development of Certain Aspects of Heritage Property in Saskatchewan." The *Act* stipulates that a heritage review by the Heritage Conservation Branch (HCB) is required prior to commencing construction for all ground disturbing development and activity that has the potential to damage heritage property. Section 63 of the *Act* states, "...where the minister is of the opinion that any operation or activity which may be undertaken by a person is likely to result in the alteration, damage or destruction of heritage property, he may require that person to: (a) carry out an assessment to determine the effect of the proposed operation or activity on that heritage property (b) prepare and submit to the minister a report...(c) undertake any salvage, preservation or protective measures..." Section 67 of the *Act* stipulates that a permit is required for the purpose of collection, researching, or otherwise managing heritage property.

Under the *Act*, all projects that may cause ground disturbance require a screening of the project areas for potential heritage resources. Screening is typically conducted using the Developers' Online Development Screening tool. If the screening indicates the site may be heritage sensitive or has not been previously screened, a referral to the HCB is required. The HCB reviews the referral and determines whether a Heritage Resource Impact Assessment (HRIA) is warranted. An HRIA is carried out by a qualified Archaeologist under an Archaeological Resource Investigation Permit obtained from the HCB under the *Act*. The Archaeologist will summarize the HRIA and provide recommendations to the HCB in a permit report. The HCB reviews the report and determines if further investigation is warranted, if the project may proceed as described, or if the project may not proceed. Projects may not proceed until Clearance is obtained from the HCB.

The Project was screened for heritage resources using the Developers' Online Development Screening tool. No further heritage work is required because the Project Area was deemed not to be heritage sensitive. The results of the screening are presented in Appendix A.

4.2.4 THE WEED CONTROL ACT

The purpose of *The Weed Control Act* is to prevent weeds from being introduced into areas that do not contain these species and prevent the spread of new weeds into and through the province. The *Weed Control Act* aims to protect natural areas such as native grassland, forests, and aquatic habitats from the introduction of these species.

Notification of occurrences of weeds listed as prohibited under Schedule 1, noxious under Schedule 2, and nuisance under Schedule 3 under the *Act* must be given to landowners and occupants of a property and to the Municipality or RM. Steps must be taken by landowners and occupants, under the supervision of a weed inspector, to eradicate prohibited or isolated infestations of noxious weeds, contain and control established infestations of noxious weeds, or control any nuisance weeds.

During the construction, operation, decommissioning and reclamation phases, the Project will employ measures to avoid the transfer of all weeds listed under the *Act*. Notifications of infestations of weeds on the Project site will be provided to the landowner and RM.

4.2.5 THE WILDLIFE ACT

The purpose of *The Wildlife Act* is to protect wildlife and wild species at risk in Saskatchewan.

Section 49 of the *Act* deals with the designation and listing of wild species as: Extirpated, Endangered, Threatened, or Vulnerable. Subject to regulations, a recovery plan may be prepared and implemented to protect any designated species. Section 51(1) stipulates activities that are prohibited under the *Act*, including the killing, injuring, possessing, disturbing, taking, capturing, harvesting, genetically manipulating or interfering with any designated wild species at risk. Under section 21, the Minister may for purposes of propagation, rehabilitation and scientific purposes, issue a license pursuant to the *Act*. Under the *Act*, the *Wild Species at Risk Regulations* lists those wild species at risk that are designated as Extirpated, Endangered and Threatened.

Section 5(1) stipulates that no person shall disturb the den, house, nest, dam or usual place of habitation of any wild species at risk designated as Extirpated or Endangered dealing with animal species. A license may be issued to remove or destroy the den, house, nest, dam or usual place of habitation of any wild species at risk (animal species) listed that are causing or is likely to cause damage to property. The Project will not remove or destroy the residence of any wild species at risk; therefore, a license from MOE will be not required.

Species Detection Survey Permits were received from the Fish, Wildlife and Lands Branch of MOE prior to field surveys. Field surveys adhering to Species Detection Survey Protocols or approved modified survey protocols were completed during the siting and design phase of the Project, such that results of the surveys could be included in the Technical Proposal and construction mitigation measures identified and implemented.

4.2.6 HIGHWAYS AND TRANSPORTATION ACT

The provincial *Highways and Transportation Act* lays out requirements for highways, public improvements, transportation and transportation systems, including but not limited to temporary and permanent closures of highways and public improvements; safety, regulation and protection of public improvements (e.g., speed limits, signage, permits, loads, etc.); establishment and maintenance of ferries; and suspension, cancellation and penalties.

Under the *Highways and Transportation Act*, proponents must submit applications to the Ministry of Highways and Infrastructure for approaches, roadside development (usually within 90 m) and utility development within or along provincial highways.

An approach permit may be required for entry to the access road. This will be determined through discussions with the Ministry of Highways and Infrastructure.

4.2.7 WILDLIFE SITING GUIDELINES FOR SASKATCHEWAN WIND ENERGY PROJECTS

Saskatchewan does not have specific siting guidelines for solar projects; however, Saskatchewan has guidelines for wind energy projects (MOE, 2016). The *Wildlife Siting Guidelines for Saskatchewan Wind Energy Projects* (MOE, 2016) assist wind energy proponents to apply a precautionary adaptive management approach to reduce or avoid environmental risks and associated liabilities, expedite environmental reviews and approvals, and result in cost efficient mitigation. The Proponent reviewed the guidelines and identified the following information that may be applicable to solar projects:

- **Desired outcomes of mitigation:**
 - Avoid sensitive areas through good siting
 - Use best practices to minimize operational impacts
 - Reclaim and restore the project site to pre-development function
 - Offset residual impacts, including landscape disturbance and fragmentation effects
 - Monitor outcomes to determine whether mitigation has been successful
- **Avoidance zones:**
 - A prescribed buffer of five kilometres around and inclusive of designated environmentally sensitive areas including:
 - National parks
 - Provincial parks
 - Last Mountain Lake National Wildlife Area
 - Important Bird Areas
 - Western Hemispheric Shorebird Reserve
 - Network sites
 - Ecological reserves
 - Last Mountain Lake
 - North Saskatchewan River
 - South Saskatchewan River
 - Frenchman River
 - Qu'Appelle River
 - Assiniboine River
 - Areas without prescribed setbacks from designated areas including:
 - Fish and Wildlife Development Fund lands
 - Conservation easements areas

- *Wildlife Habitat Protection Act* lands
 - Critical habitat for Species at Risk
 - Sage Grouse Emergency Protection Order Area
 - Federal National Wildlife Area Lands outside Last Mountain Lake National Wildlife Area
- **Siting:**
- Preferentially site on previously altered lands, such as cultivated fields, near towns or industrial areas
 - Avoid siting on natural lands, such as grasslands, woodlands and wetlands
 - Avoid species of management concern and their habitats
 - Avoid bird staging areas, migration corridors, and major watercourses
 - Avoid areas used by wildlife during critical life stages, including breeding and overwintering (e.g., ferruginous hawk nest sites, northern leopard frog overwintering wetlands).

The Proponent has taken these guidelines into consideration during the siting and design phases of the Project to reduce risks to biodiversity and support regulatory compliance.

4.2.8 ADAPTIVE MANAGEMENT GUIDELINES FOR SASKATCHEWAN WIND ENERGY PROJECTS

MOE released *Adaptive Management Guidelines for Saskatchewan Wind Energy Projects* in 2018 to outline adaptive management and post-construction monitoring and reporting requirements for wind projects and provide more certainty to proponents. The Proponent has identified the following information that may be applicable to the solar project.

Adaptive management begins with pre-project planning and assessment of potential impacts, including appropriate pre-construction surveys to assess wildlife species presence and sensitive habitats and to identify any other local environmental sensitivities. Effective planning and siting lays a foundation for initial mitigations that can be integrated into project design and operation. Mitigation efforts are expected to consist mainly of actions to avoid, reduce, and where necessary, offset unavoidable effects during construction, operation, and decommissioning. Compensatory mitigation may be required where project impacts to habitat or wildlife cannot be avoided or minimized.

The guidelines state that post-construction surveys and monitoring are essential to adaptive management. For wind energy projects, the standard minimum post-construction monitoring cycle includes monitoring for the first two years of operation and monitoring on the fifth and tenth years of operation. The EASB (pers. comm., Jeff Dereniwski, 2019) indicated this intensity of post-construction monitoring is not usually required for solar projects; rather, post-construction monitoring requirements will depend upon siting for solar projects.

For the Project, the Proponent will apply a precautionary adaptive management approach similar to that of the *Adaptive Management Guidelines for Saskatchewan Wind Energy Projects* (MOE, 2018), but adapted specifically to the Project. Post-construction wildlife monitoring plans are discussed further in Section 9.2 and will be confirmed through discussions with MOE after receipt of comments on the Technical Proposal.

4.2.9 SASKATCHEWAN ACTIVITY RESTRICTION GUIDELINES FOR SENSITIVE SPECIES

The Saskatchewan Activity Restriction Guidelines (ARGs) for Sensitive Species (MOE, 2017) aim to provide proponents with information regarding species the province has determined are sensitive.

The ARGs list the sensitive species, the feature of that species that is protected, the restricted activity period, and specific setback distances according to disturbance categories (low, medium, high). Solar project construction is considered a High disturbance in the ARGs. Therefore, the setback distances required for sensitive species for High disturbances will be applied to the Project during construction. Mitigation measures to reduce or avoid adverse effects of the Project on sensitive species will be implemented throughout the Project lifecycle.

4.2.10 ENVIRONMENTAL PROTECTION PLAN

The Proponent will submit an EPP for review and approval from MOE prior to construction, if required per approval conditions. The EPP would outline the mitigation measures to be adhered to during the construction, operation, decommissioning and reclamation phases of the project.

The EPP would likely include the following information:

1. Introduction to EPP
 - a. Scope of EPP
 - b. Objectives
 - c. Plan Applicability
2. Project Information
 - a. Project Purpose
 - b. Project Description
 - c. Location
 - d. Project Area Description
 - e. Schedule
3. Regulatory Context
 - a. Legislation, Regulations, and Guidelines
 - b. Project Permits, Approvals, and Terms and Conditions
4. Roles and Responsibilities
 - a. Key Project Personnel
 - b. Proponent
 - c. Contractor
 - d. Environmental Supervisor/Monitor
5. Communications and Reporting Plan
 - a. Communication Channels and Requirements
 - b. Scheduled Reporting Requirements
6. Management Plans and Mitigation Measures
 - a. Environmental Emergency Response (Spill Response Plan, Fire Prevention Plan)
 - b. Soil Management (Erosion and Sediment Control Plan, Soil Salvage Plan)

- c. Water Management (Surface Water Plan, Groundwater and Storm Water Management Plan)
 - d. Vegetation Management (General, Species of Management Concern, Weeds)
 - e. Wildlife Management (General, Species of Management Concern)
 - f. Waste Management
 - g. Archaeological and Heritage Resources Management
 - h. Noise, Vibration and Light Management
 - i. Air Quality Management
 - j. Construction Environmental Monitoring Plan
 - k. Post-construction Environmental Monitoring Plan
 - l. Corrective Actions
7. Emergency Contact Names and Numbers

4.2.11 ALBERTA WILDLIFE DIRECTIVE

Saskatchewan does not have specific siting guidelines for solar projects; however, Alberta has a wildlife directive for solar energy projects (AEP, 2017). In previous experience, MOE has recommended the application of Alberta guidelines when Saskatchewan does not yet have comparable guidelines. Consequently, the *Wildlife Directive for Alberta Solar Energy Projects* was included in the regulatory review for the Project.

The Directive (AEP, 2017) was deemed necessary because solar energy projects have direct and indirect impacts on wildlife and wildlife habitat during construction, operations, and decommissioning phases. The Directive categorizes these impacts as:

- Direct mortality: facilities can cause direct mortalities to birds and bats primarily from collisions
- Habitat loss, degradation and fragmentation: development can cause changes in habitat availability, quality and quantity
- Disturbance: wildlife avoidance of developed areas may increase risk to populations of wildlife species at risk

According to the Directive (AEP, 2017), the primary mortality risk to avian wildlife at PV facilities is through direct collision with solar collectors or stranding following impact. Songbirds have increased mortality due to collision likely as a result of foraging opportunities on insects that may be attracted to the solar collectors as well as potential nesting location availability within solar energy projects (Kagan et al., 2014; Horvath et al., 2010; AEP, 2017). Some literature suggests that waterbirds are more susceptible to collisions, possibly because solar panels may reflect light in a similar fashion to light reflecting off water (Kagan et al., 2014; Horvath et al., 2010; AEP, 2017). However, recent studies have concluded there is no definitive evidence supporting the “lake effect” hypothesis (Taylor et al., 2019; Visser et al., 2019). WEST (2017) determined the lake hypothesis cannot be used to predict whether waterbird fatalities may occur at a proposed solar energy project.

The Directive (AEP, 2017) provides both standards (requirements that must be met in Alberta) and best management practices to avoid or mitigate the risk to wildlife and wildlife habitat. The standards and management practices are based on the best available science and on the legislative authority of the *Alberta Wildlife Act* and *Environmental Protection and Enhancement Act*. Examples of standards in the Directive include:

- Solar energy project must not occur within 100 m from the top a valley break
- Solar energy project must not occur within 1,000 m of a named lake
- Pre-construction surveys must be completed for a minimum of one year
- All construction activities must minimize habitat disturbance and fragmentation through use of available minimum disturbance techniques (e.g., matting, reduced soil stripping, construction under frozen conditions, reduced road grades)
- The proponent must conduct post-construction monitoring wildlife surveys annually, for a minimum of three years, after the solar energy project is operational

Examples of best management practices in the Directive include:

- Solar energy project should not occur within 1000 m of a wetland based Important Bird Area (IBA) as per IBA Canada
- Siting should avoid habitat of plants that are species of special concern
- Proponents should minimize the need for operation personnel on site during sensitive wildlife time periods
- Proponents should manage construction activities to prevent and control the spread of invasive species

The Proponent has incorporated standards and best management practices from the Directive that can be applied/adapted to the Project Area.

4.3 MUNICIPAL

The provincial *Planning and Development Act* provides authority for municipalities to address local land use and development matters through zoning bylaws and official community plans.

The Project is located within the RM of Weyburn No. 67 and approximately 4 km from the City of Weyburn. Regulatory requirements of the RM of Weyburn were gathered through telephone conversations and face-to-face meetings with RM Administrators and Planners. The RM's Zoning Bylaw does not currently contain regulations specific to renewable energy; however, the RM Council passed a Zoning Bylaw amendment to regulate the development of residential and commercial solar energy systems in specified zoning districts. This amendment will be in effect upon approval from the Minister. The amended bylaw will require the Proponent to secure a Development Permit from the RM.

The Proponent also met with the City of Weyburn's Mayor and City Manager to introduce the Project and gather feedback. No approvals or permissions from the City are required for the Project.

4.4 SUMMARY OF APPLICABLE PERMITS AND APPROVALS

Federal, provincial, and municipal permits and/or approvals may be required before the Project may proceed. Table 3 lists environmental permits and approvals that are administered through the above Acts and Regulations and identifies whether these permissions are likely to be needed for the Project.

Table 3 Environmental Permitting and Approvals

Permit/ Approval	Regulatory Body	Needed for the Project?	Applicable Project Phase	Details
FEDERAL				
Impact Assessment	Impact Assessment Agency of Canada	No	N/A	The Project does not meet the criteria of a 'designated project' per the <i>Physical Activities Regulation</i> under the <i>Impact Assessment Act</i> .
Request for Project Review	DFO	No	Siting and Design	Not needed because the Project has been sited to avoid fish-bearing watercourses and waterbodies.
PROVINCIAL				
Aquatic Habitat Protection Permit	MOE	No	Pre-construction and Reclamation	An AHPP is required for work near of bed/bank/boundary of a watercourse or waterbody. Not required for the Project because a setback of 30 m has been applied to the intermittent stream. Wetlands to be disturbed have been tilled.
Drainage Approval	WSA	No.	Pre-construction and Reclamation	A drainage approval from WSA is required if changes to drainage patterns will occur as a result of the Project. This is not expected.
Species Detection Survey Permit	MOE	Yes	Siting and Design, Pre-construction, and Reclamation	Permits were required and obtained to complete species detection surveys to inform the completion of a Technical Proposal. If construction proceeds between approximately April 14 – August 24, pre-construction migratory bird nesting surveys will be required. Notification to MOE is required via submission of a Species Detection Survey Permit Application. If construction proceeds outside the breeding bird window, no further surveys are expected to be necessary.
Approval to Construct or Upgrade and Operate a Storage Facility	MOE	No	Pre-construction	If the Project will store hazardous materials on-site, therefore, an Application to Construct or Upgrade and Operate a Storage Facility is required.
Technical Proposal/ Ministerial Determination	MOE	Yes	Siting and Design and pre-Construction	A Technical Proposal is warranted for the Project.
<i>Weed Control Act</i> Notification	Ministry of Agriculture	Yes	Construction, Operation, Decommissioning and Reclamation	If occurrences of weeds listed under Schedule 1 of the <i>Act</i> are observed, notification will be provided to the Rural Municipality and required actions taken.
Heritage Referral and/or HRIA	HCBC, Ministry of Parks, Culture and Sport	No	Siting and design, Pre-construction	The Project was screened and deemed not heritage sensitive. Referral to HCB and HRIA are not required.
MUNICIPAL				
Development Permit	RM of Weyburn	Yes	All	Prior to construction, a Development is likely required.

5 APPROACH TO ASSESSMENT

The proposed Project is subject to the provincial environmental assessment process and has followed the *Technical Proposal Guidelines* (MOE, 2014). The purpose of the Technical Proposal is to provide information about the Project and assess potential interactions between the environment and Project activities to allow a determination as to whether the Project may be deemed a 'development' under the *Environmental Assessment Act*.

This assessment focuses on the evaluation of the potential interactions between the Valued Ecosystem Components (VECs) and various Project activities in construction, operation and maintenance, and decommissioning and reclamation. VECs have been determined through environmental desktop and field studies, and engagement with local stakeholders, Indigenous communities and provincial regulators.

The steps to the assessment include the following:

- Identification of VECs
- Definition of the spatial and temporal boundaries for the assessment
- Description of the existing environment
- Identification of potential interactions between the Project and VECs
- Identification of mitigation measures to be incorporated into the Project to avoid or reduce potential adverse effects of the Project on VECs
- Characterization and significance assessment of residual effects (i.e., effects remaining after the implementation of mitigation measures)
- Determination of the cumulative effects of the Project's residual effects in consideration of other activities and projects occurring in the region
- Monitoring of effects

6 SCOPING AND BOUNDING

The scoping process identifies the physical, biophysical, and socio-economic VECs that may be subject to impact given the work proposed. The proposed work is comprised of the construction, operation, and maintenance phases of the Project conducted by the Proponent including any accidents and malfunctions that may occur. The decommissioning of the Project will also be included as part of the assessment.

Scoping was also completed to define the appropriate desktop and field studies that would be relevant to the Project. Scoping is continually refined as the Project progresses, the environmental setting is studied, and engagement activities are held.

The assessment boundaries define the geographic and temporal scope or limits of the analysis for the determination of significance of residual effects from the Project. The boundaries encompass the areas (spatial boundaries) and time periods (temporal boundaries) within which the Project is expected to interact with VECs.

6.1 VALUED ECOSYSTEM COMPONENTS

The identification of the VECs is based on the potential interaction of the Project within the environmental and socio-economic settings described herein. Additionally, any concerns from stakeholders, First Nations and Métis communities, government agencies, and the general public as identified through the engagement process were taken into consideration when identifying the VECs. The value of a VEC not only relates to its role in the ecosystem, but also to the value placed on it by humans.

The Proponent has identified physical, biophysical and socio-economic VECs that were subject to assessment based on knowledge and experience, and a review of the regulatory requirements. The VECs are listed in Table 4 and addressed throughout this report.

Table 4 Identified VECs

Physical	Biophysical	Socio-economic
Soil, Terrain and Geophysical	Wildlife and Wildlife Habitat	Heritage Resources
Atmospheric Conditions	Vegetation	Land Use & Property Value
Noise	Wetlands and Watercourses	Traffic Conditions
Glare and Visual Aesthetics		Public Health and Safety
		Community and Local Economy

Effects to the Project that may be caused by the environment are addressed in Section 8.8.

6.2 SPATIAL BOUNDARIES

The spatial boundaries for the assessment have been defined to be an appropriate size to encompass enough area to complete the evaluation of potential effects that all Project components may have on the environment.

6.2.1 LOCAL ASSESSMENT AREA

For the purpose of the assessment, a Local Assessment Area is defined for most VECs as the Project footprint plus a 1 km setback distance. The 1 km setback is designed to encompass the maximum spatial

extent of direct effects from within the Project footprint and small-scale indirect effects. The 1 km setback encompasses most of the largest setback distances in the Saskatchewan Activity Restriction Guidelines for Sensitive Species (MOE, 2017) for species that are likely to occur in the area. Project effects may be predicted or measured with a higher level of confidence within the Local Assessment Area than in the Regional Assessment Area.

Local Assessment Areas not defined as the footprint plus 1 km are described accordingly in the specific VEC subsections in Section 8.

6.2.2 REGIONAL ASSESMENT AREA

Solar energy projects may result in indirect effects on the environment surrounding the Local Assessment Area. For the Project, the Regional Assessment Area is defined as the Project footprint plus a 5 km setback distance to allow an analysis of incremental and cumulative effects from the Project and other previous and future developments. It is also large enough to encompass the largest setback distances in the Saskatchewan Activity Restriction Guidelines for Sensitive Species (MOE, 2017).

6.3 TEMPORAL BOUNDARIES

The temporal boundaries for the Project are based on the proposed phases of the Project and include:

- construction (2020 to 2021)
- operation (2021 to 2041)
- decommissioning and reclamation (2041 and beyond).

For all VECs, residual effects are assessed for all phases of the Project.

7 DESCRIPTION OF THE EXISTING ENVIRONMENT

This section provides a description of the existing environmental conditions for the physical, biophysical, and socio-economic VECs that may be influenced by the Project. The information provided in this section is based on existing secondary data sources, databases, and mapping available for the location, in addition to the results of 2018 and 2019 field studies completed for the Project. Information presented in this section pertains to the Project footprint and the surrounding biophysical environment.

For the purposes of this Technical Proposal, Species of Conservation Concern (SOCC) are identified as plant or wildlife species that are tracked by the Saskatchewan Conservation Data Centre (SKCDC); ranked by the SKCDC as S1, S2 or S3; protected by the Saskatchewan *Wildlife Act*; listed by the COSEWIC as Threatened, Endangered, or Special Concern; and/or protected by the federal *Species at Risk Act*.

For each VEC, the following sections outline the study methods and existing environment.

In preparation for submitting this Technical Proposal for the MOE, the Proponent retained a qualified, local third-party consultant, WSP, to conduct environmental surveys for the Project. WLCS assisted with field surveys in 2019. WSP prepared a technical data report summarizing the methods and results of the surveys. The technical data report is provided for reference in Appendix B.

7.1 PHYSICAL ENVIRONMENT

The physical environment is defined as the area's unique landforms, slopes, runoff, soil types, subsurface stratigraphy, depth to groundwater, geophysical and atmospheric components. In addition, this section also includes information on the existing ambient noise, and visual aesthetics of the area surrounding the Project.

7.1.1 SOIL, TERRAIN AND GEOPHYSICAL

7.1.1.1 METHODS

A desktop review of site-specific soil and terrain conditions was completed for the Project Area. Information for soil association distribution (map units) and soil sensitivities in the Project Area was obtained from provincial digital soil resource, Saskatchewan Land Resource Unit (SLRU) information published by Agriculture and Agri-Food Canada (SLRU, 2004; 2009). The review of the SLRU digital soil resource information ascertained dominant soil types, surface textures, salinity, erosion potentials, landform, and slope classes which in turn identified soils potentially sensitive to wind or water erosion, areas with steep terrain, and areas with high salinity.

In addition, a geotechnical study was completed by third-party consultants in 2019.

7.1.1.2 RESULTS

The Project is within the Dark Brown Soil Zone of the prairies. The dominant soil is Dark Brown Solonetzic, which are developed on glacial till deposits. The terrain of the Project site is undulating and is located on

very gentle to gentle slopes (0 to 5% gradients). Most of the major sensitivities are related to salinity. Additional detail and a soil map can be found in Appendix B.

The geotechnical report indicates the soils encountered at this site are generally clayey and cohesive. However, the till units contain discontinuous wet sand lenses which are cohesionless and subject to sloughing. Ground water levels were measured on February 29 and March 12, 2019, ranging from 5.19 to 12.20 m in depth to bottom of the screen from the surface.

7.1.2 ATMOSPHERIC CONDITIONS

Air emissions were not estimated and air dispersion modelling was not conducted for the Project because the Project will result in a net loss of air emissions, including greenhouse gases. The Project will help the SaskPower reach their goal of 50% renewables by 2030 (SaskPower, 2017), offsetting a projected 18,860 tonnes of CO₂, and powering 2400 homes in the area.

The historic climate data in this area of the last 20 years indicates that the average monthly temperatures fluctuate from -23.3 °C, to 22.7 °C throughout the calendar year. The data also indicates that the area has had a maximum monthly average snowfall of 14.4 cm in the winter months, and a maximum monthly average rainfall of 167.8mm. Bright sunshine observations made using the Campbell-Stokes sunshine recorder average 12.34 over the course of the year (ECCC, 2019).

Table 5 Historic Climate Data for Weyburn

Parameter	Time Period	Data Source	Value
Average Daily Temperature (°C)	Yearly Average (1981-2010)	Environment and Climate Change Canada	3.9
Extreme Maximum Temperature (°C)	2007/07/24	Environment and Climate Change Canada	42.5
Extreme Minimum Temperature (°C)	1987/01/12	Environment and Climate Change Canada	-18.8
Average Total Rainfall per Year (mm)	Yearly Average (1981-2010)	Environment and Climate Change Canada	318.2
Maximum Total Daily Rainfall (mm)	1990/07/02	Environment and Climate Change Canada	113
Average Annual Snowfall (cm)	Yearly Average (1981-2010)	Environment and Climate Change Canada	105.7
Maximum Snow Depth (cm)	1994/2/24	Environment and Climate Change Canada	74

7.1.3 NOISE

Noise is defined as a sound, especially one that is loud, unpleasant or that causes disturbance. The Project will generate noise during the construction and decommissioning phases, and the inverters and transformers will generate low levels of noise throughout the operation and maintenance phase. This noise could affect local residents; therefore, noise has been identified as a VEC.

Through desktop reviews and site visits to the surrounding lands, the ambient noise in this area was observed to be consistent with most rural, agricultural areas. Noise is produced by farm equipment operating on nearby lands, homestead activities, and vehicles travelling on local roads. Additionally, noise is produced by the adjacent substation.

7.1.4 GLARE AND VISUAL AESTHETICS

Solar panels are designed to absorb as much of the sun's energy as possible to convert it to electricity. The amount of light reflected by solar panels varies greatly depending on what angle the sun hits them, the make, the age of the solar panel and many other factors. Glare is defined as intense light that shines harshly and can impair vision. Glare is typically a prolonged source of brightness. Glint is defined as flash blindness and only lasts a very short time.

PV solar panels may result in adverse reflection when the glare is angled towards an area of high traffic such as an airport or highway. In mainly flat, cultivated land, the majority of the glare is redirected back towards the sky.

Despite the low likelihood that glint or glare will be an issue for the Project, the Proponent's strategy is to address the worst-case scenario. The Proponent is currently completing a glare and glint study. Results will be provided to MOE when available.

7.2 BIOLOGICAL ENVIRONMENT

The biological environment is the culmination of all biotic factors, including wildlife and vegetation. In this section, the current biological environment is detailed.

The Project is located within the Moist Mixed Grassland Ecoregion, which is closely associated with semi-arid moisture conditions (Acton et al., 1998). The Project Area is situated on a transitional area between the boundaries of the Tressachs Plain Landscape Area and the Regina Plain Landscape Area. Nearly all of both areas are under cultivation and native vegetation is confined largely to non-arable pasture lands. Typical native vegetation in these Landscape Areas includes speargrasses (e.g., *Heterostipa* spp.), wheatgrasses (e.g., *Elymus* spp.), wolf willow (*Elaeagnus commutata*), chokecherry (*Prunus virginiana*), and western snowberry (*Symphoricarpos occidentalis*). Common wildlife species in the area include mule deer (*Odocoileus hemionus*), white-tailed deer (*Odocoileus virginianus*), coyote (*Canus latrans*), red fox (*Vulpes vulpes*), American badger (*Taxidea taxus*), jack rabbit (*Lepus townsendii*), western meadowlark (*Sturnella neglecta*), eastern kingbird (*Tyrannus tyrannus*), red-winged blackbird (*Agelaius phoeniceus*), and a variety of waterfowl (Acton et al., 1998).

A desktop environmental screening and subsequent field surveys were completed by WSP, a consultancy that was contracted by the Proponent. A qualified third-party consultant, Wicehtowak Limnos Consulting Services, Ltd., was contracted to assist with surveys in 2019. A summary of methods and key findings are detailed in the following sections. The complete Technical Data Report is presented in Appendix B.

7.2.1 DESKTOP ENVIRONMENTAL SCREENING

7.2.1.1 METHODS

Preliminary desktop screenings were conducted to identify previous occurrences of wildlife and plant SOCC and potential suitable habitat in the Project Area and setback distances. Results of the desktop screenings were also used to establish which surveys would be necessary. The preliminary desktop screening included:

- Development and review of Rare and Endangered Species Report for 5-km and 50-km setback distances around the Project Area using the HABISask online mapping application via the SKCDC website

- Review of available online aerial imagery from ESRI™ Basemap Service layer and GoogleEarth™ to identify land cover, potential suitable habitat for SOCC, and available wildlife habitat.

7.2.1.2 RESULTS

The results from the desktop screening indicated the Project Area consists mainly of cultivated land, which provides lower quality wildlife habitat when compared to natural habitat types. The site is unlikely to provide suitable habitat for plant or wildlife SOCC.

In addition to the presence of a migratory bird concentration site, the desktop screening indicates previous element occurrences of the following SOCC within 5 km of the Project:

- American badger (*Taxidea taxus taxus*)
- little brown myotis (*Myotis lucifugus*)
- bobolink (*Dolichonyx oryzivorus*)
- burrowing owl (*Athene cunicularia*)
- loggerhead shrike (*Lanius ludovicianus excubitorides*)
- short-eared owl (*Asio flammeus*)

Results of the desktop screening are presented in Appendix B.

7.2.2 VEGETATION AND LAND COVER

7.2.2.1 METHODS

Vegetation and land cover were evaluated through a mapping exercise and confirmed via site visit.

Available online aerial imagery from ESRI™ Basemap Service Layer and GoogleEarth™ was used to map vegetation within the Project Area and determine the need for surveys for plant SOCC on the site. Visual observations during a pedestrian, non-transect survey were completed during a site visit on September 26, 2018. The site visit aimed to confirm cover types and land-use in the Project Area, as well as document weed presence. Information collected from the site visit was used to refine the vegetation mapping and it provided site-specific, descriptive information on the plant communities present in the Project Area.

7.2.2.2 RESULTS

VEGETATION SPECIES BY COVER TYPE

The cover types identified in the Project Area include cultivated (C), Class I tilled wetland (1), Class II tilled wetland (2), human-made drainage (HMD), and intermittent stream (IS). Vegetation species observed during the site visit are summarized in Table 6. No plant SOCC were observed on site. More details are provided in Appendix B.

Table 6 Vegetation Observed During the Site Visit in September 2018

Common Name	Scientific Name	Cover Type Observed	The Weed Act Schedule
biennial wormwood	<i>Artemisia biennis</i>	1, HMD	N/A
Canada thistle	<i>Cirsium arvense</i>	1, IS, C	Schedule 2 – Noxious
canola (planted)	<i>Brassica sp.</i>	C, 1, 2, HMD	N/A
foxtail barley	<i>Hordeum jubatum ssp. Jubatum</i>	1	N/A

Common Name	Scientific Name	Cover Type Observed	The Weed Act Schedule
kochia	<i>Bassia scoparia</i>	1, IS	Schedule 2 – Noxious
lamb's quarters	<i>Chenopodium album var. album</i>	1, C	N/A
perennial sow-thistle	<i>Sonchus arvensis</i>	1, IS, C	Schedule 2 – Noxious
round-leaved mallow	<i>Malva pusilla</i>	1, 2, HMD, IS, C	Schedule 2 – Noxious
Russian thistle	<i>Salsola kal)</i>	1, HMD, C	Schedule 3 – Nuisance
sedge	<i>Carex sp.</i>	IS	N/A
spiny annual sow-thistle	<i>Sonchus asper</i>	1, HMD, C	Schedule 2 – Noxious
stinkweed	<i>Thlaspi arvense</i>	1	N/A
western dock	<i>Rumex occidentalis</i>	1, 2, IS	N/A
wild oats	<i>Avena fatua</i>	1, HMD	N/A

WEED SPECIES

Five noxious and one nuisance weed species were identified in the Project Area: Canada thistle, kochia, perennial sow-thistle, round-leaved mallow, Russian thistle, and spiny annual sow-thistle (Table 6). No prohibited weeds were observed. Weeds were generally observed in higher densities in tilled wetlands.

PLANT SPECIES OF MANAGEMENT CONCERN

During the site visit, habitat potential for plant SOCC was determined to be very low in the Project Area due to chronic disturbance from cultivation. As a result, it was determined surveys for plant SOCC were not necessary for the Project. No plant SOCC were observed during the site visit.

7.2.3 WETLANDS AND WATERCOURSES

7.2.3.1 METHODS

Available online aerial imagery from ESRI™ Basemap Service Layer was used to map wetlands within the Project Area. GoogleEarth™ imagery from various months in the years 2003, 2012, 2013, and 2018 were used to review historical conditions and cross reference the Project Area as necessary to determine wetland boundaries and inundation zones as these fluctuate between wet and dry periods. Wetland boundaries were manually delineated using the ArcGis™ mapping platform at a 1:2,000 scale.

Wetland delineation was confirmed during a site visit on September 26, 2018. Wetlands were classified according to Classification of Natural Ponds and Lakes in the Glaciated Prairie Region (Stewart & Kantrud, 1971). Information collected on-site was applied to refine the wetland mapping and provide site-specific, descriptive information on the habitats present in the Project Area.

7.2.3.2 RESULTS

Class IT and Class IIT wetlands were observed in the Project Area. Class I wetlands are considered ephemeral, Class II wetlands are considered temporary, and any wetland class followed by a T means that they are wetland basins that are tilled for agriculture (i.e., disturbed). An intermittent stream was observed to traverse the middle of the Project Area and is located exterior to the Project footprint. Human-made drainages were also observed. Wetland mapping, photographs and more details are provided in Section 3.3 of Appendix B.

7.2.4 FISH AND FISH HABITAT

The desktop screening indicated no fish-bearing waters located within 100 m of the Project Area. The lack of fish-bearing watercourses or waterbodies was confirmed during the 2018 vegetation site visit and 2019 bird migration surveys.

The nearest fish-bearing waters include Rinfret Brook about 6.5 km south and Nickle Lake about 10 km southeast of the Project Area. Rinfret Brook contains Brook Stickleback (*Culaea inconstans*) and Iowa Darter (*Etheostoma exile*). Nickle Lake contains Brook Stickleback, Fathead Minnow (*Pimephales promelas*), Northern Pike (*Esox lucius*), Walleye (*Sander vitreus*), White Sucker (*Catostomus commersoni*), and Yellow Perch (*Perca flavescens*). Northern pike, walleye, and yellow perch fry and fingerlings have been stocked in Nickle Lake since 1948.

No further consideration is required to fish and fish habitat for the Project.

7.2.5 WILDLIFE AND WILDLIFE HABITAT

Wildlife surveys were conducted in accordance with terms and conditions of MOE-issued Research Permits 18SD124 and 19SD117, and applicable survey protocols.

Sections 7.2.5.1 through 7.2.5.5 pertain to avian studies conducted for the Project. Avian field surveys were carried out by a qualified scientist or environmental technician experienced in survey procedures, species identification of grassland birds by sight and sound, and experience identifying suitable habitat. Amphibian surveys and incidental wildlife observations are presented in Section 7.2.5.6 and 7.2.5.7.

7.2.5.1 GRASSLAND BIRD SURVEYS

METHODS

Grassland bird surveys were conducted to assess bird species occurrence and habitat use in the Local Assessment Area during the active breeding season between May 15 and July 1. Surveys for breeding birds followed the Grassland Birds Survey Protocol (MOE, 2014), which were developed in accordance with the Alberta Sensitive Species Inventory Guidelines (Government of Alberta, 2013).

Seven-point count survey locations were established, each spaced 800 m apart (Figure 3.4-1 in Appendix B). Each point count survey lasted five minutes at each point count location. Surveys were conducted on three separate occasions, separated by a minimum of 10 days to allow observation of species with early- and late-season breeding periods. Two of the three required surveys (mid- and late-season) were conducted in 2018, and one (early-season) was conducted in 2019.

Surveys were not conducted under weather conditions less than 0 °C, with greater than very light precipitation, or when winds were greater than 20 km/h.

RESULTS

The Grassland Bird Surveys were completed as follows:

- the early-season survey on May 31, 2019
- the mid-season survey on June 22, 2018
- the late-season survey on June 29, 2019.

Table B-1 in Appendix B lists all avian species identified during the grassland bird surveys. Two avian SOCC were observed: barn swallow (*Hirundo rustica*) and bobolink (*Dolichonyx oryzivorus*).

7.2.5.2 BIRD MIGRATION SURVEYS

METHODS

Bird migration surveys were conducted in fall 2018 and spring 2019 to assess migratory bird occurrence and land-use across Local Assessment Area. The Species Detection Survey Protocol used was adapted from the *Wildlife Directive for Alberta Solar Energy Projects* (Government of Alberta, 2017) and from *Recommended Protocols for Monitoring Impacts of Wind Turbines on Birds* (Environment Canada, Canadian Wildlife Services, 2007).

Passage migration counts were conducted from a single, static location (Site 4, Figure 3.4-1 in Appendix B) that provided good visibility of the Local Assessment Area where bird movement across the landscape could be readily detected. Morning migration surveys were conducted from one half-hour before sunrise to 5 hours after sunrise. Dusk migration surveys were completed from one and a half hours before sunset to one half-hour after sunset. Survey timing corresponds with times when birds are departing from or arriving at overnight/evening roosting sites or migrating to foraging sites and when nocturnal migrants are ceasing migration, initiating migration, or are already migrating.

RESULTS

Fall bird migration surveys were completed on September 5, October 4, and November 7, 2018. No avian SOCC were detected. A full list of 2018 fall bird migration observations can be found in Table 3.4-2 in Appendix B.

Spring bird migration surveys were completed in 2019 on April 2 to 3, May 1 to 2, and May 15 to 16. SOCC detected include:

- barn swallow
- bobolink
- ferruginous hawk (*Buteo regalis*)
- golden eagle (*Aquila chrysaetos*)
- peregrine falcon (*Falco peregrinus anatum*)
- Sprague's pipit (*Anthus spragueii*).

Ferruginous hawks, golden eagles, peregrine falcons, and Sprague's pipit were not observed during grassland bird surveys. These SOCC were observed flying over the Local Assessment Area during migration and were not actively using the area. A full list of spring 2019 migration observations can be found in Table 3.4-3 in Appendix B.

Detailed weather conditions, bird species, abundance, and other data are provided in the Technical Data Report provided in Appendix B.

7.2.5.3 SHARP-TAILED GROUSE LEK SURVEYS

METHODS

Sharp-tailed grouse (*Tympanuchus phasianellus*) lek surveys in the Local Assessment Area were conducted in accordance with the Sensitive Species Inventory Guidelines (Government of Alberta, 2013). Sharp-tailed grouse lek surveys were conducted twice at each of the seven-point count locations between mid-March to mid-May, when lek activity typically peaks in the region. Surveys were conducted in the

morning, between 30 minutes before sunrise to three hours after sunrise, when lek activity is typically highest.

RESULTS

Sharp-tailed grouse lek surveys were conducted on April 3 and May 2, 2019. No sharp-tailed grouse individuals or leks were detected during lek surveys within the Project Area.

7.2.5.4 RAPTOR STICK NEST SURVEYS

METHODS

Prairie raptor stick nest surveys followed the Sensitive Species Inventory Guidelines (Government of Alberta, 2013). Surveys were conducted twice during the prairie raptor breeding season, between May 1 and June 30. Raptor stick nest surveys were completed within the Local Assessment Area during daylight hours.

If raptor nests or breeding behaviour were observed, nesting activity and species would be identified. If a nest was detected but birds were not observed at or near the nest site, observers would fully investigate the nest to determine its status.

RESULTS

Raptor stick nest surveys were conducted on April 3 and May 1, 2019. No raptor stick nests were detected within the Local Assessment Area. Additionally, no ground nesting raptors were observed nesting within the Project Area.

7.2.5.5 SHORT-EARED OWL SURVEYS

METHODS

Three short-eared owl surveys were conducted as per the Species Detection Survey Protocols: Short-Eared Owl (MOE, 2015) in May and June during peak short-eared owl breeding season. Behavioural observations were to be conducted between May and July if short-eared owls were seen. Three-minute point count surveys were carried out at each of the seven established point count locations (Figure 3.4-1, Appendix B) beginning one hour before sunset and ending 30-minutes after sunset.

RESULTS

Short-eared owl surveys were conducted on April 30, May 16, and May 30, 2019. No short-eared owls were detected within the Local Assessment Area.

7.2.5.6 AMPHIBIAN AUDITORY SURVEYS

METHODS

The objective of the amphibian auditory surveys was to identify the presence of anuran amphibians (i.e., frogs, toads, tree frogs) within the Local Assessment Area. The surveys followed the Amphibian Auditory Survey Protocol (MOE, 2014), which was developed in accordance with the Alberta Sensitive Species Inventory Guidelines (Government of Alberta, 2013). Surveys were conducted by qualified scientists or environmental technicians experienced in survey protocols who can identify all amphibian species known to occur in Saskatchewan by sound and sight, as well as a field assistant.

Seven point-count locations were established within the Local Assessment Area, each spaced 800 m apart (Figure 3.4-1 in Appendix B). Point count surveys were conducted at each location for a minimum of three

minutes. Surveys were conducted on three occasions, separated by at least 10 days to allow observation of species with early- to late-season calling periods. Surveys were completed between the hours of 20:30 and 22:00. Surveys were not conducted under weather conditions less than 0 °C, with greater than very light precipitation, or when winds were greater than 20 km/h.

RESULTS

Auditory amphibian surveys were conducted on April 15, May 16, and May 30, 2019 at all seven point-count locations. Wood frogs (*Lithobates sylvaticus*), and boreal chorus frogs (*Pseudacris maculate*) were recorded. No more than one individual was detected at any given point count location.

Both wood frogs and boreal chorus frogs have a provincial ranking of S5, indicating that they are *Secure/Common; demonstrably secure under present conditions, widespread and abundant, and low threat level*. The boreal chorus frog has also been listed as *Not at Risk* by the COSEWIC (SKCDC, 2018; SKCDC, 2019).

7.2.5.7 INCIDENTAL WILDLIFE OBSERVATIONS

METHODS

Any incidental observations of wildlife species, or signs of their presence (e.g., dens, nests, scat, etc.) in the Local Assessment Area were recorded during all field studies and site visits. Data collected included date, time, location, species, number of individuals, gender and age (if possible), type of sign, behaviour, and habitat.

RESULTS

During field studies and site visits conducted by a third-party consultant, the following terrestrial wildlife species were observed:

- American badger
- American red fox
- coyote
- mule deer
- white-tailed deer
- white-tailed jack rabbit

SOCC detected through incidental wildlife observations during unrelated surveys or outside of survey periods include the following:

- American badger
- barn swallow
- Sprague's pipit

Table 3.4-4 in Appendix B provides a full list of wildlife species observed incidentally, including avian species.

7.3 SOCIO-ECONOMIC ENVIRONMENT

Socio-economic components of the Project include heritage resources, land use, property value, vehicle traffic, public health and safety, and community and local economy.

7.3.1 HERITAGE RESOURCES

Heritage resources in Saskatchewan are broadly defined as all archaeological sites or objects, paleontological objects, architecturally significant structures, and artefacts and other objects of historical, cultural, environmental, aesthetic, or scientific value.

Heritage resource screening was completed for the entire Project Area using the Ministry of Parks, Culture and Sport's Online Developers' Screening Tool. The Project Area is not heritage sensitive; therefore, no referral to the HCB or further heritage studies are required (Appendix A).

7.3.2 LAND USE AND PROPERTY VALUE

Lands surrounding the Project are rural and urban (City of Weyburn). There are 43 dwellings within 2 km of the Project. The nearest home is located approximately 600 m from the Project. As a result, land use and property value have been identified as VECs.

According to Statistic Canada (2016), the average value of a dwelling in the Rural Municipality of Weyburn is \$476,639. This property value includes the value of the land that the dwelling is on, the dwelling itself, and any other structure located on the property (Statistics Canada, 2016).

The Project Area is privately-owned, rural, agricultural land. Upon a positive outcome of the Technical Proposal process, a lease will be obtained from the landowner allowing construction and operation of the Project. Land within the Project footprint will be converted from cultivation to accommodate Project infrastructure. Upon decommissioning, the area will be restored and put back into agricultural production.

7.3.3 TRADITIONAL LAND AND RESOURCE USE

Traditional land and resource use have been excluded from the assessment because the land is privately held. However, engagement activities were conducted with two Indigenous communities with reserves located closest to the Project Area as suggested through consultation with the First Nation Power Authority. Additionally, community meetings were held with George Gordon First Nation and Star Blanket Cree Nation members (Section 11.1.3).

7.3.4 TRAFFIC CONDITIONS

Delivery of materials and equipment will be phased throughout the construction period depending upon the specific construction activity. The vehicles likely to be involved include:

- Large trucks with trailers for delivery of materials and cargo containers for storage of tools and parts
- Dump trucks to deliver and/or move gravel for construction of the internal site road
- Pile driving equipment for pile system
- Miscellaneous light vehicles including cars and pick-up trucks

Of these predicted vehicle movements, many will be large loads associated with the delivery of the solar panel components and the machinery required to assemble them. These deliveries may be subject to movement orders as agreed upon with the governing authorities.

The solar panel manufacturer and supplier will be responsible for determining delivery routes to ensure specific requirements are met. The delivery route will be selected through consultation with local authorities in each jurisdiction. It is likely that one access road will be constructed for the purposes of delivering the

panel components during construction, and for access to the site during operation routine maintenance checks.

7.3.5 PUBLIC HEALTH AND SAFETY

Public health and safety are of the utmost concern to the Proponent. During construction, operation and decommissioning phases, worker and public health and safety will be protected by meeting requirements under the Saskatchewan *Employment Act* and *The Occupational Health and Safety Regulations, 1996*.

PSLP considers it a best practice to plan for a 'worst case scenario' when developing health and safety policies and plans. Therefore, health and safety has been identified as a VEC.

7.3.6 COMMUNITY AND LOCAL ECONOMY

The Project is located approximately 4 km southwest of the City of Weyburn, the tenth largest city in Saskatchewan with a population of around 11,000 (Statistics Canada, 2016). Population has grown approximately 3.6% in the last 5 years and unemployment has lowered recently to 5.1%. The surrounding area consists of the Rural Municipality of Weyburn, which has a population of around 1,060 (Statistics Canada, 2016).

Weyburn has an average household income of \$126,000, and an average primary residence value of \$302,000. Weyburn is the largest inland grain gathering point in Canada, with about half a million tonnes of grain being stored there. The other major components of the local economy are oil and gas exploration and development. Construction has begun on a new \$33 million elementary school that will consolidate several other schools in the area. Weyburn is home to over 220 stores and personal services, ten educational facilities including Southeast College, three parks, a hospital, and a library. A historic site in Weyburn is the 90-foot water tower that for many years held the record for the tallest tower in western Canada and now doubles as a telecommunications tower.

8 ASSESSMENT AND MITIGATION MEASURES

Potential effects and mitigation measures have been identified through technical expertise, previous experience, literature reviews, regulatory engagement, and input received from the public, stakeholders, and Indigenous communities via engagement.

8.1 PROJECT AND VEC INTERACTIONS

The construction, operation, and decommissioning phases of the Project have the potential to affect the physical, biophysical, and socio-economic environment. Following the presentation of the Project's activities in Section 3 and the Existing Environmental Setting in Section 7, the interaction of the Project activities with the VECs can be identified. Table 7 presents the potential interactions between Project activities and each identified VEC. The assessment of Project effects on VECs will be completed as outlined in the methods presented in Section 5.

Table 7 Potential Interactions between Project Activities and VECs during Project Phases

	Site Preparation and Construction									Operation and Maintenance				Decommissioning and Reclamation		
	Vegetation Removal and Site Clearing	Leveling and Grading	Pile System Installation	Racking and Panel Installation	Collection Line Trench Excavation	Inverter Installation	Access Roads	Control and Maintenance Buildings	Accidents and Malfunctions	Panel Operation	Interconnection	Inspection and Maintenance	Accidents and Malfunctions	Infrastructure Demolition	Site Reclamation	Accidents and Malfunctions
Physical VECs																
Soil, Terrain, and Geophysical	•	•	•	•	•			•	•				•	•	•	•
Atmospheric	•	•	•		•		•	•	•					•	•	•
Noise	•	•	•	•	•	•	•	•		•						
Glare & Visual Aesthetics					•					•				•		
Biophysical VECs																
Wildlife and Wildlife Habitat	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•
Vegetation	•	•					•		•			•	•		•	•
Wetlands & Watercourses	•	•							•				•		•	•
Socio-economic VECs																
Heritage Resources	•	•			•											
Land Use & Property Value	•	•		•					•	•			•			•
Traffic Conditions	•	•	•	•	•		•	•	•	•		•	•	•	•	•
Public Health & Safety									•	•			•			•
Community & Local Economy	•	•	•	•	•	•	•	•		•	•	•		•	•	

8.2 MITIGATION

Where a potential interaction between the Project and VECs is identified, site-specific and industry standard mitigations are proposed. Where possible, mitigation measures are incorporated into the Project design and implemented to avoid or reduce potential adverse effects.

The key mitigation options available for the Project are site selection, construction techniques, timing of construction activities, and monitoring. The Project has been intentionally sited to avoid native prairie, wetlands, sensitive environmental features, and unique habitats.

Mitigation measures will be presented in the Project's EPP for construction, operation and decommissioning/reclamation crews to follow.

Natural Forces, one of the partners of the PSLP, has a proven track record of successful implementation of mitigation measures on renewable energy projects totalling a rated capacity of 190 MW. Projects include:

- Fairmont Wind Farm
- Hillside Boularderie Wind Farm
- Pictou Landing Wind Farm
- Gardner Mines Wind Farm
- Gaetz Brook Wind Farm
- Barrachois Wind Farm
- Aulds Mountain Wind Farm
- Amherst Community Wind Farm
- Richibucto Wind Project
- Kent Hills Wind Farm.

8.3 CHARACTERIZATION OF RESIDUAL EFFECTS

Residual effects refer to environmental effects predicted to occur after mitigation measures have been implemented. Effects prior to implementation of mitigation are not characterized. Residual effects are characterized, where possible, by considering the criteria listed in Table 8.

Table 8 Residual Effects Characterization Criteria

Characterization	Description	Classification of Characterization
Direction	The nature of the residual effect	<ul style="list-style-type: none"> • Positive • Neutral • Adverse
Magnitude	The amount of change expected in a VEC relative to existing conditions	<ul style="list-style-type: none"> • High • Moderate • Low
Spatial Extent	The geographic extent in which the residual effect may occur	<ul style="list-style-type: none"> • Project footprint • Local Assessment Area • Regional Assessment Area

Characterization	Description	Classification of Characterization
Frequency	How often the residual effect may occur	<ul style="list-style-type: none"> • Single event • Infrequent • Frequent • Continuous
Duration	The time required for the residual effect to no longer be perceivable or measurable	<ul style="list-style-type: none"> • Short-term • Medium-term • Long-term • Permanent
Reversibility	The degree to which the residual effect can be reversed after the Project activity ceases	<ul style="list-style-type: none"> • Reversible • Irreversible
Likelihood	The likelihood that a residual effect will occur	<ul style="list-style-type: none"> • None • Unlikely • Likely • Very likely

Significance of residual effects is then determined by applying the following criteria:

– **Significant:**

- Residual effects likely to be of sufficient magnitude, frequency, duration, spatial extent, reversibility and likelihood to cause a change in the VEC that is beyond an acceptable level or threshold. The level or threshold may be a listed or legal standard or may be determined through professional judgment, literature review, and input from engagement activities

– **Not significant:**

- Residual effects not likely to result in a change in the VEC that is beyond an acceptable level or threshold. Effects deemed to be not significant could be minor, negligible, or beneficial in nature

Results of the residual effects assessment are presented in Sections 8.5 through 8.7.

8.4 CUMULATIVE EFFECTS ASSESSMENT

Cumulative environmental effects refer to effects predicted to result from the residual effects that could reasonably be expected to act in combination with the potential residual effects of other past, present or known future projects or activities within the Regional Assessment Area.

The project and activity inclusion list includes all known projects and physical activities which may have residual effects that could overlap spatially or temporally with the Project. The list includes any future projects that have been publicly announced and details were available for the assessment. Table 9 presents projects and activities in the Regional Assessment Area that have been identified for inclusion in the cumulative effects assessment as of March 2020.

Table 9 Project and Activity Inclusion List

Project/Activity	Existing	Ongoing	Future	Description
Agricultural activity and land conversion	.	.	.	The Project is located in a region substantially altered by land conversion from native vegetation to cropland, hay-land and pastureland. Agricultural activities in the Regional Assessment Area are ongoing.
Oil and gas activity	.	.	.	Oil and gas wells, pipelines, and other infrastructure exist within the Regional Assessment Area. Information regarding future plans for oil and gas development in the area were not available. However, it is assumed oil and gas activity will continue in the area.
Highways (Hwy 13, Hwy 39), gravel roads, access roads	.	.	.	There are numerous existing roads within the Regional Assessment Area, including Saskatchewan Hwys 13 and 39. These roads have fragmented the landscape for many decades. Ongoing vehicular traffic results in direct mortality of animals via collisions. There is a \$50M+ upgrade planned for Hwy 39, which will include resurfacing and the addition of sets of passing lanes by the end of 2021.
Rail lines	.	.	.	There are existing, utilized railroads within the Regional Assessment Area. Railroads have contributed to fragmentation of the landscape for many decades. Railway activities and traffic are ongoing.
Transmission lines and substation	.	.	.	Existing transmission lines, substation, and utility corridors are established in the Regional Assessment Area. These contribute to habitat fragmentation as well.
Urban development (City of Weyburn)	.	.	.	The City of Weyburn is located within the Regional Assessment Area. Typical urban development exists, is ongoing, and is likely to continue in the future.
Light industrial and commercial developments	.	.	.	Light industrial and commercial developments exist within the Regional Assessment Area. It is likely these activities will continue in the future.
Aggregate pits (e.g., gravel, sand)	.	.	.	Aggregate pits are known to occur within the Regional Assessment Area. It is likely these activities will continue in the future.

Significance of cumulative effects are discussed for VECs in Sections 8.5 to 8.7.

8.5 PHYSICAL VECs

8.5.1 SOIL, TERRAIN AND GEOPHYSICAL

8.5.1.1 POTENTIAL EFFECTS ON SOIL, TERRAIN, AND GEOPHYSICAL

The potential effects on soils, terrain, and geophysical aspects of the environment by the Project include:

- Changes in soil quantity
- Changes in soil quality (i.e., agricultural capability)

Potential effects on soils, terrain and geophysical aspects of the environment for each Project activity are presented in Table 10.

Table 10 Project Activities and Potential Effects on Soil, Terrain and Geophysical during the Project

Project Phases			Project Activity	Potential Effects	
Site Preparation and Construction	Operation and Maintenance	Decommissioning and Reclamation		Changes in Soil Quantity	Changes in Soil Quality
•			Site clearing and vegetation removal	✓	✓
•			Leveling and grading	✓	✓
•			Pile system installation	✓	✓
•			Racking and panel installation	✓	✓
•			Collection line trench excavation	✓	✓
			Inverter installation	-	-
			Access roads	-	-
	•		Control and maintenance buildings	✓	✓
			Panel operation	-	-
			Interconnection	-	-
			Inspection and maintenance	-	-
•	•	•	Accidents and malfunctions	✓	✓
		•	Infrastructure demolition	✓	✓
		•	Site reclamation	✓	✓

Notes:

- ✓ = Interactions between the Project activity and the VEC may cause an effect.
- = Interactions between the Project activity and the VEC are not expected.

8.5.1.2 MITIGATION MEASURES FOR SOIL, TERRAIN AND GEOPHYSICAL

Industry standard mitigations and site-specific measures will be implemented during construction, operations and maintenance, and decommissioning and reclamation to reduce or avoid effects on soil, terrain and geophysical aspects of the environment. The EPP will list all planned mitigation measures. Table 11 lists key mitigation measures for the protection of soil quantity and quality.

Table 11 Mitigation Measures for Soil, Terrain and Geophysical

Potential Effect(s)	Mechanism	Mitigation Measures
<ul style="list-style-type: none"> • Change in soil quantity • Change in soil quality 	<ul style="list-style-type: none"> • Topsoil loss 	<ul style="list-style-type: none"> • An EPP will be developed and implemented to support regulatory compliance and achieve best practices. The EPP will include a Soil Management Plan • Topsoil and subsoil will be stripped and stored separately to avoid admixing • Topsoil will be stripped and stored for use in future reclamation activities • Soil stockpiles will be stored in low-profile piles to reduce erosion • Soil stockpiles will be seeded or covered to reduce erosion • Exposed soils within the Project footprint will be re-vegetated to reduce erosion • Topsoil will be replaced during reclamation. Topsoil should be replaced to a uniform depth on all portions of the Project Area that were stripped to match the surrounding areas • Topsoil replacement will be completed when the soil condition is suitable (e.g., dry conditions) • During reclamation, appropriate erosion and sediment control measures will be implemented, as needed, until revegetation of the topsoil is complete

Potential Effect(s)	Mechanism	Mitigation Measures
<ul style="list-style-type: none"> Changes in soil quantity 	<ul style="list-style-type: none"> Wind and/or water erosion 	<ul style="list-style-type: none"> An EPP will be developed and implemented to support regulatory compliance and achieve best practices. The EPP will include a Soil Erosion Contingency Plan Erosion control measures, such as wind barriers or tackifiers, will be implemented as needed where soils are exposed Soil stockpiles will be stored in low-profile piles Soil stockpiles will be seeded or covered Areas with rutting or erosion will be re-graded Revegetation will be initiated as soon as possible after decommissioning and removal of Project components
<ul style="list-style-type: none"> Changes in soil quality 	<ul style="list-style-type: none"> Contamination 	<ul style="list-style-type: none"> If requested by the landowner, soil sampling will be completed pre-construction to identify soils with high salinity During construction and reclamation, areas with high salinity will be handled specifically to avoid mixing saline soils with non-saline soils, as needed The EPP will include contamination prevention and response plans (e.g., Spill Contingency Plan) to be implemented All Project vehicles must be equipped with spill containment and clean-up supplies Adequate secondary containment will be provided for all on-site storage of hydrocarbons and other hazardous materials If contaminated soils are encountered during construction, a contingency plan will be implemented and contaminated soils will be removed and disposed of accordingly All vehicles and equipment will be well-maintained and will arrive at the Project site clean and free of leaks, soil or vegetative debris
<ul style="list-style-type: none"> Changes in soil quality 	<ul style="list-style-type: none"> Compaction or rutting 	<ul style="list-style-type: none"> During construction, contingency measures will be implemented as per the EPP to avoid compaction or rutting during adverse weather Vehicles will use existing roads as much as possible Soil compaction will be limited to the Project footprint Areas with rutting or erosion will be re-graded During reclamation, if compaction has occurred, the areas may be deep ripped to alleviate compacted soils prior to topsoil replacement
<ul style="list-style-type: none"> Changes in soil quality 	<ul style="list-style-type: none"> Introduction of soil borne diseases or invasive plants 	<ul style="list-style-type: none"> The EPP will include a Weed Management Plan to be implemented to prevent and reduce the spread of weeds and invasive plants Soils will be stored on-site and erosion protection measures will be implemented All vehicles and equipment will be well-maintained and will arrive at the Project site clean and free of leaks, soil or vegetative debris Develop and implement a vehicle/equipment cleaning and sanitation procedure to prevent introduction of soil borne disease (e.g., club root) If additional soils are required for reclamation, only clean soils will be brought in

8.5.1.3 ASSESSMENT OF RESIDUAL EFFECTS ON SOIL, TERRAIN AND GEOPHYSICAL

Project activities could result in a change in soil quantity due to topsoil loss and wind or water erosion. Soil quality could be adversely impacted from contamination, compaction or rutting, and the introduction of soil borne diseases and/or invasive plants. After mitigation measures are implemented, no residual effects are anticipated because mitigation will remove the interaction and result in no measurable change to the VEC.

A cumulative effects assessment for soil, terrain, and geophysical has not been completed because no residual effects on the VEC are anticipated. Project contributions to cumulative effects on soil, terrain, and geophysical aspects of the environment are not considered measurable.

8.5.2 ATMOSPHERIC CONDITIONS

8.5.2.1 POTENTIAL EFFECTS ON ATMOSPHERIC CONDITIONS

The potential effects of atmospheric conditions by the Project include:

- Change in air emissions, including greenhouse gas emissions

Potential effects on atmospheric conditions for each Project activity are presented in Table 12.

Table 12 Project Activities and Potential Effects on Atmospheric Conditions during the Project

Project Phases			Project Activity	Potential Effects
Site Preparation and Construction	Operation and Maintenance	Decommissioning and Reclamation		Change in air emissions
•			Site clearing and vegetation removal	✓
•			Leveling and grading	✓
•			Pile system installation	✓
			Racking and panel installation	-
•			Collection line trench excavation	✓
			Inverter installation	-
•			Access roads	✓
•			Control and maintenance buildings	✓
			Panel operation	-
			Interconnection	-
			Inspection and maintenance	-
•		•	Accidents and malfunctions	✓
		•	Infrastructure demolition	✓
•			Site reclamation	✓

Notes:

- ✓ = Interactions between the Project activity and the VEC may cause an effect.
- = Interactions between the Project activity and the VEC are not expected.

8.5.2.2 MITIGATION MEASURES FOR ATMOSPHERIC CONDITIONS

Industry standard mitigations will be implemented during construction, operations and maintenance, and decommissioning and reclamation to reduce or avoid effects on atmospheric conditions. The EPP will list all planned mitigation measures. Table 13 lists key mitigation measures for the protection of atmospheric conditions.

Table 13 Mitigation Measures for Atmospheric Conditions

Potential Effect(s)	Mechanism	Mitigation Measures
<ul style="list-style-type: none"> Changes in air emissions, including greenhouse gas emissions 	<ul style="list-style-type: none"> Vehicle and heavy equipment emissions 	<ul style="list-style-type: none"> Construction vehicles and equipment will be maintained in good working order and properly muffled Project personnel will avoid excessive idling of vehicles. Vehicles will be turned off when not in use unless required for effective operation
<ul style="list-style-type: none"> Changes in air emissions 	<ul style="list-style-type: none"> Dust 	<ul style="list-style-type: none"> Dust suppressants (e.g., water, calcium chloride) will be applied during the Project as required to reduce dust Watering for dust will not result in the formation of puddles or rutting by vehicles and equipment Project personnel will work with the RM to identify and rectify possible dust control issues in the vicinity of the Project

8.5.2.3 ASSESSMENT OF RESIDUAL EFFECTS ON ATMOSPHERIC CONDITIONS

Project activities that include the use of vehicles and heavy equipment which result in emissions of greenhouse gases. Project activities that result in dusty conditions (e.g., removal of vegetation, grading) may affect the atmospheric conditions in the Regional Assessment Area. After mitigation measures are implemented, no adverse residual effects are anticipated because mitigation will remove the interaction. In addition, the Project is expected to offset a projected 18,860 tonnes of CO₂ and power 2,400 homes in the area. The Project will have a positive net benefit on atmospheric conditions.

A cumulative effects assessment for atmospheric conditions has not been completed because no adverse residual effects on atmospheric conditions are anticipated.

8.5.3 NOISE

8.5.3.1 POTENTIAL EFFECTS ON NOISE

The potential effects on noise by the Project include:

- Noise disturbance to humans and wildlife

Potential effects on noise for each Project activity are presented in Table 14.

Table 14 Project Activities and Potential Effects on Noise During the Project

Project Phases			Project Activity	Potential Effects
Site Preparation and Construction	Operation and Maintenance	Decommissioning and Reclamation		Noise Disturbance to Humans and Wildlife
•			Site clearing and vegetation removal	✓
•			Leveling and grading	✓
•			Pile system installation	✓
•			Racking and panel installation	✓
•			Collection line trench excavation	✓
•			Inverter installation	✓
•			Access roads	✓

Project Phases			Project Activity	Potential Effects
Site Preparation and Construction	Operation and Maintenance	Decommissioning and Reclamation		Noise Disturbance to Humans and Wildlife
•			Control and maintenance buildings	✓
	•		Panel operation	✓
			Interconnection	-
			Inspection and maintenance	-
			Accidents and malfunctions	✓
		•	Infrastructure demolition	✓
		•	Site reclamation	✓

Notes:

- ✓ = Interactions between the Project activity and the VEC may cause an effect.
- = Interactions between the Project activity and the VEC are not expected.

8.5.3.2 MITIGATION MEASURES FOR NOISE

Industry standard mitigations and site-specific measures will be implemented during construction, operations and maintenance, and decommissioning and reclamation to reduce or avoid effects on noise. The EPP will list all planned mitigation measures. Table 15 lists key mitigation measures for noise.

Table 15 Mitigation Measures for Noise

Potential Effect(s)	Mechanism	Mitigation Measures
<ul style="list-style-type: none"> • Noise disturbances to humans and wildlife 	<ul style="list-style-type: none"> • Construction and decommissioning activities and vehicles 	<ul style="list-style-type: none"> • Construction and decommissioning activities will be restricted to daytime hours where feasible • Vehicles and equipment will be maintained in good working order and properly muffled • Project personnel will avoid excessive idling of vehicles. Vehicles will be turned off when not in use unless required for effective operation • Health Canada recommends the long-term average day-night sound level (Ldn) be below 57 dB[A] at the closest residence. An Ldn of 57 dB[A] is expected to be within the threshold for widespread complaints for construction noise (US EPA, 1974)
<ul style="list-style-type: none"> • Noise disturbances to humans and wildlife 	<ul style="list-style-type: none"> • Operational noise 	<ul style="list-style-type: none"> • Initial siting of the Project is located 600 m from the nearest home • A Complaint Resolution Plan will be provided to allow residents to raise any concerns they may have regarding noise • The inverters and transformer will be located central to the site with panel rows blocking much of the sound propagation

8.5.3.3 ASSESSMENT OF RESIDUAL EFFECTS ON NOISE

The Project is expected to generate noise during the construction and decommissioning phases. These noises are not constant and can produce impulsive and variable sounds at different noise levels, which could create heightened annoyance levels in the surrounding community. General construction activities include those associated with vegetation clearing, road building, pile system installation, and panel installation. General decommissioning activities will include removal of roads, panels, fences, and other

Project infrastructure. These activities will likely involve the use of backhoes, concrete mixers and pumps, dump trucks, excavators and light-duty pick-up trucks with the associated sound levels predicted in Table 16.

Table 16 Noise Levels Associated with Construction Equipment (WSDoT, 2017)

Equipment	Max dB[A]
Backhoe	78
Dump Truck	76
Excavator	81
Pick-up Truck	75

It is not expected that all equipment would be running at the same time, but to determine maximum expected noise levels, the WSDoT (2017) guidelines for decibel addition were used to determine that 86 dB[A] is the highest expected noise during combined construction activities.

The environment in which the project construction will occur is considered a soft environment with normal unpacked earth. The normal unpacked earth and topography will facilitate attenuation of noise emissions at shorter distances. Table 17 identifies the noise levels predicted to be observed at distances from the construction site determined using WSDoT (2017) guidelines.

Table 17 Worst-case Construction Noise Impact to the Surrounding Environment Calculated using WSDoT (2017) Guidelines Assuming Sound Levels in a Soft Environment Attenuate at -7.5 dB[A] per Doubling of Distance

Distance (m)	Construction Noise dB[A]
15.2	86
30.5	78.5
61	71
122	63.5
244	56
488	48.5
975	41

Many noise scales refer to 70 dB[A] as an arbitrary base of comparison where levels above 70 dB[A] can be considered annoying to some people (Purdue University, 2017). As indicated in Table 17, at 61 m from the construction site, noise levels are approximately 70 dB[A], similar to that of a car travelling at 100 km/h and just at the threshold of possible annoyance (Purdue University,2000). Construction noise is not expected to be highly annoying beyond 61 m from the construction site as noise levels at this distance have already attenuated to approximately 70 dB[A].

During operation, solar panels themselves make no noise; however, the inverters do emit an audible hum while converting DC from the panels to AC for transport through the power lines. The Project is planning the installation of three inverters and one grounding transformer. At 10 m away, a large inverter will create up to a 60-decibel hum on par with human conversation at 65 dB[A]. At 100 m from the source, this sound will be at 40 decibels, comparable to the noise made by a stream flowing. At 200 m, the hum will have dropped to 33 decibels, as loud as a whisper. Operational noise is not expected to be considered highly annoying by residence because the nearest farm is over 200 m from the Project perimeter.

Estimates show that noise levels are not expected to exceed permissible sound levels during Project construction, operations and maintenance, or decommissioning and reclamation.

Mitigation measures will further reduce potential effects of noise on humans and wildlife. Therefore, adverse residual effects of the Project on noise levels are anticipated to be low in magnitude, localized, infrequent, short-term, reversible, and likely. The residual effects are predicted to be not significant.

A cumulative effects assessment for noise has taken into consideration noise associated with the projects and activities in the project inclusion list, including ongoing agricultural activities, vehicle traffic, rail traffic, existing substation, and urban development. The humans and wildlife occurring in the area are likely acclimatized to noise disturbances. The residual effects of the Project combined with the existing noise in the area is not expected to result in significant increases to the noise level in the Regional Assessment Area. Therefore, no significant cumulative effects on humans or wildlife from noise are expected.

8.5.4 GLARE AND VISUAL AESTHETICS

8.5.4.1 POTENTIAL EFFECTS ON GLARE AND VISUAL AESTHETICS

The potential effects on glare and visual aesthetics by the Project include:

- Change in visual sensory conditions (i.e., glare/glint disturbance or danger to motorists or residents)
- Change in visual aesthetics

Potential effects on glare and visual aesthetics for each Project activity are presented in Table 18.

Table 18 Project Activities and Potential Effects on Glare and Visual Aesthetics during the Project

Project Phases			Project Activity	Potential Effects	
Site Preparation and Construction	Operation and Maintenance	Decommissioning and Reclamation		Change in Visual Sensory Conditions	Change in Visual Aesthetics
			Site clearing and vegetation removal	-	-
			Leveling and grading	-	-
			Pile system installation	-	-
			Racking and panel installation	✓	✓
			Collection line trench excavation	-	-
			Inverter installation	-	-
			Access roads	-	-
			Control and maintenance buildings	-	✓
			Panel operation	✓	✓
			Interconnection	-	-
			Inspection and maintenance	-	-
			Accidents and malfunctions	-	-
			Infrastructure demolition	✓	-
			Site reclamation	-	-

Notes:

- ✓ = Interactions between the Project activity and the VEC may cause an effect.
- = Interactions between the Project activity and the VEC are not expected.

8.5.4.2 MITIGATION MEASURES FOR GLARE AND VISUAL AESTHETICS

Industry standard mitigations and site-specific measures will be implemented during construction, operations and maintenance, and decommissioning and reclamation to reduce or avoid effects on glare

and visual aesthetics. The EPP will list all planned mitigation measures. Table 19 lists key mitigation measures for glare and visual aesthetics.

Table 19 Mitigation Measures for Glare and Visual Aesthetics

Potential Effect(s)	Mechanism	Mitigation Measures
<ul style="list-style-type: none"> Change in visual sensory conditions 	<ul style="list-style-type: none"> Installation and operation of solar panels 	<ul style="list-style-type: none"> A glare/glint study will be conducted for dwellings and roadways prior to construction to identify potential impacts and solutions Perimeter fencing may partially mitigate glare/glint Project was sited to avoid potential receptors, such as high-rise buildings and airports The angle of panels can be changed to reduce glare If glare/glint is determined to be an issue during operation, installation of further screening will be considered
<ul style="list-style-type: none"> Change in visual aesthetics 	<ul style="list-style-type: none"> Installation and operation of solar panels and infrastructure (e.g., buildings) 	<ul style="list-style-type: none"> Completion of a glare/glint study prior to construction to identify potential impacts and solutions Project was sited in accordance to siting guidelines Project was responsibly sited in a cultivated area adjacent to an existing power substation near light industrial developments The Project has been setback from existing residences Decommissioning and reclamation will result in the Project Area being returned to cultivated land

8.5.4.3 ASSESSMENT OF RESIDUAL EFFECTS ON GLARE AND VISUAL AESTHETICS

Project activities could result in changes in visual sensory conditions from the PV solar panels. Installation of panels and Project infrastructure could result in changes to visual aesthetics.

After mitigation measures are implemented, residual effects from glare/glint are anticipated to be low in magnitude, local in spatial extent, infrequent, short-term, reversible, and unlikely. These residual effects have been determined to be not significant. A cumulative effects assessment was completed and indicates that no other solar energy developments exist within the Regional Assessment Area. The cumulative effects of the Project on glare are expected to be not significant.

Mostly due to appropriate siting, residual effects on visual aesthetics are anticipated to be low in magnitude, regional in spatial extent, continuous, short-term, reversible, and likely. These residual effects have been determined to be not significant.

A cumulative effects assessment was completed. The Project is located near an existing power substation, light industrial and commercial activity, urban development, roads and railways. Additionally, the Project has been sited to avoid areas of native vegetation. Project contributions to cumulative effects on visual aesthetics are not considered measurable. Therefore, the Project is not expected to result in significant cumulative effects on visual aesthetics in the Regional Assessment Area.

8.6 BIOPHYSICAL VECS

8.6.1 VEGETATION AND LAND COVER

8.6.1.1 POTENTIAL EFFECTS ON VEGETATION AND LAND COVER

The potential effects on vegetation by the Project include:

- Introduction or spread of weed species

Potential effects on vegetation for each Project activity are presented in Table 20.

Table 20 Project Activities and Potential Effects on Vegetation and Land Cover during the Project

Project Phases			Project Activity	Potential Effects
Site Preparation and Construction	Operation and Maintenance	Decommissioning and Reclamation		Introduction and/or Spread of Weed Species
•			Site clearing and vegetation removal	✓
•			Leveling and grading	✓
			Pile system installation	-
			Racking and panel installation	-
			Collection line trench excavation	-
			Inverter installation	-
•			Access roads	✓
			Control and maintenance buildings	-
			Panel operation	-
			Interconnection	-
	•		Inspection and maintenance	✓
•	•	•	Accidents and malfunctions	✓
			Infrastructure demolition	-
		•	Site reclamation	✓

Notes:

- ✓ = Interactions between the Project activity and the VEC may cause an effect.
- = Interactions between the Project activity and the VEC are not expected.

8.6.1.2 MITIGATION FOR VEGETATION AND LAND COVER

Industry standard mitigations and site-specific measures will be implemented during construction, operations and maintenance, and decommissioning and reclamation to reduce or avoid effects on vegetation. The EPP will list all planned mitigation measures. Table 21 lists key mitigation measures related to vegetation and land cover.

Table 21 Mitigation Measures for Vegetation and Land Cover

Potential Effect(s)	Mechanism	Mitigation Measures
• Introduction or spread of weed species	• Vehicle/equipment travel	<ul style="list-style-type: none"> • All vehicles and equipment will arrive on-site clean and free of soil or vegetative debris • Develop and implement a vehicle/equipment cleaning procedure • Vehicles/equipment will be inspected. Dirty vehicles/equipment will not be allowed on-site until it has been cleaned as per the cleaning procedure • More stringent inspections of equipment coming from outside the region will be conducted
• Introduction or spread of weed species	• Vegetation clearing, site grading, and reclamation	<ul style="list-style-type: none"> • The EPP will include a Weed Management Plan to be implemented to avoid and reduce the spread of weeds. The Plan will support compliance with <i>The Weed Control Act</i> • Pre-construction weed surveys will be completed on the Project footprint, access road and temporary workspaces

Potential Effect(s)	Mechanism	Mitigation Measures
		<ul style="list-style-type: none"> • Weed infestations will be addressed as per corrective actions (e.g., spraying, pulling, mowing) identified in the Weed Management Plan prior to vegetation clearing and grading • Topsoil and spoil piles will be seeded to prevent new weeds from establishing. • Topsoil and spoil piles will be monitored for weed growth. Weed growth will be addressed as per correction actions in the Weed Management Plan • Revegetation will be initiated as soon as possible after decommissioning and removal of Project components

8.6.1.3 ASSESSMENT OF RESIDUAL EFFECTS ON VEGETATION AND LAND COVER

Project activities potential to introduce or spread weed species within the Project footprint and Local Assessment Area. The Project is located on cultivated land where weed growth is common. During the vegetation site visit, five noxious and one nuisance weed species were identified in the Project footprint. It is expected that weed species will be present throughout the life cycle of the Project. The Weed Management Plan will reduce the introduction and spread of weeds.

After mitigation measures are implemented, residual effects are anticipated to be low in magnitude, short-term in duration, unlikely, local in extent, and occur infrequently. These residual effects are considered minor and not significant.

A cumulative effects assessment for vegetation and land cover indicates the Project is sited in a region where the cumulative effects of agriculture, urban development, light industrial and commercial development, and the oil and industry have impacted the landscape for many decades. Given the Project is sited on cultivated land with little natural cover, the contribution of the Project to existing cumulative effects on natural land cover in the area would not be significant. Project contributions to cumulative effects on vegetation and land cover through the potential introduction or spread of weed species are not considered significant.

8.6.2 WETLANDS AND WATERCOURSES

8.6.2.1 POTENTIAL EFFECTS ON WETLANDS AND WATERCOURSES

The potential effects on wetlands and watercourses by the Project include:

- Change in wetland and watercourse abundance and distribution

Potential effects on wetlands and watercourses for each Project activity are presented in Table 22.

Table 22 Project Activities and Potential Effects on Wetlands and Watercourses during the Project

Project Phases			Project Activity	Potential Effects
Site Preparation and Construction	Operation and Maintenance	Decommissioning and Reclamation		Change in Wetland and Watercourse Abundance and Distribution
•			Site clearing and vegetation removal	✓
•			Leveling and grading	✓
			Pile system installation	-
			Racking and panel installation	-
			Collection line trench excavation	-
			Inverter installation	-
			Access roads	-
			Control and maintenance buildings	-
			Panel operation	-
			Interconnection	-
			Inspection and maintenance	-
•	•	•	Accidents and malfunctions	✓
			Infrastructure demolition	-
		•	Site reclamation	✓

Notes:

- ✓ = Interactions between the Project activity and the VEC may cause an effect.
- = Interactions between the Project activity and the VEC are not expected.

8.6.2.2 MITIGATION MEASURES FOR WETLANDS AND WATERCOURSES

Industry standard mitigations will be implemented during construction, operations and maintenance, and decommissioning and reclamation to reduce or avoid effects on wetlands and watercourses. The EPP will list all planned mitigation measures. Table 23 lists key mitigation measures related to wetlands and watercourses.

Table 23 Mitigation Measures for Wetlands and Watercourses

Potential Effect(s)	Mechanism	Mitigation Measures
<ul style="list-style-type: none"> • Change in wetland and watercourse abundance and distribution 	<ul style="list-style-type: none"> • Site clearing, grading and levelling 	<ul style="list-style-type: none"> • The Project has been sited to avoid non-tilled wetland areas and watercourses • The intermittent stream will be protected by a minimum of 30 m setback • Erosion control measures (e.g., silt fencing, erosion control matting) will be employed to reduce or avoid the movement of soil into surface water, as needed • Surface Water Management Plan and Erosion Control Plans will be drafted and implemented • Class I and II wetlands will be re-created during contouring after Project decommissioning

8.6.2.3 ASSESSMENT OF RESIDUAL EFFECTS ON WETLANDS AND WATERCOURSES

Development within the Project footprint will result in the loss of Class IT and Class IIT wetlands during the construction and operation phases. However, implementation of mitigation measures will prevent or reduce

potential adverse effects of the Project on non-tilled wetlands and watercourses in the Local Assessment Area.

After mitigation measures are implemented, residual effects are anticipated to be low in magnitude, local, medium-term, reversible, likely, and adverse in direction within the Project footprint. These residual effects are considered minor and not significant.

A cumulative impact assessment for wetlands and watercourses was completed. The Project is sited in a region where many naturally occurring wetlands have been drained for agricultural purposes or are tilled through. Project contributions to existing cumulative effects on wetlands and watercourses due to the temporary loss of Class IT and Class IIT are not considered significant.

8.6.3 WILDLIFE AND WILDLIFE HABITAT

The potential effects on wildlife and wildlife habitat by the Project include:

- Mortality risk
- Habitat loss and/or alteration
- Wildlife displacement (i.e., degradation of wildlife habitat quality due to sensory disturbance and disruption of wildlife movement)

Potential effect on wildlife and wildlife habitat for each Project activity are presented in Table 24.

Table 24 Project Activities and Potential Effects on Wildlife and Wildlife Habitat during the Project

Project Phases			Project Activity	Potential Effects		
Site Preparation and Construction	Operation and Maintenance	Decommissioning and Reclamation		Mortality Risk	Habitat Loss and/or Alteration	Wildlife Displacement
•			Site clearing and vegetation removal	✓	✓	✓
•			Leveling and grading	✓	-	✓
•			Pile system installation	✓	-	✓
•			Racking and panel installation	✓	-	✓
•			Collection line trench excavation	✓	✓	✓
•			Inverter installation	✓	-	✓
•			Access roads	✓	✓	✓
•			Control and maintenance buildings	✓	-	✓
	•		Panel operation	✓	-	-
			Interconnection	-	-	-
	•		Inspection and maintenance	-	-	✓
•	•	•	Accidents and malfunctions	✓	✓	✓
		•	Infrastructure demolition	✓	-	✓
		•	Site reclamation	-	-	✓

Notes:

- ✓ = Interactions between the Project activity and the VEC may cause an effect.
- = Interactions between the Project activity and the VEC are not expected.

8.6.3.1 MITIGATION MEASURES FOR WILDLIFE AND WILDLIFE HABITAT

Industry standard mitigations and site-specific measures will be implemented during construction, operations and maintenance, and decommissioning and reclamation to reduce or avoid effects on wildlife and wildlife habitat. The EPP will list all planned mitigation measures. Table 25 lists key mitigation measures for the protection of wildlife and wildlife habitat.

Table 25 Mitigation measures for wildlife and wildlife habitat

Potential Effect(s)	Mechanism	Mitigation Measures
<ul style="list-style-type: none"> Mortality risk 	<ul style="list-style-type: none"> Collisions with Project vehicles, equipment, or infrastructure 	<ul style="list-style-type: none"> Confirmed or suspected bird nests, eggs, and/or young will be protected by a suitable setback distance, determined by a qualified Biologist and in keeping with the Saskatchewan Activity Restriction Guidelines for Sensitive Species, until the fledglings have left the area or the nest is abandoned Setbacks will be established around animal residences (e.g., dens, burrows) to be avoided during construction The Contractor will erect and maintain signage and/or fencing to delineate setbacks and prevent Project vehicles or equipment from entering the protected areas Speed limits will be implemented on the Project site to reduce the risk of collisions with wildlife Project personnel will be encouraged to yield to wildlife observed along roads Car-pooling to site will be encouraged to reduce the number of vehicles If wildlife is observed during work, if possible, animals will be given the opportunity to escape the work area Temporary fencing will be erected around hazards such as trenches when conditions warrant The need for operational personnel on-site during sensitive wildlife time periods will be minimized (e.g., during breeding bird season) The EPP will include a Wildlife Management Plan At least one year of post-construction monitoring, including mortality monitoring, will be completed. Adaptive management principles will be applied as per the <i>Adaptive Management Guidelines for Saskatchewan Wind Energy Projects</i> (MOE, 2018)
<ul style="list-style-type: none"> Mortality risk 	<ul style="list-style-type: none"> Stranding/ inability to take off 	<ul style="list-style-type: none"> Operations and maintenance staff will be trained to identify wildlife that may be injured or stranded Local wildlife rehabilitation organizations and/or veterinarians will be contacted to assist with wildlife rehabilitation, where appropriate Dogs will not be permitted on site by personnel At least one year of post-construction monitoring, including mortality monitoring, will be completed. Adaptive management principles will be applied as per the <i>Adaptive Management Guidelines for Saskatchewan Wind Energy Projects</i> (MOE, 2018)
<ul style="list-style-type: none"> Mortality risk 	<ul style="list-style-type: none"> Ground disturbance and infilling of wetlands 	<ul style="list-style-type: none"> The Project will adhere to the Saskatchewan ARGs for Sensitive Species (MOE, 2017) by conducting work outside the restricted activity periods that are specific to species and type of wildlife feature, wherever possible If the Contractor encounters animal residences (e.g., dens, burrows, nests) during Project activities, they will contact a qualified Biologist and/or the MOE for advice before proceeding Setbacks will be established around animal residences (e.g., dens, burrows) to be avoided during construction The Contractor will erect and maintain signage and/or fencing to delineate setbacks and prevent Project vehicles or equipment from entering the protected areas

Potential Effect(s)	Mechanism	Mitigation Measures
		<ul style="list-style-type: none"> If the Class IT and IIT wetlands are wet or soils saturated at the time of vegetation clearing and/or grading, a qualified Biologist will complete a survey for amphibians in the wetland areas and applicable setbacks. Should amphibians be observed, the Biologist will develop a plan for amphibian relocation in consultation with the MOE Terms and conditions of permits and approvals will be adhered to The EPP will include a Wildlife Management Plan
<ul style="list-style-type: none"> Habitat loss and/or alteration 	<ul style="list-style-type: none"> Construction and decommissioning activities 	<ul style="list-style-type: none"> The Project is responsibly sited in a cultivated area which has already experienced fragmentation due to roads, utilities, and land conversion for agricultural purposes. The Project siting has avoided sensitive habitats, designated lands, Important Bird Areas, etc. The design of the Project has minimized the required footprint Decommissioning and reclamation will result in the Project Area being returned to cultivated land The intermittent stream will be protected from development with a 30 m setback An AHPP will be obtained if deemed necessary. The Project will adhere to the permit terms and conditions to support regulatory compliance The Project will adhere to the Saskatchewan ARGs for Sensitive Species (MOE, 2017) If the Contractor encounters animal residences (e.g., dens, burrows, nests) during Project activities, they will contact a qualified Biologist and/or the MOE for advice before proceeding Setbacks will be established around animal residences (e.g., dens, burrows) to be avoided during construction The Contractor will erect and maintain signage and/or fencing to delineate setbacks and prevent Project vehicles or equipment from entering the protected areas Existing roads will be used to the extent possible to reduce the need for additional linear disturbances The EPP will support regulatory compliance and achieve industry best practices
<ul style="list-style-type: none"> Habitat loss and/or alteration 	<ul style="list-style-type: none"> Introduction of weed species via Project vehicles or equipment 	<ul style="list-style-type: none"> The EPP will include a Weed Management Plan to be implemented to avoid and reduce the spread of weeds. The Plan will support compliance with <i>The Weed Control Act</i> Pre-construction weed surveys will be completed on the Project footprint, access road and temporary workspaces Weed infestations will be addressed as per corrective actions (e.g., spraying, pulling, mowing) identified in the Weed Management Plan prior to vegetation clearing and grading Topsoil and spoil piles will be monitored for weed growth. Weed growth will be addressed as per correction actions in the Weed Management Plan All vehicles and equipment will arrive on-site clean and free of soil or vegetative debris Develop and implement vehicle/equipment cleaning and inspection procedures Revegetation will be initiated as soon as possible after decommissioning and removal of Project components
<ul style="list-style-type: none"> Wildlife displacement 	<ul style="list-style-type: none"> Sensory disturbances from construction, operation, and decommissioning activities 	<ul style="list-style-type: none"> Vehicles and equipment will be maintained in good working order and properly muffled Project personnel will avoid excessive idling of vehicles. Vehicles will be turned off when not in use unless required for effective operation The need for operational personnel on-site during sensitive wildlife time periods will be minimized (e.g., during breeding bird season)

Potential Effect(s)	Mechanism	Mitigation Measures
		<ul style="list-style-type: none"> Lighting for infrastructure will be reduced, down-shielded, and controlled by proximity sensors, where possible Energy efficient bulbs that are only as bright as required will be used, where possible
<ul style="list-style-type: none"> Wildlife displacement 	<ul style="list-style-type: none"> Disruption to wildlife movement 	<ul style="list-style-type: none"> Car-pooling will be encouraged to reduce the number of vehicles on-site Existing roads will be used to the extent possible to reduce the need for additional linear disturbances All materials that might attract wildlife (e.g., human food, garbage, petroleum products) will be stored in closed containers and in areas that wildlife cannot access Feeding, baiting, luring, or destruction of wildlife will be prohibited Fencing of the solar panel field will be completed to reduce the risk of wildlife entering or becoming stranded

8.6.3.2 ASSESSMENT OF RESIDUAL EFFECTS ON WILDLIFE AND WILDLIFE HABITAT

Solar energy projects, though a desirable and renewable alternative source of energy, do have direct and indirect effects on wildlife and wildlife habitat. Project activities and infrastructure from the Project have the potential to increase the risk of mortality, habitat loss and/or alteration, and wildlife displacement through sensory disturbances and/or disruption of wildlife movement. To assess the potential residual effects the Project may have on wildlife and wildlife habitat, it is necessary to revisit the results of the environmental desktop study and field studies.

There is a migratory bird concentration site located on a large wetland area approximately 7 km west-southwest of the Project footprint. According to the Alberta Wildlife Directive and IBA Canada, solar energy projects should not occur within 1 km of a wetland-based Important Bird Area (AEP, 2017; IBACanada.org). The migratory bird concentration site is not listed as an IBA and it is located over 6 km beyond the recommended setback. The Project is not predicted to have an adverse effect related to the migratory bird concentration site.

The Local Assessment Area is dominated by cultivated land, which provides lower quality wildlife habitat when compared to natural habitat types/areas. The Project footprint contains wetlands (Class IT and Class IIT), an intermittent stream, and human-made drainages, which may provide minimal habitat for breeding and/or rearing grounds for waterfowl and amphibians.

Of the approximately 9,850 birds observed during bird migration studies in 2018 and 2019, the largest numbers of birds were Canada geese (> 4,500 individuals; *Branta canadensis*) and snow geese (>3,900 individuals; *Chen caerulescens*). SOCC detected during bird migration studies included barn swallow, bobolink, ferruginous hawk, golden eagle, peregrine falcon, and Sprague’s pipit. Ferruginous hawks, golden eagles, peregrine falcons, and Sprague’s pipit were only observed flying over the Local Assessment Area during migration and were not seen actively using the area. Further details regarding SOCC are provided in the following subsection.

Approximately 250 Lapland longspurs (*Calcarious lapponicus*) were observed landing, flying, and feeding in the Local Assessment Area during spring migration in 2019. It is not uncommon for Lapland longspur flocks to use cultivated fields, haylands or pasturelands in Saskatchewan during migration. There is ample suitable habitat for Lapland longspurs in the Regional Assessment Area; therefore, the Project is not expected to result in adverse effects on their populations. No other avian species were seen staging in the Local Assessment Area during migration studies.

No sharp-tailed grouse leks, raptor stick nests, or short-eared owls were observed during target surveys in the Local Assessment Area. The Project is unlikely to adversely affect grouse or owl populations in the local or regional area.

Two species of amphibians, wood frogs (*Lithobates sylvaticus*) and boreal chorus frogs (*Pseudacris maculata*), were detected in small numbers during auditory amphibian surveys in 2019. The Local Assessment Area was sparsely populated by the species detected and no amphibian SOCC were observed. With the implementation of mitigation measures, the Project is not anticipated to result in adverse effects on local and regional amphibian populations.

WILDLIFE SPECIES OF CONSERVATION CONCERN

Wildlife SOCC were observed during field studies and incidentally within the Local Assessment Area. The following paragraphs describe the SOCC and potential effects of the Project on their populations.

AMERICAN BADGER

The American badger (*taxus* subspecies) is a SARA Schedule 1 species and is listed by the COSEWIC as a species of *Special Concern*. It is ranked provincially in Saskatchewan as S3, indicating that it is *Vulnerable/Rare to uncommon* (SKCDC, 2019; SKCDC, 2018). American badgers occur in non-forested grassland and shrubland areas, where soil and prey availability are the key defining features of viable habitat. Coherent soils that can support a burrow without collapsing are preferred, as well as availability of fossorial (ground-burrowing) rodents or other prey. American badgers can be supported by agricultural areas when there are sufficient hedgerows, fencerows, and field boundary. They have been documented to avoid cultivated fields (COSEWIC, 2012).

Because the Local Assessment Area is dominated by cultivated cropland, it is not likely the Project Area provides sufficient suitable habitat to support the American badger. Based on current land use and proposed land use development, the Project is not anticipated to result in an adverse effect to regional populations of American badger.

BARN SWALLOW

The barn swallow is a Schedule 1 species in Canada and has been designated as *Threatened* by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC); however, it has been provincially ranked S5B, S5M and is considered *Secure and Common* in Saskatchewan (SKCDC, 2019). Prior to European colonization in Canada, the barn swallow nested primarily in caves, holes, crevices, and ledges in cliff faces. Since European colonization, it has become closely associated with rural settlements, preferring to nest in and on artificial structures including barns, garages, houses, bridges, etc. (COSEWIC, 2011).

Considering that there are no artificial structures nor natural cliffs or rises within the Project Area, there are no viable nesting sites for barn swallows. Construction of infrastructure may provide limited nesting habitat for this species. Based on the current land use and proposed Project land use, the Project is not expected to have an adverse effect on regional barn swallow populations.

BOBOLINK

The bobolink is a SARA Schedule 1 species in Canada and is ranked S4B, S4M by the SKCDC (2019), indicating that both the breeding and transient/migrant populations of the species are “Apparently Secure” in Saskatchewan because the bobolink is “uncommon but not rare, and because there is “some cause for

long-term concern due to population declines or other factors” (SKCDC, 2018; 2019). The bobolink has been designated as *Threatened* since 2010 by COSEWIC (COSEWIC, 2010), and its status according to SARA is also *Threatened* (SKCDC, 2019).

The bobolink’s preferred nesting habitat is forage cropland (eg. hayfields and pastures) dominated by a variety of species, which can include clover (*Trifolium spp.*), timothy (*Phleum pratense*), tall grasses, and broadleaved plants. It can also be found in wet prairie, graminoid peatland, no-till cropland, small-grain fields, reed beds, and remnants of native tall-grass prairie. The bobolink is sensitive to vegetation structure and composition – preferring habitats with moderate litter depth, high lateral litter cover, and high grass-to-legume ratio – as well as habitat size, where lower reproductive success is reported in small habitat fragments. The bobolink also requires an abundance of small shrubs to serve as perches, and a high percent of forb cover (COSEWIC, 2010). Hayfields and pastures are preferred by the bobolink because plant cover is present at the start of the nesting season, which is not generally the case in cultivated fields (COSEWIC, 2010).

The Local Assessment Area is predominantly cultivated land with little structural complexity, providing minimal habitat for the bobolink. Based on the current land use and proposed Project land use, alteration of the Project Area is not expected to result in an adverse effect on regional bobolink populations.

FERRUGINOUS HAWK

The ferruginous hawk is a Schedule 1 species in Canada and is designated as *Threatened* by the COSEWIC. It is ranked as S3 in Saskatchewan, indicating that it is *Vulnerable/Rare to uncommon* (SKCDC, 2019). The Ferruginous hawk is heavily dependent on native grasslands – considered a native grassland specialist – and typically avoids areas of intensive agriculture (Alberta Sustainable Resource Development and Alberta Conservation Association, 2006).

The Local Assessment Area is dominated by cultivated cropland; therefore, it does not provide suitable nesting habitat for ferruginous hawks. Based on the current land use and proposed Project land use, disturbance in the Project Area is not anticipated to adversely affect regional ferruginous hawk populations.

GOLDEN EAGLE

The golden eagle is not a Schedule 1 species in Canada and is listed as *Not at Risk* by the COSEWIC, however it has been ranked S3B, S3N, S4M in Saskatchewan (SKCDC, 2019). This indicates that breeding populations of golden eagles in Saskatchewan are *Vulnerable/Rare to uncommon* – defined as when a species is *at moderate risk of extinction or extirpation due to a restricted range, relatively few populations, recent and widespread declines, threats, or other factors* –, non-breeding populations are *Vulnerable/Rare to uncommon*, and migratory or transient species are *Apparently Secure* (SKCDC, 2018).

Golden eagles use a variety of habitats in North America, including open and semi-open landscapes like prairie, sagebrush, arctic and alpine tundra, savannah, spruce woodlands, etc. Specifically, they are found in areas with a sufficient prey base and near suitable nesting sites. Their preferred breeding habitat is typically at the boundary of tundra, boreal forest, and wet meadows, while they typically forage in open habitat, preferring areas with short or sparse vegetation. They usually select nest sites on cliffs, sometimes in the upper third of deciduous and coniferous trees, and occasionally on artificial structures. They typically avoid nesting near urban habitat (Wyshynski and Pulfer, 2015).

Considering there are no suitable nest sites in the Local Assessment Area, the Project should not have an adverse effect on critical golden eagle habitat or regional populations.

PEREGRINE FALCON

The peregrine falcon, *anatum* subspecies, is a Schedule 1 species in Canada, although it is listed as *Not at Risk* by the COSEWIC. It is ranked as S1B, SNRM in Saskatchewan, indicating that the breeding population is *Critically Imperiled/Extremely rare* and that the migratory or transient population has not yet been assessed and/or assigned a rank in Saskatchewan (SKCDC, 2019; SKCDC, 2018). The peregrine falcon (all subspecies) was among the first species to be assessed by the COSEWIC and was listed early on as a species of special concern due to the severely detrimental effects of agricultural use of organochlorine pesticides on peregrine falcon populations, most notably 1,1,1-trichloro-3,3-bis(p-chlorophenyl)ethane (DDT) which was banned in Canada and the United States in the early 1970s. It is possible that other chemical pesticides may also pose a threat to the peregrine falcon (*anatum/tundrius* subspecies). Since the early listing of the peregrine falcon and therefore the initiation of reintroduction programs and regimented population monitoring, however, breeding populations have increased considerably, surpassing the size of the known historical population in some regions. As a result, the *anatum* subspecies has been delisted in the United States, and there has been speculation regarding the delisting of peregrine falcons in Canada as well (Environment Canada, 2015).

Peregrine falcons breed in a wide range of habitats, including arctic tundra, coastal islands, major urban centres, etc., and typically nest on cliff ledges, crevices, escarpments, or tall artificial structures. Given that it is an aerial predator of other bird species, the peregrine falcon prefers sites located near staging or nesting sites for seabirds, shorebirds, waterfowl, or other birds colonies (Environment Canada, 2015).

The Project Area has not been identified as a staging site or nesting site for any migratory bird colonies because there are no tall landmarks or structures within or adjacent to the Project Area. This combined with the increasingly lessened concern regarding the security of the peregrine falcon's status, development within the Project Area is not expected to have an adverse effect on regional peregrine falcon populations.

SPRAGUE'S PIPIT

Sprague's pipit is a Schedule 1 species in Canada and has been listed by the COSEWIC as *Threatened*. It has been ranked S3B, S3M provincially, in Saskatchewan, indicating that it is *Vulnerable/Rare to uncommon* (SKCDC, 2019; SKCDC, 2018). Sprague's pipit requires native prairie for nesting habitat, and is uncommonly found in cultivated lands or where native grasses have been replaced with introduced forage. Typically Sprague's pipit prefers grassland vegetation of intermediate height (10 to 30 cm), intermediate density, and few shrubs such as that found in hayland.

Pipit nests in southern Saskatchewan in particular have been found to be located in relatively tall (27 cm), dense grasslands with low forb density. Grassland patch size has been found to influence Sprague's pipit abundance, where migration routes surrounded by more than 50% grassland had mean Sprague's pipit populations of 20.6 individuals and routes with less than 50% grassland had mean populations of 3.2 individuals. In southern Saskatchewan in particular, Sprague's pipits were absent in grassland patches smaller than 29 hectares (Environment Canada, 2008).

Given that the Regional Assessment Area is dominated by cultivated cropland, there is minimal suitable grassland habitat for Sprague's pipits. Based on the current land use and proposed Project land use, the Project is unlikely to result in an adverse effect to regional Sprague's pipit populations

MORTALITY RISK

Wildlife mortality has been documented at solar projects around the globe (e.g., Walston Jr. et al., 2015, 2016; WEST, 2014; Horváth et al., 2010; Montag et al., 2016; Visser et al., 2019). For PV solar projects, the main risk of wildlife mortality results from collisions with vehicles, equipment, or infrastructure. Project activities involving vehicles have the potential to result in mortality for individuals through wildlife-vehicle collisions.

The mortality risk for wildlife-infrastructure collisions (e.g. solar panels, buildings) is greatest for birds. Kagan et al. (2014) investigated avian mortality at three utility-scale solar facilities in southern California, USA. Trauma from collisions was the leading cause of death at all three facilities. Walston et al. (2016) also demonstrated bird fatalities can occur due to collision with solar panels. There is also speculation that passerines, particularly insectivores, have an increased risk of mortality due to collision with solar panels and infrastructure due to the attraction of some insects to the solar panels (Grippio et al., 2015; Horváth et al., 2010; Kagan et al. 2014).

There has been much speculation regarding the so-called “lake effect” hypothesis wherein solar panels may attract birds from polarized light reflecting off the panels in a manner that mimics light reflecting off water surfaces (Horváth et al., 2010; Kagan et al., 2014). However, recent reviews of available literature concluded there is no definitive evidence supporting the “lake effect” hypothesis (Taylor et al. 2019; Visser et al. 2019). WEST (2017) determined the lake hypothesis cannot be used to predict whether waterbird fatalities may occur at a proposed solar energy project. Further studies are needed to properly assess the hypothesis (Walston Jr. et al., 2015; Walston Jr. et al., 2016; WEST, 2017; Taylor et al., 2019; Visser et al., 2019). No such studies have been completed in Saskatchewan to the best of our knowledge.

Some previous studies (e.g., Huso et al., 2016; Kagan et al., 2014) have documented waterbirds attempting to land on solar panels have died on impact while survivors may become stranded due to injuries or because they are unable to take off from land. Stranded birds may succumb to injuries, starvation, dehydration or predators (Kagan et al., 2014; Huso et al., 2016).

In terms of anthropogenic sources of avian mortality, the potential number of birds impacted by collisions and/or stranding from solar projects is likely low. Erickson et al. (2005) estimated that between 500 million to possibly over 1 billion birds are killed annually in the USA due to anthropogenic sources. Predicted annual avian mortality in the USA from collisions with buildings and windows is approximately 550 million and from cat predation is around 100 million (Erickson et al., 2005).

Other Project activities may also result in wildlife mortality. For example, vegetation clearing and earthworks have the potential to result in the destruction of animal dens or burrows (e.g., badger setts - an American badger was incidentally observed in the Regional Assessment Area). Also, construction in and around wetlands may result in mortality to amphibians. However, this is not anticipated to cause an increase in mortality risk because current agricultural activities in the Project footprint may result in amphibian mortality in the tilled wetlands. Additionally, the intermittent stream will be protected by a 30 m setback so amphibians within that area will be protected.

The Proponent will undertake at least one year of post-construction monitoring, including detection of bird casualties, to assess impacts of the operation of the Project (see Monitoring Section 9). Adaptive management principles will be applied. Reporting and management responses will be confirmed through discussions with MOE. Potential solar-project specific adaptations that could be implemented to attempt to decrease mortality due to collisions include minimizing vertical solar panel orientation during migration

periods or adding visual cues such as UV-reflective or solid, contrasting bands to the panels (Kagan et al., 2014; Horváth et al., 2010).

After mitigation measures are implemented, residual effects related to the increased risk of wildlife mortality are anticipated to be adverse in nature, low in magnitude, local in spatial extent, infrequent, medium-term (life cycle of the Project) in duration, reversible, and unlikely. The mortality risk will be removed when the Project ends. The residual effects are predicted to be minor and not likely to result in a change to wildlife and wildlife habitat that is significant.

HABITAT LOSS AND/OR ALTERATION

Wildlife habitat may be lost, altered or fragmented by the development of solar energy projects. The Project has been intentionally sited to avoid native grasslands in Saskatchewan which have experienced large-scale, historic and ongoing habitat loss. As per recommendations in Storms et al. (2013), the Project has been placed in an ecologically degraded site to result in the least amount of conflict with wildlife and wildlife habitat. Existing landcover in the Project Area is cultivated which provides little suitable habitat for wildlife species. The area is also highly fragmented due to past agricultural practices, road networks, and railways. Tilled wetlands will be temporarily lost for the duration of the Project but will be reclaimed after decommissioning. The intermittent stream will be protected by a 30 m setback throughout the Project. This stream may provide habitat for amphibians in the spring, though few individuals were detected during surveys.

The introduction or spread of weed species due to development activities has the potential to result in degradation of habitat. However, the Project is located on cultivated land within the Local Assessment Area where weed growth in disturbed areas is already common. Wildlife in the area are unlikely to be impacted further by the introduction or spread of weed species resulting from the Project. It is expected that weed species will be present throughout the life cycle of the Project despite implementation of the Weed Management Plan.

After mitigation measures are implemented, residual effects on wildlife and wildlife habitat due to habitat loss or alteration are anticipated to be adverse in nature, low in magnitude, limited to the Project footprint, infrequent, medium-term, reversible, and unlikely. These residual effects are considered not significant and are likely negligible in nature given the existing conditions in the Regional Assessment Area.

WILDLIFE DISPLACEMENT

Wildlife may be displaced as a result of sensory disturbances or disruptions to wildlife movements that reduce habitat effectiveness.

Sensory disturbances associated with PV solar energy developments include noise and light. The Regional Assessment Area experiences noise and light associated with residences, agricultural equipment, and large vehicle traffic routinely. It is possible that wildlife in the region may be acclimatized to sensory disturbances. Regardless, the Project is not expected to generate ambient noise beyond acceptable limits, with the possible exclusion of short-term noise during construction (Tsoutsos et al., 2005). Mitigation measures will effectively reduce Project impacts to wildlife due to sensory disturbances.

Disruptions to wildlife movements may include increased traffic and attractants. Mitigation measures, such as adherence to speed limits and proper handling and removal of waste, will reduce residual effects on wildlife and wildlife habitat.

After mitigation measures are implemented, residual effects from wildlife displacement are anticipated to be adverse in direction, low in magnitude, local in extent, infrequent, medium-term, reversible, and unlikely.

These effects are considered not significant and are likely negligible in nature given the existing conditions in the Regional Assessment Area.

CUMULATIVE EFFECTS

A cumulative effects assessment for wildlife and wildlife habitat has considered the projects and activities in the inclusion list. The Project is located in a region where the existing cumulative effects of agriculture, urban development, light industrial and commercial development, and the oil and gas industry have already contributed to decreases in wildlife habitat. The residual effects of the Project on wildlife and wildlife habitat related to mortality risk are predicted to be minor; habitat loss or alteration are predicted to be negligible; and wildlife displacement are predicted to be negligible. Therefore, Project contributions to the cumulative effects on wildlife and wildlife habitat are expected to be minor and not significant.

8.7 SOCIO-ECONOMIC VECS

8.7.1 HERITAGE RESOURCES

Generally, construction activities that cause ground disturbance, including stripping, grading and excavation, have the potential to adversely effect heritage resources. However, no effects to heritage resources are expected as a result of the Project. According to the Ministry of Parks, Culture and Sport's Developers' Online Screening Tool, the Project Area is not heritage sensitive. The Project Area has been under cultivation for several decades. There is low potential for heritage sites to be affected.

Heritage resources are not considered further in this assessment.

If heritage resources are encountered during Project activities, an Accidental Finds Protocol will be implemented such that work will not continue in the area until an Archaeologist and the HCB have been contacted and a path forward is identified.

8.7.2 LAND USE AND PROPERTY VALUE

8.7.2.1 POTENTIAL EFFECTS ON LAND USE AND PROPERTY VALUE

The potential effects on land use and property value by the Project include:

- Change in land use
- Change in property values

Potential effects on land use and property value for each Project activity are presented in Table 26.

Table 26 Project Activities and Potential Effects on Land Use and Property Value during the Project

Project Phases			Project Activity	Potential Effects	
Site Preparation and Construction	Operation and Maintenance	Decommissioning and Reclamation		Change in Land Use	Change in Property Values
•			Site clearing and vegetation removal	✓	-
•			Leveling and grading	✓	-
			Pile system installation	-	-
	•		Racking and panel installation	-	✓
			Collection line trench excavation	-	-
			Inverter installation	-	-
			Access roads	-	-
			Control and maintenance buildings	-	-
	•		Panel operation	-	✓
			Interconnection	-	-
			Inspection and maintenance	-	-
•	•	•	Accidents and malfunctions	✓	✓
			Infrastructure demolition	-	-
			Site reclamation	-	-

Notes:

- ✓ = Interactions between the Project activity and the VEC may cause an effect.
- = Interactions between the Project activity and the VEC are not expected.

8.7.2.2 MITIGATION MEASURES FOR LAND USE AND PROPERTY VALUE

Industry standard mitigations will be implemented during construction, operations and maintenance, and decommissioning and reclamation to reduce or avoid effects on land use and property value. The EPP will list all planned mitigation measures. Table 27 lists key mitigation measures addressing land use and property value.

Table 27 Mitigation Measures for Land Use and Property Value

Potential Effect(s)	Mechanism	Mitigation Measures
• Change in land use	• Site clearing and grading and installation of the Project	• An EPP will be developed and implemented, including a Soil Management Plan, to support site reclamation to allow the Project footprint area to be returned to cultivation at the end of the Project life cycle
• Change in property values	• Installation and operation of the Project	<ul style="list-style-type: none"> • Engagement was undertaken to gather feedback from landowners in the area • Ongoing education will aim to provide factual, relevant information to alleviate potential concerns of local residents • The Project was responsibly sited in a cultivated area adjacent to an existing power substation near light industrial developments. Existing aesthetics are not unique • The Project has been setback from existing residences • Decommissioning and reclamation will result in the Project Area being returned to cultivated land

8.7.2.3 ASSESSMENT OF RESIDUAL EFFECTS ON LAND USE AND PROPERTY VALUE

The Project footprint will experience a short-term change in land use from cultivation to a solar energy development. Upon decommissioning and reclamation, the Project footprint will likely be returned to cultivation. Land use on properties in the Regional Assessment Area will not be affected. With the implementation of mitigation measures in the EPP, no residual effects to land use are expected.

Project activities may have the potential to adversely affect property values in the Regional Assessment Area, mainly due to aesthetic concerns. The Canadian Solar Industries Association (CanSIA) published a study on the effects of a solar project on property value. They stated that the general concerns regarding solar projects and property value concern aesthetics and the “feel of a community” (CanSIA, 2015). They state that, if the proper setbacks and buffers are implemented, the neighbouring lands will have no lasting adverse impacts as a result of the project. Therefore, after the implementation of mitigation measures, no residual effects to property values in the Regional Assessment Area are expected due to the Project.

A cumulative effects assessment for land use and property values has not been completed because no residual effects on the VEC are anticipated.

8.7.3 TRAFFIC CONDITIONS

8.7.3.1 POTENTIAL EFFECTS ON TRAFFIC CONDITIONS

The potential effects on traffic conditions by the Project include:

- Increase in vehicular traffic

Potential effects on traffic conditions for each Project activity are presented in Table 28.

Emissions, noise, and potential contamination resulting from Project vehicles have been considered in other VECs and will not be addressed in this section. This assessment focuses solely on the Project’s effect on traffic conditions.

Table 28 Project Activities and Potential Effects on Traffic Conditions during the Project

Project Phases			Project Activity	Potential Effects
Site Preparation and Construction	Operation and Maintenance	Decommissioning and Reclamation		Increase in vehicular traffic
•			Site clearing and vegetation removal	✓
•			Leveling and grading	✓
•			Pile system installation	✓
•			Racking and panel installation	✓
•			Collection line trench excavation	✓
•			Inverter installation	✓
•			Access roads	✓
•			Control and maintenance buildings	✓
	•		Panel operation	✓
			Interconnection	-
	•		Inspection and maintenance	✓
•	•	•	Accidents and malfunctions	✓

Project Phases			Project Activity	Potential Effects
Site Preparation and Construction	Operation and Maintenance	Decommissioning and Reclamation		Increase in vehicular traffic
		•	Infrastructure demolition	✓
		•	Site reclamation	✓

Notes:

- ✓ = Interactions between the Project activity and the VEC may cause an effect.
- = Interactions between the Project activity and the VEC are not expected.

8.7.3.2 MITIGATION MEASURES FOR TRAFFIC CONDITIONS

Industry standard mitigations will be implemented during construction, operations and maintenance, and decommissioning and reclamation to reduce or avoid effects on traffic conditions. The EPP will list all planned mitigation measures. Table 29 lists key mitigation measures for traffic conditions.

Table 29 Mitigation Measures for Traffic Conditions

Potential Effect(s)	Mechanism	Mitigation Measures
<ul style="list-style-type: none"> • Increase in vehicular traffic 	<ul style="list-style-type: none"> • Use of vehicles and/or heavy equipment 	<ul style="list-style-type: none"> • Oversized loads will be delivered during times of lowest traffic to mitigate traffic jams, where feasible • All Project vehicles will adhere to legal load limits on Saskatchewan roads, including spring weight restrictions • Car-pooling to site will be encouraged • The Proponent will consult with Ministry of Highways and Infrastructure as early as possible regarding access permits and approvals required for the construction of the Project • Vehicle movements will follow traffic control guidelines, including speed limits

8.7.3.3 ASSESSMENT OF RESIDUAL EFFECTS ON TRAFFIC CONDITIONS

Project activities could result in increased vehicular traffic particularly during construction, and decommissioning and reclamation phases. After mitigation measures are implemented, residual effects are anticipated to be low in magnitude, regional in spatial extent, infrequent, short-term, reversible, and likely. The residual effects are predicted to be not significant.

A cumulative effects assessment for traffic conditions has taken into consideration traffic associated with the projects and activities on the project inclusion list, including ongoing agricultural activities, urban development, and highway travel. The minor residual effects of the Project combined with the existing traffic conditions in the area are not expected to result in significant increases in traffic. Therefore, no significant cumulative effects on traffic condition are expected.

8.7.4 PUBLIC HEALTH AND SAFETY

Developments, if not managed correctly, have the potential to adversely effect public health and safety. However, no adverse effects to public health and safety are expected from the Project. Health and safety has been a top priority during Project planning and design. The Proponent and Contractors will adhere to provincial Occupational Health and Safety legislation.

Glare/glint will be mitigated as described in Section 8.5.4. Net air emissions of greenhouse gases will decrease as a result of the Project. There is low potential for public health and safety to be affected. No residual effects are anticipated for this VEC.

Public health and safety are not considered further in this assessment.

8.7.5 COMMUNITY AND LOCAL ECONOMY

The potential effects of the Project on community and local economy are positive in direction. The Project will provide employment opportunities during construction, operation and maintenance, and decommissioning and reclamation.

It is predicted the Project will create approximately 23 full-time equivalent person years throughout its life cycle. Employment and/or contracting opportunities may arise related to, but not limited to, the following:

- Pre-construction, construction, and post-construction environmental studies
- Civil engineering and surveying
- Electrical engineering
- Geotechnical engineering
- Access road construction
- Aggregate crushing and supply
- Pile system installation
- Transportation
- Erection crew
- Site electrical work
- Maintenance work.

During operation, the Project is expected to generate approximately two full-time positions to address solar array maintenance, asset management, and ancillary services (e.g., snow clearing, civil maintenance, electrical maintenance, etc.).

The Proponent will use local services and products, when possible. Throughout the Project life cycle, money will be spent in the region on hiring local Contractors, accommodations/lodging, meals, and other items. Positive effects on community and local economy are expected and are predicted to be positive in direction, low in magnitude, long-term in duration and highly likely.

Community and local economy are not considered further in this assessment.

8.8 EFFECTS OF THE ENVIRONMENT ON THE PROJECT

Several environmental factors could have adverse effects on the Project. This section examines the interactions between the surrounding environment and the main environmental conditions that can affect the Project during all phases of the Project. Project design, mitigation, and Environmental Management plans aim to reduce risks to the Project. Effects of the environment on the Project would result in a short-term delay in construction schedule, short-term disruptions in operations, and increased operating or maintenance costs.

A significant adverse residual effect of the environment on the Project is defined as one that may cause harm to workers or the public, a critical impact to Project schedule, and/or damage to Project infrastructure that cannot be repaired (technically or due to costs).

8.8.1 DUST

The Project will be subject to dust during the summer months from existing activities prevalent in the region and when southern Saskatchewan may be dry and dusty. According to past studies, dust and particulate matter on the panels tends to have a poor correlation with energy production (Fountoukis et al., 2018).

Because dust has shown in the past to have little effect on the irradiance of the solar panels, the panels will not be regularly cleaned. However, if monitoring of the panels indicates dust may be affecting the productivity of the Project, then adjustments will be made to the maintenance of the Project. It is likely that dust would be removed by pressure-spraying the panels with water.

Dust accumulation on the panels could result in short-term disruptions to service and increases in maintenance costs. Mitigation measures in the EPP will protect the environment and reduce Project risks due to dust accumulation.

8.8.2 SEVERE WEATHER

Severe weather has the potential to affect construction, operation and decommissioning/reclamation. Therefore, severe weather is considered in facility design and Project planning. For the purposes of this assessment, severe weather events include droughts, extreme wind, extreme rain events and flooding, extreme snowfall, lightning, and extreme temperature events.

8.8.2.1 DROUGHTS

Droughts may result in increased dust accumulation and increased risk of fire. In the event of a drought, workers will adhere to the Fire Prevention Plan included in the EPP. If dust becomes an issue, dust will likely be removed by pressure-spraying the panels with water, if available.

8.8.2.2 EXTREME WIND

Extreme wind is often associated with severe weather events such as thunderstorms, winter blizzards, and tornados. July is the peak month for tornado activity and May has the greatest average wind speed (Environment Canada, 1990). Extreme winds may cause damage to panels and other above ground structures, but the risk is considered low. Construction may be delayed due to extreme winds, but such delays are expected to be short in duration. The EPP, including Erosion and Sediment Control Plan and Environmental Emergency Response Plans, will be adhered to during extreme wind events.

8.8.2.3 EXTREME RAINFALL AND FLOODING

Saskatchewan generally has dry winters and summers with precipitation that is irregular and unpredictable over time and space (Environment and Climate Change Canada, 1990). Although most extreme rainfall and flooding events are short in duration, intense storms may result in localized or regional flooding. Extreme rainfall and flooding could result in construction delays for the Project. These events may also hamper operational or maintenance activities in the short-term. Additionally, extreme rainfall and flooding events could cause erosion and safety concerns for workers. The Surface Water, Groundwater and Storm

Water Management Plan; Erosion and Sedimentation Control Plans; and Environmental Emergency Response Plans will be adhered to during and following extreme rainfall or flooding events.

8.8.2.4 *EXTREME SNOWFALL*

In Saskatchewan, extreme snowfall events may be precipitated by warm weather and low-pressure systems interacting with cold, Arctic air masses. These snowfall events are often accompanied by high winds, intense cold, and reduced visibility. Extreme snowfall may increase structural loading on panels and other above ground structures.

According to past studies, snow and ice may accumulate on solar PV panels which results in solar radiation obstruction and decreases energy output (Andenaes et al., 2018). Snow may also lead to bending, cracking, delamination, and/or corrosion of panels (Andenaes et al., 2018).

Snow removal plans will be based upon adaptive management principles and industry knowledge (e.g., trying to forcibly remove ice from panels may damage or break the panel - Andenaes et al., 2018). It is expected that snow accumulation on the panels will not be an issue due to the angle of the panel tilt, which will cause the snow to slide off the panels. Snow accumulation and energy outputs will be monitored during the first year of operation. If snow accumulation proves an issue, the snow will be carefully, manually removed.

8.8.2.5 *LIGHTNING*

Climate data specific to lightning frequency is not available for the Weyburn area. However, Saskatchewan experiences 15 to 25 lightning storms per year (Environment Canada, 1990). Direct lightning strikes could result in destroyed Project equipment, downtime, and expensive repairs. Indirect effects of lightning may result in damaged components. Therefore, solar energy developments are equipped with lightning protection systems that help protect solar panels, inverters, and other critical equipment against physical damage caused by lightning strikes and power surges. The protection system for the Project will include a grounding system, AC and DC power surge protection devices and arrestors.

8.8.2.6 *EXTREME TEMPERATURE*

Southern Saskatchewan may experience extremely hot or extremely cold temperatures. Extreme temperature events have the potential to affect the health and safety of workers. Construction activities will be halted if extreme temperatures result in safety concerns for workers. During operations, work may be shut-down if extreme temperatures affect operating conditions of the Project. Activities will be rescheduled and additional PPE will be used to protect workers. Delays due to extreme temperatures, if needed, are anticipated to be short. Mitigation measures and contingency plans will address these delays.

8.8.3 *CLIMATE CHANGE*

Global warming is expected to result in an increase in climate variability and an increase in the probability of extreme weather events (Sauchyn and Kulshreshtha, 2008). Therefore, climate change is an important consideration for all new developments. Based on the 20-year lifespan of the proposed Project, it may experience increased frequency and intensity of severe weather events. The Project has been designed to reduce impacts to infrastructure as a result of increased climate variability and large departures from average conditions. For example, the Project uses single-axis trackers to hold the solar panels. Using

control systems or mechanical means, trackers can pro-actively or reactively slow and/or pitch (i.e., adjust tilt of panels) based on forecasted and/or real time meteorological data.

Potential effects of climate change on the Project have been addressed through the inclusion of appropriate conservatism into Project design, and through mitigation and contingency planning for severe weather events and wildfire.

8.8.4 WILDFIRE

Wildfire could potentially result in delays to the construction schedule, either directly or indirectly (e.g., evacuation orders). Wildfire could interrupt operations and maintenance activities and result in damage to above ground infrastructure. Effects of wildfire on the Project would depend upon the location and nature of the wildfire event. Emergency measures will be in place to address wildfires and the Fire Prevention Plan will be followed. For example, Project vehicles will be equipped with fire extinguishers.

8.8.5 ASSESSMENT OF RESIDUAL EFFECTS OF THE ENVIRONMENT ON THE PROJECT

Potential effects of the environment on the Project will be addressed through Project planning and design, Environmental Management Plans, Emergency Response Plans, contingency plans, and health and safety procedures. Therefore, no residual effects of the environment on the Project are anticipated.

No cumulative effects assessment has been completed for the effects of the environment on the Project because no residual effects are expected.

8.9 ACCIDENTS AND MALFUNCTIONS

Accidents and malfunctions are events or conditions that are not planned as a part of Project activities. Accidents and malfunctions could occur due to abnormal operating conditions, component deterioration, equipment failure, human error, acts of nature, etc. Many accidents and malfunctions may be avoided or mitigated through proper siting, good design and equipment selection, environmental management planning, and emergency response planning.

Based on professional judgment and previous experience, the following accidents and malfunctions are considered in this assessment:

- Hazardous materials spills or leakage
 - spills of hydrocarbons or other chemicals used on site may occur during construction and decommissioning, and to a lesser extent operations and maintenance
- Vehicle accident
 - Project vehicles could be involved in accidents, including single vehicle accidents, multiple vehicle accidents, and collisions involving wildlife
- Fire
 - Project components, equipment, facilities, and vehicles could experience fire

These accidents and malfunctions have the potential to affect the following VECs:

- Soil, terrain and geophysical
- Atmospheric conditions

- Wildlife
- Vegetation and habitat
- Wetlands and watercourses

Mitigation measures will be developed and implemented through the EPP. With the implementation of prevention and response measures, no potential residual effects of accidents and malfunctions on VECs are expected.

Cumulative effects are not considered for accidents and malfunctions in this assessment.

8.10 SUMMARY OF RESIDUAL EFFECTS

Based on the completed VEC assessments, predicted residual effects of the Project have been determined. Identified residual effects for VECs are presented in Table 30. VECs are not included in this table if the assessment indicated residual effects are not expected.

The Project will provide benefits to atmospheric conditions by offsetting the production of greenhouse gas emissions. The Project will also provide a benefit to the community through local employment, contractor opportunities, and contributions to the local economy.

The assessment indicates no significant adverse residual effects are anticipated for the VECs as a result of the Project. Cumulative effects assessments determined Project contributions to cumulative effects on the VECs in the Regional Assessment Area are not predicted to be significant.

Table 30 Summary of Anticipated Residual Effects as a Result of the Project

VEC	Direction	Magnitude	Spatial Extent	Frequency	Duration	Reversibility	Likelihood	Significance
Physical VECs								
Atmospheric Conditions	Positive							Beneficial
Noise	Adverse	Low	Local	Infrequent	Short-term	Reversible	Likely	Not Significant
Glare and Visual Aesthetics	Adverse	Low	Local	Infrequent	Short-term	Reversible	Unlikely	Not Significant
Biophysical VECs								
Wildlife and Wildlife Habitat	Adverse	Low	Local	Infrequent	Medium-term	Reversible	Unlikely	Not Significant
Vegetation	Adverse	Low	Local	Infrequent	Short-term	Reversible	Unlikely	Not Significant
Wetlands and Watercourses	Adverse	Low	Local	Single event	Short-term	Reversible	Unlikely	Not Significant
Socio-Economic VECs								
Traffic Conditions	Adverse	Low	Regional	Infrequent	Short-term	Reversible	Likely	Not Significant
Community and the Local Economy	Positive							Beneficial

9 MONITORING

Post-construction monitoring for the Project will be completed for the following:

- compliance with environmental regulatory requirements and commitments made within the Technical Proposal and EPP
- effectiveness of mitigation measures
- risk management, accidents and contingencies

9.1 REGULATORY COMPLIANCE

PLSP will hire an environmental monitor to monitor Project compliance with applicable legislation, regulations, approval terms and conditions, and Technical Proposal and EPP commitments. The monitor will conduct scheduled and unscheduled site visits during the construction, operation and decommissioning phases of the Project. The monitor will compare Project activities and site observations to regulatory requirements and commitments. Issues and non-compliance will be documented and provided to the Proponent such that corrective measures are identified and implemented as soon as possible. MOE and other regulators will be notified as appropriate.

9.2 MITIGATION EFFECTIVENESS

PSLP will hire an environmental monitor to assess the effectiveness of mitigation measures for the Project. This will include post-construction wildlife monitoring surveys to identify and evaluate the Project's effects on wildlife, as well as monitoring VECs to make certain unforeseen impacts are not occurring.

The Proponent is committed to the application of a precautionary adaptive management approach and completion of annual post-construction wildlife monitoring for a period of one year from the commencement of Project operations. If the results of monitoring after the first year indicate the need to conduct another year of post-construction wildlife monitoring, the Proponent will do so in consultation with MOE.

Post-construction wildlife monitoring standards from the *Wildlife Directive for Alberta Solar Energy Projects* (Government of Alberta, 2017) that are likely applicable to the Project include the following:

- Documentation of wildlife mortalities
- Determination of carcass removal rate and searcher efficiency
- Monitoring impacts to SOCC
- Surveys to be completed between March 1 and November 15
- Surveying weekly during spring and fall migration and every two weeks throughout the summer
- The entire area of the Project will be monitored
- Adaptive management principles will be implemented as needed

These commitments and reporting requirements will be confirmed with MOE after receipt of their comments on this Technical Proposal.

9.3 RISK MANAGEMENT

Regular land inspections will be completed by Project personnel to make certain the Project Area is being properly maintained and to assess the risk of natural hazards such as grass fires or flooding. The Proponent is committed to reducing factors that may elevate the risk of natural hazards on site and to the Local Assessment Area. Additionally, a SCADA remote monitoring system will be installed to keep the Proponent up-to-date on the state of the Project. If an unforeseen complication or emergency arises, the Proponent will be alerted early allowing ample time to respond and tend to the situation.

10 DECOMMISSIONING AND RECLAMATION

When the Project has reached the end of its lifespan, the Project will be de-energized, dismantled, and the components will be recycled or disposed of as is appropriate. The lands will then be returned to their pre-construction state. If the landowner wishes to keep any of the infrastructure, such as perimeter fencing, it may be left on the Project lands.

Decommissioning measures will be in line with all of the relevant, governing agencies at the time that the Project is reclaimed and decommissioned. As mentioned previously, decommissioning plans will be completed and finalized closer to the termination of the Project. However, steps that will most likely be taken are presented in Table 31.

Table 31 Common Decommissioning Steps for Solar Energy Projects

Steps	Explanation
Pre-Dismantling	<ul style="list-style-type: none"> • Before the Project is dismantled, all components will need to be de-energized and isolated from the electrical lines. While this is happening, temporary erosion and sedimentation control measures will be implemented.
Solar Panels and Racking Systems	<ul style="list-style-type: none"> • During decommissioning, each panel will need to be disconnected from the electrical system and removed from the racking system. Panels will then need to be stored or transported off the site to be appropriately recycled or disposed of. • After the panels have been removed, the racking system will also need to be disassembled and removed from site. They will then be recycled or disposed of in the appropriate manner. • After the panels and racking systems have been de-energized, disassembled, and removed from the site, all of the remaining surface and subsurface components of up to 1m below the surface, will be removed. These components will include infrastructure including concrete footings and piles of material. • Topsoil will then be replaced.
Electrical Equipment and Collection System	<ul style="list-style-type: none"> • All inverters and inverter set-up transformer skids will be removed and disposed of as is necessary. This will include associated piling. • Collector system components up to 1 m in depth will be removed and disposed of appropriately.
Substation	<ul style="list-style-type: none"> • All of the surface infrastructure components will be removed from the site and recycled or disposed of as appropriate. This includes all surface structures, electrical equipment, circuit breakers, fencing, and grounding grid. • Any granular and geotextile materials will be removed by a dump truck or will remain on site should the landowner desire.
Access Roads	<ul style="list-style-type: none"> • All access roads will be removed from the Project site, unless otherwise specified by the landowner. If the landowner expresses interest in keeping the access roads, they will not be removed from the Project lands. • If the access roads are removed, this will include subsurface granular and geotextile materials. • After the roads have been removed, topsoil must be added to the surface to ensure that the state of the soil, terrain and geophysical is similar to pre-Project conditions.
Rehabilitation	<ul style="list-style-type: none"> • A site rehabilitation plan will be developed and will be implemented at the time of decommissioning and reclamation of the Project. The plan will include redistributing topsoil; re-seeding the land through consultation with the municipality and the landowner; de-compacting compacted areas; recontouring the land; and restoring any drainage tile that was affected by the Project. • This plan will be designed to restore the Project Area to as close to its original state as possible.

11 ENGAGEMENT

The PLSP's engagement program has been underway since June 2018 and engagement will continue throughout the life of the Project. The objectives of the engagement program are as follows:

- Facilitate meaningful dialogue with stakeholders and Indigenous communities
- Provide accurate information pertaining to the Project in an open and timely manner
- Create opportunities for stakeholders and Indigenous communities to provide input to the Project.

A comprehensive stakeholder engagement list has been populated and will be kept up to date as stakeholders and Indigenous communities express interest in the Project throughout its life cycle. Documents related to engagement are provided in Appendix C.

11.1 ENGAGEMENT ACTIVITIES

The following subsections present an overview of engagement activities conducted for the Project between June 2018 and March 2020.

11.1.1 MUNICIPAL, PROVINCIAL AND FEDERAL ENGAGEMENT

In-person and telephone meetings were held with council members and administrators from the RM of Weyburn on August 5, 2018 and February 11, 2019. An in-person meeting was held with the Mayor and City Manager of the City of Weyburn on January 30, 2019. The topics of discussion with the municipalities included Project plans and timelines, as well as the development of a new solar energy bylaw in the RM.

The Proponent held in-person meetings with MOE EASB staff on September 18, 2018 and February 12, 2019, as well as a telephone meeting with MOE EASB staff on October 25, 2018. Email and telephone communications with MOE have been ongoing since May 2018. The Proponent provided Project information and sought input from MOE. The EASB confirmed regulatory requirements, and provided guidance regarding the scoping of wildlife surveys, other studies, and engagement efforts.

The Proponent has also had informal meetings with Government of Canada staff to confirm federal regulatory requirements for solar projects.

No major concerns were identified. The concerns which were brought forward quickly dissipated during conversations in which further explanations were provided regarding the project scope, study plans and standard mitigation measures.

11.1.2 TARGETED STAKEHOLDERS

Seven neighbouring residences were identified from up-to-date RM maps and contact information was collected via public databases. Neighbours were contacted by telephone in February and March 2019, invited to attend the first open house held in Weyburn, provided the Project website, and given the opportunity to ask questions and give feedback about the Project. No major concerns were raised.

11.1.3 INDIGENOUS COMMUNITY ENGAGEMENT

The Proponent understands the duty to consult with First Nations and Metis communities did not apply to the Project because the proposed Project occurs on private lands and the Project is not anticipated to

adversely impact Treaty or Aboriginal rights. However, the Proponent is strongly committed to interest-based engagement and developing relationships with Indigenous communities.

The Project, as stated previously, is a partnership between GGD, the economic development branch of George Gordon First Nation; RDHL, the economic development branch of Star Blanket Cree Nation; and Natural Forces. As part of the engagement program, the Proponent held community meetings with George Gordon First Nation in March 2019 and Star Blanket Cree Nation in November 2018 as well as in Regina and Saskatoon for members living in the cities. Project partners shared information on the partnership and the Project with community members through presentation. Following the presentations, open discussions were held for community members to ask questions and share their knowledge and perspectives with the partners.

In consultation with the FNPA, the Proponent identified two nearby Indigenous communities that may have an interest in the Project: Ocean Man First Nation, located approximately 50 km east of the Project; and Piapot First Nation, located approximately 55 km west of the Project (Figure 3). These communities were contacted via phone calls, emails, and mailed letters to engage them with the Project. The Proponent also met face-to-face with Chief Connie Bigeagle of Ocean Man First Nation on May 1, 2019. No major concerns were raised.

The FNPA has also agreed to add Project updates and Proponent contact information to their newsletters as a means to share information on the Project with other Indigenous communities.

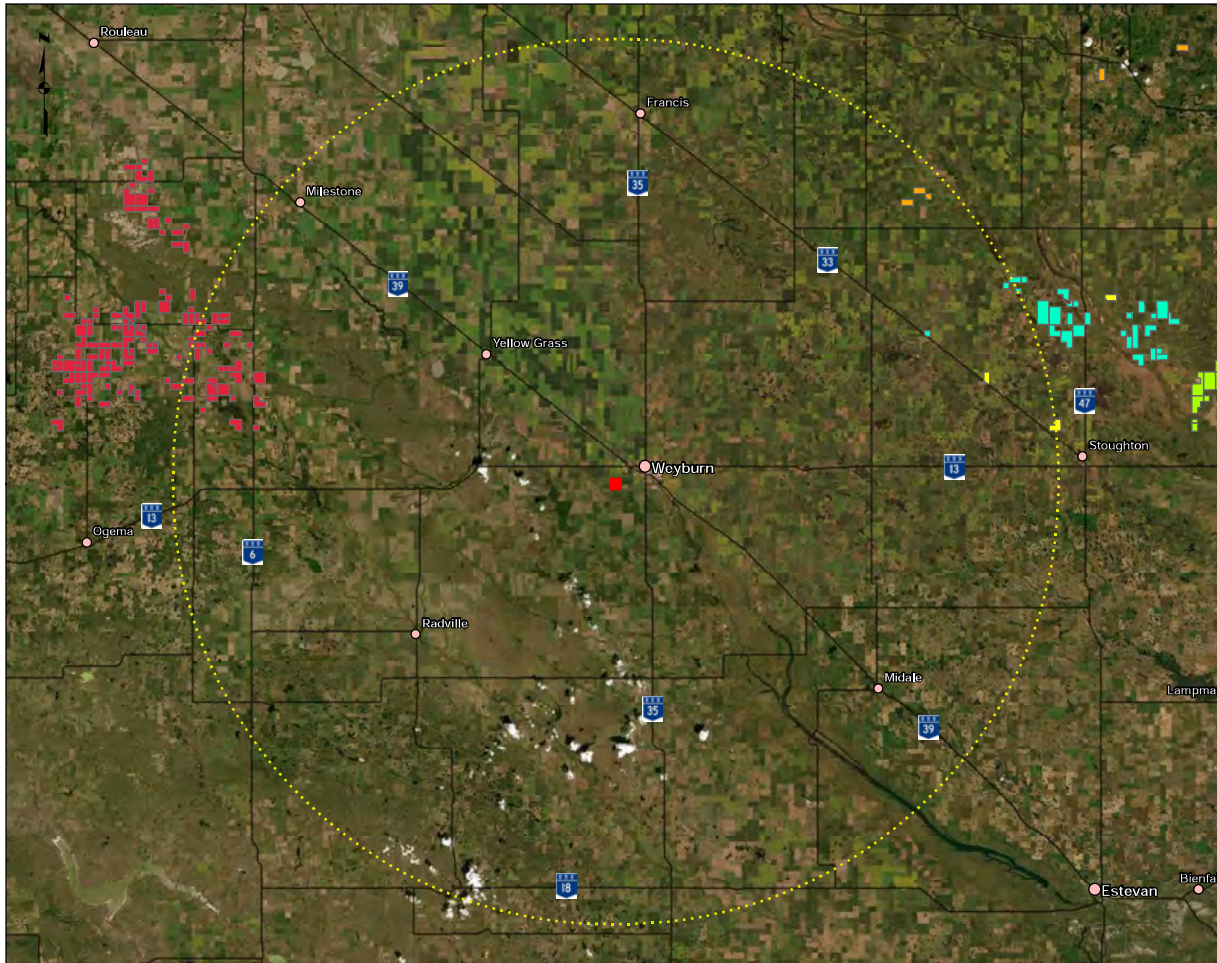
11.1.4 PUBLIC

The first public open house was conducted to inform interested members of the public about the Project and provide an opportunity to provide feedback. The open house was advertised using Canada Post Admail, a service offered that facilitates the distribution of invitations or project information sheets to a defined geographic location. The advertisements were distributed via Admail and received by residents one week prior to the open house. Advertisements were also placed in the local newspaper, Discover Weyburn.

The first open house was held at Captain's Hall in Weyburn on March 6, 2019 from 3:30 p.m. to 7:30 p.m. Twenty-five people attended the open house, as indicated by sign-in sheets. The open house was held as an open discussion, with posters displaying information on the Proponent, project description, proposed site layout, and environmental studies (Appendix C). Proponent representatives were present to discuss the Project with attendees and answer questions about the Project and solar power in general. Representatives from WSP were present to answer questions regarding environmental studies and document interactions with attendees. During the open house, questionnaires were distributed to attendees such that they could express their concerns, provide feedback, and ask questions.

No major concerns were raised.

A second public open house was planned to be held in April 2020 in Weyburn to provide Project updates and receive feedback; however, the open house has been postponed as a result of COVID-19 related travel recommendations and gathering restrictions. The next open house will be held when it is safe to do so and when attendance will not be heavily reduced due to seeding or harvesting schedules.



Legend

- Project Area
- ⋯ 60 km Radius
- Cowessess First Nation
- Flying Dust First Nation
- Ocean Man First Nation
- Pheasant Rump Nakota Nation
- Piapot Cree First Nation
- City
- Town
- Roads

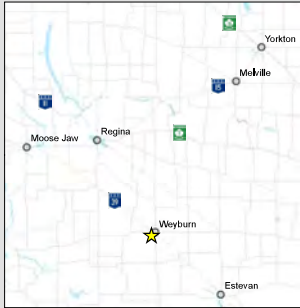
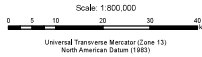


Figure 3
Indigenous Communities in Relation to the Project Area

Pesakastew Solar Project



<small> BaseMap Source: ESRI Imagery Service </small>	<small> Report By: JLF Drawn by: JLF Reviewed By: JFG </small>	<small> WSP Job #: 151-0103440 Date: April 22, 2020 Office: Saskatoon </small>
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11.2 ENGAGEMENT PRODUCTS

11.2.1 WEBSITE

Websites are an excellent way to make project information available and keep people updated on projects. A website was created for the Project in January 2019 to inform the general public, stakeholders and rights-holders about the proposed development. Website content and updates may include the following:

- Project purpose
- Project details and progress
- Proponent contact information
- Notices for public information sessions
- Photos of the Project location and the outreach events
- Frequently Asked Questions (FAQ) section that addresses common concerns identified through engagement activities
- Construction activity notifications
- Online questionnaire and comment form
- Media and Press Release related material.

The Project website can be accessed at the following link: <http://www.pesakastewsolarproject.ca/>

11.2.2 POSTERS AND HAND-OUTS

Posters and hand-outs were developed for the public open house and for sharing via the Project website. These products include a project description, preliminary site layout plan, reference map, Proponent contact information, etc. Copies of the posters and hand-outs are presented in Appendix C.

11.2.3 NEWSLETTERS

The Proponent may circulate newsletters to the local community as a method of keeping residents up to date on Project progress, as this has proven to be a useful engagement tool for other projects. These newsletters may be circulated via email, the Project website, and/or Canada Post Admail.

11.2.4 NEWSPAPER ADVERTISEMENTS AND ARTICLES

Advertisements were placed in Discover Weyburn, the local newspaper, in advance of the open house held in March 2019 (Appendix C). Additionally, articles about the Project were published in Discover Weyburn on February 13, 2019, and March 8, 2019 (Appendix C).

Advertisements will be placed in local newspapers to offer additional information to residents regarding the Project and upcoming events. Advertisements will include accurate details regarding dates and locations of events, Proponent contact information, and Project information.

11.3 IDENTIFIED ISSUES AND PROPONENT RESPONSES

The Proponent is committed to addressing, to the best of our ability, concerns pertaining to the Project and solar energy projects in general raised by government representatives, local residents, Indigenous

communities, and members of the public. The Proponent has addressed identified questions directly on the Project website; at the open house; and through telephone conversations, emails, and one-on-one meetings. Comments and questions received through engagement activities have been compiled (Appendix C). No major concerns were raised.

11.3.1 FREQUENTLY ASKED QUESTIONS AND RESPONSES

Frequently asked questions and Proponent responses that may be relevant to the Technical Proposal are summarized in Table 32. Further information is provided in Appendix C.

Table 32 Summary of Frequently Asked Questions and Answers

Questions	Proponent Responses
Will the Project produce a lot of noise during operation?	<ul style="list-style-type: none"> The Project is not expected to create significant increases to noise levels because solar projects emit very little noise. During operation, solar panels themselves make no noise; however, the inverters do emit an audible hum. The Project is planning the installation of three inverters and one grounding transformer. At 100 m from the source, the humming sound will be at 40 decibels, comparable to the noise made by a stream flowing. At 200 m, the hum will have dropped to 33 decibels which is as loud as a whisper. The nearest house to the Project is located approximately 600 m away. The background noise levels from the adjacent SaskPower owned substation will far exceed the noise from the Project.
Will glare from the solar panels impact nearby houses, traffic, and wildlife?	<ul style="list-style-type: none"> Solar panels can produce some glare, but no more than what might be produced from a still pond. A glare and glint study is being completed; however, the Project is expected to have negligible, if any, glare impact in the surrounding area.
Are there any environmental sensitivities near the proposed site?	<ul style="list-style-type: none"> Data indicates environmental sensitivity for the Local Assessment Area is low. The Project is sited in a cultivated field and does not provide suitable habitat for Species of Conservation Concern. An intermittent stream is present in the Project Area but will be protected by a setback of at least 30 m.
What maintenance will be completed for the Project?	<ul style="list-style-type: none"> The Operations Plan will include a Maintenance Plan. Maintenance will likely include equipment maintenance based on the results of regular inspections of the equipment (including solar panels, electrical connections, inverters, and transformers), and land repairs and maintenance based on inspections to monitor site drainage, erosion, and fire risk. Cleaning of solar panels is not currently planned; however, cleaning will be considered as part of regular maintenance if inspections indicate it is necessary.
How will the site be revegetated after construction?	<ul style="list-style-type: none"> The Operations Plan will include a Vegetation Management Plan. Vegetation management is expected to evolve over the life of the Project. However, the plan is likely to include planting a ground cover underneath the panels after construction is complete. Considerations when selecting ground cover will include maintenance costs, moisture availability, weed management, shade preference, and short growth height.
How will the site be reclaimed after the Project is decommissioned?	<ul style="list-style-type: none"> At the end of the Project life, the site will be de-energized and all equipment will be dismantled and removed. This will include surface components as well as those subsurface components to a depth of 1 m. Equipment and materials will be recycled as appropriate. The soil and land will be restored to original grade. In consultation with the landowner and the RM, seeding will be conducted to prevent topsoil erosion. It is expected the land will return to agricultural production.
How does the environmental review process work for solar projects?	<ul style="list-style-type: none"> In Saskatchewan, solar projects of this size are required to submit a Technical Proposal to MOE to comply with <i>The Environmental Assessment Act</i>. MOE will review the Technical Proposal and determine whether the Project meets the definition of a 'development' under the <i>Act</i>. If it is determined the Project is not a 'development', the Project may proceed. However, a number of additional applicable permits and approvals under other legislation and regulations apply. The Technical Proposal will include a project description, description of the physical, biological and human environmental features of the Project Area, potential impacts of the Project on these features, mitigation measures and residual effects, documentation of engagement activities, and other important details.

Questions	Proponent Responses
	<ul style="list-style-type: none"> Environmental studies are required to complete the Technical Proposal.
How much property tax will the Project generate for the RM of Weyburn?	<ul style="list-style-type: none"> The Project is expected to pay approximately \$28,000 to \$47,000 per year in property taxes to the RM. Because property taxes are a function of the cost of specific equipment items and structures, the value of taxes paid will decrease as the value of the Project depreciates.

11.3.2 COMPLAINT RESOLUTION PLAN

The Proponent has drafted a Complaint Resolution Plan for the Project. This plan identifies the process for community members to follow and who to contact should there be any adverse impacts affecting the community members or the environment as a result of the Project. The Complaint Resolution Plan is provided in Appendix D.

11.3.3 COMMUNITY LIAISON COMMITTEE

A Community Liaison Committee acts as an advisory board to a project proponent by providing input on existing or potential concerns the community may have with the respect to a given project. Should ample interest or concern arise for the Project, the formation of a Community Liaison Committee will be considered.

11.4 ENGAGEMENT SUMMARY

The Proponent undertook engagement activities with local municipalities, provincial and federal environmental regulators, neighbours, Indigenous communities, and members of the public. Questions regarding Project noise, glare, maintenance and vegetation plans, environmental review processes, and benefits to the community were common. No major concerns were identified.

Based on feedback received, the PLSP believes the majority of stakeholders, Indigenous communities in the area, and interested parties are supportive of the Project and understand that renewable projects are necessary to meet future power needs and lower emission targets.

Engagement activities will continue throughout the life cycle of the Project.

12 CONCLUSIONS

The Proponent is proposing to build a new 10 MW solar project near Weyburn, Saskatchewan. The Project will consist of approximately 32,700 bi-facial photovoltaic panels on single axis trackers, three inverters, one transformer per inverter, one main access road, and smaller corridors between panels. The Project will connect to the existing SaskPower electrical grid. Pre-construction preparation is expected to begin in fall 2020, after harvest. Construction will likely begin in spring 2021. The Project will be commissioned and in operation by the end of 2021. The operational phase is expected to be approximately 20 years in length and will be followed by decommissioning and reclamation.

The Project will help Saskatchewan meet its lower greenhouse gas emissions targets, and support SaskPower's goal of reaching 50% renewable energy production in the province by 2030. The Project will offset a projected 18,860 tonnes of CO₂ while powering homes in the area. The Project will also provide benefits to the community through employment of local workers, revenue to the local economy, and property tax payments to the RM of Weyburn.

The Project Area is predominantly cultivated land. The Project was intentionally sited to avoid native grassland and sensitive or rare features of the environment. The intermittent stream on site will be protected by a minimum 30 m setback. No SOCC were observed inhabiting the Project Area. The assessment indicates the Project is unlikely to have an effect on any unique, rare or endangered features of the environment. With the implementation of mitigation measures, no residual effects from the Project are anticipated for soils, terrain and geophysical; heritage resources; land use and property value; or public health and safety. Potential adverse residual effects of the Project on noise, glare and visual aesthetics, wildlife and wildlife habitat, vegetation, wetlands and watercourses, and traffic conditions are predicted to be not significant. Project cumulative effects on VECs in the Regional Assessment Area are also predicted to be not significant.

The Proponent has engaged regulatory agencies, RM of Weyburn, City of Weyburn, targeted stakeholders (e.g., neighbours), Indigenous communities, and the public to provide input on the Project. Concerns raised were effectively addressed through conversations and the provision of additional information regarding Project plans, studies, and mitigation measures. The majority of those engaged are supportive of the Project and understand the benefits of the Project. No major concerns were identified. Engagement activities will continue throughout the life cycle of the Project

The Proponent is committed to ensuring the Project is compliant with regulatory requirements and commitments made in this Technical Proposal. Additionally, an EPP will be developed for the Project that incorporates proven and accepted mitigation measures.

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- *Migratory Birds Convention Act*. S.C., 1994, c. 22. Government of Canada.
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- *Species at Risk Act*. S.C. 2002, c. 29. 2009. Government of Canada.
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- *The Weed Control Act*. 2010. Chapter W-11.1. Government of Saskatchewan.
- *The Wildlife Act*. S.C. 1998, Chapter W-13.12. 2015. Government of Saskatchewan.

APPENDIX

A

HERITAGE
SCREENING
RESULTS

Inquiry was made on April 30, 2020 at 6:01 PM

You are inquiring about the heritage sensitivity of the following land location:

Quarter-section:	SE
Section:	13
Township:	8
Range:	15
Meridian:	2

This quarter-section is NOT heritage sensitive.

It is not necessary to submit the project to the Heritage Conservation Branch for screening. These results can be printed for submission to other regulatory bodies (e.g. Saskatchewan Environment, Saskatchewan Energy and Resources). Please email arms@gov.sk.ca if you have any questions.

Refine Search

New Search

Log Out



Inquiry was made on April 30, 2020 at 6:00 PM

You are inquiring about the heritage sensitivity of the following land location:

Quarter-section: SW
Section: 15
Township: 8
Range: 13
Meridian: 2

This quarter-section is NOT heritage sensitive.

It is not necessary to submit the project to the Heritage Conservation Branch for screening. These results can be printed for submission to other regulatory bodies (e.g. Saskatchewan Environment, Saskatchewan Energy and Resources). Please email arms@gov.sk.ca if you have any questions.

[Refine Search](#)

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APPENDIX

B

TECHNICAL DATA REPORT



PESÂKÂSTÊW SOLAR LIMITED PARTNERSHIP

PESÂKÂSTÊW SOLAR PROJECT DRAFT TECHNICAL DATA REPORT

July 23, 2019





PESÂKÂSTÊW SOLAR PROJECT TECHNICAL DATA REPORT

PESÂKÂSTÊW SOLAR LIMITED
PARTNERSHIP

TYPE OF DOCUMENT:

DRAFT

PROJECT NO.: 181-09642-01

CLIENT REF:

DATE: JULY 23, 2019

WSP

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WSP.COM



July 23, 2019

Final

Pesâkâstêw Solar Limited Partnership
Natural Forces
1801 Hollis Street, Suite 1205
Halifax, Nova Scotia
B3J 3N4

Attention: Amy Pellerin and Katherine Dorey

RE: Pesâkâstêw Solar Energy Project Technical Data Report (Draft)

WSP is pleased to present the final Technical Data Report (TDR) for the proposed Pesâkâstêw Solar Energy Project near Weyburn, Saskatchewan for your files. Biophysical surveys have been completed and the TDR includes data collected in 2018 and 2019.

WSP understands you will use the TDR as the baseline from which to assess the potential effects of the Project on the environment within the Technical Proposal for submission to the Saskatchewan Ministry of Environment.

Should you have any further questions or comments, please contact me directly.

Kind regards,

A handwritten signature in blue ink that reads 'Janna Foster-Willfong'.

Janna Foster-Willfong, M.Sc., P.Biol.
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SIGNATURES

PREPARED BY

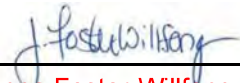


Dayne Wilkinson, D.IRM
Senior Project Technician



Jennifer Fernet, M.Sc., P.Ag.
Environmental Scientist

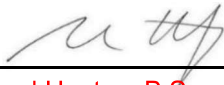
REVIEWED BY *(must be reviewed for technical accuracy prior to approval)*



Janna Foster-Willfong, M.Sc., P.Biol.
Senior Project Manager, Environment

July 23, 2019

Date



Reed Hentze, B.Sc., P.Biol, PWS, EP
Manager, Environment

July 23, 2019

Date

WSP Canada Inc. prepared this report solely for the use of the intended recipient, Pesâkâstêw Solar Limited Partnership, in accordance with the professional services agreement. The intended recipient is solely responsible for the disclosure of any information contained in this report. The content and opinions contained in the present report are based on the observations and/or information available to WSP Canada Inc. at the time of preparation. If a third party makes use of, relies on, or makes decisions in accordance with this report, said third party is solely responsible for such use, reliance or decisions. WSP Canada Inc. does not accept responsibility for damages, if any, suffered by any third party as a result of decisions made or actions taken by said third party based on this report. This limitations statement is considered an integral part of this report.

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- B AVIAN SURVEY DATA

LIST OF ABBREVIATIONS

ABBREVIATION	DEFINITION
Client	Natural Forces
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
DFO	Fisheries and Oceans Canada
e.g.	for example
et al.	and others
ha	hectare(s)
HABISask	Hunting, Angling, and Biodiversity Information of Saskatchewan
i.e.	in other words
km	kilometre
m	metre
Project	the Pesâkâstêw Solar Project
Project Area	approximately 90 acres of land located in 13-8-15 W2M
PSLP	Pesâkâstêw Solar Limited Partnership
<i>SARA</i>	<i>Species at Risk Act</i>
SK	Saskatchewan
SK CDC	Saskatchewan Conservation Data Centre
SLRU	Saskatchewan Land Resource Unit
SMOE	Saskatchewan Ministry of Environment
SOMC	Species of Management Concern
TDR	Technical Data Report

ABBREVIATION	DEFINITION
TP	Technical Proposal
WSP	WSP Canada Inc.

1 INTRODUCTION

WSP Canada Inc. (WSP) is pleased to submit this Technical Data Report (TDR) for the Pesâkâstêw Solar Project (Project) near Weyburn, SK. The objective of this TDR is to present the data collected during desktop review, 2018 and 2019 field surveys, and to describe recommended environmental mitigation measures to reduce or avoid potential adverse project effects to the environment.

The Project is being developed by Natural Forces (the Client) on behalf of the Pesâkâstêw Solar Limited Partnership (PSLP), the proponent and owner of the Project. The PSLP is a limited partnership between George Gordon Developments Ltd., Red Dog Holdings Ltd., and Natural Forces. George Gordon Developments Ltd. is the economic development branch of George Gordon First Nation. Red Dog Holdings Ltd. is the economic development branch of Star Blanket Cree Nation. Natural Forces is a private independent power producer that delivers renewable energy projects in partnership with local communities across Canada.

2 PROJECT OVERVIEW

The proposed Project is an array of photovoltaic solar panels and associated infrastructure that would generate 10 MW nameplate capacity of clean and sustainable energy for the Saskatchewan electrical grid. The Project is planned to be constructed and commissioned by December 2020. The Project will be located on approximately 90 acres of land located in 13-8-15 W2M (Project Area) southwest of the City of Weyburn (Figure 2.2-1).

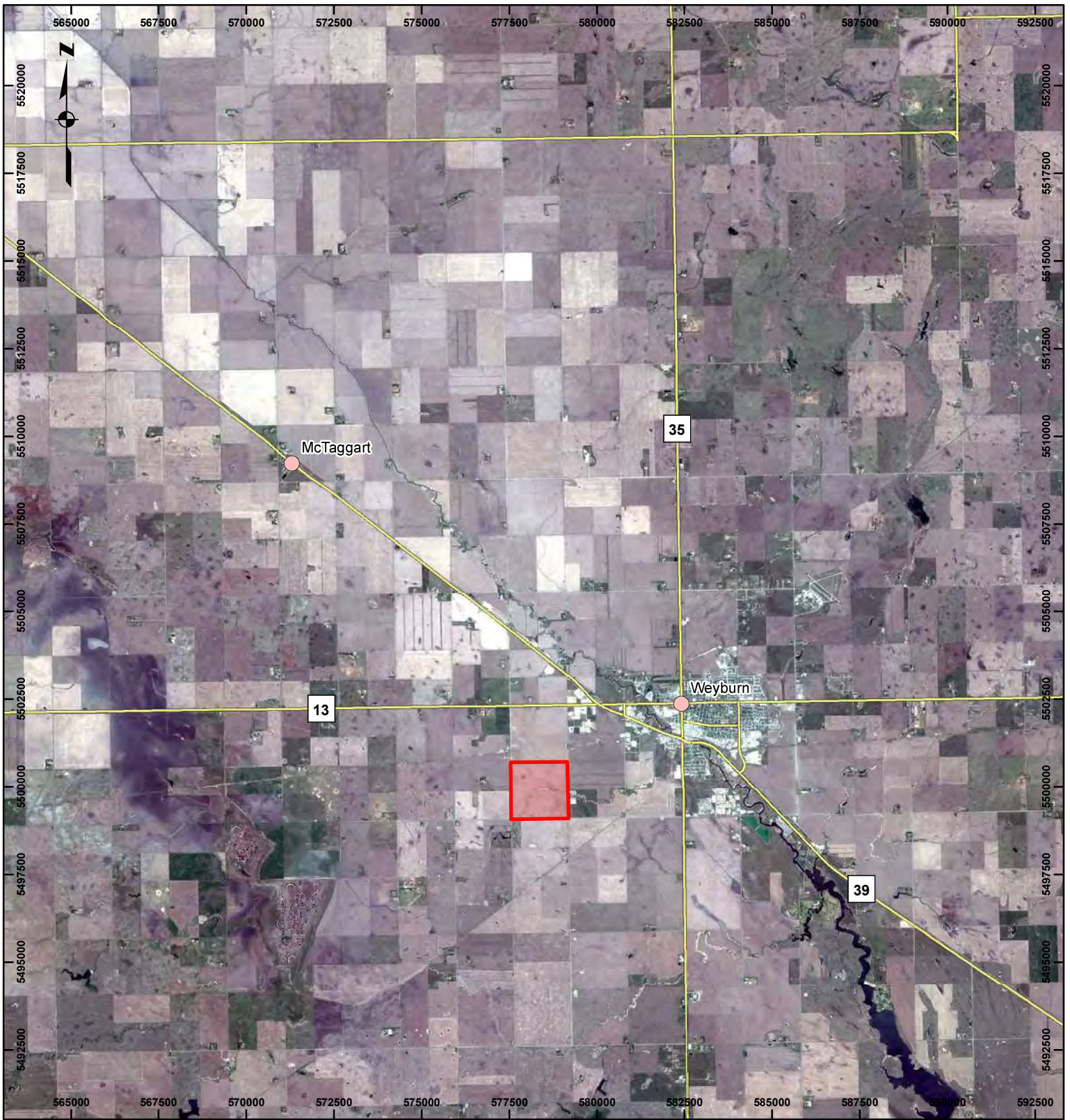
2.1 BENEFITS OF THE PROJECT

The Project will serve as a partial replacement of other more traditional provincial power energy resources. The Project will provide low emission electricity generation to approximately 2,400 homes, displace 18,860 tonnes of CO₂ equivalent annually (when compared with current generation systems), provide long-term revenue to the economic development corporations of two Saskatchewan First Nations, and contribute to SaskPower's target of 50% renewable energy by 2030 (SaskPower, 2017).

2.2 PROJECT INFRASTRUCTURE AND CONSTRUCTION ACTIVITIES

The Project is anticipated to cover an area of 90 acres and includes an access road, underground collection system, photovoltaic solar panels installed on concrete footings, inverter stations, and a control building. It is expected that the Project will tie into an existing SaskPower grid at a substation located approximately 4 kilometre (km) SW of Weyburn. Construction activities may include but are not limited to:

- site clearing
- levelling and grading
- placing formwork and reinforcement for concrete
- pouring concrete foundations
- installing a racking system and solar panels
- excavation of trenches for the collector lines and installation of the collection system
- installation of inverter stations
- construction of access roads, perimeter fencing and lighting
- construction of a control building and maintenance building
- construction of a transmission line
- grid connection and commissioning



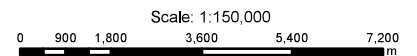
Legend

- Project Area
- Community
- Road

Note: Sentinel-2 imagery from European Space Agency



Figure 2.2-1
Project Location
Technical Data Report



Universal Transverse Mercator (Zone 13)
 North American Datum (1983)



Report By: JLF WSP Job #: 181-06367-00
 Drawn by: JLF Date: July 08, 2019
 Reviewed By: JFW Office: Saskatoon

3 EXISTING ENVIRONMENT

This section provides a description of the existing environmental conditions for soils, vegetation, wildlife, and aquatic resources that may be affected by the Project. The information provided in this section is based on the desktop environmental screening, the 2018 and 2019 field surveys, information from publicly available databases, and mapping available for the Project footprint and surrounding environment.

3.1 GENERAL OVERVIEW

The Project is located within the Moist Mixed Grassland Ecoregion which is closely correlated with semi-arid moisture conditions and dark brown soils (Acton et al., 1998). The Project Area is situated on a transitional area between the boundaries of the Tressachs Plain Landscape Area and the Regina Plain Landscape Area. Most of the land within 13-8-15 W2M (Project Area) is located within the Tressachs Plain, and the northeast portion of the section is within the Regina Plain. The Tressachs Plain is characterized by a nearly level to undulating glacial till plain. The northern portion of the Tressachs Plain, including the Project Area, drains to the Moose Jaw River. The Regina Plain is characterized by a level to gently undulating glaciolacustrine terrain. Nearly all of both Landscape Areas are under cultivation and native vegetation is confined largely to non-arable pasture lands. Typical native vegetation in these Landscape Areas includes speargrasses (e.g., *Heterostipa* spp.), wheatgrasses (e.g., *Agropyron* spp.), wolf willow (*Elaeagnus commutata*), chokecherry (*Prunus virginiana*), and snowberry (*Symphoricarpos occidentalis*). Common wildlife species in the area include mule deer (*Odocoileus hemionus*), white-tailed deer (*Odocoileus virginianus*), coyote (*Canus latrans*), red fox (*Vulpes vulpes*), American badger (*Taxidea taxus*), jack rabbit (*Lepus townsendii*), western meadowlark (*Sturnella neglecta*), eastern kingbird (*Tyrannus tyrannus*), red-winged blackbird (*Agelaius phoeniceus*), and a variety of waterfowl (Acton et al., 1998).

For the purposes of this report, Species of Management Concern (SOMC) are species tracked by the Saskatchewan Conservation Data Centre (SK CDC, 2017), listed by the Saskatchewan *Wildlife Act*, designated by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC, 2017), or protected under Schedule 1 of the federal *Species at Risk Act (SARA)*.

3.2 TERRAIN AND SOILS

3.2.1 METHODS

A desktop review of site-specific soil and terrain conditions was completed for the Project Area. Information for soil association distribution (map units) and soil sensitivities in the Project Area was obtained from provincial digital soil resource, Saskatchewan Land Resource Unit (SLRU) information published by Agriculture and Agri-Food Canada (SLRU, 2004; 2009). The review of the SLRU digital soil resource information ascertained dominant soil types, surface textures, salinity, erosion potentials, landform, and slope classes which in turn identified soils potentially sensitive to wind or water erosion, areas with steep terrain, and areas with high salinity. This data can then be used to develop soil conservation practices and identify areas that may require additional mitigation during construction (e.g., erosion control measures or special soil handling).

Soil map units represent the soil associations found within an individual mapped polygon. Soil association is a term used to show the relationship between different soil profiles that have formed on the same geological deposit within a particular climatic zone (AAFC et al., 2005). For example, the Oxbow Association is the name given to a group of soils formed on loamy glacial till occurring in the Black Soil Zone. The numbers associated with the map unit reflect the variations in the kind and distribution of soil profiles from one area to the next.

The map units are defined as simple or complex units (AAFC et al., 2005). A simple unit is defined when one soil association represents over 85% of the unit area. Where two geological units occur within a polygon area, two associations are used in the complex unit and represent the dominant soil association (60% to 70% of the polygon)

and subdominant association (25% to 30% of the polygon area). All map units include soil types that are not extensive enough to be described in the unit.

3.2.2 RESULTS

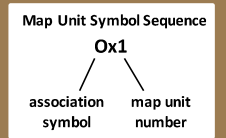
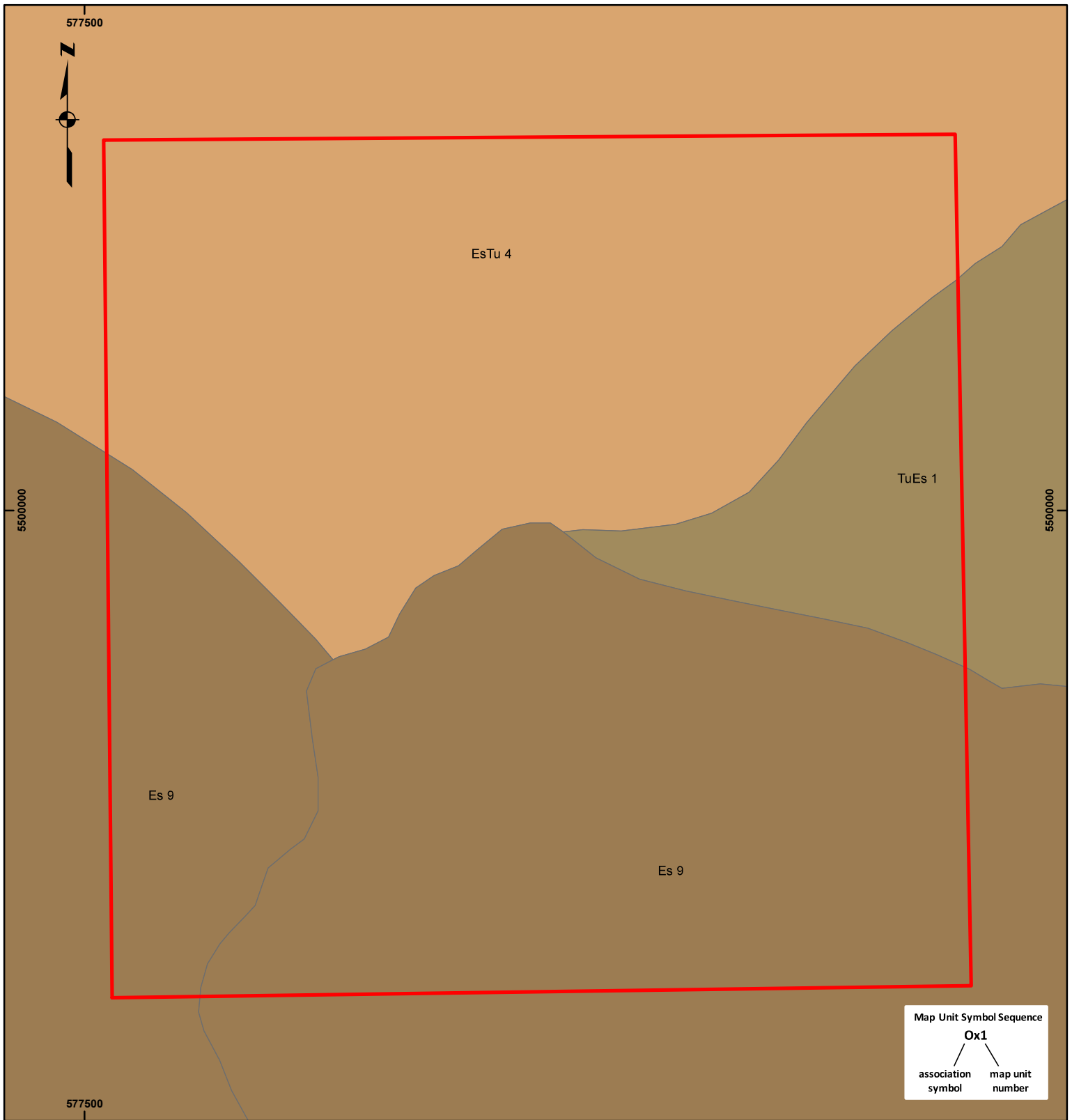
The Project Area is within the Dark Brown Soil Zone of the Canadian Prairies. Two soil associations are described in two simple and two complex map units in the Project Area (Table 3.2-1; Figure 3.2-1). The soils within the Project Area are largely Dark Brown Solonetzic soils developed on glacial till deposits. The terrain in the Project Area is undulating and occurs on very gentle to gentle slopes (0 to 5% gradients).

The major sensitivities associated with soils and terrain in the Project Area are related to salinity. Areas that contain strong salinity may require special soil handling during construction to avoid mixing saline soils with non-saline soils to prevent degradation of agricultural soil quality. Saline soil areas would be identified during a pre-construction soil sampling program.

Table 3.2-1 Soil Map Units and Associated Soil Sensitivities in the Project Area

SOIL ASSOCIATION(S)	MAP UNIT	PARENT MATERIAL	DOMINANT/SUB-DOMINANT SOILS	DOMINANT SURFACE TEXTURE(S)	SURFACE EXPRESSION	SLOPE CLASS	WIND EROSION POTENTIAL	WATER EROSION POTENTIAL	SALINITY
Estevan	Es 9	Medium to moderately fine textured, moderately calcareous, gypsiferous, modified glacial till containing Upper Cretaceous shales	<ul style="list-style-type: none"> • Dark Brown Solonetz • Solonetzic Dark Brown Chernozem • Orthic Dark Brown Chernozem • Dark Brown Solod • Dark Brown Solodized Solonetz • undifferentiated Gleysolic soils 	Clay Loam	Undulating	Very Gentle to Gentle (0.5 to 5%)	Very Low	Very Low to Low	Strongly saline soils occur throughout the bottoms of depressions and wetlands in 0 to 10% of the map unit area
Estevan-Tuxford	EsTu 4	Loam to clay loam, slightly stony, resorted glacial till (Estevan) and clayey lacustrine materials (Tuxford)	<ul style="list-style-type: none"> • Estevan Dark Brown Solonetz • Estevan Solonetzic Dark Brown Chernozem • Tuxford Dark Brown Solonetz • Tuxford Solonetzic Dark Brown Chernozem • Tuxford Dark Brown Solodized Solonetz 	Clay Loam Clay	Undulating	Very Gentle to Gentle (0.5 to 5%)	Low	Very Low	Strongly saline soils occur throughout the bottoms of depressions and wetlands in 0 to 3% of the map unit area
Tuxford-Estevan	TuEs 1	Clayey lacustrine materials (Tuxford) and loam to clay loam, slightly stony, resorted glacial till (Estevan)	<ul style="list-style-type: none"> • Tuxford Dark Brown Solonetz • Tuxford Dark Brown Solod • Tuxford Solonetzic Dark Brown Chernozem • Estevan Dark Brown Solonetz • Estevan Solonetzic Dark Brown Chernozem 	Clay Clay Loam	Undulating	Gentle (2 to 5%)	Low	Low	Strongly saline soils occur throughout the bottoms of depressions and wetlands in 0 to 3% of the map unit area

Source: SLRU 2004, 2009



Legend

Project Area

Soil Association(s)

- Estevan
- Estevan-Tuxford
- Tuxford-Estevan



PESAKASTEW SOLAR

Figure 3.2-1
Soil Map Units
Technical Data Report

Scale: 1:10,000

0 62.5 125 250 375 500 m

Universal Transverse Mercator (Zone 13)
 North American Datum (1983)

wsp Report By: JLF WSP Job #: 181-09642-00
 Drawn by: JLF Date: May 09, 2019
 Reviewed By: JFW Office: Saskatoon

3.3 VEGETATION AND WETLANDS

3.3.1 METHODS

Vegetation and wetlands were evaluated during a site visit and mapping exercise.

3.3.1.1 SITE VISIT

A site visit was completed on September 26, 2018 to confirm cover types/land-use in the Project Area, complete wetland classification, determine the need for surveys for plant SOMC, and document weed presence. Wetland classification followed Stewart and Kantrud's Classification of Natural Ponds and Lakes in the Glaciated Prairie Region (Stewart and Kantrud, 1971). Cover types/land-use and weed presence was determined by visual observations during a pedestrian, non-transect survey.

Ground truth information collected from this site visit was used to guide the vegetation and wetland mapping and provide site-specific descriptive information on the plant communities/habitats present in the Project Area.

3.3.1.2 VEGETATION AND WETLAND MAPPING

Available online aerial imagery from ESRI™ Basemap Service Layer was used to map vegetation and wetlands within the Project Area. GoogleEarth™ imagery from various months in the years 2012, 2013, and 2018 was used to review historical conditions and cross reference the Project Area as necessary to estimate wetland boundaries and inundation zones as these fluctuate between wet and dry periods. Wetland boundaries were manually delineated using the ArcGis™ mapping platform at 1:2,000 scale.

3.3.2 RESULTS

3.3.2.1 SITE VISIT

COVER TYPES/LAND-USE

The Project Area is cultivated land and was cropped to canola at the time of the site visit. Class IT and Class IIT wetlands were observed in the Project Area. Class I wetlands are considered ephemeral, Class II wetlands are considered temporary, and any wetland class followed by a T means that they are wetland basins that are tilled for agriculture (i.e., disturbed) at the time of the site visit. An intermittent stream traverses the middle of the Project Area. A number of man-made drainages were also observed. Wetlands and watercourses are mapped on Figure 3.3-1.

PLANT SPECIES OF MANAGEMENT CONCERN

Habitat potential for plant SOMC was determined to be very low in the Project Area due to chronic disturbance from cultivation. In addition, the Project footprint will be set back from the intermittent stream by a minimum of 30 metres (m). Therefore, no surveys for plant SOMC were determined to be necessary for this Project.

WEED SPECIES

Weed species in the province of Saskatchewan are defined as prohibited under Schedule 1, noxious under Schedule 2, and nuisance under Schedule 3 of the *Weed Control Act*. The purpose of this *Act* is to prevent weeds from being introduced into areas that do not contain these species and prevent the spread of new weeds into and through the province. The *Weed Control Act* also protects natural areas such as native grassland, forests, and aquatic habitats from the introduction of these species. Five noxious and one nuisance weed species were identified in the Project Area (Table 3.3-1; Figure 3.3-1). No prohibited weeds were observed. Weeds were generally observed in higher densities in tilled wetlands.

Table 3.3-1 Weed Species Observed during the 2018 Vegetation Site Visit

SCIENTIFIC NAME	COMMON NAME	SCHEDULE
<i>Cirsium arvense</i>	Canada thistle	Schedule 2 - Noxious
<i>Kochia scoparia</i>	kochia	Schedule 2 - Noxious
<i>Malva pusilla</i>	round-leaved mallow	Schedule 2 - Noxious
<i>Sonchus arvensis</i>	perennial sow-thistle	Schedule 2 - Noxious
<i>Sonchus asper</i>	spiny annual sow-thistle	Schedule 2 - Noxious
<i>Salsola kali</i>	Russian thistle	Schedule 3 - Nuisance

Defined by the Saskatchewan *Weed Control Act* as either Nuisance, Noxious or Prohibited.

3.3.2.2 VEGETATION AND WETLAND MAPPING

The cover types were identified for the Project Area include:

- Cultivated
- Class I Tilled wetland
- Class II Tilled wetland
- man-made drainage
- intermittent stream

Figure 3.3-1 presents the vegetation and wetland mapping. Species observed within each cover type are described in the following sub-sections.

CULTIVATED

Cultivated areas consist of land annually seeded for crop production. At the time of the site visit, the crop had been harvested and only canola stubble was present (Photo 3.3-1).



Photo 3.3-1 Cultivated land in the Project Area. Taken September 26, 2018.

CLASS I TILLED WETLAND (EPHEMERAL)

Most of the wetlands observed in the Project Area were Class I wetlands that were tilled (Photo 3.3-2). Associated species observed included:

- round-leaved mallow (*Malva pusilla*)
- biennial wormwood (*Artemisia biennis*)
- stinkweed (*Thlaspi arvense*)
- western dock (*Rumex occidentalis*)
- kochia (*Bassia scoparia*)
- perennial sow-thistle (*Sonchus arvensis*)
- spiny annual sow thistle (*Sonchus asper*)
- Canada thistle (*Cirsium arvense*)
- lamb's quarters (*Chenopodium album* var. *album*)
- wild oats (*Avena fatua*)
- Russian thistle (*Salsola kali*)
- foxtail barley (*Hordeum jubatum* ssp. *jubatum*).



Photo 3.3-2 Example of a Class I Tilled wetland in the Project Area. Taken September 26, 2018.

CLASS II TILLED WETLAND (TEMPORARY)

One Class II Tilled wetland was identified in the Project Area (Photo 3.3-3). Associated species observed included western dock and round-leaved mallow. This area had recently been cut at the time of the site visit.



Photograph 3.3-3 Class 2 Tilled wetland in Project Area. Taken September 26, 2018.

MAN-MADE DRAINAGE

Man-made drainages are trenches used, or were historically used, to drain the wetlands on the Section (Photo 3.3-4). Associated species observed included:

- biennial wormwood
- spiny annual sow thistle
- wild oats
- Russian thistle
- round-leaved mallow.



Photo 3.3-4 Example of man-made drainage in Project Area. Taken September 26, 2018.

INTERMITTENT STREAM

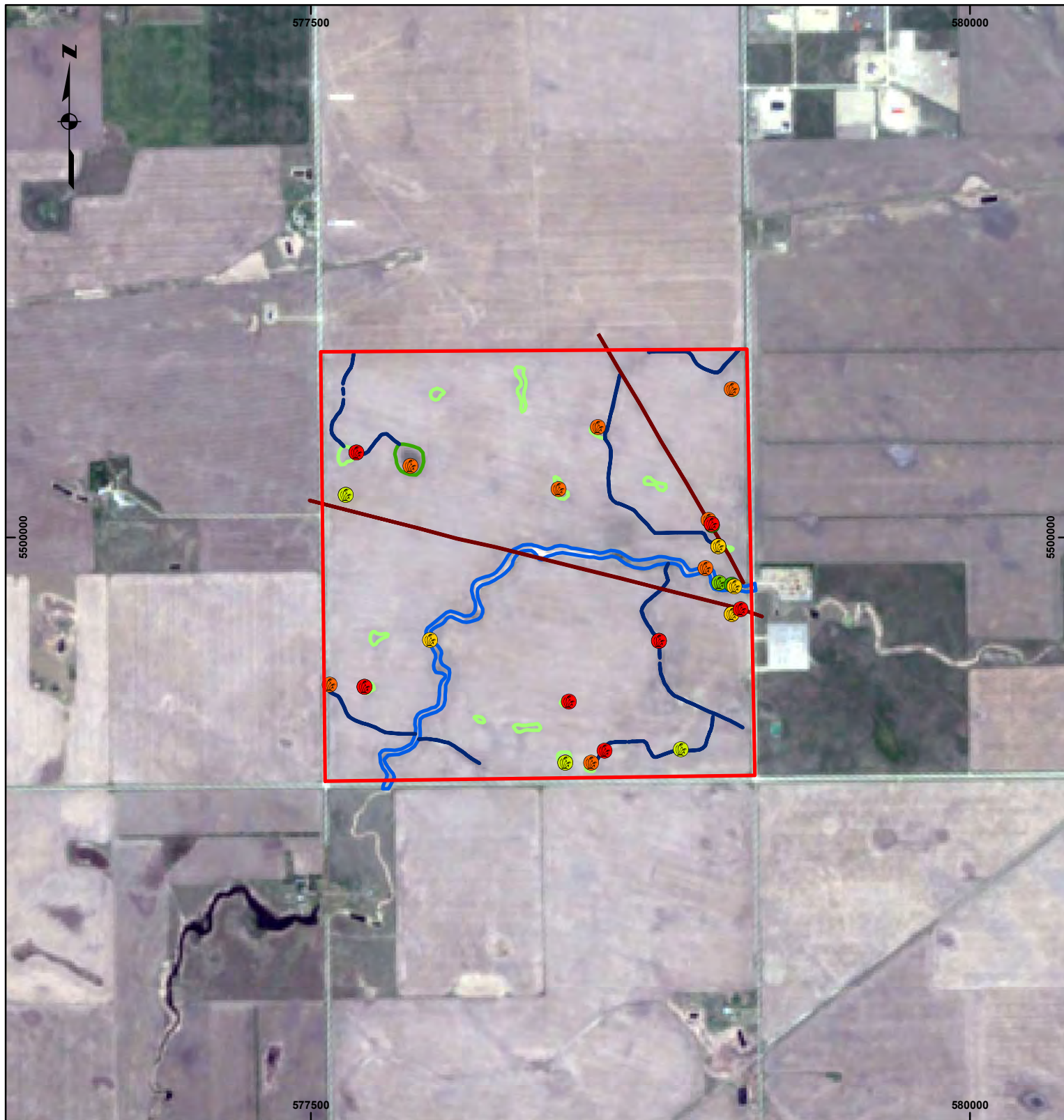
Intermittent streams are streams where surface flow is highest during the higher precipitation periods of the Project Area of April through July and cease during drier periods. Associated species observed included:

- sedge (*Carex* sp.)
- western dock
- Canada thistle
- perennial sow thistle
- round-leaved mallow
- kochia.

This stream was dry at the time of the site visit in September 2018 (Photo 3.3-5).



Photo 3.3-5 Looking west at intermittent stream (dry at time of photo). Taken September 26, 2018.



Legend

Project Area

Cover Type

IT Wetland

IIT Wetland

Man-Made Drainage

Temporary Stream

Power Line

Noxious and Nuisance Weeds

● Canada thistle

● Kochia

● Russian thistle

● perennial sow-thistle

● round-leaved mallow

● spiny annual sow thistle

Note: Sentinel-2 imagery from European Space Agency



Figure 3.3-1
Vegetation and Wetland Map
Technical Data Report

Scale: 1:20,000
 0 125 250 500 750 1,000 m

Universal Transverse Mercator (Zone 13)
 North American Datum (1983)



Report By: JLF WSP Job #: 181-06367-00
 Drawn by: JLF Date: July 08, 2019
 Reviewed By: JFW Office: Saskatoon

3.4 WILDLIFE

3.4.1 METHODS

Wildlife field surveys were conducted in accordance with Saskatchewan Ministry of Environment (SMOE) Species Detection Protocols and the terms and conditions of Species Detection Permits 18SD124 (in 2018) and 19SD117 (in 2019). Survey site locations are illustrated in Figure 3.4-1. Surveys in 2018 were completed by WSP staff. In 2019, surveys were completed by WSP staff and field assistants provided by Wicehtowak Limnos Consulting Services Ltd.

3.4.1.1 DESKTOP SCREENING

Preliminary desktop screening was conducted to identify previous element occurrences of wildlife SOMC and potential wildlife habitat in the Project Area and appropriate setback distances. The results of the desktop screening were used to help establish which surveys would be necessary for the wildlife and wildlife habitat assessment for the Project. The preliminary desktop screening included:

- development and review of Rare and Endangered Species Report for 5 km and 50 km setback distances around the Project Area using the Hunting, Angling and Biodiversity Information of Saskatchewan (HABISask) online mapping application via the SK CDC website. This information supports the identification of SOMC with the potential to occur in the Project Area.
- review of available online aerial imagery from ESRI™ Basemap Service layer and GoogleEarth™ to identify potential wildlife habitat, particularly for wildlife SOMC.

3.4.1.2 GRASSLAND BIRD SURVEYS

Surveys for breeding birds followed the Grassland Birds Survey Protocol (Saskatchewan Ministry of Environment [SMOE], 2014) which were developed in accordance with the Alberta Sensitive Species Inventory Guidelines (Government of Alberta, 2013). Grassland bird surveys were conducted to assess breeding bird species occurrence and land-use across the Project Area. Seven point count survey locations were established, each spaced 800 m apart (Figure 3.4-1). Each point count survey lasted five minutes at each of the point count locations. Surveys were conducted by a qualified scientist or environmental technician experienced in survey procedures, species identification of grassland birds by sight and sound, and identification of suitable habitat for these species.

As per the Grassland Birds Survey Protocol (SMOE, 2014), surveys were conducted during the active breeding season between May 15 and July 1. To increase the likelihood of observing a representative sample of bird species, surveys were not conducted under weather conditions less than 0 °C, conditions with greater than very light precipitation, or when winds were greater than 20 km/h.

Surveys were conducted on three separate occasions separated by at least 10 days to allow observation of species with early- and late-season breeding periods. Three survey visits are required to increase detection levels because probabilities for detection of singing and other opportunities for species identification may vary during the breeding season. Repeat survey visits also ensure opportunities to observe early migrating and late migrating bird species using the Project Area. Two of the three required surveys (mid- and late-season) were conducted in 2018, and one (early-season) was conducted in 2019.

Equipment used included binoculars, spotting scope, Kestrel wind gauge, Garmin GPS receivers (eTrex and GPSMAP 64st), bird survey data forms, bird identification field guides (e.g., Sibley Birds of North America, 2014). Surveys followed environmental conditions outlined in the Species Detection Survey Protocols: Grassland Birds Surveys, Fish and Wildlife Technical Report No. 2014-9.0 (SMOE, 2014).

All birds heard or seen from each of the seven point count locations were documented on field datasheets. Data collected included date, time, location, bird species, number of individuals, behaviour, and gender and age if possible. Incidental wildlife observations were also documented on field datasheets, including date, time, location,

species, and number of individuals, when applicable. Following the surveys, field data was entered into a Microsoft Excel spreadsheet data loadform required by SMOE.

3.4.1.3 BIRD MIGRATION SURVEYS

Bird migration surveys were conducted in fall 2018 and spring 2019 to assess migratory bird occurrence and land-use across the wildlife study area and 1 km setback. The Species Detection Survey Protocol used was adapted from the Wildlife Directive for Alberta Solar Energy Projects (Government of Alberta, 2017), and from Recommended Protocols for Monitoring Impacts of Wind Turbines on Birds (Environment Canada, Canadian Wildlife Service, 2007).

The originally developed Species Detection Protocol included two types of migration surveys: passage migration counts and staging/stopover migration counts. Passage migration counts are conducted at a stationary point within the Project Area where migration activity may be high as indicated by available habitat. Staging/stopover migration counts are conducted during daylight hours in areas where birds may rest and forage during migration (e.g. waterbodies and some upland area such as adjacent cropland) near the Project Area. However, no staging/stopover sites were identified within 1 km of the Project Area, therefore staging/stopover surveys were not required for the Project.

Passage migration counts were conducted from a single, static location (Site 4, Figure 3.4-1) that provided good visibility of the entire Project Area where bird movement across the landscape could be readily detected. WSP initiated passage migration counts 30-minutes before sunrise and ended one half-hour after sunset each day to correspond with times when birds are departing from or arriving at overnight/evening roosting sites or migrating to foraging sites and when nocturnal migrants are ceasing migration, initiating migration, or are already migrating. Morning surveys were conducted from one half-hour before sunrise to 5 hours after sunrise while dusk surveys were completed from one and one half hours before sunset to one half-hour after sunset.

Surveys were carried out by a qualified scientist or environmental technician experienced in survey procedures, species identification of migrating birds by sight and sound, and identification of suitable habitat for these species. To increase the likelihood of observing a representative sample of bird species, surveys were not conducted under weather conditions less than 0 °C, conditions with greater than very light precipitation, or when winds were greater than 20 km/h.

Equipment used included binoculars, spotting scope, Kestrel wind gauge, Garmin GPS receivers (eTrex and GPSMAP 64st), bird survey data forms, bird identification field guides (e.g. Sibley Birds of North America, 2014). All birds detected during surveys were documented on field datasheets. Data collected included date, time, location, bird species, number of individuals, behaviour, and gender and age if possible. Incidental wildlife observations were also documented on field datasheets, including date, time, location, species, and number of individuals, when applicable. Following the surveys, field data was entered into a Microsoft Excel spreadsheet data loadform required by SMOE.

3.4.1.4 SHARP-TAILED GROUSE LEK SURVEYS

Sharp-tailed grouse (*Tympanuchus phasianellus*) lek surveys were conducted in accordance with the Sensitive Species Inventory Guidelines (Government of Alberta, 2013). A survey at each of the seven point count locations were conducted two times, to ensure that leks were not missed due to unforeseen events. Sharp-tailed grouse lek surveys were conducted between mid-March to mid-May, when lek activity typically peaks in the Project Area. Surveys were conducted in the morning when lek activity is typically highest – between 30-minutes before sunrise to three hours after sunrise – and were performed by a qualified scientist or environmental technician experienced in survey procedures, grouse species identification by sight and sound, and identification of suitable lek habitat for this species. Surveys were not conducted under weather conditions less than 0 °C, conditions with any precipitation, or when wind speeds exceeded 20 km/h.

For each survey, date, start and end times, cloud cover, temperature, wind speed, precipitation, and location were documented on field datasheets. If a lek, sharp-tailed grouse individual, or evidence of sharp-tailed grouse was detected, the location and number of individuals observed (when applicable) would be documented. Any incidental observations of sharp-tailed grouse were also recorded. Following the surveys, field data was entered into a Microsoft Excel spreadsheet loadform required by SMOE.

3.4.1.5 RAPTOR STICK NEST SURVEYS

Prairie raptor stick nest surveys followed the Sensitive Species Inventory Guidelines (Government of Alberta, 2013). Surveys were conducted during the prairie raptor breeding season, between May 1 and June 30, however an active nest retains the designation of an active nest during the winter following nesting activity, the second year following nesting activity, and into the third year following nesting activity, with the designation of “active” being dropped on June 1st of the second year of inactivity (Government of Alberta, 2013).

Raptor stick nest surveys were conducted within the Project Area and a 1 km setback distance during daylight hours, and were conducted at least twice during the nesting season by a qualified scientist or environmental technician experienced in survey procedures, species identification of prairie raptors by sight and sound, and identification of suitable habitat for these species. Surveys were not conducted under weather conditions with heavy precipitation (rain or snow), or when wind speeds exceeded 40 km/h.

If raptor nests or breeding behaviour were observed, nesting activity and species would be identified. If a nest was detected but birds were not observed at or near the nest site, observers would fully investigate the nest to determine its status. The date, time, location, species, number of adults, and number of young (if visible) for all identified nest sites were documented on field datasheets. Following the surveys, field data was entered into a Microsoft Excel spreadsheet loadform required by SMOE.

3.4.1.6 SHORT-EARED OWL SURVEYS

Short-eared owl surveys were conducted as per the Species Detection Survey Protocols: Short-Eared Owl Surveys (SMOE, 2015). Short-eared owl surveys were conducted in May and June during peak short-eared owl breeding season, and behavioural observations were conducted between May and July if short-eared owls were observed. Since short-eared owls are active primarily at dusk, three-minute point count surveys were carried out at each of the seven established point count locations (Figure 3.4-1) beginning one hour before sunset and ending 30-minutes after sunset. Surveys were performed by a qualified scientist or environmental technician experienced in survey procedures, species identification of grassland birds by sight and sound, and identification of suitable habitat for these species. Surveys were not conducted in weather conditions less than 0 °C, conditions with greater than very light precipitation, or when winds were greater than 20 km/h.

All short-eared owls heard or seen from each of the seven point count locations were documented on field datasheets. Data collected included date, time, location, number of individuals, behaviour, and gender and age if possible. Following the surveys, field data was entered into a Microsoft Excel spreadsheet data loadform required by SMOE.

3.4.1.7 AUDITORY AMPHIBIAN SURVEYS

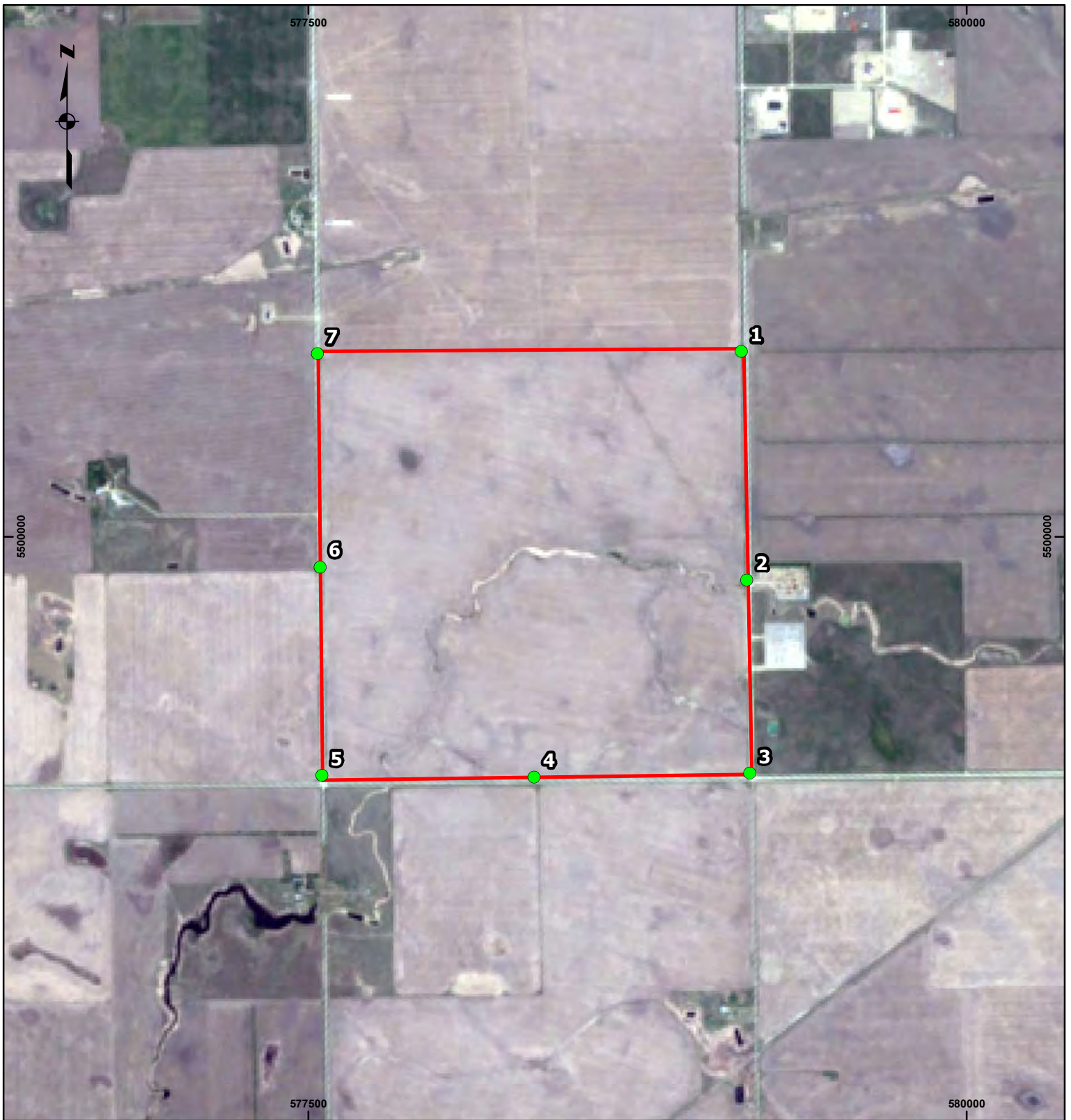
The objective of the amphibian auditory surveys was to document the presence of anuran amphibians (i.e., frogs, toads, tree frogs) within the Project Area. The surveys followed the Amphibian Auditory Survey Protocol (SMOE, 2014) which was developed in accordance with the Alberta Sensitive Species Inventory Guidelines (Government of Alberta, 2013). Seven point count locations were established within the Project Area, each spaced 800 m apart (Figure 3.4-1). As per the species detection protocols (SMOE, 2014), the point count surveys occurred at each location for a minimum of three minutes. Surveys were conducted on three separate occasions separated by at least 10 days to allow observation of species with early- to late-season calling periods.

The protocol mandates that surveys must be initiated no earlier than 30 minutes after sunset, and must be completed by 01:00, so surveys in the Project Area were completed between the hours of 20:30 and 22:00. Auditory amphibian surveys were completed by a qualified environmental scientist or wildlife technician who can identify all amphibian species known to occur in Saskatchewan by sound and sight, as well as by a field assistant. To increase probabilities of observing resident species, surveys were not conducted under weather conditions less than 0 °C, with greater than very light precipitation, or when winds were greater than 20 km/h.

Observations were documented on field datasheets. Data collected included date, time, location, amphibian species heard, and number of individuals calling. Following the surveys, field data was entered into a Microsoft Excel spreadsheet data loadform required by SMOE.

3.4.1.8 *INCIDENTAL WILDLIFE OBSERVATIONS*

Any incidental observations of wildlife species or their signs (e.g., dens, nests, scat) were recorded. Data collected included date, time, location, species, number of individuals, gender and age (if possible), type of sign (if applicable), behaviour, and habitat.



Legend

 Project Area

Survey Locations



Note: Sentinel-2 imagery from European Space Agency

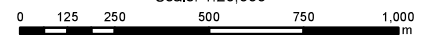


Figure 3.4-1

Wildlife Survey Site Locations

Technical Data Report

Scale: 1:20,000



Universal Transverse Mercator (Zone 13)
North American Datum (1983)



Report By: JLF WSP Job #: 181-06367-00
 Drawn by: JLF Date: July 08, 2019
 Reviewed By: JFW Office: Saskatoon

3.4.2 RESULTS

3.4.2.1 DESKTOP SCREENING

A desktop screening of information provided by the SK CDC of the Project Area and a radius of 5 km surrounding the Project Area found one or more observation reports of the following:

- migratory bird concentration site
- American badger (*Taxidea taxus taxus*)
- little brown myotis (*Myotis lucifugus*)
- bobolink (*Dolichonyx oryzivorus*)
- burrowing owl (*Athene cunicularia*)
- loggerhead shrike (*Lanius ludovicianus excubitorides*)
- short-eared owl (*Asio flammeus*)

The results of the HABISask (SK CDC) screening are presented in Appendix A.

The desktop screening and 2018 vegetation site visit indicated the Project Area is dominated by cultivated land, which provides lower quality wildlife habitat when compared to natural habitat types/areas. The Project Area also contains wetland areas, which may be used as breeding and/or rearing grounds for waterfowl and amphibians, staging areas for migratory birds, habitat for SOMC such as northern leopard frogs (*Lithobates pipiens*), and refuge for a variety of wildlife moving through a landscape modified by agriculture (Semlitsch 2002).

3.4.2.2 GRASSLAND BIRD SURVEYS

The early-season grassland bird survey was completed on May 31, 2019, the mid-season survey on June 22, 2018, and the late-season survey on June 29, 2019.

Table 3.4-1 lists the bird species identified during the grassland bird surveys. Only two observed species are identified as SOMC:

- barn swallow (*Hirundo rustica*)
- bobolink (*Dolichonyx oryzivorus*)

Please see Appendix B: Avian Survey Data for a complete list of detected species and abundance (Table B-1).

BARN SWALLOW

The barn swallow is a Schedule 1 species in Canada and has been designated as *Threatened* by the COSEWIC, however it has been provincially ranked S5B, S5M and is considered *Secure and Common* in Saskatchewan (SK CDC, 2019). Prior to European colonization in Canada, the barn swallow nested primarily in caves, holes, crevices, and ledges in cliff faces. Since European colonization, it has become closely associated with rural settlements, preferring to nest in and on artificial structures including barns, garages, houses, bridges, etc. (COSEWIC, 2011). Considering that there are no artificial structures and no natural cliffs or rises within the Project Area, there are no viable nesting sites for barn swallows. Construction of infrastructure may provide limited nesting habitat for this species. Based on the current land use and proposed Project land use development of the Project Area is not expected to have a negative effect on local and regional barn swallow populations.

BOBOLINK

The bobolink is a Schedule 1 species in Canada, and is ranked S4B, S4M by the SK CDC, indicating that both the breeding and transient/migrant populations of the species are *Apparently Secure* in Saskatchewan because the bobolink is *uncommon but not rare*, and because *there is some cause for long-term concern due to population declines or other factors* (Saskatchewan Data Conservation Centre, 2018; SK CDC, 2019). The bobolink has been designated as *Threatened* since 2010 by the Committee on the Status of Endangered Wildlife in Canada

(COSEWIC) (COSEWIC, 2010), and its status according to the Species At Risk Act (SARA) is also *Threatened* (SK CDC, 2019).

The bobolink’s preferred nesting habitat is forage cropland (eg. hayfields and pastures) dominated by a variety of species, which can include clover (*Trifolium spp.*), timothy (*Phleum pratense*), tall grasses, and broadleaved plants. It can also be found in wet prairie, graminoid peatland, no-till cropland, small-grain fields, reed beds, and remnants of native tall-grass prairie. The bobolink is sensitive to vegetation structure and composition – preferring habitats with moderate litter depth, high lateral litter cover, and high grass-to-legume ratio – as well as habitat size, where lower reproductive success is reported in small habitat fragments. The bobolink also requires an abundance of small shrubs to serve as perches, and a high percent of forb cover (COSEWIC, 2010).

Hayfields and pastures are preferred by the bobolink because plant cover is present at the start of the nesting season, which is not generally the case in cultivated fields (COSEWIC, 2010). The Project Area is predominantly cultivated land with little structural complexity, providing minimal habitat for the bobolink. Based on the current land use and proposed Project land use, alteration of the Project Area is not expected to result in a negative effect on local and regional bobolink populations.

Table 3.4-1 Bird Species Observed During Grassland Bird Surveys, 2018 and 2019

COMMON NAME	SCIENTIFIC NAME	SK CDC	COSEWIC	SARA SCHEDULE 1
American crow	<i>Corvus brachyrhynchos</i>	-	-	-
American goldfinch	<i>Spinus tristis</i>	-	-	-
American kestrel	<i>Falco sparverius</i>	-	-	-
American robin	<i>Turdus migratorius</i>	-	-	-
Baltimore oriole	<i>Icterus galbula</i>	-	-	-
barn swallow	<i>Hirundo rustica</i>	S5B, S5M	Threatened	Yes
bobolink	<i>Dolichonyx oryzivorus</i>	S4B,S4M	Threatened	Yes
Brewer's blackbird	<i>Euphagus cyanocephalus</i>	-	-	-
brown-headed cowbird	<i>Molothrus ater</i>	-	-	-
Canada goose	<i>Branta canadensis</i>	-	-	-
clay-coloured sparrow	<i>Spizella pallida</i>	-	-	-
common grackle	<i>Quiscalus quiscula</i>	-	-	-
common raven	<i>Corvus corax</i>	-	-	-
eastern kingbird	<i>Tyrannus tyrannus</i>	-	-	-
European starling	<i>Sturnus vulgaris</i>	-	-	-
horned lark	<i>Eremophila alpestris</i>	-	-	-
house wren	<i>Troglodytes aedon</i>	-	-	-
killdeer	<i>Charadrius vociferus</i>	-	-	-
lark sparrow	<i>Chondestes grammacus</i>	-	-	-
least flycatcher	<i>Empidonax minimus</i>	-	-	-
mallard duck	<i>Anas platyrhynchos</i>	-	-	-
marbled godwit	<i>Limosa fedoa</i>	-	-	-
mourning dove	<i>Zenaida macroura</i>	-	-	-
red-winged blackbird	<i>Agelaius phoeniceus</i>	-	-	-

COMMON NAME	SCIENTIFIC NAME	SK CDC	COSEWIC	SARA SCHEDULE 1
ring-billed gull	<i>Larus delawarensis</i>	-	-	-
ring-necked pheasant	<i>Phasianus colchicus</i>	-	-	-
rock dove	<i>Columba livia</i>	-	-	-
savannah sparrow	<i>Passerculus sandwichensis</i>	-	-	-
sora	<i>Porzana carolina</i>	-	-	-
Swainson's hawk	<i>Buteo swainsoni</i>	-	-	-
upland sandpiper	<i>Bartramia longicauda</i>	-	-	-
vesper sparrow	<i>Pooecetes gramineus</i>	-	-	-
warbling vireo	<i>Vireo gilvus</i>	-	-	-
western kingbird	<i>Tyrannus verticalis</i>	-	-	-
western meadowlark	<i>Sturnella neglecta</i>	-	-	-
willet	<i>Tringa semipalmata</i>	-	-	-
Wilson's snipe	<i>Gallinago delicata</i>	-	-	-
yellow warbler	<i>Setophaga petechia</i>	-	-	-

Saskatchewan Conservation Data Centre (SK CDC) Conservation Ranks: (S2) Imperiled/Very Rare; (S3) Vulnerable/Rare to Uncommon; (S4) Apparently Secure; (S5) Secure/Common; (SNA) Conservation status is not applicable to the species (e.g., may have been introduced in Saskatchewan) (-) Not at risk.

Committee on the Status of Endangered Wildlife in Canada (COSEWIC): (-) Not Assessed OR Species that has been evaluated and found to be not at risk of extinction; (Endangered) A wildlife species facing imminent extirpation or extinction; (Threatened) A wildlife species that is likely to become Endangered if nothing is done to reverse the factors leading to its extirpation or extinction; (Special Concern) A wildlife species that may become threatened or endangered because of a combination of biological characteristics and identified threats; (Data Deficient) A category that applies when the available information is insufficient (a) to resolve a wildlife species' eligibility for assessment or (b) to permit an assessment of the wildlife species' risk of extinction.

Species at Risk Act (SARA) Schedule 1: SARA establishes Schedule 1 as the official list of wildlife species at risk in Canada. Once listed on Schedule 1, measures to protect and recover a listed species are implemented. The criteria to meet Schedule 1 are different than those to be categorized under COSEWIC.

3.4.2.3 BIRD MIGRATION SURVEYS

3.4.2.3.1 FALL MIGRATION 2018

Fall bird migration surveys were completed on September 5, October 4, and November 7, 2018. No species of management concern (SOMC) were detected.

Results of the fall 2018 bird migration surveys are summarized in Table 3.4-2. More detail is provided in Appendix B.

Table 3.4-2 Fall 2018 Bird Migration Observations Summary

COMMON NAME	SCIENTIFIC NAME	ESTIMATED ABUNDANCE	SK CDC	COSEWIC	SARA SCHEDULE 1
American crow	<i>Corvus brachyrhynchos</i>	2	-	-	-
American goldfinch	<i>Spinus tristis</i>	2	-	-	-
American kestrel	<i>Falco sparverius</i>	2	-	-	-
Canada goose	<i>Branta canadensis</i>	>500	-	-	-
clay-coloured sparrow	<i>Spizella pallida</i>	1	-	-	-
common raven	<i>Corvus corax</i>	3	-	-	-
European starling	<i>Sturnus vulgaris</i>	30	-	-	-

COMMON NAME	SCIENTIFIC NAME	ESTIMATED ABUNDANCE	SK CDC	COSEWIC	SARA SCHEDULE 1
horned lark	<i>Eremophila alpestris</i>	>100	-	-	-
killdeer	<i>Charadrius vociferus</i>	1	-	-	-
Lapland longspur	<i>Calcarius lapponicus</i>	50	-	-	-
northern harrier	<i>Circus cyaneus</i>	1	-	-	-
red-tailed hawk	<i>Buteo jamaicensis</i>	2	-	-	-
rock dove	<i>Columba livia</i>	30	-	-	-
savannah sparrow	<i>Passerculus sandwichensis</i>	2	-	-	-
snow bunting	<i>Plectrophenax nivalis</i>	3	-	-	-
snow goose	<i>Chen caerulescens</i>	>3,400	-	-	-
tundra swan	<i>Cygnus columbianus</i>	8	-	-	-
unknown passerine	-	6	-	-	-
western meadowlark	<i>Sturnella neglecta</i>	11	-	-	-
yellow-rumped warbler	<i>Setophaga coronata</i>	2	-	-	-

3.4.2.3.2 SPRING MIGRATION 2019

Spring bird migration surveys were completed in 2019 on April 2–3, May 1–2, and May 15–16. SOMC detected include:

- barn swallow
- bobolink
- ferruginous hawk (*Buteo regalis*)
- golden eagle (*Aquila chrysaetos*)
- peregrine falcon (*Falco peregrinus anatum*)
- Sprague’s pipit (*Anthus spragueii*).

BARN SWALLOW

The Project Area and surroundings do not contain mature trees or vertical geological features to support barn swallow nests, and as a result do not meet the requirements for preferred habitat (COSEWIC, 2011). Based on the current land use and proposed Project land use, development within the Project Area is not anticipated to have a negative effect on local and regional barn swallow populations. Please see results in section 3.4.2.2 for more detail regarding barn swallow conservation.

BOBOLINK

Please see the above summary of grassland bird survey results (3.4.2.2) for an overview of bobolink conservation status and habitat requirements. Since the Project Area is predominantly cultivated land with little structural complexity, it provides minimal suitable habitat for the bobolink. Based on the current land use and proposed Project land use, disturbance in the Project Area is not expected to have a negative effect on local or regional bobolink populations (COSEWIC, 2010).

FERRUGINOUS HAWK

The ferruginous hawk is a Schedule 1 species in Canada, and is designated as *Threatened* by the COSEWIC. It is ranked as S3 in Saskatchewan, indicating that it is *Vulnerable/Rare to uncommon* (SK CDC, 2019). The Ferruginous hawk is heavily dependent on native grasslands – considered a native grassland specialist – and typically avoids areas of intensive agriculture (Alberta Sustainable Resource Development and Alberta Conservation Association, 2006). Since the Project Area is dominated by cultivated cropland, it does not provide suitable nesting habitat for ferruginous hawks. Based on the current land use and proposed Project land use, disturbance in the Project Area is not anticipated to negatively effect local or regional ferruginous hawk populations.

GOLDEN EAGLE

The golden eagle is not a Schedule 1 species in Canada, and is listed as *Not at Risk* by the COSEWIC, however it has been ranked S3B, S3N, S4M in Saskatchewan (SK CDC, 2019). This indicates that breeding populations of golden eagles in Saskatchewan are *Vulnerable/Rare to uncommon* – defined as when a species is *at moderate risk of extinction or extirpation due to a restricted range, relatively few populations, recent and widespread declines, threats, or other factors* –, non-breeding populations are *Vulnerable/Rare to uncommon*, and migratory or transient species are *Apparently Secure* (SK CDC, 2018). Golden eagles use a variety of habitats in North America, including open and semi-open landscapes like prairie, sagebrush, arctic and alpine tundra, savannah, spruce woodlands, etc. Specifically, they are found in areas with a sufficient prey base and near suitable nesting sites. Their preferred breeding habitat is typically at the boundary of tundra, boreal forest, and wet meadows, while they typically forage in open habitat, preferring areas with short or sparse vegetation. They usually select nest sites on cliffs, sometimes in the upper third of deciduous and coniferous trees, and occasionally on artificial structures. They typically avoid nesting near urban habitat (Wyshynski & Pulfer, 2015). Considering there are no suitable nest sites in or adjacent to the Project Area, the Project should not have a negative effect on critical golden eagle habitat, local or regional populations.

PEREGRINE FALCON

The peregrine falcon, *anatum* subspecies, is a Schedule 1 species in Canada, although it is listed as *Not at Risk* by the COSEWIC. It is ranked as S1B, SNRM in Saskatchewan, indicating that the breeding population is *Critically Imperiled/Extremely rare* and that the migratory or transient population has not yet been assessed and/or assigned a rank in Saskatchewan (SK CDC 2019; SK CDC 2018). The peregrine falcon (all subspecies) was among the first species to be assessed by the COSEWIC and was listed early on as a species of special concern due to the severely detrimental effects of agricultural use of organochlorine pesticides on peregrine falcon populations, most notably 1,1,1-trichloro-3,3-bis(p-chlorophenyl)ethane (DDT) which was banned in Canada and the United States in the early 1970s. It is possible that other chemical pesticides may also pose a threat to the peregrine falcon (*anatum/tundrius* subspecies). Since the early listing of the peregrine falcon and therefore the initiation of reintroduction programs and regimented population monitoring, however, breeding populations have increased considerably, surpassing the size of the known historical population in some regions. As a result, the *anatum* subspecies has been delisted in the United States, and there has been speculation regarding the delisting of peregrine falcons in Canada as well (Environment Canada, 2015).

Peregrine falcons breed in a wide range of habitats, including arctic tundra, coastal islands, major urban centres, etc., and typically nest on cliff ledges, crevices, escarpments, or tall artificial structures. Given that it is an aerial predator of other bird species, the peregrine falcon prefers sites located near staging or nesting sites for seabirds, shorebirds, waterfowl, or other birds colonies (Environment Canada, 2015). Since there are no tall landmarks or structures within or adjacent to the Project Area, the Project Area has not been identified as a staging site or nesting site for any migratory bird colonies, and the increasingly lessened concern regarding the security of the peregrine falcon's status, disturbance within the Project Area is not expected to have a negative effect on local or regional peregrine falcon populations.

SPRAGUE'S PIPIT

Sprague's pipit is a Schedule 1 species in Canada, and has been listed by the COSEWIC as *Threatened*. It has been ranked S3B, S3M provincially, in Saskatchewan, indicating that it is *Vulnerable/Rare to uncommon* (SK CDC 2019; SK CDC 2018). Sprague's pipit requires native prairie for nesting habitat, and is uncommonly found in cultivated lands or where native grasses have been replaced with introduced forage. Typically Sprague's pipit prefers grassland vegetation of intermediate height (10-30 cm), intermediate density, and few shrubs such as that found in hayland.

Pipit nests in southern Saskatchewan in particular have been found to be located in relatively tall (27 cm), dense grasslands with low forb density. Grassland patch size has been found to influence Sprague's pipit abundance, where migration routes surrounded by more than 50% grassland had mean Sprague's pipit populations of 20.6 individuals and routes with less than 50% grassland had mean populations of 3.2 individuals. In southern Saskatchewan in particular, Sprague's pipits were absent in grassland patches smaller than 29 hectares (ha) (Environment Canada, 2008). Given that the Project Area is dominated by cultivated cropland, there is minimal suitable grassland habitat for the Sprague's pipit. Based on the current land use and proposed Project land use, the Project is unlikely to result in a negative effect to local and regional Sprague's pipit populations.

Results of the spring 2019 bird migration surveys are summarized in Table 3.4-3. Further detail is provided in Appendix B.

Table 3.4-3 Spring 2019 Bird Migration Observations Summary

COMMON NAME	SCIENTIFIC NAME	ESTIMATED ABUNDANCE	SK CDC	COSEWIC	SARA SCHEDULE 1
American crow	<i>Corvus brachyrhynchos</i>	6	-	-	-
American golden-plover	<i>Pluvialis dominica</i>	51	-	-	-
American kestrel	<i>Falco sparverius</i>	2	-	-	-
American white pelican	<i>Pelecanus erythrorhynchos</i>	9	-	-	-
barn swallow	<i>Hirundo rustica</i>	4	S5B, S5M	Threatened	-
bobolink	<i>Dolichonyx oryzivorus</i>	1	S4B, S4M	Threatened	-
brown-headed cowbird	<i>Molothrus ater</i>	11	-	-	-
Canada goose	<i>Branta canadensis</i>	> 4000	-	-	-
cliff swallow	<i>Petrochelidon pyrrhonota</i>	16	-	-	-
common grackle	<i>Quiscalus quiscula</i>	29	-	-	-
common raven	<i>Corvus corax</i>	6	-	-	-
double-crested cormorant	<i>Phalacrocorax auritus</i>	3	-	-	-
ferruginous hawk	<i>Buteo regalis</i>	1	S3	Threatened	Yes
Franklin's gull	<i>Leucophaeus pipixcan</i>	>150	-	-	-
golden eagle	<i>Aquila chrysaetos</i>	1	S3B, S3N, S4M	Not at Risk	-
horned lark	<i>Eremophila alpestris</i>	39	-	-	-
killdeer	<i>Charadrius vociferus</i>	3	-	-	-
Lapland longspur	<i>Calcarius lapponicus</i>	>250	-	-	-
mallard	<i>Anas platyrhynchos</i>	2	-	-	-
marbled godwit	<i>Limosa fedoa</i>	2	-	-	-
mourning dove	<i>Zenaida macroura</i>	12	-	-	-
northern harrier	<i>Circus hudsonius</i>	4	-	-	-
northern rough-winged swallow	<i>Stelgidopteryx serripennis</i>	1	-	-	-

COMMON NAME	SCIENTIFIC NAME	ESTIMATED ABUNDANCE	SK CDC	COSEWIC	SARA SCHEDULE 1
peregrine falcon	<i>Falco peregrinus anatum</i>	1	S1B, SNRM	Not at Risk	Yes
red-tailed hawk	<i>Buteo jamaicensis</i>	2	-	-	-
red-winged blackbird	<i>Agelaius phoeniceus</i>	17	-	-	-
ring-billed gull	<i>Larus delawarensis</i>	100	-	-	-
ring-necked pheasant	<i>Phasianus colchicus</i>	3	-	-	-
rock dove	<i>Columba livia</i>	6	-	-	-
rough-legged hawk	<i>Buteo lagopus</i>	1	-	-	-
sandhill crane	<i>Antigone canadensis</i>	9	-	-	-
savannah sparrow	<i>Passerculus sandwichensis</i>	8	-	-	-
semipalmated plover	<i>Charadrius semipalmatus</i>	15	-	-	-
sharp-tailed grouse	<i>Tympanuchus phasianellus</i>	1	-	-	-
snow goose	<i>Chen caerulescens</i>	>500	-	-	-
Sprague's pipit	<i>Anthus spragueii</i>	1	S3B, S3M	Threatened	Yes
Swainson's hawk	<i>Buteo swainsoni</i>	7	-	-	-
tree swallow	<i>Tachycineta bicolor</i>	6	-	-	-
unknown	-	2	-	-	-
unknown duck	-	1	-	-	-
unknown small shorebird	-	45	-	-	-
unknown songbirds	-	>300	-	-	-
unknown swallow	-	1	-	-	-
upland sandpiper	<i>Bartramia longicauda</i>	4	-	-	-
vesper sparrow	<i>Pooecetes gramineus</i>	15	-	-	-
western kingbird	<i>Tyrannus verticalis</i>	4	-	-	-
western meadowlark	<i>Sturnella neglecta</i>	10	-	-	-
willet	<i>Tringa semipalmata</i>	3	-	-	-
yellow-headed blackbird	<i>Xanthocephalus xanthocephalus</i>	2	-	-	-

3.4.2.4 SHARP-TAILED GROUSE LEK SURVEYS

Sharp-tailed grouse lek surveys were conducted on April 3 and May 2, 2019. No sharp-tailed grouse individuals or leks were detected during lek surveys within the Project Area which were identified as having potential for sharp-tailed grouse congregation. Development within the Project Area is not expected to have a negative effect on local or regional sharp-tailed grouse populations.

3.4.2.5 RAPTOR STICK NEST SURVEYS

Raptor stick nest surveys were conducted on April 3 and May 1, 2019. No raptor stick nests were detected within the Project Area or 1 km setback distance. Additionally, no ground nesting raptors were observed nesting within the Project Area. Based on the current land use and the proposed development, it is not anticipated that the Project will result in a negative effect to local or regional raptor populations.

3.4.2.6 SHORT-EARED OWL SURVEYS

Short-eared owl surveys were conducted on April 30, May 16, and May 30, 2019. No short-eared owls were detected in the Project Area. Based on the current land use and the proposed development, it is not anticipated that the Project will result in a negative effect to local or regional short-eared owl populations.

3.4.2.7 AUDITORY AMPHIBIAN SURVEYS

Auditory amphibian surveys were conducted on April 15, May 16, and May 30, 2019 at the seven survey site locations (Figure 3.4-1). Standing water was observed in the Project Area (Photographs 3.4-1 and 3.4-2).

Wood frogs (*Lithobates sylvaticus*), and boreal chorus frog (*Pseudacris maculate*) were observed. No more than one individual was detected at any given point count location.

Both wood frogs and boreal chorus frogs have a provincial ranking of S5, indicating that they are *Secure/Common; demonstrably secure under present conditions, widespread and abundant, and low threat level*. The boreal chorus frog has also been listed as *Not at Risk* by the COSEWIC (SK CDC, 2018; SK CDC, 2019). Since no SOMC were detected within or adjacent to the Project Area, and since the area and surroundings were so sparsely populated by the two species detected, development within the Project Area is not anticipated to disrupt breeding populations of anuran amphibians.



Photo 3.4-1 Standing water within Project Area. Taken on April 15, 2019.



Photo 3.4-2 Standing water at culvert site within Project Area. Taken on April 15, 2019.

3.4.2.8 INCIDENTAL WILDLIFE OBSERVATIONS

Results of incidental wildlife observations are summarized in Table 3.4-4.

Table 3.4-4 Incidental Wildlife Observations

COMMON NAME	SCIENTIFIC NAME	SK CDC	COSEWIC	SARA SCHEDULE 1
American badger	<i>Taxidea taxus taxus</i>	S3	Special Concern	Yes
American goldfinch	<i>Spinus tristis</i>	-	-	-
American red fox	<i>Vulpes vulpes</i>	-	-	-
American robin	<i>Turdus migratorius</i>	-	-	-
barn swallow	<i>Hirundo rustica</i>	S5B, S5M	Threatened	Yes
black-billed magpie	<i>Pica hudsonia</i>	-	-	-
Brewer's blackbird	<i>Euphagus cyanocephalus</i>	-	-	-
brown-headed cowbird	<i>Molothrus ater</i>	-	-	-
Canada goose	<i>Branta canadensis</i>	-	-	-
common grackle	<i>Quiscalus quiscula</i>	-	-	-
common raven	<i>Corvus corax</i>	-	-	-
coyote	<i>Canis latrans</i>	-	-	-

COMMON NAME	SCIENTIFIC NAME	SK CDC	COSEWIC	SARA SCHEDULE 1
gray partridge	<i>Perdix perdix</i>	-	-	-
great horned owl	<i>Bubo virginianus</i>	-	-	-
horned lark	<i>Eremophila alpestris</i>	-	-	-
killdeer	<i>Charadrius vociferus</i>	-	-	-
marbled godwit	<i>Limosa fedoa</i>	-	-	-
mourning dove	<i>Zenaida macroura</i>	-	-	-
northern harrier	<i>Circus hudsonius</i>	-	-	-
ring-billed gull	<i>Larus delawarensis</i>	-	-	-
ring-necked pheasant	<i>Phasianus colchicus</i>	-	-	-
savannah sparrow	<i>Passerculus sandwichensis</i>	-	-	-
Sprague's pipit	<i>Anthus spragueii</i>	S3B, S3M	Threatened	Yes
upland sandpiper	<i>Bartramia longicauda</i>	-	-	-
vesper sparrow	<i>Pooecetes gramineus</i>	-	-	-
western kingbird	<i>Tyrannus verticalis</i>	-	-	-
western meadowlark	<i>Sturnella neglecta</i>	-	-	-
white-tailed deer	<i>Odocoileus virginianus</i>	-	-	-
white-tailed jack rabbit	<i>Lepus townsendii</i>	-	-	-
willet	<i>Tringa semipalmata</i>	-	-	-
Wilson's snipe	<i>Gallinago delicata</i>	-	-	-

SOMC detected through incidental wildlife observations during unrelated surveys or when surveys were not underway include:

- American badger (*Taxidea taxus taxus*)
- barn swallow
- Sprague’s pipit.

AMERICAN BADGER

The American badger (*taxus* subspecies) is a Schedule 1 species in Canada, and is listed by the COSEWIC as a species of *Special Concern*. It is ranked provincially in Saskatchewan as S3, indicating that it is *Vulnerable/Rare to uncommon* (SK CDC 2019; SK CDC 2018). American badgers occur in non-forested grassland and shrubland areas, where soil and prey availability are the key defining features of viable habitat. Coherent soils that can support a burrow without collapsing are preferred, as well as availability of fossorial (ground-burrowing) rodents or other prey. American badgers can be supported by agricultural areas when there are sufficient hedgerows, fencerows, and field boundary. They have been documented to avoid cultivated fields (COSEWIC, 2012). Since the Project Area is dominated by cultivated cropland, it is not likely the Project Area provides sufficient suitable habitat to support the American badger. Based on current land use and proposed land use development, the Project is not anticipated to result in a negative effect to local and regional populations of American badger.

Please refer to the above summary of grassland bird survey results (3.4.2.2) for further information on barn swallow conservation status and habitat needs. Since the Project Area and surroundings do not contain mature trees or vertical geological features to support barn swallow nests, the Project Area does not meet the requirements for preferred habitat (COSEWIC, 2011). Therefore, development within the Project Area is not expected to impact barn swallow populations.

For further information on the conservation status and habitat needs for Sprague’s pipit, please refer to the above summary of bird migration surveys: spring migration (3.4.2.3.2). Since Sprague’s pipit’s habitat requirements are so rigid, and are not met by the Project Area, it is not expected that populations will be impacted by development in the Project Area.

3.5 FISH AND FISH HABITAT

3.5.1 METHODS

The federal *Fisheries Act* requires that projects avoid causing ‘Serious Harm’ to fish unless authorized by the Minister of Fisheries and Oceans Canada (DFO). The first step in review of the project for fish and fish habitat is a desktop screening using the HABISask online mapping application and satellite imagery using Google Earth Pro™. If there is potential for fish-bearing watercourses or waterbodies within 100 m of the Project Area, the second step in review of a project would be the completion of a Self-assessment per DFO guidelines.

The Self-assessment helps determine whether a formal Request for Project Review should be submitted to DFO. A Request for Project Review is generally required where a project: cannot avoid ‘Serious Harm’ to fish; has a high risk of ‘Serious Harm’ after the implementation of mitigation measures; is likely to contravene one of the *SARA* prohibitions for aquatic species; or is not included in the DFO provided criteria for review (DFO 2018).

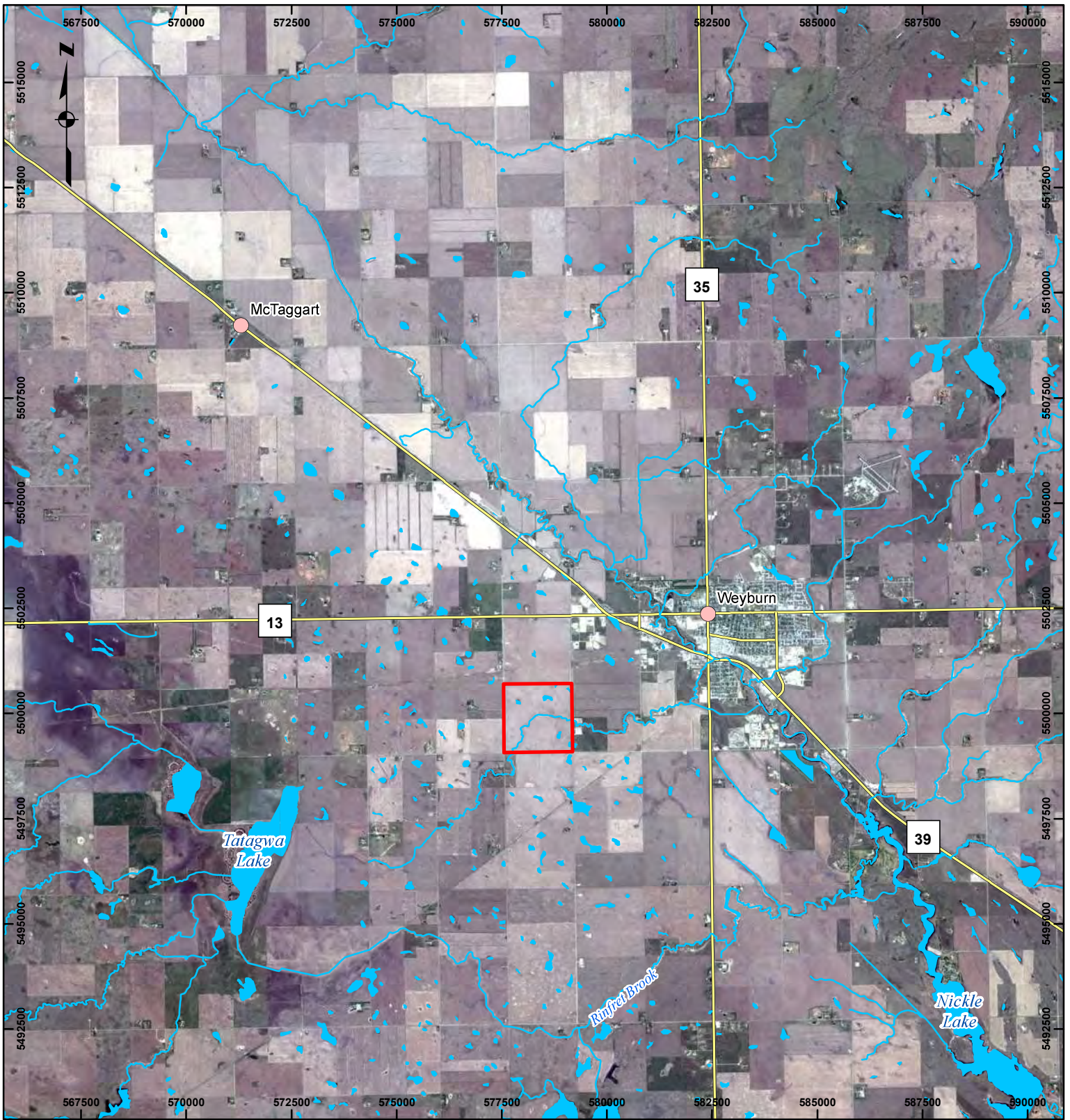
3.5.2 RESULTS

The desktop screening indicated no fish-bearing waters are located within 100 m of the Project Area. The lack of fish-bearing watercourses or waterbodies was confirmed via groundtruthing during the 2018 vegetation site visit and 2019 spring bird migration surveys.






The nearest fish-bearing waters include Rinfret Brook about 6.5 km south and Nickle Lake about 10 km southeast, and downstream of the Project Area (Figure 3.5-1). Rinfret Brook contains Brook Stickleback (*Culaea inconstans*)

and Iowa Darter (*Etheostoma exile*). Nickle Lake contains Brook Stickleback, Fathead Minnow (*Pimephales promelas*), Northern Pike (*Esox lucius*), Walleye (*Sander vitreus*), White Sucker, and Yellow Perch (*Perca flavescens*). Northern pike, walleye, and yellow perch fry and fingerlings have been stocked in Nickle Lake since 1948 (SK CDC, 2019).

A DFO Self-assessment is not required for the Project because no fish-bearing waters or fish SOMC are located within 100 m of the Project Area. The Project will not directly impact fish or fish habitat. However, Project plans to protect the intermittent stream with a setback distance of approximately 30 m will help to prevent potential indirect effects on fish habitat that may be connected to the stream during years of high precipitation.



Legend

-  Project Area
-  Community
-  Road
-  Waterbody
-  Watercourse

Note: Sentinel-2 imagery from European Space Agency




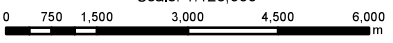



Figure 3.5-1
Watercourses and Waterbodies
Technical Data Report

Scale: 1:125,000



Universal Transverse Mercator (Zone 13)
 North American Datum (1983)


 Report By: JLF WSP Job #: 181-06367-00
 Drawn by: JLF Date: July 08, 2019
 Reviewed By: JFW Office: Saskatoon

4 RECOMMENDED MITIGATIONS

4.1 GENERAL

WSP recommends the development and implementation of a Construction Environmental Management Plan and an Operation Environmental Management Plan for the Project. These plans typically include, but are not limited to:

- Soil Management Plan
 - Sediment and Erosion Control Plan
 - Surface and Ground Water Management Plan
 - Vegetation Management Plan (includes weed management)
 - Wildlife Management Plan
 - Spill Management Plan
 - Solid Waste Management Plan
-

4.2 TERRAIN AND SOILS

The following recommendation has been identified to address potential environmental soil and terrain sensitivities in the Project Area.

- During the desktop analysis of soils information, areas with potential to contain strongly saline soils were identified in the Project Area. If determined necessary, a pre-construction soil sampling program may be completed to delineate areas with strong salinity. Desktop analysis of the available soils mapping for the Project only allowed for high-level, coarse, identification of sensitive areas.
 - Areas that contain strong salinity may require special soil handling during construction to avoid mixing saline soils with non-saline soils to prevent degradation of agricultural soil quality.
-

4.3 VEGETATION AND WETLANDS

The following recommendations have been identified to address potential environmental sensitivities and concerns based solely on the findings of the site visit that was completed in the fall of 2018.

- Construction equipment must be cleaned prior to entering and leaving the Project because noxious weeds were observed in the Project Area. Routine weed inspection and maintenance programs should be incorporated into the Project to protect natural areas from the introduction of weed species.
 - More stringent inspections are recommended for equipment coming from outside the region in order to prevent the introduction and/or spread of new weed species.
 - No rare plant surveys are recommended for the Project because habitat potential for rare plants was determined to be very low due to chronic disturbance from cultivation.
 - Drainage patterns and local water storage capacity should be maintained to mitigate local and downstream flooding, as well as channel scour and sedimentation in the intermittent watercourse.
-

4.4 WILDLIFE

The following recommendations have been identified to address potential environmental sensitivities or concerns based solely on the findings of the wildlife surveys that were completed in 2018 and 2019.

- Work shall be completed outside critical breeding windows, particularly for nesting birds. If ground disturbance activities (e.g., stripping, clearing, grubbing, excavating, trenching) must occur during the breeding season, pre-construction surveys will be required. Setbacks will be established to protect active breeding birds, their nests, eggs, and/or young, or other sensitive identified breeding wildlife.
 - Adhere to the Saskatchewan Activity Restriction Guidelines for Sensitive Species by conducting work outside the restricted activity periods that are specific to species and type of wildlife feature (SMOE, 2017).
 - A qualified environmental professional should complete pre-construction species detection and habitat surveys if construction occurs during the spring or summer months.
 - If wildlife is observed during work, if possible, give animals the opportunity to escape the work area.
 - No feeding, baiting, luring, or destruction of any wildlife. Do not approach or harass wildlife in any way.
 - Speed limits shall be strictly enforced to reduce potential of wildlife vehicle interactions and incidental take of wildlife.
 - All materials that might attract wildlife (i.e. human food and garbage, petroleum products), will be properly stored in areas that wildlife cannot access.
-

4.5 FISH AND FISH HABITAT

The following recommendations have been identified to address potential environmental sensitivities or concerns based solely on the findings of the desktop review that was completed in 2019.

- Standard mitigation measures for erosion, sedimentation, unplanned environmental releases (i.e., spills), and introduction of invasive species and noxious weeds are recommended for the Project to minimize risks to fish and fish habitat in the region.

5 REFERENCES

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APPENDIX

A HABISASK RARE AND ENDANGERED SPECIES REPORTS

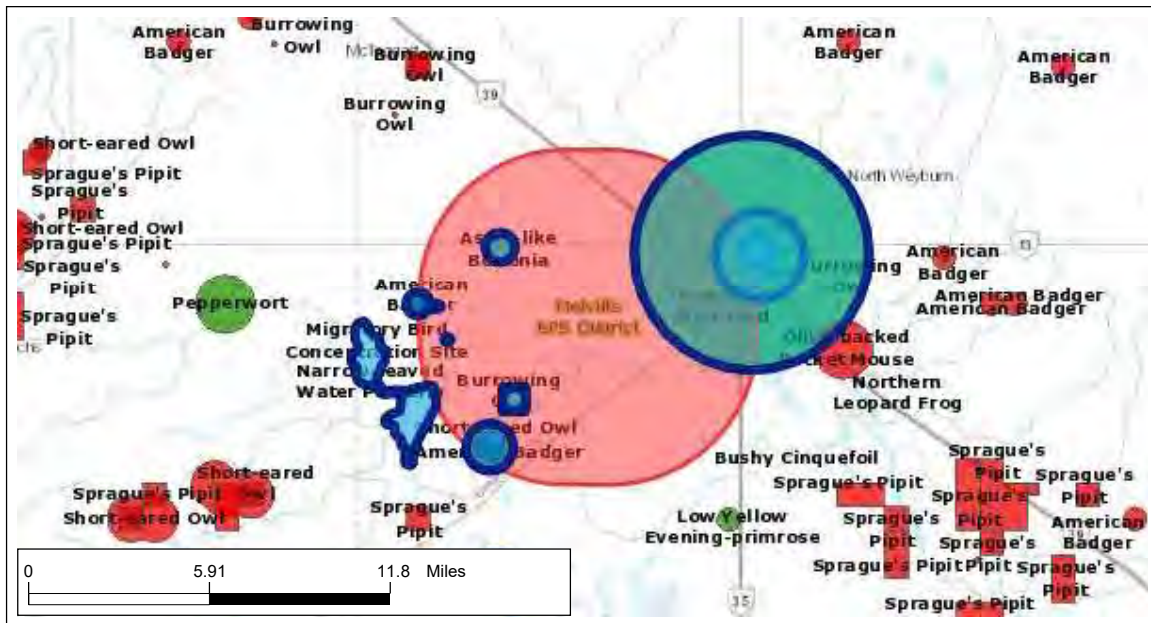
Rare and Endangered Species Report

Report Generated: 6/21/2018 11:53:08 AM

The absence of information provided by the Saskatchewan Conservation Data Centre (SKCDC) does not categorically mean the absence of sensitive species or features. The quantity and quality for data collected by the SKCDC are dependent on the research and observations of many individuals and organizations. SKCDC reports summarize the existing natural heritage information, known to the SKCDC, at the time of the request.

SKCDC data should never be regarded as final statements on the elements or areas being considered, nor should they be substituted for on-site surveys required for environmental assessments. The user therefore acknowledges that the absence of data may indicate that the project area has not been surveyed, rather than confirm that the area lacks natural heritage resources.

Rare and Endangered Species Area of Interest



Rare and Endangered Species Report

Scientific Name: *Migratory Bird Concentration Site*

Common Name: Migratory Bird Concentration Site

Provincial Rank: S3 Global Rank: G3

Observation: First: Last:

Provincial Legal Status:

Species at Risk Act Status:

COSEWIC Status:

General Description:

Occurrence ID: 9065

Occurrence Class: Animal Assemblage

Occurrence Type:

Occurrence Rank:

Occurrence Data:

Directions:

Scientific Name: *Boltonia asteroides var. recognita*

Common Name: Aster-like Boltonia

Provincial Rank: S2 Global Rank: G5T3T5

Observation: First: 1938-07-17 Last: 1938-07-17

Provincial Legal Status:

Species at Risk Act Status:

COSEWIC Status:

General Description:

WET GROUND

Occurrence ID: 8529

Occurrence Class: Vascular Plant

Occurrence Type: SPECIMEN (COLLECTED)

Occurrence Rank:

Occurrence Data:

Directions:

Rare and Endangered Species Report

Scientific Name: *Boltonia asteroides var. recognita* Occurrence ID: 3281
Common Name: Aster-like Boltonia Occurrence Class: Vascular Plant
Provincial Rank: S2 Global Rank: G5T3T5 Occurrence Type: SPECIMEN (COLLECTED)
Observation: First: 1938-07-17 Last: 1938-07-17 Occurrence Rank: H - Historical

Provincial Legal Status:
Species at Risk Act Status: Occurrence Data:
COSEWIC Status:
General Description:
WET GROUND

Directions:
5.5 MILES WEST OF WEYBURN

Scientific Name: *Vernonia fasciculata* Occurrence ID: 16246
Common Name: Fascicled Ironweed Occurrence Class: Vascular Plant
Provincial Rank: SH Global Rank: G5 Occurrence Type:
Observation: First: unknown Last: unknown Occurrence Rank: H - Historical

Provincial Legal Status:
Species at Risk Act Status: Occurrence Data:
COSEWIC Status: Endangered pre 1957 - listed in Breitung 1957
General Description:

Directions:
Weyburn

Rare and Endangered Species Report

Scientific Name: *Taxidea taxus taxus* Occurrence ID: 999958674
Common Name: American Badger Occurrence Class: Vertebrate Animal
Provincial Rank: S3 Global Rank: G5T5 Occurrence Type:
Observation: First: 2000 Last: 2017-07-15 Occurrence Rank:
Provincial Legal Status: Occurrence Data:
Species at Risk Act Status: Special Concern
COSEWIC Status: Special Concern
General Description:
Species Detected (last reported 2017)

Directions:
NW-17-8-15-2

Scientific Name: *Taxidea taxus taxus* Occurrence ID: 999958678
Common Name: American Badger Occurrence Class: Vertebrate Animal
Provincial Rank: S3 Global Rank: G5T5 Occurrence Type:
Observation: First: 2008-07-09 Last: 2016-07-15 Occurrence Rank:
Provincial Legal Status: Occurrence Data:
Species at Risk Act Status: Special Concern
COSEWIC Status: Special Concern
General Description:
Species detected (last reported 2016)

Directions:
NE-33-7-15-2

Rare and Endangered Species Report

Scientific Name: *Taxidea taxus taxus* Occurrence ID: 999958679
Common Name: American Badger Occurrence Class: Vertebrate Animal
Provincial Rank: S3 Global Rank: G5T5 Occurrence Type:
Observation: First: 2004-07-15 Last: 2016-07-15 Occurrence Rank:
Provincial Legal Status: Occurrence Data:
Species at Risk Act Status: Special Concern
COSEWIC Status: Special Concern
General Description:
Species detected (last reported 2016)

Directions:
NW-3-8-15-2

Scientific Name: *Athene cunicularia* Occurrence ID: 987
Common Name: Burrowing Owl Occurrence Class: Vertebrate Animal
Provincial Rank: S2B,S2M Global Rank: G4 Occurrence Type: OBO
Observation: First: Last: Occurrence Rank: E - Verified extant (viability not assessed)
Provincial Legal Status: Endangered Occurrence Data:
Species at Risk Act Status: Endangered
COSEWIC Status: Endangered
General Description:
As part of our agreement with Nature Saskatchewan, you are required to contact the Operation Burrowing Owl (OBO) Coordinator prior to contacting landowners regarding burrowing owls on their land. They may also be able to tell you whether the nest is active or abandoned. The OBO Coordinator can be reached at 1-800-667-4668 or obo@naturesask.ca.

Directions:

Rare and Endangered Species Report

Scientific Name: *Athene cunicularia* Occurrence ID: 1017
Common Name: Burrowing Owl Occurrence Class: Vertebrate Animal
Provincial Rank: S2B,S2M Global Rank: G4 Occurrence Type: SIGHTING
Observation: First: Last: Occurrence Rank: E - Verified extant (viability not assessed)
Provincial Legal Status: Endangered Occurrence Data:
Species at Risk Act Status: Endangered
COSEWIC Status: Endangered
General Description:
As part of our agreement with Nature Saskatchewan, you are required to contact the Operation Burrowing Owl (OBO) Coordinator prior to contacting landowners regarding burrowing owls on their land. They may also be able to tell you whether the nest is active or abandoned. The OBO Coordinator can be reached at 1-800-667-4668 or obo@naturesask.ca.

Directions:

Scientific Name: *Athene cunicularia* Occurrence ID: 3907
Common Name: Burrowing Owl Occurrence Class: Vertebrate Animal
Provincial Rank: S2B,S2M Global Rank: G4 Occurrence Type: OBO
Observation: First: Last: 2010 Occurrence Rank: E - Verified extant (viability not assessed)
Provincial Legal Status: Endangered Occurrence Data:
Species at Risk Act Status: Endangered 2010 Operation Burrowing Owl location - Pairs 2;
COSEWIC Status: Endangered Singles 0 2009 Operation Burrowing Owl location -
General Description: Pairs 2; Singles 0 2012: 2 pairs observed. OBO
As part of our agreement with Nature Saskatchewan, you are required to contact the Operation Burrowing Owl (OBO) Coordinator prior to contacting landowners regarding burrowing owls on their land. They may also be able to tell you whether the nest is active or abandoned. The OBO Coordinator can be reached at 1-800-667-4668 or obo@naturesask.ca.

Directions:

Rare and Endangered Species Report

Scientific Name: *Athene cunicularia* Occurrence ID: 5308
Common Name: Burrowing Owl Occurrence Class: Vertebrate Animal
Provincial Rank: S2B,S2M Global Rank: G4 Occurrence Type: ARCHIVE
Observation: First: Last: Occurrence Rank: E - Verified extant (viability not assessed)
Provincial Legal Status: Endangered Occurrence Data:
Species at Risk Act Status: Endangered
COSEWIC Status: Endangered
General Description:
As part of our agreement with Nature Saskatchewan, you are required to contact the Operation Burrowing Owl (OBO) Coordinator prior to contacting landowners regarding burrowing owls on their land. They may also be able to tell you whether the nest is active or abandoned. The OBO Coordinator can be reached at 1-800-667-4668 or obo@naturesask.ca.

Directions:

Scientific Name: *Myotis lucifugus* Occurrence ID: 999971783
Common Name: Little Brown Myotis Occurrence Class: Vertebrate Animal
Provincial Rank: S4 Global Rank: G3 Occurrence Type:
Observation: First: 1957-07-15 Last: 1957-07-15 Occurrence Rank:
Provincial Legal Status: Occurrence Data:
Species at Risk Act Status: Endangered
COSEWIC Status: Endangered
General Description:
Specimen (1957)

Directions:
Weyburn, SK

Rare and Endangered Species Report

Scientific Name: *Lanius ludovicianus excubitorides*
Common Name: Loggerhead Shrike
Provincial Rank: S2B,S2M Global Rank: G4T4
Observation: First: 2005 Last: 2005

Occurrence ID: 999923886
Occurrence Class: Vertebrate Animal
Occurrence Type:
Occurrence Rank:

Provincial Legal Status:
Species at Risk Act Status: Threatened
COSEWIC Status: Threatened
General Description:
1 - LOSH , SFS 2005 data

Occurrence Data:

Directions:
Z13 E 572481 N 5498991

Scientific Name: *Asio flammeus*
Common Name: Short-eared Owl
Provincial Rank: S3B,S2N,S3M Global Rank: G5
Observation: First: 1996-06-30 Last: 1997-06

Occurrence ID: 11220
Occurrence Class: Vertebrate Animal
Occurrence Type:
Occurrence Rank: B - Good estimated viability

Provincial Legal Status:
Species at Risk Act Status: Special Concern
COSEWIC Status: Special Concern
General Description:

Occurrence Data:
First observation a pair of adults were engaged in courtship or display. Second observation a pair of adults were present.

Directions:
Observation 1: 2.25 km west-southwest of Union Jack. Observation
2: 2.65 km southeast of Grassdale.

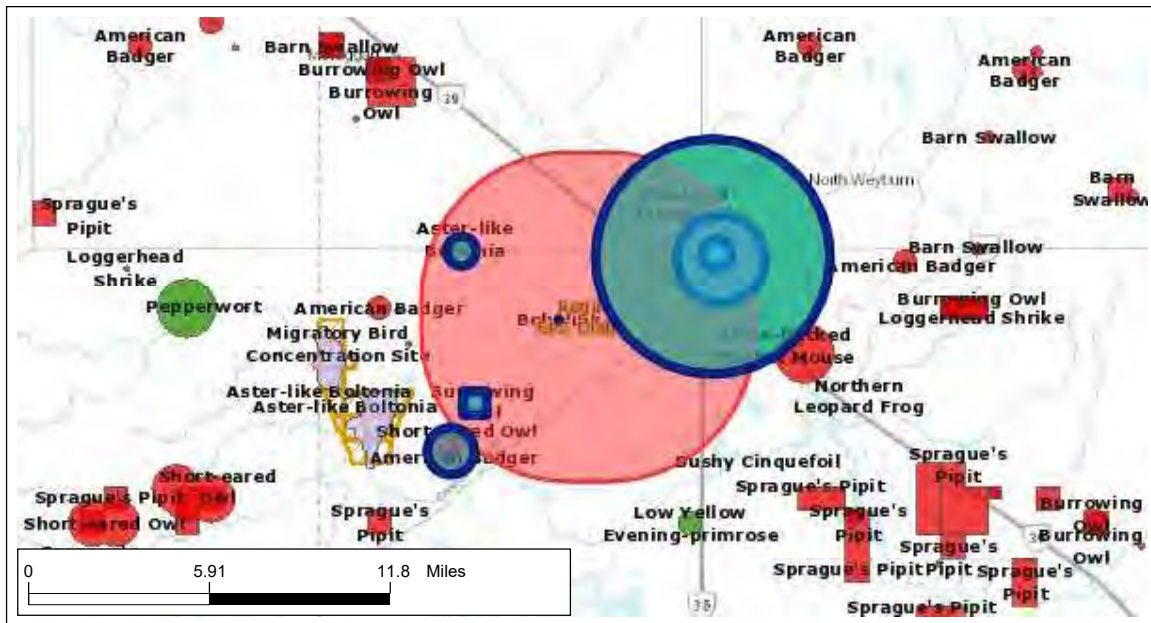
Rare and Endangered Species Report

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The absence of information provided by the Saskatchewan Conservation Data Centre (SKCDC) does not categorically mean the absence of sensitive species or features. The quantity and quality for data collected by the SKCDC are dependent on the research and observations of many individuals and organizations. SKCDC reports summarize the existing natural heritage information, known to the SKCDC, at the time of the request.

SKCDC data should never be regarded as final statements on the elements or areas being considered, nor should they be substituted for on-site surveys required for environmental assessments. The user therefore acknowledges that the absence of data may indicate that the project area has not been surveyed, rather than confirm that the area lacks natural heritage resources.

Rare and Endangered Species Area of Interest



Rare and Endangered Species Report

Scientific Name: *Boltonia asteroides* var. *recognita*

Common Name: Aster-like Boltonia

Provincial Rank: S2

Global Rank: G5T3T5

Observation: First: 1938-07-17

Last: 1938-07-17

Occurrence ID: 8529

Occurrence Class: Vascular Plant

Occurrence Type: SPECIMEN (COLLECTED)

Occurrence Rank:

Provincial Legal Status:

Species at Risk Act Status:

COSEWIC Status:

General Description:

WET GROUND

Occurrence Data:

Directions:

Scientific Name: *Boltonia asteroides* var. *recognita*

Common Name: Aster-like Boltonia

Provincial Rank: S2

Global Rank: G5T3T5

Observation: First: 1938-07-17

Last: 1938-07-17

Occurrence ID: 3281

Occurrence Class: Vascular Plant

Occurrence Type: SPECIMEN (COLLECTED)

Occurrence Rank: H - Historical

Provincial Legal Status:

Species at Risk Act Status:

COSEWIC Status:

General Description:

WET GROUND

Occurrence Data:

Directions:

5.5 MILES WEST OF WEYBURN

Rare and Endangered Species Report

Scientific Name: *Vernonia fasciculata* Occurrence ID: 16246
Common Name: Fascicled Ironweed Occurrence Class: Vascular Plant
Provincial Rank: SH Global Rank: G5 Occurrence Type:
Observation: First: unknown Last: unknown Occurrence Rank: H - Historical
Provincial Legal Status:
Species at Risk Act Status: Occurrence Data:
COSEWIC Status: Endangered pre 1957 - listed in Breitung 1957
General Description:

Directions:
Weyburn

Scientific Name: *Taxidea taxus taxus* Occurrence ID: 999958679
Common Name: American Badger Occurrence Class: Vertebrate Animal
Provincial Rank: S3 Global Rank: G5T5 Occurrence Type:
Observation: First: 2004-07-15 Last: 2018-07-15 Occurrence Rank:
Provincial Legal Status:
Species at Risk Act Status: Special Concern Occurrence Data:
COSEWIC Status: Special Concern
General Description:
1 Adult(s) (Unknown Gender); (last reported 2018)

Directions:
NW-3-8-15-2

Rare and Endangered Species Report

Scientific Name: *Dolichonyx oryzivorus* Occurrence ID: 999998421
Common Name: Bobolink Occurrence Class: Vertebrate Animal
Provincial Rank: S4B,S4M Global Rank: G5 Occurrence Type:
Observation: First: 2018-06-28 Last: 2018-06-28 Occurrence Rank:
Provincial Legal Status:
Species at Risk Act Status: Occurrence Data:
COSEWIC Status: Threatened
General Description:
1 Adult Male(s); Breeding Bird Status: H; (2018)

Directions:

Scientific Name: *Athene cunicularia* Occurrence ID: 3907
Common Name: Burrowing Owl Occurrence Class: Vertebrate Animal
Provincial Rank: S2B,S2M Global Rank: G4 Occurrence Type: OBO
Observation: First: 2009 Last: 2012 Occurrence Rank: E - Verified extant (viability not assessed)
Provincial Legal Status: Endangered Occurrence Data:
Species at Risk Act Status: Endangered 2009: Pairs 2; Singles 0. 2010: Pairs 2; Singles 0
COSEWIC Status: Endangered 2012: 2 pairs observed.
General Description:

Directions:

Rare and Endangered Species Report

Scientific Name: *Myotis lucifugus* Occurrence ID: 999971783
Common Name: Little Brown Myotis Occurrence Class: Vertebrate Animal
Provincial Rank: S4B,S4N Global Rank: G3 Occurrence Type:
Observation: First: 1957-07-15 Last: 1957-07-15 Occurrence Rank:
Provincial Legal Status:
Species at Risk Act Status: Endangered Occurrence Data:
COSEWIC Status: Endangered
General Description:
Specimen (1957)

Directions:
Weyburn, SK

Scientific Name: *Asio flammeus* Occurrence ID: 11220
Common Name: Short-eared Owl Occurrence Class: Vertebrate Animal
Provincial Rank: S3B,S2N,S3M Global Rank: G5 Occurrence Type:
Observation: First: 1996-06-30 Last: 1997-06 Occurrence Rank: B - Good estimated viability
Provincial Legal Status:
Species at Risk Act Status: Special Concern Occurrence Data:
COSEWIC Status: Special Concern First observation a pair of adults were engaged in
General Description: Second observation a pair of adults were present.

Directions:
Observation 1: 2.25 km west-southwest of Union Jack. Observation
2: 2.65 km southeast of Grassdale.

APPENDIX

B AVIAN SURVEY

DATA

APPENDIX B

Table B-1 Bird Species Abundance Detected at Each Survey Site During Grassland Bird Surveys

DATE	SURVEY SITE	UTM ZONE	UTM EASTING	UTM NORTHING	COMMON NAME	SCIENTIFIC NAME	ABUNDANCE
2018-06-22	1	13	579144	5500704	common grackle	<i>Quiscalus quiscula</i>	1
					horned lark	<i>Eremophila alpestris</i>	1
					mourning dove	<i>Zenaid macroura</i>	2
					red-winged blackbird	<i>Agelaius phoeniceus</i>	5
					upland sandpiper	<i>Bartramia longicauda</i>	4
					vesper sparrow	<i>Pooecetes gramineus</i>	2
					western meadowlark	<i>Sturnella neglecta</i>	2
	2	13	579164	5499836	American crow	<i>Corvus brachyrhynchos</i>	1
					American robin	<i>Turdus migratorius</i>	1
					brown-headed cowbird	<i>Molothrus ater</i>	1
					common grackle	<i>Quiscalus quiscula</i>	5
					killdeer	<i>Charadrius vociferus</i>	1
					mourning dove	<i>Zenaid macroura</i>	3
					red-winged blackbird	<i>Agelaius phoeniceus</i>	8
					ring-necked pheasant	<i>Phasianus colchicus</i>	1
					sora	<i>Porzana carolina</i>	1
					upland sandpiper	<i>Bartramia longicauda</i>	1
					vesper sparrow	<i>Pooecetes gramineus</i>	2
					western meadowlark	<i>Sturnella neglecta</i>	1
					3	13	579176
	clay-coloured sparrow	<i>Spizella pallida</i>	6				
	common grackle	<i>Quiscalus quiscula</i>	3				
	horned lark	<i>Eremophila alpestris</i>	1				
	killdeer	<i>Charadrius vociferus</i>	1				
	mourning dove	<i>Zenaid macroura</i>	1				
	red-winged blackbird	<i>Agelaius phoeniceus</i>	9				
	ring-necked pheasant	<i>Phasianus colchicus</i>	1				
	savannah sparrow	<i>Passerculus sandwichensis</i>	1				
	vesper sparrow	<i>Pooecetes gramineus</i>	2				
	western meadowlark	<i>Sturnella neglecta</i>	1				
	4	13	578356	5499086	Brewer's blackbird	<i>Euphagus cyanocephalus</i>	1
					brown-headed cowbird	<i>Molothrus ater</i>	1
horned lark					<i>Eremophila alpestris</i>	4	
killdeer					<i>Charadrius vociferus</i>	1	

APPENDIX B

DATE	SURVEY SITE	UTM ZONE	UTM EASTING	UTM NORTHING	COMMON NAME	SCIENTIFIC NAME	ABUNDANCE	
					mourning dove	<i>Zenaida macroura</i>	1	
					ring-necked pheasant	<i>Phasianus colchicus</i>	1	
					savannah sparrow	<i>Passerculus sandwichensis</i>	1	
					upland sandpiper	<i>Bartramia longicauda</i>	1	
					vesper sparrow	<i>Poocetes gramineus</i>	1	
					western meadowlark	<i>Sturnella neglecta</i>	2	
					Wilson's snipe	<i>Gallinago delicata</i>	1	
	5	13	577549	5499094	American robin	<i>Turdus migratorius</i>	1	
					common grackle	<i>Quiscalus quiscula</i>	10	
					eastern kingbird	<i>Tyrannus tyrannus</i>	1	
					horned lark	<i>Eremophila alpestris</i>	1	
					red-winged blackbird	<i>Agelaius phoeniceus</i>	5	
					ring-billed gull	<i>Larus delawarensis</i>	1	
					ring-necked pheasant	<i>Phasianus colchicus</i>	1	
					upland sandpiper	<i>Bartramia longicauda</i>	3	
					vesper sparrow	<i>Poocetes gramineus</i>	1	
					western meadowlark	<i>Sturnella neglecta</i>	2	
	6	13	577542	5499885	brown-headed cowbird	<i>Molothrus ater</i>	1	
					horned lark	<i>Eremophila alpestris</i>	2	
					vesper sparrow	<i>Poocetes gramineus</i>	4	
					western meadowlark	<i>Sturnella neglecta</i>	2	
					willet	<i>Tringa semipalmata</i>	1	
	7	13	577533	5500695	Brewer's blackbird	<i>Euphagus cyanocephalus</i>	1	
					brown-headed cowbird	<i>Molothrus ater</i>	4	
					European starling	<i>Sturnus vulgaris</i>	2	
					horned lark	<i>Eremophila alpestris</i>	3	
					killdeer	<i>Charadrius vociferus</i>	1	
					upland sandpiper	<i>Bartramia longicauda</i>	1	
					vesper sparrow	<i>Poocetes gramineus</i>	3	
					western meadowlark	<i>Sturnella neglecta</i>	1	
	2018-06-28	1	13	579144	5500704	American robin	<i>Turdus migratorius</i>	1
						Brewer's blackbird	<i>Euphagus cyanocephalus</i>	1
						eastern kingbird	<i>Tyrannus tyrannus</i>	1
mourning dove						<i>Zenaida macroura</i>	4	
upland sandpiper						<i>Bartramia longicauda</i>	5	
vesper sparrow						<i>Poocetes gramineus</i>	3	

APPENDIX B

DATE	SURVEY SITE	UTM ZONE	UTM EASTING	UTM NORTHING	COMMON NAME	SCIENTIFIC NAME	ABUNDANCE
					western meadowlark	<i>Sturnella neglecta</i>	2
	2	13	579164	5499836	Baltimore oriole	<i>Icterus galbula</i>	1
					brown-headed cowbird	<i>Molothrus ater</i>	4
					mourning dove	<i>Zenaida macroura</i>	2
					red-winged blackbird	<i>Agelaius phoeniceus</i>	1
					vesper sparrow	<i>Pooecetes gramineus</i>	3
					warbling vireo	<i>Vireo gilvus</i>	1
					western kingbird	<i>Tyrannus verticalis</i>	1
	3	13	579176	5499102	Brewer's blackbird	<i>Euphagus cyanocephalus</i>	5
					brown-headed cowbird	<i>Molothrus ater</i>	1
					lark sparrow	<i>Chondestes grammacus</i>	2
					mourning dove	<i>Zenaida macroura</i>	2
					red-winged blackbird	<i>Agelaius phoeniceus</i>	1
					savannah sparrow	<i>Passerculus sandwichensis</i>	2
					upland sandpiper	<i>Bartramia longicauda</i>	1
					vesper sparrow	<i>Pooecetes gramineus</i>	1
					western meadowlark	<i>Sturnella neglecta</i>	2
	4	13	578356	5499086	American goldfinch	<i>Spinus tristis</i>	2
					Brewer's blackbird	<i>Euphagus cyanocephalus</i>	1
					brown-headed cowbird	<i>Molothrus ater</i>	2
					common grackle	<i>Quiscalus quiscula</i>	1
					killdeer	<i>Charadrius vociferus</i>	1
					marbled godwit	<i>Limosa fedoa</i>	1
					savannah sparrow	<i>Passerculus sandwichensis</i>	2
					upland sandpiper	<i>Bartramia longicauda</i>	3
					vesper sparrow	<i>Pooecetes gramineus</i>	1
					western kingbird	<i>Tyrannus verticalis</i>	1
					western meadowlark	<i>Sturnella neglecta</i>	2
	5	13	577549	5499094	American goldfinch	<i>Spinus tristis</i>	1
					American kestrel	<i>Falco sparverius</i>	1
					American robin	<i>Turdus migratorius</i>	2
					Baltimore oriole	<i>Icterus galbula</i>	1
					Brewer's blackbird	<i>Euphagus cyanocephalus</i>	2
					killdeer	<i>Charadrius vociferus</i>	3

APPENDIX B

DATE	SURVEY SITE	UTM ZONE	UTM EASTING	UTM NORTHING	COMMON NAME	SCIENTIFIC NAME	ABUNDANCE				
2019-05-31					lark sparrow	<i>Chondestes grammacus</i>	1				
					red-winged blackbird	<i>Agelaius phoeniceus</i>	1				
					Swainson's hawk	<i>Buteo swainsoni</i>	2				
					vesper sparrow	<i>Pooecetes gramineus</i>	1				
					western meadowlark	<i>Sturnella neglecta</i>	1				
	6	13	577542	5499885	bobolink	<i>Dolichonyx oryzivorus</i>	1				
					Brewer's blackbird	<i>Euphagus cyanocephalus</i>	2				
					killdeer	<i>Charadrius vociferus</i>	1				
					mallard	<i>Anas platyrhynchos</i>	1				
					savannah sparrow	<i>Passerculus sandwichensis</i>	2				
					upland sandpiper	<i>Bartramia longicauda</i>	2				
					vesper sparrow	<i>Pooecetes gramineus</i>	2				
					western meadowlark	<i>Sturnella neglecta</i>	2				
					7	13	577533	5500695	American goldfinch	<i>Spinus tristis</i>	1
									American robin	<i>Turdus migratorius</i>	1
	Brewer's blackbird	<i>Euphagus cyanocephalus</i>	12								
	savannah sparrow	<i>Passerculus sandwichensis</i>	1								
	vesper sparrow	<i>Pooecetes gramineus</i>	4								
	western meadowlark	<i>Sturnella neglecta</i>	3								
	1	13	579144	5500704					American goldfinch	<i>Spinus tristis</i>	4
	American robin				<i>Turdus migratorius</i>	1					
	Brewer's blackbird				<i>Euphagus cyanocephalus</i>	2					
	brown-headed cowbird				<i>Molothrus ater</i>	3					
	Canada Goose				<i>Branta canadensis</i>	2					
	horned lark				<i>Eremophila alpestris</i>	2					
	least flycatcher				<i>Empidonax minimus</i>	1					
red-winged blackbird	<i>Agelaius phoeniceus</i>				1						
savannah sparrow	<i>Passerculus sandwichensis</i>				1						
vesper sparrow	<i>Pooecetes gramineus</i>				3						
western meadowlark	<i>Sturnella neglecta</i>				2						
2	13				579164	5499836	American robin	<i>Turdus migratorius</i>	7		
							brown-headed cowbird	<i>Molothrus ater</i>	6		
		common grackle	<i>Quiscalus quiscula</i>	7							
		eastern kingbird	<i>Tyrannus tyrannus</i>	1							
		house wren	<i>Troglodytes aedon</i>	1							

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DATE	SURVEY SITE	UTM ZONE	UTM EASTING	UTM NORTHING	COMMON NAME	SCIENTIFIC NAME	ABUNDANCE
					killdeer	<i>Charadrius vociferus</i>	1
					mourning dove	<i>Zenaida macroura</i>	5
					red-winged blackbird	<i>Agelaius phoeniceus</i>	1
					ring-necked pheasant	<i>Phasianus colchicus</i>	1
					rock dove	<i>Columba livia</i>	3
					vesper sparrow	<i>Pooecetes gramineus</i>	2
					western meadowlark	<i>Sturnella neglecta</i>	1
					yellow warbler	<i>Setophaga petechia</i>	1
	3	13	579176	5499102	brown-headed cowbird	<i>Molothrus ater</i>	3
					common grackle	<i>Quiscalus quiscula</i>	3
					common raven	<i>Corvus corax</i>	1
					killdeer	<i>Charadrius vociferus</i>	1
					mallard	<i>Anas platyrhynchos</i>	1
					marbled godwit	<i>Limosa fedoa</i>	1
					red-winged blackbird	<i>Agelaius phoeniceus</i>	1
					rock dove	<i>Columba livia</i>	5
					savannah sparrow	<i>Passerculus sandwichensis</i>	1
					upland sandpiper	<i>Bartramia longicauda</i>	2
					vesper sparrow	<i>Pooecetes gramineus</i>	2
					western meadowlark	<i>Sturnella neglecta</i>	3
	4	13	578356	5499086	Brewer's blackbird	<i>Euphagus cyanocephalus</i>	1
					brown-headed cowbird	<i>Molothrus ater</i>	8
					common grackle	<i>Quiscalus quiscula</i>	6
					horned lark	<i>Eremophila alpestris</i>	2
					mallard	<i>Anas platyrhynchos</i>	1
					upland sandpiper	<i>Bartramia longicauda</i>	1
					vesper sparrow	<i>Pooecetes gramineus</i>	2
					western meadowlark	<i>Sturnella neglecta</i>	1
	5	13	577549	5499094	American robin	<i>Turdus migratorius</i>	3
					barn swallow	<i>Hirundo rustica</i>	1
					brown-headed cowbird	<i>Molothrus ater</i>	7
					common grackle	<i>Quiscalus quiscula</i>	10
					horned lark	<i>Eremophila alpestris</i>	1
					mallard	<i>Anas platyrhynchos</i>	5
					mourning dove	<i>Zenaida macroura</i>	1
					vesper sparrow	<i>Pooecetes gramineus</i>	2

APPENDIX B

DATE	SURVEY SITE	UTM ZONE	UTM EASTING	UTM NORTHING	COMMON NAME	SCIENTIFIC NAME	ABUNDANCE
					western meadowlark	<i>Sturnella neglecta</i>	1
	6	13	577542	5499885	American goldfinch	<i>Spinus tristis</i>	2
					brown-headed cowbird	<i>Molothrus ater</i>	10
					common grackle	<i>Quiscalus quiscula</i>	11
					horned lark	<i>Eremophila alpestris</i>	1
					mallard	<i>Anas platyrhynchos</i>	2
					ring-billed gull	<i>Larus delawarensis</i>	4
					upland sandpiper	<i>Bartramia longicauda</i>	1
					vesper sparrow	<i>Pooecetes gramineus</i>	3
					western meadowlark	<i>Sturnella neglecta</i>	1
	7	13	577533	5500695	American goldfinch	<i>Spinus tristis</i>	1
					brown-headed cowbird	<i>Molothrus ater</i>	6
					eastern kingbird	<i>Tyrannus tyrannus</i>	1
					mallard	<i>Anas platyrhynchos</i>	1
					ring-billed gull	<i>Larus delawarensis</i>	2
					vesper sparrow	<i>Pooecetes gramineus</i>	1
					western meadowlark	<i>Sturnella neglecta</i>	3

APPENDIX B

Table B-2 Bird Species Abundance Detected During Migratory Bird Surveys in 2018 and 2019

DATE	SURVEY SITE	UTM ZONE	UTM EASTING	UTM NORTHING	COMMON NAME	SCIENTIFIC NAME	ABUNDANCE
2018-09-05	4	13	578356	5499086	American crow	<i>Corvus brachyrhynchos</i>	1
					American goldfinch	<i>Spinus tristis</i>	2
					Canada goose	<i>Branta canadensis</i>	42
					clay-coloured sparrow	<i>Spizella pallida</i>	1
					horned lark	<i>Eremophila alpestris</i>	2
					killdeer	<i>Charadrius vociferus</i>	1
					savannah sparrow	<i>Passerculus sandwichensis</i>	2
					unknown passerine		5
2018-10-04	4	13	578356	5499086	American kestrel	<i>Falco sparverius</i>	2
					Canada goose	<i>Branta canadensis</i>	13
					common raven	<i>Corvus corax</i>	2
					European starling	<i>Sturnus vulgaris</i>	30
					horned lark	<i>Eremophila alpestris</i>	30
					Lapland longspur	<i>Calcarius lapponicus</i>	50
					northern harrier	<i>Circus cyaneus</i>	1
					red-tailed hawk	<i>Buteo jamaicensis</i>	1
					red-tailed hawk	<i>Buteo jamaicensis</i>	1
					rock dove	<i>Columba livia</i>	30
					snow bunting	<i>Plectrophenax nivalis</i>	3
					snow goose	<i>Chen caerulescens</i>	3,457
					tundra swan	<i>Cygnus columbianus</i>	8
					western meadowlark	<i>Sturnella neglecta</i>	11
					yellow-rumped warbler	<i>Setophaga coronata</i>	2
2018-11-07	4	13	578356	5499086	American crow	<i>Corvus brachyrhynchos</i>	1
					Canada goose	<i>Branta canadensis</i>	480
					common raven	<i>Corvus corax</i>	1
					horned lark	<i>Eremophila alpestris</i>	8
					unknown corvid		2
					Unknown passerine		1
2019-04-02/2019-04-03	4	13	578356	5499086	American crow	<i>Corvus brachyrhynchos</i>	4
					Canada goose	<i>Branta canadensis</i>	4,371
					common raven	<i>Corvus corax</i>	1
					horned lark	<i>Eremophila alpestris</i>	29
					northern harrier	<i>Circus cyaneus</i>	1
					red-tailed hawk	<i>Buteo jamaicensis</i>	1
					ring-billed gull	<i>Larus delawarensis</i>	19
					rock dove	<i>Columba livia</i>	5

APPENDIX B

					rough-legged hawk	<i>Buteo lagopus</i>	1
					sharp-tailed grouse	<i>Tympanuchus phasianellus</i>	1
					snow goose	<i>Chen caerulescens</i>	517
					western meadowlark	<i>Sturnella neglecta</i>	1
2019-05-01/2019-05-02	4	13	578356	5499086	American kestrel	<i>Falco sparverius</i>	1
					brown-headed cowbird	<i>Molothrus ater</i>	2
					Canada goose	<i>Branta canadensis</i>	17
					common grackle	<i>Quiscalus quiscula</i>	24
					common raven	<i>Corvus corax</i>	5
					Franklin's gull	<i>Leucophaeus pipixcan</i>	110
					golden eagle	<i>Aquila chrysaetos</i>	1
					horned lark	<i>Eremophila alpestris</i>	4
					killdeer	<i>Charadrius vociferus</i>	1
					Lapland longspur	<i>Calcarius lapponicus</i>	270
					mallard	<i>Anas platyrhynchos</i>	1
					mourning dove	<i>Zenaida macroura</i>	7
					northern harrier	<i>Circus hudsonius</i>	1
					red-tailed hawk	<i>Buteo jamaicensis</i>	1
					red-winged blackbird	<i>Agelaius phoeniceus</i>	2
					ring-billed gull	<i>Larus delawarensis</i>	15
					rock dove	<i>Columba livia</i>	1
					sandhill crane	<i>Antigone canadensis</i>	9
					Sprague's pipit	<i>Anthus spragueii</i>	1
					Swainson's hawk	<i>Buteo swainsoni</i>	4
					unknown duck		1
					unknown songbird		331
					vesper sparrow	<i>Pooecetes gramineus</i>	4
					western meadowlark	<i>Sturnella neglecta</i>	2
					willet	<i>Tringa semipalmata</i>	1
					yellow-headed blackbird	<i>Xanthocephalus xanthocephalus</i>	1
2019-05-15/2019-05-16	4	13	578356	5499086	American crow	<i>Corvus brachyrhynchos</i>	2
					American golden-plover	<i>Pluvialis dominica</i>	51
					American kestrel	<i>Falco sparverius</i>	1
					American white pelican	<i>Pelecanus erythrorhynchos</i>	9
					barn swallow	<i>Hirundo rustica</i>	4
					bobolink	<i>Dolichonyx oryzivorus</i>	1
					brown-headed cowbird	<i>Molothrus ater</i>	9
					Canada goose	<i>Branta canadensis</i>	8
					cliff swallow	<i>Petrochelidon pyrrhonota</i>	16


APPENDIX B

				common grackle	<i>Quiscalus quiscula</i>	5
				double-crested cormorant	<i>Phalacrocorax auritus</i>	3
				ferruginous hawk	<i>Buteo regalis</i>	1
				Franklin's gull	<i>Leucophaeus pipixcan</i>	57
				horned lark	<i>Eremophila alpestris</i>	6
				killdeer	<i>Charadrius vociferus</i>	2
				mallard	<i>Anas platyrhynchos</i>	1
				marbled godwit	<i>Limosa fedoa</i>	2
				mourning dove	<i>Zenaida macroura</i>	5
				northern harrier	<i>Circus hudsonius</i>	2
				northern rough-winged swallow	<i>Stelgidopteryx serripennis</i>	1
				peregrine falcon	<i>Falco peregrinus anatum</i>	1
				red-winged blackbird	<i>Agelaius phoeniceus</i>	15
				ring-billed gull	<i>Larus delawarensis</i>	66
				ring-necked pheasant	<i>Phasianus colchicus</i>	3
				savannah sparrow	<i>Passerculus sandwichensis</i>	8
				semipalmated plover	<i>Charadrius semipalmatus</i>	15
				Swainson's hawk	<i>Buteo swainsoni</i>	3
				tree swallow	<i>Tachycineta bicolor</i>	6
				Unknown small shorebird		47
				unknown swallow		1
				upland sandpiper	<i>Bartramia longicauda</i>	4
				vesper sparrow	<i>Pooecetes gramineus</i>	11
				western kingbird	<i>Tyrannus verticalis</i>	4
				western meadowlark	<i>Sturnella neglecta</i>	7
				willet	<i>Tringa semipalmata</i>	2
				yellow-headed blackbird	<i>Xanthocephalus xanthocephalus</i>	1

APPENDIX

C

ENGAGEMENT DOCUMENTS



Open house materials
Newsletter
Newspaper ads and articles
Letter to nearby landowners

Welcome to the Pesâkâstêw Solar Project Open House



Project Overview

With the best solar resource in Canada, Saskatchewan is well-positioned for solar projects to make significant contributions to achieving SaskPower's target of 50% renewable electricity by 2030. In particular, the Rural Municipality of Weyburn, being located in southern Saskatchewan, has some of the highest solar potential in the province.

The Pesâkâstêw Solar Project is a proposed array of photovoltaic solar panels that will generate 10 MW of sustainable energy for the Saskatchewan electrical grid. This solar farm is being proposed by the Pesâkâstêw Solar Limited Partnership - George Gordon Developments Ltd., Red Dog Holdings Ltd., and Natural Forces. The project is planned to be constructed and commissioned by December 2020, supplying clean energy to the Saskatchewan electrical grid via a connection to the existing SaskPower electrical infrastructure directly adjacent to the site.

The project will use approximately 90 acres of private land with low environmental sensitivity in the Rural Municipality of Weyburn, Saskatchewan, approximately 4 km southwest of the city of Weyburn.

This open house is being held to inform residents, business owners, and other stakeholders about the project to provide the opportunity for all interested parties to ask questions and voice concerns at this early stage in project development.

What are the benefits?

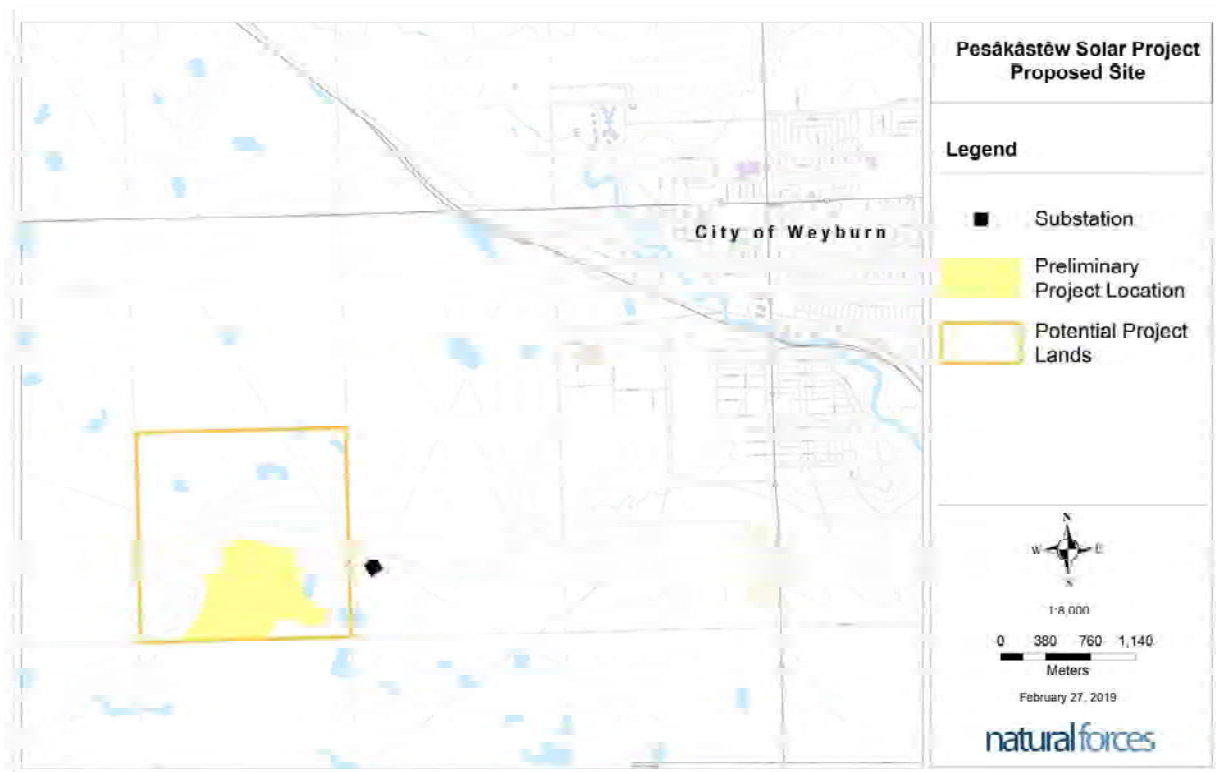
- Provide clean electricity to approximately 2,400 homes
- Displace 18,860 tonnes of CO₂ equivalent annually
- Provide long-term revenue to the economic development corporations of two Saskatchewan First Nations
- Contribute to SaskPower's target of 50% renewable energy by 2030

March 2019

The Proposed Project



The project being proposed by the Pesâkâstêw Solar Limited Partnership is an array of photovoltaic solar panels that would generate 10 MW of clean and sustainable energy for the Saskatchewan electrical grid. The project is planned to be constructed and commissioned by December 2020. The project will use approximately 90 acres of land with low environmental sensitivity in the RM of Weyburn, just southwest of the City of Weyburn.



What are the benefits?

- Provide clean electricity to approximately 2,400 homes
- Displace 18,860 tonnes of CO₂ equivalent annually
- Provide long-term revenue to the economic development corporations of two Saskatchewan First Nations
- Contribute to SaskPower's target of 50% renewable energy by 2030

Project Proponents



The project is being developed by Natural Forces on behalf of Pesâkâstêw Solar Limited Partnership, the proponent and owner of the Pesâkâstêw Solar Project. The Pesâkâstêw Solar Limited Partnership is a partnership between George Gordon Developments Ltd., Red Dog Holdings Ltd., and Natural Forces.



George Gordon Developments Ltd. (GGDL) is the economic development branch of George Gordon First Nation. By establishing important business partnerships, GGDL has become a regional First Nation leader in business development. Through these partnerships, GGDL has assembled the capacity and capability to successfully enter high quality bids on major projects related to resource development with renowned North American companies.



Red Dog Holdings Ltd. (RDHL) is the economic development branch of Star Blanket Cree Nation. One of the main goals of RDHL is to develop long term partnerships with companies that have shared values and objectives. RDHL also strives to provide opportunities for sustainable employment, training, wealth creation, and community development.

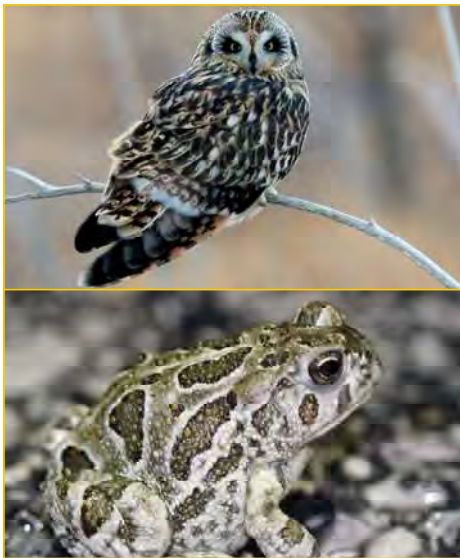
Natural Forces is a private independent power producer that delivers renewable energy projects in partnership with local communities across Canada. Natural Forces develops, constructs, owns, and operates wind, solar, and hydro projects with First Nation communities, universities, municipalities, and local community funds.



Environmental Studies



A project of this size requires a Technical Proposal to be submitted to the Saskatchewan Environmental Assessment and Stewardship Branch. The preliminary environmental studies and surveys necessary to produce this proposal are currently underway on the proposed site. These studies began in Spring 2018 and will continue through Spring 2019. Once submitted, the technical review committee will review the proposal to determine whether an Environmental Impact Assessment will be required.



Conducting public consultation early in the process allows the proponent to fully address questions or concerns brought forward. This then allows for the incorporation of stakeholder concerns into the scope of the studies and in project design.



What studies are being done?

- Soil mapping
- Migratory and breeding birds
- Vegetation and weeds
- Wetland delineation
- Sharp-tailed Grouse Lek
- Amphibian auditory
- Raptor nest and owl surveys
- Common Night Hawk
- Noise studies
- Heritage resource review

How does solar power work?

Step 1: Solar panels collect sunlight and convert it to DC electricity

The sunlight is absorbed by the material of the panel, which produces a direct current (DC) by knocking electrons out of the atoms. This is called the photovoltaic effect.



What is a solar panel?

A solar panel is made up of a series of solar modules, which are made up of a series of solar cells. Each solar cell has a glass lens covering the conductor material that absorbs the sunlight to produce an electrical current, which is most often crystalline silicon.

Step 2: An inverter converts the DC electricity to AC electricity

The DC electricity produced by the panels is not compatible with the electrical grid and the electronics in your home, which are all alternating current (AC) compatible. The inverter remedies this issue.

Step 3: The AC electricity is fed into the power grid

The AC electricity is sent into the power grid through nearby electrical infrastructure, which transforms the electricity to the proper voltage for the system. Here, the electricity reduces our reliance on non-renewable energy sources.

Facts About Solar

- Solar farms produce virtually no noise, since they have no moving parts
- Solar panels are still productive on cloudy, rainy, and cold days
- Solar panels can last up to 30 years without any significant output reduction
- Solar farms are a reversible land use - the land can be fully restored after the lifecycle

Project Timeline

2017—2018
WORK COMPLETED

Site Identification
Solar Resource Assessment
Secure Lands
Bid for PPA
Preliminary Design
Consultation with RM

2019
IN PROGRESS

Field Surveys
Consultation with RM
Public Consultation
Site Design
Project Permitting
Technical Proposal Submission
Power Purchase Agreement

2020
FUTURE WORK

Procurement of Components
Site Preparation
Electrical and Civil Works
Panel Installation
Project Commissioning

2020 & 20 years

Project Operation
On-site Maintenance
Remote Monitoring
Decommissioning
Site Reclamation

Pesâkâstêw Solar Project Proposed Site

Legend

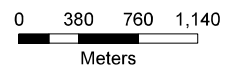
■ Substation

■ Preliminary
Project Location

□ Potential Project
Lands

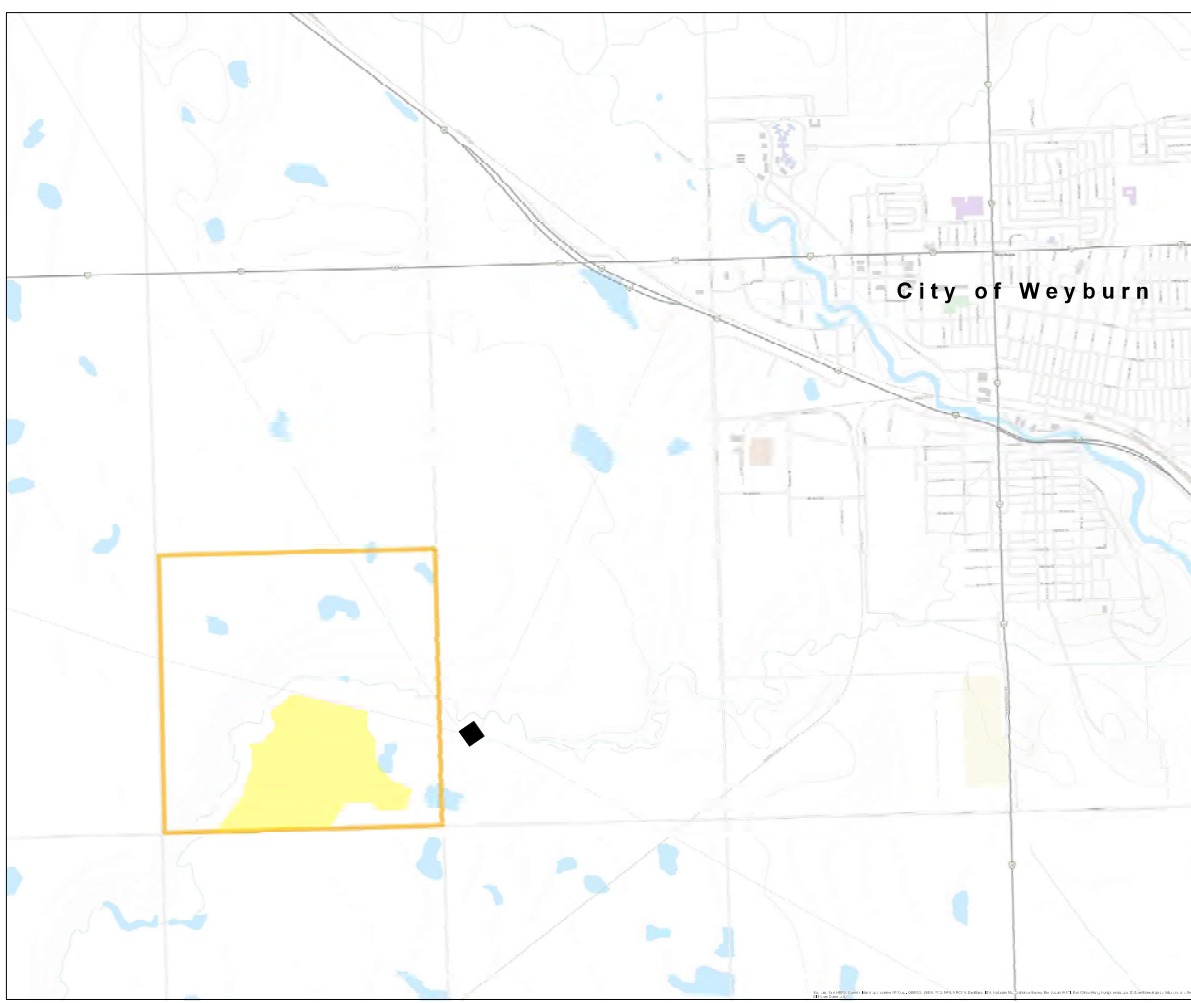


1:8,000



February 27, 2019


natural forces





Pesâkâstêw Solar Project Proposed Site

Legend

 Substation

 Proposed Solar Site



1:13,897.11

0 670 1,340 2,010
Meters

February 27, 2019



Pesâkâstêw Solar Project - Public Information Session
March 6th, 2019
Participant Questionnaire

Your feedback as a valued stakeholder is important to us.

We appreciate that you have taken the time to fill out this questionnaire. This information will help us shape the Pesâkâstêw Solar Project and plan future energy developments in Saskatchewan. Thank You!

Contact Information: (This information will not be shared with the general public.)

Name: (Please circle: Mr. / Mrs. / Ms. / Dr.) _____

Address: _____ Town: _____ Postal code: _____

Is this your primary residence? **Yes** **No**

Telephone number: _____ E-mail: _____

How did you hear about this meeting? _____

Do you have any questions about the proposed Pesâkâstêw Solar Project, including anything about the environmental studies, the partnership, and the community benefits?

Did you have any previous knowledge of the Pesâkâstêw Solar Project? If so, how did you hear about it?

Did you have the chance to speak with one of the representatives for the project? If so, did you find your discussion helpful? If not, what could have been improved?

Please continue on reverse...

Please check the most appropriate response:

Do you support solar energy, in general? Yes No Undecided

Do you support solar energy in Weyburn RM? Yes No Undecided

If you answered no to the previous question, what are your specific concerns?

Avian species

Other fauna

Vegetation and habitat

Noise impact

Visual impact

Other: _____

Correspondence:

Would you like to be added to our **MAILING LIST** for future correspondence? Yes No

How would you prefer to receive correspondence? Regular Mail E-mail

*(Please ensure a full mailing address or e-mail address is clearly printed on the reverse side.
Your phone number will only be used to clarify contact details in the event of an email or letter returned to sender)*

Please tell us a little bit about yourself (optional):

Occupation: _____



Age (check range): Under 25 25 – 34 35 – 49 50 – 64 Over 65

Are you a member of any organizations in the area? Yes No

If so, which one(s)? _____

Thank you for filling out this questionnaire!

Please leave the questionnaire with an employee of Natural Forces at the information session. It can also be forwarded to our offices via fax, email, or regular mail.

	<p>Natural Forces 1205-1801 Hollis St Halifax, NS B3J 3L1 www.naturalforces.ca</p> <p>www.naturalforces.ca/solarproject Telephone: 902-422-9663 Toll free: 1-844-422-WIND (9463)</p>	<p>Contact Person Amy Pellerin apellerin@naturalforces.ca 902-422-9663 ext. 210</p>
	<p>Please feel free to contact us with any further questions or comments.</p>	

Pesâkâstêw Solar Project

Open House #1 Summary

Open House Overview

The first public open house for the Pesâkâstêw Solar Project was held on March 6th, 2019. The open house was attended by more than 30 community members. Overall, feedback on the event was positive. Following are the questions asked by the attendees and our responses. These questions and answers have been posted to the project website as well (www.pesakastewsolarproject.ca).

In addition to these questions, we received feedback and suggestions that we will apply to future open houses and to the project itself. All comments will serve to shape our actions and decisions as we move forward.

Frequently Asked Questions and Answers

Will there be a maintenance plan for the project? If so, what will it include?

Yes, there will be a maintenance plan, which will be part of the operations plan.

Generally, equipment maintenance will be driven by the results of regular on-site inspections of the equipment, including solar panels, electrical connections, inverters, and transformers. Based on these inspections, repairs and maintenance will be carried out as needed.

Land inspections will also be part of the maintenance plan, conducted to monitor site drainage, monitor erosion, and assess risk of grass fires. Land repairs and maintenance will be driven by the results of land inspections.

Cleaning the solar panels is not planned at this time, however the first year of operation will assist in determining if cleaning should be considered as part of the regular maintenance. Snow removal is dependent upon final design.

How will the site be revegetated after construction?

There will be a vegetation management plan as part of the operations plan. Vegetation management is expected to evolve over the life of the project. The plan includes planting a ground cover underneath the panels after construction is complete. The ground cover will be selected with a view to minimizing maintenance while considering shading and moisture availability under the panels, weed removal requirements, native species, and short-growing species.

How will the site be reclaimed after the project is decommissioned?

At the end of the project life, the site will be de-energized and all of the equipment will be dismantled and removed. This will include all surface components as well as those subsurface components to a depth of 1 m. Equipment and materials will be recycled as appropriate. The soil and land will be restored to original grade. In consultation with the municipality and landowner, seeding will be carried out growing to prevent topsoil erosion.

March 2019



How much property tax will this project supply for the RM of Weyburn?

At this time, the property tax assessment indicates that the project will pay approximately \$28,000 to \$47,000 per year in property taxes. As property taxes are a function of the cost of specific equipment items and structures, the value of taxes paid will decrease as the value of the project depreciates.

Will the project produce a lot of noise during operation?

Solar projects emit very little noise, with the loudest noise being from the transformers. As the project is located directly adjacent to an existing SaskPower owned substation, the background noise levels will far exceed the noise from the project. As such, the project is not expected to create significant increase to the noise levels.

How big is each solar panel/module?

The average size of solar module used in a utility sized solar project is approximately 1 m x 2 m. Together, several solar modules form a solar array. While this will likely be the size of modules used for this project, the design of the project and the specific equipment have not been finalized or selected.

When will the project start producing electricity?

The project is planned to be commissioned in late 2020, which will mark the beginning for electricity production on the site.

Do solar panels produce glare? How will this impact nearby houses, traffic, and animals?

Solar panels can produce some glare, but no more than what might be produced from a still pond. This project is expected to have negligible, if any, glare impact in the surrounding area.

How does the Environmental Assessment process work?

According to the Saskatchewan Environmental Assessment Act, 2018, a solar project of this size is required to submit a Technical Proposal (expanded upon below) to the Saskatchewan Environmental Assessment and Stewardship Branch (EAB). This is the first step in the Environmental Assessment (EA) process. The Technical Proposal is then screened by the staff at the Department of Environment to determine if the project is deemed to be a *Development* under the definition in the Act. A *Development* is a project deemed to have an effect on unique, rare, or endangered features in the area, use a substantial provincial resource, cause emissions or by-products, cause widespread concern due to potential environmental changes, induce significant environmental change, or have a significant impact on the environment.

If it is determined that the project is not a *Development*, the project can proceed, however it is still required to secure a number of additional applicable permits and approvals under other departments and government levels.

If it is determined that the project is considered a *Development*, the proponent is required to conduct an EA and submit an Environmental Impact Statement (EIS). This document is reviewed by the Saskatchewan EA Review Panel and the EAB, which, if necessary, provide comments for revisions to the proponent. Once the EIS is deemed adequate, it is released for a 30-day public review period along with the technical review comments. Finally, the EIS, technical review comments, and any public comments are submitted to the Minister who decides whether or not to approve the development. A flow chart of this process can be found at: <http://publications.gov.sk.ca/documents/66/89132-EAFlowProcessMap.pdf>

What goes into a Technical Proposal?

The Technical Proposal that must be submitted to the Saskatchewan Environmental Assessment and Stewardship Branch requires the following information:

- Project description
- Description of the biological, physical, and human environmental features of the project site
- Potential impact the project might have on the environmental features and associated mitigation measures
- Monitoring programs to minimize impacts during construction and operation
- Conceptual decommissioning and reclamation plans
- Documentation of stakeholder engagement
- Documentation of First Nation and Métis engagement

Who makes the decision of whether the project can proceed or not?

If the project is not deemed a *Development*, the staff at the Saskatchewan Environmental Assessment and Stewardship Branch decide if the project requires additional permits.

If the project is deemed a *Development* and be required to submit an EIS, the Minister of Environment makes the final decision at the end of the Environmental Assessment process as to whether the project can proceed or not. The Minister is given all of the technical review comments and the public comments to aid in this decision.

When do the environmental studies occur?

Environmental studies are typically conducted from early Spring through Fall. During the 2018 study season, the following studies were completed:

- Breeding bird surveys
- Fall migratory bird surveys
- Vegetation, wetland, and weed assessments

The field surveys required in the 2019 season include:

- Spring migratory bird surveys (early and mid-Spring)
- Sharp-tailed Grouse Lek surveys (mid to late March and early May)
- Raptor Stick nest survey
- Amphibian auditory survey (early, mid, and late Spring)
- Breeding bird survey to supplement 2018 data
- Short Eared Owl survey
- Common Night Hawk survey

Are there any environmental sensitivities near the proposed site?

Based on the data gathered to date, the environmental sensitivity of the site has been designated as low. Some drainage channels have been observed, but it is believed that this will be advantageous to the project in helping to maintain natural drainage on the site during operation.

Who are the proponents and where are they from?

There are three proponents for this project who, together, form the Pesâkâstêw Solar Limited Partnership. The limited partners are:

- **George Gordon Developments Ltd. (GGDL)**, which is the economic development branch of George Gordon First Nation based in Punnichy, SK. By establishing important business partnerships, GGDL has become a regional First Nation leader in business development. Through these partnerships, GGDL has assembled the capacity and capability to successfully enter high quality bids on major projects related to resource development with renowned North American companies.
- **Red Dog Holdings Ltd. (RDHL)**, which is the economic development branch of Star Blanket Cree Nation based in Fort Qu'Appelle, SK. One of the main goals of RDHL is to develop long term partnerships with companies that have shared values and objectives. RDHL also strives to provide opportunities for sustainable employment, training, wealth creation, and community development.
- **Natural Forces**, which is a private independent power producer based in Halifax, NS that delivers renewable energy projects in partnership with local communities across Canada. Natural Forces develops, constructs, owns, and operates wind, solar, and hydro projects with First Nation communities, universities, municipalities, and local community funds.

How does the partnership between First Nations and the independent power producer work?

The Pesâkâstêw Solar Limited Partnership is a true equity partnership between Natural Forces, and George Gordon Developments Ltd. and Red Dog Holdings Ltd. Each partner contributes their proportionate share of the capital required for this project and once the project is operational, each partner will receive their proportionate share of project income.

How are Atim-Ka Mikosit - ONEC and WSP involved in the project?

Atim-Ka Mikosit - ONEC are acting in their capacity as the project engineers for the design and construction of the project.

WSP have been hired to conduct the environmental baseline surveys on the project site.

Have you considered the use of local sheep for vegetation control in the project area instead of mowing?

Yes, sheep are being considered for vegetation control around the project area. There are several methods of controlling the vegetation being considered. Vegetation control will be part of the vegetation management plan.

Next Steps

Community support is important for a project of this kind. We are thrilled that community members expressed interest and provided valuable feedback at the open house. We hope community involvement continues as the project progresses and as we organize more public consultation sessions. At this time, the next open house is being considered to take place in early summer 2019, which will be advertised on our website and through local media outlets. This second open house will serve to update the community on the status of the project, to answer any questions, and to collect comments and feedback. In the meantime, we will be continuing our environmental studies and working with the RM of Weyburn to satisfy our permitting requirements. We expect to submit the Technical Proposal to the Ministry of Environment during the summer months, once our surveying is completed.

YOU'RE INVITED

OPEN HOUSE

PROPOSED SOLAR PROJECT IN WEYBURN RM

MARCH 6TH, 2019

3:30-7:30 PM

Captains Hall

122 4th St. Weyburn, SK

Come Join Us!

On behalf of the Pesâkâstêw Solar Limited Partnership, Natural Forces is hosting an open house for the proposed Pesâkâstêw Solar Project. The 10 MW solar project is proposed for a location 4 km southwest of the City of Weyburn. Natural Forces, George Gordon Developments Ltd., and Red Dog Holdings Ltd., the three partners, will all be present to help answer any questions you may have. Project information will be on display boards, with prints available to take home. Food and beverages will be provided.

Contact Us

Amy Pellerin

1 (902) 422-9663

1 (844) 422-9463 (toll free)

www.naturalforces.ca

apellerin@naturalforces.ca



Proposed Solar Project in Weyburn RM



Open House

March 6th, 2019
3:30 pm - 7:30 pm
Captains Hall
122 4th St.



Proposed Solar Project in Weyburn RM



Open House

March 6th, 2019
3:30 pm - 7:30 pm
Captains Hall
122 4th St.



Proposed Solar Project in Weyburn



OPEN HOUSE

March 6th, 2019

3:30 pm - 7:30 pm

Captains Hall

122 4th St.

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LICENSED & BONDED

Sunshine Attracting Project To Weyburn Area

Category: Local News
Published: Wednesday, 13 February 2019 05:36
Written by Steven Wilson



Natural Forces, which has partnered on wind projects such as this one in Nova Scotia, is embarking on their first ever solar energy project in the R.M. of Weyburn. (photo courtesy Natural Forces)

Quicklinks

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- Weyburn Red Wings
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Search the Biz Guide

The southeast corner of Saskatchewan is well known for the amount of sunshine the region receives each year. For those in the renewable resource industry, in particular, solar energy, it could be considered the equivalent of striking gold.

Pesākāstēw Solar Limited Partnership is a joint venture involving Red Dog Holdings, George Gordon Developments, and Natural Forces, a company based out of Halifax. They are in the process of getting a solar energy project off the ground in the Rural Municipality of Weyburn, and were in the community this week, ahead of a planned open house next month.

"This is a 10-megawatt solar project, so it's a big utility-scale project that will be able to produce electricity for about 2300 homes in the area," explained Amy Pellerin, a development engineer with Natural Forces.

The project is expected to get underway in the fall of 2020, and for a project on this scale, it means more than likely, there will be a number of jobs created during the construction process.

"When construction starts, we are going to be looking at hiring local contractors for the work, and also including some of our partners that will be owning the project into the construction as well," Pellerin added.

Ahead of the start of the work with the project, the team from Pesākāstēw has been meeting with community leaders in the R.M. of Weyburn, and in the City of Weyburn.

They will be holding an open house to provide more information to the general public in the coming weeks. It is scheduled for March 6th, at Captain's Hall in Weyburn from 3:30 p.m. to 7:00 p.m.

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Upcoming Events

Feb 20 10:00 am **Drop In Story Time**

Feb 20 12:30 pm **Carvers Niche**

Feb 20 2:00 pm **Games Galore**

Feb 20 6:00 pm **Knights of Columbus Bingo**

More Events

Solar Power Proponent Aiming for Big Project Near Weyburn

☰ Category: [Local News](#)

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✍️ Written by Marna McManus



A field now, this is the proposed site of the Pesâkâstêw Solar Project. (photo courtesy naturalforces.ca)

Weyburn stands to be put on the map for renewable energy thanks to the Pesâkâstêw project. They held an open house in Weyburn on Wednesday to consult with the public about a solar project near Weyburn.

“The project that was being discussed yesterday at the open house is a solar project being proposed in the RM of Weyburn just southwest of the City of Weyburn,” explained Twila Walkeden with Weyburn Regional Economic Development. “So right now what they’re doing is they’re conducting public consultation, informing the public of the scope of the project and hearing any concerns.”

She said the turnout for the open house was great, with a number of individuals from Natural Forces, one of the partners in the project, also in attendance.

Walkeden explained the proposed project.

“There will be proposed an array of solar panels that will occupy approximately 90 acres of land located about four kilometres southwest of the city. This will potentially generate ten megawatts of clean, sustainable energy for the

Saskatchewan electrical grid," she said. "So this really puts Weyburn on the map in terms of expanding those renewable energy sources so we can contribute to the reduction of greenhouse gas emissions."

She noted solar panels are, in fact, actually still productive on cloudy, rainy and cold days.

"This positions our community for those other proponents who are maybe looking at developing wind or solar or geothermal," said Walkeden. "It allows our community to really showcase our open for business attitude, the fact that we are embracing these types of technologies. I really think it's something we can look forward to expanding in the future."

Walkeden said from the proponent's point of view, Saskatchewan is currently the focus of both solar and wind.

"We're known around the world of having abundant wind and abundant sunshine, so we're really looking at huge opportunities for investment, and huge opportunities to really lessen our reliance on non-renewable energy resources," she said.

While Pesâkâstêw is looking at commissioning by December 2020, a project of this size requires the submission of a technical proposal to Saskatchewan Environmental Assessment.

"The preliminary studies are going on right now," she said. "I think what they're looking for in the spring, is the completion of some of the studies, so of course soil mapping, migratory and breeding birds, amphibian studies, all those things have to take place before this type of proponent is successful in getting the permits that they require from the Saskatchewan government."

She said the studies, in conjunction with the public consultation to fully address any concerns, reflect that Pesâkâstêw is working by the book.

"They're doing the right things in terms of what they're doing for both the environment and the community, so we really hope that the public is aware of it and has faith in the process."



Their address

May 4, 2020

Dear _____,

My name is Amy Pellerin and I work with a company called Natural Forces. We are a renewable energy developer who develops, constructs, owns and operate wind, solar and small hydro projects across Canada.

The reason for my letter is that we are currently proposing to develop a 10 MW solar photovoltaic project in the Rural Municipality of Weyburn neighbouring lands that you own.

Project description

The Pesâkâstêw solar project is proposed to be located on lands numbered 13-8-15 and would be constructed in 2020. Currently, the project would produce approximately 10MW of energy, enough to supply electricity to approximately 2,400 homes.

The project will connect to the existing substation East of the project lands. The exact design of the project has yet to be determined and further studies are required in order to finalize the design and the location of the project such as geotechnical studies which will be undertaken in the coming weeks.

To produce 10MW of electricity, solar panels will be installed on approximately 85-100 acres of land.

Open house

An Open House is planned on March 6th from 3:30-7:30 at the Captain's Hall in Weyburn. I hope you are able to attend to help answer questions you may have. Additionally, please feel free to reach out to me directly at:

Amy Pellerin
apellerin@naturalforces.ca
902-422-9663 x 210
1801 Hollis Street, Suite 1205
Halifax, NS B3J 3N4

Sincerely,

Amy Pellerin, P.Eng
Development Engineer

APPENDIX

D

COMPLAINT RESOLUTION PLAN



Formal Complaint and Concern Procedure for the Pesâkâstêw Solar Project

Pesâkâstêw Solar Limited Partnership (the Proponent) and owner of the Pesâkâstêw Solar Project, is committed to addressing any public concerns regarding the Project located in the Rural Municipality of Weyburn, Saskatchewan. The intention is that this plan can inform the public on the ways that they can communicate their concerns to the Partnership and how concerns will be addressed.

1.0 PURPOSE

The purpose of this policy is to ensure all public concerns are dealt with consistently and effectively. Pesâkâstêw Solar Limited Partnership aims to:

- Manage concerns and complaints openly, promptly and properly;
- Resolve concerns and complaints as soon as possible; and
- Learn from the issues and improve our commitment to minimize any impacts on the community.

2.0 SCOPE

This policy will address any concerns complaint; written or spoken expression of dissatisfaction that are brought forward to the Partnership regarding the Pesâkâstêw Solar Project.

3.0 PROCEDURE

All concerns or complaints of the Pesâkâstêw Solar Project will be directed to the Community Liaison Officer, Amy Pellerin:

Amy Pellerin | Senior Development Manager
Natural Forces Wind Inc.
1801 Hollis Street | Suite 1205 | Halifax | NS | B3J 3N4
Tel: +1 902 422 9663 x 210
Fax: +1 902 422 9780
Website www.naturalforces.ca

Complainant will be notified upon receipt of the complaint. The Community Liaison Officer will investigate complaints within 20 days of being receiving; upon which complainant will be notified of how the concern was or will be addressed.

3.1 Noise and Glare

Complaints regarding noise and glare will be assessed on a case by case basis. The specific date and time frame at which the noise or glare was perceived as well as the local weather conditions will be noted. The Operations Team will then be contacted to determine the operational data at the time of the perceived impact.

All the details will be included in a concern and complaint tracker.

The complainant will also be asked to record any additional incidents or occurrences.

If several occurrences of issues regarding noise and/or glare arise from the Pesâkâstêw Solar Project, an assessment of the causes of the impacts will be conducted and a monitoring program will be developed and implemented in consultation with the complainant.

Mitigation measures to reduce noise and glare have been described in the Technical Proposal and will be discussed with the Project's Operations Team.

Complainant(s) will be informed of noise and glare mitigation strategies and will be contacted periodically throughout the first year of the implementation of the noise or glare reduction strategies to determine the success of the strategy.

3.2 Construction and Operation

Complaints regarding construction and operation activities will be discussed with workers or contractors involved.

Solutions to the complaints will be established with worker(s) and contractor(s). Complainant will be informed of how issue was addressed.

If complaints persist, then worker(s) and contractor(s) may be dismissed.

4.0 CLOSURE

If the complainant is not satisfied with the initial response, the complaint will be referred to a higher authority within the company to further resolve the issue.