



**ALBERTA UTILITIES COMMISSION
POWER PLANT APPLICATION
(AUC RULE 007)
FOR THE PROPOSED
VULCAN SOLAR PROJECT**

**Submitted by:
Vulcan Solar Hybrid Energy Centre Limited Partnership
53 Jarvis Street Suite 300
Toronto, ON M5C 2H2
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LIST OF ACRONYMS

AC	Alternating Current
ACT	Alberta Culture and Tourism
AEP	Alberta Environment and Parks
AESO	Alberta Electric System Operator
AIES	Alberta Interconnected Electric System
AUC	Alberta Utilities Commission
BSR	Blackspring Ridge Wind Power Project
DC	Direct Current
EE	Environmental Evaluation
ECDI	EDF EN Canada Development Inc.
HEEA	Hydro and Electric Energy Act
HRA	Historical Resources application
kVA	kilovolt-ampere
LSD	Legal Subdivision
MVA	megavolt-ampere
MW	megawatt
PIP	Participant Involvement Program
PV	Photovoltaic
SLD	Single Line Diagram

Executive Summary

Vulcan Solar Hybrid Energy Centre Limited Partnership (Vulcan Solar LP) proposes to permit, construct, and operate a 77.5 megawatt alternating current [MW_{AC}] (109.84 megawatt direct current (MW_{DC})) solar photovoltaic (PV) facility, known as the Vulcan Solar Project (the Project) in southern Alberta. Vulcan Solar LP is 100% owned by EDF EN Canada Development Inc. (ECDI). ECDI is wholly owned by EDF EN Canada Inc. See Figure 1 below.

The Project is located approximately 18 kilometres east, 40 kilometres north, and 43 kilometres southeast of Carmangay, Lethbridge, and Vulcan, respectively. Vulcan Solar LP proposes to site the Project over six quarter-sections, within the Blackspring Ridge Wind Power Project (AUC Approval No. U2013-14) area and interconnect it to the Blackspring Ridge 485S substation (Permit and Licence No. U2012-629). Pending Alberta Utilities Commission (AUC) approval, Vulcan Solar LP will phase the Project into two parts: approximately 55 MW_{AC} (73.23 MW_{DC}) and 22.5 MW_{AC} (36.61 MW_{DC}), constructed in 2017 and 2018, respectively.

Typically, ground-mount solar photovoltaic technology consists of solar PV modules mounted at ground level on a racking system. For solar facilities, the racking can be fixed, fixed-tilt, single-axis tracking, or dual-axis tracking. The type of racking system depends on the solar resource and the cost of the racking system. The PV modules are aligned on collection strings and joined with combiner and re-combiner boxes to an inverter skid. The direct current side of the system is called the direct current (DC) collection system. The inverters then convert the power from direct current to alternating current, bringing power to a transformer to step up the power, and then to the substation or switchyard.

Solar PV is quiet. Solar PV does not typically require water during the power production cycle; however, water can be used for washing the panels to remove debris when needed. Normal operation uses rainfall to clean the panels.

The Project will include solar PV modules installed on single-axis tracking racks. The solar PV technology selected is a monofacial N-type monocrystalline silicon called LG NeON2 72 Cell 370W.

ECDI submitted a “behind the fence” system application for the Project to the Alberta Electric System Operator (AESO) (Project number 1762, Project Name EDF EN Vulcan Solar PV). The Project has received signoff from Alberta Environment and Parks. Vulcan Solar LP expects the Project to achieve commercial operations by fall 2017 (Phase 1) and fall 2018 (Phase 2).

The Blackspring Ridge Wind Power Project (BSR) is close to the Project. Affiliates of ECDI and Enbridge co-own BSR and the substation; Enbridge is the operator and ECDI is the manager of BSR. ECDI exclusively owns the Project. The Project lands were included in the environmental studies that were completed in preparation for the BSR AUC application. While some study BSR results have been utilized in the study of the Project, additional studies were performed by the ECDI at the request of Alberta Environment and Parks (AEP). Vulcan Solar LP expects the BSR and the Project to share the same interconnection point and transformer. Vulcan Solar LP does not expect to require any new transmission infrastructure for the Project. Vulcan Solar LP will implement a separate metering scheme for the Project at the Blackspring Ridge 485S substation; Vulcan Solar LP will submit a separate AUC behind the fence substation application.

While AUC Rule 007 does not have specific requirements identified for solar PV technology, Vulcan Solar LP reviewed the requirements of Rule 007 and, specifically, the wind power plant information requirements to identify which requirements could likely apply to single-axis tracking ground-mount solar PV technology. Vulcan Solar LP addresses these aspects in this application.

Pending AUC approval, the Project will use approximately 297,000, ground-mounted high efficiency solar PV panels. The Project will utilize infrastructure at the Blackspring Ridge 485S substation.

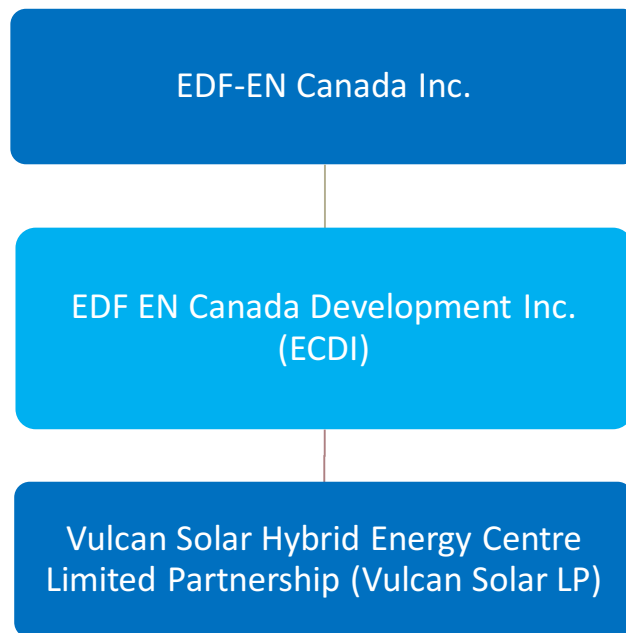


FIGURE 1: ORGANIZATIONAL CHART FOR ENTITIES ASSOCIATED WITH VULCAN SOLAR PROJECT

PP1

Identify the sections of the Hydro and Electric Energy Act under which the application is made.

Vulcan Solar LP hereby applies under Section 11 of the *Hydro and Electric Energy Act*, c H-16, R.S.A 2000 (HEEA), as amended.

PP2

Identify any other acts (e.g., Environmental Protection and Enhancement Act, Water Act, and Wildlife Act) that may affect the project.

The following provincial and federal statutes may affect the Project:

- *Electric Utilities Act*, S.A. 2003, c. E-5.1;
- *Municipal Government Act*, R.S.A. 2000, c. M-26;
- *Alberta Utilities Commission Act*, 2007, c. A-37.2;
- *Safety Codes Act*, R.S.A. 2000, c. S-1;
- *Historical Resources Act*, R.S.A. 2000, c. H-9;
- *Environmental Protection and Enhancement Act*, R.S.A. 2000, c. E-12;
- *Wildlife Act*, R.S.A. 2000, c. W-10;
- *Migratory Birds Convention Act*, S.C. 1994, c. 22;
- *Species At Risk Act*, S.C. 2002, c. 29; and,
- *Water Act*, R.S.A. 2000, c. W-3.

PP3

State the approvals that are being applied for from the Commission, and provide a draft of the approval being requested.

Vulcan Solar LP applies for the following approval: Pursuant to Section 11 of the *HEEA*, an order approving the construction and operation of the Project.

Attachment 1 provides draft approval for the Project.

PP4

Provide a list of existing approvals for facilities directly affected by this project, if any.

The Project is among the turbines in the Blackspring Ridge Wind Power Project (BSR) (AUC Approval No. U2013-14) and will connect to the BSR 485S substation (Permit and Licence No. U2012-629). Affiliates of EDF EN Canada Inc. and Enbridge co-own the facilities.

There are no other known approvals for facilities the Project directly affects.

PP5

Provide details and outcome of consultation with local jurisdictions (e.g., municipal districts, counties).

Ongoing consultation with affected municipal districts and elected representatives began on August 5, 2015. Project representatives engaged with local stakeholders early and throughout the Project's planning and development. Vulcan Solar LP personally consulted with all stakeholders through face-to-face meetings, phone calls, and email, and provided them with an original and an updated Project Information Package.

Project representatives met with Vulcan County on four occasions to discuss the Project and provide updated Project information. Project representatives worked closely with the County as part of the municipal development permit process. At Vulcan County's request, Vulcan Solar LP is deferring the development permit application until construction is imminent. On June 14, 2016, Vulcan County issued a letter to the AUC demonstrating its understanding of and support for the Project (Attachment 2).

On four occasions, Project representatives also met with the Mayor of the Village of Carmangay to discuss the Project. On July 11, 2016, the Mayor of the Village of Carmangay issued a letter of support to the AUC demonstrating her understanding of and support for the Project (Attachment 2).

Attachment 3 provides further details on the engagement activities and consultation results, including those with Vulcan County representatives.

PP6

Provide a list of parties that may be affected by the project, confirm that these parties have no concerns regarding the application, and indicate which other agreements are necessary to carry out the project.

PP17, PP18, PP20, PP21, PP22, and PP23 cover notification and consultation with landowners, residents, and occupants.

Vulcan Solar LP consulted the following companies, which have a registered interest in the Project lands. None of these parties indicated concerns. Please see Attachment 3 for the *Participant Involvement Program – Engagement Report*. Vulcan Solar LP will require a crossing agreement with each of the following parties/companies:

- Little Bow Gas Co-op Ltd. — registered caveat on SW 20-13-21 W4M
- Tuscany Energy Ltd. — registered caveat on SW 1-14-22 W4M
- AltaLink Management Ltd — registered caveat 36-13-22 W4M and 1-14-22 W4M
- Blackspring Ridge I Wind Project L.P. — registered caveat on NE18-13-21 W4M, E19-13-21 W4M, W20-13-21 W4M, NW17-13-21 W4M, S30-13-21 W4M, E25-13-22 W4M, E36-13-22 W4M, NW36-13-22 W4M, LSD3 1-14-22 W4M (Crossing agreement required for SE30-13-21 W4M)
- Vulcan County

PP7

For wind power plants, provide a copy of approval from Transport Canada for any structures 20 metres or taller and an evaluation from NAV Canada.

Not applicable, as the Project is a solar power facility and no structures will exceed 20 metres.

PP8

For wind power plants, provide a copy of an assessment from Environment Canada regarding the potential for interference with weather radars. For assessments in which Environment Canada has identified the potential for significant interference with a weather radar, also provide a copy of a mitigation agreement to be concluded with Environment Canada prior to operation of the wind power plant. No wind power plant will be permitted within a five-kilometre radius, or as otherwise agreed to by Environment Canada, of a federal weather radar station due to the significant interference to Environment Canada's ability to accurately forecast the weather.

Not applicable, as the Project is a solar power facility and no structures will exceed 20 metres.

PP9

Provide a copy of the approval from Alberta Transportation if a wind power plant that is within 300 metres of a numbered highway is being applied for.

Not applicable, as the Project is a solar PV facility and it will not be within 300 metres of a numbered highway.

PP10

Confirm that an application to AEP has been made, if applicable, and list all other government departments and agencies from which approval is required. For all power plant applications, a local AEP wildlife biologist must be consulted unless the project is located within an urban area with no nearby wildlife habitat. The Commission requires a sign-off from AEP prior to processing any new wind power applications.

Application to Alberta Environment and Parks (AEP) under the *Environmental Protection and Enhancement Act* is not required for the Project.

Project representatives consulted with AEP Senior Species at Risk Biologist, Ms. Brandy Downey, throughout Project planning. While not a new wind facility, AEP issued a "*Wildlife Renewable Energy Referral Report*" on July 5, 2016, approving both the proposed Project and a Post Construction Monitoring Plan (PCMP) (Attachment 4).

PP11:

With respect to new facilities or alterations, that may have historical, archaeological or paleontological impacts, confirm that a *Historical Resources Act* clearance has been obtained or is being applied for. If a historical or archaeological impact assessment is required, briefly describe any historical, archaeological or paleontological sites close to the power plant site. Please ensure that any summary provided protects the confidential location of any historical, archaeological or paleontological resources.

On August 14, 2015, Project representatives, Stantec Consulting Ltd. (Stantec), submitted an Historical Resources application (HRA) to Alberta Culture and Tourism (ACT), detailing that

limited potential for archaeological and palaeontological resources occur in the Project given the cultivated habitat and depth to bedrock within the Project area.

On September 21, 2015, Alberta Culture and Tourism issued a Historic Resources Application granting *Historical Resources Act* approval (Attachment 5). Specifically, the September 2015 approval states:

“Historical Resources Act approval is granted subject to Section 31, ‘a person who discovers an historic resource in the course of making an excavation for a purpose other than for the purpose of seeking historic resources shall forthwith notify the Minister of the discovery.’ The chance discovery of historical resources is to be reported to the contacts identified within the Listing of Historic Resources.”

On June 2, 2016, Stantec submitted an updated HRA to ACT, detailing additional Project lands and their limited potential for archaeological and palaeontological resources given that the land use is cultivation. Stantec recommended that clearance be given and no further work completed (e.g., historical resources impact assessment). ACT is reviewing the updated lands HRA. Upon receipt of ACT re-evaluation, it will be submitted to the AUC.

PP12

Provide the ISO assigned asset identification code, if available.

The Project will use the same ISO asset identification code as the Blackspring Ridge Wind Power Project. The ISO asset identification code for the Project is 1676.

PP13

Provide the legal description of the proposed power plant site (legal subdivision [LSD], Section, Township, Range, Meridian and/or Plan, Block, Lot, municipal address for urban parcels) and connection point, if applicable.

Table 1: Project Legal Land Description

Component	LSD/Quarter section	Section	Township	Range	Meridian
Generating units	NW	17	13	21	W4
Generating units	NE	18	13	21	W4
Generating units	NE	19	13	21	W4
Generating units	SE	19	13	21	W4
Generating units	NW	20	13	21	W4
Generating units	SW	20	13	21	W4
Collection to substation	SE	30	13	21	W4
Collection to substation	SW	30	13	21	W4
Collection to substation	SE	25	13	22	W4
Collection to substation	NE	25	13	22	W4
Collection to substation	SE	36	13	22	W4

Component	LSD/Quarter section	Section	Township	Range	Meridian
Collection to substation	NE	36	13	22	W4
Collection to substation	NW	36	13	22	W4
Collection to substation	LSD 3	1	14	22	W4

PP14

For wind power plant applications, provide the longitude and latitude coordinates for the centre of each structure supporting a wind-powered generator. If, after approval is granted, the location of any supporting structure has to be relocated more than 50 metres from the coordinates stated in the application, the power plant proponent must reapply to the Commission for approval to relocate the structure prior to construction. For movement less than 50 metres, the applicant is not required to reapply unless there is an adverse impact on the permissible sound level or wildlife setback distances.

Not applicable, as the Project is a solar power facility.

PP15

Describe the number of generating units and the total capacity (kilovolt-ampere [kVA], or megavolt-ampere [MVA]) for the project.

The Project will consist of approximately 297,000, 370-watt solar PV panels constructed in two phases. If technological improvements are available prior to construction, Vulcan Solar LP will review the potential to integrate higher efficiency solar PV panels; however, cumulatively, the solar PV panels will generate 77.5 MW_{AC} (109.8 MW_{DC}), with 55 MW_{AC} in Phase 1, and 22.5 MW_{AC} in Phase 2.

PP16

Describe the existing environmental and land use conditions in the local study area, and discuss potential siting and land use issues. Also, describe the regional setting of the development including regional land use plans in force (e.g., the Lower Athabasca Regional Plan). If applicable, include maps showing important environmental features and sensitive areas on or near the project site.

Maps detailing the Project are provided in Attachment 6.

The proposed Project's power-generating component (solar panels and inverters) is on six quarter-sections of private land in Vulcan County (Table 1). The Project area is bounded to the north by Township Road 134 and bisected by Range Road 215.

The Project's electrical collection component (the "Collection System") connects the panels and inverters to the BSR 485S substation (in SW 1-14-22 W4M) via underground cabling through eight quarter-sections of private land, also in Vulcan County (Table 1).

The Vulcan County Land Use Bylaw 2010-010 and Land Use District Map classifies the Project area as “Rural General — RG.” This land use classification is not a siting concern. The landowners have executed right-of-way agreements with ECDI for the Project. In addition, these landowners are participants in the EDF EN Canada Inc. co-owned BSR. There are 10 residences and 1 abandoned house within 2,000 metres of the Project.

The Project area consists of cultivated agricultural cropland. Vulcan Solar LP specifically targeted cultivated cropland habitat to avoid potential wildlife conflicts, as detailed in the Stantec (2015a) *Vulcan Solar Project Wildlife Assessment (Attachment 7)*. This document also provides maps.

As detailed in Stantec’s 2016 report, *Wetland Impact Assessment, Vulcan Solar Photovoltaic Facility (Attachment 7)*, Vulcan Solar LP completed a wetland assessment for the Project to comply with the Alberta *Water Act* (Government of Alberta, 2000). Based on its layout, Vulcan Solar LP anticipates the Project will affect five ephemeral waterbodies; as such, ECDI submitted a *Water Act* application to Alberta Environment and Parks (AEP) on July 12, 2016. Historically, the Project area has been used primarily for agriculture (cultivation), and no rare plants, rare ecological communities, or wildlife species of management concern were found.

Besides the land-use zoning, landowner interest, and environmental considerations outlined above, Vulcan Solar LP took into account other technical siting considerations, as detailed in Table 2.

Table 2: Project Site Selection Criteria

Site Selection	Discussion
Preliminary solar resource assessment	The solar resource in southern Alberta is high quality. The land that Vulcan Solar LP chose has a high quality solar resource.
Review of terrain and topography	The proposed Project terrain, topography, and soil conditions are suitable for Project construction.
Review of shade potential	The Project area does not have trees that could shade the proposed facility. Layouts have been selected to minimize shading. The Project integrates a setback from wind turbines to avoid shading from BSR.
Access to transmission and existing infrastructure	The Project is “behind the fence” generation at BSR and will use available transformer capacity at the BSR substation. Use of existing infrastructure reduces the Project’s overall environmental footprint and Project cost.
Landowner interest	Landowners are familiar with ECDI through their involvement in the BSR.
Community support	Both Vulcan County and the Village of Carmangay issued letters of support for the Project (Attachment 2).

PP17

At a level of detail commensurate with the size and type of potential impact(s) of the project, complete and submit an environmental evaluation of the project and provide a sign-off from AEP addressing the environmental aspects of the project that AEP is satisfied with.

An environmental evaluation describes and predicts a project's effects on the environment before the project is actually carried out, and the measures to avoid or mitigate the project's predicted adverse environmental effects and any monitoring proposed to evaluate the efficacy of those measures. The purpose of an environmental evaluation is to ensure that enough information is provided by the applicant to inform the public and government agencies about the applicant's understanding of the consequences of its project, and to help the AUC determine if the project is in the public interest. The environmental evaluation should be conducted or overseen by an individual or individuals who possess appropriate environmental experience related to the type and scale of development. An environmental evaluation should:

- **describe the present (pre-project) environmental conditions in the local study area**
- **identify and describe the project activities and infrastructure that may adversely affect the environment**
- **identify what specific ecosystem components (i.e., terrain and soils, surface water bodies and hydrology, groundwater, wetlands, vegetation species and communities, wildlife species and habitat, aquatic species and habitat, air quality and environmentally sensitive areas) within the local study area may be adversely affected by the project**
- **describe the potential adverse effects of the project on the ecosystem components during the life of the project**
- **describe the mitigation measures the applicant proposes to implement during the life of the project to reduce these potential adverse effects**
- **describe the predicted residual adverse effects of the project and their significance after implementation of the proposed mitigation**
- **describe any monitoring activities the applicant proposes to implement during the life of the project to verify the effectiveness of the proposed mitigation**
- **describe the methodology used to identify, evaluate and rate the adverse environmental effects and determine their significance, along with an explanation of the scientific rationale for choosing this methodology**

If the power plant project requires preparation of a federal environmental assessment report or a provincial environmental impact assessment report, then that report should be submitted as an appendix to the application as required by PP38, and a separate environmental evaluation report satisfying the requirements of PP17 need not be prepared for the project. In such cases, the federal environmental assessment or the provincial environmental impact assessment report is sufficient to also satisfy the environmental requirements outlined in PP17.

As detailed in the Stantec (2015a) *Vulcan Solar Project Wildlife Assessment* and *Vulcan Solar Project — Wetland Assessment* (Stantec 2015b) (Attachment 7), Project representatives consulted with AEP regional biologists to understand their potential wildlife and wildlife habitat concerns. Given the understanding of the Project area from the wildlife studies conducted for the BSR, AEP provided guidance on wildlife studies it considered necessary. AEP subsequently supported the Project via the *Wildlife Renewable Energy Referral Report* dated July 5, 2016 (Attachment 4).

The Project may affect wildlife through habitat displacement as wildlife avoid portions of the Project area occupied by the PV panels. As the Project is on cultivated cropland, which represents minimal wildlife habitat through habitat displacement, Vulcan Solar LP does not expect impacts to wildlife.

During Project construction, construction vehicles and equipment may negatively affect wildlife species via collisions or destruction of their nests, burrows, or dens. However, as the Project is entirely on cultivated lands, the overall potential for habitat loss or wildlife mortality is negligible.

Vulcan Solar LP does not anticipate Project effects to wetlands and rare/listed plant species and communities, given the proposed wetland setbacks and due to siting the Project in cultivated cropland habitat.

Vulcan Solar LP anticipates the Project's visual effect will be minor and localized to the Project area's immediate vicinity. As the Project is within the Blackspring Ridge Wind Power Project, which consists of tall wind turbines, Vulcan Solar LP expects most of the public will overlook the Project due to the nearby, taller, moving structures (turbines). Attachment 6 provides photomontages of the Project.

Project representatives worked with AEP to develop a Project-specific post-construction monitoring program (PCMP) to be completed upon commencement of operations.

PP18

If the project site occurs within the plan boundaries of a regional land use plan in force:

- i. Confirm that the proposed project is being developed in accordance with the applicable regional land use plan.**
- ii. Confirm if the proposed project is in a conservation area or provincial recreation area established in the applicable regional land use plan. Provide submissions describing how the activity may be considered incidental to a previously approved activity.**
- iii. Indicate what, if any, management frameworks in place under the applicable regional land use plan are applicable to the project, the reason why any management frameworks are not applicable to the project and summarize discussions held with AEP and any other government department required to be consulted under the management frameworks regarding the project and its impacts in terms of the management frameworks. Include details on any actions or mitigation measures recommended as a result of the discussions and describe how these actions or mitigation measures will be incorporated into the project.**

The Project is within the South Saskatchewan Region regional planning area. The South Saskatchewan Regional Plan (SSRP) was approved on July 23, 2014, and became effective on September 1, 2014. The SSRP:

“...establishes a long-term vision for the South Saskatchewan Region and aligns provincial policies at the regional level to balance Alberta's economic, environmental and social goals. The regional plan also includes strategies for responsible energy development, sustainable farming and ranching, forest management, and nature-based tourism.”

With respect to renewable energy, the SSRP indicates that:

“...the region has a natural advantage for the development of renewable energy (e.g., wind bioenergy, solar, hydro) sources. To enable the integration of more renewable energy and reinforce the transmission system in the region, the Electric Statures Amendment Act has set the framework for the Alberta Electric System Operator to be responsible for the economic planning and the safe, reliable operation of the Alberta Interconnected Electric System. Provincial policy direction and programs related to renewable energy are provided through Alberta's Climate Change Strategy, the Provincial Energy Strategy, the Bioenergy Infrastructure Development Program and the Nine-Point Bio-Energy Plan. The Government of Alberta also focuses on renewable and alternative energy research, supporting development and delivery of alternative and renewable energy sources through Alberta Innovates — Energy and Environment Solutions.”

For land use planning the SSRP applies to private and Crown lands. For private lands:

“...planning on private lands is primarily governed by the Municipal Government Act (MGA) and instruments made under its authority such as the Subdivision and Development Regulation. Private landowners make decisions about how to use and manage their land consistent with existing provincial legislation and municipal bylaws. The SSRP does not change this or alter private property rights. Municipal governments under Part 17, Planning and Development of the MGA, with few exceptions (such as Section 618 and 619) are delegated with the responsibility and authority for local land-use planning and development on all lands within their boundaries...”

As the Project is proposed on private land and Vulcan Solar LP is working with Vulcan County, which provided a letter of support (Attachment 2), the proposed Project also meets the SSRP's land-use planning requirements. The Project is not within a conservation area or provincial recreation area established in the SSRP.

Project representatives consulted with AEP and sought its input regarding the development and post-construction monitoring of the Project. Through this consultation and the various environmental studies conducted onsite and detailed in the Stantec (2015a) *Vulcan Solar Project Wildlife Assessment* and *Vulcan Solar Project — Wetland Assessment* (Stantec 2015b) (Attachment 7), the AEP signed off on July 5, 2016 (Attachment 4).

Vulcan Solar LP representatives understand that the Project meets the SSRP requirements.

PP19

Describe the participant involvement information. (See Appendix A — Participant involvement program requirements).

Attachment 3 provides the Participant Involvement Program (PIP) Summary. ECDI commissioned Communicata Public Affairs Inc. (Communicata) to assist with the PIP design and execution, along with the support of land agents Scott Land & Lease (Scott Land).

The PIP Summary includes the Project PIP, including a description of engagement activities completed up to the August 2016 application filing. Vulcan Solar LP values the long-term benefits of working with local communities and is committed to continued engagement throughout the Project. The PIP was created to meet or exceed the requirements set out in the Alberta Utilities Commission's (AUC) Rule 007. It includes:

- Goals and objectives of stakeholder engagement
- Methodology for identifying stakeholders
- Consultation and notification activities
- A description of stakeholder concerns and mitigation strategies
- Aboriginal consultation activities
- Ongoing consultation

Vulcan Solar LP submitted a pre-consultation assessment to the Aboriginal Consultation Office (ACO) on September 21, 2015. On September 28, 2015, the ACO responded to Vulcan Solar LP notifying that no consultation was required for the Project. The ACO submitted a copy of the assessment to the AUC. The pre-consultation request letter signed by Mr. Kevin Morton, ACO Consultation Advisor, can be found in Attachment 3.

Subsequent to the ACO's decision, the project footprint changed to include two additional quarter sections south of the original footprint. Additionally, an application under the *Water Act* was submitted on July 12, 2016. Vulcan Solar LP is in the process of submitting updated information to Mr. Morton and will provide the AUC with a copy of the ACO's updated pre-consultation assessment when available.

If the AUC approves the Project, Vulcan Solar LP will continue its dialogue with stakeholders throughout the application process, pre-construction, construction, and operation activities.

PP20

List all occupants, residents and landowners on lands within 2,000 metres of the project area, as well as other interested persons that were consulted as part of the participant involvement program. If there are populated areas just outside the 2,000 metre limit, applicants should consider including those areas in the participant involvement program.

Table 3 identifies the landowners, residents and occupants within the 2,000 metres of the Project. Resident's home quarters are identified with a "*" in the table.

Table 3: Landowners, Residents, and Occupants within 2,000 metres of the Project

Representative	Title Holder/ Stakeholder	Land Description	Land Interest
Bruce Murray	Bowville Farms Ltd.	NE 20-13-21 W4M NE 24-13-22 W4M NE 30-13-21 W4M NW 24-13-22 W4M SE 20-13-21 W4M SE 30-13-21 W4M SE 31-13-21 W4M SW 30-13-21 W4M SW 32-13-21 W4M	Landowner
Daniel Greene	JMB Farms Ltd.	SW 1-14-22 W4M; LSD 4 SW 1-14-22 W4M; LSD 5	Landowner
Dennis Benci	Benci Seed Farms Inc.	NE 35-13-22 W4M NW 35-13-22 W4M SW 35-13-22 W4M; LSD 3 SW 35-13-22 W4M; LSD 4 SW 35-13-22 W4M; LSD 5 SW 35-13-22 W4M; LSD 6	Landowner

Representative	Title Holder/ Stakeholder	Land Description	Land Interest
Ed Hofer	Hutterian Brethren Church of Shadow Ranch	NE 16-13-21 W4M NE 2-14-22 W4M NE 28-13-21 W4M NE 29-13-21 W4M NW 21-13-21 W4M NW 28-13-21 W4M NW 29-13-21 W4M NW 16-13-21 W4M; LSD 13,14 NW 16-13-21 W4M; LSD 11,12 SE 21-13-21 W4M SE 28-13-21 W4M SE 29-13-21 W4M SE 32-13-21 W4M SW 16 13-21 W4M SW 21-13-21 W4M SW 28-13-21 W4M SW 29-13-21 W4M SW 33-13-21 W4M	Landowner
Edith Leora Svanes and Ronald John Svanes	1767203 Alberta Ltd.	NE 7-13-21 W4M Ptn. NW 7-13-21 W4M (East Half) Ptn. NW 7-13-21 W4M (West Half) SE 18-13-21 W4M	Landowner
Edith Svanes	Bowville Cemetery Company	Ptn. 13-13-22 W4M; LSD 9	Landowner
George Wurz	Hutterian Brethren Church of Albion Ridge	NE 31-13-21 W4M SE 11-14-22 W4M SE 12-14-22 W4M; LSD 1 SE 12-14-22 W4M; LSD 2 SE 12-14-22 W4M; LSD 7 SE 12-14-22 W4M; LSD 8 SEC 6-14-21 W4M SW 12-14-22 W4M SW 7-14-21 W4M	Landowner

Representative	Title Holder/ Stakeholder	Land Description	Land Interest
James Praskach and Paul Praskach	Praskach Farms Ltd.	NE 18-13-21 W4M NE 19-13-21 W4M NW 17-13-21 W4M NW 18-13-21 W4M NW 19-13-21 W4M NW 20-13-21 W4M SE 19-13-21 W4M SW 17-13-21 W4M SW 19-13-21 W4M SW 20-13-21 W4M	Landowner
Jason Zeinstra and Ronald Svanes	Egersund Farms Ltd.	NE 12-13-22 W4M NW 12-13-22 W4M SE 13-13-22 W4M	Landowner
Lawrence Fremstad	Lawrence Fremstad and Phyllis Fremstad	SW 13-13-22 W4M	Landowner
	Ashley Victoria McLeod and Rory Joel McLeod	SE 26-13-22 W4M	Landowner
	Caroline Irene Shimek	SW 9-13-21 W4M	Landowner
	Cassie Anne Greene and Kurt Kent Greene	NW 31-13-21 W4M SW 31-13-21 W4M*	Landowner, Resident
	Charles Duane Dick and Elaine Mae Dick	NE 17-13-21 W4M SE 16-13-21 W4M SE 17-13-21 W4M	Landowner
	Daniel Greene and Shari Greene	NE 23-13-22 W4M SW 24-13-22 W4M*	Landowner, Resident
	Diane Marie Greene and Kim Arnold Greene	NE 25-13-22 W4M SW 36-13-22 W4M	Landowner
	Kyle George Greene and Cynthia Chung Greene	Ptn, SW 33-13-21 W4M: LSD4* Ptn. NW 28-13-21 W4M: LSD13*	Landowner, Resident
	Donald Carvel Phillips and Gaye E Mitchell	SE 24-13-22 W4M Plan* 9911499; Block 1	Landowner, Resident
	Drahotin (Stanley) Brecka	SE 7-13-21 W4M	Landowner
	Edith Leora Svanes Ronald John Svanes	SW 18-13-21 W4M*	Landowner, Resident
	Eileen Nicole Hooper and Michael Todd Hooper	SE 1-14-22 W4M; LSD 1*	Landowner, Resident

Representative	Title Holder/ Stakeholder	Land Description	Land Interest
	Ethel Ardella Klack and Gordon Duane Klack	NE 8-13-21 W4M SE 12-13-22 W4M SE 8-13-21 W4M SW 7-13-21 W4M SW 8-13-21 W4M	Landowner
	Grant Arnold Odegard	NE 9-13-21 W4M NW 9-13-21 W4M	Landowner
	Henry Banman and Sara Banman	NW 30-13-21 W4M*	Landowner, Resident
	J Mark Johnson	SW 12-14-22 W4M Plan* 9912993; Block 1; Lot 1	Landowner, Resident
	Jeffrey McLeod and Kelly McLeod	NE 1-14-22 W4M NW 1-14-22 W4M	Landowner
	Johanna G Brecka and Stanley D Brecka	NW 8-13-21 W4M	Landowner
	Johannes Hendrikus Oosterbroek	NW 2-14-22 W4M SW 11-14-22 W4M	Landowner
	Kelly George Greene and Patricia Eleanor Greene	NE 36-13-22 W4M NW 36-13-22 W4M SE 36-13-22 W4M, LSD 1,8 SW 2-14-22 W4M SE 36-13-22 W4M, LSD 2,7	Landowner
	Kenneth Alexander Orosz	SE 1-14-22 W4M; LSD 2 SE 1-14-22 W4M; LSD 7 SE 1-14-22 W4M; LSD 8 SW 1-14-22 W4M; LSD 3 SW 1-14-22 W4M; LSD 6	Landowner
	Kevin Klima and Edward Klima	SE 2-14-22 W4M	Landowner
	Kim Arnold Greene	NW 25-13-22 W4M SE 25-13-22 W4M SW 25-13-22 W4M*	Landowner, Resident
	Lawrence Fremstad	NE 13-13-22 W4M; LSD 15, 16 SE 24-13-22 W4M	Landowner
	Lawrence J Fremstad	NE 13-13-22 W4M; LSD 9,10 NW 13-13-22 W4M	Landowner

Representative	Title Holder/ Stakeholder	Land Description	Land Interest
	Stanley S Praskach	NE 26-13-22 W4M SE 35-13-22 W4M	Landowner
	Tyler J Bowes and Cheri D Bowes	NE 2-14-22 W4M Plan 1310752; Block 1; Lot 1	Landowner
	Hutterian Bretheren Church of Turin	NE 21-13-21 W4M	Landowner
Jason Zeinstra and Ronald Svanes	Egersund Farms Ltd.	NE 17-13-21 W4M	Occupant
	Kurt Kent Greene	SE 36-13-22 W4M	Occupant
	Ed and Denver Stronks	NE 20-13-21 W4M SE 20-13-21 W4M	Occupant
	Jerry Bjornson	NE 25-13-22 W4M NW 25-13-22 W4M SE 25-13-22 W4M SW 25-13-22 W4M SW 36-13-22 W4M	Occupant

PP21

Supply a list of mailing addresses, with corresponding land locations and two sets of printed mailing labels of those parties mentioned in PP20, above.

Attachment 8 provides mailing addresses.

PP22

Identify any persons who expressed concerns about the project and the specifics of their concerns.

Attachment 3 provides the results of personal consultation, including the names and contact information for people with questions and/or concerns about the Project.

PP23

Summarize discussions held with potentially directly and adversely affected persons.

Attachment 3 provides the results of personal consultation, including the details of the discussions held with potentially directly and adversely affected people. In general, discussions with potentially directly and adversely affected people were information-sharing in nature. Stakeholders asked questions about what the Project would entail and, depending on the nature of the inquiry, Vulcan Solar LP had subject matter experts provide appropriate technical responses. These discussions are categorized and summarized below; Attachment 3 has further information about these discussions.

Table 4: Summary of Key Concerns Identified

Key Concerns	Specific Interests	Vulcan Solar LP Response
Environmental impacts	<ul style="list-style-type: none"> • Spraying and weed control • Wildlife impacts • Possibility of a microclimate produced from the Solar Project 	<ul style="list-style-type: none"> • Vulcan Solar LP provided information regarding equipment cleaning procedures. • Vulcan Solar LP explained that the panels absorb the sun's light and heat, which minimizes the effects of glare on local wildlife. • Vulcan Solar LP representatives explained that any increased ambient temperature would dissipate and that setbacks are planned to prevent adverse effects outside the Project area.
Siting issues	<ul style="list-style-type: none"> • Visual impact, including panel height and glare • Noise • Heat from panels • Placement of access roads • Site selection 	<ul style="list-style-type: none"> • Vulcan Solar LP provided visual simulations for the Project and discussed possible visual impacts with a variety of stakeholders. Vulcan Solar LP explained that the panels would absorb the majority of the sun's light, minimizing glare or sight impairment on properties adjacent to the Project boundary. • Vulcan Solar LP provided information on the panel heights. • Vulcan Solar LP provided information regarding the results of its noise and environmental health studies. • Vulcan Solar LP discussed the proposed location of access roads to the site. Where practical, Vulcan Solar LP will accommodate stakeholder requests regarding access road location.

Key Concerns	Specific Interests	Vulcan Solar LP Response
Compensation	<ul style="list-style-type: none"> • Property values • Property tax revenue 	<ul style="list-style-type: none"> • Vulcan Solar LP responded that it has lease or ROW agreements in place, with several nearby landowners. Vulcan Solar LP explained there is no per-unit compensation for stakeholders whose land is not directly impacted. • Vulcan Solar LP indicated that the Project representative's experience in Ontario is that there is a minimal impact on property values during construction. However, this impact disappears once the facility is operational. (There are studies completed for wind power, but not for solar projects.) • Vulcan Solar LP indicated that the County would collect property taxes for the Project, which would benefit everyone living in the County. The amount of property tax revenue is calculated based on the project size and the county mill rate applicable to the taxation year.
Construction	<ul style="list-style-type: none"> • Traffic • Dust • Employment opportunities (contracting) 	<ul style="list-style-type: none"> • Vulcan Solar LP responded to concerns about traffic and dust control by referring to discussions with Vulcan County and the Road Use Agreement under negotiation. • All contractors involved in the Project construction will adhere to ECDI best practices in addition to any requirements from Vulcan County regarding dust control. • The company contracted to build the Project will manage employment and contracting opportunities.
Decommissioning and Reclamation	Reclamation process	<ul style="list-style-type: none"> • Vulcan Solar LP identified that there will be a reclamation plan provided prior to decommissioning the site, approximately 30 years after commissioning. Vulcan Solar LP will remove all equipment to a depth of 36 inches below grade.

Key Concerns	Specific Interests	Vulcan Solar LP Response
Vegetation and soil impacts	<ul style="list-style-type: none"> • Impacts to vegetation and ground cover • Potential crop loss 	<ul style="list-style-type: none"> • Project representatives provided information regarding the results of its environmental studies. Project representatives responded to concerns about ground cover by indicating that it would use a grass and seed mix appropriate to the area, but that it still needs to determine the mix. • Vulcan Solar LP discussed the possibility of using the land underneath the solar panels as a grazing area for sheep.
General	<ul style="list-style-type: none"> • Solar panel design • Snow management • Hail impact • Legacy issues surrounding the Blackspring Ridge Wind Project 	<ul style="list-style-type: none"> • Vulcan Solar LP representatives spoke to various stakeholders about solar power in Alberta, the design of the solar panels, the Project technology, and maintenance issues. Discussions are still in progress. • Project representatives spoke to various stakeholders and indicated that they anticipate minimal snow in the area. Snow clearing is not performed between rows of panels. The panel angle results in snow typically sliding off of the panels. • Project representatives spoke to various stakeholders about the standards that solar panels are required to meet for hail impact. • Vulcan Solar LP representatives spoke to various stakeholders about ongoing legacy issues surrounding BSR. They explained that this Project was separate from BSR, but that they would be happy to discuss any ongoing concerns that they may have. Discussions are still in progress.

PP24

If potentially directly and adversely affected persons raised any concerns, describe how these concerns were dealt with or are being dealt with.

Attachment 3 provides the results of personal consultation, including the details of the discussions held with potentially directly and adversely affected people.

PP25

For those potentially directly and adversely affected persons identified above, include a confirmation of resolution of the concerns, if applicable.

Attachment 3 provides the results of personal consultation, including the details of the resolution of the concerns where applicable.

PP26

If the power plant is to be located within an oil and gas facility, confirm the power plant will comply with the standards outlined in Section 8.090 of the *Oil and Gas Conservation Rules*.

The Project is not within an oil and gas facility.

PP27

Provide a noise impact assessment, in accordance with the current AUC Rule 012.

Attachment 9 provides the Rule 012 compliant noise impact assessment (NIA) that Stantec prepared.

PP28

For an application where no changes to the major components of the power generating equipment are contemplated after filing of the application, provide details of the power generating equipment and associated facilities, such as make, model and nominal capacity.

The Project will include approximately 297,000 panel modules and 11,418 strings in parallel with 33 inverters.

Solar modules

The solar modules Vulcan Solar LP chose are a monofacial N-type monocrystalline silicon called LG NeON2 72 Cell 370W. The selected module is dual rated, IEC and UL, safety class II, and fire class A. The solar cells use n-type silicon wafers, and are coated in a-Si to form a heterojunction.

Inverter

The inverter that Vulcan Solar LP will use is a Power Electronics FS2800CU15 deployed on a gigawatt scale. The inverters are rated at 2,500kW @0.90PF and 50°C and are 1500V; 1500V inverters generally have higher efficiency, use less wire for DC collection, and require less combiner boxes on site.

Collection system

The collection system will be at 34.5 kV and will be underground. Vulcan Solar LP has not yet selected the collection system materials supplier.

Racking system

The racking system is based on single-axis racks or frames attached to ground-based mounting supports. Racking supports are primarily galvanized steel (steel coated with zinc). Vulcan Solar LP has not yet selected the racking system supplier.

PP29

For an application where vendors which are to supply the major components of the power generating equipment have not been selected, provide the nominal capacity of the applied-for power plant and the design and maximum operating parameters, and characteristics specified for the power generating equipment and associated facilities.

This is not applicable to this Project, as Vulcan Solar LP has selected the components.

PP30

Present the estimated power plant heat rates, efficiency of the power plant and details of the cooling system for the power plant.

This is not applicable to this Project.

PP31

State the fuel requirements of the power plant, including type, source, method of handling, transportation, processing, storage and environmental effects.

This is not applicable to this Project.

PP32

Provide a legible plant site drawing showing all major equipment components.

Attachment 6 provides maps of the proposed Project.

PP33

Provide a legible map showing the power plant site boundaries and land ownership, including any residences and dwellings within 2,000 metres of the boundaries, as well as any additional energy-related facilities within the project area.

Attachment 6 provides maps of the proposed Project.

PP34

Provide a legible map of the project area suitable for use in a public notice.

Vulcan Solar LP has provided a map of the Project area for public notice. See Attachment 6.

PP35

Supply the expected in-service dates, and describe ramifications if the approval date cannot be met.

The expected in-service date is December 31, 2017 for the Phase 1 of the Project. Phase 2 is expected by December 31, 2018. Vulcan Solar LP anticipates AUC approval by March 1, 2017, subject to regulatory review delays.

Vulcan Solar LP will complete detailed engineering at that time, followed by selecting the engineering, procurement and construction (EPC) contractor, selecting and ordering major equipment (around 300 days), and then site mobilization and construction. The anticipated construction schedule is subject to regulatory review delays, market conditions, and renewable policy details.

The ramifications of construction dates not being met are that building the plant will be delayed, which could impact negotiated contracts and result in revenue loss. In the event of construction delays, the delay impacts will be subject to contract renegotiations.

PP36

Indicate the plant's emission rates, in kilograms per megawatt-hour (kg/MWh) of nitrogen oxides (NO_x), sulphur dioxide (SO₂), and primary particulate matter, and state whether the emissions will comply with the current Alberta Source Emission Standards for Electricity Generation and any other emission rate standards or guidelines that are applicable to the proposed project.

The Project will not have any emissions, as it is a solar power plant.

PP37

State whether the proposed plant will comply with the *Alberta Ambient Air Quality Objectives and Guidelines Summary* and any other standards or guidelines that are applicable to the proposed project for ground-level concentrations of pollutants.

This is not applicable to this Project, as there are no emissions from the proposed plant.

PP38

Provide the federal environmental assessment or provincial environmental impact assessment as an appendix to the application, if one was required by a federal or provincial authority. The applicant must obtain approval from AEP for thermal power plant facilities greater than one megawatt in total capacity at one site. An environmental impact assessment is mandatory for thermal power plant facilities that use non-gaseous fuel and are greater than 100 megawatts in total capacity; an environmental impact assessment may be required for other power plant facilities regardless of total capacity. When an environmental impact assessment is not mandatory, AEP will determine if it is necessary, based on the specific nature of the project. The applicant should consult with the Commission and AEP in the initial stages of preparing its application to determine the level of detail required..

This does not apply to this Project, as it is not a thermal power facility.

PP39

If the power plant is to be connected to the transmission system of the Alberta Interconnected Electric System, irrespective of voltage level, provide the following information:

- **An electrical single-line diagram obtained from the ISO or sanctioned by the ISO showing the transmission development plan for the interconnection, and**
- **A map with one or more conceptual layouts showing possible routes and general land locations for facilities that would be used to interconnect the power plant to the Alberta Interconnected Electric System.**

Attachment 10 provides a single line diagram.

Attachment 6 provides maps of the proposed Project.

Additional attachments for power plant applications without an accompanying application for connection (e.g., if the answer is “No” to Question 8 on the power plant schedule). If the power plant is to be connected at transmission voltage level (generally 69 kV or greater), the following information must be provided in the attachments indicated below:

- **Electric single-line diagram;**
- **Project area map.**

Attachment 10 provides a single line diagram.

Attachment 6 provides maps of the proposed Project.

PP40

If the power plant is to be connected at distribution voltage level to the Alberta Interconnected Electric System (generally less than 69 kV), the applicant must provide a statement from the distribution facility owner indicating that it is willing to connect the generating facilities.

Additional attachments for power plant applications without an accompanying application for connection (e.g., if the answer is “No” to Question 8 on the power plant schedule). If the power plant is to be connected to a distribution system (generally less than 69 kV), the following information must be provided in the attachments indicated below.

This does not apply to this Project.

PP41

For a municipality or a subsidiary of a municipality to hold an interest in a generating unit, documentation confirming compliance with Section 95 of the *Electric Utilities Act* is required.

This is not applicable to this Project, as there is no municipality or subsidiary that holds interest in the Project.

PP42

For a wind power application, provide legible maps and/or air photo mosaics upon which the proposed collector power line route or routes have been imposed and showing the residences, landowner names, and major land use and resource features (e.g., vegetation, topography, soil type, existing land use, existing rights-of-way, and superficial and mineable resources).

Attachment 6 provides maps of the proposed Project.

ATTACHMENT 1:

DRAFT AUC APPROVAL



ATTACHMENT 2:

VULCAN COUNTY AND VILLAGE OF CARMANGAY LETTERS OF SUPPORT



ATTACHMENT 3:

PARTICIPANT INVOLVEMENT PROGRAM – ENGAGEMENT REPORT



ATTACHMENT 4:

ALBERTA ENVIRONMENT AND PARKS — WILDLIFE RENEWABLE ENERGY REFERRAL REPORT



ATTACHMENT 5:

ALBERTA CULTURE — HISTORICAL RESOURCES CLEARANCE



ATTACHMENT 6:

MAPS AND PHOTOMONTAGE



ATTACHMENT 3:

**WILDLIFE AND WETLAND
REPORTS**



ATTACHMENT 4:

MAILING LIST



ATTACHMENT 5:

NOISE IMPACT ASSESSMENT



ATTACHMENT 6:

SINGLE LINE DIAGRAM

