Alberta Environment and Parks

Wildlife Management
Operations Division
530 8th Street South, 2nd Floor
Lethbridge, Alberta T1J 2J8

March 4, 2020

Will Patterson, Project Manager
Elemental Energy Renewables Inc.
2150 - 745 Thurlow Street
Vancouver, BC V6E 0C5
wpatterson@elementalenergy.ca

Transmitted via email

Dear Mr. Patterson,

RE: Renewable Energy Referral Report for the Chappice Lake Solar Project by Elemental Energy Renewables Inc.

This letter is to advise that Alberta Environment and Parks - Wildlife Management (AEP-WM) Staff have completed the review of the project proposed by Elemental Energy Renewables Inc., called Chappice Lake Solar Project. Attached is a copy of the AEP-WM Renewable Energy Referral Report, which reviews the potential impacts of the project on wildlife and wildlife habitat for inclusion with your application to other regulatory agencies. This review is only for the project as it has been presented by the proponent and any changes to the project (footprint, layout, mitigation measures, etc.), requires further review and written acknowledgement from AEP-WM to ensure wildlife and habitat are protected.

Sincerely,

Rachael Firminger, B.Sc., P.Biol., R.P.Bio.
Wildlife Referral Technician, Renewable Energy Projects
Alberta Environment and Parks - Wildlife Management
Rachael.Firminger@gov.ab.ca

cc:
Brandy Downey, AEP-WM, Brandy.Downey@gov.ab.ca
Robert McCallum, McCallum Environmental Ltd., Robert@mccallumenvironmental.com

Alberta Environment and Parks

Alberta Environment and Parks – Wildlife Management Renewable Energy Referral Report

A. ALBERTA ENVIRONMENT AND PARKS – WILDLIFE MANAGEMENT (AEP-WM) REVIEW

The Chappice Lake Solar Project (the Project) proposed by Elemental Energy Renewables Inc. (the Proponent) was reviewed by the Alberta Environment and Parks – Wildlife Management (AEP-WM) regional wildlife contact for renewable energy projects. AEP-WM has reviewed the proposed location, mitigation strategies, including associated infrastructure and construction plans, and post-construction monitoring and mitigation program, as presented by the Proponent in a submission dated November 4, 2019 and accepted by AEP-WM on November 5, 2019.

Documents reviewed by AEP-WM and collectively referred to as the *Project Submission* throughout this referral report, include:

- *Renewable Energy Project Submission for the Chappice Lake Solar Project Alberta*; 103 pages; dated November 4, 2019
- AEP-WM Initial Review_Chappice Lake_response (excel spreadsheet); dated February 14, 2020
- Chappice Lake Solar - Mitigation Update; dated March 3, 2020

Note: various clarifications and edits of the original documents are discussed in the subsequent files and these changes are to supersede the original documents.

The AEP-WM review of the Chappice Lake Solar Project was guided by the AEP-WM policy document, *Wildlife Directive for Alberta Solar Projects* (October 2017; hereafter called the *Directive*) and the *Post-Construction Survey Protocols for Wind and Solar Energy Projects (*January 2020; hereafter called the *PCMP Protocol*). The proponent must follow the *Directive* and *PCMP Protocol* for requirements on siting, pre-construction surveys, construction, operation, and post-construction monitoring and mitigation plans.

This referral report summarizes the review undertaken by AEP-WM that was restricted to reviewing information provided in the submitted documents, completed by completed by McCallum Environmental Ltd. and Kestrel Environmental Ltd on behalf of the Proponent, and applying the wildlife standards and best management practices for the siting, construction and operation of the solar facility. This office undertook no independent on-site assessment. This referral report is not intended to relieve any party from any liability if there are detrimental effects to wildlife or wildlife habitat during construction or operation that were not identified and mitigated for in the documents submitted. It is the responsibility of the Proponent to ensure compliance under all other policy and legislation, including but not limited to the *Alberta Wetland Policy*, *Water Act, Code of Practice for Watercourse Crossings*, *Environmental Protection and Enhancement Act*, *Alberta Wildlife Act, Migratory Bird Convention Act,* and *Species at Risk Act*. Federal requirements may differ from AEP-WM policy, therefore additional consultation may be necessary. AEP-WM review does not eliminate the need for review by other branches of the Environment and Parks Department, Government of Canada or other governing bodies. This

referral report summarizes the potential risks to wildlife and wildlife habitat based on the information provided to AEP-WM.

Summary: This summary is a condensed version of the entire referral report. For details on specific topics, see the body of this report. The overall project risk ranking is provided in the last paragraph of this summary.

The Chappice Lake Solar Project is sited entirely on cultivated land and avoids named lakes, permanent watercourses, seasonal wetlands and valley breaks, which aligns with the *Directive*. AEP-WM has determined the risk of wildlife entrapment due to the Project fence is low, based on the commitments made by the Proponent. AEP-WM has determined the risk of wildlife mortality is low based on Project siting and avian use in the Project area. The Project has been sited to avoid wildlife features, including the house, nest, den and lek of species of management concern and has provided adequate alternative mitigation for the infringement on the required setbacks one ferruginous hawk nest, which aligns with the *Directive*; therefore, the risk to wildlife features is considered low.

AEP-WM has ranked the Chappice Lake Solar Project proposed by Elemental Energy Renewables Inc., a low risk to wildlife and wildlife habitat, based on Project siting, and commitments made by the Proponent to mitigate and monitor wildlife impacts. This AEP-WM Renewable Energy Referral Report expires on March 6, 2025.

AEP-WM Referral Report Prepared by:

Signature: _____ Date: March 4, 2020
Printed Name, Position, and Office: Rachael Firminger, Wildlife Referral Technician, Red Deer North Saskatchewan Region, Operations Division, Red Deer, Alberta

AEP-WM Referral Report Reviewed by:

Signature: _____ Date: March 4, 2020
Printed Name and Position: Brandy Downey, Senior Species at Risk Biologist, South Saskatchewan Region Operations Division, Grassland District, Lethbridge, Alberta

B. PROJECT DETAILS

Project Name: Chappice Lake Solar Project (also referred to as the Project)

Proponent Name: Elemental Energy Renewables Inc. (also referred to as the Proponent)

Project Location: NE 35-014-04 W4M

Disturbance footprint for construction phase (temporary): 63 ha
Disturbance footprint for operation phase (permanent): 43 ha

Nameplate Capacity (total megawatts): 15 MW

Facility Type: Photovoltaic (PV) solar facility

C. WILDLIFE CONCERNS RELATED TO SOLAR ENERGY

Impacts to wildlife identified for all solar energy projects in Alberta, which forms the basis for project-specific review.

HABITAT LOSS, DEGRADATION AND FRAGMENTATION

Solar facilities may result in the direct loss of habitat for wildlife. Negative effects may include, but are not limited to, interruption of movement corridors, isolation of species and populations, shifts in composition and degradation of foraging/breeding/brood rearing habitat. There are particularly negative effects to wildlife, especially species at risk, by siting solar energy facilities in areas of native habitats. AEP-WM requires siting the solar facility and associated infrastructure (access roads, substation, etc.) on cultivated or other previously disturbed lands that do not contain sensitive features such as wetlands, to significantly reduce potential negative effects on wildlife habitat.

WILDLIFE DISTURBANCE AND MORTALITY

AEP-WM has identified concerns over the potential negative effects on wildlife caused by solar facilities and related infrastructure, including access roads, transformer/invertor stations, collection lines, and fencing. For example, solar projects may result in site avoidance and abandonment, decreased productivity, collision mortality, and trapping or stranding of wildlife.

Wildlife Movement and Fencing

Due to human safety concerns, solar photovoltaic sites are fenced to exclude people; this exclusion also impacts wildlife. Fencing can create hazards and barriers for wildlife, such as mammals, reptiles and birds. Fences can block or hinder daily wildlife movements, seasonal migrations and access to forage or watering sites. AEP-WM requires that solar projects are fenced in a manner to prevent harm or mortality to wildlife and to facilitate reasonable wildlife movement through or around the solar project.

Direct Mortality

Bird mortalities have been documented at a number of solar facilities in North America. Bird mortality related to PV facilities is caused by impact trauma, predation and starvation. The mechanism of mortality for birds appears to vary between the family groups. Mortalities of waterbirds, such as grebes, loons and some ducks, have been detected at PV sites. Water obligate birds, such as grebes and loons, which fail to die on impact, become stranded because they require water to take flight and subsequently succumb to starvation or predation.

AEP-WM requires siting solar facilities away from areas with large concentrations of waterbirds, such as lakes, rivers, 'Important Bird Areas' and 'Wetlands for Tomorrow' wetlands.

PROJECT-SPECIFIC CONCERNS

Desktop and field investigations are required to determine the potential of the Chappice Lake Solar Project to affect wildlife and wildlife habitat. Per Standard 100.2.1 of the *Directive*, the Proponent must complete the following pre-assessment wildlife surveys:

- Spring and fall bird migration surveys
- Breeding bird surveys
- Raptor nest searches
- Determination of habitat types

In addition, surveys must be conducted for species of management concern that may occur in and around the Project area. The proposed Project is sited within the following Key Range or Wildlife layers, as described within the provincial Wildlife Sensitivity Data Sets:

- Sensitive amphibians
- Sensitive raptors (including ferruginous hawk, bald eagle, golden eagle, peregrine falcon, and prairie falcon)
- Sharp-tailed grouse
- Burrowing owl

Surveys for all of the above must be conducted following protocols outlined in the *Sensitive Species Inventory Guidelines,* as applicable. If a species of management concern is identified, AEP-WM requires that areas immediately adjacent to key wildlife habitats be avoided by appropriate setbacks as outlined in the *Directive* and *Recommended Land Use Guidelines for Protection of Selected Wildlife Species and Habitat within Grassland and Parkland Natural Regions of Alberta.*

D. WILDLIFE MONITORING PROGRAM

Completion of pre-development surveys and submission of information to the Fisheries and Wildlife Management Information System (FWMIS).

Research Permit and Collection Licence Number(s): 19-334

Pre-assessment survey data completed within two years of submission to AEP-WM:
Pre-assessment survey methods and results were provided in the *Project Submission*. Wildlife surveys conducted include:

- Spring bird migration surveys: April 11, 17, 23 and May 3 and 8, 2019;
- Fall bird migration surveys: August 18, September 9, 10 and 15 and October 2 and 12, 2019;
- Breeding bird point count surveys: early survey May 25, and late survey June 19, 2019;
- Raptor nest searches: May 25 and June 19, 2019;
- Sharp-tailed grouse lek surveys: April 11 and 23, 2019; and
- Burrowing owl surveys: call playback and ground surveys May 25 and June 19, 2019.

The Proponent has committed to keeping wildlife surveys current by completing additional site-specific wildlife surveys (i.e., raptor nest searches, sharp-tailed grouse lek surveys and burrowing owl surveys) every two years until the Project is commissioned as per Standard 100.2.4 of the *Directive*. All wildlife related surveys (pre- and post-construction) and analysis of data are required

to be conducted by experienced wildlife biologists as defined by the *Directive*. Survey results are to be submitted to the AEP-WM Fish and Wildlife Management Information System (FWMIS). The Proponent has committed to implementing additional mitigation measures if any new sensitivities or features are detected, as determined by AEP-WM.

If the Project has not been constructed within five years of this AEP-WM Renewable Energy Referral Report being issued (expiry date: March 6, 2025), wildlife surveys will need to be updated and a new Renewable Energy Referral Report will be required, as per Standard 100.2.5 of the *Directive*. Wildlife surveys that would be required may include, but may not be limited to, all those listed above.

E. SOLAR ENERGY FACILITY - AVOIDANCE AND MITIGATION OF WILDLIFE RISKS

Review of the proposed wildlife avoidance and mitigation strategies identified in the submission, in comparison with the Directive.

HABITAT LOSS, DEGRADATION AND FRAGMENTATION

Native Habitat

The Project area is located in the Dry Mixedgrass Natural Sub-region of the Grassland Natural Region. Project infrastructure, including but not limited to solar arrays (mounted on tracking tilt racking supported by driven or helical piles), transformers, collection lines, access roads, a perimeter fence, and staging area, etc., has been sited to avoid native habitat because the Project is sited entirely on cultivated land. This Project siting reduces the risk to wildlife habitat and aligns with the *Directive*.

Valley Breaks

Project infrastructure will be sited a minimum of 100 m from valley and coulee breaks. This is consistent with the *Directive*.

Lakes and Large Waterbodies

The Project siting has avoided named lakes, and large permanent watercourses. The nearest waterbodies in the area include Chappice Lake (6.9 km southeast of the Project area); this is consistent with the *Directive*.

Wetlands

The Project is not located within 100 m of any seasonal marshes/seasonal shallow open waterbodies, semi-permanent marsh/semi-permanent shallow open waterbodies, permanent shallow open water or intermittent shallow open water. The Proponent has identified three seasonal wetlands (Class II) in the Project area, one of the temporary wetlands, at the northern edge of the Project will be impacted during the final layout, and the other two will not be disturbed. AEP-WM recommends that no disturbance occur within the margins of ephemeral and temporary (Class I and II) wetlands, however these wetlands are not subject to any setback requirements. Temporary wetlands are unlikely to provide suitable breeding habitat to wildlife or amphibians and therefore the mitigation aligns with the *Directive*.

Amphibian surveys were not conducted as the Proponent did not identify suitable breeding habitat within the Project area, the Project siting adequately protects the wildlife by avoiding Class III or higher wetlands and therefore aligns with the *Directive*.

Watercourses

The Proponent has not identified any watercourses within or adjacent to the Project area that may provide habitat for wildlife and may also function as a wildlife corridor and therefore aligns with the *Directive*.

WILDLIFE DISTURBANCE AND MORTALITY

Wildlife Movement and Fencing

The Proponent has committed to installing the perimeter security fence using straight lines, squared corners and raising the fence 5-15 centimetres off the ground to prevent brood separation or wildlife entrapment. The above commitments will reduce the risk of wildlife entrapment caused by the fence and is consistent with the AEP-WM *Directive*.

Migrating Birds

During the five rounds of fall 2019 migration surveys, a total of 1,618 birds from 25 different bird species were identified (~2.7 bird observations per minute; 2 individuals incidentally observed outside the survey time or survey distance of 800 m). During the five rounds of spring 2019 migration surveys a total of 632 birds from 30 different species were identified (~1.05 bird observations per minute. The most commonly observed species were the Brewer's blackbird, horned lark, house sparrow, and rock pigeon, which are listed as secure (or exotic in the case of the sparrow and pigeon) and are abundant in the Project area. There were eleven species of management concern observed during the surveys, including the American kestrel, bald eagle, barn swallow, chestnut-collar longspur, Eastern kingbird, ferruginous hawk, loggerhead shrike, long-billed curlew peregrine falcon, sandhill crane and Sprague's pipit.

As the Project is sited away from landscape features associated with increased bird activity during migration (e.g., valley/coulee breaks, large waterbodies), it is not expected to pose an elevated risk to migrating birds. This is consistent with the *Directive*.

Breeding Birds

Songbirds and waterbirds: Results from the 2019 breeding bird surveys for song birds and waterbirds (including waterfowl, shorebirds, grebes, loons and pelicans) show 259 individual birds from 17 species were observed at the five survey points. This equates to an average of 5 individual birds per minute (not including incidentals). The most common species observed were horned lark, western meadowlark and vesper sparrow, all species that belong to the grassland bird guild. Overall, grassland specialists - a guild that is declining on a continental scale - were the largest avian group observed, accounting for approximately 86% of all individuals observed. No exotic species were observed and five species at risk (chestnut-collared longspur, ferruginous hawk, long-billed curlew, Sprague's pipit and Baird's sparrow) were identified during the surveys. In total, 17% of all observations were species at risk. All observations of species at risk occurred in habitat

identified as native or tame pasture by the Proponent. This suggests that native or tame pasture surrounding the Project is being used by grassland specialists, including species at risk.

To reduce the mortality risk to breeding birds, the Proponent will limit ground disturbing activity within the breeding bird restricted activity period (April 1 to July 15) as per the *Directive*. If construction extends into the breeding bird restricted activity period the Proponent will conduct nest sweeps in suitable nesting habitat (native prairie, tame pasture and all wetlands unless fully cultivated) within 100 m of the construction activity. Nest sweeps will be completed no longer than 7 days prior to work commencement. If nests or nesting behaviour (including but not limited to alarm calling, carrying nesting material, food or fecal sacks) are detected, a species-specific setback (minimum 100 m) will be applied until young fledge. Nest status can be checked by an experienced wildlife biologist after the anticipated end date.

As described above, results of the pre-assessment wildlife surveys indicate that wildlife, including species at risk, use the habitat surrounding the Project for breeding and foraging. However, given that the Project footprint is located within cultivated lands and the proposed mitigations outlined in the *Project Submission documents*, the Project is consistent with the intent of the *Directive* to protect breeding birds and the risk is assessed to be low.

Raptors: The Proponent identified treed habitat around farmyards and in shelterbelts suitable for raptor nesting. One ferruginous hawk nest was observed 300 m northwest of the Project boundary (12U 540446 E 5563584 N), which is within the required 1000 m setback. It was identified in the Fall of 2019 that the nest had been blown down. As per AEP-WM Policy, the nest is still considered active nesting site as the nesting tree is still intact with ample nesting material in the vicinity to reactivate the nest. This nesting location will be considered active for a period of two years from the time of last known activity. The Proponent proposed the following mitigation measure to protect breeding ferruginous hawks:

- A biologist will monitor the nesting tree for breeding behaviour in 2020 to confirm activity
- In the event that a nesting pair reactivates the nest, Elemental will no construct within 1000 m of the nest during the raptor breeding season from March 15 to July 15.
    - In the event that another raptor species nests at the noted location, a species specific buffer will be applied
- The Operations and Service building will be placed outside the required 1000 m setback
- Elemental will install two nesting platforms 1000 m away from the Project boundary to encourage nesting in native prairie habitat away from Project activities. Nest platform locations will be determined following biologist assessment and consultation with local landowners.
- Operation maintenance will occur outside the 1000 m required setback of any active nests during the raptor breeding season of March 15 to July 15.

The alternative mitigation provided meet the requirements of the *Directive* and the assessed risk to breeding raptors is low.

Sharp-tailed Grouse: The Proponent completed sharp-tailed grouse lek surveys within the Project footprint and areas with approved land access out to 500 m. Habitat surrounding the Project footprint may provide suitable lekking habitat, however no sharp-tailed grouse or leks were

observed during the surveys. If a lek is identified the proponent will implement a species specific buffer and work with AEP-WM to ensure appropriate mitigation strategies, acceptable to AEP-WM, are implemented. This is consistent with the intent of the *Directive*.

Burrowing Owls: The Proponent completed burrowing owl call playback and ground searches within the Project footprint and areas with approved land access out to 500 m. The ground searches within the project area and siting of the project in previously disturbed land has identified that burrowing owl nests are not present within the area of proposed infrastructure. Habitat surrounding the Project footprint may provide suitable habitat for burrowing owl dens, however no burrowing owls were observed during the surveys. If a den is identified the proponent will implement a species specific buffer and work with AEP-WM to ensure appropriate mitigation strategies, acceptable to AEP-WM, are implemented. This is consistent with the intent of the *Directive*.

Bird Mortality

Aboveground collector lines are a risk of avian mortality due to collision or electrocution. Additionally, the presence of above ground structures could increase perching opportunities for avian predators, which could increase mortality. The Proponent has committed to collection lines and cables underground, which is consistent with the requirements of the *Directive*. Include statement on guy wires and marked barbed wire here if relevant.

The Project is sited away from named lakes, large permanent watercourses, valley/coulee breaks and on previously disturbed land, which reduces the habitat quality for wildlife and results in lower mortality risk for the Project. AEP-WM has conducted a bird risk assessment based on the migration and breeding bird data and it was determined that most species observed are currently listed as secure and one species at risk were observed. AEP-WM expects that the mortality risk will be low because the Project is small and sited on previously disturbed land. If mortality is found to be high, the Proponent has committed to mitigating wildlife mortality as discussed in the below section titled, *Post-Construction Monitoring and Mitigation*.

Snake Hibernacula and Mortality

The Project has been sited outside sensitive snake range but incidental observations of prairie rattle-snake occurred in the Project area. The Proponent has committed to the following Snake Protection Plan outlined in the *Project Submission documents* to protect workers and snakes during construction and operations.

- Traffic control measures will include reducing traffic speeds to 30 km/hr and installing snake signage to increase driver awareness
- Roads will be monitored for snakes during peak migration periods in spring and fall
- Workers onsite will receive instruction on snake identification and procedures in the event an individual is encountered
- If snakes are observed within the project area, construction within the immediate vicinity of the snake will stop until it has left the area and it is safe to resume construction

- In the event that snakes persist in the construction area and continues to be a safety concern, the AEP-WM will be contacted to determine the next steps. If relocation of the snake is necessary the relocation will be completed by an experienced biologist.
- Health and safety concerns regarding venomous snakes will be included in the Emergency Response Plan which will be prepared closer to the construction start date.

These commitments are consistent with the *Directive*.

CONSTRUCTION AND OPERATION MITIGATION

AEP-WM requires the construction and operation mitigation plan, which outlines construction techniques, mitigation and standard operating procedures, will meet the requirements outlined in Stage 3 of the *Directive.* The mitigations outlined in the *Chappice Lake Solar Project Submission* will be implemented with the intent to reduce disturbance to wildlife and wildlife features (house, nest, den, etc.). This does not preclude any liability under the *Wildlife Act*, the *Species at Risk Act*, or other legislation. AEP-WM considers all injured or dead wildlife found in the Project area during construction and operation of the facility to be caused by the facility. In the event that injured wildlife is found, AEP-WM will be notified and the Proponent will act in accordance with regulatory direction and requirements. All wildlife mortalities must be reported to AEP-WM.

POST-CONSTRUCTION MONITORING AND MITIGATION

AEP-WM requires the post-construction monitoring and mitigation plan to meet the requirements outlined in Stage 4 of the *Directive.* Post-construction monitoring for the proposed Project must follow the minimum standards outlined in the AEP-WM *PCMP Protocol*. A Wildlife Research Permit and Collection Licence must be obtained from AEP-WM prior to conducting the post-construction monitoring surveys and all surveys and analysis must be conducted by an experienced wildlife biologist as defined in the *Directive*.

The Proponent has committed to repeating wildlife surveys, including raptor nest occupancy surveys at any active raptor nesting sites to help AEP-WM understand how solar facilities may impact nesting raptors. Notable wildlife observations as well as observed changes in wildlife behavior, species composition, or potential threats to wildlife during the post-construction monitoring period will be documented and reported.

A detailed report of the post-construction monitoring will be provided to AEP-WM and the Alberta Utilities Commission (AUC) annually by the end of December the year of the mortality monitoring period, as per Standard 100.4.7 of the Directive.

Should carcass surveys, at any time, result in unusually high fatality numbers or fatalities of species at risk (provincially and/or federally listed, including species provincially listed as 'sensitive') carcasses must be collected, frozen, and submitted to AEP-WM. The Proponent must *immediately* notify AEP-WM and the AUC of the mortality event and then discuss mitigation measures

The Proponent has committed to operational adaptive management strategies related to avian impacts or other wildlife disturbances related to the operation of the Chappice Lake Solar Project. Should adaptive management be required, specific strategies will be developed and implemented

in agreement with AEP-WM. Potential mitigation measures for excessive wildlife fatalities may include, but are not limited to:

- the use of avian deterrents;
- white gridlines on solar panels;
- installation of nest deterrents to prevent nesting of raptors/corvids; and
- any mitigation that is deemed appropriate based upon the site specific circumstances following consultation and agreement by AEP-WM.

Mitigation plans will be submitted for review and agreement by AEP-WM. If post-construction mitigation is required, as determined by AEP-WM, at least two additional years of monitoring will be required to determine if the mitigation is successful at reducing the fatalities to acceptable levels, as per the *Directive.*