



## **PARAGRAPH 35(2)(b) *FISHERIES ACT* AUTHORIZATION**

**Authorization issued to**  
Serafina Energy Ltd.

Attention to: Brandon Thomas, P. Eng., M. Eng.  
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### **Location of Proposed Project**

Nearest community: Frenchman Butte  
Municipality, district, township, county: Rural Municipality of Frenchman Butte No. 501  
Province: Saskatchewan  
Name of watercourse, waterbody: North Saskatchewan River  
Longitude and latitude, UTM Coordinates: 53° 36'14.06"N, 109° 44'38.01"W; 12U 583115 E, 5940187 N

### **Description of Proposed Project**

The proposed project of which the work, undertaking or activity authorized is a part involves:

Serafina Energy Ltd. (The Proponent) is proposing to construct a bank-style river water intake structure consisting of a pre-cast intake vault with a flat intake screen on the North Saskatchewan River (NSR) near Frenchman's Butte, Saskatchewan. The river water intake will connect to a proposed pipeline that will supply water to the Glenbogie Thermal Project.

### **Description of Authorized work(s), undertaking(s) or activity(ies) likely to result in *serious harm to fish***

The work(s), undertaking(s), or activity(ies) associated with the proposed project described above, that are likely to result in *serious harm to fish* are:

- The installation and operation of a bank-style river water intake structure consisting of steel sheet piles and a pre-cast concrete intake vault located on the north bank of the NSR.

### **The *serious harm to fish* likely to result from the proposed works, undertakings, or activities, and covered by this authorization includes**

- The destruction of 3512 m<sup>2</sup> of fish habitat along the north bank of the NSR;

### **Conditions of Authorization**

The above described work(s), undertaking(s), or activity(ies) that are likely to result in *serious harm to fish* must be carried on in accordance with the following conditions.

1. **Conditions that relate to the period during which the work(s), undertaking(s) or activity(ies) that will result in *serious harm to fish* can be carried on**

The work(s), undertaking(s), or activity(ies) that result in *serious harm to fish* are authorized to be carried on during the following period:

From: Date of Issuance

To: **December 31, 2020**

If the Proponent cannot complete the work(s), undertaking(s), or activity(ies) during this period, Fisheries and Oceans Canada (DFO) must be notified in advance of the expiration of the above time period. DFO may, where appropriate, provide written notice that the period to carry on the work(s), undertaking(s), or activity(ies) has been extended.

The periods during which other conditions of this authorization must be complied with are provided in their respective sections below. DFO may, where appropriate, provide written notice that these periods have been extended, in order to correspond to the extension of the period to carry on work(s), undertaking(s), or activity(ies).

2. **Conditions that relate to measures and standards to avoid and mitigate *serious harm to fish***

2.1 Sediment and erosion control: Sediment and erosion control measures must be in place and shall be upgraded and maintained, such that release of sediment is avoided at the location of the authorized work(s), undertaking(s), or activity(ies).

2.1.1 An Erosion and Sediment Control (ESC) plan shall be developed for the site that avoids sediment from entering the NSR during all phases of the project. Erosion and Sediment Control measures shall be maintained until all disturbed ground have been permanently stabilized to ensure that suspended soil particles in surface runoff water are trapped before being discharged into the aquatic environment. The plan shall include:

2.1.1.1 Effective sediment controls installed prior to construction and inspected, maintained and repaired as required;

2.1.1.2 During in-water work, an on-site environmental monitor will ensure mitigation measures are in place and functioning, and to notify site supervisory staff if sediment releases occur from unexpected sources;

2.1.1.3 Implementation of a TSS/turbidity program to monitor sediment downstream of the work area during sheet pile installation;

2.1.1.4 Minimize clearing of riparian vegetation. Disturbed areas within the temporary construction footprints shall be re-vegetated and exposed soils and river banks shall be stabilized as appropriate. Permanently disturbed areas associated with the footprint of the intake or building structures above the Ordinary High Water Mark (OHWM) shall have permanent ESC measures installed where appropriate.

2.2 List of measures and standards to avoid and mitigate *serious harm to fish*: Described below and as set out in the Proponent's plan (Serafina Application for Authorization and Offsetting Plan), and any subsequent version(s), approved by DFO (hereafter referred to as "The Plan").

2.2.1 Sheet piles, serving as isolation structures below the OHWM shall be installed outside of the spring Restricted Activity Period (RAP) for the NSR in central Saskatchewan, **(April 16 – July 15)**.

2.2.2 Fish shall be removed from the isolated work area by qualified fisheries professionals using standard methodology and multi-pass elimination from isolated and dewatered construction areas, prior to dewatering the area entirely. Fish shall be enumerated to species and number and then relocated immediately into the river outside of the construction area. The qualified fisheries professional shall have the authority to provide direction during the dewatering and



relocation activities and shall temporarily stop work if the potential for *serious harm to fish* goes beyond the *serious harm to fish* that is authorized herein. This authority shall also be extended to all DFO staff present at the project site.

- 2.2.2.1 During isolation dewatering pumps used shall be screened according to DFO *Freshwater Intake and End-of-Pipe Fish Screen Guideline* (1995).
- 2.2.3 Flow in the NSR shall be maintained throughout construction and fish passage shall be maintained past the construction site at all times.
- 2.2.4 A Spill Management Plan shall be developed and be available on-site in the event of a spill.
- 2.2.5 Machinery and equipment shall be maintained in clean condition free of leaks. An on-site environmental monitor shall be on-site during sensitive work to inspect for leaks and administer the Spill Management Plan if necessary.
- 2.2.6 Equipment fuelling and maintenance shall take place away from the watercourse;
- 2.2.7 Fish screens for "intake operation" shall be designed, installed, and maintained as previously described to DFO:
  - 2.2.7.1 Fish screens shall meet requirements of 0.125 m<sup>3</sup>/s intake flow (7.045 m<sup>2</sup> of total screen area, when 3.589 m<sup>2</sup> is a minimum to prevent entrainment and impingement of Anguilliform fishes), reducing approach velocity to lower than 0.038 m/s (the minimum suggested approach velocity);
  - 2.2.7.2 Screen faces shall be oriented parallel to downstream water flow in order to maximize sweeping velocity, serving to minimize eggs and fish that drift down the water column from being entrained in the intake;
  - 2.2.7.3 The 3 rectangular intakes are spaced 1 m apart, at least 0.5 m from the river bottom.
- 2.2.8 Water diverted for this project should follow the DFO Canadian Science Advisory Secretariat's (CSAS) criteria contained in, "Framework for Assessing the Ecological Flow Requirements to Support Fisheries in Canada" for the NSR. This criteria is as follows: 'Cumulative water use >10% of instantaneous discharge or that results in flows <30% of the mean annual discharge (MAD).' In situation where water withdrawals exceed this advice, water withdrawals should follow conditions within the Water Security Agencies Permit
  - 2.2.8.1 Water withdrawals that exceed DFO's CSAS low risk criteria may result in additional impacts to fish and fish habitat that would require a more rigorous level of assessment (e.g. detailed instream flow needs assessment) and monitoring to evaluate the potential effects on ecosystem functions which support fisheries. If additional negative effects are identified, then further mitigation measures may be required and DFO should be notified.
- 2.3 Contingency measures shall be put in place if monitoring required in condition 3 below indicates that the measures and standards to avoid and mitigate *serious harm to fish* are not successful. Additional measures to avoid and mitigate *serious harm to fish* shall be developed and submitted to DFO for approval prior to works recommencing.
  - 2.3.1 Cease all work immediately if sediment-laden water or other deleterious substances are entering the watercourse. The containment and clean-up of this material is to occur immediately (without causing further environmental damage) to prevent it from moving downstream. Work shall not recommence until the spill has been contained and properly managed.
  - 2.3.2 Turbidity levels and Total Suspended Sediment (TSS) concentrations should not exceed guidelines provided by Canadian Council of Ministers of the Environment (CCME). If TSS exceeds these guidelines, work shall cease and additional ESC measures shall be installed to isolate the work area prior to work recommencing.
  - 2.3.3 Should daily monitoring or ESC measures show that they are not functioning as intended, all work shall be halted and the issue corrected prior to work recommencing.
  - 2.3.4 Should re-suspended sediment be observed entering the waterbody outside of the work site, work shall cease and additional ESC measures shall be installed to isolate the work area prior to work recommencing.



- 2.3.5 Should a breach in the site isolation occur, work shall cease, the site re-isolated and fish shall be removed from the isolated work area prior to de-watering and resuming the work. Once all fish have been removed, work may recommence within the isolated work area.
- 2.4 Dates by which these measures and standards shall be implemented: Measures and standards to avoid and mitigate *serious harm to fish* shall be implemented before, during, and following in-water work.
- 3. Conditions that relate to monitoring and reporting of measures and standards to avoid and mitigate *serious harm to fish***
- 3.1 Monitoring of avoidance and mitigation measures: The Proponent shall monitor the implementation of avoidance and mitigation measures referred to in section 2 of this authorization and report to DFO within thirty **(30) days** after completion of construction or no later than **December 31, 2020**, and indicate whether the measures and standards to avoid and mitigate *serious harm to fish* were conducted according to the conditions of this authorization. The Proponent shall demonstrate effective implementation and functioning of these measures by:
- 3.1.1 Providing dated photographs and inspection reports to demonstrate effective implementation and functioning of mitigation measures and standards described above to limit the *serious harm to fish* to what is covered by this authorization;
  - 3.1.2 Monitoring TSS/turbidity three times daily (minimum) and continuously if TSS is elevated during all in-water activities. Two upstream control sites and three downstream sampling sites shall be selected to determine if the ESC plan is effective;
  - 3.1.3 Conducting an as-built survey following the completion of construction including a final measurement of the project footprint below the OHWM;
  - 3.1.4 Data collected from the fish relocation shall be provided to DFO and shall include the total number of fish recovered, including species identification and number of mortalities during fish recovery efforts;
  - 3.1.5 Providing details of any contingency measures that were followed, to prevent impacts greater than those covered by this authorization in the event that mitigation measures did not function as described.
- 4. Conditions that relate to the offsetting of the *serious harm to fish* likely to result from the authorized work, undertaking or activity**
- 4.1 Letter of credit: DFO may draw upon funds available to DFO as the beneficiary of the letter of credit (in the amount of \$342,200.00) provided to DFO as part of the application for this authorization, to cover the costs of implementing the offsetting measures required to be implemented under this authorization, including the associated monitoring and reporting measures included in section 5, in instances where the Proponent fails to implement these required measures.
- 4.2 Scale and description of offsetting measures: Offsetting measures shall be undertaken in accordance with the measures set out in the Offsetting Plan, dated February, 2018 and amended August, 2018 and January, 2019. The Offsetting Plan is summarized as follows:
- 4.2.1 Habitat enhancement of a minimum area of 5,800 m<sup>2</sup> consisting of the installation of a gravel/cobble bar:
    - 4.2.1.1 The gravel/cobble bar shall be placed against the river bank and extend into the river 30 m from the 2-year flood line. The structure will start 40 m downstream from the edge of the river intake structure to avoid an expected area of sedimentation) and extend 270 m downstream;
    - 4.2.1.2 The gravel/cobble bar shall consist of rounded stone between 15 – 150 mm in diameter. The thickness of the gravel/cobble bar shall be 300 mm;



- 4.2.1.3 At no point shall the gravel/cobble bar extend into the river further than the river water intake structure;
  - 4.2.1.4 Installation of the gravel/cobble bar shall occur during a low flow period (fall).
- 4.3 Offsetting criteria to assess the implementation and effectiveness of the offsetting measures: All fish habitat offsetting measures shall be completed and functioning according to the criteria as set out in the Proponent's Offsetting Plan referred to in condition 4.2. The offsetting structure shall be installed to specifications indicated in the Offsetting Plan as identified in condition 5.1 and show a statistical improvement in habitat quality through the use of a Before-After-Control-Impact design.
- 4.4 Contingency measures: If the results of monitoring as required in condition 5 indicate that the offsetting measures are not completed by the date specified and/or are not functioning according to the above criteria in 4.3, the Proponent shall give written notice to DFO and shall implement the contingency measures and associated monitoring measures, as contained within the approved Offsetting Plan and in consultation with DFO as referenced in section 4.2 and detailed below, to ensure the implementation of the offsetting measures is completed and/or functioning as required by this authorization. In particular, this shall include:
- 4.4.1 Remediation of a perched culvert crossing on Big Gulley Creek, a tributary to the NSR; and/or remediation of a perched culvert crossing on Jackfish Creek;
  - 4.4.2 Scale and description of contingency measures: The Proponent shall conduct necessary works, undertaking, or activities to ensure the structural stability and ongoing functionality of any contingency offsetting habitat to the satisfaction of DFO should the initial Offsetting Plan not meet the requirements for offsetting associated with this Authorization;
  - 4.4.3 Monitoring measures to ensure offsetting contingency is completed and/or functioning as required: All fish habitat offsetting contingency measures shall be completed and functioning according to criteria developed in consultation with DFO.
- 4.5 The Proponent shall not carry on any work, undertaking or activity that will adversely disturb or impact the offsetting measures.
- 5. Conditions that relate to monitoring and reporting of implementation of offsetting measures (described above in section 4):**
- 5.1 Schedule(s) and criteria: The Proponent shall conduct monitoring of the implementation of offsetting measures according to the approved timeline and criteria below and according to the Offsetting Plan approved by DFO. The Proponent shall report to DFO on whether the offsetting measures were conducted according to the conditions of this Authorization by providing the following:
- 5.1.1 A digital photograph record of pre-construction, during construction, and post-construction conditions shall be compiled using the same vantage points and direction to show that the approved works have been completed in accordance with the Offsetting Plan;
  - 5.1.2 An as-built survey of the offsetting structure confirming the quality of the installation, including a measurement of the area relative to the Offsetting Plan shall be submitted to DFO following completion of the offsetting measures;
  - 5.1.3 Monitoring of the offsetting structure, post-construction in reference to a control site, conducted post-freshet (summer) for three years following installation (**2021, 2022, 2023**). This monitoring shall include characterizing depth variability and velocity distribution within the offset structure area using sonar surveys.
  - 5.1.4 The degree of sedimentation shall also be determined by conducting an embeddedness survey in late summer for 3 years following installation (**2021, 2022, 2023**). This monitoring shall include quantifying % embeddedness and particle size distribution within the offsetting structure area;



- 5.1.5 Post-construction functional monitoring of the offset structure in reference to pre-construction data collected in fall 2018 and spring 2019 and a control site. The post-construction monitoring shall be conducted in spring and late-summer or early-fall for three years following installation (**2021, 2022, 2023**). To confirm effectiveness of the offsetting structure, parameters shall be measured including but not limited to: species diversity, species richness, species relative abundance, Catch-per-Unit-Effort (CPUE), Biomass-per-Unit-Effort (BPUE), and fish length frequency.
- 5.2 Should the offsetting measures be deemed unstable, not functioning as intended, and/or are deficient, additional mitigation measures, repairs, and/or replacements shall be implemented by the Proponent to rectify the offsetting measures (at the cost of the Proponent), in consultation with DFO.
- 5.3 List of reports to be provided to DFO: The Proponent shall report to DFO on whether the offsetting measures were conducted according to the conditions of this authorization by providing the following:
  - 5.3.1 The results of the construction monitoring (as described above in conditions 5.1.1 and 5.1.2) shall be submitted to DFO at the end of the post-construction monitoring year and as late as **December 31, 2020**;
  - 5.3.2 Compliance and functional monitoring referenced in conditions 5.1.3, 5.1.4 and 5.1.5, respectively shall be provided in Years 1, 2, and 3 Post-Construction Monitoring Reports which are due on or before **March 31, 2022, 2023, and 2024**, respectively.

#### Authorization Limitations and Application Conditions

The Proponent is solely responsible for plans and specifications relating to this authorization and for all design, safety and workmanship aspects of all the works associated with this authorization.

The holder of this authorization is hereby authorized under the authority of Paragraph 35(2)(b) of the *Fisheries Act*, R.S.C., 1985, c.F. 14 to carry on the work(s), undertaking(s) and/or activity(ies) that are likely to result in *serious harm to fish* as described herein. This authorization does not purport to release the applicant from any obligation to obtain permission from or to comply with the requirements of any other regulatory agencies.

This authorization does not permit the deposit of a deleterious substance in water frequented by fish. Subsection 36(3) of the *Fisheries Act* prohibits the deposit of any deleterious substances into waters frequented by fish unless authorized by regulations made by Governor in Council.

This authorization does not permit the killing, harming, harassment, capture or taking of individuals of any aquatic species listed under the *Species at Risk Act* (SARA) (s. 32 of the SARA), or the damage or destruction of residence of individuals of such species (s. 33 of the SARA) or the destruction of the critical habitat of any such species (s. 58 of the SARA).

At the date of issuance of this authorization, no individuals of aquatic species listed under the *Species at Risk Act* (SARA) were identified in the vicinity of the authorized works, undertakings or activities.

The failure to comply with any condition of this authorization constitutes an offence under Paragraph 40(3)(a) of the *Fisheries Act* and may result in charges being laid under the *Fisheries Act*.

This authorization must be held on site and work crews must be made familiar with the conditions attached.

This authorization cannot be transferred or assigned to another party. If the work(s), undertaking(s) or activity(ies) authorized to be conducted pursuant to this authorization are expected to be sold or transferred,

or other circumstances arise that are expected to result in a new Proponent taking over the work(s), undertaking(s) or activity(ies), the Proponent named in this authorization shall advise DFO in advance.

Date of Issuance: FEB 26 2020

Approved by: 

David Nanang  
Regional Director General  
Central & Arctic Region  
Fisheries and Oceans Canada