



**Pembina Gas Services Ltd.**

**Kakwa River Gas Plant Industrial System Designation**

**February 26, 2021**

**Alberta Utilities Commission**

Decision 26117-D01-2021

Pembina Gas Services Ltd.

Kakwa River Gas Plant Industrial System Designation

Proceeding 26117

Application 26117-A001

February 26, 2021

Published by the:

Alberta Utilities Commission  
Eau Claire Tower  
1400, 600 Third Avenue S.W.  
Calgary, Alberta T2P 0G5

Telephone: 310-4AUC (310-4282) in Alberta  
1-833-511-4AUC (1-833-511-4282) outside Alberta

Email: [info@auc.ab.ca](mailto:info@auc.ab.ca)

Website: [www.auc.ab.ca](http://www.auc.ab.ca)

The Commission may, within 30 days of the date of this decision and without notice, correct typographical, spelling and calculation errors and other similar types of errors and post the corrected decision on its website.

## 1 Decision summary

1. In this decision, the Alberta Utilities Commission approves an application from Pembina Gas Services Ltd. for an industrial system designation that encompasses electric facilities at the Kakwa River Gas Plant industrial site including the Musreau Power Plant.

## 2 Introduction

2. Pembina Gas Services Ltd. owns and operates the sour gas processing facility and the associated 20.59-megawatt (MW) Musreau Power Plant at its Kakwa River Gas Plant industrial complex, approximately 130 kilometres south of Grande Prairie. Pembina has requested that the Commission designate the electric facilities as an industrial system for the purpose of connecting the existing power plant to the Alberta Interconnected Electric System (AIES). Pembina filed an application with the AUC on November 24, 2020, registered as Application 26117-A001, and requested:

- An industrial system designation encompassing all the electric facilities at the Pembina industrial site pursuant to Section 4 of the *Hydro and Electric Energy Act*.
- An exemption from the operation of the *Electric Utilities Act* for the electric energy produced from and consumed by the industrial system.

3. The Kakwa River Gas Plant industrial complex is located in the southwest quarter of Section 13, Township 63, Range 5, west of the Sixth Meridian.

4. A notice of application was issued on January 20, 2021. The Commission did not receive any responses related to the notice of application.

## 3 Legislative scheme

5. When deciding whether to approve an industrial system designation application the Commission must take into account the *Hydro and Electric Energy Act*, the *Electric Utilities Act*, and the requirements of Rule 007: *Applications for Power Plants, Substations, Transmission Lines, Industrial System Designations and Hydro Developments*. More specifically, the Commission must consider the industrial system designation application in accordance with the principles and criteria set out in Section 4 of the *Hydro and Electric Energy Act*; (i) Subsection 4(2) sets out a number of principles that the Commission must have regard for when considering an application for industrial system designation; (ii) Subsection 4(3) sets out specific criteria for determining whether a project should be designated as an industrial system; and (iii)

subsections 4(4) and 4(5) set out further criteria for the Commission to consider when a project does not meet the criteria set out in Subsection 4(3), as follows:

**(2)** Where the Commission is considering an application for designation as an industrial system, the Commission shall have regard to the following principles:

- (a) the designation must be consistent with the objective of giving appropriate economic signals so that integrated industrial processes can develop their own internal supply of electricity where that is the most economical source of generation;
- (b) the designation must support
  - (i) the development of the economical supply of generation to meet the requirements of integrated industrial processes,
  - (ii) the efficient exchange, with the interconnected electric system, of electric energy that is in excess of the industrial system's own requirements, and
  - (iii) the making of decisions respecting the location of generation and consumption facilities so that the efficiency of the interconnected electric system is improved, including improved voltage stability and reduction of losses and congestion on transmission lines;
- (c) the designation must not facilitate
  - (i) the development of independent electric systems that attempt to avoid costs associated with the interconnected electric system, and
  - (ii) uneconomical by-pass of the interconnected electric system;
- (d) duplication of the interconnected electric system must be avoided where it is more economical to use the transmission facilities or electric distribution systems owned by persons in whose service area the industrial system is or will be located.

**(3)** The Commission may make a designation under subsection (1) if the Commission is satisfied that all of the following criteria have been met:

- (a) the electric system includes a generating unit located on the property of the one or more industrial operations it is intended to serve, there is a high degree of integration of the electric system with one or more industrial operations the electric system forms part of and serves, and there is a high degree of integration of the components of the industrial operations;
- (b) the industrial operations process a feedstock, produce a primary product or manufacture a product;
- (c) there is a common ownership of all of the components of the industrial operations;
- (d) the whole of the output of each component within the industrial operation is used by that operation and is necessary to constitute its final products;

- (e) there is a high degree of integration of the management of the components and processes of the industrial operations;
  - (f) the application to the Commission for a designation under subsection (1) demonstrates significant investment in both the expansion or extension of the industrial operations processes and the development of the electricity supply;
  - (g) where an industrial operation extends beyond contiguous property, the owner of the industrial operation satisfies the Commission that the overall cost of providing the owner's own distribution or transmission facilities to interconnect the integral parts of the industrial operation is equal to or less than the tariffs applicable for distribution or transmission in the service area where the industrial operation is located.
- (4) Where the Commission is not satisfied that subsection (3)(c) or (d) has been met, the Commission may make a designation under subsection (1) if the Commission is satisfied that all of the separately owned components and all of the industrial operations are components of an integrated industrial process.
- (5) Where the Commission is not satisfied that all of clauses (a) to (g) of subsection (3) have been met, the Commission may make a designation under subsection (1) if the Commission is satisfied that
- (a) all of clauses (a) to (g) of subsection (3) and subsection (4) have been substantially met, and
  - (b) there is a significant and sustained increase in efficiency in a process of the industrial operation or in the production and consumption of electric energy by the industrial operation as a result of the integration of the electric system with the industrial operations the electric system forms part of and serves.

6. The Commission has stated that read broadly, Section 4 permits an industrial system designation where the development of on-site generation is a component of an efficient, highly integrated industrial process where on-site generation represents the most economical source of generation for on-site operations.<sup>1</sup>

## 4 Discussion

7. The Kakwa River Gas Plant contains a power plant, designated as the Musreau Power Plant, that consists of three 5.63-MW natural gas-fired generating units, one 1.4-MW natural gas-fired unit and two emergency diesel generating units with a total capability of 20.59 MW. The three 5.63-MW natural gas-fired generating units have the ability to provide the sour gas processing facility with electricity as well as the capability to provide process heat to industrial operations via the turbines' waste heat recovery units (WHRUs). The natural gas-fired generating units are fueled with sweet natural gas supplied by a takeoff from the gas plant's sale gas stream. During start-up, the fuel gas is supplied by a third party sales pipeline.

---

<sup>1</sup> Decision 25044-D01-2020: Horseshoe Power GP Ltd., Gull Lake Cogeneration Power Plant Expansion Project, Proceeding 25044, Applications 25044-A001 to 25044-A003, August 6, 2020, paragraph 86.

8. Pembina explained that the Kakwa River Gas Plant was constructed prior to the completion of ATCO Electric Ltd.'s Thornton 2091S Substation and due to distribution capacity restrictions and lack of nearby distribution infrastructure, the previous gas plant owner opted to self-supply electricity through the construction of the power plant. Pursuant to Decision 21583-D02-2016,<sup>2</sup> Pembina has an exemption to own and operate the power plant for its own use.

9. In response to an information request, Pembina clarified that the 1.4-MW natural gas-fired generating unit was decommissioned and has not been operated for over two years.

10. Pembina stated that the total load of the Kakwa River Gas Plant is 3.5 MW and that the generation is oversized. This is because the gas plant requires two of the natural gas-fired generating units to operate to provide stability when starting large electric drivers as well as to provide reliability for the sour gas processing.

11. Pembina stated that the WHRUs supply heat to a circulating heating medium system. This heating medium system provides heat to a de-methanizer trim reboiler, stabilizer reboiler and amine regenerator. Pembina confirmed that when the three natural gas-fired turbine generators are operating at full capacity, all waste heat would be utilized.<sup>3</sup>

12. In response to an information request, Pembina explained that the natural gas-fired generating units have historically been operated at approximately 40 per cent of their nameplate power rating. At less than half of their capacity, the natural gas-fired generating units cannot provide the thermal energy required by the Kakwa River Gas Plant and the industrial processes must be supplemented by gas-fired heaters. Pembina stated that connecting to the AIES would allow the three natural gas-fired generating units to operate at full load thereby enabling the facility to fully utilize waste heat, limiting the requirement for gas-fired heaters.<sup>4</sup>

13. Pembina also confirmed that there would be a significant and sustained increase in efficiency of the power plant by fully utilizing the natural gas-fired generating units and associated WHRUs. Pembina stated that the generating units would improve their energy efficiency by approximately 38 per cent as a result of connecting to the AIES and being utilized at full capability.<sup>5</sup>

14. Pembina submitted that it was applying for an industrial system designation to allow for excess electricity to be exported to the AIES during times when the generation capacity exceeds the power demand.

15. In response to an information request, Pembina confirmed that it has submitted a distribution connection request with ATCO Electric Ltd. and will be filing an application for a connection order with the AUC once the Alberta Electric System Operator (AESO) has given its approval, which occurs in Phase 3 of the connection process.<sup>6</sup>

---

<sup>2</sup> Decision 21583-D02-2016: Paramount Resources Ltd. and Pembina Gas Services Ltd. – Musreau Power Plant Ownership Change, Proceeding 21584, Application 21583-A002, May 16, 2016.

<sup>3</sup> Exhibit 26117-X0006, Pembina - Kakwa SIR R1, PDF page 2.

<sup>4</sup> Exhibit 26117-X0009, Pembina Responses to Application 26117 AUC IR Round 2, PDF pages 3 and 4.

<sup>5</sup> Exhibit 26117-X0009, Pembina Responses to Application 26117 AUC IR Round 2, PDF page 3.

<sup>6</sup> Exhibit 26117-X0009, Pembina Responses to Application 26117 AUC IR Round 2, PDF page 6.

16. Pembina also clarified that it would be filing a letter of enquiry for a power plant approval for the Musreau Power Plant since the self-supply exemption would no longer be valid once the facility is connected to the AIES. Pembina stated that limited modifications would be required to interconnect the facilities to the AIES.<sup>7</sup>

17. Pembina stated that it has invested approximately \$40 million into its electricity and heating equipment at the Kakwa River Gas Plant.

## 5 Commission findings

18. As mentioned earlier, the Commission must consider Pembina's industrial system designation application in accordance with the principles and criteria set out in Section 4 of the *Hydro and Electric Energy Act*. For the reasons below, the Commission finds that granting an industrial system designation would be consistent with the principles in Subsection 4(2) and each of the criteria found in Subsection 4(3).

19. The Commission understands that Pembina is seeking an industrial system designation in order to connect to the AIES with the intent to export electricity produced by the power plant in excess of the facilities' electricity load. Importantly, the natural gas-fired turbine generators produce both electricity and heat that is used for the industrial operations of the facility. Pembina has stated that 100 per cent of the heat produced at full capacity will be used for heating requirements of the plant and that connecting to the AIES would improve the efficiency of the power plant.

20. The Commission is satisfied that Pembina's proposal to export excess electricity will facilitate the efficient exchange with the AIES of electric energy that is in excess of Pembina's own electricity requirements, but which must be generated to meet the heating requirements of the facility.

21. Subsection 4(2)(c)(i) requires the Commission to have regard for the principle that an industrial system designation must not facilitate the development of an independent electric system that attempts to avoid costs associated with the AIES. Subsection 4(2)(c)(ii) requires the Commission to have regard for the principle that an industrial system designation must not facilitate an uneconomical bypass of the AIES.

22. The Commission is satisfied that Pembina is not seeking an industrial system designation to avoid system costs. At the time of construction of the facility, the distribution system infrastructure in the area was lacking and the previous owner of the Kakwa River Gas Plant therefore chose to create on-site generation as a result of the distribution system restrictions. The decision to install generation at the facility was made out of necessity and not to avoid system costs.

23. The Commission is satisfied that Subsection 4(3)(a) has been met. As mentioned above, the industrial operations of the Kakwa River Gas Plant use not only the electricity generated by the natural gas-fired units but also the heat produced by those units, which is captured by the

---

<sup>7</sup> The Commission expects that Pembina Gas Services Ltd. will request approval for a power plant with a total capability of 19.19 megawatts as a result of the decommissioning of the 1.4-megawatt natural gas-fired generating unit in its next related application.

WHRUs and utilized to meet the heating requirements of the industrial operations. In turn, the natural gas-fired units are fuelled by gas produced by the plant. The Commission is satisfied that there is a high degree of integration of the electric system with the industrial operations it forms part of and serves, and there is a high degree of integration of the components of the industrial operations.

24. Subsections 4(3)(b) and 4(3)(c) have also been met as the industrial operations of the Kakwa River Gas Plant create a primary product, namely processed sour gas, and Pembina is the owner of all of the components of the industrial operations.

25. Regarding Subsection 4(3)(d), the Commission is aware that an industrial system designation is intended to support generation that is needed and used for integrated industrial processes. Pembina explained that the natural gas-fired generating units are responsible for supplying the electrical load and providing heat to the industrial operations. Pembina stated that all waste heat produced by the natural gas-fired generating units will be utilized but acknowledged that the generation capacity exceeds the gas plant's electricity needs.

26. In the present case, the Commission considers that the power plant is reasonably scaled to meet the electricity and heating needs of the Kakwa River Gas Plant. The Commission observes that it would be impractical to precisely scale onsite generation for a specific thermal or electrical output given the need for operational variability and having regard for reasonable expansion or growth of the industrial operations. The Commission accepts that the power plant was constructed to serve the industrial operations at a time when the facility could not connect to the AIES and it was not expected that the facility would connect to the AIES. Therefore, the Commission accepts that the decision to install generation capacity in excess of the site's electricity needs was reasonable and was taken to ensure the provision of reliability, stability and heat to the Kakwa River Gas Plant. The Commission is satisfied that Subsection 4(3)(d) has been met.

27. Subsection 4(3)(e) has been met because Pembina owns and operates the industrial operations required to process sour gas at the Kakwa River Gas Plant and the Musreau Power Plant that powers and provides heat to those operations and in turn the power plant is fueled by gas processed by the gas plant. Hence, there is a high degree of integration of management of both the components and the processes of the industrial operations.

28. The Commission accepts that Pembina has invested \$40 million into its electricity and heating equipment satisfying Subsection 4(3)(f).

29. The Commission finds that Subsection 4(3)(g) is not applicable in this case because the industrial operations do not extend beyond contiguous property.

30. In conclusion, having considered the applicable principles and criteria set out in Section 4 of the *Hydro and Electric Energy Act*, the Commission finds that Pembina's proposal meets the principles and criteria for an industrial system designation.



## **6 Decision**

31. Pursuant to Section 4 of the *Hydro and Electric Energy Act* and sections 2(1)(d) and 117 of the *Electric Utilities Act*, the Commission approves the application and grants to Pembina Gas Services Ltd. an industrial system designation as set out in Appendix 1– Industrial System Designation Order 26117-D02-2021 – February 26, 2021 (Appendix 1 will be distributed separately).

Dated on February 26, 2021.

### **Alberta Utilities Commission**

*(original signed by)*

Carolyn Dahl Rees  
Chair

*(original signed by)*

Cairns Price  
Commission Member

*(original signed by)*

Vera Slawinski  
Commission Member