25-H9 - CNSC Staff Submission

Denison Mines Corp. Licence Application to Prepare Site and Construct the Wheeler River Project

Classification	UNCLASSIFIED
CMD Type	Original
CMD Number	25-H9 (VOLUME 1)
Reference CMD(s)	N/A
Type of Licensing CMD	A New Licence
Hearing	Commission Public Hearing - Part 1 (CNSC staff and proponent)
Date of Hearing	October 8, 2025
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Summary	This CMD presents information about the following matters of regulatory interest with respect to the proposed Wheeler River Project: • CNSC staff's review, assessment and recommendations regarding the request by Denison Mines Corp. for the Commission to issue a licence to prepare site and construct the Wheeler River Project, which would consist of a uranium mine and mill. CNSC staff recommend the Commission consider taking the following actions: • determine the Wheeler River Project is not likely to cause significant adverse environmental effects referred to in subsections 5(1) and 5(2) of the *Canadian Environmental Assessment Act,* 2012, • conclude, pursuant to paragraphs 24(4)(a) and (b) of the *Nuclear Safety and Control Act* in that Denison:

	a) Is qualified to carry on the activities authorized by the licence b) Will make adequate provision for the protection of the environment, the health and safety of persons and the maintenance of national security and measures required to implement international obligations to which Canada has agreed • Approve Denison Mines Corp.'s application to prepare site and construct the Wheeler River Project • Determine that CNSC, as an agent of the crown, has upheld the honour of the crown and has fulfilled its common law obligations to consult and where appropriate accommodate Indigenous Peoples, pursuant to section 35 of the *Constitution Act*, 1982 • Delegate authority to CNSC staff as set out in section 5.5 of this CMD.

Sommaire	Le présent CMD présente de l'information sur les questions d'ordre réglementaire suivantes concernant le projet proposé de Wheeler River :
	• Examen, évaluation et recommandations du personnel de la CCSN concernant la demande de Denison Mines Corp. visant la délivrance, par la Commission, d'un permis de préparation de l'emplacement et de construction pour le projet de Wheeler River, qui comprendrait une mine et une usine de concentration d'uranium.
	
	La Commission pourrait considérer prendre les mesures suivantes :
	• déterminer que le projet de Wheeler River n'est pas susceptible d'entraîner les effets environnementaux négatifs importants visés aux paragraphes 5(1) et 5(2) de la *Loi canadienne sur l'évaluation environnementale (2012)*;
	• conclure que Denison, conformément aux alinéas 24(4)a) et b) de la *Loi sur la sûreté et la réglementation nucléaires* :
	  • a) est compétente pour exercer les activités visées par le permis;
	  • b) prendra les mesures voulues pour préserver la santé et la sécurité des personnes, protéger

	l'environnement, maintenir la sécurité nationale et respecter les obligations internationales que le Canada a assumées; • approuver la demande de Denison Mines Corp. visant à préparer le site du projet de Wheeler River et à entamer les activités de construction; • déterminer que la CCSN, en tant que mandataire de la Couronne, a préservé l'honneur de la Couronne et s'est acquittée de son obligation, aux termes de la common law, de consulter les peuples autochtones et, le cas échéant, de prendre des mesures d'accommodement en vertu de l'article 35 de la *Loi constitutionnelle de 1982*; • déléguer au personnel de la CCSN le pouvoir décrit à la section 5.5 du présent CMD.

CMD 25-H9

Licence Application to Prepare Site and Construct the Wheeler River Project

2025-08-12

Signed by:

Sigouin, Luc
C=CA, O=GC, OU=CNSC-CCSN, CN="Sigouin, Luc"

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Luc Sigouin
Director General, Directorate of Nuclear Cycle and Facilities Regulations

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Land acknowledgement

Canadian Nuclear Safety Commission (CNSC) staff would like to acknowledge that the Wheeler River Project is situated within historic Treaty 10 (1906) and Homeland of the Métis and is within the traditional territories of the Dene, Cree, and Métis peoples.

Plain Language Summary

Background

The Denison Mines Corp. (Denison) Wheeler River Project consists of a proposed uranium mine and mill. Denison is seeking approval to prepare site and construct the mine and mill and eventually wishes to operate and then decommission. The proposed project is located midway between Cameco's McArthur River mine and Key Lake mill in northern Saskatchewan. Denison seeks to use the *in-situ* recovery mining method, where uranium is extracted from the ground by pumping a solution from the surface, through the ore body, and then back to the surface. This would be the first use of this technology in Canada, though it has been used in countries such as the United States of America, Australia, Kazakhstan and China.

Denison currently holds a licence to possess uranium in the form of uranium-bearing solution on the proposed Wheeler River Project site for the purposes of its exploration activities. Denison also holds 2 unrelated licences for the decommissioned mine and mill sites of Denison and Stanrock, located in the Elliot Lake area of northeastern Ontario.

Regulatory Requirements

The Wheeler River Project is subject to a licensing regulatory review under the *Nuclear Safety and Control Act* (NSCA) and to an environmental assessment (EA) under the *Canadian Environmental Assessment Act, 2012* (CEAA 2012). Denison submitted the project description to the CNSC in 2019, and submitted the initial licence application to prepare site and construct in June 2023 [1]. By December 2024, Denison had submitted the final licence application documents, which included updated technical documentation. CNSC staff determined that the application was sufficient under section 8.1 of the *Uranium Mines and Mills Regulations*, which was communicated to Denison on November 22, 2024 [2]. The proposed Wheeler River Project is a uranium mine and mill, which is included under the definition of a nuclear facility in the NSCA and which therefore requires the Commission's authorization before prepare site and construction activities may proceed. In addition, an EA decision is required before a licence to prepare site and construct the uranium mine and mill can be issued.

Both the EA and licensing decisions trigger the Crown's duty to consult and, where appropriate, to accommodate Indigenous peoples whose potential or established Indigenous and/or treaty rights, under section 35 of the *Constitution Act, 1982*, may be impacted by the proposed Wheeler River Project.

Therefore, the Commission has 3 decisions to make with respect to the proposed Wheeler River Project:

- an EA decision under CEAA 2012
- a licensing decision under the NSCA
- a decision on whether the honour of the Crown has been upheld by the CNSC in fulfilling its duty to consult and accommodate

Indigenous Consultation and Engagement

As an agent of the Crown, the CNSC recognizes and understands the importance of building relationships and meaningfully consulting with Indigenous peoples in Canada. The CNSC's goal is to build partnerships and trust with Indigenous Nations and communities through collaborative, ongoing engagement activities related to CNSC-regulated facilities and activities of interest within their traditional and/or treaty territories.

CNSC staff conducted extensive consultation activities with the identified Indigenous Nations and communities to ensure their full participation in the regulatory review process, and to ensure their concerns were heard and addressed by Denison and the CNSC in a meaningful way. CNSC staff consider that the consultation and engagement process thus far for the Wheeler River Project has been meaningful, reasonable and responsive and that it has followed best practices.

Denison continues to work to support and maintain relationships with Indigenous Nations and communities and is working to address items of concern related to the project. To date, Denison has been responsive to questions, concerns and comments raised by Indigenous Nations and communities and has met CNSC staff's expectations with regard to the approach and process it has used and in terms of reporting updates to the CNSC.

CNSC staff's final conclusions and recommendations about the adequacy of consultation will be presented at Part 2 of the Commission hearing. This will include information on the project's potential impacts on Indigenous and/or treaty rights, and CNSC staff's final conclusions on and assessment of Denison's engagement.

CNSC Staff Conclusions

While the licence application is limited to site preparation and construction, Denison was required to submit information for all phases of the project, including the operation and decommissioning phases, to complete the EA, which takes into account the full lifecycle of the facility.

CNSC staff performed rigorous technical assessments of the Wheeler River Project proposal, including Denison's environmental impact statement, safety case, licence application and extensive supporting documentation submitted for the Commission's consideration.

CNSC staff concluded that the proposed Wheeler River Project is not likely to cause significant adverse environmental effects. This conclusion takes into account the implementation of all identified mitigation and follow-up program measures. The proposed Wheeler River Project is suitable for the mining and milling of uranium, and includes measures that protect people and the environment. Validation of these assessments and predictions will be part of ongoing licensing and compliance activities throughout all phases – construction, operation, decommissioning and post-decommissioning monitoring – of the project's lifecycle.

In terms of the application for a licence to prepare site and construct, CNSC staff's review has determined that Denison has made adequate provision for the protection of the environment and the health and safety of persons, the maintenance of national security, and the implementation of relevant international agreements to which Canada has agreed. CNSC staff are satisfied that the information presented addresses the regulatory requirements set out in the NSCA and its regulations. If the Commission issues a licence to prepare site and construct, the CNSC's regulatory oversight will continue throughout the life of the facility by means of compliance activities, reviews and monitoring.

CNSC staff conducted extensive consultation activities with Indigenous Nations and communities to ensure their full participation in the regulatory review process, and to ensure that their concerns were heard and addressed by Denison and the CNSC in a meaningful way. CNSC staff consider that the consultation and engagement process thus far for the Wheeler River Project has been thorough and has followed best practices. CNSC staff's final assessment, conclusions and recommendations on the adequacy of consultation and the project's potential impacts on Indigenous and/or treaty rights will be included in their supplemental submission to the Commission for Part 2 of the public hearing.

CNSC Staff Recommendations

Based on their assessment, CNSC staff recommend that the Commission determine that the Wheeler River Project is not likely to cause significant adverse environmental effects, taking into account the implementation of all identified mitigation and follow-up program measures. Further, CNSC staff recommend that the Commission issue Denison a licence to prepare site and construct for the Wheeler River Project.

Referenced documents in this CMD are available to the public upon request, subject to confidentiality considerations.

CMD Structure

This Commission Member Document (CMD) is presented in 2 parts.

Part 1 of this CMD includes

1. An overview of the matter being presented
2. Overall conclusions and overall recommendations
3. General discussion pertaining to the safety and control areas (SCAs) that are relevant to this submission
4. Discussion about other matters of regulatory interest
5. Appendices material that complements items 1 through 4

Part 2 of this CMD provides all available information pertaining directly to the proposed licence and associated licence conditions handbook (LCH). The Environmental Assessment Report (EA Report) and information on the duty to consult can be found respectively in appendix B and C of this CMD.

1 Overview

1.1 Background

The proposed Wheeler River Project site is located approximately 650 km north of Saskatoon, midway between the existing McArthur River mine and Key Lake mill, is within historic Treaty 10 (1906) and Homeland of the Métis, and is within the traditional territories of the Dene, Cree, and Métis peoples.

The proposed Wheeler River Project is a facility designed for the extraction of uranium ore and milling into triuranium oxide (U_3O_8) uranium concentrate, also known as yellowcake. The proposed Wheeler River Project includes a wellfield over the ore body to extract the uranium using the in-situ recovery (ISR) mining method through surface operations. The Project also includes processing the uranium bearing solution (UBS) which is pumped out of the wellfield with an on-site mill designed to process UBS. It is the first proposed ISR uranium mine in Canada, though it is used in countries such as the United States of America, Australia, Kazakhstan and China.

The proponent, Denison Mining Corp. (Denison), which currently has not been issued a uranium mine and mill licence for the Wheeler River Project, holds a nuclear substance and radiation device licence for the possession of uranium which resulted from their field feasibility test (FFT) for the Wheeler River Project, as well as 2 uranium mine decommissioning licences for the decommissioned mine and mill sites of Denison and Stanrock, located in the Elliot Lake area of northeastern Ontario (UMDL-MINEMILL-DENISON.01/indf and UMDL-MINEMILL-STANROCK.02/indf).

1.1.1 Past Performance

As part of exploration activities, Denison requested to perform a FFT. CNSC staff assessed the planned activity and determined that the FFT did not require a uranium mine and mill licence, as the resulting UBS was neither pure enough for use in the nuclear fuel cycle, nor legally able to be used commercially under Provincial legislation. Due to the low-risk nature of the requested activities, CNSC staff determined that a nuclear substance and radiation device licence was required in order to authorize Denison to possess UBS. The licence was initially issued August 3, 2022 (60677-1-23.0) by a designated officer (DO) appointed by the Commission, then was renewed on January 1, 2023 (60677-1-24), and again on January 1, 2025 (60677-1-26.0). The current nuclear substance licence expires on December 31, 2026. Should a licence to prepare site and construct a uranium mine and mill facility be issued by the Commission, the activities currently authorized by the nuclear substances and radiation devices licence

will be authorized by the uranium mine and mill licence and Denison will apply to have their Nuclear Substances and Radiation Licences revoked. CNSC staff determined that Denison's performance across the safety and control areas (SCA)s applicable to the nuclear substance licence has been satisfactory. The applicable SCAs include management systems, operating performance, radiation protection, conventional health and safety, and environmental protection. While information on Denison's performance is covered in the 2022 and 2023 editions of the Regulatory Oversight Report on the Use of Nuclear Substances in Canada, CNSC staff inform the commission that Denison had satisfactory regulatory performance regarding their Nuclear Substance and Radiation Device licences.

Denison also has a compliance history at the 2 decommissioned sites in Elliot Lake Ontario. As part of their licence, Denison's Elliot Lake sites must demonstrate that they have an adequate fitness for service program, radiation protection program, conventional health and safety program, and environmental protection program. The performance is reported every 3 years through the Regulatory Oversight Reports for Uranium Mines, Mills, Historic and Decommissioned Sites in Canada, most recently presented in January 2025, where the performance of all relevant SCAs was rated as satisfactory.

1.1.2 Denison Application

On May 15, 2019, following Denison's submission of the project description (PD), the CNSC issued the notice of commencement of a federal EA for the Project pursuant to CEAA 2012. The Project is subject to an EA under CEAA 2012, as it constitutes a designated activity under item 31 of the *Regulations Designating Physical Activities*:

> **31** The construction, operation and decommissioning of a new uranium mine or uranium mill on a site that is not within the licensed boundaries of an existing uranium mine or uranium mill.

On May 19, 2019, Denison notified CNSC staff of its intention to proceed with an application for a licence to prepare site and construct a uranium mine and mill, along with supporting infrastructure to support the activities.

In October 2022, Denison submitted the draft Environmental Impact Statement (EIS) [3] to the CNSC. As described further in the EA report (appendix B), the EIS [3] was thoroughly reviewed by CNSC staff, as well as the federal and Indigenous review team as described in the EA Report in appendix B of this CMD. In December 2024, CNSC staff determined that the final EIS was complete.

In June 2023, Denison submitted the initial licence application, which included the Facility Licensing Manual [4], and the Facility Description Manual [5]. Denison subsequently submitted all required program documents and required plans and procedures at the request of CNSC staff. On November 22, 2024, pursuant to section 8.2 of the *Uranium Mines and Mills Regulations*, CNSC staff informed Denison that the licence application was determined to contain sufficient information to commence the technical review.

1.1.3 Project Overview

The proposed Wheeler River Project is a facility designed for the safe extraction of uranium from the Phoenix deposit. It is the first proposed use of in-situ recovery (ISR) mining method for uranium in Canada. The extracted uranium will be processed into yellowcake at the onsite mill before shipment offsite. The use of ISR technology reduces the footprint of the facility as well as minimizes mining and milling waste compared to traditional mining methods currently in use. This means that a tailings management facility (TMF) is unnecessary. In addition, given that there is no excavation as typically seen in open-pit or underground mines, the volumes of waste rock will be significantly lower.

The wellfield of the proposed ISR mining method consists of a combination of injection and recovery wells, arranged in a typical 5-spot pattern, with 1 recovery well in the centre surrounded by 4 injection wells. This method works by injecting the mining solution through injection wells directly into the ore body, with recovery wells simultaneously pumping out uranium bearing solution (UBS) up to the surface facility. This will create mining solution flow from injection wells to recovery wells. As the mining solution is moving through the orebody from the injection wells to recovery wells, the uranium in the ore body dissolves to create the UBS. The uranium is then processed at the mill facility by use of precipitation, thickening and drying to produce U_3O_8 powder.

ISR mines in other jurisdictions operate without freeze walls, relying primarily on hydraulic control of injected and recovered fluids (i.e., maintaining an inward hydraulic gradient by recovering more solution than is injected), and secondarily on well design to contain the mining solution (both the injection and recovery wells will use double casing: the mining solution flows through the inner casing, while the outer casing serves secondary containment for the mining fluids). In order to provide an additional layer of containment to prevent the mining solution from migrating into the surrounding groundwater, the Wheeler River Project includes a freeze wall surrounding the wellfield.

Figure 1.1.1 provides a conceptual diagram the proposed ISR mining approach for this application.

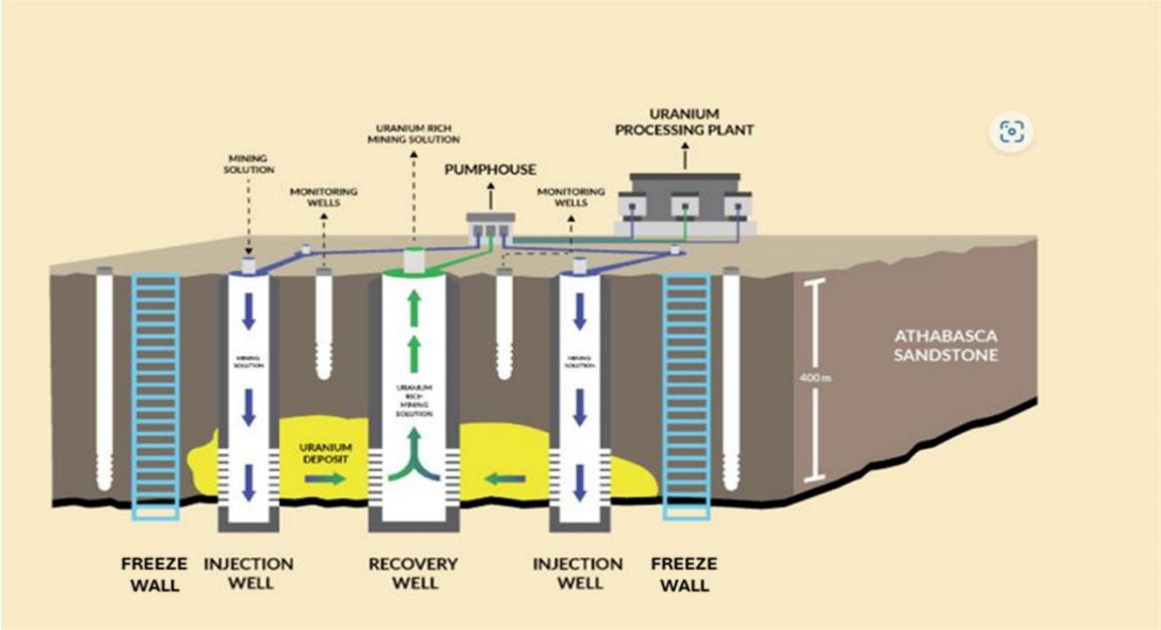

Figure 1.1.1 Conceptual ISR mine plan for the Project (taken from Denison Mines, 2025).

The proposed mine is planned to proceed in phases throughout the construction and operation period beginning with a limited initial installation in support of the first of the 5-phase mining approach. The construction of the freeze wall is planned to proceed in the same phased approach, surrounding the sections of the ore body that will be mined at those times. As mining advances, subsequent phases will be initiated by incrementally expanding the freeze wall to encompass new target areas. The freeze wall will be embedded into the competent basement rock. Figure 1.1.2 shows the phased approach proposed by Denison.

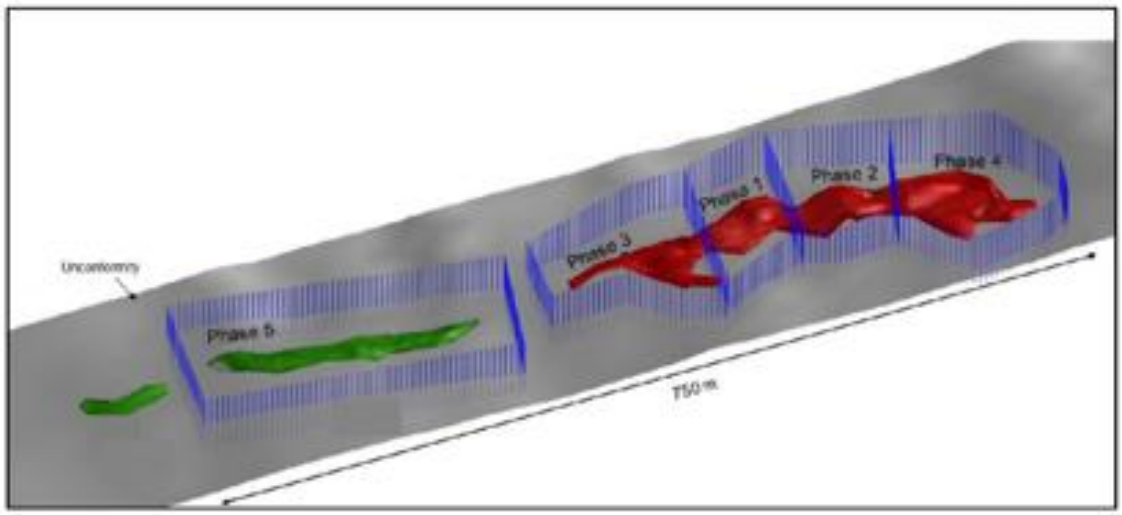

Figure 1.1.2 Views of Proposed Mine Phases with Freeze Wall (taken from Denison Mines 2024).

The total area of the Wheeler River property is approximately 117 square kilometers and consists of 19 mineral claims. It is located 4 km west of Highway 914 mid-way between the Key Lake Operation and McArthur River Operation in the Athabasca Basin.

The Phoenix deposit is considered a high-grade deposit with approximately 31,800 tonnes of U_3O_8 at an average grade of 11.4% U_3O_8. Denison is proposing to create a wellfield of injection and recovery wells using established drilling techniques, surrounded by a freeze wall. In the Facility Description Manual [5], Denison describes how their monitoring wells would be installed both inside and outside of the production wellfield to monitor the containment of mining fluids in the wellfield along with temperature monitoring holes to monitor the freeze wall integrity. Further monitoring wells would be installed outside of the freeze wall to monitor freeze wall performance. The freeze wall would be installed in phases which progressively expand the mining area over time.

In the application, Denison is requesting to perform activities to prepare a site and construct a uranium mine and mill facility, including activities listed in Table 1 below. The *Uranium Mines and Mills Regulations* require the submission of a proposed commissioning plan and included in Table 1 are commissioning activities, which are integral to both site preparation and construction especially in the ISR mining method. Commissioning activities may include the extracting and processing of some uranium bearing solution (UBS). Any uranium extracted and processed prior to the issuance of a CNSC licence to operate will not be considered as saleable product. Should Denison decide to commission the facility using UBS, CNSC staff will work with provincial authorities in Saskatchewan to ensure all regulatory requirements are met, and that proper controls are in place for the associated materials. The *Nuclear Safety and Control Act* and the *Uranium Mines and Mills Regulations* prohibit Denison from progressing beyond commissioning activities without a CNSC licence to operate. Denison has outlined their Project activities, by phase in the EIS [3]. A summary of the project activities by phase is captured in Table 1. Table 1 captures the activities in the scope of the environmental assessment, which includes activities not in scope for licensed activities.

Table 1: Wheeler River Project activities and duration by phase

Project phase (planned duration)	Project activities
Prepare site and Construction (2-3 years) In scope for this application	• Development of access roads and air strip • Site preparation and earthworks; clearing, levelling, and grading of the Project area • Power generation – generators • Installation of main substation and distribution of power around site • Wellfield, freeze hole and monitoring well drilling; ground freezing • Storage and disposal of drill waste rock • Concrete plant operation; aggregate crusher operation • Development of surface infrastructure (camp, operations centre, acid and processing plants, monitoring ponds, waste pads, and support facilities) • Waste management (composting, domestic and industrial landfill operation, recycling) • Water management (including treatment and site runoff) • Groundwater supply • Surface water withdrawal • Fuel management (e.g., propane for comfort heating; vehicle and aircraft fuel) • Air transportation for workers • Regulatory site inspections • Engagement - site visit from interested parties • Commissioning activities to test/verify installed systems
Operations (15 years) Pending future licence to operate	• Operation of the in-situ recovery (ISR)in-situ recovery (in-situ recovery (ISR)) wellfield • Wellfield and freeze wall drilling • Operation and expansion of freeze wall • Batch plant operation (grout and cement); crusher at borrow area • Expansion of pond and pads • Operation of the processing plant and production of uranium concentrate • Water withdrawal from groundwater or surface water body • Management of surface water (including seepage and site runoff) • Water treatment, both domestic and industrial

Project phase (planned duration)	Project activities
	• Water release to surface water body • Waste management (composting, domestic and industrial landfill operation, recycling) • Hazardous waste management (temporary storage, handling, and off-site transportation) • Storage and disposal of drill waste rock, process precipitates and industrial wastewater treatment plant precipitates • On-site and off-site operation of vehicles and transport of materials • Power supply – primarily power from the grid, also generators and back-up generators • Package and transport of nuclear substances (uranium ore concentrate) • Fuel management (e.g., propane for comfort heating; vehicle and aircraft fuel) • Air transportation for workers • Progressive decommissioning and reclamation • Regulatory site inspections • Engagement - site visit from interested parties • Employment and expenditures
Decommissioning (5 years)	• Site water management, treatment, and release • Mining area remediation and thawing of freeze wall • Process water treatment and release • Closure of in-situ recovery (ISR) and freeze wells and related infrastructure • Decontamination of surface facilities and injection, recovery, and monitoring wells • Asset removal (including site power transmission lines and electrical infrastructure) • Demolition and disposal of non-salvageable surface infrastructure and materials • Remediation of contaminated areas (wellfield, pads, ponds, domestic wastewater treatment location, and process plant area) • Waste management (composting and landfill operation) • Decommissioning of landfills; hazardous materials management (temporary storage and off-site disposal) • On-site and off-site operation of vehicles and transport of materials

Project phase (planned duration)	Project activities
	• Reclamation of disturbed areas • Regulatory site inspections • Engagement - site visit from interested parties • Employment and expenditures
Post-Decommissioning (15 years)	• Ongoing long-term monitoring to verify facility performance during institutional control period • Surveillance and inspection activities to verify integrity of the site • Engagement - site visit from interested parties • Employment and expenditures

1.2 Highlights

The Commission has 3 separate decisions to render with respect to the proposed Wheeler River Project:

1. an EA decision under CEAA 2012,
2. a licensing decision under the NSCA, and
3. a decision on whether the Honour of the Crown has been met in fulfilling CNSC's duty to consult obligations

For the EA decision, in order to grant a licence, the Commission must be satisfied, pursuant to section 7 of CEAA 2012, that the Wheeler River Project is not likely to cause the significant adverse environmental effects set out in section 5 of CEAA 2012 or that the significant adverse environmental effects that it is likely to cause are justified in the circumstances.

For the licensing decision, in order to grant a licence the Commission must be satisfied, pursuant to subsection 24(4) of the NSCA, that Denison is qualified to carry on the activity that the licence will authorize the licensee to carry on; and will, in carrying on that activity, make adequate provision for the protection of the environment, the health and safety of persons and the maintenance of national security and measures required to implement international obligations to which Canada has agreed.

For the decision on the duty to consult, the Commission must determine whether issuing a licence to Denison might adversely impact potential or established Indigenous and/or treaty rights; and if it might do so, whether the CNSC as an agent of the Crown has upheld the honour of the Crown by fulfilling its duty to consult and, where appropriate, accommodate Indigenous interests.

The project description was submitted in 2019, commencing the EA process. In accordance with CEAA 2012, the CNSC must ensure an EA is complete before a licensing decision under the NSCA is considered. To inform the Commission's EA decision, CNSC staff's Environmental Assessment Report (EA Report) is attached as appendix B to this CMD.

Pursuant to the *Nuclear Safety and Control Act*, in June 2023, Denison submitted an application [1] for a Licence to Prepare Site and Construct a Uranium Mine and Mill using an in-situ recovery (ISR) mining method. Denison applied for a 5-year licence term to prepare site and construct activities. During this licence term, Denison plans to submit a separate application for a licence to operate the facility. Should the Commission issue a licence for the preparation and construction of the Wheeler River Project, Denison's licence application and associated technical documents will become part of Denison's licensing basis as outlined in the proposed LCH in part 2 of this CMD. CNSC staff's assessment of the Wheeler River licence application is provided in this CMD.

CNSC staff's final conclusions and recommendations regarding the adequacy of consultation and the Project's potential impacts on Indigenous and/or Treaty rights will be provided in CNSC staff's supplemental submission to the Commission in support of Part-2 of the public hearing. Part 2 will also provide an opportunity for Indigenous Nations and communities to intervene directly with the Commission on this topic.

Information to support the Commission's decision on whether the Honour of the Crown has been met can be found in section 4.1 of this CMD, section 9 of the EA Report and in the Indigenous Consultation Report attached as appendix C to this CMD. CNSC staff consider that the consultation and engagement process thus far for the Wheeler River Project was meaningful, reasonable, responsive, and followed best practices.

1.2.1 CNSC Staff Assessment of Denison's Application

The following provides highlights on the scope, methodology and approach applied in CNSC staff's assessment of Denison's application.

CNSC staff's technical regulatory review process is a robust, iterative and thorough process. CNSC staff assessed Denison's submissions of technical documents and safety assessments against the regulatory requirements of the NSCA and its associated regulations, as well as the CNSC regulatory framework, CSA standards and International Atomic Energy Agency (IAEA) documentation. Denison's Wheeler River Project is the first proposed application of in-situ recovery (ISR) mining technology for uranium in Canada, although this technology is used for other types of mines in Canada, and is used in uranium mines in other countries. CNSC staff found that the existing Canadian regulatory framework for uranium mines and mills is adequate for the assessment of Denison's application, and for the regulation of Denison's project should the Commission issue a licence for it.

The Wheeler River Project must be designed, constructed, commissioned, operated, and decommissioned in a manner that protects persons and the environment during the prepare site and construction phase, operation phase, and during and after decommissioning. CNSC staff reviewed the applicability of current regulations and regulatory framework to determine that the appropriate regulations and guidance apply to the new technology. CNSC staff determined that the existing regulations and regulatory framework is appropriate for the proposed ISR mining and milling methods and the licence application as described in appendix A1.

As mentioned above, CNSC staff carried out their assessment of the Wheeler River Project technical documents in an iterative manner. CNSC staff communicated questions and comments from their technical assessments to Denison. Subject matter experts from CNSC and Denison held focused technical theme meetings to provide clarification and explain CNSC staff expectations to resolve outstanding issues. Correspondence between CNSC and Denison continued for each comment and question raised during the review of Denison's submissions until CNSC staff were satisfied that all regulatory requirements were met. In support of the evaluation of Denison's licence application, on several occasions CNSC staff visited the Wheeler River site to discuss Denison's licence application with Denison staff, and to view the proposed site and its major features. While all requirements are met, Denison was requested to provide updates to documentation across their management system as their activities evolve throughout the prepare site and construction phase.

If the Commission issues the licence, Wheeler River Project technical documents will be included in the licensing basis for the facility. Many of these documents will need to be updated or revised at different stages of the development of the facility (pre-operational, operational, and post operational periods). Updates to key documents, and the submission of additional documents are described in appendix D of this CMD. The content in appendix D has been identified by CNSC staff during the technical review of Denison's licence application and Environmental Impact Statement. These commitments are bounded by the proposed licensing basis and will be monitored by CNSC staff and tracked via the proposed Wheeler River LCH. CNSC staff will continue to review all of Denison's submissions to ensure that activities at the Wheeler River site remain within the licensing basis established by the Commission. CNSC's regulatory oversight will continue throughout the lifecycle of the project via compliance activities. CNSC staff will report to the Commission any significant deviation from the licensing basis.

1.2.2 Other Regulatory Approvals

To proceed with the prepare site and construction activities of the Wheeler River Project, should the Commission grant its approval, Denison may be required to obtain other regulatory approvals from provincial agencies responsible for regulating mining activities. Denison is the sole entity responsible for meeting all CNSC regulatory requirements. In addition, Denison is also responsible to ensure that any contractor or third party engaged on the Project also respects the licensing basis for the Wheeler River Project.

Provincial permits that may be required for the Wheeler River Project include but are not necessarily limited to the following permits from the Saskatchewan Ministry of Environment:

- approval to construct a pollutant control facility
- permit to construct a facility to handle hazardous substances or waste dangerous goods

It is to be noted that the provincial approvals that may be required for the Project to proceed are not contingent on the Commission's decisions. CNSC staff will monitor the receipt of other regulatory approvals as the project progresses and will also keep provincial counterparts apprised of CNSC's work.

1.2.3 Wheeler River Prepare Site and Construct Licence and LCH

If the Commission issues a prepare site and construction licence for the Wheeler River Project, an LCH will be implemented, and documents submitted as part of this application will be included as part of the licensing basis. Key licensing basis documents will in turn be listed in the LCH. The proposed LCH is included in Part 2 of this CMD and describes the CNSC's expectations for compliance with the licence conditions and licensing basis. The compliance verification criteria included in the proposed LCH describes how CNSC staff will evaluate compliance with the licence conditions included in the licence.

LCH appendix D includes a list of EA and regulatory commitments that Denison will be required to close prior to the commencement of specific activities. All of those regulatory commitments are required to be completed during the licence to prepare site and construct phase of the Wheeler River Project. CNSC staff will verify the completion of these regulatory commitments through compliance verification activities.

The proposed LCH includes content on both the standard set of licence conditions used for other similar licences, and the 2 proposed facility-specific licence conditions (conditions G.5 and G.6) on the implementation of regulatory commitments and EA conditions, and the implementation of an Indigenous engagement program. The proposed EA conditions are derived from the EA Report appended to this CMD to ensure that the project activities are not likely to cause significant adverse environmental effects to the surrounding environment, and like any other licence conditions included by the Commission, they will be verified by CNSC staff through compliance activities.

1.2.4 Compliance Verification for a Licence to Prepare Site and Construct the Wheeler River Project

Should the Commission issue a licence for the prepare site and construction of the Wheeler River Project, CNSC staff will implement the 3-year compliance plan included in appendix A.5, which aligns with the proposed prepare site and construction schedule provided in Denison's application. Should the Denison's schedule change, CNSC staff are prepared to modify regulatory compliance activities in response.

Planned inspection activities include a mix of general inspections, which may observe a number of SCAs, and focused inspections, which observe a single SCA or activity. Inspections will be performed when work is being performed on site, focusing on milestones of significance for prepare site, construction and commissioning activities.

Denison will be required to submit annual, quarterly and monthly reports, as well as event reports, as needed. As part of compliance activities, CNSC staff will review the reports to ensure activities are within the licensing basis.

Should the Commission issue a licence, CNSC staff will monitor activities at the Wheeler River Project and adapt compliance activities as needed.

1.2.5 Next Licensing Phase

Should the Commission issue a licence to prepare site and construct the Wheeler River Project, Denison can proceed with the planning and preparation of subsequent Wheeler River Project licensing phases, which will also require licences issued by the Commission. The Wheeler River Project licensing lifecycle includes 3 phases: prepare site and construction phase, operation phase, and decommissioning phase. While prepare site and construction activities are expected to take 2-3 years, the requested 5-year licence accounts for any unforeseen changes in the construction plans.

If the Commission grants a licence to prepare site and construct the Wheeler River Project, Denison will be required to seek subsequent licences from the Commission for the following stages:

Operation: Denison plans to apply for a licence to operate the Wheeler River Project prior to the completion of site preparation and construction. Operation includes extraction of uranium from the ore body through the in-situ recovery (ISR) method, and processing of the uranium bearing solution (UBS) in the mill to produce yellowcake before transporting offsite.

Decommissioning: following the operating phase, Denison would seek Commission approval to proceed with decommissioning of the facility and site infrastructure. Denison will be required to submit a detailed decommissioning plan to support this approval request. During the decommissioning phase, Denison will be required to carry out surveys to ensure the land meets the criteria and requirements established in the detailed decommissioning plan and in compliance with the applicable regulatory requirements in effect at that time.

1.3 Overall Conclusions

An EA under CEAA 2012 was conducted for the proposed Wheeler River Project. Based on the regulatory review and technical assessments of Denison's EIS and supporting documentation, CNSC staff determined that the proposed Wheeler River Project is not likely to cause significant adverse environmental effects, taking into account the implementation of all identified EA regulatory commitments, proposed mitigation and follow-up monitoring program measures (for further details, please refer to section 5.5, part two of this CMD and the EA Report in appendix B).

Based on the licensing regulatory review and technical assessments, CNSC staff concluded that Denison's licence application to prepare site and construct the Wheeler River Project complies with all applicable regulatory requirements.

With respect to the CNSC's duty to consult obligations, CNSC staff's final conclusions and recommendations will be provided in a supplemental submission to the Commission in support of Part-2 of the public hearing.

1.4 Overall Recommendations

With respect to the Commission's licensing decision, the regulatory basis and technical basis for CNSC staff's recommendations are provided in appendix B, "Basis for the Recommendation(s)" of this CMD.

CNSC Staff Recommend that the Commission:

1) Determine that the Wheeler River Project is not likely to cause significant adverse environmental effects referred to in section 5 of CEAA 2012
2) Conclude, pursuant to paragraphs 24(4)(a) and (b) of the *Nuclear Safety and Control Act* in that the applicant:
   a) Is qualified to carry on the activities that the licence will authorize the licensee to carry on, and
   b) Will make adequate provision for the protection of the environment, the health and safety of persons and the maintenance of national security and measures required to implement international obligations to which Canada has agreed.
3) Issue the proposed licence, including conditions and regulatory commitments with which Denison must comply as articulated in appendix D.
4) Delegate authority to staff as set out in section 5.5 of this CMD.

2 Environmental Assessment

CNSC staff, as Responsible Authority, conducted an EA of the proposed Wheeler River Project in accordance with CEAA 2012, as this was the federal EA legislation at the time the application was received. The Wheeler River Project is subject to CEAA 2012 as it qualifies as a Designated Project as per section 37(b) of the *Regulations Designating Physical Activities*.

The *Impact Assessment Act, 2019* (IAA 2019) came into force on August 28, 2019, repealing CEAA 2012. The IAA 2019 contains transitional provisions for EAs of designated projects commenced under CEAA 2012 for which the CNSC is the Responsible Authority. As per the transition provision described in subsection 182 of the IAA 2019:

"Any environmental assessment of a designated project by the Canadian Nuclear Safely Commission or the National Energy Board commenced under the 2012 Act, in respect of which a decision statement has not been issued under section 54 of the 2012 Act before the day on which this Act comes into force, is continued under the 2012 Act as if that Act had not been repealed."

Thus, the EA process for the proposed Wheeler River Project continued under CEAA 2012. The Commission must ensure an EA is complete in accordance with CEAA 2012 before a licensing decision under the NSCA is rendered.

The appended EA report (appendix B of this CMD) summarizes the assessment conducted by CNSC staff, including information and analysis on potential environmental effects of the Wheeler River Project. CNSC staff assessed the potential effects that the Wheeler River Project is likely to have on the environment, based on information provided by Denison in their EIS and supporting documentation and expert advice provided by the federal and Indigenous review team (FIRT). The EA report was informed by comments received from Indigenous Nations and communities and the public throughout the assessment process. Indigenous Nations and communities were offered opportunities to collaboratively develop sections of the EA Report.

Based on the regulatory review and technical assessments conducted to support the EA, CNSC staff recommend that the Commission conclude that the proposed Wheeler River Project is not likely to cause significant adverse environmental effects, taking into account the implementation of all identified mitigation measures, follow-up program measures, commitments from Denison, as well as proposed EA conditions from CNSC staff. For further details, please refer to the appended EA report.

Information on CNSC staff's assessment of Denison's environmental monitoring and protection programs specific to the licence to prepare site and construct for the Wheeler River Project can be found in the environmental protection SCA section of this CMD (section 3.9).

3 General Assessment of SCAs

CNSC staff review and assess an applicant's proposed measures and controls, and if applicable, a licensee's past performance in each SCA. Although CNSC's staff assessment of the application considers all SCAs, only those that are most relevant in providing a good overall indication of how regulatory requirements will be met by applicants and the past safety performance of the licensees are covered in this CMD. CNSC staff may also choose to combine multiple SCAs together to provide a more integrated picture of the licensee's performance over the licensing period.

The specific areas that comprise the SCAs for this proposed uranium mine and mill are identified in Appendix C, section C.2. For each specific area that is identified in section 3 as being implicated in the overall conclusions or recommendations for an SCA, detailed reviews are provided that have been considered by CNSC staff.

3.1 Management System

The management system SCA covers the framework that establishes the processes and programs required to ensure an organization achieves its safety objectives, continuously monitors its performance against these objectives, and fosters a healthy safety culture.

The following specific areas that comprise this SCA are discussed as relevant to the licence application including:

- management system
- safety culture
- supply and contractor management

3.1.1 Discussion

In order to meet regulatory requirements in this area, Denison must implement and maintain a management system that will be in accordance with CSA N286-12, *Management System Requirements for Nuclear Facilities* [6]. The management system brings together, in a planned and integrated manner, the processes necessary to satisfy the requirements that must be met to safely carry out a licensed activity. The management system includes documentation related to all safety and control areas, Indigenous Consultation and engagement, and all other areas of regulatory interest.

In conformity with these requirements Denison has submitted a management system program for the Wheeler River Project in accordance with CSA N286-12. Furthermore, Denison has committed to continual improvement for their management system.

Denison's management system for its Wheeler River Project activities will assure the protection of the health and safety of workers, the public, and the environment. Denison will implement written operating procedures and carry out the licensed activities in accordance with the policies and programs for the purposes described in the licence application. These procedures will continue to be maintained and updated as licensed activities are carried out, taking operational experience and best practices into consideration, in accordance with the proposed management system.

Management System

Denison has developed a management system for the proposed Wheeler River Project. The structure includes the use of site-specific documents which will apply to the facility and incorporates requirements from the CSA N286-12 standard.

As part of regulatory oversight for the proposed Wheeler River Project, CNSC staff evaluated the significant volume of management system documents submitted with the licence application and will continue to evaluate Denison's management system documentation throughout the project's lifecycle by reviewing and assessing Denison's documents, verifying records, and conducting inspections. As activities on the Wheeler River site change over time, Denison will be required to update existing documentation and to draft new documentation where required. CNSC staff will review updates and new documents via our risk-informed compliance program to ensure that activities on the site remain within the licensing basis approved by the Commission.

The Management System Program is a higher tier document that explains the integrated management system and sets out the framework of policies and procedures through which Denison will be governed and managed, from the setting of direction through to day-to-day operations. The framework applies to research and development, design engineering, procurement, manufacturing, qualification testing, construction, commissioning, operations, decommissioning, demolition, waste management, inspection, maintenance and facility life management, and project management for nuclear and non-nuclear facilities and installations.

CNSC staff have reviewed Denison's programs, plans and procedures that are required to commence licensed activities. Further plans and procedures will be drafted in accordance with the proposed management system in line with their licensed activities. The management system will apply to all work performed by Denison employees, contractors and sub-contactors at the Wheeler River Project. CNSC staff are satisfied that Denison's proposed management system program elements are acceptable for the proposed activities for the Wheeler River Project.

Safety Culture

As part of the review of the application, CNSC notes that Denison's Management Systems Program [7], contains information pertaining to their commitment to foster safety culture. This document outlines leadership's commitment to safety and their responsibility to promote a strong safety culture and provide the required resources to do so. Further to this, Denison has provided additional information regarding safety culture processes in their Health and Safety Management Program [8]. These documents reflect the requirement found in Section 2 of REGDOC-2.1.2, *Safety Culture*: "Licensees shall document their commitment to fostering safety culture in their governing documentation."

Supplier and Contractor Management

In the review of the licence application, CNSC staff placed emphasis on this specific area due to the proposed use of contractors for the proposed project, especially during the prepare site and construction phases. Denison's management system program provides the framework for contractors performing site preparation, construction and installation activities. Construction work carried out at the Wheeler River Project is governed and controlled by various procedures that provide the basis and guidelines to ensure that construction activities comply with CSA N286-12.

Construction quality assurance and quality control play a significant role in ensuring that the proposed facility's performance will meet the long-term safety criteria and objectives, verifying that construction activities are carried out in conformance with design requirements and specifications.

CNSC staff have determined that if implemented as intended, Denison's program and adherence to accepted procedures is adequate for managing external contractors with respect to prepare site and construction activities.

3.1.2 Summary

A summary of the licensee's past performance, challenges and proposed improvements is presented in the following sub-sections.

3.1.2.1 Past Performance

There is no previous performance for the management system SCA at the Wheeler River Project as this is a licence application for a new facility.

As part of the licence requirements for the nuclear substance and radiation devices licences, Denison implemented a management system that was verified through CNSC staff's technical assessment. The management system SCA for these licences was determined to be satisfactory.

3.1.2.2 Regulatory Focus

During the proposed licence period, management system criteria will be included in inspections to be conducted by CNSC staff at the Wheeler River Project, as will the implementation of management systems, safety culture, and supply and contractor management specific areas to ensure the program is successfully implemented. CNSC staff intend to carry out 2 focused inspections on the management system SCA during the prepare site and construct phase.

CNSC staff will monitor performance in this area through routine regulatory oversight activities including inspections and desktop reviews.

3.1.2.3 Proposed Improvements

No improvements are proposed by CNSC staff with respect to the management systems SCA.

3.1.3 Conclusion

Based on reviews of the Wheeler River Project management system documentation, CNSC staff concluded that the program is adequate to support the proposed prepare site and construction activities of the Wheeler River Project.

Should the Commission issue a licence for the preparation of site and construction of the Wheeler River Project, CNSC staff will monitor activities through the conduct of regular compliance verification activities to ensure that Denison continues to meet requirements of the management system SCA.

3.2 Human Performance Management

The human performance management SCA covers activities that enable effective human performance through the development and implementation of processes that ensure a sufficient number of licensee personnel are in all relevant job areas and have the necessary knowledge, skills, procedures and tools in place to safely carry out their duties.

The specific area that is applicable to this SCA for the Wheeler River Project is personnel training.

3.2.1 Discussion

Licensees are required to ensure that workers are qualified and competent to do the work assigned to them through the use of a training system that is performance-oriented and systematically developed. They are responsible for training and assessing their workers to ensure they have acquired and maintained the knowledge, skills, and competencies to safely perform their work assignments.

Training

REGDOC-2.2.2, *Personnel Training* sets out requirements and guidance for the analysis, design, development, implementation, evaluation, documentation and management of training at nuclear facilities within Canada, including the essential principles and elements of an effective training system.

Denison's proposed training system uses a systematic approach to training (SAT). It provides the basis for the analysis, design, development, implementation, evaluation, documentation and management of training for workers at the Wheeler River Project. Denison's application proposes the implementation of REGDOC-2.2.2 at the Wheeler River Project. CNSC staff are satisfied with the proposed training system at the Wheeler River Project.

3.2.2 Summary

A summary of the licensee's past performance, challenges and proposed improvements is presented in the following subsections.

3.2.2.1 Past Performance

There is no previous performance for the human performance management SCA for the Wheeler River Project.

3.2.2.2 Regulatory Focus

During the proposed licence period, human performance management criteria will be included in inspections to be conducted by CNSC staff at the Wheeler River Project, as will the implementation of the SAT specific area to ensure the program is successfully implemented. CNSC staff intend to carry out a focused inspection on the human performance management SCA during the prepare site and construct phase.

CNSC staff will monitor performance in this area through routine regulatory oversight activities including inspections and desktop reviews.

3.2.2.3 Proposed Improvements

No improvements are proposed by CNSC staff with respect to the management systems SCA.

3.2.3 Conclusion

Based on CNSC staff's reviews of the Wheeler River Project human performance management and training documentation, CNSC staff concluded that the program is adequate to support the proposed prepare site and construction activities of the Wheeler River Project.

Should the Commission issue a licence for the preparation of site and construction of the Wheeler River Project, CNSC staff will monitor activities through the conduct of regulatory compliance verification activities to ensure that Denison continues to meet requirements of the human performance management SCA.

3.3 Operating Performance

The operating performance SCA includes the conduct of the licensed activities, and the activities that enable effective performance.

Based on CNSC staff's assessment of Denison's licence application and supporting documents for the construction of the facility, focused highlights are provided for the following specific areas:

- procedures
- reporting and trending

3.3.1 Discussion

To meet regulatory requirements in this SCA, Denison must implement and maintain operational programs at the Wheeler River site in accordance with the *Uranium Mines and Mills Regulations* and REGDOC-3.1.2, *Reporting Requirements, Volume I: Non-Power Reactor Class I Nuclear Facilities and Uranium Mines and Mills*.

In conformity with these requirements, Denison has proposed operational programs that will ensure the proposed licensed activities at the Wheeler River site are performed safely and in compliance with regulatory requirements.

Commissioning is focused on verifying and documenting that the facility fulfills the functional and performance requirements of the design. In 2023, Denison submitted the commissioning plan. This plan outlines the process and methodology to conduct commissioning activities, as well as roles and responsibilities for performing those activities.

Procedures

Denison maintains a comprehensive set of procedures across all programs and will develop new procedures as their operations evolve. CNSC staff have reviewed a subset of Denison's processes and procedures and concluded that they meet regulatory requirements. The subset that was reviewed included the processes and procedures required to verify program elements and for starting up licenced activities, should a licence be granted.

Denison's procedures are governed by management system principles, and any changes made to procedures are carried out in accordance with Denison's change control process. As part of CNSC's compliance verification activities, the review of procedure level documents will ensure that Denison continually updates facility-specific procedures as needed to support ongoing process improvements at the Wheeler River site. CNSC staff are satisfied that the proposed implementation of Denison's processes is adequate for meeting program requirements with respect to prepare site and construction activities. Further details on CNSC staff's assessment of Denison's management system can be found in section 3.1 (Management System) above.

Should the Commission approve the construction of the Wheeler River Project, the facility will be subject to these operating performance program elements. In addition, CNSC staff will monitor the Wheeler River facility through the conduct of regular compliance verification activities to verify that Denison continues to meet operating performance requirements.

Reporting and Trending

In accordance with the proposed licence condition and REGDOC-3.1.2, Denison will be required to report information to the CNSC through annual, quarterly and monthly compliance monitoring and operational performance reports. Denison will also be required to report any unplanned events such as injuries to persons, releases of nuclear substances to the environment, or security events. Denison is also required to notify CNSC staff as far in advance as possible of major planned changes to the site or their management system. CNSC staff's review of Denison's management system included provisions to report to the CNSC in accordance with all regulatory requirements.

3.3.2 Summary

A summary of the licensee's past performance, challenges and proposed improvements is presented in the following subsections.

3.3.2.1 Past Performance

There is no previous performance for the operating performance SCA for the Wheeler River Project.

As part of the licence requirements for the nuclear substance and radiation devices licences and the Elliot Lake licences, Denison implemented an operating performance system, including reporting requirements, that was verified through CNSC staff's technical assessment, annual compliance reports, and review of other reportable events. The operating performance SCA for these licences was determined to be satisfactory.

3.3.2.2 Regulatory Focus

During the proposed licence period, operating performance criteria will be included in inspections to be conducted by CNSC staff at the Wheeler River Project, as will the implementation of procedures, and reporting and trending specific areas to ensure the program is successfully implemented. CNSC staff intend to carry out a focused inspection on the operating performance SCA during the prepare site and construct phase.

CNSC staff will monitor performance in this area through routine regulatory oversight activities including inspections and desktop reviews.

3.3.2.3 Proposed Improvements

No improvements are proposed by CNSC staff with respect to the operating performance SCA.

3.3.3 Conclusion

Based on CNSC staff's reviews of the Wheeler River Project operating performance documentation, CNSC staff concluded that Denison will maintain and implement effective operational programs that ensure that licensed activities will be performed safely and in compliance with regulatory requirements.

Should the Commission issue a licence for the preparation of site and construction of the Wheeler River Project, CNSC staff will monitor activities through the conduct of regulatory compliance verification activities to ensure Denison continues to meet requirements of the operating performance SCA.

3.4 Safety Analysis

The safety analysis SCA covers the maintenance of the safety analysis that supports the overall safety case for the facility. Safety analysis is a systematic evaluation of the potential hazards associated with the conduct of a proposed activity or facility and considers the effectiveness of preventative measures and strategies in reducing the effects of such hazards.

3.4.1 Discussion

As a licensing requirement, Denison will be required to implement and maintain a process to identify and assess hazards and risks on an ongoing basis at the Wheeler River Project. This includes identifying and evaluating new or unforeseen risks that were not considered at the planning and design stages and updating previous risk assessments by replacing important assumptions with performance data. CNSC REGDOC-2.4.4, *Safety Analysis for Class IB Nuclear Facilities* offers guidance on safety analysis for uranium mine and mill licensees.

Hazard Analysis

Denison has submitted the results of a process-hazard analysis, and these results have been taken into account for the Wheeler River Project.

Hazard analysis provides an opportunity to identify and mitigate potential hazards to worker health and safety, and to the environment, to an acceptable level. These analyses will be completed before the work begins as described in Denison's Health and Safety Management Program [8]. Denison has proposed to use the following methods for identifying risks and hazards at the Wheeler River Project as the jobs are being planned:

- hazard identification
- assessing hazards and risks
- addressing identified hazards and risks

CNSC staff reviewed Denison's assessment and concluded that the systematic hazard analysis methodology is adequate and meets regulatory requirements.

3.4.2 Summary

A summary of the licensee's past performance, challenges and proposed improvements are presented in the following subsections.

3.4.2.1 Past Performance

There is no previous performance for the safety analysis SCA for the Wheeler River Project.

3.4.2.2 Regulatory Focus

During the proposed licence period, safety analysis criteria will be included in inspections to be conducted by CNSC staff at the Wheeler River Project, as will the implementation of the hazard analysis specific area to ensure the program is successfully implemented.

CNSC staff will monitor performance in this area through routine regulatory oversight activities including inspections and desktop reviews.

3.4.2.3 Proposed Improvements

There are no other proposed improvements for this SCA.

3.4.3 Conclusion

Based on the above assessment, CNSC staff concluded that Denison's submitted application meets the regulatory requirements and CNSC staff's expectations to protect workers and the environment at the Wheeler River Project as it relates to the development and maintenance of the safety analysis for the facility.

Should the Commission issue a licence for the preparation of site and construction of the Wheeler River Project, CNSC staff will monitor activities through the conduct of regulatory compliance verification activities to ensure that Denison continues to meet requirements of the safety analysis SCA.

3.5 Physical Design

The physical design SCA relates to activities that impact the ability of structures, systems and components (SSCs) to meet and maintain their design basis given new information arising over time and taking changes in the external environment into account.

The specific areas that comprise this SCA at the Wheeler River Project include:

- design governance
- site characterization
- facility design
- structure, system and component design

3.5.1 Discussion

Denison is required to implement and maintain a process to ensure that the design of the facilities is managed using a well-defined systematic approach, which will be managed through their Facility and Equipment Management Program [9]. The program confirms that safety-related SSCs and any modifications to them will continue to meet their design basis given new information arising over time.

The *Uranium Mines and Mills Regulations* require the submission of a description of the proposed designs; final detailed designs are not required for a licence to prepare site and construct. Furthermore, it is expected that a licence to prepare site and construct would be required to gather the information to include in the final detailed engineering designs based on site conditions. Denison provided CNSC staff the Facility Description Manual [5] which provides descriptions of all components of the facility and the design criteria which govern the design of the components of all aspects of the facility. If a licence is issued, Denison will be required to submit final design documentation to CNSC for review prior to construction as described in the regulatory commitments in appendix D.

Design Governance

In addition to the Facility Description Manual [5], Denison submitted the following design documentation which will govern the detailed design of the facility:

- civil earthworks design criteria
- civil utility and surface piping design criteria
- structural design criteria
- mechanical equipment design criteria
- piping design criteria
- heating ventilation and air conditioning design criteria
- fire protection design criteria
- electrical design criteria
- instrumentation and controls design criteria
- process design criteria
- wellfield containment design criteria
- well design criteria

These documents currently cover the criteria that Denison has set in place for the conceptual design of all aspects of the Wheeler River Project facilities and will be updated with detailed design criteria as these become available. CNSC staff reviewed these documents and have determined that they meet regulatory requirements.

CNSC staff are satisfied that the design criteria will govern the design process through to the final design.

Engineering Change Control (ECC) Process

Denison's engineering change control (ECC) process is documented by the document *Change Management Procedure* [10]. CNSC staff have reviewed the procedure for regulatory compliance and provided Denison comments to address. Denison has addressed the comments and CNSC staff are satisfied that the Denison ECC process meets regulatory requirements and that any design changes to the Wheeler River Project will be sufficiently documented. Should the Commission issue a licence to prepare site for and construct the Wheeler River Project, CNSC staff will monitor Denison's implementation of the ECC process.

Human Factors in Design

Denison has provided a framework for considering human factors within the engineering design control plan, as governed by the *Human Factors Engineering Procedure* [11]. Denison's *Human Factors Engineering Procedure* provides guidelines to establish a systematic process for integrating human factors into the design, construction, operation, and maintenance of nuclear facilities in accordance with CNSC REGDOC-2.5.1, *General Design Considerations: Human Factors*. To ensure factors are adequately incorporated, the procedure outlines criteria for considering human factors, steps to follow and the required qualifications for the Human Factors Team. Human factors are considered in new plant designs and include:

- control room design and upgrades
- maintenance and operations procedures
- human-machine interfaces (HMI)
- training and staffing strategies
- facility design modifications

Radiation Protection in Design

Denison intends the facility design to incorporate features to keep radiation exposures as low as reasonably achievable (ALARA). This will include separate work areas with their own ventilation, negative pressure enclosure of dust-generating equipment, and shielding materials in tanks and piping. To support the engineering design and control plan and establish how the Wheeler River Project incorporates engineering controls for radiation protection, Denison developed the *Establishing Engineering Controls for Radiation Protection Procedure* [12]. This procedure is intended to guide engineering design decisions during the engineering phase with emphasis on verification after implementation.

Examples of engineered controls for radiation protection include:

- sparging to off-gas dissolved radon gas (RnG) from the uranium bearing solution (UBS) and venting to atmosphere
- ventilation in all enclosed work areas to control worker exposures to long-lived radioactive dust (LLRD), RnG and radon progeny (RnP)
- negative pressure enclosure of key LLRD sources in the drying area (dryer, calciner) and the packaging/loading area (drum loader)
- shielding around source materials to reduce external radiation exposure (includes steel in tanks and drums, High Density Poly Ethylene (HDPE) in totes and piping, and a berm around the special waste pad)

Three radiological control zones are planned within the operation according to radioactive contamination potential. Additional provisions for radiation protection are elaborated in section 3.7 for the radiation protection SCA.

Site Characterization

CNSC staff conducted a comprehensive review of the geological, hydrogeological, meteorological, hydrological, aquatic and terrestrial environment characterization of the site provided by Denison. CNSC staff have reviewed the information provided to date and have accepted that the provided information is sufficient at this time to determine any impact to the ability of SSCs to meet the requirements for the physical design SCA for the site preparation and construction phase. However, should the Commission issue a licence, Denison will conduct additional supporting baseline characterization and analyses as part of regulatory commitments that will be addressed prior to conducting specific licensed activities.

Structures, Systems and Components Design

Denison has completed the preliminary design or outline of several key structures, systems and components of the Wheeler River Project which were identified by CNSC staff as critical components. The detailed design of these critical components will be provided to CNSC staff for review and acceptance prior to construction as noted in appendix D. Specific requests for further information were communicated to Denison and will require CNSC staff review and acceptance prior to activities related to the requests.

In-Situ Recovery Wellfield Design

The in-situ recovery (ISR) well field preliminary design was submitted for CNSC staff review in the Facility Description Manual [5]. Included in this submission were the components of the wellfield including well patterns, well spacing, the draft designs of the injection wells, recovery wells, the freeze holes and monitoring holes.

A 5-spot well pattern will be the primary design layout of the wellfield injection and recovery wells, although various other pattern shapes will also be used, depending on the subsurface geometry of the ore deposit. The spacing between wells is anticipated to be 5 m to 10 m, and the depth approximately 430 m. Both injection and recovery wells are expected to be outfitted to allow the reversal of flows to facilitate a higher recovery of uranium. Operational parameters including injection pressures and flow rates will be adjusted as necessary to maintain a steady UBS grade concentration and flow rate acceptable to the mill, while maintaining an inward hydraulic gradient that will be the primary control of the mining solution. Key considerations for wellfield design include the selection of well locations and operational parameters, which will be finalized based on the field test, laboratory test, and geological and hydrogeological modelling.

The Well Design Criteria [13] provides detailed technical requirements for the well design, fabrication, installation, testing, and commissioning of the production systems for each well type (including freeze holes, injection/recovery wells, and environmental monitoring wells). Final detailed designs of the design will be provided by Denison prior to the commencement of wellfield construction, as per regulatory commitment in appendix D. Continual improvement of the wellfield design is expected and will be ongoing throughout operation of the facility.

Denison has conducted laboratory studies to investigate the in-situ recovery (ISR) process using mineralized drill cores from the Wheeler River Project and a feasibility field test (FFT) to confirm the technical feasibility of utilizing the ISR mining method at the Wheeler River deposit. These also support the production wellfield design and reclamation plan.

CNSC staff have reviewed the well design criteria, wellfield containment design criteria, and ISR wellfield conceptual level designs. Denison will submit the detailed ISR wellfield design and other related documents for review before proceeding with construction related activities.

Freeze Wall Design

The construction of the freeze wall is planned to proceed in phases throughout construction and operation of the Project, beginning with a limited initial installation in support of the first of the 5-phase mining approach. As mining advances, subsequent phases will be initiated by incrementally expanding the freeze wall to encompass new target areas. The freeze wall will be embedded into the competent basement rock.

Monitoring wells will be placed on the perimeter of the wellfield, both inside and outside of the freeze wall. Monitoring will facilitate timely identification of, and responses to, potential excursion of mining fluid from the mining zone in both horizontal and vertical directions. The parameters to be monitored include water level, downhole solution temperature, solution conductivity, downhole pressure, and recovered solution oxidation reduction potential, pH, and temperature. A conceptual monitoring network has been provided, however, the detailed design will be provided prior to the initiation of construction, as noted in appendix D.

CNSC staff reviewed the preliminary design of the freeze wall and determined that it meets regulatory requirements for the proposed activities.

Surface Drainage and Water Management Infrastructure

Denison will manage surface water accumulated on the site (i.e. contact or non-contact water) due to precipitation and runoff through site grading, ditches and culverts. Infrastructure will be designed and constructed to convey the design event precipitation and runoff volumes to assigned detention ponds or the environment. The proposed ditches and the various ponds designed to manage contact and non-contact water are presented in *Civil Overall Site Drainage Collection and Diversion Plan* [14].

Clean, non-contact runoff will be diverted away from project components where possible. Contact water such as runoff from the wellfield and areas surrounding the mill, will be collected in designated ponds and directed to the Industrial Wastewater Treatment Plant (IWWTP) for treatment prior to discharge into Whitefish Lake as described in the *Civil Overall Site Drainage Collection and Diversion Plan*, [14]. Surface runoff drainage ditches (collection and conveyance of surface runoff) will be designed to convey surface runoff from 24-hour probable maximum precipitation (PMP) (493 mm) event and 24-hour 100-year event (89 mm) for contact water and non-contact water respectively. The culverts will be designed for the 24-hour 100-year event, but in locations where there is potential for overflow that could result in a reportable spill, these culverts will be sized for larger capacity using the 24-hour PMP event, for additional conservancy.

CNSC staff have reviewed the conceptual level designs for surface water management (site grading and ditches) and found them to meet regulatory requirements. To address regulatory commitments for final detailed designs, the proponent will submit additional design documents for review as described in appendix D.

Pond Design

A double-lined process water pond with leak detection has been designed to capture water from multiple sources, including the process precipitates storage pad and the special waste pad. Located adjacent to the mill, the pond will have a storage capacity of up to 30,000 m^3 and is engineered to accommodate a 24-hour PMP event. It will also be capable of receiving water from all site ponds and monitoring wells. The wellfield runoff pond has also been designed to capture runoff from the wellfield and special waste pad and will be designed to hold up to 38,200 m^3 water and have a double composite liner with leak detection. It is designed to manage runoff from the 24-hour PMP event.

CNSC staff have reviewed the conceptual level designs for all monitoring and runoff ponds and found them to meet regulatory requirements. To address regulatory commitments for final detailed designs, the proponent will submit additional design documents for review as described in appendix D.

Waste Pads Design

Denison will construct a special waste pad, approximately 2,500 m^2 in size and built with a double composite liner system with leak detection, to contain the special waste rock. The pad will be able to hold the estimated 364 m^3 special waste that will be produced throughout operation. Special waste rock is defined as uranium-containing materials unsuitable for the clean waste pile and includes mineralized core, wellfield development cuttings, basement rock, and potentially acid-generating (PAG) waste rock. The pad may also temporarily store other potentially radioactive materials, such as contaminated soil, before final disposal. Contact water from the special waste pad will be directed to the wellfield runoff pond.

A clean waste pad, approximately 2,500 m^2 in size, will be constructed with a single geomembrane liner to store clean waste rock. The clean waste rock includes non-mineralized, non-PAG sandstone cuttings and core and may be reused for road construction or concrete production. During operations, the clean waste rock will be assayed and tested for PAG potential to confirm its suitability for reuse. A runoff collection pond will be constructed adjacent to the clean waste rock pad, also lined with a single geomembrane and protective layer.

CNSC staff have reviewed the relevant documents and determined that they meet regulatory requirements for the proposed activities.

Mill Design

CNSC staff were provided with the preliminary design of the mill and all the constituent components. The construction of the mill will include components to process the uranium bearing solution (UBS), including tanks for precipitation, thickeners, dewatering systems, drying and packaging. A solution holding area will also be included for additional storage capacity, as mining and milling may happen at different rates and times.

To keep worker doses ALARA, Denison is including in its designs a radon purge tank to remove the initial volume of radon before the solution enters the mill.

CNSC staff are satisfied with the preliminary design of the mill. However, because the mill design may have potential impacts to the environment and is an important component during its operation, Denison will provide the detailed designs for the mill as described in appendix D.

3.5.2 Summary

A summary of the licensee's past performance, challenges and proposed improvements are presented in the following subsections.

3.5.2.1 Past Performance

There is no previous performance for the physical design SCA for the Wheeler River Project.

3.5.2.2 Regulatory Focus

During the proposed licence period, physical design criteria will be included in inspections to be conducted by CNSC staff at the Wheeler River Project, as will the implementation of design governance, site characterization, facility design, and structure, system and component design specific areas to ensure the program is successfully implemented. Due to the importance of this SCA while structures, systems and components are being built, CNSC staff intend to carry out 3 focused inspections on the physical design SCA during the prepare site and construct phase.

CNSC staff will monitor performance in this area through routine regulatory oversight activities including inspections and desktop reviews.

3.5.2.3 Proposed Improvements

Denison has committed that they will submit detailed designs of their facilities prior to construction. Regulatory commitments are found in appendix D.

3.5.3 Conclusion

Based on CNSC staff's assessment of Denison's licence application and supporting documents for the construction of the project facilities, CNSC staff concluded that the Wheeler River Project physical design meets regulatory requirements. Denison has demonstrated to CNSC staff's satisfaction that the Wheeler River Project physical design will adequately follow the relevant codes and standards and align with industry good practices.

Should the Commission issue a licence for the prepare site and construction of the Wheeler River Project, CNSC staff will track the completion of Denison's regulatory commitments for the licence to prepare site for the submission of the final designs for the site water management, the well field, and for the mill as described in appendix D.

Should the Commission issue a licence for the preparation of site and construction of the Wheeler River Project, CNSC staff will monitor activities through the conduct of regulatory compliance verification activities to ensure that Denison continues to meet requirements of the physical design SCA.

3.6 Fitness for Service

The fitness for service SCA covers the activities that impact the physical condition of structures, systems and components to ensure that they remain effective over time. This area includes programs that ensure all equipment is available to perform its intended design function when called upon to do so.

Based on CNSC staff's assessment of Denison's licence application and supporting documents for the construction of the Wheeler River Project, focused highlights are provided for the specific area of maintenance.

3.6.1 Discussion

Denison will be required to manage the structures, systems and components (SSCs) at the Wheeler River Project. Implementing and maintaining fitness for service requirements confirms that safety-related SSCs and any modifications to them continue to meet their design given new information arising over time and taking changes in the external environment into account. It also confirms that SSCs continue to be able to perform their safety functions under all facility states.

Should the Commission issue a licence to prepare site and construct the Wheeler River Project, CNSC staff will verify Denison's licensed activities to make sure that equipment and SSCs (temporary or permanent) are installed as per design and specifications, commissioned as per the commissioning plans and procedures, and that assets put into operation during the construction phase are adequately maintained to perform their design function and remain fully functional. As such, CNSC staff's review for this licence application focused on assessing whether adequate design considerations (such as maintainability) and preparatory work for readiness to move to the operation have been undertaken to establish the required specific programs under the fitness for service SCA.

CNSC staff verified that the Wheeler River Project design description and design requirements documents addressed the maintainability of components and systems. CNSC staff conducted a detailed review of the Wheeler River Facilities and Equipment Management Program and Denison's design criteria documents and assessed that Denison's maintenance governance will be adequate to support the Wheeler River Project's maintenance activities that will be carried out during the prepare site and construction phase.

Maintenance

CNSC staff verified that the Wheeler River Project design description and design requirements documents addressed the maintainability of components and systems. CNSC staff reviewed provisions in the Facility and Equipment Management Program [9] and its associated procedures and determined that the licence application is adequate to support the maintenance activities that will be carried out during the prepare site and construction of the Wheeler River Project.

Should the Commission approve the prepare site and construction of the Wheeler River Project, Denison will establish schedules for preventative maintenance and work instructions as described in their submitted management system for the overall maintenance of the facility to ensure that the relevant structures, systems and components can meet the design requirements of the project.

3.6.2 Summary

A summary of the licensee's past performance, challenges and proposed improvements is presented in the following subsections.

3.6.2.1 Past Performance

There is no past performance for the fitness for service SCA for the Wheeler River Project as this is a licence application for a new facility.

As part of the licence requirements for the Elliot Lake licences, Denison has demonstrated that they maintain an adequate fitness for service program by performing necessary monitoring and maintenance inspections, and by taking action when improvements are required. This was demonstrated via the upgrading of their water treatment system in 2015. This upgrade work was verified through CNSC staff's compliance verification activities, including an inspection. The fitness for service SCA for these licences was determined to be satisfactory.

3.6.2.2 Regulatory Focus

During the proposed licence period, fitness for service criteria will be included in inspections to be conducted by CNSC staff at the Wheeler River Project, as will the implementation of maintenance specific areas to ensure the program is successfully implemented.

CNSC staff will monitor performance in this area through routine regulatory oversight activities including inspections and desktop reviews.

3.6.2.3 Proposed Improvements

No improvements are proposed by CNSC staff with respect to the fitness for service SCA.

3.6.3 Conclusion

Based on CNSC staff's assessment of Denison's licence application and supporting documents, CNSC staff concluded that Denison's provisions for the fitness for service SCA meets regulatory requirements.

Should the Commission issue a licence for the preparation of site and construction of the Wheeler River Project, CNSC staff will monitor activities through the conduct of regulatory compliance verification activities to ensure that Denison continues to meet the requirements of the fitness for service SCA.

3.7 Radiation Protection

The radiation protection SCA covers the implementation of a Radiation Protection (RP) program in accordance with the *Radiation Protection Regulations*. The program must ensure that contamination levels and radiation doses received by individuals are monitored, controlled and maintained As Low As Reasonably Achievable (ALARA).

The specific areas that comprise this SCA at the proposed Wheeler River Project include:

- application of ALARA
- worker dose control
- radiation protection program performance
- radiological hazard control

3.7.1 Discussion

Denison is required to implement an RP program in accordance with the *Radiation Protection Regulations*. The program must ensure that contamination levels and radiation doses received by individuals are monitored, controlled and maintained ALARA. Denison also must supply a code of practice under the *Uranium Mines and Mills Regulations* which includes action levels for radiation dose.

Denison developed a RP program [15] commensurate with the radiological hazards associated with the proposed activities for a licence to prepare a site and construct application for the Wheeler River Operation. The program outlines the plan for risk management, setting of RP objectives and targets, and qualifications and training. The program also covers processes for monitoring and controlling worker doses, radiation work planning, contamination monitoring and control, and clearance of objects for off-site release.

The objectives of the RP program are to:

- protect people and the environment from harm due to radiation exposure
- keep radiation exposures to workers and members of the public ALARA, considering social and economic factors

There are a number of supporting plans under the RP program, including the *Radiation Protection Plan* [16], the *ALARA Plan* [17], and the *Radiation Protection Code of Practice* (RCOP) [18]. Implementation of the RP program is supported by procedures and work instructions.

Based on CNSC staff's assessment of Denison's licence application and supporting documentation for the Wheeler River Project, focused highlights are provided for each specific area of the radiation protection SCA.

Application of ALARA

The ALARA Plan [17] supports the RP program and describes the process for ensuring that radiation exposures in the workplace are ALARA, considering social and economic factors. The ALARA Plan describes the planning and control of exposures through radiation work planning and engineered controls incorporated into the design of the Wheeler River Operation (as detailed in the physical design SCA). Preliminary facility designs and criteria have features intended to reduce radiation exposure, including separate work areas with their own ventilation, negative pressure enclosure of dust-generating equipment, and shielding materials in tanks and piping. The ALARA Plan also details the Radiation Work Permit process controlling non-routine exposure situations. The planning is based on anticipated radiation hazards, estimated worker exposures and doses, and selection of controls to optimize exposure and dose. The resulting work permit outlines the new task, and its anticipated hazards, exposures, doses, controls, associated monitoring to verify that exposures are as expected, and actions to be taken if they are not.

The RCOP, required by the *Uranium Mines and Mills Regulations*, supports the RP program and defines the action levels and administrative levels that will be in place at the facility, and actions that will be undertaken when these levels are exceeded, in order to control workplace exposures. It also details the use of respiratory protection through the Radiation Work Permit process for controlling non-routine radiological exposure situations. The RCOP provided meets the requirements of section 4 of the *Uranium Mines and Mills Regulations.* The RCOP includes effective dose action levels and administrative levels for workers, as well as administrative levels for monitoring radiological conditions of work areas for gamma radiation, radon gas (RnG), radon progeny (RnP), long-lived radioactive dust (LLRD), uranium-in-urine concentration, and surface contamination.

Worker Dose Control

The Radiation Protection Plan also supports the RP program, and presents details on implementation of the RP program, with specific reference to the Wheeler River Project work areas and associated radiological hazards, area and worker monitoring requirements, radiation instrumentation and equipment, and processes to be followed.

Workers engaged in the Wheeler River Project will be exposed to radiation sources in several work areas. Expected exposure pathways are through inhalation of LLRD, RnG and RnP, as well as external exposure to gamma radiation from process solids and liquids containing radionuclides of the uranium-238 decay chain.

Drilling of the wellfield within the ore body is planned to commence during the licence to prepare site and construct phase. These activities will result in low occupational exposures to workers in the wellfield. Workers are expected to be classified as nuclear energy workers (NEWs) as there is a reasonable likelihood of workers' doses exceeding 1 mSv/year. During the construction phase, wellfield workers will handle natural uranium bearing core materials. Drillers on the wellfield will also be exposed to radiation from ore cuttings stored in drums at the well head and exposed to low levels of radon in outdoor air due to venting at the wellfield.

Predicted doses to NEWs across all phases of the Wheeler River Project are below CNSC's effective and equivalent dose limits. Total effective doses to drillers on the wellfield during construction are bounded by those estimated for drillers during operations, where drillers on the wellfield during operations are conservatively estimated to have a total effective dose of 10 mSv/year. This conservative dose estimate does not take into account any mitigation measures or work controls provided for by the RP program.

Monitoring of workers' radiation exposures is a key component of the RP program. NEWs' effective doses will be calculated as the sum of the following components: gamma radiation, RnG, RnP, and LLRD. Monitoring equipment will include real-time warning systems, such as continuous air monitors and direct-reading dosimeters, enabling workers to respond to changing conditions to minimize exposure. External gamma radiation doses will be monitored in all work areas by means of passive and real-time personal dosimeters. Air grab samples and continuous air monitoring for RnG and RnP, and air grab samples and personal dust pumps for LLRD will monitor internal radiation doses. NEWs will also participate in a routine urine bioassay program. Routine bioassay measurements of uranium in urine provide a check on a worker's internal exposure to LLRD, which includes special bioassay monitoring to investigate any known or suspected abnormal intakes.

In addition to personal dose monitoring, area monitoring for gamma radiation, and concentrations of RnG, RnP and LLRD in air will be performed in work areas where higher exposures are expected. This will provide information for estimating doses in these areas to facilitate safe work planning. Action levels and administrative levels for exposures are defined in the RCOP, and monitoring data will be compared to these levels, to make sure that corrective actions are taken to maintain worker doses ALARA.

Radiation Protection Program Performance

The RP program [15] includes monitoring and measuring radiation protection performance against established objectives and targets as described previously. Monitoring results (including radiation exposures, worker doses and contamination levels) will be routinely evaluated against action levels and administrative levels (as defined in the RCOP) and evaluated over time by calculating indicators of performance for the RP program. Denison intends to conduct internal audits of the RP program to assure compliance with the requirements set out in the program and to determine if the program is effectively implemented and maintained. Workplace inspections will also be performed. The RP program will be reviewed by Denison management in accordance with a defined frequency to assure the program is meeting its objectives.

Should the Commission issue a licence to prepare site and construct the Wheeler River Project, CNSC staff will monitor and review Denison's RP program performance on a routine basis, to ensure that the program remains effective in the protection of workers and is commensurate with the level of radiological risk.

Radiological Hazard Control

The RP program and the supporting *Radiation Protection Plan* describe provisions for contamination monitoring and control. All areas of the Wheeler River Project are to be divided into contamination zones based on thresholds for allowable removable and fixed surface contamination within each zone. The contamination control process, via routine monitoring, will verify that radioactive contamination is not being tracked into areas with lower thresholds. Personal protective equipment and personal hygiene restrictions apply to workers moving between and within zones. Eating and drinking restrictions will also be applicable within designated areas. As described previously, area monitoring concentrations of RnG, RnP and LLRD in air will be performed in work areas where higher exposures are expected.

3.7.2 Summary

A summary of the licensee's past performance, challenges and proposed improvements are presented in the following subsections.

3.7.2.1 Past Performance

There is no previous performance for the radiation protection SCA for the Wheeler River Project.

As part of the licence requirements for the field feasibility test licences, Denison implements a RP program that adequately protects workers and the environment, ensures contamination is minimized, with required radiation warning signage used to warn of radiation hazards. This was verified through CNSC staff's technical assessment and on-site verification. The radiation protection SCA for these licences were determined to be satisfactory.

As part of the licence requirements for the Elliot Lake licences, Denison implements a RP program that was protective of workers and people from radiation hazards that was verified through CNSC staff's compliance verification activities. The radiation protection SCA for these licences were determined to be satisfactory.

3.7.2.2 Regulatory Focus

During the proposed licence period, radiation protection SCA criteria will be included in inspections to be conducted by CNSC staff at the Wheeler River Project, as will the implementation of application of ALARA, worker dose control, RP program performance and radiological hazard control specific areas to ensure the program is successfully implemented.

CNSC staff will monitor Denison's performance in the radiation protection SCA through regulatory oversight activities including inspections, desktop reviews of compliance reports, and relevant program documentation.

3.7.2.3 Proposed Improvements

No improvements are proposed by CNSC staff with respect to the radiation protection SCA.

3.7.3 Conclusion

Based on CNSC staff's assessment of Denison's licence application and supporting documents, CNSC staff concluded that Denison's provisions for the radiation protection SCA meet regulatory requirements and CNSC staff expectations. CNSC staff are satisfied that Denison will implement sufficient measures in accordance with the *Radiation Protection Regulations* for the protection of workers during the licence to prepare site and construct phase for the Wheeler River Project.

Should the Commission issue a licence for the preparation of site and construction of the Wheeler River Project, CNSC staff will monitor activities through the conduct of regulatory compliance verification activities to ensure that Denison continues to meet requirements of the radiation protection SCA.

3.8 Conventional Health and Safety

The conventional health and safety SCA covers the implementation of a program to manage workplace safety hazards and protect workers.

Based on CNSC staff's assessment of Denison's licence application and supporting documents for the construction of the Wheeler River Project, focused highlights are provided for the following specific areas:

- performance
- practices
- awareness

3.8.1 Discussion

Denison's activities at the Wheeler River Project site must comply with the *Canada Labour Code* and *Canada Occupational Health and Safety Regulations*, and other applicable federal and provincial health and safety acts and regulations. Employment and Social Development Canada is mandated with overseeing and enforcing compliance with the *Canada Labour Code* and its regulations with the exception of sections 122 to 158 (Part II) of the *Canada Labour Code* as described in the *Saskatchewan Uranium Mines and Mills Exclusion Regulations.* The excluded sections govern occupational health and safety, which are enforced by the Saskatchewan Ministry of Labour Relations and Workplace Safety pursuant to the *Saskatchewan Employment Act*, SS 2013, c S-15.1.

Reporting

A key performance indicator for this SCA is the number of lost-time injuries (LTIs) that occur per year. An LTI is an injury that takes place at work, resulting in the worker being unable to return to work and carry out their duties for a period of time. Licensees are required by the NSCA to report all LTIs to the CNSC. In order to harmonize regulatory efforts for the uranium mines and mills, CNSC staff and the province of Saskatchewan maintain a Memorandum of Understanding (MOU) and will continue to collaborate in regulatory efforts pertaining to the Wheeler River Project.

Practices

Denison's Health and Safety Management Program will apply to all work performed by Denison employees at the Wheeler River Project facility. Denison will apply its Health and Safety Management Program through:

- safety orientation and training
- work permits for specialized work
- occupational health committees
- planned inspection program
- planned preventative maintenance
- management of change
- contractor management
- management reviews
- work procedures

Risk assessments are used to compile a list of safety and health hazards and their controls.

All contractors working at the Wheeler River Project will be required to adhere to Denison's Health and Safety Management Program [8] or an equivalent program that has been authorized by Denison. Contractors are required to comply with program requirements and regulations, manage the hazards and controls associated with its work, and provide a health and safety program for its workers.

According to the Health and Safety Management Program, Denison will require that all workers and visitors participate in site orientation, this orientation will cover general site rules and provide the worker with the required information to work safely at the facility.

Awareness

Denison promotes conventional health and safety through several measures including the use of hazard identification processes and documented procedures for licensed activities. There are 2 hazard identification processes used by Denison which require the participation of the workers conducting the work. The first is a Job Hazard Analysis (JHA) which is used for non-routine work without defined procedures. The second being Field Level Hazard Assessments (FLHA) which are conducted prior to work done under a JHA or as per a defined procedure. The use of both processes provides CNSC staff confidence that workers are involved in reviewing the hazards associated with their workplace. Denison's programs also require Denison management review of the implementation of the health and safety program to identify areas for improvement.

Denison's systematic approach to training is also used to deliver safety-related training at the Wheeler River Project to employees and contractors. This training includes site specific safety requirements, first aid training, and on Denison's Workplace Hazardous Materials Information System (WHMIS), which provides information on the safe use of hazardous materials onsite.

3.8.2 Summary

A summary of the licensee's past performance, challenges and proposed improvements are presented in the following subsections.

3.8.2.1 Past Performance

There is no previous performance for the conventional health and safety SCA at the Wheeler River Project.

As part of the Elliot Lake licences, Denison implemented a conventional health and safety program that was protective of workers from licensed activities that was verified through CNSC staff's compliance verification activities. The conventional health and safety SCA for these licences was determined to be satisfactory.

3.8.2.2 Regulatory Focus

During the proposed licence period, conventional health and safety criteria will be included in inspections to be conducted by CNSC staff at the Wheeler River Project, as will the implementation of the performance, practices and awareness specific areas to ensure the program is successfully implemented.

CNSC staff will monitor performance in this area through routine regulatory oversight activities including inspections and desktop reviews.

3.8.2.3 Proposed Improvements

No improvements are proposed by CNSC staff with respect to the conventional health and safety SCA.

3.8.3 Conclusion

Based on CNSC staff's assessment of Denison's Wheeler River Project licence application and supporting documents for the construction of the project facilities, CNSC staff concluded that the Wheeler River Project's conventional health and safety program meets regulatory requirements and CNSC staff expectations. Denison has demonstrated to CNSC staff's satisfaction that the Wheeler River Project conventional health and safety program is in compliance with regulatory requirements.

Should the Commission issue a licence for the preparation of site and construction of the Wheeler River Project, CNSC staff will monitor activities through the conduct of regulatory compliance verification activities to ensure that Denison continues to meet the requirements of the conventional health and safety SCA.

3.9 Environmental Protection

The environmental protection SCA covers programs that identify, control, and monitor all releases of radioactive and hazardous substances and effects on the environment from facilities or as the result of licensed activities.

The specific areas that comprise this SCA at the Wheeler River Project include:

- environmental risk assessment
- effluent and emissions control (releases)
- assessment and monitoring
- protection of people
- environmental management system (EMS)

3.9.1 Discussion

CNSC staff's assessment in this subsection addresses environmental protection measures relevant to the activities associated with the licence to prepare site and construct as well as information related to the overall environmental effects resulting from the prepare site and construction phase of the project.

During the prepare site and construction phase, the Wheeler River Project will produce negligible radiological releases which are not expected to contribute significantly to doses that members of the public could receive from the proposed activities at the project site.

Environmental Risk Assessment

An Environmental Risk Assessment (ERA) [19] is a systematic process used by licensees to identify, quantify, and characterize the risk posed by contaminants (radiological and non-radiological/chemical) and physical stressors in the environment on human and other biological receptors, including the magnitude and extent of the potential effects associated with a facility. Human receptors are assessed through a human health risk assessment (HHRA) and ecological receptors (i.e., non-human biota) are addressed through an ecological risk assessment (EcoRA). An ERA can be predictive, retrospective, or include elements of both. The ERA serves as the basis for the development of site-specific environmental protection measures and the results from future ERA updates determine whether the facility's effluent monitoring and Environmental Monitoring Program (EMP) are effective. The results of these programs, in turn, inform and refine further updates to the ERA. REGDOC-2.9.1, *Environmental Protection: Environmental Principles, Assessments and Protection Measures* includes a requirement for an ERA in accordance with CSA N288.6-22, *Environmental Risk Assessments at Nuclear Facilities and Uranium Mines and Mills* [20], and outlines expectations that ERAs be updated every 5 years, or when a significant change to the facility or activities occurs, or when a project moves to a new phase in the lifecycle (e.g., an application to progress licensing from construction to operations).

In support of their licence application, Denison submitted their predictive ERA [19] for a separate licensing review against regulatory requirements in REGDOC-2.9.1 and CSA N288.6 [20]. CNSC staff conducted a comprehensive review of the predictive ERA and found it to meet the regulatory requirements of REGDOC 2.9.1 and CSA N288.6. Prior to certain site preparation and construction activities, Denison will be taking actions to address conditions prescribed through the Environmental Assessment Report (EA Report), which includes gathering more baseline data to update and refine the conclusions of the ERA. Denison is currently collecting more baseline data and will be required to update the predictive ERA prior to in-water activities. In-water activities include construction of the industrial wastewater treatment plant (IWWTP) effluent discharge pipeline and diffuser and the water intake in Whitefish Lake South. CNSC staff concluded that the current iteration of the predictive ERA and Denison's commitments are adequate for a licence to prepare site and construct.

CNSC staff's review of the predictive ERA also found that regulatory commitments carried over from the EA review to the licensing process had not yet been fully addressed. Several of these regulatory commitments are related to baseline data/characterization and/or potential climate change impacts. In the ERA update that will be submitted prior to in-water works, Denison will provide the information required to address these commitments. The regulatory commitments must be met prior to initiation of in-water project activities under the licence to prepare site and construct.

Denison will be required to submit an updated ERA to support an application for a licence to operate which must address the remaining comments from the EA process that are required prior to operation.

Should the Commission issue a licence to prepare site and construct the Wheeler River Project, CNSC staff will review the updated predictive ERA prior to commencement of in-water activities as conditions of the EA (EA2 and EA4). Should the updates to the ERA identify any new or revised risks to the environment or receptors, Denison will implement additional mitigation measures and/or adaptive management programs to ensure the protection of the environment that will be reviewed by CNSC staff.

Effluent and Emissions Control (Releases)

Uranium mines are metal mines under the *Metal and Diamond Mining Effluent Regulations* (MDMER), they are subject to paragraph 4(1) of the MDMER which authorizes a mine to deposit effluent containing deleterious substances if the concentrations of the deleterious substances do not exceed the maximum authorized concentrations that are set out in schedule 4 of the MDMER, if the pH of the effluent is equal to or greater than 6.0 but is not greater than 9.5, and if the effluent is not acutely lethal. Paragraph 14(1) of the MDMER requires a mine to conduct acute lethality testing and determine whether the effluent is acutely lethal. Authorized release limits will be harmonized, where available, with those required under the MDMER.

Denison will be required to maintain an effluent and emissions monitoring program in compliance with REGDOC-2.9.1, *Environmental Protection: Environmental Principles, Assessments and Protection Measures* and CSA N288.5, *Effluent monitoring programs at Class 1 nuclear facilities and uranium mines and mills* [21]. Denison submitted an effluent and emissions monitoring program for the prepare site and construction phases. Denison noted that the effluent and emission monitoring identified are intended to apply to future phases of the Project. For a licence application to operate the Wheeler River Project, Denison will be required to update the effluent and emissions monitoring program accordingly.

Atmospheric emissions associated with the prepare site and construction phases of the Wheeler River Project will be limited to fossil fuel combustion emissions from mobile equipment and stationary equipment (e.g., generators, heaters, vehicle and equipment movements) and fugitive dust emissions from vehicle generated road dust. To mitigate dust, Denison has proposed several measures, such as applying water at least twice per day to unpaved roads and surfaces and limiting equipment and vehicle speeds along the access road and site roads to less than 40 km/h. During the proposed licencing period, CNSC staff will verify that these mitigation measures are effective.

Significant effluent releases are not anticipated for the construction phase of the Project, however, Denison noted that there may be a need to sample and release precipitation or runoff water collected in the ponds during the construction phase. Denison is required to sample and to analyze for major ions, total dissolved solids, total suspended solids, total ammonia nitrogen, pH, temperature, and metals. Prior to any potential effluent release to the environment, the analysis must demonstrate that the parameters meet the MDMER limits. Then, Denison will be required to provide the results in the next quarterly environment report.

Denison submitted a Best Available Technology Economically Achievable (BATEA) preliminary assessment for air treatment and water treatment during the operation phase. It is expected that Denison will continue to update the BATEA during the licensed activities, and that it will be adequate prior to the licence application to operate the Wheeler River Project.

Section 4 of the *Uranium Mines and Mills Regulations* requires Denison to submit an environmental code of practice (ECOP). The ECOP defines action levels for nuclear and hazardous substances in effluent, and for physical stressors, which, if exceeded, would indicate a potential loss of control of the environmental protection program. The ECOP also contains actions to take in the event that an action level is exceeded. Denison is required to derive the action levels in accordance with CSA N288.8, *Establishing and implementing action levels for releases to the environment from nuclear facilities* [22].

Denison submitted an environmental code of practice, which contained their proposed administrative and action levels. Administrative levels are internal levels that are in place to provide an early warning that an action level may be exceeded if certain actions are not taken and will not need to be reported to the CNSC if they are exceeded.

Assessment and Monitoring

Denison is required to maintain an EMP in compliance with REGDOC-2.9.1, *Environmental Protection: Environmental Principles, Assessments and Protection Measures* and CSA N288.4, *Environmental monitoring programs at nuclear facilities and uranium mines and mills* [23]. Denison is also required to implement an EA Follow-up Monitoring Program. Denison submitted a draft EMP that applies to all phases of the project. The EMP includes details about monitoring locations, frequencies, and environmental parameters to be measured, and is informed by the ERA. Denison will update the environmental monitoring program accordingly as more information becomes available and as other reports are finalized (i.e. predictive ERA). The details of Denison's EMP contains monitoring for air quality, noise, surface water, fish, sediment and benthic, soil, vegetation, groundwater, terrestrial, and country foods. Each of these are described in the following paragraphs.

Air Quality Monitoring

Air quality monitoring will be implemented to verify the accuracy of the predicted effects and the effectiveness of the proposed mitigation measures. CNSC requires that Denison meets provincial requirements, therefore Denison must demonstrate compliance with the provincial ambient air quality standards. Air quality monitoring is done continuously and includes using alpha-track etch monitors to monitor radon, dustfall samplers to monitor dustfall, passive samplers to monitor nitrogen dioxide and high-volume air samplers to monitor total suspended particulates and other metals.

Noise Monitoring

Noise monitoring will be implemented to confirm if the federal and provincial guidelines for noise are met. The program consists of a 1-week campaign once per phase near the baseline location and near the cabin at McGowan Lake, where the nearest human receptors are located.

Surface Water Monitoring

Surface water quantity and quality monitoring will be implemented to verify the accuracy of the predicted effects and the effectiveness of the proposed mitigation measures. Denison will be required to monitor the flow and levels of the lakes in the vicinity of the Wheeler River Project. Denison will also be required to collect annual grab samples during construction at 7 surface water locations, including Whitefish Lake, McGowan Lake, and Russell Lake. The locations include the baseline locations and in reference areas that are not going to be impacted by the facility. The sampling locations were selected based on their location and potential for downstream effects from the Wheeler River Project. The parameters to monitor include COPCs identified in the ERA, such as metals, the uranium-238 series of radionuclides, chloride, and sulphate.

Fish Monitoring

The fish monitoring program consists of monitoring fish habitat and fish health every 3 years. The purpose of the program is to verify the accuracy of the predicted effects and the effectiveness of the proposed mitigation measures. Denison will be required to collect fish at an upstream reference location, a downstream near-field location near the discharge point, a downstream mid-field location, and a downstream far-field location. During the sampling, Denison will be required to observe and measure physical parameters that indicate the health of the fish habitat. This program will collect fish tissue data of hazardous and radiological parameters and life history parameters (e.g., length, weight, sex, condition, age).

Sediment and Benthic Invertebrate Monitoring

Sediment quality and benthic invertebrate monitoring will be implemented every 3 years to verify the accuracy of the predicted effects and the effectiveness of the proposed mitigation measures. The samples will be collected at 5 locations in the vicinity of the Wheeler River Project. The parameters to be monitored in sediment include moisture content, grain size, total organic carbon, metals, radionuclides, nutrients, total mercury, and methylmercury (at select locations). The parameters to be monitored for benthic invertebrates include community measures (e.g., mean Simpson's diversity, dominant taxa), and benthic invertebrate chemistry (metals and radionuclides).

Soil Monitoring

Soil monitoring will be implemented to verify that mitigation measures are appropriate and effective. The program consists of several sampling plots in the vicinity of the Wheeler River Project every 3 years. Furthermore, soil stockpiles on-site will be periodically monitored to evaluate soil quality and quantity, and to verify suitability for reclamation.

Vegetation Monitoring

Vegetation monitoring will be implemented to verify that mitigation measures are appropriate and effective. The program consists of sampling lichen and blueberries in the vicinity of the Wheeler River Project every 3 years. The timing and sample locations of the vegetation monitoring program will coincide with the soil sampling program. Furthermore, vegetation communities and ecosites, as well as "species richness" and "structural diversity" for plants, and the occurrence of invasive plants will be monitored periodically.

Groundwater Monitoring

Groundwater monitoring will be implemented through the groundwater protection and monitoring program for the Wheeler River Project and is required to comply with REGDOC-2.9.1 and CSA N288.7, *Groundwater protection programs at Class 1 nuclear facilities and uranium mines and mills* [24]. Denison submitted a draft Groundwater Protection and Monitoring Plan [25], which applies to all phases of the project. CNSC staff have noted that this plan is required to be updated as additional information becomes available and as related reports, such as the predictive ERA, are finalized.

The objectives of groundwater monitoring are to verify the accuracy of the EA predictions and the effectiveness of the mitigation measures, confirm the integrity of the freeze wall, detect potential excursions and provide timely signals for further evaluation and actions. The groundwater well monitoring network, sampling plan, and the specific parameters to be analyzed will be tailored to each Project phase (from pre-construction to post decommissioning) and each Project area (e.g., surface facilities versus mining area versus freeze wall perimeter).

The groundwater monitoring network for the in-situ recovery mining area will be installed during prepare site and construction phases. Groundwater monitoring will align with Denison's 5-phase mining plan and staged freeze wall development. Specifically, data collected during the pre-construction and construction phase will supplement established baseline conditions. Groundwater monitoring network will also monitor conditions within and around the freeze wall, focusing on groundwater quality changes and potential excursions due to freezing capacity loss.

Constituents to be considered as key performance indicators in groundwater include hydraulic response, temperature, electrical conductivity (EC), pH, oxidation-reduction potential, sulphate, uranium, and chloride. Hydraulic response, temperature, and EC may be considered for continuous measurement. Sampling frequency of groundwater constituents in different monitoring wells and in the different phases of the Wheeler River Project are specified in the Groundwater Protection and Monitoring Plan [25].

Throughout the Project's duration, predictions of the subsurface's assimilative capacity and the migration potential of COPCs will be refined using updated reactive transport modeling. These insights will inform the detailed design of the post-decommissioning groundwater monitoring.

A groundwater monitoring network will also be established for surface facilities, primarily consisting of shallow wells to monitor groundwater conditions upgradient, on the perimeter, and downgradient of those facilities. Baseline groundwater samples will be collected at each site before operation, ideally in 2 different seasons, to establish alignment with existing conditions.

Terrestrial Monitoring

Terrestrial wildlife monitoring will be implemented to verify that mitigation measures are appropriate and effective. This monitoring is proposed to include furbearers, ungulates, small mammals, amphibians, birds, and species at risk. Specifically, Denison is developing a management plan for woodland caribou.

Denison is required to implement mitigation measures to minimize the impact of prepare site and construction activities on at-risk or endangered species, or on their habitats, in accordance with any approvals issued under the federal *Species at Risk Act*. In this context, Denison provided the draft methodology and timing of "pre-clearance surveys" for terrestrial species at risk to be conducted prior to site clearing or disturbance.

Country Foods Monitoring

The monitoring of environmental COPC concentrations in the various media described above will take into consideration country foods and human health. In particular, should the Project proceed Denison has committed to assessing health risks from fish consumption by comparing fish tissue data collected during operations from the monitoring program. Denison will also continue to engage with local Indigenous Nations and communities to ensure the environmental monitoring plan reflects their interests. For instance, in consultation with Indigenous Nations and communities, site-specific contaminant or trigger mechanisms will be developed to support country food monitoring undertaken during operations.

Protection of People

This specific area ensures that the public and Indigenous Nations and communities are protected from the releases of nuclear and hazardous substances from the facility.

Denison is required to report any uncontrolled releases of radioactive and hazardous substances to the environment (e.g., spills) through reporting requirements outlined in appendix A of CNSC REGDOC-3.1.2, *Reporting Requirements, Volume I: Non-Power Reactor Class I Nuclear Facilities and Uranium Mines and Mills*. CNSC staff will review these event reports to verify whether the environment and the public are protected from any releases to the environment on the Wheeler River Project site.

The *Radiation Protection Regulations* contain regulatory dose limits to protect the health and safety of persons, including members of the public. Based on the information provided by Denison, there will be no radiological releases to the environment during the prepare site and construction phase. Therefore, the development of licensed release limits specific to the Wheeler River Project will not be required until the operation phase.

Denison conducted a HHRA, inclusive of traditional foods, for all Project phases (construction, operation, decommissioning and post-decommissioning) in their predictive ERA to evaluate estimated exposures to both radiological and non-radiological COPCs by members of the public and identify any potentials risks.

For the radiological releases, Denison calculated that the maximum incremental radiological dose during all Project phases would be 0.06 mSv/yr to the fisher/trapper receptor located at Russell Lake. Denison also calculated that the total incremental dose to the camp worker would be 0.16 mSv/year. Both of these values are below the dose limit for a non-NEW of 1 mSv/yr. Therefore, CNSC staff concluded that no discernable health effects are anticipated due to exposure of these receptors to radioactive releases from the Wheeler River Project.

With respect to the non-radiological releases, Denison's modelling identified 1 potential impact to human health from exposure of the fisher/trapper receptor located at Russell Lake to selenium through fish ingestion. This finding for this fisher/trapper receptor was based on the conservative assumption of high consumption of Traditional Foods, and a conservative assumption regarding the residency time at Russell Lake, whereas most of those fishing, hunting, and trapping in the local and regional areas would consume traditional foods more consistent with the average Traditional Foods diet. As such, Denison deemed the overall risk associated with this potential impact to be low. However, Denison has committed to assessing health risks from fish consumption by comparing fish tissue data of relevant COPCs collected from their monitoring program during operations against applicable human health risk-based maximum permissible concentrations. Further, Denison has committed to developing a country food monitoring document to support a licence to operate. Site-specific contaminant criteria and/or trigger mechanisms will be developed in consultation with Indigenous Nations and communities.

Denison will submit an updated predictive ERA prior to in-water activities which will include an updated HHRA, as described in appendix D. CNSC staff will review and determine the acceptability of the HHRA prior to commencement of licensed project activities, should a licence to prepare site and construct be issued. CNSC staff will verify whether the conclusions of the HHRA remain valid throughout the lifecycle of the facility, including through the results of the BATEA/ALARA assessment, ongoing reviews of the Environmental Assessment Follow-Up Monitoring Program, the site environmental monitoring program, and updates to the ERA.

Environmental Management System (EMS)

REGDOC-2.9.1 requires licensees to develop and maintain an EMS to provide a framework for integrated activities related to environmental protection. An EMS refers to the management of an organization's environmental policies, measures, and procedures in a comprehensive, systematic, planned, and documented manner.

Denison submitted an environmental management program, which includes their EMS. It was created in accordance with ISO 14001:2015, *Environmental Management Systems – Requirements with Guidance for Use* [26]. The environmental management program is organized according to the "Plan-Do-Check-Act" iterative process to ensure that continual improvement initiatives can be implemented. The environmental management program identifies and manages environmental risks and also identifies the pollution control activities that are in place to mitigate those risks.

As part of regulatory oversight, CNSC staff will evaluate the implementation of Denison's EMS to ensure compliance with regulatory requirements.

3.9.2 Summary

A summary of the licensee's past performance, challenges and proposed improvements are presented in the following subsections.

3.9.2.1 Past Performance

There is no previous performance for the environmental protection SCA for the Wheeler River Project.

As part of the licence requirements for the Elliot Lake licences, Denison implemented an environmental protection program that was protective of the environment from licensed activities, which has been verified through CNSC staff's compliance verification activities. The environmental protection SCA for these licences was determined to be satisfactory.

3.9.2.2 Regulatory Focus

During the proposed licence period CNSC staff will monitor Denison's performance in the environmental protection SCA through regulatory oversight activities including inspections, desktop reviews of compliance reports, and relevant program documentation. CNSC staff will focus on regulatory oversight of Denison's implementation of their environmental protection program in accordance with REGDOC-2.9.1 and REGDOC-2.9.2 and verify the implementation of the CSA N288 series of standards. CNSC staff intend to carry out a focused inspection on the environmental protection SCA during the prepare site and construct phase.

In addition, CNSC staff will track the implementation of the EA commitments as described in sections 1.2.3 and 5.5 of the CMD and the regulatory commitments as described in appendix D. CNSC staff will also have regulatory oversight of Denison's EA follow-up monitoring program to verify that the predictions of environmental effects of the EA completed under CEAA 2012, are accurate, that mitigation measures are effectively implemented, and to verify that Denison is addressing CNSC staff's outstanding information requests made during the EA process. CNSC staff will conduct compliance verification activities to verify that Denison has implemented the mitigation measures identified in the EA follow-up monitoring program throughout the prepare site and construction phase.

CNSC staff will monitor performance in this area through routine regulatory oversight activities including inspections and desktop reviews.

3.9.2.3 Proposed Improvements

Denison has committed that they will submit an updated predictive ERA prior to in-water works. Denison may be required to submit an updated BATEA and updated environmental protection documents to address CNSC staff's recommendations and incorporate additional information should a licence to prepare site and construct be issued. Regulatory commitments are found in appendix D.

3.9.3 Conclusion

Based on CNSC staff's assessment of Denison's licence application and supporting documents for prepare site and construction of the project facilities, CNSC staff concluded that the Wheeler River Project meets regulatory requirements for the Environmental Protection SCA under paragraph 3(c) the *Uranium Mines and Mills Regulations*, REGDOC 2.9.1 and the CSA N288 series of standards. On the basis of the reviews conducted to-date, and the commitments made, CNSC staff are satisfied that Denison will take all reasonable precautions to protect the environment and the health and safety of persons.

Should the Commission issue a licence for the prepare site for and construction of the Wheeler River Project, CNSC staff will track the completion of Denison's regulatory commitments for the licence to prepare site for the submission of the updated ERA as described in appendix D.

Should the Commission issue a licence for the preparation of site and construction of the Wheeler River Project, CNSC staff will monitor activities through the conduct of regulatory compliance verification activities to ensure that Denison continues to meet requirements of the environmental protection SCA.

3.10 Emergency Management and Fire Protection

The emergency management and fire protection SCA covers emergency plans and emergency preparedness programs that exist for emergencies and for non-routine conditions. This area also includes any results of participation in exercises.

Based on CNSC staff's assessment of Denison's licence application and supporting documents for the construction of the Wheeler River Project, focused highlights are provided for the following specific areas:

- conventional emergency preparedness and response
- nuclear emergency preparedness and response
- fire emergency preparedness and response

3.10.1 Discussion

The Wheeler River Project licence application provides details of the proposed emergency preparedness program, and demonstrates how it meets the requirements outlined in REGDOC-2.10.1, *Nuclear Emergency Preparedness and Response*. REGDOC-2.10.1 provides regulatory requirements for emergency preparedness for all licences, including for the licence to prepare site and construct.

A licence application must provide details of the proposed emergency preparedness program, including how they meet the requirements outlined in REGDOC-2.10.1.

Denison is required to ensure the prepare site and construction activities are monitored and to have provisions in place to protect workers. Denison provided their Fire Protection Program [27] that describes how the fire protection activities will be implemented, managed, and monitored during the prepare site and construction phase to ensure that fire risks are minimised. Denison also described how the prepare site and construction phase will address prevention of, protection from, control of, mitigation of, response to, and recovery from fires (including explosions) to protect persons and the environment.

Conventional Emergency Preparedness and Response

Denison provided CNSC staff for review a set of detailed procedures that address non-radiological and non-routine conditions and emergencies commensurate with the emergency preparedness program. The licence application included procedures to address emergency situations that have the potential to endanger the safety of workers, the environment, and the public. Specifically, the application described the procedures in place to respond to fires, medical emergencies, spills, rescues, or off-site accidents affecting the construction site. The application also included the details of emergency response organisations, personnel, and equipment to be used to respond to on-site emergencies.

Denison has provided their Emergency Preparedness and Response Program [28] to CNSC. Denison is located approximately 260 km from the nearest community and cannot rely on them for emergency responses. They are proposing to have adequate emergency response resources on site during the prepare site and construction stages. In preparation for future licence applications, discussions are on-going for off-site transportation emergencies, however, for the prepare site and construction phase, there will be no transportation of nuclear substances and so this is not required for this application.

In addition, if a licence is granted, Denison will be accountable for all contracting companies to ensure that they have a site-specific safety plan designed to meet Denison's management system and CNSC requirements. Denison has demonstrated to CNSC staff that they will have provisions for emergency response and submit for review any additional plans required for the licence.

Nuclear Emergency Preparedness and Response

A nuclear emergency preparedness program is not required during prepare site and construction. If Denison applied for a licence to operate, regulatory requirements require the submission of a fully developed nuclear emergency preparedness and response program that will be implemented for the operation phase.

Fire Emergency Preparedness and Response

Fire Response

As mentioned under the Emergency Preparedness and Response [28] above, Denison will establish an on-site emergency response due to their distance from the closest town.

Contractor partners are also required to issue their own site-specific safety plan (SSSP), designed to meet requirements specified in the emergency response governance.

Fire Protection

Denison developed a preliminary Fire Protection Program (FPP) aimed at minimizing both the likelihood and potential consequences of fire events. The FPP outlines the implementation, management, and monitoring of fire protection activities to ensure fire risks are effectively controlled. Denison has demonstrated how the construction phase will address fire prevention, protection, control, mitigation, response, and recovery measures to protect both personnel and the environment.

Denison's Fire Protection Program ensures that a fire safety plan will be adequately implemented during the prepare site and construction activities in accordance with the licence.

Denison submitted Fire Protection Design Criteria [29] document that outlines the engineering standards and practices to be followed during the design phase and provides guidance on active fire protection systems. These systems include fire detection and alarm systems, automatic suppression systems, and firefighting equipment, which are intended to mitigate fire hazards through early detection, effective suppression, and control. However, CNSC staff noted that passive fire protection measures such as fire separations, rated enclosures, or locally applied fire barriers are not currently included in the Fire Protection Design Criteria [29] document. Therefore, Denison is expected to provide design documentation that incorporates passive fire protection elements as captured in appendix D. The fire protection design criteria document also establishes that the fire mitigation design will conform to the latest editions of CSA N393, the *National Building Code of Canada*, and the *National Fire Code of Canada.*

3.10.2 Summary

A summary of the licensee's past performance, challenges and proposed improvements are presented in the following subsections.

3.10.2.1 Past Performance

There is no previous performance for the emergency management and fire protection SCA for the Wheeler River Project.

3.10.2.2 Regulatory Focus

During the proposed licence period, emergency management and fire protection criteria will be included in inspections to be conducted by CNSC staff at the Wheeler River Project, as will the implementation of conventional emergency preparedness and response, nuclear emergency preparedness and response, and fire emergency preparedness and response specific areas to ensure the program is successfully implemented.

CNSC staff will monitor performance in this area through routine regulatory oversight activities including inspections and desktop reviews.

3.10.2.3 Proposed Improvements

CNSC staff will require that Denison will submit an updated fire protection design criteria that includes passive fire protection measures. Requirements are found in appendix D.

3.10.3 Conclusion

Based on CNSC staff's review of the Wheeler River Project emergency management and fire protection documentation, CNSC staff concluded that Denison will maintain and implement an effective Emergency Management Program and Fire Protection Program that ensure activities in this SCA will be performed in compliance with regulatory requirements. Should the Commission issue a licence for the prepare site for and construction of the Wheeler River Project, CNSC staff will track the completion of Denison's regulatory commitments for the licence to prepare site and construction licence for the submission of the updated design criteria as described in appendix D.

Should the Commission issue a licence for the preparation of site and construction of the Wheeler River Project, CNSC staff will monitor activities through the conduct of regulatory compliance verification activities to ensure Denison continues to meet requirements of the emergency management and fire protection SCA.

3.11 Waste Management

The waste management SCA covers internal waste-related programs that form part of the facility's operations up to the point where the waste is removed from the facility to a separate waste management facility. This area also covers the planning for decommissioning

The specific areas that comprise this SCA at the Wheeler River Project include:

- waste characterization
- waste minimization
- waste management practices
- decommissioning plans

3.11.1 Discussion

Denison's application must include a description of their proposed waste management program and a decommissioning plan in accordance with paragraph 3(1)(j) of the *General Nuclear Safety and Control Regulations* and paragraph 3(c) and subparagraph 3(a)(viii) of the *Uranium Mines and Mills Regulations*.

Denison submitted their waste management program and their proposed preliminary decommissioning plan (PDP) [30] with their application to prepare site and construct the facility, as required by the *Uranium Mines and Mills Regulations.*

Waste Characterization

Based on CNSC staff's review of the Wheeler River Project's Waste Management Program [31], CNSC staff are satisfied with the measures in place for waste characterization of the wastes generated and managed during the prepare site and construct phase of the Wheeler River Project. Waste that is predicted to be generated during the licence activities include hazardous non-radiological waste, special waste rock and clean waste rock. Recyclable and domestic wastes are expected to be generated outside of licence activities in locations such as the camp facilities or in designated eating locations.

Waste Minimization

Waste minimization activities at the proposed Wheeler River Project will be carried out in accordance with the Waste Management Program [31] provided. Likely contaminated or known contaminated low-level radioactive or hazardous waste will be sorted and segregated from clearable/likely clean waste. If radioactive contamination is found, Denison would perform cleanup or decontamination operations by following the appropriate Wheeler River Project site procedures, to minimize the amount of contaminated radioactive waste requiring further management. Based on CNSC staff's review of Denison's Waste Management Program, CNSC staff are satisfied with the measures in place for waste minimization during the different lifecycle stages of the Wheeler River Project.

Waste Management Practices

CNSC staff's assessment of Denison's waste management program, processes and procedures concludes that Denison considers waste segregation, waste minimization, and the associated operating practices through the use of approved engineered principles and practices, and Denison's internal work permit and engineering change control processes. Denison will continue to develop processes and equipment and enabling facilities to support waste management at the Wheeler River Project.

Unlike other uranium mine and mill operations, the proposed Wheeler River Project will not contain a tailings management facility (TMF) that is used to manage tailings waste from the mill facility. As the tailings that would result from mining the ore would remain in the ground with the in-situ recovery (ISR) mining method, no TMF is proposed to be constructed for this facility.

Decommissioning Plans

In accordance with subparagraph 3(a)(viii) of the *Uranium Mines and Mills Regulations*, Denison is required to maintain a decommissioning plan throughout the life of the proposed Wheeler River Project. CNSC staff have assessed the PDP for the Wheeler River Project [30] and concluded that it is in compliance with CSA Group standard N294-19, *Decommissioning of facilities containing nuclear substances* [32] and CNSC REGDOC-2.11.2, *Decommissioning*.

Alongside the PDP, CNSC staff reviewed the Preliminary Decommissioning Cose Estimate (PDCE) submitted as part of the PDP. The PDCE provides the estimated cost for the PDP. CNSC staff's review of the PDCE determined that it followed the regulatory requirements, and that the cost associated with the PDP are commensurate with the activities described in the PDP. Information on the financial guarantee that is associated with the PDP and PDCE can be found in section 5.2 of this CMD.

3.11.2 Summary

A summary of the licensee's past performance, challenges and proposed improvements are presented in the following subsections.

3.11.2.1 Past Performance

There is no previous performance for the waste management SCA for the Wheeler River Project.

3.11.2.2 Regulatory Focus

During the proposed licence period, waste management criteria will be included in inspections to be conducted by CNSC staff at the Wheeler River Project, as will the implementation of waste characterization, waste minimization, waste management practices and decommissioning plans specific areas to ensure the program is successfully implemented.

CNSC staff will monitor performance in this area through routine regulatory oversight activities including inspections and desktop reviews.

3.11.2.3 Proposed Improvements

No improvements are proposed by CNSC staff with respect to the waste management SCA.

3.11.3 Conclusion

Based on CNSC staff's assessment of the Denison application and supporting documents, CNSC staff concluded that Denison will implement and maintain an effective waste management program in compliance with regulatory requirements, and international and industry best practice associated with waste characterization, waste minimization and waste management practices.

Should the Commission issue a licence for the preparation of site and construction of the Wheeler River Project, CNSC staff will monitor activities through the conduct of regulatory compliance verification activities to ensure that Denison continues to meet requirements of the waste management SCA.

3.12 Security

The specific areas that comprise this SCA at the proposed Wheeler River Project include:

- facilities and equipment
- security practices

3.12.1 Discussion

The security SCA covers the programs required to protect the licensed activities from unauthorized access and the illegal possession, use, or removal of nuclear substances, prescribed equipment, or prescribed information. Based on the information provided, the proponent's programs will be required to meet the requirements set out in paragraph 3(1)(e) of the *Uranium Mines and Mills Regulation* and will not be subject to the *Nuclear Security Regulations*. In their application, Denison has provided their proposed Security Management Program [33] and measures to meet the requirements of the *General Nuclear Safety and Control Regulations*. Details of the security program and measures are considered prescribed information.

Facilities and Equipment

Denison has outlined its proposed measures to control access to the site of the activity to be licensed in a Security Management Program [33]. The description of the facilities and equipment are sufficient to meet the requirements under *General Nuclear Safety and Control Regulations* paragraphs 3(g) and (h), 12(1)(c), and (g), and *Uranium Mines and Mills Regulations* 3(e) for the current prepare site and construct phase of licensing.

Security Practices

Denison's proposed security practices are outlined across the Security Management Program and the Nuclear Substances and Radiation Devices Management Procedure [34] under the RP Program [15]. In its submissions, Denison has outlined its procedures for controlling access to nuclear substances, prescribed equipment, and prescribed information. They have also provided information on the proposed measures that will be implemented to support detection of illegal use, or removal of nuclear substances and prescribed equipment. Denison has also submitted to the CNSC their procedure [35] for performing threat and risk assessments.

It is anticipated that Denison will continue to provide submissions related to their security program in support of a future application for a Licence to Operate. CNSC staff's primary concern for the current phase of licensing is to ensure Denison has an adequate process to identify and protect the prescribed information that will be required in future licensing phases. Denison has provided CNSC staff a short list of procedures they anticipate being designated as prescribed information, as well as a set of criteria for identifying future prescribed information that may be generated. Denison has indicated prescribed information will be restricted on a "need-to-know" basis.

CNSC staff are satisfied with the information provided by Denison for the security practices.

3.12.2 Summary

A summary of the licensee's past performance, challenges and proposed improvements are presented in the following subsections.

3.12.2.1 Past Performance

There is no past performance for the security SCA for the Wheeler River Project.

3.12.2.2 Regulatory Focus

During the proposed licence period, security criteria will be included in inspections to be conducted by CNSC staff at the Wheeler River Project, as will the implementation of facilities and equipment, and security practices specific areas to ensure the program is successfully implemented.

CNSC staff will monitor performance in this area through routine regulatory oversight activities including inspections and desktop reviews.

3.12.2.3 Proposed Improvements

No improvements are proposed by CNSC staff with respect to the security SCA.

3.12.3 Conclusion

CNSC staff are satisfied the security measures proposed by Denison are sufficient to meet the *General Nuclear Safety and Control Regulations* and *Uranium Mines and Mills Regulation* requirements for security for the activities anticipated to occur during prepare site and construction. CNSC staff's assessment of the regulatory requirements was guided by the nuclear substances, prescribed equipment, and prescribed information anticipated to be included in the licence. CNSC staff will monitor performance to ensure Denison meets the security requirements for any activities which they are licensed to conduct.

Should the Commission issue a licence for the preparation of site and construction of the Wheeler River Project, CNSC staff will monitor activities through the conduct of regulatory compliance verification activities to ensure that Denison continues to meet the requirements of the security SCA.

3.13 Safeguards and Non-Proliferation

The safeguards and non-proliferation SCA covers the programs and activities required for the successful implementation of the obligations arising from the Canada/IAEA safeguards agreements as well as other measures arising from the Treaty on the Non-Proliferation of Nuclear Weapons (NPT). This SCA comprises a safeguards program and a non-proliferation program.

The specific area that comprises this SCA at the proposed Wheeler River Project includes access and assistance to the IAEA.

3.13.1 Discussion

Pursuant to the NPT, Canada has entered into a Comprehensive Safeguards Agreement and an Additional Protocol (hereafter referred to as the safeguards agreements) with the IAEA. The objective of the safeguards agreements is for the IAEA to establish a set of measures that confirm nuclear material is not being diverted and that all nuclear activities are peaceful in nature.

The CNSC, through the *Nuclear Safety and Control Act*, regulations, and licences, is the authority that implements safeguards requirements in Canada. CNSC regulatory document REGDOC-2.13.1, *Safeguards and Nuclear Material Accountancy* outlines the regulatory requirements for safeguards programs for applicants and licensees who possess nuclear material, operate a uranium or thorium mine, carry out specific types of nuclear fuel cycle-related research, or carry out specific types of nuclear-related manufacturing activities. REGDOC-2.13.1 is essential to ensure Canadian compliance with the safeguard's agreements entered into with the IAEA and are consistent with modern national and international practices.

The safeguards requirements applicable to this site during the licence to prepare site and construct phases include:

- nuclear material accountancy and control
- provision of access and assistance to the IAEA
- annual reporting information related to safeguards agreements

Denison maintains a Security Management Program [33] which includes content that meets the requirements of REGDOC-2.13.1. Denison's documentation describes considerations and measures taken to satisfy the regulatory requirements and expectations for the Safeguards and Non-Proliferation SCA, which includes the provision of access to IAEA inspectors on request.

3.13.2 Summary

A summary of the licensee's past performance, challenges and proposed improvements are presented in the following subsections.

3.13.2.1 Past Performance

There is no past performance for the safeguards and non-proliferation SCA for the Wheeler River Project.

3.13.2.2 Regulatory Focus

CNSC staff will monitor Denison's performance related to the SCA through appropriate regulatory oversight activities, including desktop reviews of relevant program documentation.

3.13.2.3 Proposed Improvements

No improvements are proposed by CNSC staff with respect to this SCA.

3.13.3 Conclusion

CNSC staff assessed Denison's application and determined that, based on the information submitted in the application, Denison has demonstrated it has adequate measures in place to meet applicable safeguards and non-proliferation requirements. CNSC staff will monitor the licensee's performance and compliance with this SCA through reporting and revisions to relevant program documentation.

Should the Commission issue a licence for the preparation of site and construction of the Wheeler River Project, CNSC staff will monitor activities through the conduct of regulatory compliance verification activities to ensure that Denison continues to meet requirements of the safeguards and non-proliferation SCA.

3.14 Packaging and Transport

Packaging and transport requirements apply to programs for the safe packaging and transport of nuclear substances and radiation devices to and from the Wheeler River Project site and are not applicable to the prepare site and construction phase. Given Denison's licence application is limited to the prepare site and construction of the Wheeler River Project and does not include activities to transport any nuclear substances off-site, this SCA was not assessed for this licensing stage.

4 Consultation and Engagement

4.1 Indigenous Consultation and Engagement

The common-law duty to consult with Indigenous Nations and communities applies when the Crown contemplates actions that may adversely affect potential or established Indigenous and/or treaty rights. The CNSC ensures that all of its licence decisions under the NSCA uphold the honour of the Crown and consider Indigenous peoples' potential or established Indigenous and/or treaty rights pursuant to section 35 of the *Constitution Act, 1982*.

CNSC staff are committed to building long-term relationships with Indigenous Nations and communities who have the potential to be impacted by or have an interest in CNSC-regulated facilities within their traditional and/or treaty territories. The CNSC's Indigenous consultation and engagement practices include sharing information, discussing topics of interest, seeking feedback and input on CNSC processes, responding to and addressing concerns, oversight of licensee engagement activities and providing opportunities to participate in CNSC assessment, decision-making and monitoring processes. The CNSC also provides funding support (through the CNSC's Participant Funding Program and Indigenous and Stakeholder Capacity Fund) for Indigenous peoples to meaningfully participate in Commission proceedings and ongoing regulatory activities.

CNSC staff have identified the following Indigenous Nations and communities who have Indigenous and/or Treaty Rights in the area where the Project is proposed (collectively, the "potentially impacted Indigenous Nations and communities"):

- English River First Nation
- Kineepik Métis Local #9
- Ya'thi Néné Lands and Resource Officer which represents the communities of Hatchet Lake First Nation, Black Lake First Nation, Fond du Lac First Nation as well as the municipalities of Camsell Portage, Uranium City, Stony Rapids and Wollaston Lake
- Métis Nation – Saskatchewan

In addition, based on the information reviewed and received to date, CNSC staff have identified the following Indigenous Nations, communities and organizations that have expressed an interest in the Project (collectively, the "interested Indigenous Nations and communities"):

- Lac La Ronge Indian Band
- Peter Ballantyne Cree Nation
- Birch Narrows Dene Nation
- Prince Albert Grand Council

The potentially impacted Indigenous Nations and communities and the interested Indigenous Nations and communities collectively will be referred to as the "identified Indigenous Nations and communities."

4.1.1 Discussion

This section of the CMD summarises the Indigenous consultation and engagement activities conducted to date by CNSC staff and Denison, in relation to the Denison Wheeler River licence to prepare a site and construct application. Due to the amount and complexity of the information and collaborative nature of the development of the content , details related to consultation and engagement activities with Indigenous Nations and communities are contained in a separate report, titled *"CNSC Staff's Indigenous Consultation Report for the Denison Wheeler River Environmental Assessment (EA) and Licence to Prepare a Site and Construct Application"* (here after, the "Consultation Report"), which is appended to this CMD. The information in this section of the CMD provides an overview of the detailed information found in the Consultation Report.

CNSC staff have been consulting and engaging with potentially impacted or interested Indigenous Nations and communities with regards to the Denison Wheeler River Project ("the Project") on an on-going basis since 2019, throughout the federal EA under the CEAA 2012 and the Licence to Prepare a Site and Construct Application under the NSCA. Due to the proximity of the Wheeler River site to existing CNSC-licensed uranium mines and mills, CNSC staff's relationships with these Indigenous Nations and communities in fact significantly pre-dates this timeframe.

In relation to Wheeler River, CNSC staff have provided numerous opportunities for Indigenous Nations and communities to identify and discuss potential concerns, including potential impacts on rights that may arise from the Project. Consultation efforts during the EA and licensing assessment processes included letters, emails, telephone calls, regular meetings, community meetings, community tours, meetings with leadership, funding support, technical discussions, review and comment periods, collaboration on responding to and addressing concerns raised, collaboration on the inclusion and reflection of Indigenous Knowledge and land use information, ceremony and collaboration on reporting and assessments.

CNSC staff are working collaboratively with English River First Nation (ERFN), Kineepik Métis Local (KML), Ya'thi Nene Lands and Resources (YNLR), and Métis Nation – Saskatchewan (MN-S) on Nation specific Rights Impact Assessments (RIA) in relation to the Project. This is to ensure there is a clearly documented assessment of any potential impacts to Indigenous and/or Treaty Rights that may result from the Wheeler River Project along with an assessment of proposed mitigation and accommodation measures, should it proceed. CNSC staff's final conclusions and recommendations regarding the adequacy of consultation and the Project's potential impacts on Indigenous and/or Treaty rights, including the collaboratively developed RIAs, will be included in CNSC staff's supplemental submission to the Commission in support of Part-2 of the public hearing.

CNSC staff have ensured that the consultation and engagement process for the Project took into consideration recent changes and evolution of best practises and case law. This includes the *United Nations Declaration on the Rights of Indigenous Peoples Act* (UNDA), the CNSC's commitment to reconciliation and the *Principles Respecting the Government of Canada's Relationship with Indigenous Peoples*. CNSC staff also acknowledge that should the Project proceed through the licensing stages with an approved EA, there will be a continued obligation on the CNSC to continue to consult and engage Indigenous Nations and communities over the lifecycle of the Project. Specifically, for the Denison EA and Licence to Prepare a Site and Construct Application, based on CNSC staff's assessment as described in the Consultation Report, CNSC staff determined that the application for both the EA and licensing raised the CNSC's legal Duty to Consult and, where appropriate, accommodate, potentially affected Indigenous Nations and communities.

In order to provide additional time to collaborate and consult with the potentially impacted Indigenous Nations and communities, CNSC staff will be submitting a supplemental report to the Commission in advance of Part 2 of the Denison Wheeler River Commission hearing. This supplemental submission will include an update on CNSC staff's consultation activities, RIAs, updated issues tracking tables, Denison's engagement activities, as well as CNSC staff's conclusions and recommendations regarding the Duty to Consult and, where appropriate, accommodate. Information regarding the outcomes of CNSC staff's efforts to reach a consensus on the Project, the position of potentially impacted Indigenous Nations with regards to their Free, Prior and Informed Consent (FPIC) in relation to the Project, as well as any concerns and key measures and commitments to address any potential impacts as a result of the Project will also be included.

Asserted or Established Indigenous and/or Treaty Rights in the Project Area

The Denison Wheeler River Project is located in Saskatchewan's Athabasca Basin approximately 4 km west of Highway 914. The Project falls within the boundaries of Treaty 10, the Nuhtsiye-kwi Benéne (Ancestral Lands) of English River First Nation, the traditional territory of the Kineepik Métis Local #9, the homeland of the Métis and the Nuhenéné, the traditional territory of the Athabasca Denesuliné.

The Project falls within the boundaries of Treaty 10 of 1906, which covers the northeast quadrant of Saskatchewan, and is bordered by Manitoba and the Northwest Territories to the east and north, while the south and west border extends to central Saskatchewan and Alberta. Treaty 10 (1906) includes the signatories of seven First Nations and contains a provision that establishes treaty rights to hunt, fish and trap throughout the Treaty territory. Signatories of Treaty 10 include: English River First Nation, Birch Narrows Dene Nation, Buffalo River Dene Nation, Hatchet Lake First Nation, Canoe Lake Cree First Nation, Barren Lands First Nation and Northlands First Nation.

No communities or settlements are located within the immediate proximity of the Wheeler River property. Travelling by existing roads, the closest community to the Project is 260 km away. Calculated using a straight line, the closest communities are approximately 150 km from the site. The federal lands within a 100 km radius of the Project area are First Nation reserve lands which do not contain permanent residences and belong to English River First Nation.

This determination is a preliminary assessment that can be adjusted based on information received from Indigenous Nations and communities throughout the lifecycle of the Project, should it proceed.

CNSC Staff-led Consultation Activities with Indigenous Nations and Communities

In order to fulfill the CNSC's consultation obligations for a decision rendered under the NSCA and CEAA 2012 on the Wheeler River Project, CNSC staff sent early notification of the expected Wheeler River Project application to Indigenous Nations and communities and since have provided multiple opportunities for consultation, engagement and collaboration with Indigenous Nations and communities regarding their concerns and interests related to the Project. CNSC staff provided opportunities for dialogue through multiple phone calls, correspondence, and meetings with leadership and community representatives, as well as through the provision of funding and capacity support. CNSC staff have also encouraged and facilitated the participation of the identified Indigenous Nations and communities in the Commission's public hearing process to advise the Commission of any concerns they may have and proposed resolution to those concerns. Additional information about the specific consultation and engagement activities with each Indigenous Nation and community can be found in Section 4 of the Consultation Report.

CNSC staff also developed a Terms of Reference (TOR) for Consultation on the Project with ERFN in December 2021 which outlined a collaborative and mutually agreeable approach to the consultation, regulatory review and the assessment processes for the Project. This included opportunities for ERFN's participation in the technical review of the draft EIS and their participation in the FIRT, reviews of responses to information requests, and collaborating on the RIA process. CNSC staff offered this same process to KML, YNLR and MN-S but due to capacity constraints, MN-S and KML indicated that they would prefer to keep consulting and engaging on the Project during regular monthly meetings and did not require the development of a project specific TOR. YNLR decided to continue working on the Project through our long-term engagement TOR and when needed, project-specific meetings.

CNSC staff have also been consulting and engaging with the identified Indigenous Nations and communities on an ongoing basis concerning nuclear projects and activities in northern Saskatchewan. The CNSC has TORs for long-term engagement established with ERFN and YNLR. CNSC staff are also working to finalize a TOR for long-term engagement with KML within the 2025 calendar year. The TORs provide a commitment and process for collaboration and structure for regular meetings and dialogue, as well as the development of annual engagement work plans to address areas of interest or concern regarding CNSC-regulated facilities and activities, including the Denison Wheeler River Project, that are located within an Indigenous Nation's traditional and/or treaty territories.

During these regular meetings and dialogue, CNSC staff provided updates specific to the Project, and had discussions regarding each Nations' interests, concerns and potential impacts on Indigenous and/or Treaty Rights in relation to the Wheeler River Project. CNSC staff have offered and have held multiple project-specific meetings to discuss issues of concern, and to collaborate proactively on an approach to consultation and engagement for the Denison Wheeler River Project with each identified Indigenous Nation and community. In addition to the Nations whom the CNSC meets regularly with, CNSC staff have offered and held multiple meetings and discussions with the other identified Indigenous Nations and communities including MN-S, LLRIB, PBCN, BNDN and PAGC. The CNSC is open to developing and establishing TORs for long-term engagement and engagement work plans with these and other Indigenous Nations and communities should there be interest.

Engagement Led by Denison

CNSC regulatory document REGDOC-3.2.2, *Indigenous Engagement* sets out requirements and guidance for licensees whose projects may raise the Crown's Duty to Consult. While the Crown cannot delegate the Duty to Consult and is ultimately responsible for ensuring the discharge of the Duty to Consult and, where appropriate, accommodate, the Commission can consider the engagement activities undertaken by Denison when determining whether consultation has been adequate. The engagement activities conducted by Denison, including measures proposed by Denison to avoid, mitigate, or offset potential adverse impacts from the Wheeler River Project are used to support the CNSC in meeting its consultation obligations.

CNSC staff have determined that REGDOC 3.2.2 was applicable in relation to the Wheeler River Project. Since starting the regulatory review process in 2019 Denison has submitted to the CNSC multiple versions and updates of their Indigenous engagement report, covering the period between July 2016 and June 2024. CNSC staff have reviewed each version of the report and provided feedback and held regular discussions and meetings with Denison to assist in the monitoring of progress with regards to Denison's engagement activities and meeting the requirements and expectations outlined in REGDOC 3.2.2.

CNSC staff are aware that Denison has been engaging the identified Indigenous Nations and communities by holding meetings, hosting open houses, conducting workshops, site visits and ceremonies, sharing newsletters and discussing issues and concerns including potential options to mitigate and address the concerns raised to date. Denison has offered capacity funding agreements to assist Indigenous Nations and communities in their engagement with Denison, where appropriate. Denison has also supported multiple Indigenous Knowledge and Land Use studies and integrated the results of the studies, knowledge and wisdom shared by the Nations into their EIS and technical documents submitted to the CNSC.

Denison continues to work to support and maintain relationships with Indigenous Nations and communities and is working to address items of concern and requests related to the Wheeler River Project. Denison has been responsive to questions, concerns and comments and has met the regulatory requirements with regards to their approach and process for considering, responding to and addressing comments, questions and concerns raised by Indigenous Nations and communities to date. CNSC staff encourage Denison to continue engagement and collaboration activities with Indigenous Nations in relation to the Wheeler River Project in order to discuss issues and concerns including proposed mitigation measures and commitments, to address any potential impacts to Indigenous and/or Treaty Rights, as appropriate. CNSC staff's final conclusions and assessment on Denison's engagement related to the Denison Wheeler River Project will be included as part of the supplemental submission prior to Part 2 of the hearing.

4.1.2 Conclusion

CNSC staff have aimed to conduct a thorough, transparent, flexible, and collaborative consultation and regulatory process for the Denison Wheeler River Project. All identified Indigenous Nations and communities were provided with multiple opportunities to participate in the regulatory review and consultation process, and funding was offered to support their participation. Indigenous Nations and communities who have raised issues and concerns related to the Wheeler River Project were offered opportunities to collaboratively develop sections of the Consultation Report, EA Report and issues tracking tables.

CNSC staff will continue to monitor and assess Denison's engagement activities throughout the regulatory review process as per REGDOC 3.2.2, and staff's conclusions and assessment on Denison's engagement related to the Wheeler River Project will be included in the supplemental submission prior to Part 2 of the hearing.

An update on consultation efforts with all identified Indigenous Nations and communities, as well as updated issues tracking tables, will be submitted as part of the public record for the Project in advance of Part 2 of the hearing.

Additionally, CNSC staff continue to offer and aim to work collaboratively in consultation with English River First Nation, Kineepik Métis Local, Ya'thi Néné Lands and Resources and the Métis Nation – Saskatchewan on project-specific rights impact assessments. The reports will include CNSC staff's and the Indigenous Nations' views on potential impacts to their Indigenous and/or Treaty Rights, as well as mitigation and/or accommodation measures to address any identified impacts. These reports will be included in CNSC staff's supplemental submission.

The RIAs, issues and concerns tables and additional consultation activities, including collaborative efforts with each potentially impacted Indigenous Nation or community with regards to identifying, and agreeing to specific measures and commitments to address identified concerns and impacts to Rights and interests to the greatest extent possible, as well as each potentially impacted Nations position with regards to their Free, Prior and Informed Consent (FPIC) for the Project, will help to inform CNSC staff's conclusions and recommendations to the Commission with regards to the adequacy of consultation and engagement for the Wheeler River Project. CNSC staff will also continue to engage and collaborate with all identified and interested Indigenous Nations and communities to address and respond to any outstanding concerns with regards to the Wheeler River Project. CNSC staff will involve Denison in these discussions and consultation activities as appropriate.

CNSC staff conducted extensive consultation activities with the identified Indigenous Nations and communities to ensure their full participation in the regulatory review process, and to ensure their concerns were heard and addressed by Denison and the CNSC in a meaningful way. CNSC staff consider that the consultation and engagement process thus far for the Wheeler River Project was meaningful, reasonable, responsive, and followed best practices. CNSC staff's final conclusions and recommendations regarding the adequacy of consultation and the Project's potential impacts on Indigenous and/or Treaty rights as well as CNSC staff's final conclusions and assessment on Denison's engagement will be included in CNSC staff's supplemental submission to the Commission in support of Part-2 of the public hearing.

4.2 Public Consultation and Engagement

The NSCA mandates the CNSC to disseminate objective scientific, technical and regulatory information to the public concerning its activities and the activities it regulates. CNSC staff fulfill this mandate in a variety of ways, including hosting in-person and virtual information sessions and through annual regulatory reports.

4.2.1 Discussion

Sub-paragraph 3(c)(i) of the *Uranium Mines and Mills Regulations* requires that an application for a licence in respect of a uranium mine or mill shall contain a "program to inform persons living in the vicinity of the mine or mill of the general nature and characteristics of the anticipated effects of the activity to be licensed on the environment and the health and safety of persons". Expectations surrounding public information and disclosure are outlined in REGDOC-3.2.1, *Public Information and Disclosure*.

CNSC staff held webinars, meetings and public information sessions, as well as attended multiple in-person northern community tours alongside Denison to provide updates on the Denison Wheeler River Project, since 2019. CNSC staff attended Northern Saskatchewan Environmental Quality Committee (NSEQC) meetings in 2022, 2023, 2024 and 2025, where CNSC presented on projects and updates happening in northern Saskatchewan including the Denison Wheeler River Project. The Northern Saskatchewan Environmental Quality Committee (NSEQC) is a provincial body intended to create avenues for dialogue between residents of northern Saskatchewan, Provincial and Federal bodies, and the uranium industry. CNSC staff also held the Regulatory Oversight Report (ROR) for Uranium Mines and Mills in-person engagement session in September 2022, 2023, and 2024, where potentially impacted Indigenous Nations were invited and participated. At these sessions, Denison Wheeler River Project updates were provided, and questions were answered. CNSC staff also leveraged the CNSC social media channels (LinkedIn, Facebook, Twitter/X) and updated the Denison Wheeler River webpage on the CNSC's website to ensure information was easily accessible and available. This included sharing project updates and information through the Wheeler River Project inbox to the Project subscribers which consisted of members of the public and community representatives.

CNSC staff informed the public of the Denison Wheeler River Federal EA and made all documents submitted by Denison and Indigenous Nations and communities publicly available on the Canadian Impact Assessment Registry (the Registry) Wheeler River Project website. The Registry page for the Wheeler River Project began in 2019 and continues to be updated as required.

The CNSC also communicated information about the regulatory process to the public and stakeholders through various methods, including graphics on the CNSC website, emails to subscribers, public webinars, community tours, and through social media.

4.2.2 Conclusion

CNSC staff conducted early and ongoing engagement activities with members of the public and stakeholders, to encourage their participation in both the Federal EA and licensing regulatory processes. During these activities, CNSC staff ensured participants' concerns were heard and considered. When necessary, CNSC staff ensured meaningful follow-up was completed by Denison and CNSC staff.

CNSC staff's view is that the ongoing engagement activities have been thorough, responsive, and flexible. CNSC staff are committed to continuing to engage with the public and stakeholders in relation to the Denison Wheeler River Project.

4.3 Licensee Public Information and Engagement

A Public Information and Disclosure Program (PIDP) is a standard licence condition, and provides the regulatory requirement for licence applicants and licensees of Class I nuclear facilities, uranium mines and mills and certain Class II nuclear facilities. These requirements are found in REGDOC-3.2.1, *Public Information and Disclosure*.

The primary goal of the PIDP is to ensure that information related to the health, safety and security of persons and the environment, and other issues associated with the lifecycle of nuclear facilities are effectively communicated to the public. The program must include a commitment to, and protocol for ongoing, timely communication of information related to the licensed facility during the course of the licence period.

CNSC's expectations of a licensee's public information program and disclosure protocol are commensurate with the level of risk of the facility, as well as the level of public interest in the licensed activities. The program and protocol may be further influenced by the complexity of the nuclear facility's lifecycle and activities, and the risks to public health and safety and the environment perceived to be associated with the facility and activities.

4.3.1 Discussion

Denison's PIDP for the Wheeler River Project was deemed sufficient by CNSC staff in 2024.

While their PIDP includes their Indigenous consultation program, CNSC staff initially requested that the 2 be separated. However, given that the primary affected audience are Indigenous communities, Denison Mines chose to integrate both programs. The CNSC has accepted this approach.

As Denison is currently applying for a licence to prepare the site and construct the Wheeler River Project, there are no reporting requirements regarding their PIDP at this stage.

As per REGDOC-3.2.1 and stated by Denison, a copy of the PIDP will be made available on Denison's website (www.denisonmines.com) following licensing approval.

However, a review of their pre-licensing public communications indicates that they maintain a comprehensive website dedicated to the Project. This website features recent photos, a project description, updated maps, and the latest developments. Some content is available in the languages in their target audiences: English, Cree and Dene.

As per their PIDP, Denison notifies local media of news related to the company's operations. These press releases are available on the Denison website.

Denison also actively shares project-related information through its social media accounts on X, Facebook, LinkedIn, and Instagram.

4.3.2 Conclusion

If a licence is granted by the Commission, Denison will need to comply with applicable reporting requirements, and it is recommended that Denison continue adhering to their PIDP by regularly providing updates to their target audiences as the Project progresses.

4.4 Participant Funding Program

Pursuant to paragraph 21(1)(b.1) of the NSCA, the Commission may establish and maintain a participant funding program to facilitate the participation of the public in its proceedings.

The CNSC established the Participant Funding Program (PFP) in 2011 to:

1. enhance the participation of Indigenous Nations and communities, members of the public, and interested parties in the CNSC's environmental assessment (EA) and licensing processes for major nuclear facilities (e.g., uranium mines, nuclear power plants, nuclear substance processing, or nuclear waste facilities)
2. assist Indigenous Nations and communities, members of the public, and interested parties to bring value-added information to the Commission through informed and topic-specific interventions related to EAs and licensing (i.e., new, distinctive and relevant information that contributes to a better understanding of the anticipated effects of a project)

4.4.1 Discussion

The CNSC made funding available through its PFP to assist Indigenous Nations and communities, members of the public, and interested parties in participating in the regulatory review process for Denison's Wheeler River Project and providing value-added information to the Commission through informed and topic-specific interventions.

The CNSC offered funding for the Denison Wheeler River Project in 2 phases. The first phase was to assist with reviewing Denison's draft EIS. The second phase was to assist with the review of CNSC staff's EA Report, CMD, and participation in the public Commission hearing. A Funding Review Committee, independent of CNSC staff, reviewed the funding applications received, and made recommendations on the allocations of funding to eligible applicants.

Based on recommendations from the Funding Review Committee, the CNSC awarded $404,723 for the first phase to the following recipients:

- Birch Narrows Dene Nation
- English River First Nation
- Ya'thi Néné Land and Resource Office
- Peter Ballantyne Cree Nation
- Métis Nation-Saskatchewan
- Kineepik Metis Local #9
- Prince Albert Grand Council

Based on recommendations from the Funding Review Committee, the CNSC awarded a total of $545,639 for the second phase to the following recipients:

- Birch Narrows Dene Nation
- English River First Nation
- Kineepik Metis Local #9
- Lac La Ronge Indian Band
- Métis Nation-Saskatchewan
- MiningWatch Canada
- Peter Ballantyne Cree Nation
- Saskatchewan Environmental Society and Nuclear Transparency Project
- Ya'thi Néné Land and Resource Office

In addition, the CNSC awarded $88,780 to English River First Nation to assist with their participation in the Federal and Indigenous Review Team for Denison's Wheeler River Project.

4.4.2 Conclusion

Through the PFP, the CNSC has offered assistance to interested members of the public, Indigenous Nations and communities, and interested parties to prepare for and participate in the Commission's public hearing. Should the Commission approve the Denison Wheeler River Project, CNSC staff's engagement efforts will continue as the project moves into future licensing stages.

5 Events and Other Matters of Regulatory Interest

5.1 Cost Recovery

Paragraph 24(2)(c) of the NSCA requires that a licence application is accompanied by the prescribed fee. The *CNSC Cost Recovery Fees Regulations* (CRFR) set out the specific requirements based on the activities to be licensed. An applicant for a Class I facility licence is subject to Part 2 of CRFR, which is based on Regulatory Activity Plan fees.

5.1.1 Discussion

Though the review of CNSC records, CNSC staff have determined that Denison is in good standing with respect to CNSC CRFR requirements. Denison's licence application is an initial application, and as such, the applicant was required to submit the initial fee of C$25,000 as described in paragraph 7(1)(a) of the CNSC CRFR. Denison has paid their cost recovery fees in full. Furthermore, Denison's licensing fees with respect to the Nuclear Substances and Radiation Devices licence are also in good standing.

5.1.2 Conclusion

After assessing CNSC records, CNSC staff concluded that Denison is in good standing with respect to the CNSC CRFR requirements for the Wheeler River Project. Based on Denison's payment history, CNSC staff do not have concerns regarding payment of future cost recovery fees.

No licence condition is required for this matter.

5.2 Financial Guarantees

Under subsection 24(5) of the NSCA, the Commission may require as a condition of a licence a financial guarantee that it considers necessary for the purposes of the NSCA. Any financial guarantee put forward by the applicant in fulfilment of a requirement must be in a form that is acceptable to the Commission. REGDOC-3.6, *Glossary* provides further context in stating that such Financial Guarantees "... assure adequate funding of a decommissioning program". Paragraph 3(1)(l) of the *General Nuclear Safety and Control Regulations* requires that, "an application for a licence shall contain a description of any proposed financial guarantee related to the activity for which a licence application is submitted." The financial guarantee for decommissioning is established to fund the activities described in the PDP. The CNSC's general expectations with respect to financial guarantees are found in REGDOC-3.3.1, *Financial Guarantees for Decommissioning of Nuclear Facilities and Termination of Licensed Activities*.

5.2.1 Discussion

Denison's application for a licence to prepare site and construct the Wheeler River Project included a description of a financial guarantee [36] to fund the proposed decommissioning activities and strategy outlined in the Preliminary Decommissioning Plan [30] and the included Preliminary Decommissioning Cost Estimate.

Denison's total financial guarantee for the prepare site and construct licence would be in the amount of $42.7M that would be implemented in 2 phases:

- Year 1: $12.8M to cover the cost of decommissioning of the first year, including civil earthworks, freeze hole drilling, freeze plant construction, permanent camp, air strip and substation construction
- Year 2: $42.7M The FG will be increased to cover cost of decommissioning the entire site, including infrastructure constructed in the second year such as the process plant infrastructure, wellfield drilling, wellfield construction, and operations center construction

Denison would have the financial guarantees in place at the beginning of each phase. Denison proposed a *Surety Bond* as the legal instrument to secure this funding, to which the Province of Saskatchewan is the beneficiary as per the Memorandum of Understanding between the CNSC and the Saskatchewan Ministry of Environment, and the insurance or bonding agent will be a Canadian company subject to Canadian regulatory oversight. The only requirement for drawing upon the financial guarantee would be the formal request by the Province of Saskatchewan, as authorized by the Commission, so that payout for decommissioning purposes is not prevented, unduly delayed or compromised for any reason in the event that Denison fails to perform its obligations under the preliminary decommissioning plan.

5.2.2 Conclusion

CNSC staff concluded that the cost estimate and financial guarantee is sufficient for the prepare site and construction activities described in the application, should it be approved by the Commission

5.3 Improvement Plan and Significant Future Activities

This section discusses the activities to be completed and information to be submitted by Denison to CNSC staff for review, in this phase of the Wheeler River Project. Denison's submissions of the information pertaining to the prepare site and construction phase is captured in the regulatory commitments list in appendix D. For future activities and applications, a similar approach will be used. CNSC staff will report on the status of the project during updates provided as part of the Uranium Mine and Mills Regulatory Oversight Report or another appropriate mechanism.

5.4 Nuclear Liability Insurance

Pursuant to section 7 of the *Nuclear Liability and Compensation Act*, (NLCA) which came into force on January 1, 2017, and previously under the *Nuclear Liability Act*, the licensee is required to maintain nuclear liability insurance for designated nuclear installations.

There is no requirement for nuclear liability insurance for uranium mines or mills, as these types of facilities are not listed in the schedule of the *Nuclear Liability and Compensation Regulations* made under the NLCA.

5.5 Delegation of Authority

The Commission may include in a licence any condition it considers necessary for the purposes of the NSCA. The Commission may delegate authority to CNSC staff with respect to the administration of licence conditions, or portions thereof.

There is 1 proposed facility-specific licence condition in the proposed licence that contain the phrase “the Commission or a person authorized by the Commission”:

Wheeler River Project – Facility-Specific:

- Licence Condition G.5: The licensee shall implement the Wheeler River Project EA conditions and regulatory commitments.

As indicated in appendix D, Denison will be required to update and report on the progress of the implementation of licensing regulatory actions and EA regulatory commitments to CNSC staff on an annual basis or as required by the Commission.

CNSC staff recommend the Commission, for the purposes described in the above licence conditions, delegate authority to the following CNSC staff:

- Director, Uranium Mines and Mills Division
- Director General, Directorate of Nuclear Cycles and Facilities Regulation
- Executive Vice-President and Chief Regulatory Operations Officer, Regulatory Operations Branch

6 Overall Conclusions and Recommendations

An EA under CEAA 2012 was conducted for the proposed Wheeler River Project. Based on the regulatory review and technical assessments of Denison's EIS and supporting documentation, CNSC staff have determined that there are grounds on which the Commission may find that the proposed Wheeler River Project is not likely to cause significant adverse environmental effects, taking into account the implementation of all identified EA regulatory commitments, proposed mitigation and follow-up monitoring program measures.

Based on the licensing regulatory review and technical assessments, CNSC staff have determined that Denison's licence application to prepare site and construct the Wheeler River Project complies with all applicable regulatory requirements and that the proposed Wheeler River Project is protective of people and the environment. CNSC staff concluded that with respect to the Commission's licensing decision, the regulatory basis and technical basis for CNSC staff's recommendations are provided in appendix A, *Basis for Recommendation(s)* of this CMD.

With respect to CNSC's Duty to Consult obligations CNSC staff's final conclusions and recommendations regarding the adequacy of consultation and the Project's potential impacts on Indigenous and/or Treaty rights will be included in CNSC staff's supplemental submission to the Commission in support of Part-2 of the public hearing.

Overall Recommendations

CNSC staff recommend that the Commission:

1) Determine that the Wheeler River Project is not likely to cause significant adverse environmental effects referred to in section 5 of CEAA 2012
2) Conclude, pursuant to paragraphs 24(4)(a) and (b) of the *Nuclear Safety and Control Act* in that the applicant:
    a) Is qualified to carry on the activities that the licence will authorize the licensee to carry on, and
    b) Will make adequate provision for the protection of the environment, the health and safety of persons and the maintenance of national security and measures required to implement international obligations to which Canada has agreed.
3) Issue the proposed licence, including conditions and regulatory commitments with which Denison must comply as articulated in appendix D.
4) Delegate authority to staff as set out in section 5.5 of this CMD.

CNSC staff will systematically track the implementation of these commitments and will report publicly on any updates and the progress made towards achieving these objectives.

References

[1] Denison letter, R. Nagel (Denison) to D. Saumure (CNSC), Subject: *Denison Mines Corp. Application for the Wheeler River Operation*, June 29, 2023 (e-Doc 7079884)

[2] CNSC Letter, C. Salmon (CNSC) to J. Switzer (Denison), Subject: *Wheeler River Project – Final Submission of Documents to Support a Licence Application to Prepare Site and Construct a Uranium Mine and Mill*, November 22, 2024 (e-Doc 7314637)

[3] Wheeler River Project: Final Environmental Impact Statement: https://iaac-aeic.gc.ca/050/evaluations/document/159977

[4] Denison Mines Corp. Wheeler River Operation, *Facility Licensing Manual*, Version 2, June 2023 (e-Doc 7079437)

[5] Denison Mines Corp. Wheeler River Operation, *Facility Description Manual*, Version 1, June 2023 (e-Doc 7080144)

[6] CSA Group Standard, N286 – *Management System Requirements for Nuclear Facilities*, 2012 edition, reaffirmed in 2022

[7] Denison Mines Corp. Wheeler River Operation, *Management Systems Program*, Version 2, March 2025 (e-Doc 7127457)

[8] Denison Mines Corp. Wheeler River Operation, *Health and Safety Management Program*, Version 1, July 2023 (e-Doc 7135731)

[9] Denison Mines Corp. Wheeler River Operation, *Facility and Equipment Management Program*, Version 2, May 2025 (e-doc 7128612)

[10] Denison Mines Corp. Wheeler River Operation, *Change Management Procedure*, July 2023 (e-Doc 7188917)

[11] Denison Mines Corp. Wheeler River Operation, *Human Factors Engineering Procedure*, May 2025 (e-Doc 7512109)

[12] Denison Mines Corp. Wheeler River Operation, *Establishing Engineering Controls for Radiation Protection*, Version 1, Date (e-Doc 7551613)

[13] Denison Mines Corp. Wheeler River Operation, *Well Design Criteria*, March 2025 (e-Doc 7495534)

[14] Denison Mines Corp. Wheeler River Operation, *Civil Overall Site Drainage Collection and Diversion Plan*, March 2025 (e-Doc 7551757)

[15] Denison Mines Corp. Wheeler River Operation, *Radiation Protection Program*, Version 1, September 2023 (e-Doc 7127463).

[16] Denison Mines Corp. Wheeler River Operation, *Radiation Protection Plan*, Document # 23 Version 2, March 2025 (e-Doc 7192965).

[17] Denison Mines Corp. Wheeler River Operation, *ALARA Plan*, Version 1, December 2023 (e-Doc 7192966).

[18] Denison Mines Corp. Wheeler River Operation, *Radiation Code of Practice*, Version. 2, March 2025 (e-Doc 7192967).

[19] Denison Mines Corp. Wheeler River Operation, *Environmental Risk Assessment*, December 2024 (e-Doc 7416400)

[20] CSA Group Standard, N288.6 – *Environmental Risk Assessments at Nuclear Facilities and Uranium Mines and Mills*, 2022 edition

[21] CSA Group Standard, N288.5 – *Effluent Monitoring Programs at Class I Nuclear Facilities and Uranium Mines and Mills*, 2022 edition, published January 2022

[22] CSA Group Standard, N288.8 – *Establishing and implementing action levels for releases to the environment from nuclear facilities*, 2017 edition, reaffirmed in 2022

[23] CSA Group Standard, N288.4 – *Environmental Monitoring Programs at Nuclear Facilities and Uranium Mines and Mills*, 2019 edition, reaffirmed in 2024

[24] CSA Group Standard, N288.7 – *Groundwater Protection Programs at Class I Nuclear Facilities and Uranium Mines and Mills*, 2015 edition, reaffirmed in 2020

[25] Denison Mines Corp., Wheeler River Operation, *Groundwater Protection and Monitoring Plan*, Version #1, January 2024.

[26] CSA Group, CAN/CSA ISO 14001, *Environmental Management Systems – Requirements with Guidance for Use*, 2015 edition

[27] Denison Mines Corp. Wheeler River Operation, *Fire Protection Program*, Version #1, July 2023 (e-Doc 7139227)

[28] Denison Mines Corp. Wheeler River Operation, *Emergency Preparedness and Response Program*, Version #1, July 2023 (e-Doc 7139191)

[29] Denison Mines Corp. Wheeler River Operation, *Fire Protection Design Criteria*, Version #1, March 2025 (e-Doc 7480828)

[30] Denison Mines Corp. Wheeler River Operation, *Preliminary Decommissioning Plan*, Version 1, July 2023 (e-Doc 7211378)

[31] Denison Mines Corp. Wheeler River Operation, *Waste Management Program*, Version 1, July 2023 (e-Doc 7144023)

[32] CSA Group Standard, N294, *Decommissioning of Facilities Containing Nuclear Substances*, 2019 Version

[33] Denison Mines Corp. Wheeler River Operation, *Security Management Program*, Version #1, Date (e-Doc 7168672)

[34] Denison Mines Corp. Wheeler River Operation, *Nuclear Substances and Radiation Devices Management Procedure*, Date (e-Doc 7495935)

[35] Denison Mines Corp. Wheeler River Operation, *Threat and Risk Assessment Procedure*, Version #1, Date (e-Doc 7204501)

[36] Denison Mines Corp. Wheeler River Operation, *Wheeler River Preliminary Decommissioning Cost Estimate and Financial Guarantee Memo*, June 2025 (e-Doc 7551762)

Glossary

For definitions of terms used in this document, see *REGDOC-3.6, Glossary of CNSC Terminology*, which includes terms and definitions used in the *Nuclear Safety and Control Act* and the *Regulations* made under it, and in *CNSC regulatory documents* and other publications.

Additional terms and acronyms used in this CMD are listed below.

Acronym	Term
ALARA	As Low As Reasonably Achievable
BATEA	Best Available Technology Economically Achievable
CEAA	Canadian Environmental Assessment Act
CMD	Commission Member Document
CNSC	Canadian Nuclear Safety Commission
CRFR	Cost Recovery Fees Regulations
CSA	Canadian Standards Association, CSA Group
EA	Environmental Assessment
EA Report	Environmental Assessment Report
EC	Electrical Conductivity
ECC	Engineering Change Control
ECOP	Environmental Code of Practice
EcoRA	Ecological Risk Assessment
EIS	Environmental Impact Statement
EMP	Environmental Monitoring Program
EMS	Environmental Management System
ERA	Environmental Risk Assessment
ERFN	English River First Nation

FIRT	Federal and Indigenous Review Team
FFT	Feasibility Field Test
FLHA	Field Level Hazard Assessment
FPIC	Free, Prior and Informed Consent
FPP	Fire Protection Program
HDPE	High Density Poly Ethylene
HHRA	Human Health Risk Assessment
HMI	Human-Machine Interface
IAA	Impact Assessment Act
IAEA	International Atomic Energy Agency
ISR	In-Situ Recovery
IWWTP	Industrial Waste Water Treatment Plant
JHA	Job Hazard Analysis
KML	Kineepik Métis Local
LCH	Licence Condition Handbook
LLRD	Long-Lived Radioactive Dust
LTI	Loss-Time Injury
MDMER	Metal and Diamond Mining Effluent Regulations
MN-S	Métis Nation – Saskatchewan
MoU	Memorandum of Understanding
NEW	Nuclear Energy Worker
NFCC	National Fire Code of Canada
NLCA	Nuclear Liability and Compensation Act
NSCA	Nuclear Safety and Control Act

NSEQC	Northern Saskatchewan Environmental Quality Committee
PAG	Potentially Acid-Generating
PDP	Preliminary Decommissioning Plan
PFP	Participant Funding Program
PIDP	Public Information and Disclosure Program
PMP	Probable Maximum Precipitation
RCOP	Radiation Code of Practice
RIA	Rights Impact Assessment
RnG	Radon Gas
RnP	Radon Progeny
ROR	Regulatory Oversight Report
RP	Radiation Protection
SCA	Safety and Control Area
SSC	Structures, Systems and Components
SSSP	Site-Specific Safety Plan
TMF	Tailings Management Facility
TOR	Terms of Reference
UBS	Uranium Bearing Solution
UNDA	United Nations Declaration of the Rights of Indigenous Peoples Act
WHMIS	Workplace Hazardous Materials Information System
YNLR	Ya'thi Nene Lands and Resources

Appendix

APPENDIX A:
Basis for the Recommendation(s)

A1: Regulatory Basis

The recommendations presented in this CMD are based on compliance objectives and expectations associated with the relevant SCAs and other matters. The regulatory basis for the matters that are relevant to this CMD are as follows.

Management System

The regulatory foundation for the recommendation(s) associated with Management System includes the following:

- It is a requirement of the *General Nuclear Safety and Control Regulations* require that an application for a licence shall contain, under the following paragraph:
    - 3(1)(k), the applicant's organizational management structure insofar as it may bear on the applicant's compliance with the NSCA and the Regulations made under the NSCA, including the internal allocation of functions, responsibilities and authority.
    - 15(a), the persons who have the authority to act for them (the applicant/licensee) in their dealings with the Commission.
    - 15(b), the names and position titles of the persons who are responsible for the management and control of the licensed activity and the nuclear substance, nuclear facility, prescribed equipment or prescribed information encompassed by the licence.
- It is a requirement of *Uranium Mines and Mills Regulations* 3(b)(v) that an application for a licence must contain the proposed management system for the activity, including measures to promote and support safety culture.

Human Performance Management

The regulatory foundation for the recommendation(s) associated with Human Performance Management includes the following:

- It is a requirement of the *General Nuclear Safety and Control Regulations* that the licensee shall:
    - 12(1)(*a*), ensure the presence of a sufficient number of qualified workers to carry on the licensed activity safely and in accordance with the NSCA, the Regulations made under the NSCA, and the licence.
    - 12(1)(*b*), train the workers to carry on the licensed activity in accordance with the NSCA, the Regulations made under the NSCA, and the licence.
    - 12(1)(*e*), require that every person at the site of the licensed activity to use equipment, devices, clothing, and procedures in accordance with the NSCA, the Regulations made under the NSCA, and the licence.
- It is a requirement of *Uranium Mines and Mills Regulations* 3(d)(v) that an application for a licence must contain the proposed training program for workers.

Operating Performance

The regulatory foundation for the recommendation(s) associated with Operating Performance includes the following:

- It is a requirement of the NSCA subsection 24(5) that the licence may contain any term or condition that the Commission considers necessary for the purpose of the NSCA.
- It is a requirement of the *Uranium Mines and Mills Regulations* that the application shall contain:
    - 3(b)(i) a description of and the schedule for the planned activity.
    - 3(b)(ii) a description of the proposed methods for carrying on the activity.

Safety Analysis

The regulatory foundation for the recommendation(s) associated with Safety Analysis includes the following:

- It is a requirement of the *General Nuclear Safety and Control Regulations* paragraph 3(1)(i) that an application shall contain a description and the results of any test, analysis or calculation performed to substantiate the information included in the application.
- It is a requirement of the *Uranium Mines and Mills Regulations* paragraphs 5(1)(e) and 5(2)(e) that an application to prepare site and construct shall contain the results of a process-hazard analysis and a description of how those results have been taken into account.

Physical Design

The regulatory foundation for the recommendation(s) associated with Physical Design includes the following:

- It is a requirement of *General Nuclear Safety and Control Regulations* paragraph 3(1)(d) that an application shall contain a description of any nuclear facility, prescribed equipment, or prescribed information to be encompassed by the licence.
- It is a requirement of the *Uranium Mines and Mills Regulations* that the application shall contain:
    - 5(1)(a) and 5(1)(b) a description of the proposed design of the mine and mill.
    - 5(1)(b) and 5(2)(b) the proposed construction program, including its schedule.
    - 5(1)(d) and 5(2)(d) the proposed quality assurance program for the design of the mine and mill.

Fitness for Service

The regulatory foundation for the recommendation(s) associated with Fitness for Service includes the following:

- It is a requirement of the *General Nuclear Safety and Control Regulations* paragraph 3(1)(d) that an application shall contain a description of any nuclear facility, prescribed equipment of prescribed information to be encompassed by the licence.

Radiation Protection

The regulatory foundation for the recommendation(s) associated with Radiation Protection includes the following:

- It is a requirement under the *General Nuclear Safety and Control Regulations* that a licence application contains the following information under paragraph:
    - 3(1)(*e*), the proposed measures to ensure compliance with the *Radiation Protection Regulations*.
    - 3(1)(*f*), any proposed action level for the purpose of section 6 of the *Radiation Protection Regulations*
- It is a requirement of the RPRs under sections 4 to 6 that the licensee implements a RP program, ascertain and record doses, and take the required actions in the case that an action level has been reached.
- It is a requirement of the *Uranium Mines and Mills Regulations* that a licence application contains:
    - 3(d)(iv) the proposed positions for and qualifications and responsibilities of radiation protection workers.
    - 3(d)(vi) the proposed measures to control the spread of any radioactive contamination.
    - 3(d)(vii) the proposed ventilation and dusty control methods and equipment for controlling air quality.
    - 4(2) the proposed code of practice that includes any action level that the applicant considers appropriate, a description of any action that the applicant will take if an action level is reached, and the reporting procedures that will be followed if an action level is reached.
- It is a requirement of the *Uranium Mines and Mills Regulations* that a licensee shall:
    - 14(a) post signs at all entrances to each area where the dose rate of gamma radiation exceeds 25 µSv/h, designating the area as a radiation area and indicating the dose rate of gamma radiation in that area.
    - 14(b) provide every worker who is to enter an area where the dose rate of gamma radiation exceeds 100 µSv/h with a direct-reading dosimeter.

Conventional Health and Safety

The regulatory foundation for the recommendation(s) associated with Conventional Health and Safety includes the following:

- It is a requirement of the *Uranium Mines and Mills Regulations* subparagraphs 3(d)(i),(ii), and (iii) that a licence application contains the effects on the health and safety of persons that may result from the activity to be licensed, and the measures that will be taken to prevent or mitigate those effects; the proposed program for selecting, using and maintaining personal protective equipment; the proposed worker health and safety policies and programs.

Environmental Protection

The regulatory foundation for the recommendation(s) associated with Environmental Protection includes the following:

- It is a requirement of the *General Nuclear Safety and Control Regulations* paragraphs 12(1)(*c*) and (*f*) that each licensee take all reasonable precautions to protect the environment and the health and safety of persons, and to control the release of radioactive nuclear substances and hazardous substances within the site of the licensed activity and into the environment.
- It is a requirement of the RPRs that prescribes the dose limit for the general public, which under subsection 1(3) is 1mSv per calendar year.
- It is a requirement of the *Uranium Mines and Mills Regulations* that an application shall contain:
    - 3(c)(i) the program to inform persons living in the vicinity of the mine or mill of the general nature and characteristics of the anticipated effects of the activity to be licensed on the environment and the health and safety of persons.
    - 3(c)(ii) the program to determine the environmental baseline characteristics of the site and the surrounding area.
    - 3(c)(iii) the effects on the environment that may result from the activity to be licensed, and the measures that will be taken to prevent or mitigate those effects.
    - 3(c)(vi) the proposed positions for and qualifications and responsibilities of environmental protection workers.
    - 3(c)(v) the proposed environmental protection policies and programs.
    - 3(c)(vi) the proposed effluent and environmental monitoring programs.

- 3(c)(vii) the proposed location, the proposed maximum quantities and concentrations, and the anticipated volume and flow rate of releases of nuclear substances and hazardous substances into the environment, including their physical, chemical and radiological characteristics.
- 3(c)(viii) the proposed measures to control releases of nuclear substances and hazardous substances into the environment.
- 3(c)(ix) a description of the anticipated liquid and solid waste streams within the mine or mill, including the ingress of fresh water and any diversion or control of the flow of uncontaminated surface and ground water.

Emergency Management and Fire Protection

The regulatory foundation for the recommendation(s) associated with Emergency Management and Fire Protection includes the following:

- It is a requirement of the *General Nuclear Safety and Control Regulations* that a licensee shall:
  - 12(1)(*c*) take all reasonable precautions to protect the environment and the health and safety of persons and to maintain the security of nuclear facilities, and of nuclear substances.
  - 12(1)(f) take all reasonable precautions to control the release of radioactive nuclear substances or hazardous substances within the site of the licensed activity and into the environment of the licensed activity.
- It is a requirement of the *Uranium Mines and Mills Regulations* that an application shall contain:
  - 3(c)(x)(A) assist off-site authorities in planning and preparing to limit the adverse effects of an accidental release.
  - 3(c)(x)(B) notify off-site authorities of an accidental release or the imminence of an accidental release.
  - 3(c)(x)(C) report information to off-site authorities during and after an accidental release.
  - 3(c)(x)(D) assist off-site authorities in dealing with the adverse effects of an accidental release.
  - 3(c)(x)(E) test the implementation of the measures to control the adverse effects of an accidental release.

Waste Management

The regulatory foundation for the recommendation(s) associated with Waste Management includes the following:

- It is a requirement of the *General Nuclear Safety and Control Regulations* under paragraph 3(1)(*j*) that an application for a licence include the name, origin, quantity, form, and volume of any radioactive waste or hazardous waste that may result from the activity to be licensed, including waste that may be stored, managed, processed, or disposed of at the site of the activity to be licensed, and the proposed method for managing and disposing of that waste.
- It is a requirement of the *Uranium Mines and Mills Regulations* that an application shall contain:
    - 3(c)(xii) a description of the proposed waste management system.
    - 5(1)(h) the anticipated quantities and grade of ore and waste rock that will be removed, their proposed storage location, and the proposed method, program and schedule for their removal and disposal.

Security

The regulatory foundation for the recommendation(s) associated with Security includes the following:

- Paragraph 3(1)(e) of the *General Nuclear Safety and Control Regulations* requires that an application for a licence contains the proposed measures to ensure compliance with the *Radiation Protection Regulations*, the *Nuclear Security Regulations* and the *Packaging and Transport of Nuclear Substances Regulations, 2015*.
- Paragraph 12(1)(c) of the *General Nuclear Safety and Control Regulations* requires the licensee to take all reasonable precautions to protect the environment and the health and safety of persons and to maintain the security of nuclear facilities and of nuclear substances.
- It is a requirement of the *Uranium Mines and Mills Regulations* paragraph 3(e) that a licence application contains, in relation to security, the proposed measures to alert the licensee to acts of sabotage or attempted sabotage at the mine or mill.

Safeguards and Non-Proliferation

The regulatory foundation for the recommendation(s) associated with Safeguards and Non-Proliferation includes the following:

- Paragraph 12(1)(i) of the *General Nuclear Safety and Control Regulations* requires the licensee to take all necessary measures to facilitate Canada's compliance with any applicable safeguard agreement.

A2: Detailed Summary of CNSC Assessment of Application

CNSC's staff assessment of the Denison licence application included a completeness check, a sufficiency check, and a technical assessment against regulatory requirements. The completeness check verified whether the application included the prescribed information in accordance with the *Nuclear Safety and Control Act* and applicable regulations. For all facilities (i.e., Class I and Class II facilities), it is important to consider and address all licence application requirements within the applicable CNSC regulations.

The sufficiency check verified whether the application included sufficient and quality information in order for CNSC staff to conduct the technical assessment. The technical assessment verified whether the application included adequate safety and control measures to address CNSC requirements. Documents originally submitted as part of the application may have been revised, updated, or replaced over the course of the assessment to address CNSC requirements.

Pursuant to Section 3 of the *General Nuclear Safety and Control Regulations* Licences – General Application Requirements	**Location in Application or Supporting Document(s) as Noted by Denison**	**Complete?**	**Sufficient?**	**Adequate?**
(1) An application for a licence shall contain the following information:				
(a) the applicant's name and business address;	Facility Licensing Manual	Y	Y	Y
(b) the activity to be licensed and its purpose;	Facility Licensing Manual	Y	Y	Y
(c) the name, maximum quantity, and form of any nuclear substance to be encompassed by the licence;	Facility Licensing Manual	Y	Y	Y

Pursuant to Section 3 of the *General Nuclear Safety and Control Regulations* Licences – General Application Requirements	Location in Application or Supporting Document(s) as Noted by Denison	Complete?	Sufficient?	Adequate?
(d) a description of any nuclear facility, prescribed equipment, or prescribed information to be encompassed by the licence;	Facility Licensing Manual Facility Description Manual	Y	Y	Y
(e) the proposed measures to ensure compliance with the *Radiation Protection Regulations*, the *Nuclear Security Regulations* and the *Packaging and Transport of Nuclear Substances Regulations, 2015;*	Facility Licensing Manual Radiation Protection Program Security Management Program	Y	Y	Y
(f) any proposed action level for the purpose of section 6 of the *Radiation Protection Regulations*;	Radiation Protection Program Radiation Code of Practice	Y	Y	Y
(g) the proposed measures to control access to the site of the activity to be licensed and the nuclear substance, prescribed equipment, or prescribed information;	Security Management Program Security Plan	Y	Y	Y

Pursuant to Section 3 of the *General Nuclear Safety and Control Regulations* Licences – General Application Requirements	Location in Application or Supporting Document(s) as Noted by Denison	Complete?	Sufficient?	Adequate?
(h) the proposed measures to prevent loss or illegal use, possession, or removal of the nuclear substance, prescribed equipment, or prescribed information;	Security Management Program Security Plan	Y	Y	Y
(i) a description and the results of any test, analysis or calculation performed to substantiate the information included in the application;	Facility Licensing Manual	Y	Y	Y
(j) the name, quantity, form, origin and volume of any radioactive waste or hazardous waste that may result from the activity to be licensed, including waste that may be stored, managed, processed, or disposed of at the site of the activity to be licensed, and the proposed method for managing and disposing of that waste;	Facility Licensing Manual Facility Description Manual Waste Management Program Waste Management Plan Waste Rock Management Plan	Y	Y	Y

Pursuant to Section 3 of the *General Nuclear Safety and Control Regulations* Licences – General Application Requirements	Location in Application or Supporting Document(s) as Noted by Denison	Complete?	Sufficient?	Adequate?
(k) the applicant's organizational management structure insofar as it may bear on the applicant's compliance with the [NSCA] and the regulations made under it, including the internal allocation of functions, responsibilities and authority;	Facility Licensing Manual Management System Program	Y	Y	Y
(l) a description of any proposed financial guarantee relating to the activity to be licensed;	Facility Licensing Manual Preliminary Decommissioning Program	Y	Y	Y
(m) any other information required by the [NSCA] or the regulations made under it for the activity to be licensed and the nuclear substance, nuclear facility, prescribed equipment or prescribed information to be encompassed by the licence.		Y/N	Y/N	Y/N

Pursuant to Section 3 of the *Uranium Mines and Mills Regulations* Licences Application – General Requirements	Location in Application or Supporting Document(s) as Noted by Denison	Complete?	Sufficient?	Adequate?
An application for a licence in respect of a uranium mine or mill, other than a licence to abandon, shall contain the following information in addition to the information required by section 3 of the *General Nuclear Safety and Control Regulations*:				
(a) in relation to the plan and description of the mine or mill,				
(i) a description of the site evaluation process and of the investigations and preparatory work to be done at the site and in the surrounding area,	Facility Licensing Manual Facility Description Manual Environmental Impact Statement	Y	Y	Y

Pursuant to Section 3 of the *Uranium Mines and Mills Regulations* Licences Application – General Requirements	Location in Application or Supporting Document(s) as Noted by Denison	Complete?	Sufficient?	Adequate?
(ii) a surface plan indicating the boundaries of the mine or mill and the area where the activity to be licensed is proposed to be carried on,	Facility Licensing Manual Facility Description Manual Wellfield Containment Design Criteria	Y	Y	Y
(iii) a plan showing the existing and planned structures, excavations and underground development,	Facility Licensing Manual Facility Description Manual	Y	Y	Y
(iv) a description of the mine or mill, including the installations, their purpose and capacity, and any excavations and underground development,	Facility Description Manual	Y	Y	Y

Pursuant to Section 3 of the *Uranium Mines and Mills Regulations* Licences Application – General Requirements	Location in Application or Supporting Document(s) as Noted by Denison	Complete?	Sufficient?	Adequate?
(v) a description of the site geology and mineralogy,	Facility Licensing Manual Facility Description Manual Environmental Impact Statement	Y	Y	Y
(vi) a description of any activity that may have an impact on the development of the mine or mill, including any mining-related activity that was carried on at the site before the date of submission of the application to the Commission,	Facility Licensing Manual Environmental Impact Statement	Y	Y	Y

Pursuant to Section 3 of the *Uranium Mines and Mills Regulations* Licences Application – General Requirements	Location in Application or Supporting Document(s) as Noted by Denison	Complete?	Sufficient?	Adequate?
(vii) a description of the design of and the maintenance program for every eating area,	N/A	Y	Y	Y
(viii) the proposed plan for the decommissioning of the mine or mill,	Preliminary Decommissioning Plan	Y	Y	Y
(ix) a description of the proposed emergency power systems and their capacities;	Facility Licensing Manual Facility Description Manual	Y	Y	Y
(b) in relation to the activity to be licensed,		Y	Y	Y
(i) a description of and the schedule for the planned activity,	Facility Licensing Manual Construction Management Plan	Y	Y	Y

Pursuant to Section 3 of the *Uranium Mines and Mills Regulations* Licences Application – General Requirements	Location in Application or Supporting Document(s) as Noted by Denison	Complete?	Sufficient?	Adequate?
(ii) a description of the proposed methods for carrying on the activity,	Facility Licensing Manual Facility Description Manual	Y	Y	Y
(iii) a list of the categories of material proposed to be mined and a description of the criteria used to determine those categories,	Facility Licensing Manual Facility Description Manual	Y	Y	Y
(iv) the anticipated duration of the activity	Facility Licensing Manual	Y	Y	Y

Pursuant to Section 3 of the *Uranium Mines and Mills Regulations* **Licences Application – General Requirements**	**Location in Application or Supporting Document(s) as Noted by Denison**	**Complete?**	**Sufficient?**	**Adequate?**
(v) the proposed management system for the activity, including measures to promote and support safety culture;	Facility Licensing Manual Management Systems Program Human Performance Management Program Health and Safety Management Program	Y	Y	Y
(c) in relation to the environment and waste management,		Y	Y	Y

Pursuant to Section 3 of the *Uranium Mines and Mills Regulations* Licences Application – General Requirements	Location in Application or Supporting Document(s) as Noted by Denison	Complete?	Sufficient?	Adequate?
(i) the program to inform persons living in the vicinity of the mine or mill of the general nature and characteristics of the anticipated effects of the activity to be licensed on the environment and the health and safety of persons,	Public and Indigenous Information Program Environmental Impact Statement	Y	Y	Y
(ii) the program to determine the environmental baseline characteristics of the site and the surrounding area,	Environmental Management Program Environmental Impact Statement	Y	Y	Y

Pursuant to Section 3 of the *Uranium Mines and Mills Regulations* Licences Application – General Requirements	Location in Application or Supporting Document(s) as Noted by Denison	Complete?	Sufficient?	Adequate?
(iii) the effects on the environment that may result from the activity to be licensed, and the measures that will be taken to prevent or mitigate those effects,	Environmental Management Program Environmental Impact Statement	Y	Y	Y
(iv) the proposed positions for and qualifications and responsibilities of environmental protection workers,	Environmental Management Program	Y	Y	Y
(v) the proposed environmental protection policies and programs,	Environmental Management Program Environmental Health, Safety and Sustainability Policy	Y	Y	Y

Pursuant to Section 3 of the *Uranium Mines and Mills Regulations* Licences Application – General Requirements	Location in Application or Supporting Document(s) as Noted by Denison	Complete?	Sufficient?	Adequate?
(vi) the proposed effluent and environmental monitoring programs,	Environmental Management Program Effluent and Emissions Monitoring Plan	Y	Y	Y
(vii) the proposed location, the proposed maximum quantities and concentrations, and the anticipated volume and flow rate of releases of nuclear substances and hazardous substances into the environment, including their physical, chemical and radiological characteristics,	Environmental Management Program Waste Management Program Effluent and Emissions Monitoring Plan	Y	Y	Y

Pursuant to Section 3 of the *Uranium Mines and Mills Regulations* Licences Application – General Requirements	Location in Application or Supporting Document(s) as Noted by Denison	Complete?	Sufficient?	Adequate?
(viii) the proposed measures to control releases of nuclear substances and hazardous substances into the environment,	Facility Description Manual Environmental Management Program Waste Management Program Effluent and Emissions Monitoring Plan	Y	Y	Y
(ix) a description of the anticipated liquid and solid waste streams within the mine or mill, including the ingress of fresh water and any diversion or control of the flow of uncontaminated surface and ground water,	Facility Description Manual Environmental Management Program Waste Management Program Effluent and Emissions Monitoring Plan	Y	Y	Y

Pursuant to Section 3 of the *Uranium Mines and Mills Regulations* Licences Application – General Requirements	Location in Application or Supporting Document(s) as Noted by Denison	Complete?	Sufficient?	Adequate?
(x) the proposed measures to prevent or mitigate the effects of accidental releases of nuclear substances and hazardous substances on the environment, the health and safety of persons and the maintenance of security, including measures to		Y	Y	Y

Pursuant to Section 3 of the *Uranium Mines and Mills Regulations* Licences Application – General Requirements	Location in Application or Supporting Document(s) as Noted by Denison	Complete?	Sufficient?	Adequate?
(A) assist off-site authorities in planning and preparing to limit the adverse effects of an accidental release,	Environmental Management Program Emergency Management Program Emergency Response Plan Spill Management Plan Reporting Procedures	Y	Y	Y
(B) notify off-site authorities of an accidental release or the imminence of an accidental release,	Emergency Response Plan Spill Management Plan Reporting Procedures	Y	Y	Y

Pursuant to Section 3 of the *Uranium Mines and Mills Regulations* Licences Application – General Requirements	Location in Application or Supporting Document(s) as Noted by Denison	Complete?	Sufficient?	Adequate?
(C) report information to off-site authorities during and after an accidental release,	Emergency Response Plan Spill Management Plan Reporting Procedures	Y	Y	Y
(D) assist off-site authorities in dealing with the adverse effects of an accidental release,	Environmental Management Program Emergency Management Program Emergency Response Plan Spill Management Plan Reporting Procedures	Y	Y	Y

Pursuant to Section 3 of the *Uranium Mines and Mills Regulations* Licences Application – General Requirements	Location in Application or Supporting Document(s) as Noted by Denison	Complete?	Sufficient?	Adequate?
(E) test the implementation of the measures to control the adverse effects of an accidental release,	Facility Licensing Manual Facility Description Manual	Y	Y	Y
(xi) the anticipated quantities, composition and characteristics of backfill,	Facility Licensing Manual Facility Description Manual	Y	Y	Y
(xii) a description of the proposed waste management system;	Facility Description Manual Waste Management Program Waste Rock Management Plan Waste Management Plan	Y	Y	Y

Pursuant to Section 3 of the *Uranium Mines and Mills Regulations* Licences Application – General Requirements	Location in Application or Supporting Document(s) as Noted by Denison	Complete?	Sufficient?	Adequate?
(d) in relation to health and safety,		Y	Y	Y
(i) the effects on the health and safety of persons that may result from the activity to be licensed, and the measures that will be taken to prevent or mitigate those effects,	Health and Safety Management Program	Y	Y	Y
(ii) the proposed program for selecting, using and maintaining personal protective equipment,	Health and Safety Management Program Facility and Equipment Management Program	Y	Y	Y

Pursuant to Section 3 of the *Uranium Mines and Mills Regulations* Licences Application – General Requirements	Location in Application or Supporting Document(s) as Noted by Denison	Complete?	Sufficient?	Adequate?
(iii) the proposed worker health and safety policies and programs,	Health and Safety Management Program Occupational Health Plans and Procedures	Y	Y	Y
(iv) the proposed positions for and qualifications and responsibilities of radiation protection workers,	Radiation Protection Program	Y	Y	Y
(v) the proposed training program for workers,	Training Management Program Training Management Plan	Y	Y	Y
(vi) the proposed measures to control the spread of any radioactive contamination,	Radiation Protection Program Radiation Protection Plan ALARA Plan	Y	Y	Y

Pursuant to Section 3 of the *Uranium Mines and Mills Regulations* Licences Application – General Requirements	Location in Application or Supporting Document(s) as Noted by Denison	Complete?	Sufficient?	Adequate?
(vii) the proposed ventilation and dust control methods and equipment for controlling air quality,	Facility Description Manual Facility and Equipment Management Program Radiation Protection Program	Y	Y	Y
(viii) the proposed level of effectiveness of and inspection schedule for the ventilation and dust control systems;	Facility Description Manual Facility and Equipment Management Program Radiation Protection Program	Y	Y	Y

Pursuant to Section 3 of the *Uranium Mines and Mills Regulations* Licences Application – General Requirements	Location in Application or Supporting Document(s) as Noted by Denison	Complete?	Sufficient?	Adequate?
(e) in relation to security, the proposed measures to alert the licensee to acts of sabotage or attempted sabotage at the mine or mill.	Security Management Program Security Management Plan	Y	Y	Y

A3: Technical Basis

The technical basis for the recommendations presented in this CMD are listed in the table

Applicable Standards and Codes per Safety and Control Area

SCA	Document Title	Sufficient?	Adequate?
Management System	CSA N286-12, *Management system requirements for nuclear facilities* CSA N286.0.1:21, Commentary on N286-12, *Management system requirements for nuclear facilities*	Y	Y
Human Performance Management	REGDOC-2.2.2, *Personnel Training*, version 2	Y	Y
Operating Performance	REGDOC-2.3.1, *Conduct of Licensed Activities: Construction and Commissioning*	Y	Y
Safety Analysis	N/A	N/A	N/A
Physical Design	REGDOC-2.5.1	Y	Y
Fitness for Service	N/A	N/A	N/A
Radiation Protection	REGDOC-2.7.1, *Radiation Protection*, version 1.1 REGDOC-2.7.2, *Dosimetry*, Volume I: Ascertaining Occupational Dose	Y	Y
Conventional Health and Safety	REGDOC-2.8.1, *Conventional Health and Safety*	Y	Y

SCA	Document Title	Sufficient?	Adequate?
Environmental Protection	REGDOC-2.9.1, *Environmental Protection: Environmental Principles, Assessments and Protection Measures*, version 1.2 REGDOC-2.9.2, *Controlling Releases to the Environment* N288.0, *Environmental management of nuclear facilities*: Common requirements of the CSA N288 series of Standards N288.4, *Environmental monitoring programs at nuclear facilities and uranium mines and mills* N288.5, *Effluent monitoring programs at nuclear facilities and uranium mines and mills facilities* N288.6, *Environmental risk assessment at nuclear facilities and uranium mines and mills* N288.7, *Groundwater protection and monitoring programs at nuclear facilities and uranium mines and mills* N288.8, *Establishing and implementing action levels for releases to the environment from nuclear facilities*	Y	Y
Emergency Management and Fire Protection	REGDOC-2.10.1, *Nuclear Emergency Preparedness and Response*, version 2 N393-22, *Fire protection for facilities that process, handle, or store nuclear substances* *National Fire Code of Canada*	Y	Y
Waste Management	REGDOC-2.11.1, *Waste Management, Volume I: Management of Radioactive Waste* REGDOC-2.11.1, *Waste Management, Volume II: Management of Uranium Mine Waste Rock and Mill Wailings* REGDOC-2.11.2, *Decommissioning*	Y	Y
Security	N/A	N/A	N/A

SCA	Document Title	Sufficient?	Adequate?
Safeguards and Non-Proliferation	REGDOC-2.13.1, *Safeguards and Nuclear Material Accountancy*	Y	Y
Packaging and Transport	N/A	N/A	N/A
Public Information Program	REGDOC-3.2.1, *Reporting Requirements, Volume I: Non-Power Reactor Class I Facilities and Uranium Mines and Mills*	Y	Y
Aboriginal Consultation	REGDOC-3.2.2, *Indigenous Engagement*	Y	Y
Financial Guarantee	REGDOC-3.3.1, *Financial Guarantees for Decommissioning of Nuclear Facilities and Termination of Licensed Activities*	Y	Y

A4: Specific Areas for this Facility Type

The following table identifies the specific areas that comprise each SCA for uranium mines and mills

SPECIFIC AREAS FOR THIS FACILITY TYPE		
Functional Area	**Safety and Control Area**	**Specific Areas**
Management	Management System	▪ Management System ▪ Organization ▪ Performance Assessment, Improvement and Management Review ▪ Operating Experience (OPEX), Problem Identification and Resolution (PI&R) ▪ Change Management ▪ Safety Culture ▪ Configuration Management ▪ Records Management ▪ Supply and Contractor Management ▪ Business Continuity

SPECIFIC AREAS FOR THIS FACILITY TYPE		
Functional Area	**Safety and Control Area**	**Specific Areas**
	Human Performance Management	▪ Human Performance Programs ▪ Personnel Training ▪ Personnel Certification ▪ Work Organization and Job Design ▪ Fitness for Duty
	Operating Performance	▪ Conduct of Licensed Activity ▪ Procedures ▪ Reporting and Trending ▪ Outage Management Performance ▪ Safe Operating Envelope ▪ Severe Accident Management and Recovery ▪ Accident Management and Recovery
Facility and Equipment	Safety Analysis	▪ Deterministic Safety Analysis ▪ Hazard Analysis ▪ Probabilistic Safety Analysis ▪ Criticality Safety ▪ Severe Accident Analysis ▪ Management of Safety Issues (including R and D Programs)
	Physical Design	▪ Design Governance ▪ Site Characterization ▪ Facility Design ▪ Structure Design ▪ System Design ▪ Components Design

SPECIFIC AREAS FOR THIS FACILITY TYPE		
Functional Area	**Safety and Control Area**	**Specific Areas**
	Fitness for Service	▪ Equipment Fitness for Service/Equipment Performance ▪ Maintenance ▪ Structural Integrity ▪ Aging Management ▪ Chemistry Control ▪ Periodic Inspection and Testing
Core Control Processes	Radiation Protection	▪ Application of ALARA ▪ Worker Dose Control ▪ Radiation Protection Program Performance ▪ Radiological Hazard Control
	Conventional Health and Safety	▪ Performance ▪ Practices ▪ Awareness
	Environmental Protection	▪ Effluent and Emissions Control (releases) ▪ Environmental Management System (EMS) ▪ Assessment and Monitoring ▪ Protection of People ▪ Environmental Risk Assessment
	Emergency Management and Fire Protection	▪ Conventional Emergency Preparedness and Response ▪ Nuclear Emergency Preparedness and Response ▪ Fire Emergency Preparedness and Response
	Waste Management	▪ Waste Characterization ▪ Waste Minimization ▪ Waste Management Practices ▪ Decommissioning Plans

SPECIFIC AREAS FOR THIS FACILITY TYPE		
Functional Area	**Safety and Control Area**	**Specific Areas**
	Security	▪ Facilities and Equipment ▪ Response Arrangements ▪ Security Practices ▪ Drills and Exercises ▪ Cyber Security
	Safeguards and Non-Proliferation	▪ Nuclear Material Accountancy and Control ▪ Access and Assistance to the IAEA ▪ Operational and Design Information ▪ Safeguards Equipment, Containment and Surveillance ▪ Import and Export
	Packaging and Transport	▪ Package Design and Maintenance ▪ Packaging and Transport ▪ Registration for Use

A5: Compliance Plan for Construction of the Wheeler River Project

The proposed compliance plan looks to cover all relevant safety and control areas to verify compliance with requirements. The plan is flexible to align with Denison's licensed activities, including any changes to the construction schedule. Each year, 1 general inspection will take place as early in spring as possible, and 1 as late in fall as possible, to view the site at the beginning and end of the construction seasons. Focused inspections will cover a primary safety and control area but will also incorporate other inspection needs at that time if necessary. The inspections plan to target construction milestones.

All 13 relevant SCAs will be verified through inspections planned for

	FY26/27	FY27/28	FY28/29
GENERAL INSPECTION	2	2	2
PHYSICAL DESIGN	1	1	1
ENVIRONMENTAL PROTECTION		1	
MANAGEMENT SYSTEM	1		1
HUMAN PERFORMANCE MANAGEMENT			1
OPERATING PERFORMANCE			1
TOTAL INSPECTIONS /YR	4	4	6

General inspections cover multiple safety and control areas, as needed.

Physical design inspections will verify that the facilities are constructed as per Commission-accepted designs.

Environmental protection inspections will verify the construction and efficacy of environmental protection measures.

Management systems inspections will verify the evolution and implementation of Denison's management system.

Human performance management inspection will verify the implementation of Denison's training program as commissioning activities begin.

Operating performance inspection will verify Denison's commissioning work in detail.

Appendix B: Environmental Assessment Report

Canada's Nuclear Regulator

Environmental Assessment Report:
Wheeler River Project

August 2025

e-Doc: 6992445 (Word English)
e-Doc: 7204777 (Word French)
e-Doc: 7204773 (PDF English)
e-Doc: 7204774 (PDF French)

Canadian Nuclear Safety Commission
Commission canadienne de sûreté nucléaire

Canada

Signed/Signé le
August 12, 2025 / 12 août 2025

Dana Beaton
Director General
Directorate of Environmental and Radiation Protection and Assessment

Directrice générale
Direction de l'évaluation et de la protection environnementales et radiologiques

Executive summary

Background

Denison Mines Corp. (Denison) is proposing to develop an *in-situ* recovery (ISR) uranium mining and processing operation. The proposed Wheeler River mine (the Project) is located in the Athabasca Basin in Saskatchewan, approximately 600 kilometres north of the City of Saskatoon, 35 km northeast of Cameco's Key Lake mill and 35 km southwest of Cameco's McArthur River mine. The Project is located within Treaty 10 territory, the homeland of the Métis, and within the traditional territories of the Dene, Cree, and Métis peoples.

Denison anticipates the Project would produce an annual average of 9 million pounds of tri-uranium octoxide, with a potential peak production of 12 million pounds per year, for 15 years. Under the *Nuclear Safety and Control Act (NSCA)*, a licence from the Canadian Nuclear Safety Commission (CNSC) is required in order to prepare a site for and construct a new uranium mine and mill (Wheeler River Project).

Environmental assessment requirements

CNSC staff conducted an environmental assessment (EA) of the Project in accordance with the *Canadian Environmental Assessment Act, 2012* (CEAA 2012). The Wheeler River Project is subject to CEAA 2012 because it qualifies as a designated project as per section **31** of the *Regulations Designating Physical Activities.* The Commission must ensure an EA is complete in accordance with CEAA 2012 and make an EA decision to determine whether the proposed project is likely to cause significant adverse environmental effects before a licensing decision under the NSCA is rendered.

This EA report summarizes the assessment conducted by CNSC staff, including the information and analysis on the potential environmental effects of the Project, and CNSC staff's findings on whether the Project is likely to cause significant adverse environmental effects, after taking into account the implementation of mitigation measures.

CNSC staff prepared this EA report with expert advice from the following federal authorities:

- Environment and Climate Change Canada
- Natural Resources Canada
- Health Canada
- Transport Canada
- Fisheries and Oceans Canada

CNSC staff also consulted with the Province of Saskatchewan to ensure regulatory collaboration ands to harmonize environmental assessment processes, to the extent possible. CNSC staff also collaborated with the U.S. Nuclear Regulatory Commission to leverage operational and technical expertise on in-situ recovery technologies. Many interested Indigenous Nations and communities provided input to CNSC staff in the development of sections of this EA report related to information or concerns in respect to potential project impacts on rights, interests, culture, or traditional uses, as well as Indigenous Knowledge. Furthermore, this EA report was informed by comments submitted throughout the EA process by Indigenous Nations and communities.

Scope of the Assessment

CNSC staff analyzed potential environmental effects of the Project, throughout its entire lifecycle, according to the scope of factors determined by the Commission in its 2019 EA Scoping Decision, including paragraphs 19(1)(a) to (h) of CEAA 2012. The Commission also determined that the EA was to consider Indigenous Knowledge and community knowledge, in accordance with subsection 19(3) of CEAA 2012.

Indigenous consultation and engagement

As an agent of the Crown, the CNSC recognizes and understands the importance of meaningful consultation and engagement and building relationships with Indigenous peoples in Canada. CNSC staff conducted extensive consultation activities with the identified Indigenous Nations and communities to ensure their full participation in the regulatory review process, including the CEAA 2012 EA process. CNSC staff ensured that the concerns of Indigenous Nations and communities were heard and addressed by Denison and the CNSC in a meaningful way. CNSC staff consider that the consultation and engagement process for the Project has been meaningful, reasonable, responsive, and followed best practices, and note that this process is ongoing and will continue through to and including the Commission hearing. CNSC's final assessment, conclusions and recommendations with regards to the adequacy of consultation will be summarized in the supplemental submission to the Commission prior to the Part 2 hearing.

In addition, Denison has worked bilaterally with a number of the identified Indigenous Nations and communities to negotiate commitments and long-term agreements that address their specific concerns to mitigate potential impacts to their Indigenous and/or Treaty rights. CNSC staff are of the view that the Project's potential impacts on Indigenous and/or Treaty rights have been adequately identified and mitigated to the extent possible. The supplemental submission that the CNSC will be providing to the Commission prior to Part 2 of the hearing will include CNSC's conclusions and recommendations on potential impacts to Indigenous rights.

CNSC staff's Consultation Report for the Project provides all details, records and information regarding the consultation and engagement process conducted with Indigenous Nations and communities for the Project to date.

Follow-up monitoring program

Should the Commission determine that the Project is not likely to cause significant adverse environmental effects, CNSC staff propose that Denison be required by a licence condition to further design and implement an EA Follow-Up Monitoring Program to verify the accuracy of the EA predictions for the Project, determine the effectiveness of measures taken to mitigate the potential adverse environmental effects and support the implementation of adaptive management measures to address unanticipated adverse environmental effects. Other environmental monitoring will be required under permits, licences and authorizations that may be issued upon completion of the EA, and what is outstanding as part of regulatory oversight for the Project.

Should the Commission determine that the Project is not likely to cause significant adverse environmental effects, Denison will be required to further design and implement an EA Follow-Up Monitoring Program to verify the accuracy of the EA predictions for the Project, determine the effectiveness of measures taken to mitigate potential adverse environmental effects and support the implementation of adaptive management measures to address unanticipated adverse environmental effects. The Follow-Up Monitoring Program will form part of the licensing basis, should the Commission issue a licence to prepare site and construct the Project, and will be part

of the planned regulatory oversight along with environmental monitoring programs required by the licence.

Summary of Potential Effects of the Project

The Project has the potential to interact with environmental and human components in various ways. CNSC staff reviewed Denison's assessment, including identified mitigation and follow-up monitoring program measures, and have considered expert advice from federal and provincial authorities, as well as comments from Indigenous Nations and communities. Taking all of this into account, CNSC staff have found that the Project is unlikely to result in significant adverse environmental effects.

Recommendations

Taking into account the implementation of the proposed mitigation measures, follow-up monitoring program measures and commitments made by Denison to Indigenous Nations and communities, CNSC staff recommend that the Commission conclude that the Project is not likely to cause significant adverse environmental effects.

These findings are contingent on the recommended EA Conditions in table 12.1 of this EA Report and the conditions listed in the Licence Condition Handbook.

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1.0 Introduction

Denison Mines Corp. (Denison) is proposing the construction of an *in-situ* recovery (ISR) uranium mine and processing plant (the Wheeler River Project or the Project) in the Athabasca Basin in Saskatchewan, approximately 600 kilometres north of the City of Saskatoon, 35 km northeast of Cameco's Key Lake mill and 35 km southwest of Cameco's McArthur River mine. The proposed project is located within Treaty 10 territory, the homeland of the Métis, and within the traditional territories of the Dene, Cree, and Métis peoples. It is also located within the Northern Administration District of Saskatchewan. The proposed Wheeler River Project is a designated project under the former *Canadian Environmental Assessment Act, 2012* (CEAA 2012) and as such, requires the conduct of a comprehensive assessment and evaluation of the effects of the proposed project on the environment.

The Wheeler River Project would mine the Phoenix deposit, producing an annual average of 9 million pounds of tri-uranium octoxide (U_3O_8) for 15 years, with a potential peak production of 12 million pounds of U_3O_8. As mentioned above, this EA Report references a processing plant, in alignment with documents submitted by Denison. However, in accordance with definitions under the *Nuclear Safety and Control Act* and the *Uranium Mines and Mills Regulations*, the proposed processing plant is considered a uranium mill facility. For an overview of the proposed Project, project components and activities, please refer to section 2 of this report and section 1.1.2 of staff's Commission Member Document (CMD).

This Environmental Assessment (EA) report summarizes the assessment conducted by Canadian Nuclear Safety Commission (CNSC) staff to inform the Commission's decision on whether the Project is likely to cause significant adverse environmental effects, including any adverse effect with respect to Indigenous peoples. Indigenous interests, as described within this EA report, refer to any change to the environment or the health and socio-economic conditions, physical and cultural heritage, the current use of lands and resources for traditional purposes and any structure, site or thing that is of historical, archaeological, paleontological or architectural significance.

1.1 Environmental assessment requirements

On May 15, 2019, following Denison's submission of the Project Description (PD), the CNSC issued the Notice of Commencement of a federal EA for the Project pursuant to CEAA 2012. The Project is subject to an EA under CEAA 2012, as it constitutes a designated activity under item 31 of the *Regulations Designating Physical Activities*:

> **31** The construction, operation and decommissioning of a new uranium mine or uranium mill on a site that is not within the licensed boundaries of an existing uranium mine or uranium mill.

The CNSC determined that it is the responsible authority for this Project pursuant to paragraph 15(a) of CEAA 2012:

> **15** For the purposes of this Act, the responsible authority with respect to a designated project that is subject to an environmental assessment is
>
> **(a)** the Canadian Nuclear Safety Commission, in the case of a designated project that includes activities that are regulated under the Nuclear Safety and Control Act and that are linked to the Canadian Nuclear Safety Commission as specified in the regulations made under paragraph 84(a) or the order made under subsection 14(2);

On August 28, 2019, the *Impact Assessment Act* (IAA) came into force, repealing the CEAA 2012. Subsection 182 of the IAA outlines transitional provisions for the EAs of designated projects commenced under CEAA 2012 for which the CNSC or National Energy Board (now the Canada Energy Regulator) are Responsible Authorities and for which a decision statement has not been issued:

> **182** any environmental assessment of a designated project by the Canadian Nuclear Safety Commission or the National Energy Board commenced under the 2012 Act, in respect of which a decision statement has not been issued under section 54 of the 2012 Act before the day on which this Act comes into force, is continued under the 2012 Act as if that Act had not been repealed.

The CNSC informed Denison on May 31, 2019 that the EA process for the Project would continue under CEAA 2012, as a decision statement had not been reached before the implementation of the new Act.

As a federal authority under CEAA 2012, the CNSC is subject to section 7 of CEAA 2012:

> **7** A federal authority must not exercise any power or perform any duty or function conferred on it under any Act of Parliament other than this Act that could permit a designated project to be carried out in whole or in part unless
>
> **(b)** the decision statement with respect to the designated project that is issued under subsection 31(3) or section 54 to the proponent of the designated project indicates that the designated project is not likely to cause significant adverse environmental effects or that the significant adverse environmental effects that it is likely to cause are justified in the circumstances.

As the responsible authority under CEAA 2012, the CNSC is required by s. 22 of CEAA 2012 to ensure that:

> **(a)** an environmental assessment of the designated project is conducted; and
>
> **(b)** a report is prepared with respect to that environmental assessment.

Pursuant to subsections 27(1) and 52(1) of CEAA 2012, after taking into account the EA report, the CNSC must decide whether the designated project is likely to cause significant adverse environmental effects as set out in section 5 of CEAA 2012.

If the CNSC decides that the Project is likely to cause significant adverse environmental effects, it must refer the Project, pursuant to subsections 52(2) and (3), to the Governor in Council for determination as to whether the significant adverse environmental effects are justified in the circumstances.

If the CNSC decides that the Project is not likely to cause significant adverse environmental effects, pursuant to section 53 it must establish the conditions in relation to environmental effects with which Denison must comply, including mitigation measures and a follow-up program.

The CNSC conducted the EA in consultation with Environment and Climate Change Canada (ECCC), Fisheries and Oceans (DFO), Health Canada (HC), Transport Canada (TC) and Natural Resources Canada (NRCan), as federal authorities (FAs) having specialist and expert information or knowledge needed to support the conduct of the EA in the following areas:

- ECCC: species at risk, migratory birds, effluent discharge, surface water
- DFO: fish and fish habitat
- HC: noise, human health
- TC: navigable waters, transportation activities
- NRCan: geology, seismicity

These FAs, along with CNSC subject matter experts and a representative from English River First Nation (ERFN) formed the Federal-Indigenous Review Team (FIRT) for the Project.

Given the proposed location of the Project, it is also subject to the EA requirements of the *Government of Saskatchewan under the Environmental Assessment Act*. The provincial ministries provided support upon request on areas within their expertise and within the scope of their regulatory responsibilities, particularly Saskatchewan Environmental Assessment Branch (SKEAB). CNSC staff also consulted with the U.S. Nuclear Regulatory Commission for their expertise related to ISR technologies.

Denison has also submitted an application requesting a licence to Prepare Site and Construct. As detailed in the CMD, to which this report is appended, this application is subject to a regulatory decision under the *Nuclear Safety and Control Act* (NSCA). The Commission must decide whether the applicant is qualified to carry out the project and whether the environment will be protected from project activities. Although the licensing decision is specific to the first licensing phase (Prepare Site and Construct), the EA considers all phases of the facility's lifecycle. A decision that the Project will not likely result in significant adverse environmental effects, or that those effects are justified in the circumstances does not grant permission for any activities beyond activities described in a licence. An EA decision under CEAA 2012 does not authorize project activities; it enables the Commission to consider licensing under the NSCA, which is required for site preparation and construction.

The Commission's decisions for the Project under CEAA 2012 and the NSCA also trigger the Crown's duty to consult, and where appropriate, accommodate Indigenous Nations and communities whose potential or established rights and interests protected under section 35 of the *Constitution Act, 1982*, may be impacted by the proposed Project. These decisions will all be made following a two-part hearing planned for October and December of 2025.

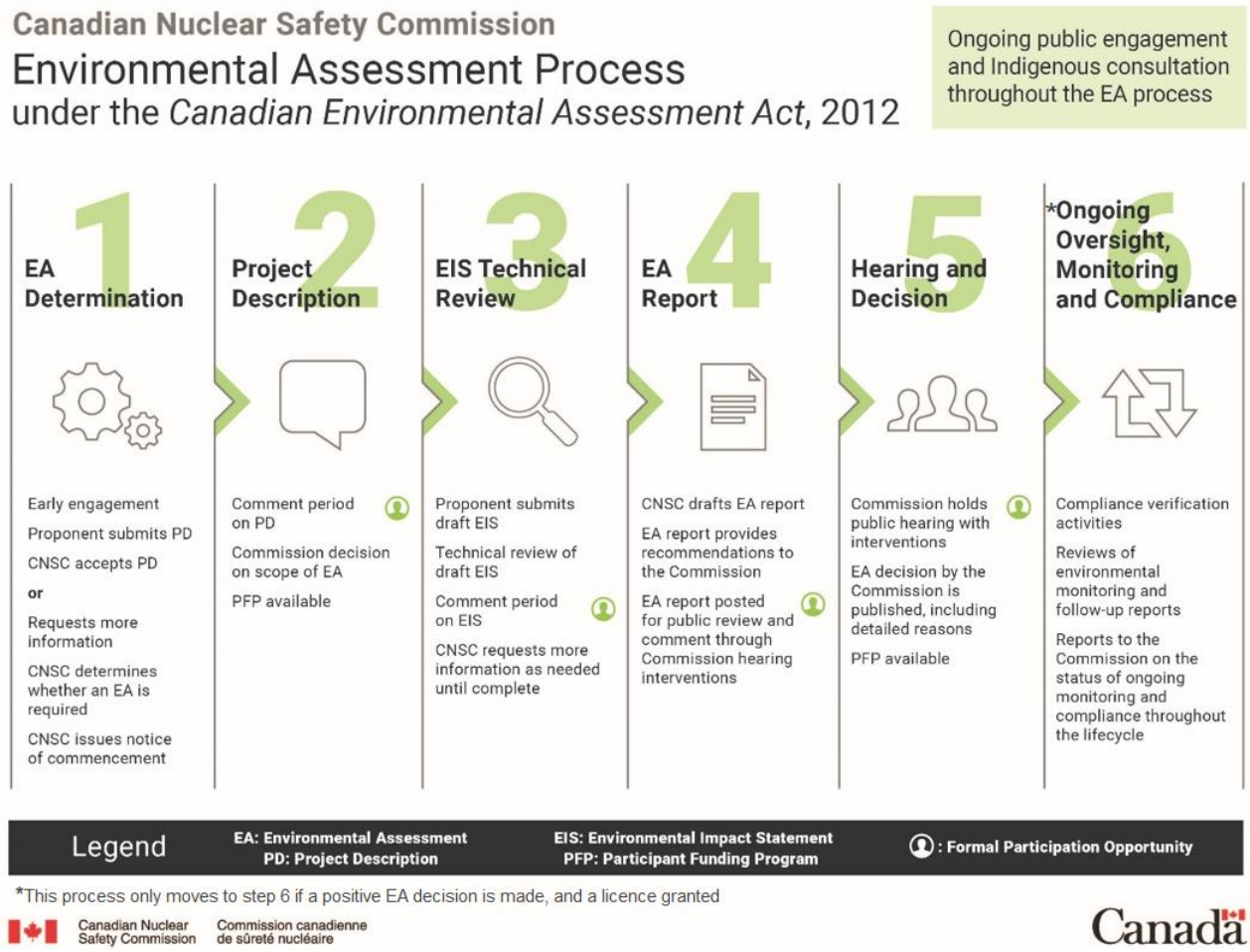
The full details and records related to consultation and engagement activities with Indigenous Nations and communities are contained in a separate report, titled *"CNSC Staff's Indigenous Consultation Report for the Denison Wheeler River Environmental Assessment (EA) and Licence to Prepare a Site and Construct Application"* (herein referred to as "the "Consultation Report"). This can be found in appendix C of the CMD and provides key information and recommendations to date, as well as next steps regarding the Indigenous consultation and engagement activities conducted by CNSC staff in relation to the EA and Licence to Prepare a Site and Construct application for the Project. The Consultation Report also provides information about Denison's engagement activities to date as per the requirements and guidance of REGDOC 3.2.2: *Indigenous Engagement* (Herein referred to as REGDOC 3.2.2) and will form part of CNSC staff's submissions and recommendations to the Commission. Key consultation activities related to the EA process under CEAA 2012 are summarized in section 9 of this report. An update on consultation efforts with all identified Indigenous Nations and communities, as well as updated issues tracking tables and Rights Impact Assessments (RIAs), will be submitted to the

Commission as part of the CNSC staff's supplemental submission prior to the Denison Wheeler River Part-2 hearing.

1.2 Environmental assessment process and timeline

The CNSC, as responsible Authority, carried out the various stages of the EA process under CEAA 2012 for the Project. These stages are presented in figure 1.1. The timeline associated with the Project EA process with link to related documentation can be found in table 1.1.

Figure 1.1: Environmental assessment process conducted by the CNSC under CEAA 2012



Stage 1: EA Determination

During stage 1, the CNSC determined whether an EA was required for the Project. Denison submitted a PD for the proposed Wheeler River Project. CNSC staff assessed the PD against the CNSC's *Generic Guidelines for the Preparation of an Environmental Impact Statement – Pursuant to the Canadian Environmental Assessment Act, 2012* (herein referred to as the CNSC Generic Guidelines, as identified in CNSC's REGDOC-2.9.1 *Environmental Protection: Environmental Principles, Assessments and Protection Measures*, herein referred to as REGDOC-2.9.1). On May 15, 2019, the CNSC deemed the PD complete, and issued the Notice of Commencement of a federal EA process for the Wheeler River Project pursuant to CEAA 2012.

Stage 2: Project Description

Stage 2 consisted of two main steps: a public comment period on the PD, and a Commission decision on the scope of the EA. A public comment period was held from May to June 2019, to allow Indigenous Nations and communities and the public to review the PD submitted by Denison. In December 2019, the Commission issued a decision on the scope of the EA, taking into account the comments received from Indigenous Nations and communities and the public related to the PD.

In March 2020, Denison announced the suspension of activities related to the EA as a result of the COVID-19 pandemic. In November 2020, Denison announced the restart of the EA activities, and in December 2020 submitted a revised PD. The revised PD included some changes to the freeze wall design, but the CNSC determined, in consultation with the Impact Assessment Agency, that any changes would not to constitute a new project.

Stage 3: EIS Technical Review

Stage 3 started in October 2022, with the submission of a draft Environmental Impact Statement (EIS) by Denison. CNSC staff conducted a 30-day conformity review to ensure that the information submitted was in accordance with CNSC's Generic Guidelines and then the draft EIS was posted for a 90-day public comment period from November 2022 to February 2023. Concurrently, CNSC staff and the FIRT also undertook a 120-day technical review of the draft EIS and its technical supporting documents, which included ensuring that the requirements of CNSC's REGDOC-3.2.2 and REGDOC-2.9.1 were met.

In March 2023, CNSC staff completed the initial technical review and produced consolidated tables of FIRT comments, including information requests (IRs) and Advice to the Proponent comments. These were provided to Denison for response. Multiple rounds of iterative review occurred between March 2023 and November 2024, whereby Denison provided responses to IRs, which the FIRT assessed and provided follow-up requests for outstanding information for Denison, as demonstrated in table 1.1.

Once Denison provided complete and sufficient responses to all comments and IRs, Denison was invited to submit a revised final EIS, which was received on November 22, 2024. CNSC staff reviewed Denison's final EIS and all supporting documents, including Denison's responses to IRs to ensure that all changes had been incorporated into the final EIS. CNSC staff deemed Denison's final EIS complete on December 24, 2024.

For more information on the technical review process methodology, see section 3.4 of this report.

Stage 4: EA Report Drafting

In stage 4 of the EA process, the information contained in the final EIS and supplemental resources and documents (such as technical supporting documents, responses to information requests) were used to prepare this EA report.

Stage 5: Hearing and Decision

During stage 5, the CNSC will hold a two-part public hearing to consider Denison's application for a licence to prepare a site for and construct its Wheeler River project. As a prerequisite to the licensing decision, the Commission must first make an EA decision to determine whether the proposed project is likely to cause significant adverse environmental effects, s outlined in CMD 25-H9.

During Part 1 of the hearing, the Commission will consider oral and written submissions, related to Denison's application, from Denison and CNSC staff. During Part 2 of the hearing, the Commission will consider oral and written interventions from Indigenous Nations and communities, members of the public and other interested parties.

In advance of the public hearing, the CNSC granted $548,350 in funding through its Participant Funding Program. The purpose of this funding is to assist Indigenous Nations and communities, members of the public and interested parties in reviewing submissions to the Commission from

CNSC staff and Denison, as well as in participating in the hearing process by providing topic-specific interventions to the Commission.

Table 1.1: Timelines associated with the Wheeler River EA process

Activity or step in EA process	Date
Denison submits Wheeler River Project description and Notice of Commencement issued for Project	May 15, 2019
Public comment period on Project description (30 days)	May 31- June 30, 2019
Commission hearing and decision on the scope of the Wheeler River EA	December 2019
Temporary suspension of the EA	March - November 2020
Denison submitted the Revised Project description	December 31, 2020
Resumption of the EA and Notice of participant funding offering for draft EIS review	January 2021
CNSC webinar – CNSC regulatory review process	September 2022
Denison submits the draft EIS	October 2022
CNSC conducts conformity review of draft EIS (30 days) and conclusions	October 21 - Nov 21, 2022
Public comment period on the draft EIS (90 days)	November 21, 2022 - February 18 2023
The FIRT completes initial technical review and deems draft EIS incomplete (120 days), transmission of federal IRs to Denison	November 21, 2022 - March 21, 2023
CNSC completes review of public comments and transmission of public information requests/comments to Denison	June 27, 2023
Denison submits responses to IRs from the FIRT and CNSC completeness review passes	August 29, 2023
The FIRT completes a technical review of Denison's responses to IRs and deems incomplete	August 30 - December 5 2023
Denison re-submits a draft EIS package and responses to IRs to the FIRT and CNSC completeness review passes	February 10, 2024
The FIRT completes extended technical review of the Denison's responses to IRs and deems incomplete	February 21 - October 11, 2024
Denison re-submits responses to IRs to the FIRT and CNSC completeness review passes	October 18, 2024

Activity or step in EA process	Date
The FIRT completes the technical review of the Denison's responses to IRs and all comments are addressed to the satisfaction of CNSC staff	October 25 - November 20, 2024
Denison submits final EIS	November 22, 2024
CNSC deem final EIS complete, along with comment tables	December 24, 2024
Notice of participant funding offering (2)	February 3, 2025
Notice of Public hearing	February 27, 2025

These steps are documented on the Canadian Impact Assessment Registry (herein referred to as the Registry - formally the Canadian Environmental Assessment Registry) for the project (Reference Number 80178).

1.3 Purpose of the environmental assessment report

The purpose of the EA report is to summarize the assessment conducted by CNSC staff, including the information and analysis considered by CNSC staff in reaching its findings on whether the Project is likely to cause significant adverse environment effects, after taking into account the implementation of proposed mitigation measures. The report also includes recommended conditions, based on key mitigation measures and follow-up measures for the Commission to consider in their decision.

This EA report is designed to reflect the scope of the EA decision by the Commission and address requirements of CEAA 2012 (see section 2.1). The Commission will consider this report and comments received by Indigenous Nations and communities and the public when issuing an EA decision for the Project under CEAA 2012.

In short, the report content is structured as follows:

- introductory chapters, providing an overview of the project, regulatory requirements and existing site conditions (section 1, section 2, section 3, section 4 and section 5)
- predicted changes to the environment that could be caused by the Project (section 6)
- predicted effects on valued components (VCs) from changes to the environment (section 7 and section 8)
- views expressed by Indigenous Nations and communities, including their key issues and concerns, co-developed by interested Indigenous Nations and communities (section 6, section 7 and section-8)
- Indigenous consultation and engagement and key issues and description of Indigenous and/or Treaty rights that could be potentially affected by the Project (section 9)
- public engagement and key issues raised during EA-specific engagement activities (section 10)
- follow-up monitoring program (section 11)
- CNSC staff findings and recommendations (section 12)

2.0 Project overview

Denison is proposing to develop an ISR uranium mining and processing operation located in the Athabasca Basin in Northern Saskatchewan. The Project would produce up to an average of 9 million pounds of U_3O_8 annually over 15 years and would include wellfields, waste management and industrial landfill operations, airstrip, supporting facilities and site infrastructure. The operations phase is anticipated to last approximately 15 years, followed by decommissioning (5 years) and a post-closure phase of approximately 15 years. Section 4 of this EA report summarizes the alternative means considered by Denison for the Project. Additional Project details can be found in section 1.1.3 of the CMD and the following sections provide a brief overview of the Project.

2.1 Project location

The Project is proposed to be located in Saskatchewan's Athabasca Basin approximately 4 km west of Highway 914, in between Key Lake Operation and McArthur River Operation. The Project falls within the boundaries of Treaty 10, the Nuhtsiye-kwi Benéne (Ancestral Lands) of ERFN (Treaty 10), the traditional lands of Kineepik Métis Local of Pinehouse (KML), the Homeland of the Métis, and is within Nuhenéné, the traditional territory of the Athabasca Denesųłiné First Nations. The Wheeler River exploration property is host to the Phoenix and Gryphon uranium deposits, but the proposed Project assessed as part of this EA includes only the mining of the Phoenix deposit.

Figure 2.1: Project location

Source: Denison Mines Corp., 2022

2.2 Project components

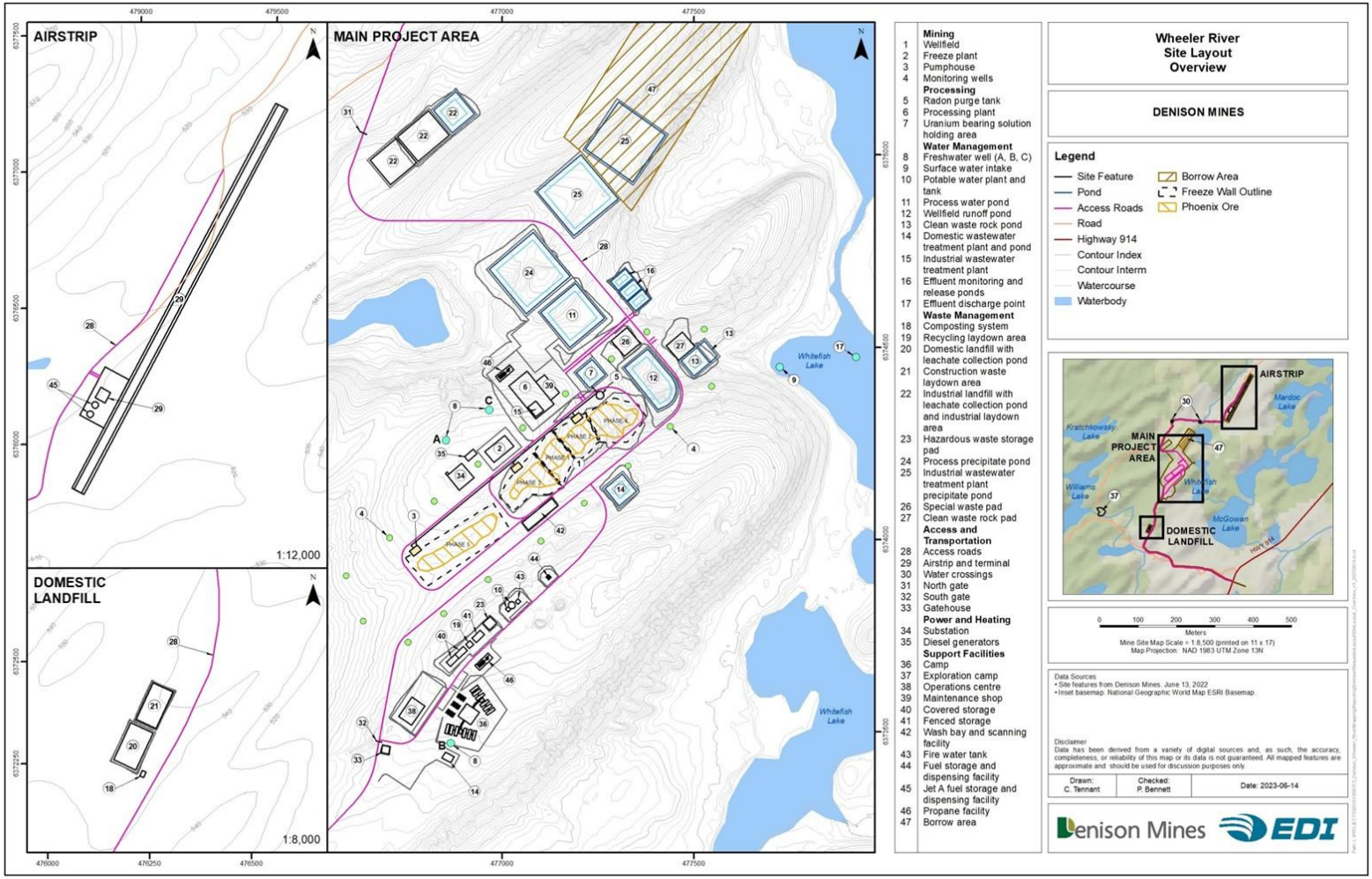
The main Project components and descriptions are listed in table 2.1. Below, figure 2.2 illustrates the proposed geographic locations of Project components.

Table 2.1: Descriptions of the main Wheeler River Project components

Project component	Description
Mining Wellfield	The mining wellfield will comprise ISR wells that are installed in the ore zone. The Project wellfield will include injection and recovery wells in a five-spot pattern, with 1 injection well surrounded by 4 recovery wells. It is anticipated that approximately 300 wells will be installed over an area measuring 90 m x 750 m.
Freeze Wall and Plant	The freeze wall will act as an additional containment measure to isolate the mining solution and enhance environmental protection. A series of wells will be installed around the mining wellfield. The wells will be injected with a chilled brine solution from the freeze plant to remove heat from the ground and form a continuous frozen wall that will contain the mining wellfield from the surrounding regional groundwater.
Processing Plant	The processing plant will house the tanks and equipment to process the uranium bearing solution (UBS) recovered from the mining wellfield into yellowcake. There will be a control room, laboratory, storage tank facilities, laundry facilities, changerooms and maintenance shop.
Roads and Airstrip	Mainland access to the site will be via Highway 914. A 7-km road will connect the highway to the Project site, and a 5-km road will link the site to a proposed airstrip. The Project, as a fly-in fly-out operation, will require a 1,600-m airstrip in a flat valley northeast of the site. Additional roads will include a service loop to the camp.
Support facilities	Supporting facilities for the Project would include both modular and permanent structures designed for year-round operation. The main support facilities would include the operations centre, a camp for operations staff, covered and fenced storage, wash bays and radiological clearance scanning areas, fire water system, hazardous substances management for support facilities, fuel storage and dispensing facility, propane storage areas and other hazardous substances storage areas.
Site infrastructure	The site infrastructure systems would be designed to accommodate year-round operations during construction and operations phases and long-term monitoring and maintenance during the closure and post-closure phases. The site infrastructure would include access roads, site security (perimeter fencing and boundary setbacks), sanitary sewage disposal system, surface water management, and utilities such as natural gas, power, telecommunications, data, and domestic water pump and distribution.

Project component	Description
Management of generated waste	All wastes that arise from the construction, operations, and closure phases of the Project will be managed according to Denison's Waste Management Program. Facilities and activities within the Project site will be planned, developed, and operated in a manner that reduces both the volume and the level of hazard of all wastes generated during the life cycle of the facilities.

Figure 2.2: Project components and site layout



Source: Denison Mines Corp., 2022

2.3 Project activities

Table 2.2 lists the key project activities that would occur during each phase of the Project. The table also shows the approximate expected duration of each project phase.

Table 2.2: Wheeler River Project activities and duration by phase

Project phase (planned duration)	Project activities
Site Preparation and Construction (1-3 years)	• Development of access roads and air strip • Site preparation and earthworks; clearing, levelling, and grading of the Project Area • Power generation – generators • Installation of main substation and distribution of power around site • Wellfield and freeze hole drilling; ground freezing • Storage and disposal of drill waste rock • Batch plant operation (concrete); crusher at borrow area • Development of surface infrastructure (camp, operations centre, plants, ponds, • pads, and support facilities) • Waste management (composting, domestic and industrial landfill operation, recycling) • Water management (including treatment and site runoff) • Groundwater supply • Surface water withdrawal • Fuel management (e.g., propane for comfort heating; vehicle and aircraft fuel) • On-site and off-site operation of vehicles and transport of materials • Air transportation for workers
Operations (3-18 years)	• Operation of the ISR wellfield • Wellfield and freeze wall drilling • Operation and expansion of freeze wall • Batch plant operation (grout and cement); crusher at borrow area • Expansion of pond and pads • Operation of the processing plant and production of uranium concentrate • Water withdrawal from groundwater or surface water body • Management of surface water (including seepage and site runoff)

Project phase (planned duration)	Project activities
	• Water treatment, both domestic and industrial • Water release to surface water body • Waste management (composting, domestic and industrial landfill operation, recycling) • Hazardous waste management (temporary storage, handling, and off-site transportation) • Storage and disposal of drill waste rock, process precipitates and industrial wastewater treatment plant precipitates • On-site and off-site operation of vehicles and transport of materials • Power supply – primarily power from the grid, also generators and back-up generators • Package and transport of nuclear substances • Fuel management (e.g., propane for comfort heating; vehicle and aircraft fuel) • Air transportation for workers • Progressive decommissioning and reclamation
Decommissioning (18-23 years)	• Site water management, treatment, and release • Mining area remediation and thawing of freeze wall • Process water treatment and release • Closure of ISR and freeze wells and related infrastructure • Decontamination of surface facilities and injection, recovery, and monitoring wells • Asset removal (including site power transmission lines and electrical infrastructure) • Demolition and disposal of non-salvageable surface infrastructure and materials • Remediation of contaminated areas (wellfield, pads, ponds, domestic wastewater treatment location, and process plant area) • Waste management (composting and landfill operation) • Decommissioning of landfills; hazardous materials management (temporary storage and off-site disposal) • On-site and off-site operation of vehicles and transport of materials • Reclamation of disturbed areas

Project phase (planned duration)	Project activities
Post-Decommissioning (23-38 years)	• Ongoing long-term monitoring to verify facility performance during institutional control period • Surveillance and inspection activities to verify integrity of the site

3.0 Assessment methods and EA report approach

In order to assess the effects to the environment from a project and for CNSC staff to perform their analysis of the submission by Denison, three basic elements needed to be in place:

- the scope of the environmental assessment (section 3.1 of this report)
- the identification of valued components that were deemed important and for which effects would be assessed (section 3.2)
- the spatial and temporal boundaries of the project (section 3.3)
- the consideration of Indigenous Knowledge (section 3.4), and
- the analysis methodology followed for the EA process (section 3.5)

3.1 Scope of the environmental assessment

Scoping is a procedural step in the EA process under CEAA 2012 that establishes the extent of what is to be reviewed for the federal EA. The scope identifies which elements of the proposal to consider and include in the EA, and which environmental components are likely to be affected.

Subsection 19(2) of CEAA 2012 requires Responsible Authorities to determine the scope of the factors to be taken into consideration in the EA of a proposed project. On December 2019, the Commission issued a decision on the extent of information to be included in the EA. The decision took into account the comments received from Indigenous Nations and communities and the public related to the project description, as well as CNSC staff recommendations. The Commission determined that the proposed project must include a review of the factors mandated in paragraphs 19(1)(a) to (h) of CEAA 2012:

- the environmental effects of the designated project as per section 5 of CEAA 2012, including the environmental effects of malfunctions or accidents that may occur in connection with the designated project and any cumulative environmental effects that are likely to result from the designated project in combination with other physical activities that have been or will be carried out
- the significance of the effects referred to above
- comments from the public and Indigenous Nations and communities that are received in accordance with CEAA 2012
- mitigation measures that are technically and economically feasible and that would mitigate any significant adverse environmental effects of the designated project
- the requirements of the follow-up monitoring program in respect of the designated project
- the purpose of the designated project

- alternative means of carrying out the designated project that are technically and economically feasible and the environmental effects of any such alternative means
- any change to the designated project that may be caused by the environment

In addition, CNSC staff recommended that the EA for the Project should consider Indigenous Knowledge (IK) and community knowledge. The Commission decision made these a requirement as part of the factors to be considered in the scoping decision.

For the Wheeler River Project, the EA considered potential environmental effects on areas of federal jurisdiction in relation to subsection 5(1) of CEAA 2012, including:

- fish and fish habitat, migratory birds (5(1)(a))
- a change that may be caused to the environment that would occur on federal lands (5(1)(b))
- with respect to Indigenous peoples, an effect of any change that may be caused to the environment on:
    - health and socio-economic conditions
    - physical and cultural heritage
    - current use of lands and resources for traditional purposes
    - any structure, site or thing that is of historical, archaeological, paleontological or architectural significance for Indigenous peoples (5(1)(c))

In accordance with subsection 5(2) of CEAA 2012, the EA also considered:

- changes other than those referred to in paragraphs 5(1)(a) and (b), that may be caused to the environment that are directly linked or necessarily incidental to any federal decisions pursuant to other legislation (5(2)(a))
- effects other than those referred to in paragraph 5(1)(c), of any changes that may be caused to the environment, referred above, on health and socio-economic conditions, physical and cultural heritage, or any structure, site, or thing that is of historical, archaeological, paleontological, or architectural significance (5(2)(b))

Federal EAs consider the potential adverse effects of a proposed project on species at risk, pursuant to subsection 79(1), and (2) of the *Species at Risk Act* (SARA) and their critical habitat:

> **79 (1)** Every person who is required by or under an Act of Parliament to ensure that an assessment of the environmental effects of a project is conducted, and every authority who makes a determination under paragraph 82(a) or (b) of the Impact Assessment Act in relation to a project, must, without delay, notify the competent minister or ministers in writing of the project if it is likely to affect a listed wildlife species or its critical habitat.
>
> **79(2)** the person must identify the adverse effects of the project on the listed wildlife species and its critical habitat and, if the project is carried out, must ensure that measures are taken to avoid or lessen those effects at to monitor them

These subsections require any authority who is required by or under an Act of Parliament to ensure that an assessment of the environmental effects of a project is conducted to ensure that the environmental assessment considers whether the project is likely to affect a listed wildlife species or its critical habitat, and if the project is carried out, to ensure that measures are taken to avoid or lessen any adverse effects on those species. This must identify the adverse effects of the project on the wildlife species listed in Schedule 1 of the SARA and associated critical habitat. Species listed under SARA are protected from being disturbed, collected, harvested, captured,

killed, or exported. Under SARA, over 400 species have been identified by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) as being at risk in Canada and require special management considerations, including appropriate surveys and setbacks on lands where species have been recorded.

Effects on species designated by the COSEWIC and provincially designated species of concern are also considered in the Wheeler River assessment process, as well as species of interest identified by Indigenous Nations and communities and the public.

Transport Canada highlighted that Denison must adhere to the requirements of the *Canadian Navigable Waters Act* (CNWA) and conditions outlined in any CNWA approval(s) that may be granted by the Minister of Transport for the Project, to ensure that no significant residual adverse effects to navigation occur.

If the watercourse crossings, water intake, and effluent discharge/intake pipeline and diffuser are constructed as minor works, Denison must follow the mitigations outlined in the CNWA Minor Works Order. Should a CNWA approval(s) be required for any of the in-water works, mitigation measures will be developed during the regulatory phase and included as terms and conditions in the CNWA approval(s).

Given that the Project is located in the Athabasca Basin region of Northern Saskatchewan and is also regulated by the province of Saskatchewan, the following provincial permits may be required:

- approval to construct a pollutant control facility
- permit to construct a facility to handle hazardous substances or waste dangerous goods

Notwithstanding this, it is Denison's responsibility to identify and comply with all applicable regulatory requirements, both federal and provincial.

Other Views Expressed sub-sections will be included in section 6, section 7, and section 8 to provide summaries of the views expressed by federal authorities, where applicable, with respect to each potential effect on the environmental component or VC under review.

These sections will capture key issues and concerns heard in writing or verbally through technical meetings or engagement and consultation activities, as well as how Denison will be mitigating or managing such concerns, as a result of commitments, or as requested by CNSC staff and other federal and/or provincial authorities.

3.2 Selection of valued components

A valued component (VC) is a component that is considered to be ecologically, culturally, socially, or economically significant. These are the components for which effects from the project will be assessed. Characterization of the existing environment includes the identification of VCs by Denison, government agencies, Indigenous Nations and communities, and the public.

The VCs selected by the CNSC are presented in table 3.2 and were selected based upon CEAA 2012 and SARA legislative requirements. A review by CNSC staff and the FIRT of existing information, baseline data analyses, consultations with Indigenous Nations and communities and consideration of Indigenous Knowledge yielded the list of equivalent species and ecosystems of interest presented in the second column . The equivalent Denison-identified VCs are also presented in this table.

Table 3.2: Rationale for CNSC-identified VCs and their equivalent Denison-identified VCs

CNSC-identified VCs	Species and ecosystems of interest identified by Indigenous Nations and communities	Equivalent Denison-identified VCs	Rationale
Effects identified pursuant to subsection 5(1) of the CEAA 2012			
Fish and fish habitat (5(1)(a))	Lake Whitefish Lake Trout Northern Pike Walleye White Sucker Yellow Perch	Arctic Grayling Burbot Lake Chub Lake Trout Lake Whitefish Longnose Sucker Ninespine Stickleback Northern Pike Slimy Sculpin Spottail Shiner Walleye White Sucker Yellow Perch Benthic Invertebrates	Project-related predicted changes to water quality and quantity, and discharge of treated effluent to Whitefish Lake could adversely affect fish and fish habitat.
Migratory birds (5(1)(a))	Canada Goose Lesser Scaup Loons Mallard Surf Scoters	Raptors (Bald Eagle, Osprey) Migratory breeding birds (Waterbirds and waterfowl, Upland game birds, Migratory songbirds)	Project-related predicted changes to surrounding terrestrial environment could adversely affect migratory birds and their habitat.
Indigenous uses: Current use of lands and resources for traditional purposes (5(1)(c))	Noise Moose Woodland caribou Fish (see fish and fish habitat) Upland game birds Berries Traditional plants	Traditional land and resource use by Indigenous peoples	Project-related predicted changes to surrounding terrestrial and aquatic environments could adversely affect the use of lands and resources for traditional purposes by Indigenous peoples.

CNSC-identified VCs	Species and ecosystems of interest identified by Indigenous Nations and communities	Equivalent Denison-identified VCs	Rationale
Transboundary environmental effects: GHG emissions (5(1)(2))	Air Quality	Greenhouse Gases (GHG)	Project-related predicted changes to GHG emissions could contribute to global climate change.
Effects identified pursuant to subsection 5(2) of the CEAA 2012			
Human Health (5(2)(b)) (Includes Indigenous peoples Health*) (5(1)(c)) *applies to both 5(1) and 5(2)	Surface Water Quality Traditional Food and Diet	Public Health and Worker Health	Project-related predicted changes in water quality and air quality could adversely affect the health of Indigenous peoples, the public and workers.
Wetlands (5(2)(b))	Wild Rice	Wetlands	Project-related predicted changes to water quantity and quality, and disturbance of terrestrial environment, could adversely affect wetlands, which are difficult to restore and play an important role in ecosystem function. Also related to other federal decisions.
Terrestrial biota (5(2)(b))	Blueberries Fisher Labrador Tea Pine Marten Moose Mink Muskrat Moss Mushrooms Snowshoe Hare Specialty Wood	Ungulates (Moose) Furbearers (Pine Marten, Mink, Muskrat) Vegetation and ecosystems Listed plant species	Project-related predicted changes to the terrestrial wildlife and vegetation, and disturbances to the terrestrial environment, could adversely affect the Terrestrial environment beyond the boundaries of the project site. Also related to other federal decisions, including SARA.
Effects identified pursuant to subsection 79(2) of the SARA			
Species at risk	Woodland Caribou Wolverine	Woodland Caribou Wolverine	Project-related predicted disturbances of terrestrial and aquatic environments could adversely affect species at risk

CNSC-identified VCs	Species and ecosystems of interest identified by Indigenous Nations and communities	Equivalent Denison-identified VCs	Rationale
		Nine-spotted Lady Beetle Transverse Lady Beetle Yellow-banded Bumble Bee Northern Leopard Frog Little Brown Myotis Northern Myotis Bank Swallow Barn Swallow Common Nighthawk Horned Grebe Short-eared Owl Yellow Rail Rusty Blackbird Olive-sided Flycatcher	and their critical habitat. There are no fully aquatic SAR (i.e., fish) identified within the vicinity of the Project.

3.3 Spatial and temporal boundaries

Spatial boundaries define the areas within which a designated project may cause direct or indirect environmental effects. Temporal boundaries define the timeframe during which an environmental effect may occur in relation to a designated project's activities. Defining spatial and temporal boundaries allows a frame of reference to be established for identifying and assessing the environmental effects associated with a designated project.

Spatial Boundaries

The spatial boundaries for the Project were determined by CNSC staff to be appropriate for each selected environmental component (atmospheric and acoustic environment, geology and groundwater environment, aquatic environment and terrestrial environment), and associated VCs. Effects on the VCs are caused by changes to the environmental components, which may originate from project activities. Consistent with the CNSC Generic Guidelines, the following spatial boundaries identified by Denison were considered for each environmental component:

- **Site study area (SSA)**: The SSA (referred to as Project Area in the EIS) is the Wheeler River Project footprint (the area where all project activities are proposed to be undertaken, including facilities, buildings, and infrastructure).
- **Local study area (LSA)**: The LSA is the area existing outside the SSA, where measurable changes to the environment may be anticipated due to project activities. These changes may occur during any phase of the project, either through normal activities or from possible accidents or malfunctions.
- **Regional study area (RSA)**: The RSA is the maximum area within which the potential effects of the project may interact with the effects of other projects and activities (or anticipated projects and activities), resulting in a potential for cumulative effects.

The Project Area's direct physical disturbance covers an area approximately 1.75 $km^{2,}$ (not including the airstrip), while the LSA is approximately 84 km in length by 42 km in width, covering approximately 2,620 km^2, and the RSA has a maximum length of 338 km and maximum width of 163 km, covering approximately 29,754 km^2.

Table 3.3 summarizes the spatial boundaries for the Project for each environmental component. Maps of the spatial boundaries for each environmental component are provided in figures 3.1, 3.2, 3.3, 3.4, 3.5, 3 and 3.7, as illustrated in Denison's final EIS.

Temporal boundaries

Project phases define the time periods for which likely project-specific and cumulative effects would be considered. In the Commission's scoping decision, the Commission directed Denison to consider the longest period of potential effects when defining temporal boundaries, as outlined in section 5.2.2 of the CNSC Generic Guidelines. The temporal boundaries for the Project were determined by CNSC staff to be appropriate. Consistent with the CNSC Generic Guidelines, the following temporal boundaries identified by Denison were considered for the EA:

- **Site Preparation and Construction phase** (1-3 years): When physical activities relating to site preparation and construction occur, including activities such as installing necessary supporting infrastructure, inactive commissioning, systems testing, and transportation of construction materials.

- **Operations phase** (3-18 years): When all activities relating to waste placement occur, including operation of the ISR wellfield, freeze wall operation and expansion and processing plant operations, vehicle movements, and maintenance activities.
- **Decommissioning phase** (18-23 years): After mining and processing has permanently ceased, when activities necessary for the decommissioning of wells and implementation of long-term monitoring occur.
- **Post-Decommissioning phase** (23-38 years): After closure phase activities have been completed, when long-term environmental monitoring will occur to ensure that the final cover is functioning as intended.

The temporal scope of the assessment for Geology and Groundwater (section 6.2) includes a unique 'future centuries' modelling assessment period (up to 10,000 years) following post decommissioning. The ‘future centuries’ scenario considers the period for which the highest COPC concentrations in groundwater migrating from the decommissioned mining area are predicted to interact with surface water and aquatic VCs based on groundwater modeling.

Table 3.3: Spatial boundaries for each environmental component considered in the EA

Environmental component	Spatial boundaries		
	SSA	LSA	RSA
Atmospheric environment (see figure 3.1)	Synonymous with the Project footprint	Includes the SSA and lands within 10km of the Project Area.	10 km from the LSA based on proximity to other nearby projects.
Geological and hydrogeological environment (see figure 3.2)	Synonymous with the Project footprint	Includes the SSA and is centered on the Phoenix Deposit and extends 2 km south for groundwater.	Approximately 100 km radius surrounding the SSA.
Surface water environment (see figure 3.4)	Synonymous with the Project footprint	Includes the SSA and is bounded by Whitefish Lake and adjacent surface waterbodies. Centered on the Phoenix Deposit and extends 1.5 to 2.5 km in all directions to surface waterbodies.	Approximately 100 km radius surrounding the SSA.
Aquatic environment (see figure 3.4)	Synonymous with the Project footprint	Includes the SSA and is bounded by watershed boundaries and areas directly downstream of the SSA.	The RSA is bounded by the regional watershed area in which the Project Area is located and extends downstream to include Russell Lake.

Environmental component	Spatial boundaries		
	SSA	LSA	RSA
Terrestrial environment (see figure 3.3)	Synonymous with the Project footprint	Includes the SSA and a 500 m buffer around the Plate Site and Ancillary facilities as well as a 250m buffer for access roads and other linear features.	Encompasses the SSA, LSA and a minimum buffer of 8 km around the LSA.
Human environment (see figure 3.5)	Synonymous with the Project footprint	Includes the SSA, parts of the Icelander River drainage to its confluence with Russell Lake in the Wheeler River.	The area that surrounds and includes the LSA including parts of Russell Lake and the Wheeler River.
Land and resource use (see figure 3.6 and figure 3.7)	Synonymous with the Project footprint	A polygon including the SSA with a maximum length of 84 km and a maximum width of 42 km.	The approximate physical parameters of the RSA include a maximum length of 338 km and a maximum width of 163 km.
Economics (see figure 3.6 and figure 3.7)	Synonymous with the Project footprint	ERFN (including Indian Reserve Wapachewunak 192D and Indian Reserve La Plonge 192); Patuanak, Northern Hamlet (Patuanak), and Métis Local #82 of Patuanak; Pinehouse Lake, Northern Village, and Kineepik Métis Local (KML) #9; Beauval, Northern Village, and Métis Local #37.	The RSA encompasses Census Division 18 which is the Northern Saskatchewan Administrative District.

The figures throughout this section were provided by Denison in the 2024 Final EIS.

Figure 3.1: Local and regional study areas and sensitive points of reception for the air quality valued component

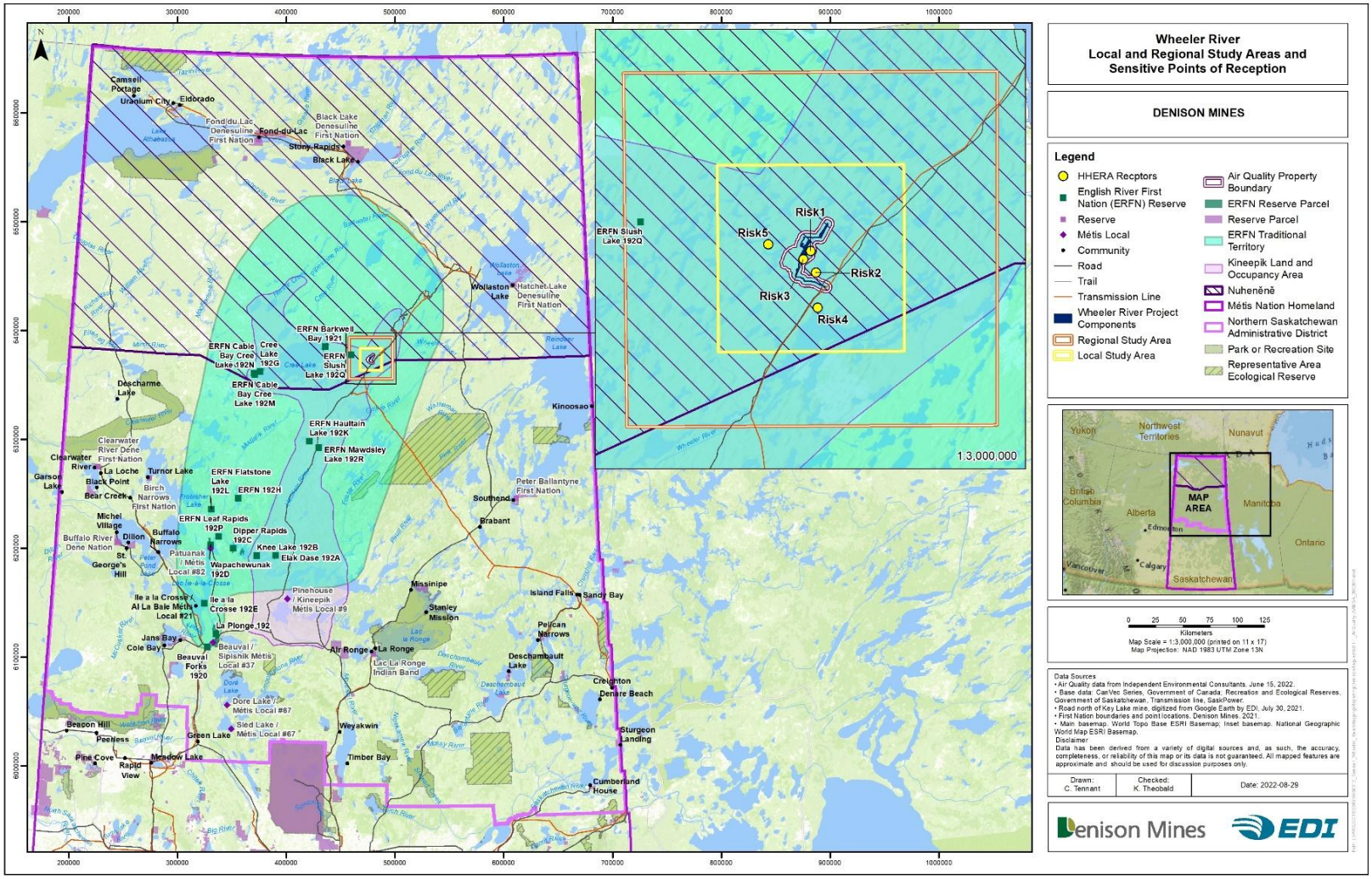


Figure 3.2: Spatial boundary of the local study area for the geology and groundwater valued components

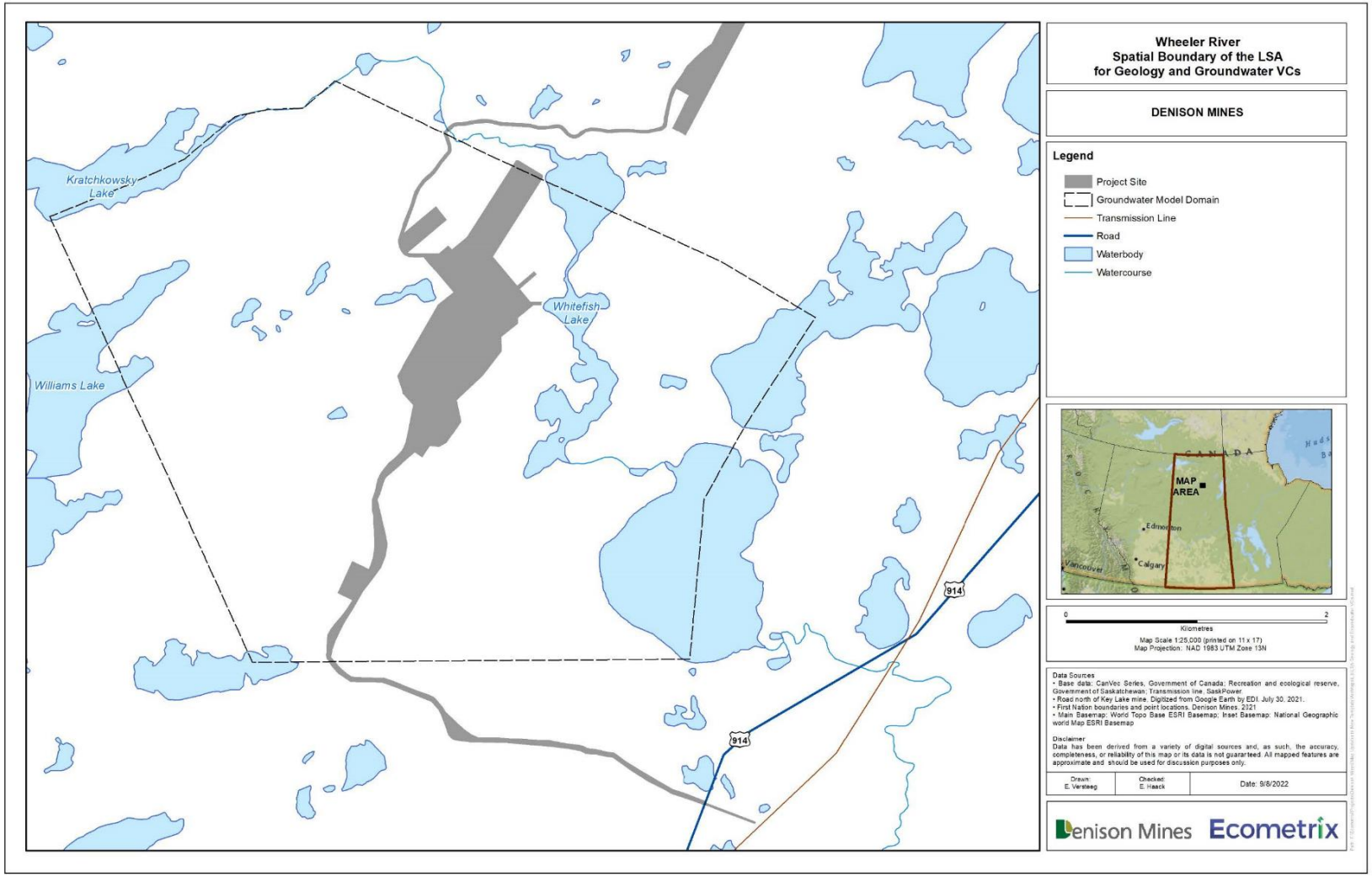


Figure 3.3: Terrain, soil, and organic matter/peat – Study area boundaries

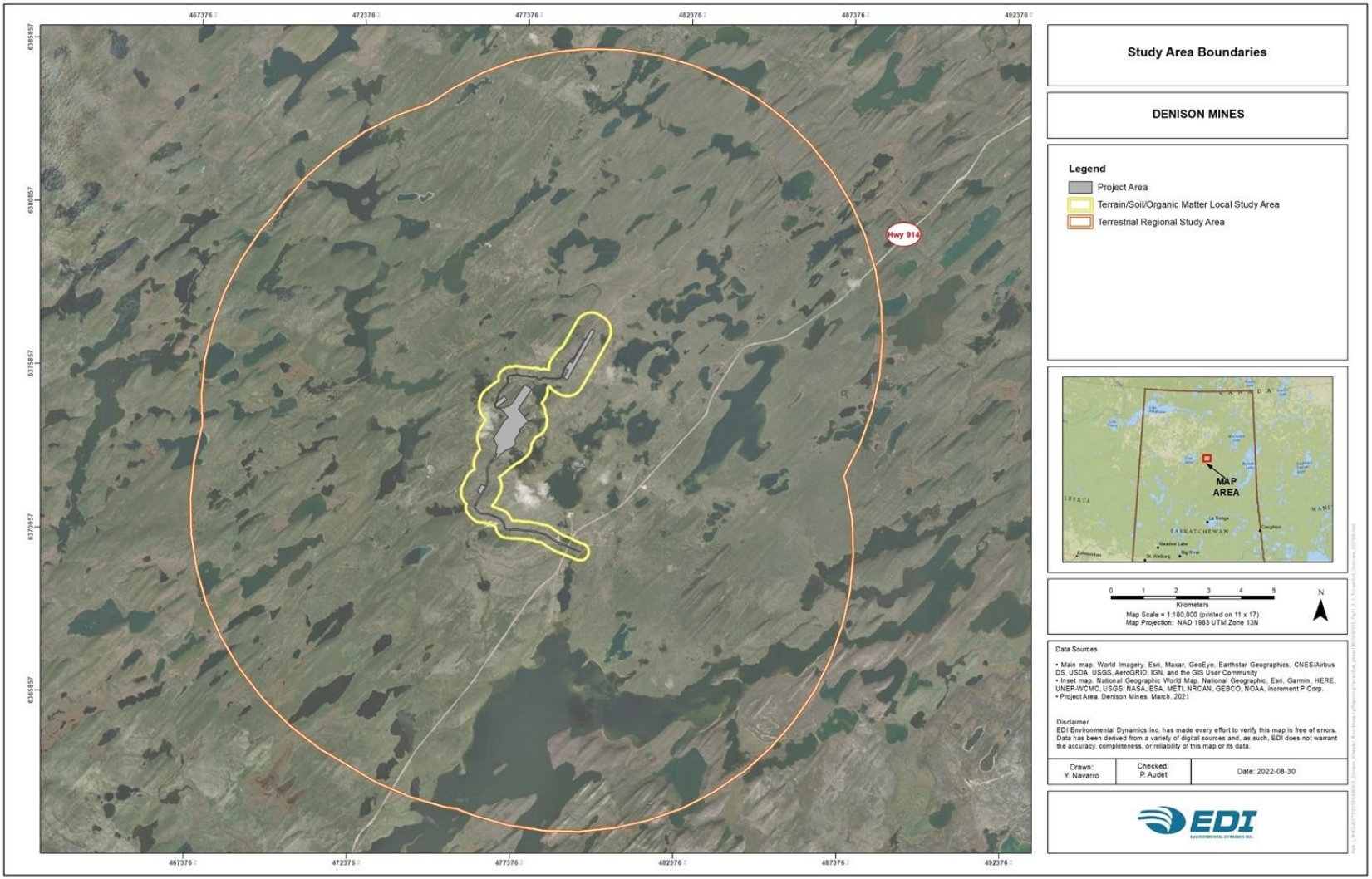


Figure 3.4: Study area boundaries – Aquatic environments

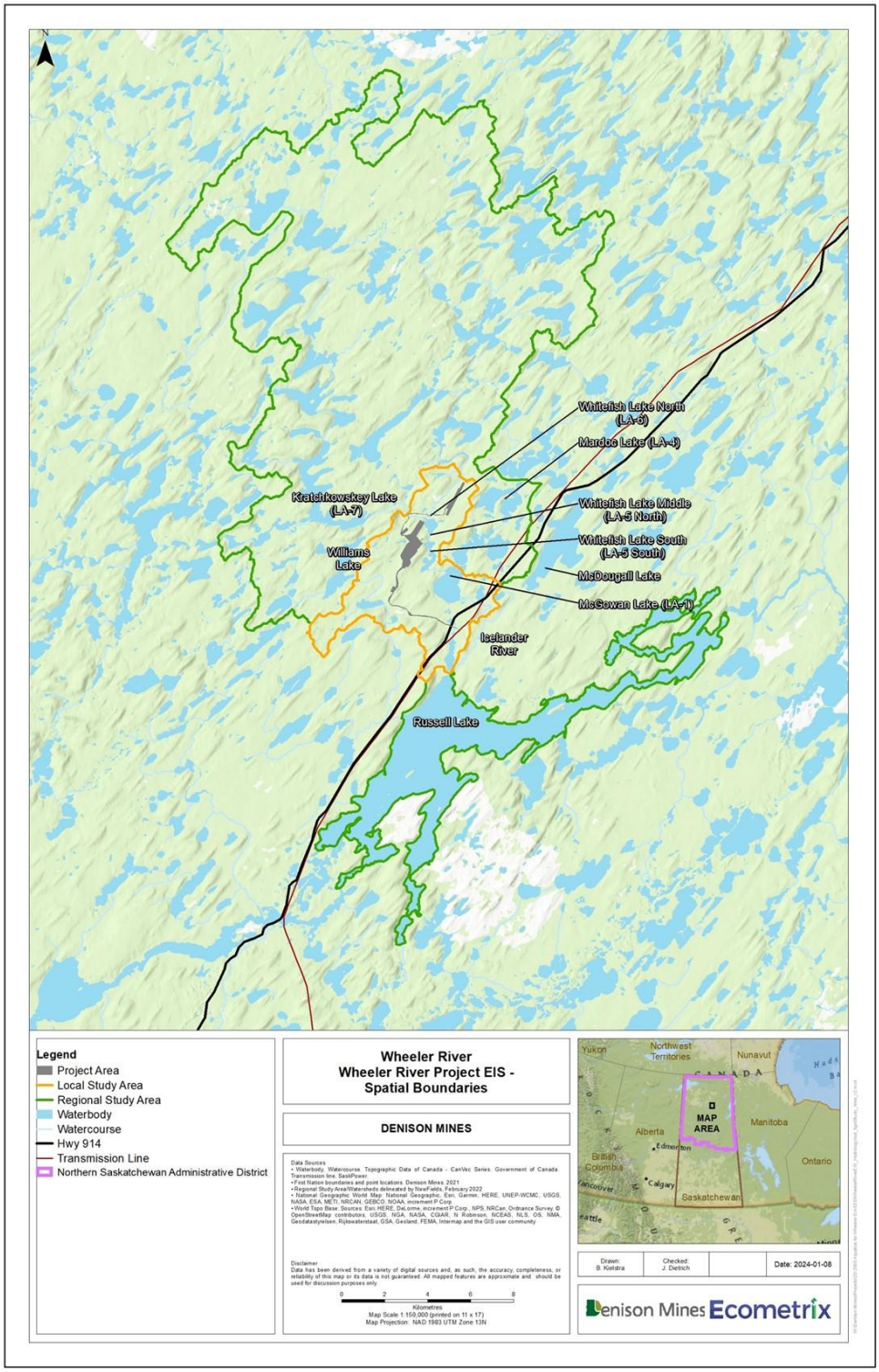


Figure 3.5: Spatial boundaries – Human health

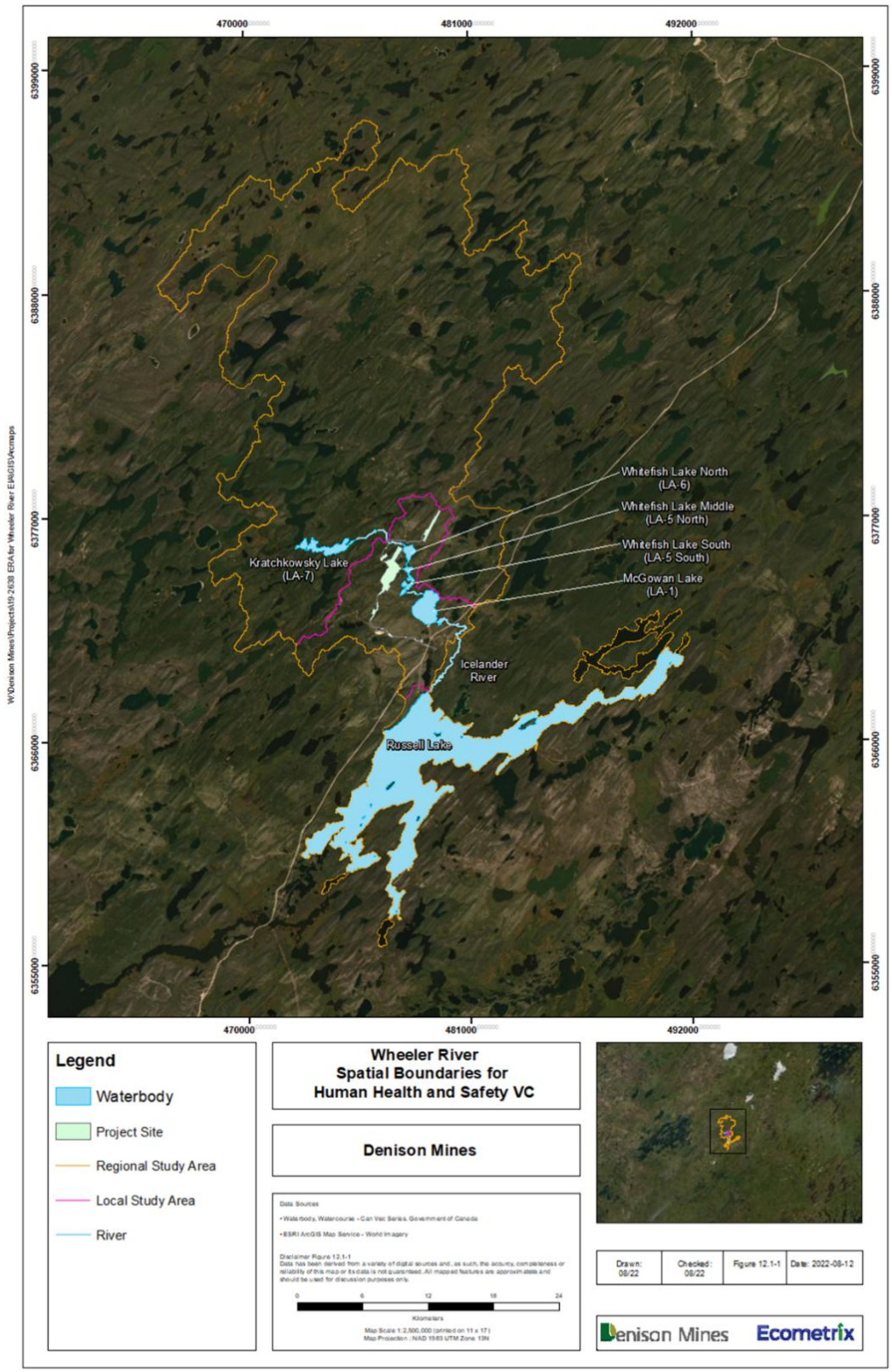


Figure 3.6: Indigenous land and resource use places and waterbodies

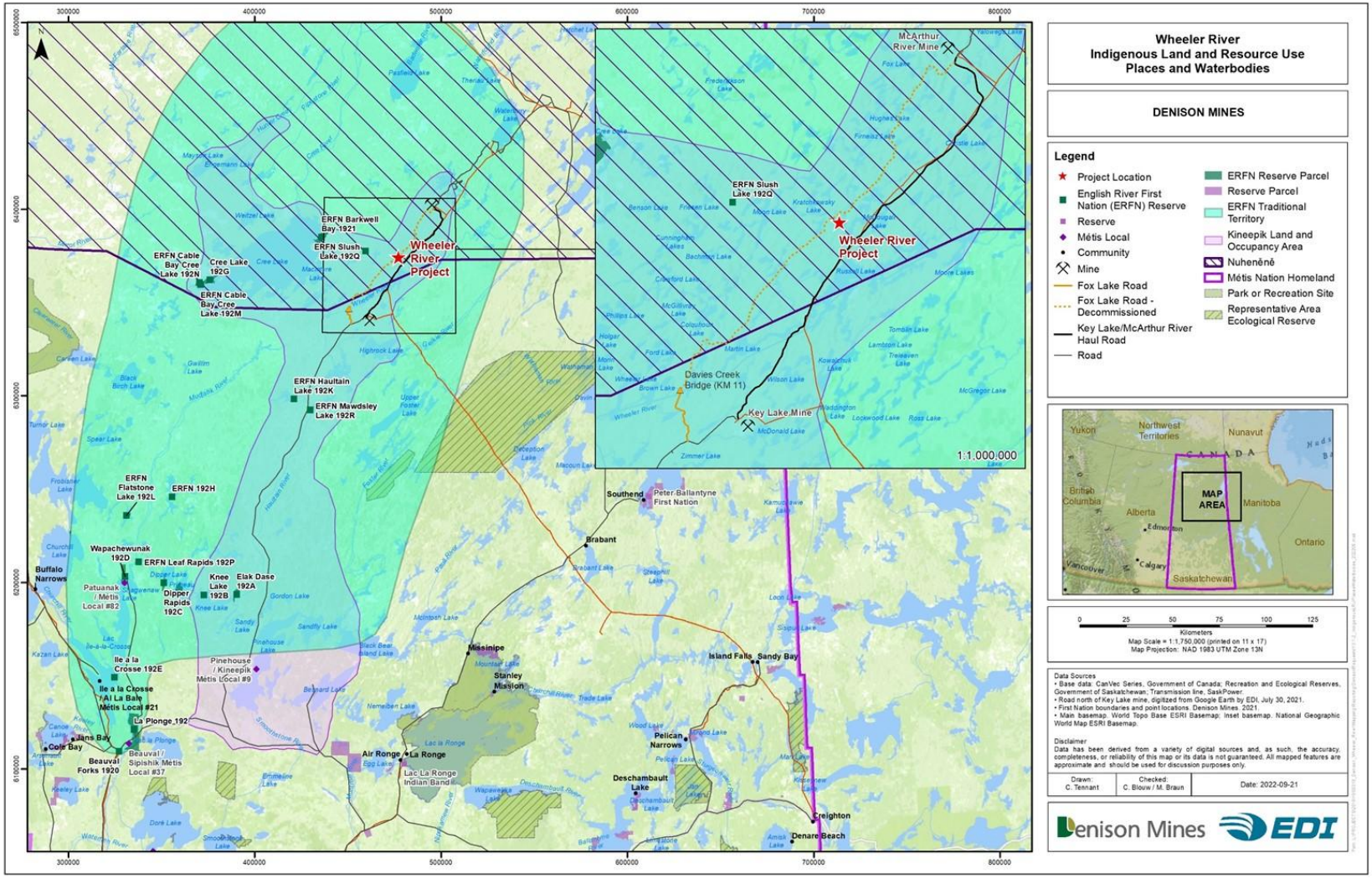
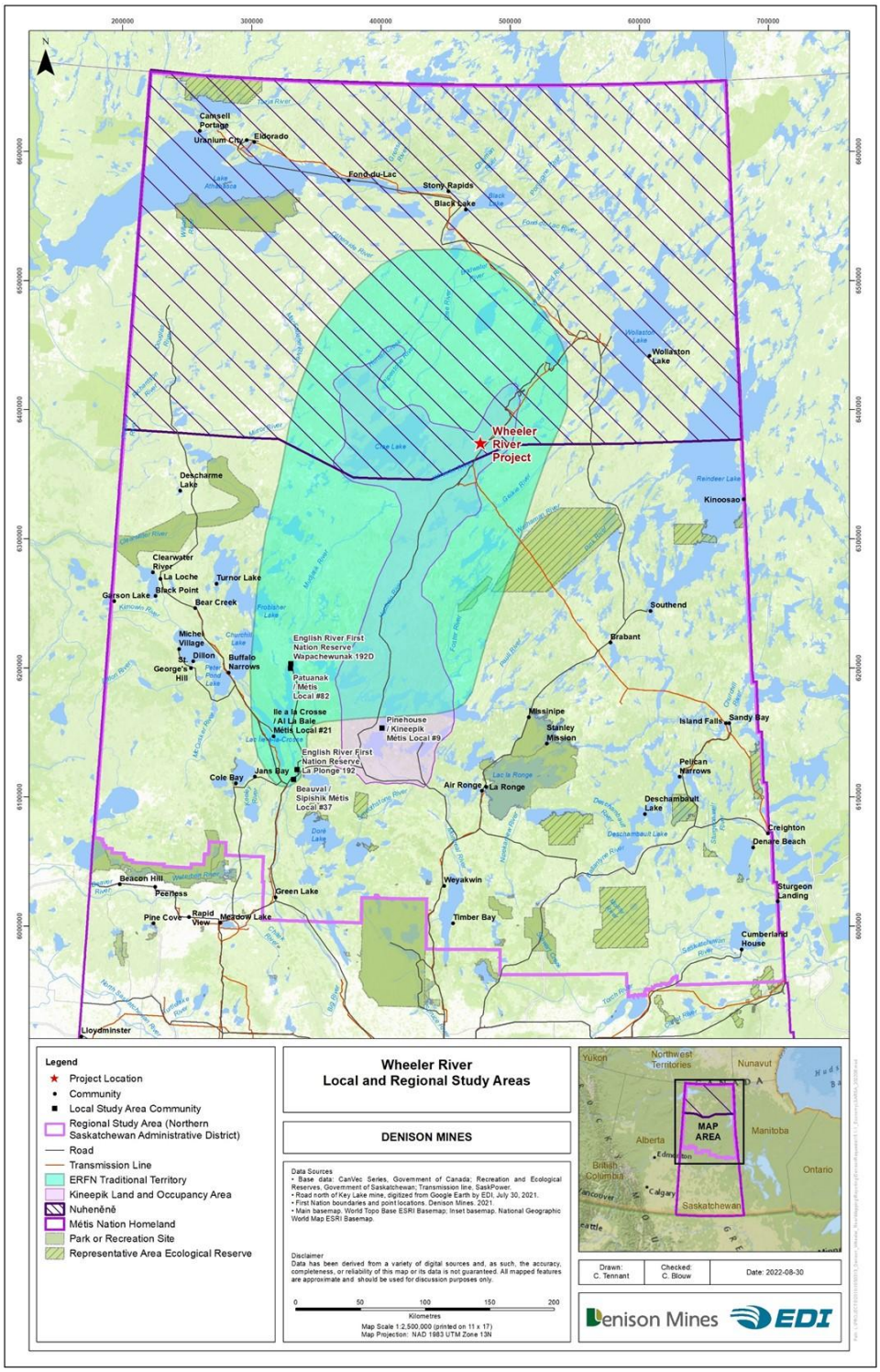


Figure 3.7: Location of the Project in relation to the communities in the local and regional study areas



3.4 Consideration of Indigenous Knowledge

Denison completed their environment and effects assessment and selection of the VCs considering feedback provided during engagement with Indigenous Nations and communities.

Indigenous Knowledge and Métis Knowledge (MK) was used to determine which traditional land use activities occur in the area, such as hunting, fishing, trapping and navigation (boating), camps of particular importance to local Indigenous Nations and communities and confirmation that the Project Area contained cultural and or heritage resources.

IK and MK also helped improve Denison's understanding of species' habitat and diet preferences, calving areas, population trends, and local harvesting practices, and traditional food consumption in the Project area, especially in terms of frequency and diet composition (collected from information provided by ERFN, KML, Ya'thi Néné Land and Resource Office (YNLR), and MN-S). With regards to evaluating the terrestrial environment, IK from ERFN and YNLR's studies and MK from KML and MN-S' studies helped Denison better understand species distribution and regional population trends.

Denison considered concerns shared by Indigenous Nations and communities in the evaluation of all environmental components, and potential effects of the project. Concerns included: changes in the abundance of animals; air quality; workforce fishing levels; noise; potential for accidental release of pollution; the safety of drinking water downstream of the treated effluent discharge pipe; and the ISR mining method and its safety for animals and human health, to name a few.

CNSC's evaluation of Denison's consideration of IK/MK in their environmental and effects assessment are described in more detail in section 6, section 7 and section 8.

Other Views Expressed sub-sections will be included in section 6 and section 7 to provide summaries of the views expressed by Indigenous Nations and communities, where applicable, with respect to each potential effect on the environmental component or VC under review.

These sections will capture key issues and concerns heard in writing or verbally through technical meetings or engagement and consultation activities, as well as how Denison will be mitigating or managing such concerns, as a result of commitments, or as requested by CNSC staff and other federal and/or provincial authorities.

3.5 CNSC analysis methodology

3.5.1 EIS Technical Review Process

Stage 3 of the EA process, as described in section 1.2, is the EIS technical review. The purpose of the EIS technical review is to assess whether the proponent has adequately assessed the potential impacts of the project, for the purposes of subsequently assessing the significance of adverse effects on environmental components and related VCs. The information provided by the proponent should be sufficient to allow for the evaluation of both the accuracy of the predicted EA findings and the effectiveness of the identified mitigation measures.

Led by CNSC staff as responsible Authority, the EIS technical review is completed by the FIRT. Upon determination that a draft EIS has met the CNSC's Generic Guidelines (i.e., it is deemed to "conform"), a full technical review of the EIS commences. Where gaps are found, or additional information is required during this review, FIRT members (Subject matter experts) create IRs, and any questions or comments that are directly related to the EIS or EA process (i.e., not

necessary to make a determination of effects of the projects on the environment) were provided to Denison as *Advice to the Proponent*. The CNSC EA lead collates and edited all IR and advice inputs prior to sending the conclusions to the project proponent.

The scope of CNSC staff's technical review of Denison's submission was to assess whether there were any significant adverse effects expected from the project, based on consideration of the requirements and guidance in REGDOC 2.9.1, REGDOC 3.2.2 and relevant CEAA guidance, including:

- Addressing "Purpose of" and "Alternative Means" under the Canadian Environmental Assessment Act, 2012 - Canada.ca.
- Technical guidance for assessing cumulative environmental effects under the *Canadian Environmental Assessment Act*, 2012.
- Technical Guidance for Determining Whether a Designated Project is Likely to Cause Significant Adverse Environmental Effects under the Canadian Environmental Assessment Act, 2012 - Canada.ca.
- Technical guidance for assessing physical and cultural heritage or any structure, site or thing that is of historical, archeological, paleontological or architectural significance under CEAA 2012.
- Technical guidance for assessing the current use of lands and resources for traditional purposes under CEAA 2012.

CNSC staff reviewed various sources of information to complete the EIS technical review and conduct its analysis of the potential for adverse effects from the Project. These included:

- the draft EIS submitted by Denison in November 2022, revised draft EIS submitted in February 2024 and Final EIS submitted in November 2024
- Denison's responses to IRs from the CNSC and the FIRT during the EIS technical review and related supplemental information
- Denison responses to comments received from the public and Indigenous Nations and communities
- advice from expert federal departments and provincial ministries
- IK and MK knowledge and land use studies from ERFN, KML, Métis Nation of Saskatchewan (MN-S) and YNLR

CNSC staff also reviewed the Denison Mines Corp. Commitments Register (Version 5), a document that captures all mitigation measures, follow-up monitoring program measures and other commitments made by Denison to the public and Indigenous Nations and communities throughout the EA process. CNSC staff examined this information to ensure that all key issues and concerns that have been brought forward to date by Indigenous Nations and communities and the public have been addressed.

Throughout the technical review of the EIS, IRs from the FIRT and their responses from Denison resulted in Denison incorporating additional mitigation and follow-up monitoring program measures into the revised and final EIS document. Where appropriate, these have also been added to Denison's Commitments Register, which is an evergreen document that will continue to be updated to capture any additional commitments made by Denison during public hearings, and any actions directed by the Commission to Denison.

Following resolution of all IRs, CNSC staff accepted the Final EIS and drafted this report. Any outstanding issues from the review have been addressed as commitments or will be resolved

through the use of EA Conditions, proposed later on in this report and summarized in table 12.1. Should the Commission issue a licence, the Commitments Register will be included in the Licence Control Handbook as part of the licensing basis for the project, as a proposed EA Condition (EA11).

The conclusions from CNSC's review are captured in section 6, section 7 and section 8, for all of the environmental components evaluated.

3.5.2 Comments received during EIS Technical Review

The comments received from the public and Indigenous Nations and communities as part of the 90-day public comment period from November 21, 2022, to February 18, 2023, on Denison's draft EIS were addressed as part of the EA process. Comments directed to Denison were addressed and resulted in changes to Denison's Final EIS. Comments directed to CNSC staff were taken into consideration in their analysis. Tables presenting the disposition of comments addressed to the CNSC and to Denison, respectively, are posted on the Registry.

Of the 9 submissions received during the public comment period for the draft EIS, the primary commenters were Indigenous Nations and communities, with the exception of one submission (Canadian Nuclear Association). In addition to submissions from ERFN, KML, MN-S and YNLR, CNSC staff also received comments from Birch Narrows Dene Nation (BNDN), Peter Ballantyne Cree Nation (PBCN) and Prince Albert Grand Council (PAGC). Issues and concerns raised by all Indigenous Nations and communities can be found in sections 6, section 7 and section 8, as *Views Expressed.*

3.5.3 Determination of Likelihood for Significant Adverse Environmental Effects

CNSC staff assessed the likelihood of the Project to cause significant adverse environmental effects, following the application of mitigation measures, in accordance with the CNSC Generic Guidelines, CNSC's REGDOC-2.9.1, *appendix A,* and the Canadian Environmental Assessment Agency's (now the Impact Assessment Agency of Canada) *Operational Policy Statement: Determining Whether a Designated Project is Likely to Cause Significant Adverse Environmental Effects under CEAA 2012*.

The approach used by CNSC staff was to assess each predicted, residual adverse effect in three steps:

- step 1: determining whether the residual environmental effects are adverse
- step 2: determining whether the residual adverse environmental effects are significant
- step 3: determining whether the significant adverse environmental effects are likely

The related *Technical Guidance for Determining Whether a Designated Project is Likely to Cause Significant Adverse Environmental Effects under the Canadian Environmental Assessment Act, 2012* defines residual effect as: *"…an environmental effect of a project that remains, or is predicted to remain, after mitigation measures have been implemented. The determination of whether a project is likely to cause significant adverse environmental effects relates to the residual environmental effects."*

In step 2, the residual adverse effects were characterized using the following assessment criteria:

- magnitude: severity of the adverse effects

- geographic extent: spatial reach of the adverse effect
- duration: length of time of the adverse effect
- frequency: rate of recurrence of the adverse effect
- reversibility: degree to which the environmental conditions can recover after the adverse effect occurs
- timing: consideration for the time of year that a project activity is undertaken

CNSC staff also considered context for all residual adverse effects across all the criteria listed above. Context refers generally to the current state of the environment or of the VC and the sensitivity and resilience to the change caused by the Project.

The definitions and limits used to assign the level of effect for each rating criterion are presented in appendix A. CNSC staff used the tables in appendix A to help determine the significance of the effects which combines the degree (low, moderate or high) of the residual effect of each criterion.

CNSC staff considers effects to be **not significant** where the residual effects after mitigation measures have been implemented are low, moderate or high in magnitude; localized in geographic extent; short-term in duration; and are fully or partly reversible.

CNSC staff considered effects to be **significant** where the residual effect after mitigation measures have been implemented would be high or moderate in magnitude; regional in geographic extent; long- or medium-term in duration; and irreversible.

Where CNSC's determination of not significant was contingent on outstanding request made to Denison through the EIS technical review, CNSC staff have recommended EA Conditions to the Commission. These EA Conditions are included in the sub-sections of Predicted Changes to the Environment (section 6) and Predicted Effects on Valued Components (section 7). Tables detailing the CNSC's predicted degree of residual effects can all be found in appendix B.

CNSC staff analysis and findings are based on the final EIS which is a culmination of all the revisions and additions that have been made as a result of the analysis, IRs and comments submitted during the EA process.

4.0 Purpose of the project and alternative means

4.1 Purpose of the project

The purpose of the Project is to construct, operate and decommission an ISR uranium mine and processing plant. Denison has indicated that the proposed Project would provide uranium supplies for the increasing demands in nuclear power generation.

As part of the initial project planning (outside of the CEAA 2012 process), Denison undertook an analysis of alternatives to the project as a first step to determine the appropriate facility type (open pit vs. in-situ recovery) required for this project. The analysis served to validate that the preferred alternative is a reasonable approach to meeting the need and purpose of the project.

After consultation with Indigenous Nations and communities, and members of the public, and following completion of a pre-feasibility study, Denison selected the ISR method. For the purposes of the CEAA 2012, the ISR mining method was the proposed mining method described in the PD and was carried through to the EIS.

4.2 Alternative means to carry out the project

Once a mining method is chosen, "alternative means" are the various technically and economically feasible ways under consideration by the proponent that would allow a designated project to be carried out. The alternative means should be considered by the proponent as early as possible in the planning of a designated project. EA documentation must clearly explain and justify the methodologies used to identify, assess and select alternative means. The CNSC's Generic Guidelines and REGDOC-2.9.1 outline requirements and approach to conducting an alternative means assessment for a CNSC-led designated project under CEAA 2012.

4.2.1 Proponent's Assessment of Alternative Means

This section presents Denison's assessment of alternative means to carry out the Project. In addition, this section includes a summary of public and Indigenous comments received regarding the Project alternative means assessment and CNSC staff analysis and findings.

4.2.1.1 Mining method

Denison assessed five different options/facility types, including open pit, jet boring, surface boring, micro tunnel boring and ISR mining, and selected the ISR mining method based on technical, socio-economic, and environmental considerations for each alternative.

4.2.1.2 Containment methods for mining solution

Denison considered two alternative designs for a third level of containment of the mining solution: a freeze dome and a freeze wall. Both methods rely on established ground freezing technology, and involve circulating a low-temperature brine through cased drill holes to freeze the surrounding groundwater and create an impermeable barrier:

1. Freeze wall: involves drilling vertical freeze holes from the surface to the impermeable basement rock and creating a vertical frozen barrier around the perimeter of the mining area.
2. Freeze dome: involves encapsulating the uranium deposit by creating a frozen shell above and around the ore body, requiring directional drilling from both ends of the deposit to install horizontal freeze holes along its length.

Alternative 2 (freeze dome) was eliminated as the freeze wall could be installed with the same ground freezing technology but would be anchored into the impermeable basement rock. The freeze wall method would still contain the Uranium Bearing Solution (UBS) without additional risk or costs.

4.2.1.3 Permeability enhancement

Three alternatives were considered for the permeability enhancement of fluids:

1. Hydraulic stimulation: involves injecting pressurized water into the ore zone to flush and open existing fractures, improving fluid connectivity. This method is used to clean the well and formation in preparation for mining.
2. Propellant stimulation: uses controlled, low-hazard propellants to rapidly generate gas pressure, clearing pathways and connecting natural fractures. This method is near-instantaneous and does not involve explosive shock waves.

3. Mechanical stimulation: employs a downhole tool to drill small radial tunnels from the borehole into the ore zone, creating clean flow paths for mining solution movement.

Denison's proposal includes all three methods of improving permeability enhancement of fluids within the ore body. Denison proposes to evaluate the performance as the Project advances through the engineering process into operations.

4.2.1.4 Mining solution

Two mining solutions were considered by Denison:

1. Alkaline solution: composed of sodium bicarbonate and hydrogen peroxide. This solution is commonly used in ISR operations where the host rock contains high carbonate concentrations. Laboratory testing conducted in 2017 using core samples from the Phoenix deposit found it recovered less than 1% of uranium after 30 pore volumes. This option was determined to be technically and economically unfeasible, due to the geochemical characteristics of the deposit.
2. Acidic solution: composed of sulfuric acid and hydrogen peroxide. This solution was found to be much more effective. The same laboratory testing showed that the acidic solution recovered approximately 30% of uranium after 30 pore volumes. The Phoenix deposit's low carbonate and organic content makes it well-suited for acid leaching, which is more efficient and cost-effective under these geochemical conditions.

In 2017 the acidic solution was selected (lixiviant), given that it more effectively facilitates the acid leach of uranium.

4.2.1.5 Processing location

Denison considered on-site and off-site reprocessing and final disposal, as follows:

1. Off-site processing at an existing mill would involve temporarily storing UBS, ore, or slurry on site before transporting it to a licensed third-party facility for processing. This would require surface infrastructure for safe storage and load-out, including containment systems and water management facilities. While technically feasible, this option would depend on securing a toll-milling agreement and would result in lower project value due to the sale of UBS prior to processing.
2. On-site processing in a purpose-built plant would allow Denison to process UBS directly at the Wheeler River site. The plant would include circuits for uranium precipitation and drying, with associated infrastructure for waste management and effluent treatment. This option avoids reliance on third-party agreements and provides greater control over processing operations.

Denison selected to use on-site processing with a processing plant designed to precipitate the uranium out of the recovered lixiviant, which was more technically and economically feasible.

4.2.1.6 Water management

Water supplies for the Project included groundwater and surface water, transporting water to site and establishing a water treatment plant. Denison considered two alternative sources for freshwater supply to support drilling, processing, potable water, and other operational needs.

1. Sourcing of groundwater from shallow wells located outside the freeze wall: This option benefits from the availability of abundant groundwater in the Athabasca Basin and typically requires less treatment to meet potable water standards. Denison has historically used groundwater for its exploration camp.
2. Drawing of surface water from a nearby lake using an intake pipe and pump system: Baseline hydrology data supported the feasibility of this option, and Denison evaluated potential effects on aquatic ecosystems, including fish habitat and water levels.

Denison elected to use both groundwater and surface water as the freshwater supply for the project and will establish a water treatment plant to supply potable water. This approach provides operational flexibility and ensures a reliable water source under varying seasonal and operational conditions.

Denison considered two options for effluent discharge from the project:

1. Discharge to groundwater: injection of treated effluent into purpose-built discharge wells located in aquifers capable of accepting the volume. This method requires double-walled, heat-traced pipelines and real-time monitoring to prevent operational issues. While technically feasible, this option could pose challenges related to monitoring complexity and potential interactions with groundwater used for other purposes.
2. Discharge to surface water: release of treated effluent into Whitefish Lake South via a pipeline and multi-port diffuser system. This method is consistent with standard practice in the uranium mining sector and aligns with existing regulatory frameworks (e.g., *Metal and Diamond Mining Effluent Regulations* (MDMER)). It was preferred due to clearer permitting pathways, more predictable environmental performance, and alignment with community preferences for discharging into flowing water systems.

Denison elected to discharge into Whitefish Lake South, as fishing has not been documented and the effect of discharge would be of low magnitude on the natural environmental flows, with no significant effects on sediment movement or benthic invertebrate habitats.

4.2.1.7 Waste management

Denison considered several alternatives for managing three types of waste generated by the Project: organic waste, process precipitates, and domestic waste.

Organic Waste Disposal Alternatives:

1. On-site incineration: burning organic waste in a dedicated incinerator. While technically feasible, this option would generate air emissions and require ongoing monitoring and maintenance.
2. On-site disposal in a domestic landfill: co-disposing organic waste with other non-hazardous materials. This would increase landfill volume and require a larger footprint.
3. On-site composting: use of a contained, automated composting system (e.g., Brome composter) to process organic waste into usable compost. This method reduces emissions and aligns with sustainability goals.

For organic waste disposal, Denison selected on-site composting based on its environmental benefits, alignment with recommendations from the YNLR, and its ability to reduce landfill volume and emissions.

Process Precipitate Management Alternatives:

1. On-site permanent disposal: construction of a dedicated disposal cell for long-term containment of precipitates. This option would require robust design and long-term monitoring.
2. Off-site reprocessing and final disposal: temporary on-site storage followed by transport to a licensed third-party facility for reprocessing and disposal.

For process precipitate management, Denison selected off-site reprocessing and final disposal to reduce potential interactions with groundwater and surface water at the project site and to align with best practices for managing uranium-bearing waste.

Domestic Waste Disposal Alternatives:

1. Off-site disposal by a third-party contractor: transporting non-recyclable, non-hazardous waste to a regional landfill. This would increase traffic and emissions.
2. On-site disposal in a domestic landfill: construction and operation of a lined landfill with leachate collection and monitoring systems.

For domestic waste disposal, Denison selected on-site disposal to reduce traffic on Highway 914, lower greenhouse gas emissions, and avoid burdening regional waste facilities. Recyclable materials (e.g., paper, cardboard, plastic, metals, electronics) will be collected and stored temporarily on-site until transported to a licensed facility.

4.2.1.8 Access and transportation

Denison plans to build clear span bridges and build on the existing exploration access roads rather than building direct routes and culverts to the site to minimize new disturbances to the terrestrial and aquatic environments. Denison considered alternatives for both road access to the site and air transportation for workers and supplies.

Road access alternatives:

1. Direct route: This option intersected a drumlin and followed the height of land to the proposed site facilities. It required significant cut and fill volumes and was located over 500 m from nearby recreational leases.
2. Modified direct route: This option skirted the drumlin to reduce cut volumes but came closer to nearby waterbodies and recreational leases.
3. Route following the existing exploration access road: This option had the lowest cut volumes and followed previously disturbed areas, minimizing new environmental disturbance and staying over 1,000 m from recreational leases.

Air access alternatives:

1. Ground transport only: All personnel and supplies would be transported by road.
2. Air transport to an existing Cameco-operated airstrip: This option would require a commercial agreement with Cameco and ground transport from the airstrip to the site.
3. Construction of a new on-site airstrip: Denison would build and operate its own airstrip, including a 5 km access road and two stream crossings.

For road access, Denison elected to use the existing exploration road to minimize new terrestrial and aquatic disturbance, and to address concerns raised by local land users. For air access, Denison submitted the on-site airstrip option for EA to ensure flexibility but has committed to using an existing Cameco airstrip if a contract is secured before construction. This approach allows Denison to maintain operational flexibility, while minimizing environmental and land use impacts.

4.2.1.9 Power

Denison considered four alternative means for supplying power to the proposed Project:

1. Liquefied natural gas (LNG) power plant: transportation of LNG to site and storage in large tanks to fuel on-site generators. While technically feasible, this option would require regular fuel deliveries, increase traffic and emissions, and higher operating costs.
2. Solar photovoltaic power plant: use of solar panels to generate electricity. With the land area required to meet the Project's 7.6 MW peak demand, combined with storage and reliability limitations in Northern Saskatchewan, this option was technically and economically unfeasible.
3. Diesel generators: on-site power using diesel fuel stored in large tanks is an option commonly used in remote operations but would result in higher greenhouse gas emissions and increased fuel transport requirements.
4. Connection to the provincial power grid: extension of an existing 138 kV transmission line to the site. Most of the electricity on this line is generated by hydroelectric power, making this option the lowest in emissions.

Denison selected the provincial power grid as the primary power source, with diesel generators as a backup. This approach minimizes greenhouse gas emissions, reduces traffic and habitat disturbance from fuel transport, and aligns with Denison's sustainability objectives.

4.2.2 Views expressed

Denison held technical meetings with concerned Indigenous Nations and communities in advance of developing the alternative means assessment for this project. Denison considered information provided by Indigenous Nations and communities in selecting the preferred alternatives for the Project components and responded to questions and concerns raised in these meetings, as referenced in appendix 2-A of the Wheeler River EIS.

4.2.3 CNSC Staff Findings

In collaboration with the FIRT, CNSC staff reviewed Denison's Alternative Means Assessment against the *Operational Policy Statement: Addressing "Purpose of" and "Alternative Means" under the Canadian Environmental Assessment Act, 2012*, CNSC's Generic Guidelines and REGDOC-2.9.1. During the EIS technical review process, several IRs were raised by the FIRT, including a request for more information on the justification of selecting an acidic ISR solution, as well as additional details on how comments and concerns from Indigenous Nations and communities were considered, as described in section 4.2.2 above.

Based on its review of Denison's analysis and the information provided by Denison in response to IRs, CNSC staff are satisfied that Denison has adequately assessed alternative means of

carrying out the Project in accordance with applicable guidance documentation, and for the purposes of assessing the environmental effects of the proposed Project under CEAA 2012.

5.0 Geographic setting

This section contains a brief description of the biophysical and human environments. Detailed information related to baseline information can be found in the respective environmental component sections, in section 6, section 7 and section 8.

5.1 Biophysical environment

The Project site is located in the Boreal Shield Ecozone and contains the Phoenix and Gryphon uranium deposits. This area is typical of the continental sub-arctic region, characterized by short, cool and moist summers with cold, dry winters. The Wheeler River site has been shaped by glacial and fluvial processes, with drumlins and eskers separated by lowland areas of well drained glaciofluvial outwash sands and gravels and associated wetlands. The ground surface elevation in the area varies from 494-600 metres above sea level (masl) for the Project Area and 520-550 masl for the Phoenix deposit range.

The geographic area of the Project site is characterized by a diverse mix of upland and waterbodies, with lowland, lakes and waterbodies representing 27.2% of the surface area within the RSA. The landscape is characterized by gently sloping terrain with long winding ridges and hills, and supports mostly undeveloped forested upland, with lowland and waterbodies. The region has undergone previous disturbance associated with land use activities such as road development, seismic lines, and mineral exploration. Additionally, the region is dominated by post-fire regeneration vegetation, as well as a wide variety of plant species. Characteristic tree species for this ecoregion are dominated by the jack pine (*Pinus banksiana*) and black spruce (*Picea mariana*). Native plants including lichen, feathermoss, blueberries and Labrador tea are also available within the area.

The area of the proposed Project has been subject to exploration activities, including airborne and ground geophysical surveys, geochemical surveys, prospecting and diamond drilling. These exploration activities encompass ground geophysical survey grid lines, approximately 750 cleared exploration pads and disturbed ground cover such as vegetation removal. Denison currently has an exploration field operation with on-site camp facilities approximately 3 km southwest of the Phoenix deposit, including a warehouse, tank, trailer units and tent facilities. A site road, temporary bridges, gravel and sand roads and drill trails are maintained by Denison for site access.

Denison discovered the Phoenix deposit using diamond drilling in 2008 with delineation completed from 2008 to 2014. The Phoenix deposit is geologically situated at or above a major unconformity that separates sandstone from underlying basement rock, approximately 400m below the surface. The deposit is estimated to contain a total of 70.2 million pounds of U_3O_8. Denison has determined that the Phoenix deposit is amenable to ISR mining as it is overlain and underlain by a natural barrier which will limit the release or movement of uranium and proposed lixiviants.

Groundwater flow is estimated to occur in two flow regimes within the LSA. The uppermost flow system will be unconfined and would include groundwater flow through the overburden and upper sandstone aquifer while a lower, semi-regional flow system within the Lower Sandstone

Aquifer would be confined by an intermediate sandstone aquitard. Horizontal groundwater flow in the lower semi-regional system would flow from west to east and southeast and vertical gradients are observed to be downward in areas west of the Phoenix deposit and upward beneath surface waterbodies.

5.2 Human environment

The Project is proposed to be located in the Athabasca Basin of Saskatchewan, 4 km west of Highway 914. The proposed Project is located within the Northern Saskatchewan Administration District, which includes approximately 250,000 km^2 (44% of Saskatchewan's land area) and approximately 36,000 residents. No communities are located within the immediate proximity (<100 km) of the Wheeler River property. Ground access to the project is through Highway 914, with control managed by the Cameco Key Lake Operation gatehouse.

As is detailed further in section 7.3, Current Use of Lands and Resources, ERFN and KML are the communities with the closest population centres to the proposed Project location. The proposed Project site is located within trapping blocks N-16 and N-18 as part of the partitioning of fur conservation areas in 1946. The area has been used by outfitters and cabin lease holders, fishing, hunting and harvesting by resource users as well as for navigation and travel along waterbodies and roads by Indigenous peoples. The primary land uses within the region include fishing, hunting, harvesting, mining and exploration. Additional information on how this land is used by Indigenous Nations and communities can be found in section 7.3.

6.0 Predicted changes to the environment

Predicted changes to the environment caused by Project activities are presented in terms of effects to the atmospheric environment, geological and hydrogeological environment, aquatic environment, and terrestrial environment. These sub-divisions of the environment are referred to as environmental components. While changes to the environment can be considered as effects under section 5(1)(b) of CEAA 2012, they are also more generally understood as changes or effects to non-living components that can then lead to effects on identified VCs, as described in section 7. VCs refer to environmental components and receptors that may be affected by a project and that have been identified to be of concern by Denison, government agencies, Indigenous Nations and communities or the public.

Denison has categorized VCs as either an intermediate VC or a receptor VC. Intermediate VCs generally represent an environmental component that acts as a pathway of influence to a receptor VC, which are generally biological or integrated assessment endpoints. Therefore, intermediate VCs are considered Key Indicators (KIs) of potential effects to a receptor VC and are considered in the assessment of effects and significance determination to receptor VCs. Denison has completed a residual effects evaluation on all VCs, however Denison did not conclude a significance determination for intermediate VCs; instead the residual effects evaluation and characterization for intermediate VCs as KIs are integrated into the significance determination for the related receptor VCs. Examples of receptor VCs include fish and fish habitat, benthic invertebrates, soil, vegetation and ecosystems, migratory birds, terrestrial wildlife, species at risk, and human health. Intermediate VCs include air quality, noise, geology, groundwater quantity and quality, surface water quantity and quality, and sediment quality.

This section provides a description of the existing environment for each environmental component. The baseline information included in the EIS was used to identify and determine potential changes due to the Project. Note: The term "baseline" should not be confused with "background" or "reference" conditions but understood as the state of the environment as it is now.

The purpose of these reviews is to provide an analysis of the relevant information for each component, comparing CNSC staff's technical assessment with the proponent's assessment and drawing conclusions on key mitigation measures, follow-up programs and the likelihood of significant adverse effects. CNSC staff's analysis of Denison's assessment on the changes to the environment considered the views expressed by federal departments and Indigenous Nations and communities.

6.1 Atmospheric environment

The proposed Project could potentially cause changes to the atmospheric environment through:

- changes to air quality due to an increase in emissions, including dust, NO_2, SO_2, radon, and external gamma and from unpaved road surfaces, site clearing and construction activities, fuel combustion (e.g., power generators, diesel-powered mobile equipment), wellfield and freeze hole drilling, operation of the ISR wellfield, operation of the ISR processing plant, and storage and disposal of drill waste rock and process precipitates
- increase in noise above applicable guidelines (e.g., Health Canada 2003)

CNSC staff concurred with Denison's assessment of Project activities that may interact with air quality and the acoustic environment and cause residual effects, during construction, operation and decommissioning activities, as detailed below.

6.1.1 Description of the atmospheric and acoustic environment

The study area includes the potentially affected airshed in the vicinity of the project, which is located within the Athabasca Plain ecoregion of the Boreal Shield ecozone, specifically in the cold and snowy forest zone of Northern Saskatchewan.

Air quality was established through field studies, a literature review and dispersion modelling.

Ambient background air quality measurement data from Denison, the Saskatchewan Ministry of the Environment (SK MOE), and neighbouring uranium mines in Northern Saskatchewan were used to characterize baseline air quality for the project. The baseline monitoring program included particulate matter (i.e., total suspended particles (TSP), PM10, PM2.5, dustfall), NO_2, CO, SO_2, metals (e.g., As, Cd, Co), radon, and external gamma. Potential effects related to air quality were identified using thresholds set by federal and provincial authorities pertaining to predicted concentrations in air of the identified constituents of potential concern (COPC).

A baseline noise measurement program was completed using a Class 1 sound level meter system, outfitted with a wind shield, and with all components calibrated to a traceable national standard (e.g., National Institute of Standards and Technology, ISO 2007). The baseline sound measurements were completed over approximately one week in May 2021, in accordance with industry best practices and instrument manufacturer recommendations. Baseline sound level monitoring was completed at one location: off Highway 914 in the south-easterly direction. It was reported that this highway was no longer being used to haul ore from Cameco McArthur

River to Key Lake operations; therefore, baseline sound levels did not include traffic along Highway 914.

Ambient noise levels averaged 30.7 dBA during daytime (15-hour dBA), 31.3 dBA during nighttime (9-hour dBA), and 37.6 dBA day and night (24-hours dBA), for the measurement period. Using the Health Canada 2023 metric of % HA (percent highly annoyed), a 24-hours day and night noise level of 37.6 dBA corresponds to a %HA of 0.43%. If the baseline day and night noise level is increased 10 dBA to account for the heightened expectation of quiet in a remote area, then resulting value of 47.6 dBA corresponds to a %HA value of 1.6 % (Health Canada, 2017). The change in %HA value due to project-related noise is discussed in section 6.1.3.2.

6.1.2 Proponent's Assessment

Denison's assessment considered air quality and the acoustic environment as intermediate VCs, and changes to the intermediate VCs were evaluated to facilitate the assessment of potential effects of the Project on receptor VCs. Both air quality and the acoustic environment are assessed as a KIs in the potential residual adverse effects significance determinations for the receptor VCs in the Terrestrial Environment (section 6.5), Terrestrial Biota (section 7.2), the Human Environment (section 7.3), and Indigenous Land and Resource Use (section 7.4).

Denison concluded that the residual effects to air quality and the acoustic environment are unlikely to have significant adverse effects on receptor VCs. More information on each project related effect and the residual effects evaluation can be found below and in the EIS section 6.1.6.

6.1.2.1 Air Quality

Existing air quality conditions in the Project Area have been established by Denison through field studies and a literature review, and predictions have been completed as part of this assessment using dispersion modelling to evaluate how the anticipated project activities may change existing air quality conditions, and what the effect of these changes may be on people and the biophysical environment, such as soil and vegetation quality. Residual effects were predicted at receptors located beyond the Property Boundary (i.e., SSA) for 24-hour concentrations of TSP, PM10, and uranium, and 1-hour concentrations of NO. The effects during construction were short-term (less than three years), while the effects during Operation and decommissioning were medium-term (duration of operation and decommissioning phase). The 24-hour TSP and PM10 exceedances during construction and operation were sporadic; however, the residual effects during operation were considered unlikely. During decommissioning, 24-hour TSP exceedances were infrequent. Exceedances of the 24-hour uranium criterion during operation and the 1-hour NO_2 criterion during construction, operation, and decommissioning were also infrequent. In general, in all Project phases, the residual effects were predicted to be limited in geographic extent and mostly infrequent.

Through implementation of appropriate mitigation measures and follow-up monitoring, Denison anticipates that air quality will be managed throughout all Project phases. Therefore, Denison determined that the Project is not expected to have residual effects on air quality.

Table 6.1: Summary of site air quality residual effects (adapted from EIS)

Constituents of Potential Concern	Averaging Period	Criteria	Construction		Operation		Decommissioning	
			Max. Off-Property Conc.	% Of Criteria	Max. Off-Property Conc	% Of Criteria	Max. Off-Property Conc.	% Of Criteria
Total suspended particulates (TSP)	24-hour	100 µg/m³ (SAAQS/AAAQO)	313.3 µg/m³	313%	281.2 µg/m³	281%	114.8 µg/m³	115%
Particulate matter (PM_{10})	24-hour	50 µg/m³ (SAAQS/AAAQO)	116.2 µg/m³	232%	103.8 µg/m³	208%	n/a	n/a
Nitrogen dioxide (NO_2)	1-hour	79 µg/m³ (CAAQS 2025)	176.5 µg/m³	223%	177.7 µg/m³	225%	177.7 µg/m³	225%
Uranium (U)	24-hour	0.15 µg/m³ (OAAQC)	n/a	n/a	0.22 µg/m³	148%	n/a	n/a

Notes: d/y – days per year; h/y – hours per year; n/a – not applicable; Max. = maximum; Conc. = concentration

Criteria: Ontario Ambient Air Quality Criteria (OAAQC); Saskatchewan Ambient Air Quality Standards (SAAQS); Alberta Ambient Air Quality Objectives (AAAQO); Canadian Ambient Air Quality Standards (CAAQS 2025)

***Total Suspended Particulates (TSP)**: 24-hour Total Suspended Particulate Exceedances*

Concentrations of 24-hour TSP were predicted to exceed the criterion of 100 µg/m³ during construction, operation, and decommissioning, up to a maximum of 313% of the criterion during construction (table 6.1). An analysis of exceedances showed that 24-hour TSP concentrations exceed the criterion 28% of the time during construction, 21% of the time during operation, and 0.5% of the time during decommissioning at the maximum off-property receptor. The analysis also showed that exceedances do not extend beyond 200 m from the Property Boundary in any of the modelled Project phases. Exceedances are attributable to fugitive dust from general construction activities (e.g., earthworks) and unpaved road dust during construction and operation. The 24-hour TSP exceedance plots are presented in EIS figure 50, 52 and 54 of appendix 6-A.

***Particulate Matter (PM10)**: 24-hour Particulate Matter (PM10) Exceedances*

Concentrations of 24-hour PM10 were predicted to exceed the criterion of 50 µg/m³ at off-property receptors during construction and operation, up to a maximum of 232% of the criterion during construction. An analysis of exceedances showed that 24-hour PM10 concentrations exceed the criterion 17% of the time during construction and 12% of the time during operation at the maximum off-property receptor, which occurs on the Property Boundary. The analysis also showed that exceedances do not extend beyond 300 m from the Property Boundary in any of the modelled Project phases. Exceedances are attributable to fugitive dust from general construction

activities (e.g., earthworks) and unpaved road dust during construction and operation. The 24-hour PM10 exceedance plots are presented in EIS figure 51 and 53 of appendix 6-A.

Nitrogen Dioxide (NO_2): 1-hour Nitrogen Dioxide Exceedances

Concentrations of 1-hour NO_2 were predicted to exceed the criterion of 79 µg/m³ at off-property receptors during construction, operation, and decommissioning, up to a maximum of 225% of the criterion during operation and decommissioning. An analysis of exceedances showed that 1-hour NO_2 concentrations exceed the criterion less than 1% of the time during any of the modelled Project phases at the maximum off-property receptor, which occurs on the Property Boundary. The analysis also showed that exceedances do not extend beyond 1 km from the Property Boundary in any of the modelled Project phases. Exceedances are attributable to the use of diesel generators. The standby diesel generators were included in the operation and decommissioning modelling as a worst-case scenario; however, the standard operating condition of the site will be to operate using power from the provincial grid during these Project phases. The 1-hour NO_2 exceedance plots are presented in EIS figure 55 and 56 of appendix 6-A.

Uranium (U)*: 24-hour Uranium Exceedances*

Concentrations of 24-hour uranium were predicted to exceed the criterion of 0.15 µg/m³ at off-property receptors during operation only, up to a maximum of 148% of the criterion. Analysis of exceedances showed that 24-hour uranium concentrations exceed the criterion less than 0.5% of the time at the maximum off-property receptor, which occurs on the Property Boundary. The analysis also showed that exceedances do not extend beyond 400 m from the Property Boundary. Exceedances are attributable to uranium emissions from the ISR plant stacks during operation. The 24-hour uranium concentration and exceedance plots are presented in EIS figure 32 and 57 of appendix 6-A.

Greenhouse gas (GHG) emissions associated with the project were also estimated as part of the atmospheric assessment. Unlike the emissions constituents presented above, GHG emissions are not assessed for site-specific effects. They are presented as inputs with consideration of their potential to hinder or contribute to the Government of Canada's ability to meet its environmental obligations and its commitments in respect of climate change (i.e., Transboundary effect). Denison concluded that the Project GHG emissions would represent only a small fraction of total provincial or national emissions and support the production of low GHG emission nuclear power production, potentially replacing much higher GHG emitting energy sources such as coal and natural gas.

Estimated GHG Emissions: *transboundary effect* ***(table 6.2)***

Denison estimated the direct and indirect Project GHG emissions utilizing the methodologies outlined in ECCC's 2021 Draft Technical Guide Related to the Strategic Assessment of Climate Change (SACC Report) where applicable. Direct emissions included stationary (e.g., diesel generators, propane heaters) and mobile (e.g., on-road trucks and vans; off-road heavy equipment like graders and dozers) combustion sources. The operational phase would benefit from obtaining low carbon energy from Saskatchewan's northern hydroelectric grid. The GHG emissions associated with this indirect, or acquired energy, are additive to the direct emissions discussed above. The estimated annual GHG emissions (tonnes/year) for each of the main Project phases are provided in table 6.2.

Table 6.2 Estimated* Greenhouse Gas Emissions

Project phase	Annual GHG emissions in $CO_{2equivalent}$ tonnes per year		
	Direct emissions	Acquired emissions	Total emissions
Construction	31,039	---	31,039
Operation	12,002	18,700	30,702
Decommissioning	25,019	---	25,019
Post-Decommissioning	0	---	---

*Assessment of upstream GHG emissions are not necessary as estimated emissions are well below the 500 kt of CO_{2e} per year threshold triggering for such calculations (ECCC SACC 2021).

Based on these estimates the project is expected to be required to report annually to the federal Greenhouse Gas Reporting Program, as it is likely to exceed the annual reporting threshold (i.e., > 10,000 tonnes CO_{2e} per year). However, such emissions would only account for a small fraction of total national (0.0043%) and provincial (0.041%) emissions.

6.1.2.2 Acoustic Environment

Noise was selected as a VC in general based on the potential of Project-related activities to interact with and change the existing acoustic (sound) environment. Any change to the existing acoustic environment near the Project has the potential to affect Indigenous groups and the public by creating nuisance noise that could affect human health, and to change animal behaviours with respect to hunting activity in the vicinity of the Project. The potential effects of noise levels on ungulates, furbearers, and woodland caribou are discussed in section 7.2. The assessment is focussed on potential effects on human receptors. Indicators of effects on human health due to noise exposure include sleep disturbance and prolonged periods of high annoyance, which may result in health effects associated with cardiovascular health, mental health, and other effects.

The first potential noise-related effect relates to the parameters associated with the Health Canada guidelines. There were no predicted exceedances of the Health Canada limits (75dBA) or a change in %HA of 6.5 or more for either of the modelled scenarios (construction or operation), as the location of human receptors.

As there currently is no Saskatchewan environmental noise guidance, Alberta provincial guidance (AER Directive 2013) was used as a surrogate for assessing daytime and nighttime sound/noise levels. The daytime sound levels were not predicted to exceed the 40 dBA guideline level (modelled to be a maximum of 35.8 dBA for construction and 34.1 dBA for operation), whereas the nighttime sound levels were not predicted to exceed 36 dBA guideline level (modelled to be a maximum of 35.9 dBA for construction and 34.0 dBA for operation). These noise levels were attributable to drilling activity in the wellfield, concrete batching during construction, and movement of trucks on the access road.

The third potential effect is associated with the incremental increases in sound/noise level over the baseline conditions. It was estimated that the maximum increase in noise levels would be during construction in the daytime hours, in the order of +5.1 dBA, characterized to be a moderate effect. Similarly, a modelled nighttime increase of +4.6 dBA during construction would be characterized as low. During operation, it was estimated that the maximum increase in noise level would be in the order of +3.4 dBA during the daytime and +2.7 dBA during

nighttime. These noise levels would be characterized as low and marginal, respectively, however the increases in noise level would result in a moderate effect at one receptor location during construction in the daytime hours which may be perceptible and potentially objectionable. Therefore, as a conservative measure, this was carried forward as a residual effect and evaluated using criteria provided in table 6.2-6 of EIS section 6.2.6.1. It was determined that the residual effect was limited to daytime hours during the construction phase. This effect (exceedance of +5.1 dBA) was predicted to be short-term (less than 3 years), and mitigation measures are expected to assist in reducing the likelihood of this effect occurring.

Through implementation of appropriate mitigation measures and follow-up monitoring, Denison anticipates that changes in noise levels that can affect human health will be managed throughout all Project phases. Therefore, Denison determined that the Project is not expected to have residual effects on the acoustic environment.

6.1.2.3 Mitigation Measures for air quality and acoustic (noise)

Denison has proposed the following measures to mitigate the potential adverse effects from identified project activities on air quality and noise. CNSC staff have assessed the mitigation measures proposed by Denison and have concluded that they are adequate to manage potential adverse effects to air quality and noise. See summary tables 6.3 and 6.4 below.

Table 6.3: Proposed mitigation measures to address effects on air quality

Construction, operation and decommissioning phases
• To control road dust during summer (May to October), water and/or chemical dust suppressant will be applied to all site roads. In the winter months (November to April), natural mitigation from snow/ice can help control unpaved road.
• Limiting equipment and vehicle speeds along the access road and site roads to <40 km/h. The roads are also maintained during the summer months using a grader.
• Creating and implementing an Environmental Management System (EMS) and a dust management plan to address air quality monitoring, including the application of water or chemical dust suppressants to control fugitive dust, in addition to other operational strategies to assist in dust control
• Planning vehicle and equipment routes to minimize travel distances, where possible
• Employing standard operating procedures and completing regular inspections of equipment machinery to make sure it is in good working order
• Collect dust measurements and determine whether the actual effect of Project activities is different than what was modelled.
• Avoid dust-generating activities (e.g., earthworks, material handling) during dry or high wind conditions.
• Avoid dropping material from height.
• Make sure all exhausts (e.g., mobile equipment, generators) are in good working condition.
• Turn off vehicles and equipment when not being used.
• Maintain unpaved road surfaces via grading or other maintenance practices to reduce the amount of silt (i.e., fines) present in the roadbed material
• Air emissions will be reduced by: 1. directing processing plant exhaust from drying and packaging areas through a stack prior to release outside of the building.

2. designing the stack height based on results of air dispersion modelling to be an appropriate height for optimal dispersion. 3. employing battery-powered light vehicles where practical to reduce air emissions and noise levels and improve energy efficiency.
Operation phase only
• Equipping the dryer, calciner, and hygiene exhausts with scrubber systems
• Making sure the dryer, calciner, and hygiene exhaust stacks are at least two times the building height to eliminate building downwash effects
• Collecting and venting radon gas from wellfield operations (including test phases) through a radon surge tank equipped with a vertical stack at least 15 feet (4.5 m) above grade

Table 6.4: Mitigation measures for noise during the construction phase

Construction phase
• Avoiding the use of concrete batching plant and crusher during nighttime hours
• Locating the concrete batching operation as far away as possible from sensitive location
• Directing the generator discharge openings away from sensitive locations
• Making use of available on-site obstructions to control sound exposure at sensitive areas (e.g., locate sources behind buildings)
• Monitoring sound levels from the identified sources
• Use high-quality, low sound emission equipment and regular maintenance will reduce noise

6.1.2.4 Monitoring and Follow-up Measures

In order to verify the accuracy of the assessment and determine the effectiveness of the mitigation measures, Denison will implement the following EA follow-up measures.

Table 6.5: Follow-up program measures for effects on air quality

Changes in air quality due to increased air emissions
• Monitoring to confirm the residual effects of the Project on air quality and demonstrate compliance with provincial ambient air quality standards, an adaptive air quality management program will be implemented. The plans within the air quality management program will incorporate mitigation measures and monitoring requirements directed by provincial and federal regulators and by Indigenous groups and other Interested Parties as requested.
• The air quality management plan will outline operational procedures and controls used to control fugitive emissions of particulate matter from unpaved roads, open areas, and material stockpiles and will also address community complaints and response procedures. An air quality monitoring plan will be designed to evaluate the effectiveness of these measures, and will detail the monitoring objectives, sampling design, methods and quality assurance and control requirements. The air quality monitoring plan will be an extension of the ongoing baseline monitoring program for the Project and will include the following: o TSP; o PM2.5 (construction only) o dustfall o uranium, select metals, and radionuclides in TSP and/or dustfall o passive NO2 o radon

Table 6.6: Follow-up program measures for effects on the acoustic environment

Changes in noise levels
• Monitoring to confirm that the Project is compliant with the federal guidelines during both Construction and Operation.

• The monitoring program will incorporate mitigation measures and monitoring requirements directed by provincial and federal regulators and by Indigenous groups and other Interested Parties as requested.
  o Prior to the commencement of the first routine noise monitoring campaign during Construction, Indigenous Groups and other Interested Parties will be notified of the monitoring schedule and planned locations.
  o Initially, the proposed locations will be the same locations as were used in the baseline program for direct comparison of the data to the baseline conditions. These locations may be revised or expanded upon to include other locations based on feedback received.
• Indigenous Groups and other Interested Parties will also be notified of how noise complaints may be registered, and if a noise complaint is received, the associated monitoring would then take place at the location of the complainant.

• Routine and complaints-based noise monitoring will utilize the same methods as the baseline monitoring program.
• Sound levels will be monitored on a continuous basis using a calibrated Class 1 sound level meter and data logger.
  o Calibrated to a National Institute of Standards and Technology traceable standard within one year of its use in the program, and field calibrated using a Class 1 acoustic calibrator.
  o The sound level meters log sound levels on a minimum one-hour basis (and logged on the hour for direct comparison to site meteorological data).
• The parameters to be logged include:
  o The energy equivalent sound level (Leq) and statistical parameters (Lmin, Lmax, L10, L50 and L90) logged on a continuous basis.
  o The daily summed sound level (Ldn) logged on a 24-hour basis (midnight to midnight).
• The collected data will be compared with hourly meteorological data collected on-site for purposes of validation, and any data collected under unrepresentative conditions will be discarded prior to analysis.
• For routine monitoring, the programs will be of a minimum one-week duration. For complaints-based monitoring, the duration will be set based on the nature of the complaint.

6.1.3 Other Views Expressed

6.1.3.1 Air Quality

Indigenous Nations and communities

During consultation and engagement activities with Indigenous Nations and communities, concerns regarding changes in air quality were raised by ERFN, YNLR, MN-S and BNDN.

ERFN[1] raised general concerns regarding the project's impact on air quality in the area as increased traffic, and site preparation and construction activities can increase dust and emissions due to the increased levels of activity. In addition to the general concerns raised, ERFN were concerned where there were exceedances of NOx, PM10 and uranium that these constituents were not identified as part of the Human Health Risk Assessment.

YNLRO was concerned about the potential impacts of radon gas released and if there were predicted or possible impacts to fish and wildlife as a result of the presence of radon gas.

MN-S indicated an in interest in monitoring programs and raised concerns on how Denison would use and incorporate Métis knowledge to inform the air emissions monitoring program. MN-S also indicated that dust emissions would have an impact to Indigenous land and resource users.

BNDN raised concerns that BNDN traditional land and resource use points were not included as special receptors in Denison's air dispersion model and that the model did not account for air emissions from Cameco's McArthur River Mine and Key Lake Mill sites. In addition, BNDN was interested in how Nation members could be involved in air quality monitoring activities that Denison will complete. BNDN also raised issues with the Project's reliance on using diesel generation for operations and the impacts that will have on increasing greenhouse gas emissions.

Federal Authorities

ECCC requested clarity on the potential effects to air quality from backup diesel generators and suggested that Denison use low-cost sensors to continuously monitor particulate matter (PM2.5) concentrations, in addition to other mitigation measures.

ECCC recommended that Denison provide a plan that estimates GHG during post-decommissioning, a GHG follow-up program, and mitigation measures following the BAT/BEP determination process, and a net-zero by 2050 plan. ECCC also noted that Denison should re-evaluate the LUC calculation and estimate the Project impact on carbon sinks. HC recommended that mitigation measures to reduce diesel exhaust emissions be implemented during all stages of the project and that exhaust emissions are limited to the greatest extent possible. Additionally, HC recommended that the air quality monitoring (of TSP), nitrogen dioxide, particulate matter, uranium in TSP, PM10 and PM2.5 for comparison to CAAQS and applicable standards) be fully integrated into the Project's air quality management program and that an adaptive management plan for NO2 be developed as part of the licensing phase.

6.1.3.2 Noise Emissions

*Indigenous Nations and communities*Concerns regarding an increase in noise emissions were raised by ERFN, MN-S, and BNDN. Each Nation's concern regarding noise were due to the sensory disturbance an increase in noise creates for wildlife and traditional users and their experience on the land.

[1] At the outset of the regulatory process ERFN had raised issues and concerns that are reflected in the Other Views Expressed sections throughout the EA Report. These project-specific concerns have been responded to and addressed to the satisfaction of ERFN by both Denison and CSNC staff through the consultation and engagement process.

ERFN indicated that baseline data was not sufficient to assess the potential impacts of noise. MN-S raised concerns that Indigenous land and resource users would be negatively impacted by the increased level of traffic and the associated increased noise emissions, which may lead to the avoidance of using certain areas near the proposed project site. Lastly, BNDN raised issues of sensory disturbance associated with increased anthropogenic noise which in turn would impact wildlife. BNDN is concerned that the impacts to wildlife from noise emissions may alter wildlife behaviour and thus alter hunting activities of traditional land users.

Federal Authorities

HC raised concerns around noise levels and impacts on nearby human receptors, including night-time noise and noise complaint resolution and response procedures.

6.1.3.3 Summary of Mitigations and Commitments related to Views Expressed

Air Quality

Denison has made commitments (Commitments 6-1 to 6-3) to mitigate any potential adverse effects on air quality. Mitigation measures and follow-up monitoring will be employed to ensure that potential impacts related to air quality are effectively managed. This includes verifying the Project's residual effects on air quality through future measurement programs and air quality modelling and the implementation of an adaptive air quality management program. The program will be finalized during permitting and licensing.

With respect to project-related activities that may increase dust generation, elevated emissions (including nitrogen oxide, PM10, and uranium), and releases of radon gas, mitigation and monitoring approaches include:

- applying water or chemical dust suppressants at least twice per day to unpaved roads and surfaces (in winter, when water-based suppression is not effective due to freezing, Denison will rely on snow cover and, reduced traffic levels)
- limiting equipment and vehicle speeds along access and site roads to reduce dust generation
- equipping key exhaust systems—such as those for dryers, calciners, and hygiene units—with scrubber systems
- designing exhaust stack heights based on air dispersion modelling to optimize contaminant dispersion
- implementing radon gas collection and venting systems through surge tanks with elevated vertical stacks

Denison has further committed to engaging Indigenous Nations and communities by incorporating IK/MK into the air emissions monitoring program and recognizing traditional land and resource use areas as special receptors within air dispersion models. An Environmental Management System (EMS) is also being developed to include an Environmental Protection Plan (EPP), which will provide a framework for ongoing environmental monitoring and compliance with regulatory standards. Details of these initiatives will be finalized during subsequent phases of the Project.

With regards to ECCC concerns on GHGs, Denison has committed to reassessing the GHG and climate change components of the EIS and the Strategic Assessment of Climate Change once more site-specific information is available (Commitment 6-6). The reassessment should include more detailed study around GHG emissions, carbon sinks and mitigation options, best available

technology/best env practices, net zero carbon planning and offsetting. With respect to carbon offsetting, Denison noted that options to offset GHG emissions will be considered as the Project advances.

Noise Emissions

Denison has made commitments (Commitments 6-4 & 6-5) to mitigate any potential adverse effects resulting from increased noise emissions and the sensory disturbance these emissions may cause for wildlife and traditional land users. Mitigation measures and follow-up monitoring will be implemented to ensure that the potentially negative impacts on the land and its users are adequately managed. These measures include source elimination and operational planning—such as scheduling high-noise activities (e.g., concrete batching and crushing) outside nighttime hours, locating such operations as far away from sensitive receptors as practicable, and using on-site obstructions to control sound exposure—ensuring that noise levels remain within acceptable limits.

With respect to noise management, mitigation and monitoring approaches include, redirecting generator discharge openings away from sensitive locations, collecting sound level measurements from key noise sources once they are operating, using battery-powered light vehicles and mobile equipment (and an AC-powered dual rotary drill for ISR wellfield development) in place of traditional diesel-powered units, and reducing the overall Project Area to lower noise propagation. Denison has further committed to developing an Environmental Management System (EMS) that will incorporate a comprehensive noise management and monitoring plan in collaboration with ERFN and KML.

6.1.4 CNSC Staff Analysis

Air Quality

CNSC staff reviewed Denison's effect assessment on air quality related to the change in total suspended particulates, particulate matter concentration, nitrogen dioxide concentration and uranium concentrations, and confirmed that Denison conducted a comprehensive analysis of these effects and that identified mitigation and follow-up monitoring program measures are adequate.

Greenhouse Gas Emissions

CNSC staff assessed Denison's GHG assessment and found the assessment and methods of assessment to be adequate. CNSC staff verified that GHG emissions have been calculated for the most GHG intensive phases of the proposed project with results indicating that emissions are low relative to both national (0.0043%) and provincial (0.04%) total emissions. CNSC staff and the FIRT reviewed this current assessment and in response to comments raised, Denison has committed to re-evaluating the GHG and climate change components once more detailed site-specific data is available including more a more detailed assessment of mitigative options, best available technology and best environmental practices (Commitment 6.6). GHGs will also be further evaluated under licensing through a Best Available Technology Economically Achievable (BATEA) for air emissions and treatment technologies and techniques assessment.

Considering the currently available information and Denison's commitments, with respect to transboundary implications of GHG emissions and their potential to hinder or contribute to the Government of Canada's ability to meet its environmental obligations and its commitments in

respect of climate change, CNSC staff conclude that the project is not likely to cause a significant adverse effect.

Acoustic Environment

With respect to the acoustic (noise) environment, CNSC staff reviewed Denison's assessment and determined that the expected increase in daytime noise levels during the construction phase would be limited to a period of about 3 years, and there are mitigation measures proposed which will help attenuate the noise to some extent. Follow-up/ongoing monitoring using appropriately calibrated equipment will also be used to refine the model predictions and ensure that the environment remains protected.

6.1.4.1 Summary of CNSC's assessment on predicted residual effects on air quality and noise

In summary, the assessment predicted residual effects on air quality due to change in total suspended particulates, particulate matter, nitrous oxides and uranium. However, with the implementation of appropriate mitigation measures any effects are expected to be low in magnitude and localized. CNSC staff reviewed Denison's models and predictions for effects to air quality and confirmed that Denison conducted a comprehensive analysis of these effects. Furthermore, CNSC staff reviewed Denison's identified mitigation and follow-up monitoring program measures for the identified effects and have found that they are adequate.

Air quality feeds into other assessment endpoints (e.g., terrestrial, aquatic), so the residual effects for air quality do not require significance determinations of their own.

6.1.5 CNSC Staff Findings and Recommendations

Taking into account the implementation of mitigation measures and recommended follow-up program measures, CNSC staff found that the project is not likely to cause adverse effects on air quality, the acoustic (noise) environment, or Greenhouse Gas emissions. The effects significance determination table for Greenhouse Gas emissions can be found in appendix B.

6.2 Geology and Groundwater

The proposed Project could potentially cause changes to the hydrogeological environment through:

- changes to soil terrain and subsidence at ground surface from ISR mining
- changes to groundwater quantity from alteration in precipitation infiltration, groundwater extraction and effluent release
- changes to groundwater quality from construction activities, operation of site infrastructure, ISR mining, and groundwater remediation

CNSC concurred with Denison's assessement of the project activities that may interact with geology and groundwater and cause residual effects during all project phases, as detailed below.

6.2.1 Description of the environment: geology and groundwater

6.2.1.1 Studies conducted by the proponent to characterize baseline geology and hydrogeology

Characterization of existing conditions was based on regional studies of the Athabasca Basin (as referenced by Denison in section 7.3 of the EIS) and extensive project-specific data collection. Project-specific data collection included:

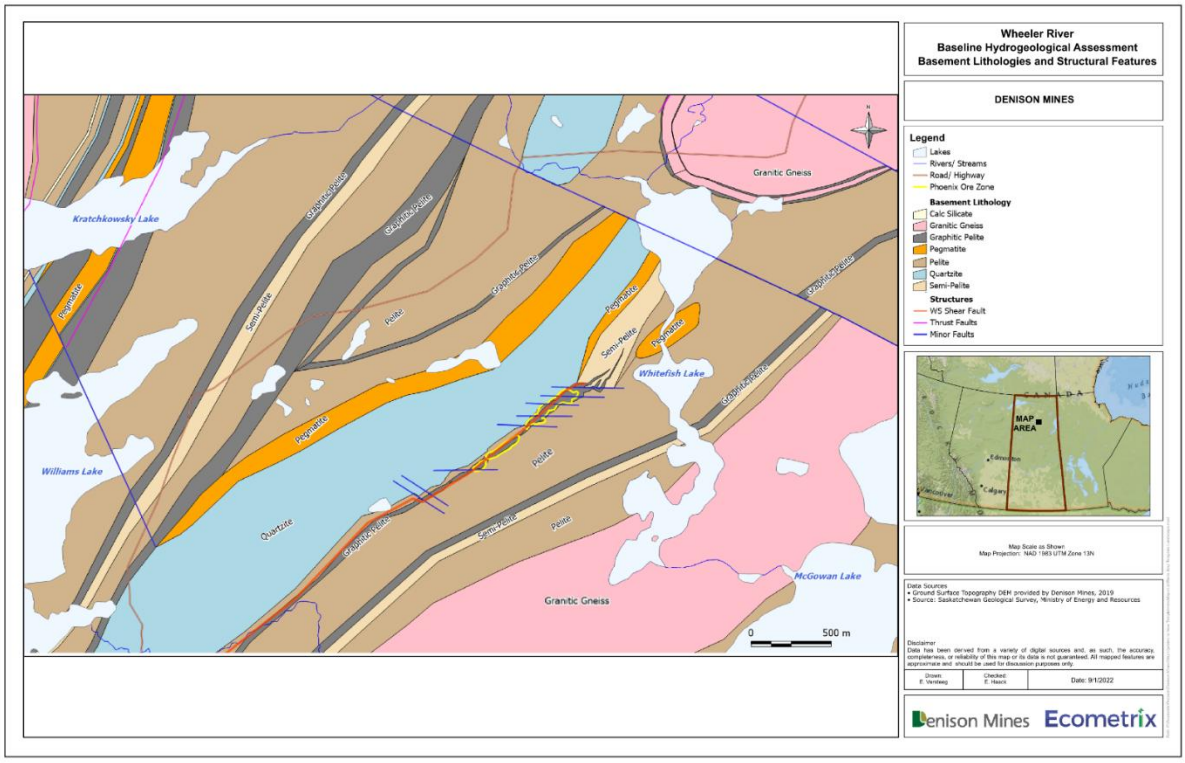
- a geological, geochemical, and geotechnical database covering 16 years of exploration and 300+ drill holes, with lithology, rock quality, fracture intensity, core recovery, and alteration details - composite and discrete core samples were collected and analyzed for bulk geochemical composition and mineralogy
- matrix permeability, hydraulic conductivity, porosity, and dry density determined from permeameter data
- hydrogeological assessments, including packer tests, pumping tests, and injection tests
- groundwater quality analysis from 26 monitoring wells (2019–2021), which were tested for general chemistry, dissolved metals, trace elements, radionuclides, and tritium, and
- water level monitoring from 390 records in 150+ core holes, with manual and continuous pressure transducer data

This information can all be found in the references included in the EIS.

6.2.1.2 Characterization of baseline geology

The Phoenix uranium deposit is located at the base of the Athabasca Supergroup sedimentary rocks that unconformably overly the Wollaston Group basement rocks (figure 6.1), forming an unconformity-related uranium deposit. The figures throughout this section were provided by Denison in the 2024 Final EIS.

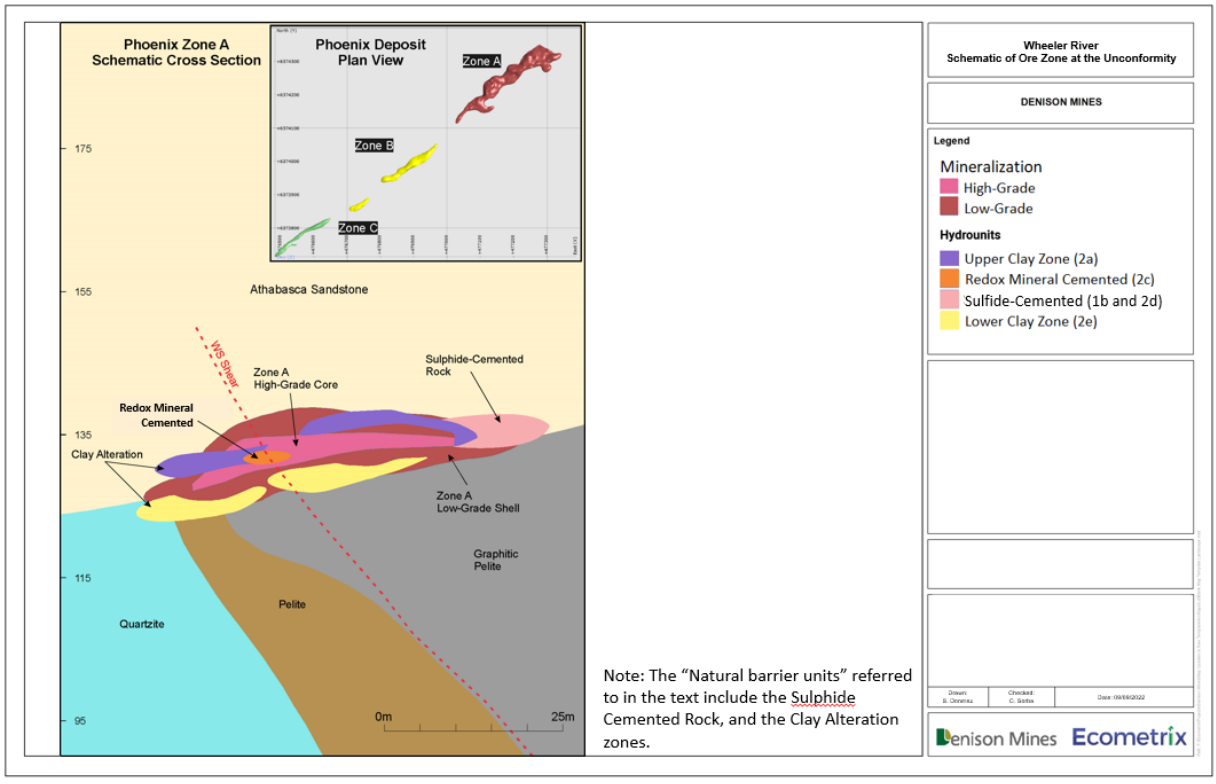
Figure 6.1 Basement lithologies and structural features



The lithologic units within the LSA are described as follows:

- Basement rock: consists of extensively altered Paleoproterozoic metamorphic and igneous (figure 6.1) beneath the Phoenix deposits. Major faults within this unit are generally oriented northeast-southwest, including the WS Shear zone, a major northeast-southwest-oriented and southeast-dipping reverse fault (055°/55°) (figure 6.1). West-east-striking minor faults intersect the WS Shear zone at a high angle and cut through both the ore zone and basement rocks. Quartzite ridges, alteration facies resulting from pre-Athabasca Supergroup basement silicification that manifest as topographic features of the sub-Athabasca unconformity surface, were documented proximal to the Phoenix deposit. One northeast-southwest-oriented quartz ridge occurs parallel to the Phoenix deposit and is interpreted as a low permeability zone that acts as a barrier to fluid flow and played a role in controlling alteration patterns and mineralization.
- Ore deposit: consists of long and narrow (~ 25 to 50 m wide) uranium orebodies with a complex mineral assemblage proximal to the unconformity between the basement rocks and the overlying Athabasca Supergroup sedimentary rocks. A ~3-m-thick hydrothermal alteration zone associated with the ore, form a natural barrier unit or halo that isolates the ore zone from the overlying sandstone and the underlying basement (Upper and Lower Clay Zones, and Sulphide Cemented zones shown in figure 6.2). This natural barrier zone has limited the release or subsurface migration of uranium, and other chemical constituents associated with the ore zone, in groundwater for more than 1 billion years.

Figure 6.2 Schematic of the ore zone at the unconformity



- Athabasca Supergroup sedimentary rocks: consists of horizontally bedded, consolidated Proterozoic (1.5 to 1.74 billion years old) sandstones (iron rich, quartz-dominated) and conglomerates of the Athabasca Supergroup overlying the basement rock. The Athabasca Supergroup sandstones include the Manitou Falls Group (MF), which from top to bottom is subdivided into the MFd (Dunlop Formation), MFc (Collins Formation), MFb (Bird Formation), and the MFa (Read Formation) (figure 6.3). The MFa hosts most of the uranium mineralization associated with the Phoenix deposit, but some mineralization lies within the underlying paleoweathered basement (figure 6.2). The Athabasca Supergroup sandstone exhibits a Desilicified Zone overlying and east of the Phoenix deposit that was delineated by cores logged as having very low rock quality designation values, high fracture intensity, and high friability (figure 6.4). These sandstones are also faulted and fractured, which affects the movement of groundwater through these units.
- Overburden: consist predominantly of outwash sand and glacial till with organic and alluvial sediments (figure 6.5), with thickness ranging from less than a few metres on low-lying areas to over 100 m in the northwestern reaches of Whitefish Lake where weathering and glacial erosion of the sandstone bedrock formed a bedrock valley or 'trough' (as shown in the far northeast extent of the cross section in (figure 6.3). The overburden exhibits glacial landforms such as the NE-SW-oriented drumlins and eskers, form topographic highs on the landscape (figure 6.5).

Figure 6.3 An example cross-section illustrating borehole lithology and interpreted lithologic surfaces

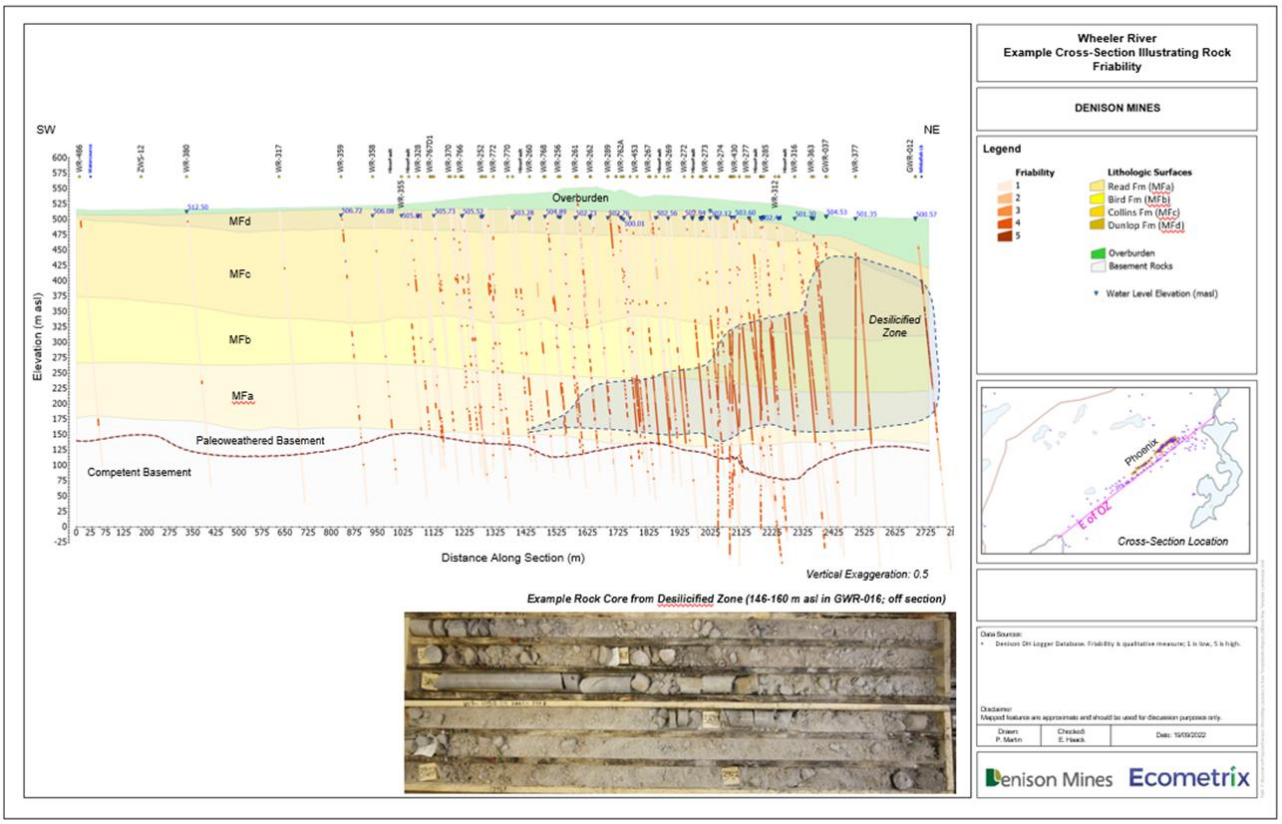


Figure 6.4 Example cross-section illustrating rock friability

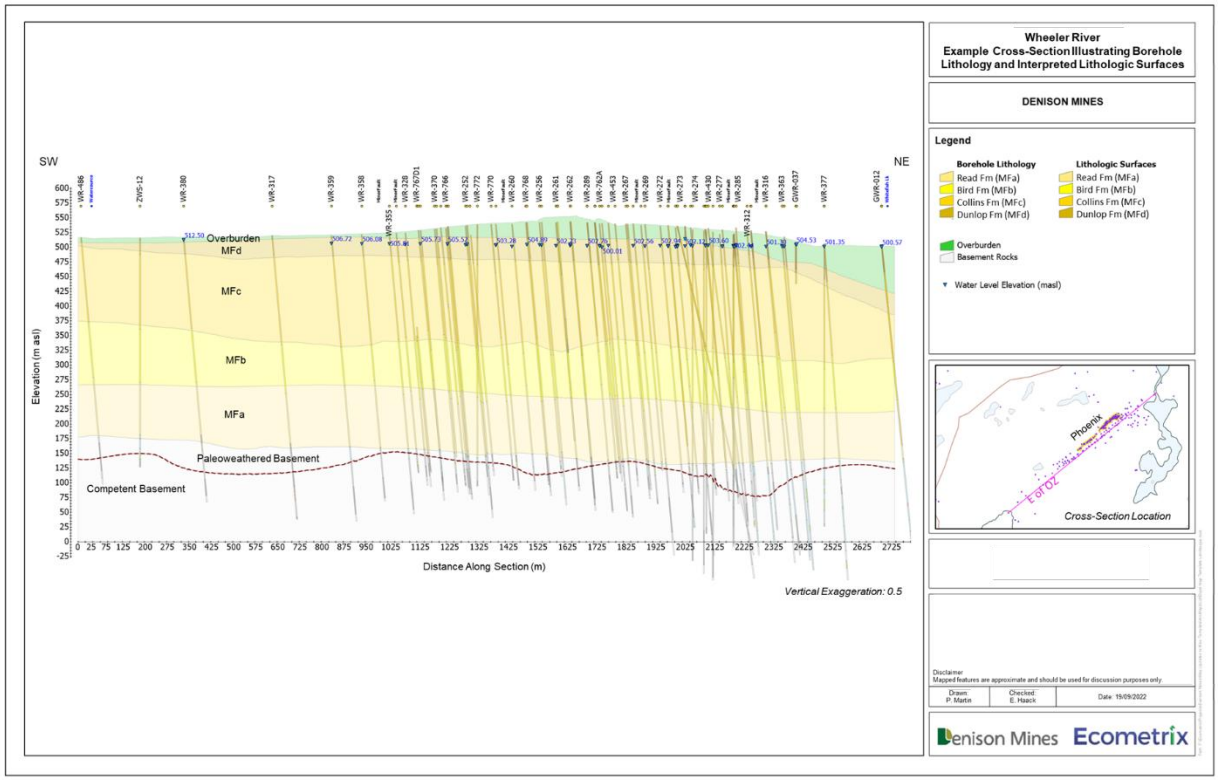
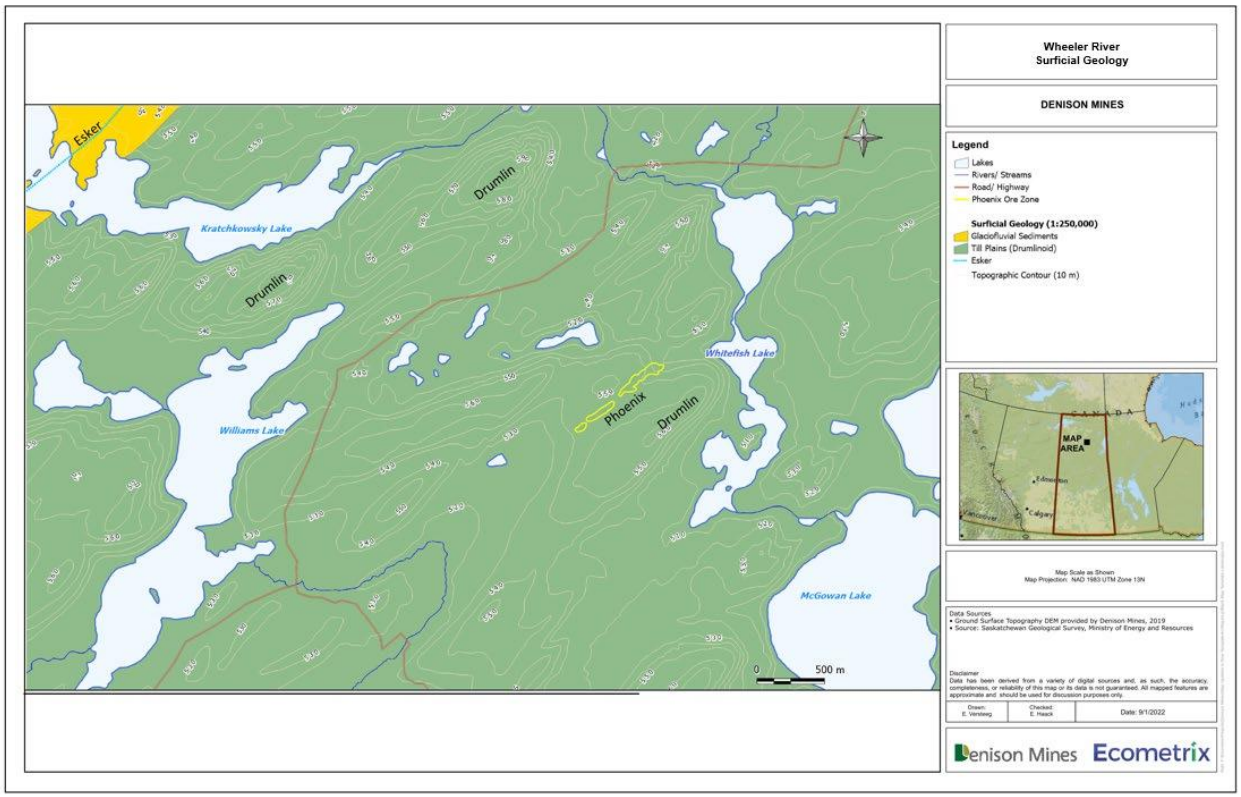


Figure 6.5 Surficial geology



6.2.1.3 Characterization of baseline hydrogeology

Baseline groundwater flow conditions

A hydrogeological Conceptual Site Model (CSM), as shown in figure 6.6, was developed based on the Phoenix deposit geological model and the hydrogeological studies of the project site. Hydrostratigraphic units often combine geologic units with similar hydrogeologic properties. Within the LSA, nine hydrostratigraphic units have been defined, as illustrated in the hydrogeological CSM in figure 6.6. The hydrogeological CSM provided the basis for development of a numerical groundwater flow and transport model for the baseline and post-decommissioning phase.

As shown in figure 6.6, groundwater flow in the LSA is conceptualized to occur in two groundwater regimes: an unconfined upper system flowing through the Overburden and Upper Sandstone Aquifer, and a confined semi-regional system within the Lower Sandstone Aquifer and, locally, the Ore Zone Aquifer. Horizontal groundwater flow in the deeper, semi-regional system generally moves west to east and southeast, as interpreted from water level and groundwater quality observations (figure 6.7). In the Overburden and Upper Sandstone Aquifer, groundwater flow is influenced by surface topography and nearby surface water features (figure 6.8).

Vertical gradients are inferred to flow downward west of the Phoenix deposit and upward beneath surface water bodies like Whitefish Lake and Williams Lake. Flow from the Overburden and Upper Sandstone System to the Lower Sandstone system is inferred to occur along fault zones and in areas with downward gradients.

In the LSA, shallow groundwater from the Overburden and Upper Sandstone Aquifer is inferred to discharges into Whitefish Lake, about 500 m east of the deposit at ~500 masl (figure 6.8). Water level elevations between the Phoenix deposit and Whitefish Lake consistently show an upward hydraulic gradient from the Lower Sandstone Aquifer (including the ore zone) toward Whitefish Lake, flowing through the Desilicified Zone in the Intermediate Sandstone Aquitard (figure 6.7). It is interpreted that the high-conductivity Desilicified Zone represents a preferential pathway for water to discharge into Whitefish Lake.

Exploration holes in the Phoenix area were grouted 10–20 m above and below the ore zone, leaving open sections in the overlying materials. These portions of the open holes may serve as conduits for groundwater flow through 400 m of Athabasca Supergroup Sandstone and will be considered in groundwater monitoring plan design.

Figure 6.6 Hydrogeological conceptual site model

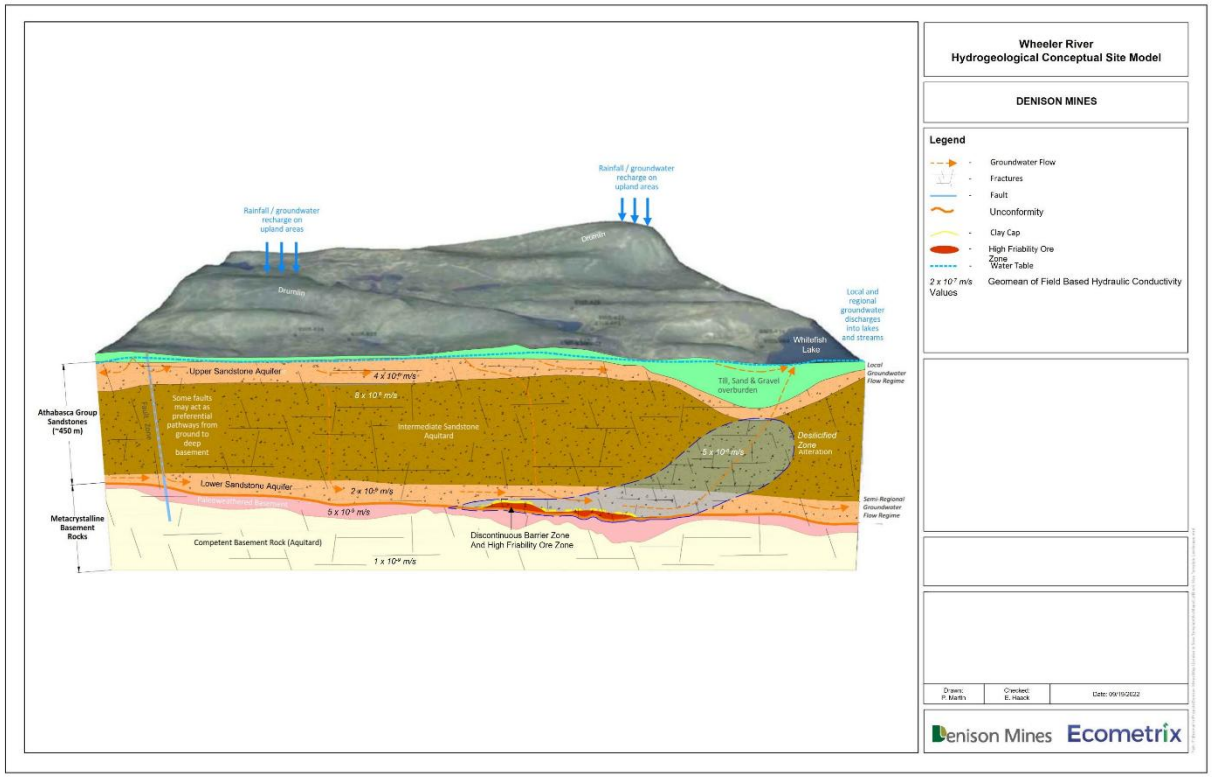


Figure 6.7 Groundwater flow in the lower sandstone system

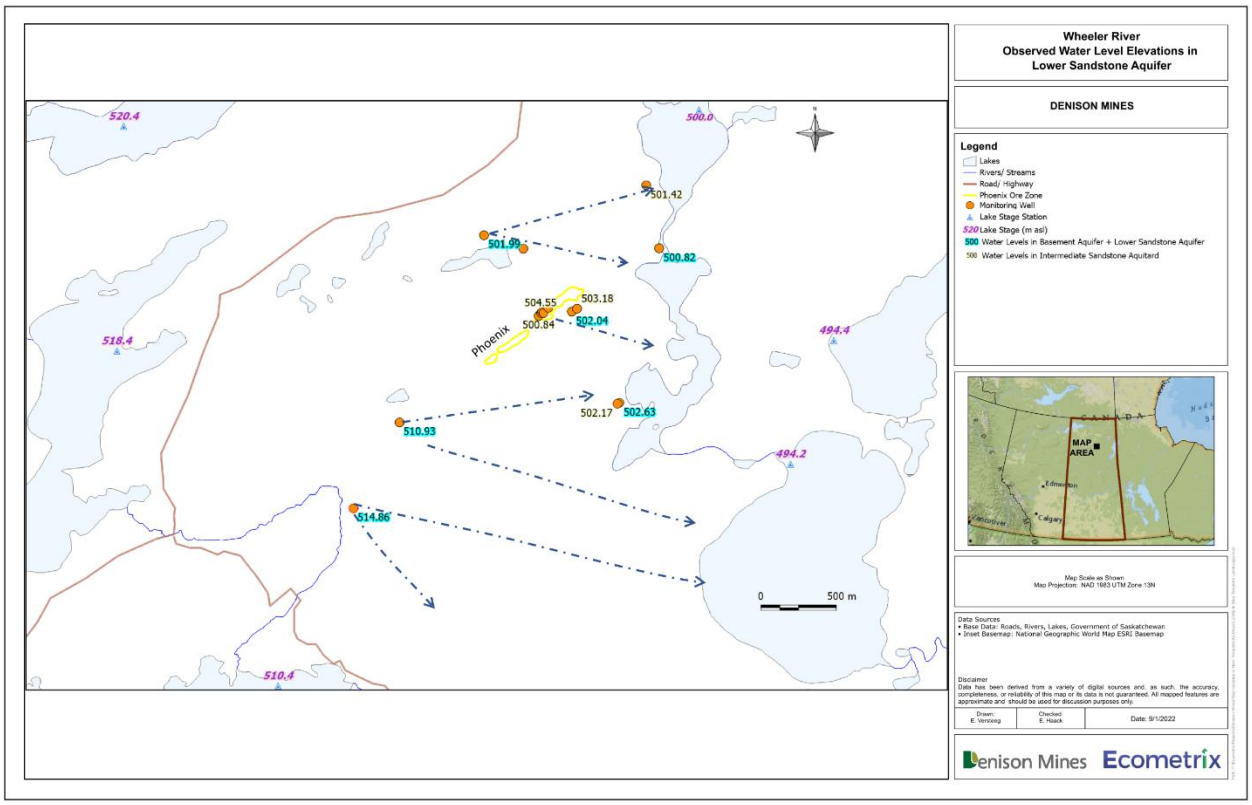
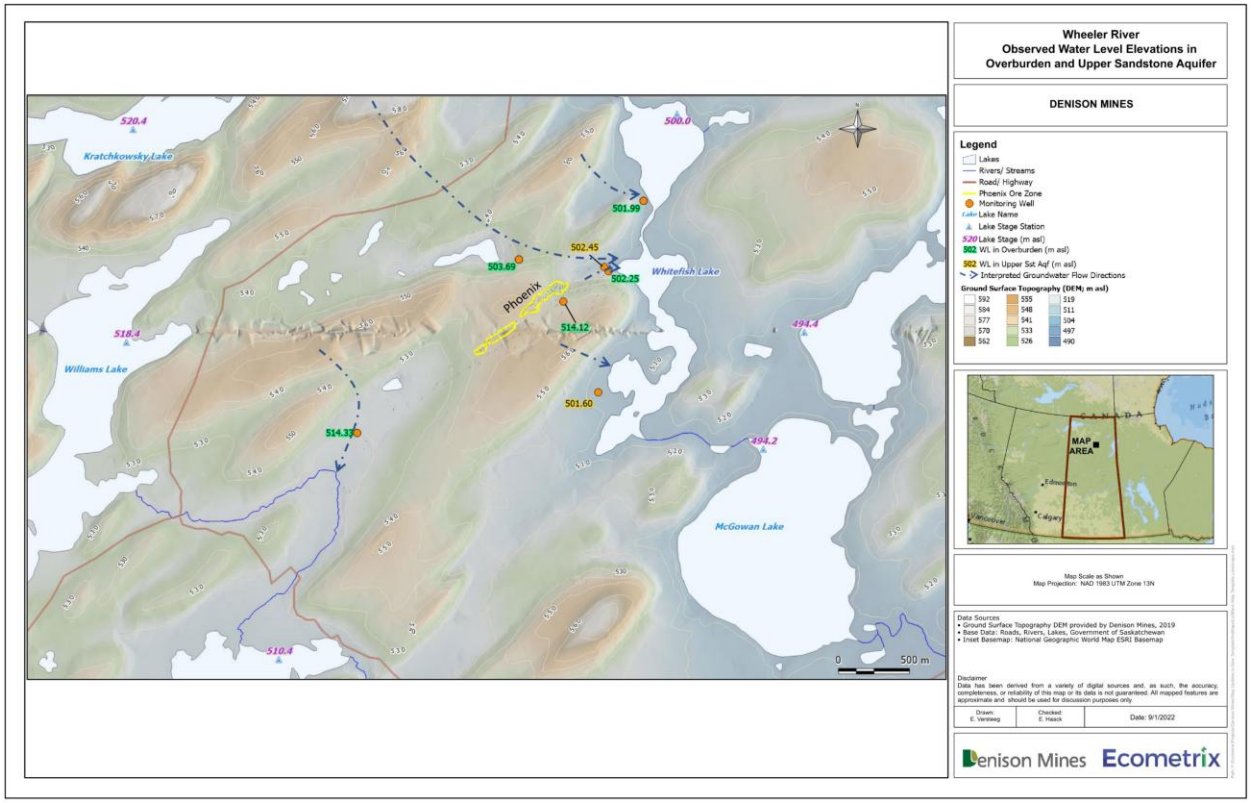


Figure 6.8 Groundwater flow in the overburden and upper sandstone system



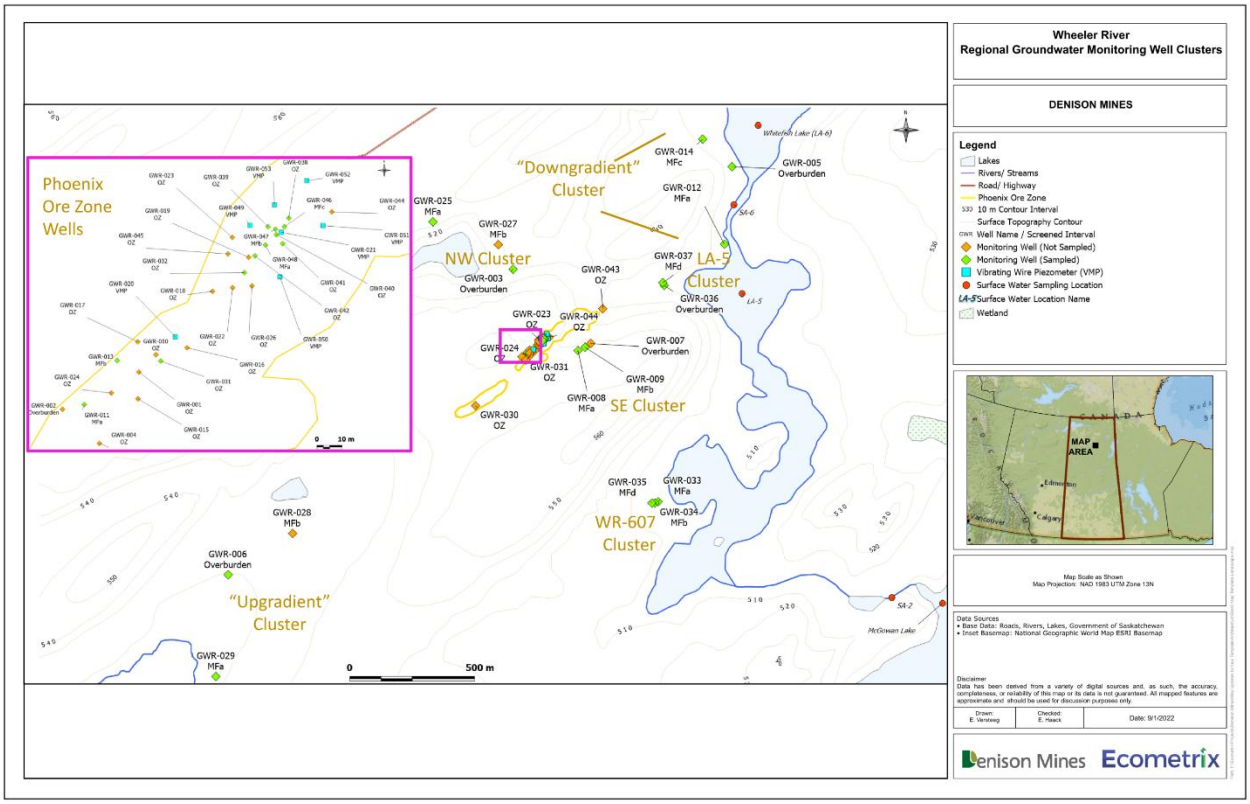
Baseline Groundwater Chemistry

The LSA's groundwater monitoring network (figure 6.9) includes Groundwater Regional (GWR) series wells installed in groups of three around the ore zone, each well having a single screening interval and targeting one of the key groundwater zones: a) Overburden and Upper Sandstone Aquifers, b) Intermediate Sandstone Aquitard, and c) Lower Sandstone Aquifer.

Groundwater quality data for the LSA demonstrate that groundwater across hydrostratigraphic units generally has low mineralization (total dissolved solids (TDS) < 1,000 mg/L). Radiological constituents and a small number of heavy metals and trace elements measured in groundwater near the Phoenix uranium deposit are significantly lower in overlying units and surface water than in ore zone samples.

Groundwater chemistry supports the presence of an unconfined Overburden and Upper Sandstone Aquifer, Intermediate Sandstone Aquitard, and Lower Sandstone Aquifer.

Figure 6.9 Regional groundwater monitoring well clusters



Improved understanding of baseline groundwater flow conditions through numerical modeling

A calibrated 3D groundwater flow model for the LSA was developed using FEFLOW based on the dataset of available hydrology and hydrogeology information for the Project. This model forms the basis for enhancing understanding of the baseline groundwater flow and evaluating impact of the Project on groundwater.

The modeling results suggest Whitefish Lake is the primary potential receiving surface water body for discharging groundwater along with COPCs originating from the mining area, while the potential for groundwater to discharge to other surface water bodies is significantly lower.

6.2.2 Proponent's Assessment

Denison's assessment considered geology and groundwater as intermediate VCs, and changes to the intermediate VCs were evaluated to facilitate the assessment of potential effects of the Project on receptor VCs. Both geology and groundwater are assessed as KIs in the potential residual adverse effects significance determinations for the receptor VCs in Sediment and Invertebrates (section 6.4), Terrestrial Environment (section 6.5), Fish and Fish Habitat (section 7.1), the Human Environment (section 7.3), and Indigenous Land and Resource Use (section 7.4).

Denison concluded that the residual effects to geology and groundwater are unlikely to have significant adverse effects on receptor VCs. More information on each project related effect and the residual effects evaluation can be found below and in the EIS section 7.4.

6.2.2.1 Effect of the Project on Geology

Terrain Morphology (Subsidence) and Stability During Operation

A potential impact on the geology is subsidence at ground surface associated with extraction of rock mass (ore) at significant depth (approximately 400 m) below ground, from within the active mining area. Stability of the rock matrix while leaching rock (ore) mass is critical for protecting the overlying aquifers, preventing substantial surface disturbance, safeguarding casing integrity, and mitigating plug-off of the remaining ore as well as mining extraction efficiently.

A study was conducted by Denison to evaluate the geomechanical stability of the rock mass within the Phoenix deposit, overlying sandstones, and underlying basement rock, following ore extraction with ISR. The assessment was based on a conservative "worst-case" scenario, in which the model assumed a single mass loss event post extraction across the entire active mining area. In practice, however, mining will occur in phases, which is expected to reduce potential impacts on geological stability. Modelling results indicated that ground surface subsidence resulting from host rock displacement is predicted to be negligible, with an average vertical displacement estimated at approximately 2.5 mm.

Another impact Denison considered is the potential for subsidence related to lowered groundwater level (due to changes in fluid balance) within the freeze wall during operation. A fluid balance study was conducted to inform Feasibility Study production rates within the freeze wall–confined mining zone. The study indicates that, to mitigate subsidence risk, operating parameters would not support a significant drawdown of the groundwater table. If monitoring during operations indicates water levels are falling quicker than anticipated, water from groundwater wells outside of the freeze wall will be injected inside of the freeze wall during wellfield development and accounted for in the fluid balance. This precludes significant drawdown and associated potential for subsidence.

Overall, Denison proposes to mitigate subsidence at the project site through incorporation of specific project design components and practices. Particularly, injection and recovery wells will be collared at surface and surveyed regularly to monitor for any changes in collar height over time.

Through implementation of appropriate mitigation measures and follow up monitoring, Denison anticipates that the impacts of subsidence and stability from extraction on the geology will be negligible throughout all Project phases. Therefore, Denison determined the impact of ISR mining operations are not expected to have residual effects on terrain morphology and stability.

6.2.2.2 Effect of the Project on Groundwater

The primary potential effects from the Project on the groundwater are changes to groundwater quantity and quality during construction, operation, decommissioning, and post decommissioning associated with mining activities and following remediation of the mining area.

Groundwater Quantity

(1) Effect of ISR mining operations (freeze wall) on groundwater flow conditions

In conventional ISR operations, vertical containment is usually achieved through naturally impermeable geological layers above and below the ore body, while horizontal containment primarily relies on hydraulic control of injected and recovered fluids, supplemented by well design. At the Project site, the low-permeability basement rock beneath the uranium deposit acts as a natural aquitard; however, the overlying sandstone is permeable. Hydrogeological studies and models indicate that mining solution containment can be effectively managed by maintaining an inward hydraulic gradient, achieved by recovering more solution than is injected. Denison proposed a freeze wall to provide an added layer of containment to prevent migration of the mining solution into the surrounding groundwater. Mining solution will be confined within the freeze wall during operation.

The footprint of the freeze walled area represents < 0.04% of the area of the regional groundwater flow model. The effect of the freeze wall on groundwater flow conditions within the LSA was simulated using the regional groundwater flow model. The simulation results show that the effect of the freeze walls on groundwater flow is confined to the immediate vicinity around the freeze walls. Water levels outside the freeze wall are simulated to be relatively unchanged during freeze wall operations. Overall, the impact of the freeze wall on the local and semi-regional groundwater flow regimes is minor. Once decommissioning is completed, groundwater flow path patterns are expected to return to conditions similar to those before mining.

Denison anticipates that the impact of ISR mining operations on the groundwater flow system will be negligible throughout all Project phases. Therefore, Denison determined the impact of ISR mining operations are not expected to have residual effects on groundwater quantity.

(2) Impact of surface facilities and activities on groundwater flow system

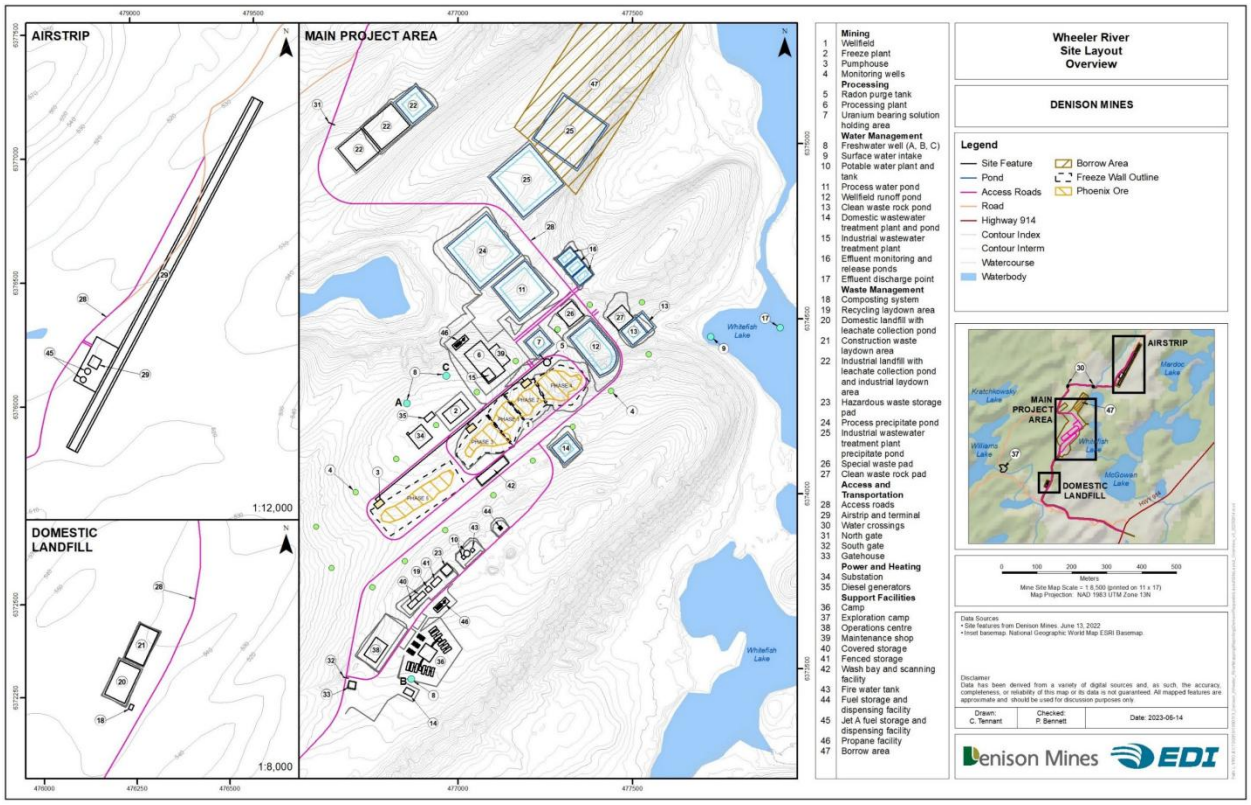
Transient groundwater simulation was conducted based on the calibrated groundwater flow model, incorporating changes to groundwater flow conditions (such as change to groundwater recharge, pumping of groundwater, etc.) during construction, operation, and decommissioning, to evaluate the impact of mining activities on groundwater flow. The model simulation time began 10 years before mining and continued for over 50 years to cover the entire period of ISR mining and flushing of the mined-out zone.

Mining operations will involve groundwater pumping from three freshwater wells near the ISR wellfield (Wells A, B, and C, see figure 6.13) in the Upper Sandstone Aquifer. Simulation results indicate that drawdowns due to pumping could range from 2.4 m at Well C to 9 m at Well B during decommissioning, when pumping rates are highest. Following the cessation of pumping in post-decommissioning, groundwater levels are predicted to return to baseline within nine years.

Groundwater discharge to Whitefish Lake is expected to decrease by up to 25% during decommissioning, with smaller reductions during construction (10%) and operation (17%). Recovery to 90% of baseline levels is projected within four years into post-decommissioning, with full recovery expected in nine years. Since groundwater discharge is a minor part of total flow through Whitefish Lake (which has been measured over the years of streamflow monitoring from 2011 to 2019), these changes in water quantity are predicted to be negligible and unmeasurable.

Denison anticipates that the impact of surface facilities and activities on the groundwater flow system will be negligible throughout all Project phases. Therefore, Denison determined the impact of surface facilities and activities are not expected to have residual effects on groundwater quantity.

Figure 6.13: Wheeler River Project Proposed Site Layout



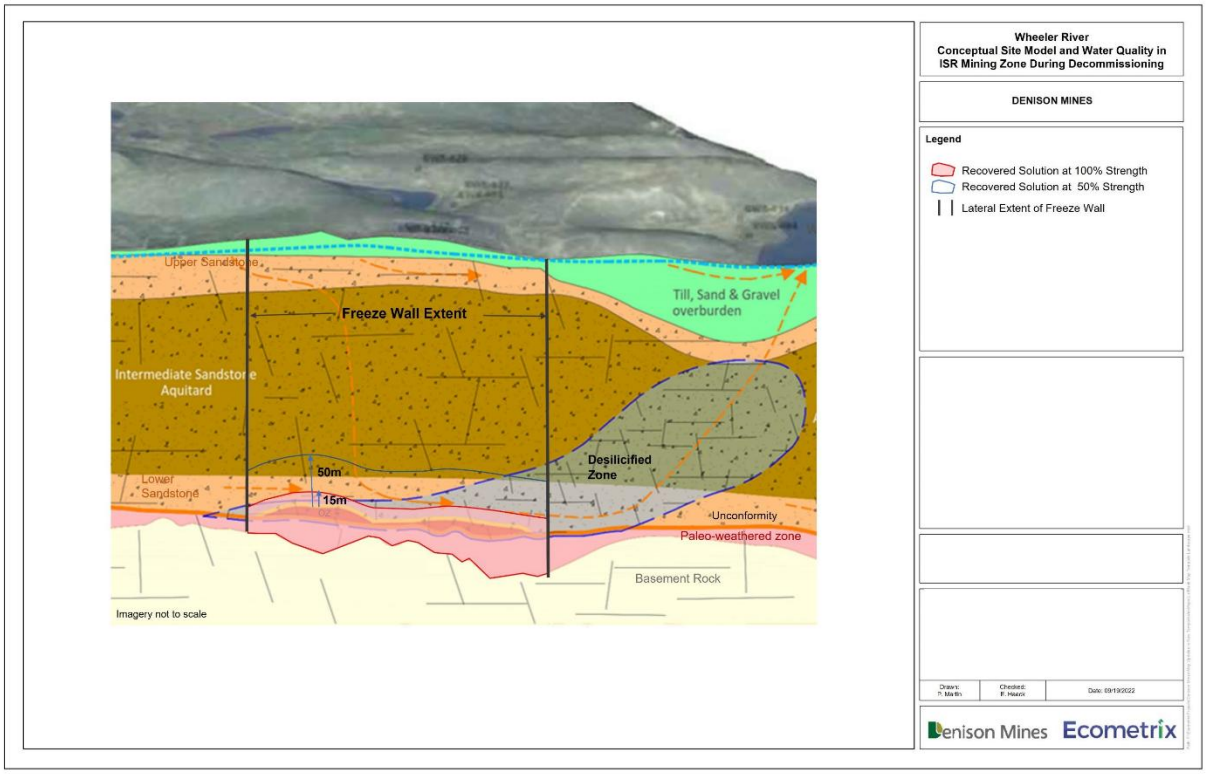
Groundwater Quality

Geochemical reactive transport modelling was conducted to assess the migration and attenuation of COPCs from the mining area toward Whitefish Lake, the primary surface water receptor. A 1D reactive transport model using PHREEQC was employed (due to its practicality and lower computational demands compared to 3D modeling) to identify key geochemical reactions affecting dissolved groundwater constituents along the flow path. Key processes identified in the 1D reactive transport model are then carried forward for further evaluation in the 3D model.

(1) Effect of ISR mining operations on groundwater quality

The mining area comprises three zones (figure 6.14): the active mining area, the anticipated maximum upward migration zone (11–13 m above the active area), and a potential upset zone (50 m above the active area). Mining solution in these zones will be contained within the freeze wall during operations and decommissioning until groundwater remediation targets are achieved, and consequently the freeze wall will be thawed. The proposed design features and mitigation measures (as summarized in table 6.5) are considered effective and protective, and no effects to the surrounding geology and groundwater VCs were predicted during the life of the Project (i.e., 0 to 38 years).

Figure 6.14 Conceptual site model and water quality in the in-situ recovery mining area during decommissioning



For the post-remediation groundwater quality assessment using the 3D reactive transport model, the area was simplified into two zones limited by the freeze wall.

- Zone 1 extends from the base of the paleo weathered zone to 15 m above the active mining area and is assumed to have water quality equivalent to Restored Solution #1 (pH 4.3) or #2 (pH 6.1) (Note: Restored Solution represents the remediated groundwater in laboratory tests. Details on the development of the chemistry of the restored solutions from the metallurgical testing is provided in appendix F of appendix 7-C, EIS, Denison Mines 2024).
- Zone 2 extends from 15 to 50 m above the active area and is assumed to contain a 50% mix of Restored Solutions #1 or #2 with baseline groundwater.

Groundwater constituents identified as COPCs associated with mining of the ore zone include:

- pH
- sulfate and chloride
- uranium, iron, aluminum, and heavy metals/trace elements (i.e., As, Cd, Co, Cu, Cr, Pb, Mo, Ni, Se, V, and Zn)
- radionuclides (i.e., Ra-226, Th-230, Pb-210, and Po-210)

Groundwater quality in the mining area will be remediated during decommissioning to meet acceptable levels, known as decommissioning objectives or remediation targets. Numerical modelling was used as a tool to establish decommissioning objectives in terms of concentrations of COPCs in groundwater, such that surface water quality is protected. Results from 3D reactive transport modeling and the appendix 10A assessment concluded that water quality matching Restored Solution #1 does not pose an environmental risk. Thus, decommissioning objectives are proposed as water quality achieving that of Restored Solution #1.

The process of groundwater remediation involves injection and circulation of water (with or without addition of chemical reagents to accelerate groundwater quality recovery) through the mining area until it can be demonstrated that recovered groundwater has stabilized and meets groundwater quality decommissioning objectives.

The freeze wall will remain until groundwater quality meets these targets, after which thawing will occur. This will allow the eventual re-establishment of the pre-operational groundwater flow regime in the LSA.

Following remediation of the mining area and thawing of the freeze wall during decommissioning, dissolved COPCs from the mined-out zone may migrate downstream with natural groundwater flow and potentially discharge into nearby surface water bodies, such as Whitefish Lake. A ‘future centuries’ scenario, with an assessment time frame of hundreds to thousands of years, was modeled to assess the spatial and temporal behavior of residual COPCs and their potential impact on Whitefish Lake.

Simulations indicate that COPC concentrations and mass loadings from mining activities at Whitefish Lake are expected to show modest variations from background levels (as shown in figure 6.17 and figure 6.18). Sulphate is predicted to see the largest change in concentration at Whitefish Lake, rising from 3 to 12 mg/L, but this change is limited to a small portion of the lake, resulting in a mass flux increase by 14%. Most other constituents are expected to experience mass flux increases by less than 5%. Under the base case scenario (i.e., the best estimate of what will occur), exceedances of groundwater quality screening criteria were only predicted for iron, manganese, and pH, but these values remain within naturally occurring ranges (i.e., baseline concentrations observed) in the LSA. Iron and manganese concentrations in groundwater are naturally elevated and pH values in groundwater range naturally down to approximately pH 6.

Figure 6.17: Simulated concentrations of select constituents of potential concern reaching Whitefish Lake – Base case

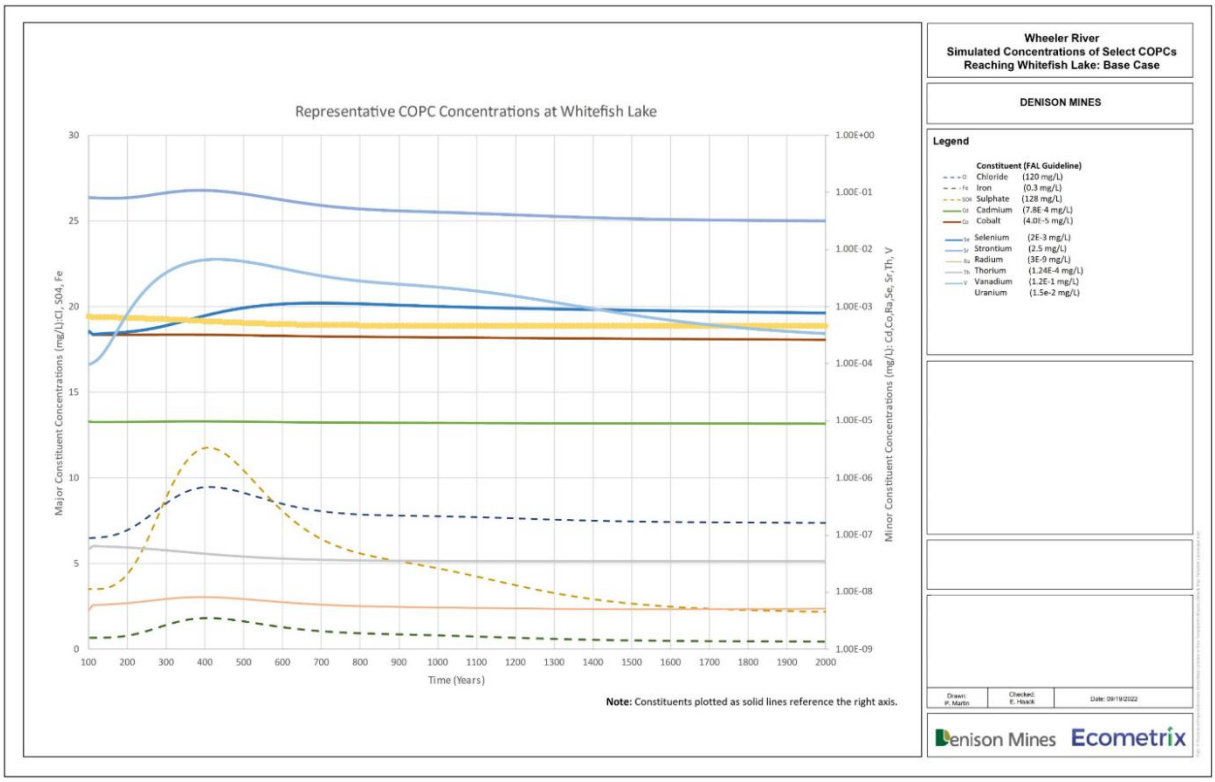
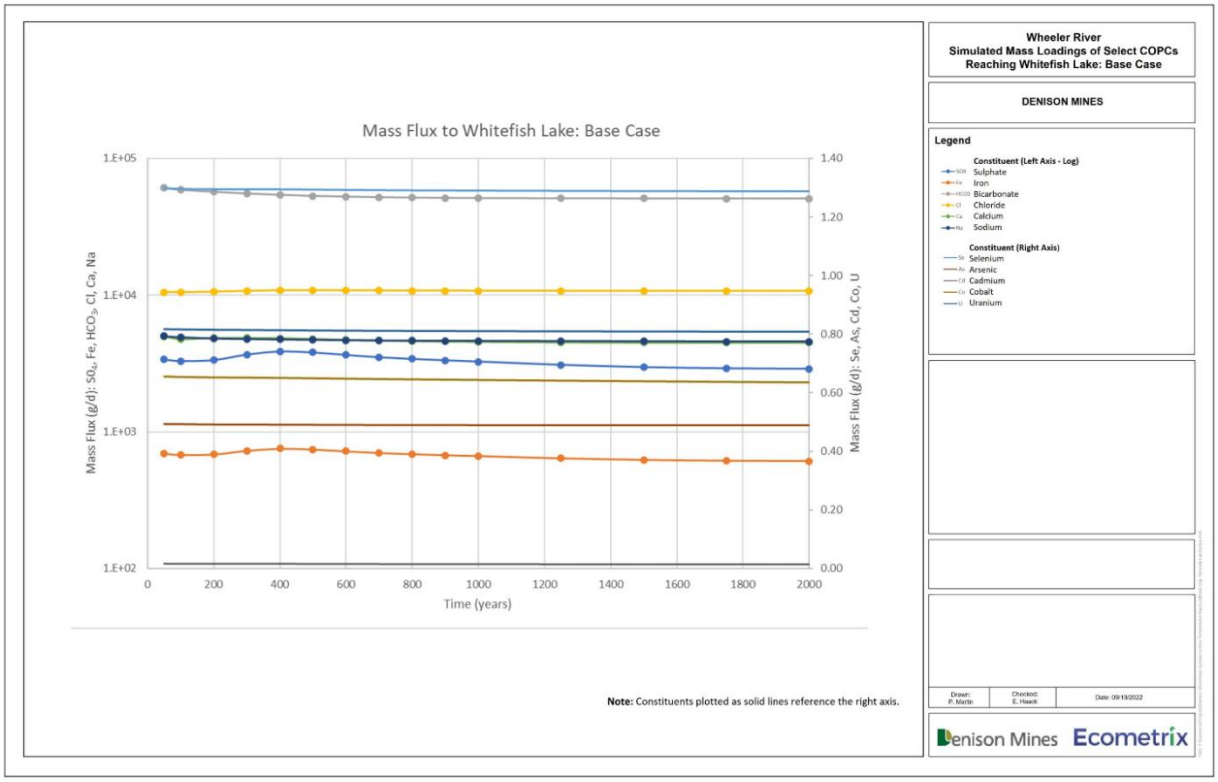


Figure 6.18: Simulated mass loading of select constituents of potential concern reaching Whitefish Lake – Base case



Sensitivity analyses were conducted to evaluate the sensitivity of the results to uncertainties in the model inputs and assumptions. Fifteen (15) scenarios were developed, covering variations in COPC source concentrations (scenario 1), consideration of longer-term plume conditions from the ore zone with respect to acidic pH values (scenario 2), transport simulation time (scenario 3), hydraulic conductivity (scenarios 4, 5, 6, 7, 8, 9), reduction in the number of available sorption sites (scenario 10, 11), , longitudinal and transverse dispersivity (scenario 13), and redox conditions (scenarios 14, 15). Results indicated that COPC concentrations in groundwater discharging to Whitefish Lake showed gradual changes, with no significant deviation from baseline water quality in Whitefish Lake.

The numerical model results indicate that with appropriate mitigation during decommissioning, dissolved COPC concentrations are expected to remain below levels posing an environmental risk. No residual effects on Whitefish Lake's surface water quality were identified (as summarized in table 6.4).

Potential project-related effects from ISR mining will be mitigated via operation of the freeze wall and other measures as outlined in table 6.4. As such, these potential project-related effects are not expected to be a primary contributor to potential residual effects following application of the proposed mitigation measures.

Through implementation of appropriate mitigation measures and follow up monitoring, Denison anticipates that the impact of ISR mining operations on the groundwater quality will be negligible throughout all Project phases. Therefore, Denison determined the impact of ISR mining operations are not expected to have residual effects on groundwater quality.

(2) Impact of surface facilities and activities on groundwater quality

During construction, spills or leaks from routine refuelling and fuel handling activities may impact shallow groundwater quality in localized areas. Fuel storage and handling sites are confined to a defined area. Project designs, best practices, and mitigation measures (as outlined in table 12.1) will be implemented to minimize risks, making residual effects unlikely.

Figure 6.13 shows the Project layout with the location of the ponds, pads, and landfills. Specific Project designs, best practices, and mitigation measures, such as liners and pumping to control fluid movement (as outlined in table 6.8), will be employed to eliminate, reduce, or control potential Project-related effects on shallow groundwater.

Most surface facilities will be decommissioned and removed during decommissioning. While the facilities remain, shallow groundwater quality may be changed by accidents and malfunctions related to leachate leaks from waste pads and ponds, spills of hazardous substances (e.g., reagents and fuels), leaks from water treatment plant ponds, and leaching from the landfill.

The potential Project-related effects during decommissioning are not expected to be a primary contributor to potential residual effects following application of the mitigation measures.

Through implementation of appropriate mitigation measures and follow up monitoring, Denison anticipates that the impact of surface facilities and activities on the groundwater quality will be negligible throughout all Project phases. Therefore, Denison determined the impact of surface facilities and activities are not expected to have residual effects on groundwater quality.

6.2.2.3 Mitigation Measures for Geology and Groundwater (Quantity and Quality)

Denison has proposed the following measures to mitigate the potential adverse effects from identified project activities on geology and groundwater quantity and quality. CNSC staff have assessed the mitigation measures proposed by Denison and have concluded that they are adequate to manage potential adverse effects to geology and groundwater quantity and quality. See a summary in tables 6.7, 6.8 and 6.9 below.

Table 6.7: Proposed mitigation measures to address effects on geology

Subsidence at ground surface
• Incorporation of specific Project design components and practices to minimize disturbance to the natural geological environment beyond the mining area. • Injection and recovery wells will be collared at surface and surveyed regularly to monitor for any changes in collar height over time.

Table 6.8: Proposed mitigation measures to address effects on groundwater quantity

Changes in groundwater elevation, flow patterns, and discharge rates to local surface water
• Incorporation of specific Project design components and practices, including: o limiting the construction footprint (i.e., Project Area) to the extent possible to reduce the potential for reductions in groundwater recharge and limit the number of watersheds overprinted by the Project Area o designing the Project to limit water use and enhance water recycling o implementing water management best practices to reduce site runoff and recharge to aquifers
• In addition, commitment to follow-up on ongoing hydrogeological evaluations, as well as monitoring and adaptive management, including: o groundwater elevations in the groundwater well network; and o water elevations of surface waters within the LSA

Table 6.9: Proposed mitigation measures to address effects on Groundwater Quality

Changes in groundwater discharge to local surface waterbodies (i.e., Whitefish Lake)
• Incorporate best management practices to avoid effects on groundwater from hazardous substances, including those outlined in section 2. No fuels, oils, or other hazardous substances will be stored within 100 m of any waterbody and no equipment maintenance or re-fuelling will be conducted within 100 m of a waterbody.
• Develop environment management plans, programs, and procedures to provide consistent and responsible practices.
• During the operation phase, incorporation of specific Project design components for ISR operations affecting groundwater, including: o establishment of the freeze wall before mining operations to hydraulically isolate the mining area from the surrounding groundwater environment o creation of hydraulic controls that will limit vertical migration to the zone 50 m above the ore zone within the freeze wall o design injection and recovery wells to have secondary containment o recognize option to drill additional wells to recover mining solution excursions o design pipelines to have secondary containment or catchment o establishment of a leak detection system for wells and pipelines

o implementation of a groundwater monitoring well network within and surrounding the outer perimeter of the freeze wall, and a groundwater monitoring (quantity and quality) plan o development of contingency plans, including drilling additional wells into any potentially contaminated areas for recovery of the mining solution back to surface o development of contingency plans to respond to excursions
• During the operation phase, incorporation of Project design components for site infrastructure (e.g., landfills and pads) affecting groundwater, including: o design landfill and pads with geomembrane liner protective systems and double liner systems with leak detection and leachate collection systems appropriate for the materials stored o store hazardous substances in approved storage areas with secondary containment, as required o implement appropriate monitoring and management plans, including: ▪ a groundwater monitoring well network and GWMP for surface facilities ▪ environment, health, and safety management plans, programs, and procedures ▪ waste management plans, programs, and procedures
• During the decommissioning phase, incorporation of Project design components, including: o mining area remediation during Decommissioning – water will be injected into the mining area via injection wells and then recovered through the recovery wells to flush residual COPC mass in groundwater o continued groundwater remediation until appropriate levels (i.e., Decommissioning objectives), protective of the environment over the long term (i.e., 'future centuries' period), are achieved o implement groundwater monitoring (quantity and quality) within and exterior to the former freeze wall and along the groundwater flow path to demonstrate that groundwater conditions are aligned with those bounded by the modelling predictions, and, as such, are protective of the receiving environment o develop contingency plans, including drilling additional wells into potentially contaminated areas for recovery of the mining solution back to surface

6.2.2.4 Monitoring and Follow-up

To address uncertainties identified during the effect assessment, Denison has developed follow-up monitoring programs to verify the accuracy of predictions made in the EIS and confirm the effectiveness of proposed mitigation measures. A Groundwater Monitoring Program (GWMP) will be implemented throughout the Project's lifecycle. The groundwater well monitoring network (i.e., well locations and density) and sampling plan will be informed by the baseline groundwater conditions, the anticipated operational conditions and associated fate and behaviour of COPCs as identified by reactive transport modelling.

The GWMP objectives are:

- detecting potential excursions and provide timely signal for further evaluation and actions
- verifying EA commitments are met
- ensuring protection of groundwater end use and receiving environment

The chemical and physical constituents to be monitored in groundwater include the COPCs identified to be associated with mining of the ore zone as follows:

- pH
- sulfate and chloride

- uranium, iron, aluminum, and heavy metals/trace elements (i.e., As, Cd, Co, Cu, Cr, Pb, Mo, Ni, Se, V, and Zn)
- radionuclides (i.e., ^{226}Ra, ^{230}Th, ^{210}Pb, and ^{210}Po)

Other major ion constituents of groundwater are also recommended (e.g., total alkalinity, bicarbonate, carbonate, sodium, magnesium, potassium, and calcium). Additional COPCs identified in association with surface facilities are nitrogen species (i.e., ammonium, nitrate, and nitrite) and volatile organic compounds.

Not all COPCs will be measured at every sampling location or during each sampling event. Priority will be given to key indicator (KI) parameters that signal site activity-related changes in water quality. These include:

- Hydraulic response
- Temperature
- EC (electrical conductivity)
- pH
- ORP (oxidation-Reduction Potential)
- Sulphate
- Dissolved uranium

Change in the above KI parameters may indicate an excursion has occurred. The first three may be considered for continuous measurement. Temperature, electrical conductivity, and oxidation-reduction potential (ORP) are included as measurable groundwater parameters for the Project. Temperature is monitored due to expected increases of 10°C or more above ambient groundwater temperatures during operation. Electrical conductivity serves as a bulk water quality indicator, while ORP is a qualitative measure of groundwater conditions.

Chloride is included as a key parameter since changes in its concentration, along with electrical conductivity (EC), may indicate a loss of freezing capacity in the freeze wall, signaling an excursion and identifying brine migration. However, such incidents are expected to be detected earlier through operational monitoring (e.g., pressure changes in the cooling circuit).

Tritium concentrations will also be measured to assess groundwater age in the subsurface.

The groundwater well monitoring network, sampling plan, and the specific parameters to be analyzed will be tailored to each Project phase and each Project Area (e.g., surface facilities versus mining area versus freeze wall perimeter).

Monitoring for Surface Facilities

A groundwater monitoring network will be established to monitor groundwater conditions upgradient, on the perimeter, and downgradient of the surface facilities as shown in figure 6.13 (including 11, 12, 13, 14, 16, 20, 21, 22, 23, 24, 25, 26, 27, 42). Since these facilities extend no more than approximately 4 metres below ground surface, the network will primarily consist of shallow wells installed in overburden. The monitoring well network will be built up over time in alignment with construction and operation of the facilities.

Baseline samples will be collected at each location before operation to confirm alignment with established groundwater conditions. These samples should be taken on two occasions, preferably in different seasons.

During operation, groundwater monitoring will occur at least semi-annually, with increased frequency near certain facilities if needed. Samples will be analyzed for the full suite of COPCs or KI parameters.

During decommissioning, shallow monitoring wells for decommissioned surface facilities will be decommissioned per provincial regulations. Retained facilities include:

- The industrial landfill with low-level radiological waste, which will have an engineered cover to reduce water infiltration.
- The Industrial Wastewater Treatment Plant (IWTP) precipitate (primarily gypsum) pond, which will be covered and decommissioned in place.

Monitoring wells for these facilities will remain to monitor the potential impact on groundwater post-cover placement. Monitoring may continue into post-decommissioning.

Monitoring for In-situ recovery mining area - pre-construction and construction phase

The groundwater monitoring network for the operation phase will be installed during pre-construction and construction. Existing wells will be used where possible, with additional wells added as needed. Data collected during this period will supplement established baseline conditions, providing:

- Expanded spatial coverage of baseline conditions in the mining area.
- Additional water quality data for the Desilicified Zone Aquifer.

Monitoring for In-situ recovery mining area – operation phase

Denison proposes a five-phase mining approach, with each phase targeting a specific deposit area (figure 6.19). The freeze wall will be developed in stages to align with the phased mining plan. During operation, the groundwater monitoring network will monitor conditions within and around the freeze wall, focusing on groundwater quality changes and potential excursions due to freezing capacity loss. The conceptual design of the monitoring well network within and surrounding the freeze wall is shown in figure 6.19 and includes four types of installations:

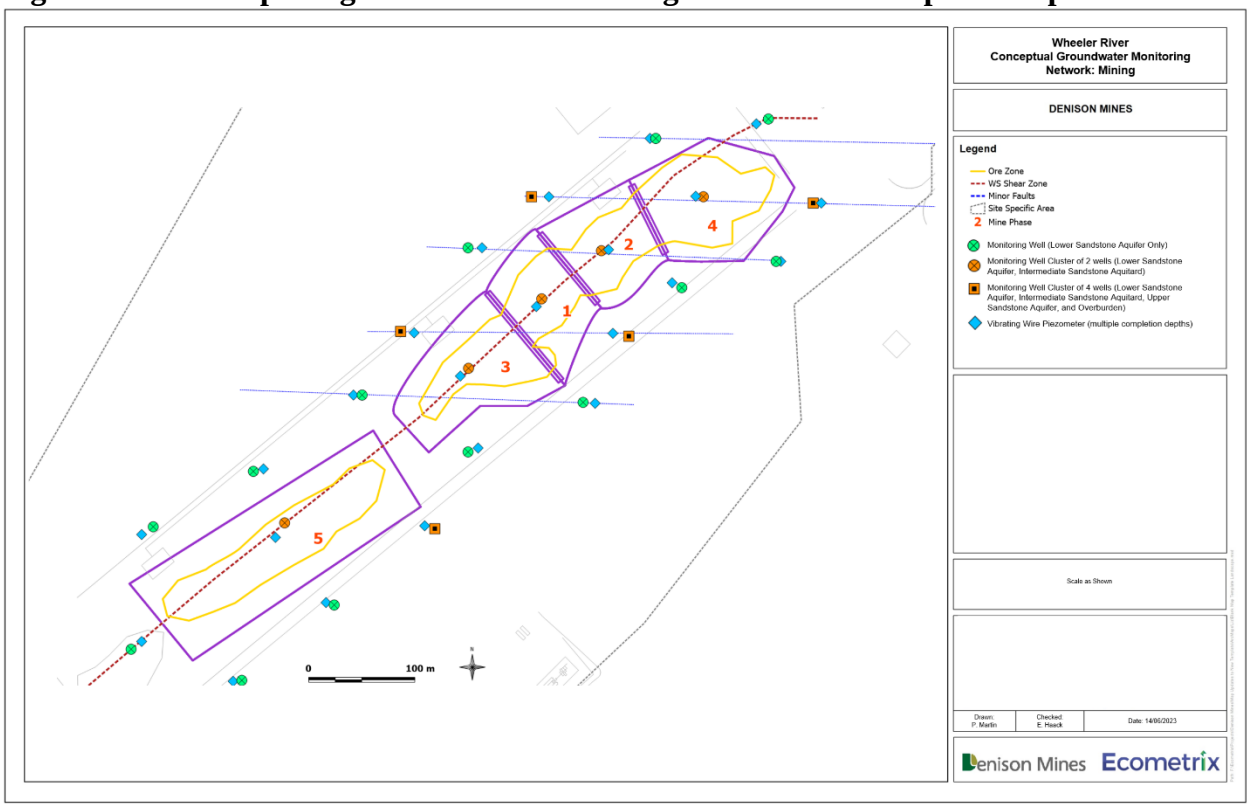
- Single-Interval Wells: Positioned around the freeze wall perimeter (20 m from the outside perimeter), these wells target the Lower Sandstone Aquifer, the most likely pathway for mobilized COPCs to migrate laterally.
- Multi-Level Well Clusters (Four Wells): Located near each mining phase, these clusters monitor multiple elevations at discrete intervals to detect vertical changes above or below the active mining area.
- Multi-Level Well Clusters (Two Wells): Installed within each mining phase footprint, these clusters monitor vertical pressure changes and potential upward COPC migration. Vibrating Wire Piezometers (VWPs) in these clusters will have multiple completions with depth to monitor pressure variability between the active mining area and overlying strata.
- VWPs: Installed adjacent to all monitoring wells, VWPs provide early warning of potential excursions by detecting pressure changes outside the freeze wall.

The monitoring wells and VWPs in the mining area and along the freeze wall perimeter are primarily positioned along the WS Shear zone or minor faults to monitor changes in groundwater flow and quality along potential preferential pathways.

Groundwater monitoring will focus on KI parameters, with continuous measurement of hydraulic response, temperature, and electrical conductivity (EC). VWPs will measure hydraulic response and temperature, while EC probes will be deployed in some wells within and around the freeze wall. Groundwater samples will be collected at least monthly within the freeze wall and semi-annually on the free wall perimeter.

In addition to the groundwater monitoring wells in the above proposed network, vibrating wire piezometers will be installed within the ore zone and basement aquitard, including the upper paleo weathered zone to delineate the pressure front. If an excursion is detected through pressure monitoring, the prescribed response process (i.e., excursion emergency plan) will be followed.

Figure 6.19: Conceptual groundwater monitoring network for the operation phase



Monitoring for In-situ recovery mining area - decommissioning phase

The groundwater monitoring network for the decommissioning phase will utilize existing wells from the operation phase where possible, supplemented by new wells as needed. At least five to seven multi-well clusters are proposed across the mined area. Sampling will include KI parameters or the full suite of COPCs at different times in the remediation process. The focus of the groundwater monitoring network inside the freeze wall during decommissioning is to demonstrate groundwater remediation meet the decommissioning objectives.

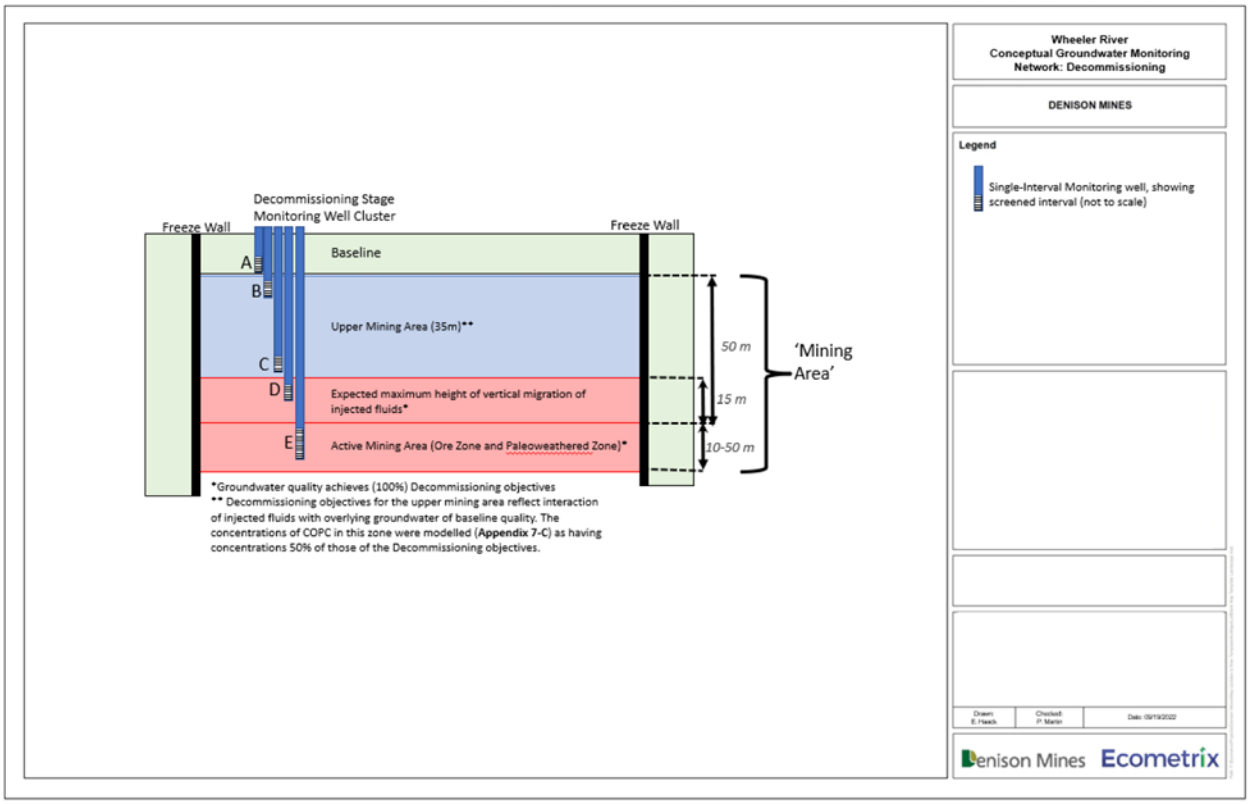
Frequent sampling (at least weekly) will occur in the active mining area to allow the remedial approach to be adapted, while sampling in the upper mining area and Athabasca Sandstones will

be seasonal for the first three years and potentially more frequent later to demonstrate chemical stability.

Groundwater quality is expected to vary across wells, so meeting the decommissioning objectives will be demonstrated statistically that water quality in each zone meets remediation target values with acceptable statistical confidence.

Monitoring outside the freeze wall will follow a schedule similar to the operation phase.

Figure 6.20: Conceptual groundwater monitoring well cluster during decommissioning (taken from Denison Mines 2024)



Monitoring for In-situ recovery mining area - post-decommissioning phase

Following groundwater remediation, the freeze wall will be allowed to thaw to restore pre-operational groundwater flow conditions. The post-decommissioning phase will continue until the site is transferred to Saskatchewan's Institutional Control Program or released back to the Crown.

The primary objectives of the post-decommissioning monitoring are to demonstrate that:

- the pre-operational flow conditions have been re-established; and
- chemical stability has been achieved.

The post-decommissioning groundwater monitoring will require an augmented monitoring network beyond the outer perimeter of the freeze wall.

The groundwater constituents to be measured and the sampling frequency for wells in the post-decommissioning groundwater network will be defined in future updates of the GWMP.

Throughout the Project's duration, predictions of the subsurface's assimilative capacity and the migration potential of COPCs will be refined using updated reactive transport modeling. These insights will inform the detailed design of the Post-Decommissioning GWMP.

Excursion Contingency Plan

The Excursion Contingency Plan aims to facilitate the timely identification of, and response to, potentially emerging conditions (excursions). During each mining stage, excursions signal that performance expectations are not being met.

- Mining and decommissioning phases: Excursions are indicated by changes in water quality compared to baseline conditions.
- Post-decommissioning phase: Excursions are identified by water quality changes that fall outside of that bounded by model predictions.

An excursion triggers a response. The response plan is tiered and involves confirmation of an excursion with successive levels of response.:

The GWMP will provide details regarding the aforementioned investigative and mitigative actions.

6.2.3 Other Views Expressed

6.2.3.1 In-Situ Recovery Mining Method & Mining Fluids

Indigenous Nations and communities

ERFN expressed concerns about the In-Situ Recovery (ISR) mining method and the potential for mining recovery fluids to contaminate groundwater in the event the freeze wall containment system fails. ERFN were concerned that any groundwater contamination could lead to impacts to waterbodies such as the Wheeler River and Cree Lake given the complex flow pathways of groundwater.

KML[2] community members expressed concerns about perceived risks resulting from past legacy project activities, lack of confidence in the protection of groundwater quality, and the need for robust community engagement to build confidence in groundwater protection. KML also raised concerns about the new mining method's impact on the area, including fears of environmental contamination and limited capacity to fully understand the technology and its potential effects.

Concerns regarding possible leaks in the freeze wall containment and basement bedrock were also raised by MN-S as they identified that ISR is a new mining technique to be used in Canada and Northern Saskatchewan. MN-S elders are concerned about the permeability of the basement rock.

[2] At the outset of the regulatory process KML had raised issues and concerns that are reflected in the Other Views Expressed sections throughout the EA Report. These project-specific concerns have been responded to and addressed to the satisfaction of KML by both Denison and CSNC staff through the consultation and engagement process.

BNDN shared concerns around the freeze wall decommissioning. BNDN worries that a thawing of the freeze wall could expand existing fractures in the bedrock, which may allow for contaminant transport away from the ore body. ERFN had similar concerns of the possible transport of contaminants during freeze wall thawing activities.

These concerns are further compounded by perceived inherent risks associated with the nuclear industry, potentially leading to modified behaviors such as avoidance and reduced enjoyment or connectedness to Nuhtsiye-kwi Benéne (Ancestral Lands).

6.2.3.2 Seismic Activity

Indigenous Nations and communities

ERFN had concerns that human induced seismic activity may increase as a result of the ISR mining process. Given ISR is a new mining process for Canada, a process that is used outside Canada internationally, ERFN requested information from Denison on the potential risks to the underlying geology as a result of ISR mining. In response to this concern Denison has provided additional information to ERFN and have indicated that human-induced seismic activity is not predicted to occur as a result of the ISR mining process.

6.2.3.3 Contamination of Receiving Environment

Indigenous Nations and communities

ERFN expressed concerns about the risk of hazardous materials from the Project contaminating the surrounding environment, particularly through underground spills that may remain invisible or undetectable. Additionally, the lack of detailed modeling for the dispersion of radioactive materials in the event of entry into Wheeler River raised concerns.

BNDN indicated they are concerned about uranium contamination of groundwater and raised issues that Denison's groundwater contamination model was assigned an inappropriate level of confidence given the complexity of uranium transport in groundwater. BNDN's concerns regarding groundwater were also indicated for the post-decommissioning period as long-term groundwater contamination was raised by BNDN.

YNLR and PBCN highlighted concerns about personal exposure to contamination of surface and groundwater, soils, waste sources, and fish species.

Federal Authorities

ECCC made recommendations in their final conclusions regarding modeling around the Decilicified zone, with respect to potential COPC transport to Whitefish Lake. ECCC recommended testing the model outside a constrained K range to better understand worse case scenarios, and to develop and implement a groundwater monitoring program during all project phases, including installing monitoring wells downgradient from mining operations.

6.2.3.4 Water Resource Management

Indigenous Nations and communities

YNLR has highlighted critical issues related to water resource management. The proposed utilization of natural lake and groundwater volumes to support the project raises concerns about

potential impacts on stream flows and contamination of water both below and above ground. YNLR expresses worry about the future water quality for Whitefish Lake, Russell Lake, Wheeler River, Geikie River, and Wollaston Lake. Ensuring robust monitoring and mitigation strategies are essential to safeguard these vital water bodies and their ecosystems.

PBCN informed CNSC staff that its members actively fish, hunt, trap and harvest for medicinal and sacred purposes in and around the Proposed Project, with three reserves downstream of the proposed Project within the geographic boundary of Treaty 10. PBCN has requested that water quality monitoring stations be set up at Kinoosao, Southend, and Sandy Bay to ensure accurate data is collected, as part of Denison's groundwater monitoring well network and groundwater protection and monitoring plan.

All Nations and communities expressing concerns of the potential impacts from groundwater contamination indicated that any contamination regarding groundwater would lead to changes in traditional land use. In particular, the Indigenous Nations and communities indicated that potential contamination may lead to avoidance behaviour in areas near the proposed Project site.

6.2.3.5 Overall Hydrogeological Assessment

Federal Authorities

NRCan reviewed this topic area along with CNSC staff and submitted nine IRs, primarily focussed on key hydrogeological and geochemical aspects of the Project. These included requests for clarification on groundwater remediation targets and the composition of lixiviant remaining post-mining, and a more robust technical justification for the selection of an acidic ISR lixiviant over an alkaline alternative. Several IRs focused on the adequacy of the groundwater flow model, including the need for an alternative conceptualization of the Intermediate Sandstone as a leaky aquitard, demonstration that the model reproduces observed vertical hydraulic gradients, and justification for the spatial variability in hydraulic conductivity values. Additional requests addressed the need to consider extended contaminant release scenarios in reactive transport modeling, the expected geochemical and mineralogical changes due to acidic lixiviant injection, and correction of calibration plot scaling and discussion of observation well clustering. These IRs were resolved to the satisfaction of NRCan and CNSC staff through the EIS technical review.

6.2.3.6 Mitigations and Commitments related to Views Expressed

In-Situ Recovery Mining Method & Mining Fluids

Denison has provided more information on the ISR mining method and freeze wall in the EIS (section 2.2.1) and through continued engagement and discussion with nations and communities. Denison has also committed to on-going discussions on this topic as part of their continued Indigenous engagement. Denison addressed concerns regarding freeze wall decommissioning and bedrock permeability by providing more information about the modelling approach and assumptions and made commitments to monitor groundwater around the freeze wall. This monitoring includes wells installed within the freeze wall which can determine if there is vertical strain or stresses on the wall. Injection and recovery wells will also be continuously monitored for pressure and temperature, and annual mechanical integrity testing will be conducted on wells.

Contamination of Receiving Environment

Denison has committed to avoiding residual effects to groundwater beyond the mining area during operations and during decommissioning activities. Denison has also committed to no effects from changes in groundwater to surface water in the vicinity of the project during the same period. Additional commitments to ensure the mitigation and management of potential adverse effects, such as contamination, include, but are not limited to, surface water and groundwater monitoring programs, developing a groundwater monitoring network with a focus on conditions within and on the outside of the perimeter freeze wall, and continued remediation until groundwater quality in the mining area meets acceptable levels.

Denison will also design and implement an Environmental Code of Practice which will define action levels and steps to take to mitigate the concentration of chemical and radiological constituents in treated effluent discharge to acceptable levels. Denison has committed to monitoring treated effluent and surface water and applying adaptive management if necessary.

Water Resource Management

Denison has made several commitments to ensuring the mitigation and management of potential adverse effects to both groundwater and surface water (Commitment Register 7-2 to 7-22 and 8-1 to 8-15). These include, but are not limited to, surface water and groundwater monitoring programs, maximizing the recycling and reuse of process water to reduce freshwater intake and release into Whitefish Lake, developing a groundwater monitoring network with a focus on conditions within and on the outside of the perimeter freeze wall, and continued remediation until groundwater quality in the mining area meets acceptable levels. As noted elsewhere, Denison has committed to no residual effects to groundwater beyond the mining area during operations and during decommissioning activities. Denison has also committed to no effects from changes in groundwater to surface water in the vicinity of the project during the same period.

Denison has committed to working with Indigenous Nations and communities to develop and implement the monitoring approach and the framework for sharing monitoring results with Indigenous communities of interest. This commitment includes collaborating with ERFN and KML on developing a monitoring regime suited to each of their interests and needs. Denison's commitment also includes engagement and input on the Environmental Management Plan (EMP), Emergency Preparedness and Response Plan (EPRP), and the Environmental Effects Monitoring Programs (EEMP). Note, details of these plans will be developed during the licensing/permitting phase of the process. Denison has committed to considering local and IK/MK in all areas of the project through continued engagement.

Denison responded to concerns related to the lack of detailed modeling for radioactive materials into waterways by providing more detailed information in discussion with ERFN and noted that both parties agreed this concern was resolved. Additionally, Denison has committed to numerous groundwater and surface water monitoring and mitigation measures, including comparing monitoring with predictions for surface water quality (Commitments 7-2 to 7-22 and 8-1 to 8-15). With respect to the groundwater contamination model, Denison acknowledged BNDN's concerns but emphasized that their modelling was not limited in scope and was informed by the relevant literature.

6.2.4 CNSC Staff Analysis

6.2.4.1 Effect of the Project on Geology

CNSC staff reviewed Denison's effect assessment on geology, related to changes in terrain morphology (subsidence) and stability during operations. CNSC staff confirmed that Denison conducted a comprehensive analysis of effects to geology and identified mitigation and follow-up monitoring program measures that are adequate. The review considered IRs raised by the FIRT related to geology covered topics such as potential induced seismicity, ground subsidence, and rock stability. CNSC staff requested clarification on the potential induced seismicity at the Project site. Denison explained the different possible sources of induced seismicity at the site (e.g., collapse of cavity voids, hydraulic fracturing, and permeability enhancement techniques) and presented their basis for justifying the absence of any potential for mining-induced seismicity under normal operating conditions. The CNSC inquired into Denison's strategy for dealing with subsidence related to the extraction of rock mass within the active mining area. Denison discussed the expected magnitude of ground subsidence based on modelling (<10 mm) and has proposed a monitoring program (commitment 7-1). This program will include a contingency plan with the aim of facilitating the timely identification and response to subsidence that exceeds the expected range of subsidence from modelling. CNSC requested more details on how Denison plans to reduce the uncertainties and risks associated with the stability and deformation analyses of the ore zone rock matrix and its overlying rock mass formation. Denison indicated that an appropriate level of conservatism has been applied and has carried out sensitivity analyses to fulfill the requirements of the CEAA 2012. Denison has committed to providing additional detailed geomechanical studies during licensing to reduce the aforementioned uncertainties and risks and assess any potential impacts on the mine operation and closure (Commitment 7-23).

6.2.4.2 Effect of the Project on Groundwater

CNSC staff reviewed Denison's effect assessment on groundwater quantity and quality, related to changes from ISR mining operations and the impact of surface facilities and activities. CNSC staff confirmed that Denison conducted a sufficient analysis of effects to groundwater quantity and quality and identified mitigation and follow-up monitoring program measures that are mostly adequate. CNSC staff have proposed an EA Condition for Denison to address during licensing for additional characterization and assessment to address IRs (see table 12.1, EA1).

CNSC staff and other FIRT members reviewed the calibration of the 3D groundwater flow model and raised concerns about the conservativeness of the hydraulic conductivity value used for the Desilicified Zone. This zone represents a key potential pathway for contaminant transport to Whitefish Lake. In response, Denison has committed to conducting a follow-up study to supplement existing data on hydraulic conductivity within the Desilicified Zone, quantifying horizontal and vertical flow gradients, and mapping geological structures such as fractures and fault zones (Commitment 7-20). Additionally, Denison has committed to revisiting and updating the groundwater models as necessary based on this study and other data collected through the EA follow-up monitoring program (Commitment 7-24). This follow-up study is necessary to improve the understanding of groundwater flow, COPC transport, and potential environmental impacts.

CNSC staff and other FIRT members also raised concerns on the monitoring plan for freeze wall integrity, the adequacy of available tritium concentration data for refining the hydrogeological conceptual model, and uncertainty in reactive transport predictions related to long-term COPC

source concentrations and sorptive capacity of the bedrock matrix. Denison has committed to addressing these issues through different programs (Commitments 7-11, 7-21, 7-22).

Further concerns were raised regarding the representativeness of the calibrated hydraulic conductivity values compared to the field measured data, uncertainty in effective porosity values and longitudinal and transverse dispersivity values. CNSC staff have proposed an EA Condition for Denison to address these issues during licensing (see table 12.1 EA1).

6.2.4.3 Summary of CNSC's assessment of predicted residual effects on geology and groundwater (quantity and quality)

The Project is designed to minimize disturbance to the natural geological environment beyond the mining area. Subsidence at the ground surface, resulting from rock mass consolidation about 400 m below ground from within the mining chamber, is predicted to be minimal (2-3 mm) and unlikely to be measurable.

The Project Area and operations are designed to minimize disturbance to the natural groundwater environment beyond the immediate mining area. Mitigation measures will be implemented to eliminate, reduce, or control potential residual effects of the Project on groundwater quality and quantity, and protect discharges to local surface water bodies. A numerical model was used to predict how residual COPCs in groundwater may interact with the environment following remediation. The model results indicate that, with appropriate mitigation, the Project's impact on groundwater is not expected to cause adverse residual effects, with COPC concentrations in receiving environment predicted to remain below levels that pose environmental risks.

CNSC staff have concluded that Denison's effect assessment related to geology and groundwater (Denison Mines 2024) provides sufficient information to characterize baseline geological and hydrogeological conditions; the geological model and groundwater flow/transport model are adequately developed; the potential impact of the Project on geology and groundwater for each phase of the Project has been appropriately assessed; the mitigation measures proposed for each phase of the Project are suitable. Given the uncertainties inherent in geological model development and hydrogeological analysis, the EA follow-up monitoring is necessary, and considered to be adequate by CNSC staff.

6.2.5 CNSC Staff Findings and Recommendations

Taking into account the implementation of mitigation measures and follow-up monitoring program proposed for each phase of the project, CNSC staff conclude that changes to geology and groundwater quantity and quality are not likely to cause adverse effects to the receiving environment.

In order to ensure the aforementioned assessment conclusions remain valid, CNSC staff recommend that the Commission include EA1, as outlined in table 12.1, should it issue a licence. If accepted, Denison will be required to address this condition, which relates to IRs carried over from the EA Review. CNSC staff's assessment conclusions are contingent on the establishment of this condition.

6.3 Aquatic Environment

The proposed Project could potentially cause changes to the aquatic environment through changes to surface water quantity and quality.

The proposed Project could potentially cause changes to surface water quantity through:

- project overprinting (loss) of drainage areas from project infrastructure
- intake of surface water for use in project activities
- surface water discharge to Whitefish Lake and downstream receiving environments

The proposed Project could potentially cause changes to surface water quality through:

- site water management
- mobilization of suspended materials due to erosion and sedimentation
- controlled discharge of treated effluent to Whitefish Lake and receiving environments
- long-term transport of groundwater solutes from the remediated ore zone area to Whitefish Lake (in 'future centuries')

CNSC staff concurred with Denison's assessment of Project activities that may interact with surface water quantity and quality and cause residual effects during all project phases, as detailed below.

6.3.1 Description of the aquatic environment

The LSA is the area where both direct and indirect effects resulting from Project activities can be reasonably measured and includes the waterbodies of Whitefish Lake North (LA-6), Whitefish Lake Middle (LA-5 North), Whitefish Lake South (LA-5 South), McGowan Lake (LA-1), and the Icelander River that flows into Russell Lake. The RSA, which surrounds and includes the LSA, may experience indirect effects of the Project, as well as other activities in a regional context. It is bounded by the regional watershed including Kratchkowsky Lake (LA-7), Williams Lake and Mardoc Lake (LA-4,) and extends downstream to Russel Lake. Hydrological monitoring for the project has been ongoing since 2011 and has included streamflow monitoring and lake level monitoring to capture stream discharge and water level data, including seasonal and interannual variability. Additional long term historical discharge data extending from 1977 to 2019 was obtained from Water Survey of Canada operating hydrometric station (Station ID: 06DA005) and used to establish long term stream flow trends at the Project site. A summary of assessment nodes, which are coincident with baseline hydrological monitoring stations, can be found in table 6.11 below and in figure 8.1-4 of section 8 of the EIS, and hydrological data for the RSA can be found in table 8.1-3 of section 8 of the EIS.

Table 6.11 Adapted from EIS section 8: Table 8.1-2: Drainage areas for assessment nodes

Location	Description	Gross Drainage area (km^2)
SA-1	Icelander River flowing from McGowan Lake	280.6
SA-2	Inflow to McGowan Lake from Whitefish Lake	257.4
SA-3	Inflow to McGowan Lake	15.5
SA-4	Inflow to LA-6 (Unnamed Lake) from Kratchkowsky Lake	80.5
SA-5	Inflow to LA-6	167.3

Location	Description	Gross Drainage area (km^2)
SA-6/LA-6	Flow from LA-6 to Whitefish Lake	251.7
SB-3	Southern Project drainage basin flowing to Russell Lake	24.9
LA-1	McGowan Lake	277.5
LA-5	Whitefish Lake	257.2

The estimated seven-day average of the one in 10-year return period low flow (i.e., the 7Q10 flow rate, defined as the lowest 7-day average flow that occurs on average once every 10 years) were estimated for:

- McGowan Lake (LA-1): 0.874 m^3/s
- Whitefish Lake (LA-5) upstream: 0.626 m^3/s
- Whitefish Lake (LA-5) downstream: 0.810 m^3/s

Climate model projections for the Representative Concentration Pathway (RCP) 4.5 and RCP 8.5 emissions scenarios for the region predict mean temperature and total precipitation increases throughout the century. The amount of snow depth and surface wind speed are projected to decrease by up to 2.6 % and 39% respectively by the end of the century.

Table 6.12 Climate model projections for future time horizons up to 2100 for mean temperature and total precipitation (baseline period 1986 to 2005)

Climate Parameter	Emission Scenario	Time Period			
		2021-2040	2041-2060	2061-2080	2081-2100
Mean Temperature	RCP 4.5	+1.4°C	+2.3°C	+2.8°C	+3.1°C
	RCP 8.5	+1.6°C	+3.2°C	+4.8°C	+6.2°C
Total Precipitation	RCP 4.5	+2.7%	+7.3%	+8.0%	+7.9%
	RCP 8.5	+5.0%	+8.1%	+9.4%	+10.7%

The Project water infrastructure capacity and design are based on the one in 100-year, 24-hour return period precipitation event and the Probable Maximum Precipitation (PMP) extreme rainfall event. The one in 100-year, 24-hour return period rainfall event for baseline is 79.9 mm and considering climate change is 88.6 mm, while the PMP event is estimated to be 489.3 mm.

Surface water quality data was sampled in the LSA and RSA between 2014 to 2019, and included data collection of physical, nutrient, metal, and radiological parameters. Baseline surface water quality was collected for several lakes and rivers, however the primary receiving waterbody for the Project is Whitefish Lake North (LA-5 North) and is the focus of near-field water quality modelling. Regional surface water quality modelling was conducted for Whitefish Lake Middle (LA-5 North), Whitefish Lake South (LA-5 South), McGowan Lake (LA-1), and Russell Lake (LAB-1 and LAB-2) as exposure areas, and Kratchkowsky Lake (LA-7) and Whitefish Lake North (LA-6) as reference sites. Detailed summaries of baseline concentrations of surface water quality parameters at all sampled locations can be found in table 8.2-2 and 8.2-3 of section 8 of the EIS and appendix 8-D Aquatic Environment Baseline Study. Measured concentrations were compared to water quality guidelines to determine if there were existing

baseline exceedances of certain parameters. Water quality guidelines were selected based on the most conservative provincial, federal, or other jurisdiction environmental quality guidelines available, and were calculated with site-specific data where available. For lakes that will be considered as exposure areas within the LSA, there were baseline exceedances of aluminum in Whitefish Lake South, McGowan Lake, and the Icelander River, and iron and pH in the Icelander River. Additional information on baseline concentration exceedances of water quality guidelines in additional waterbodies and watercourses of the LSA can be found in table 8.2-4 of section 8 of the EIS.

6.3.2 Proponent's Assessment

Denison's assessment considered surface water quantity and quality as intermediate VCs, and changes to the intermediate VCs were evaluated to facilitate the assessment of potential effects of the Project on receptor VCs. Both surface water quantity and quality are assessed as a KIs in the potential residual adverse effects significance determinations for the receptor VCs in Sediment and Invertebrates (section 6.4), Fish and Fish Habitat (section 7.1), Terrestrial Biota (section 7.2), the Human Environment (section 7.3), and Indigenous Land and Resource Use (section 7.4).

Denison concluded that the residual effects to surface water quantity and quality are unlikely to have significant adverse effects on receptor VCs. More information on each project related effect and the residual effects evaluation can be found below and in the EIS section 8.2 and appendix 10-A.

6.3.2.1 Surface Water Quantity

Surface Water Quantity Project Effect Scenarios

Continuous water intake and discharge is not expected through the operation or decommissioning phases; however, the project was assessed assuming a continuous average water intake rate of 40.5 m^3/hr and a continuous average water discharge rate of 36.5 m^3/hr for a conservative assessment. Withdrawal and discharge were assessed independently to exaggerate project effects and cumulatively with the Project Area and estimated changes to groundwater contributions through different temporal phases of the Project. Expected changes from baseline flows and water levels within watershed areas of the project were estimated for Project phases as three different scenarios (see below, table 6.13). Changes in monthly and annual streamflow rates were projected based on effects predicted for assessment nodes SA-1, SA-2, SA-6/LA-6, LA-1, LA-5, and SB-3 whilst changes in flow rates were assessed for the mean and 5th percentile low flow statistics as they are appropriate hydrologic indicators for effects assessment. The Project is expected to have the greatest effect on baseline flow rates during very low flow conditions.

Table 6.13 Adapted from EIS section 8: table 8.1-9: Project effect scenarios

Temporal stages	Scenario number	Project influence
Construction	1	Fully developed (site footprint) Project Area
Operation and Decommissioning with water withdrawal	2	Fully developed (site footprint) Project Area Freshwater withdrawal from LA5

Temporal stages	Scenario number	Project influence
Operation and Decommissioning with effluent discharge	3	Fully developed (site footprint) Project Area Effluent discharge to LA5

Project Overprinting of Drainage Areas – Scenario 1

During construction, the primary effect pathways for project overprinting of drainage areas is due to site clearing, grading and infrastructure construction and commissioning causing alteration to 175 ha in functional drainage areas that would have reported to surface water features in the LSA. Drainage patterns will be altered to redirect surface runoff or flows to water management features such as ponds for collection of water for mine processing and site water balance. During construction it is expected that waterbodies LA-1, LA-5, and LA-6 will experience a less than 1% reduction in surface water flows compared to baseline due to overprinting of surface drainage areas by the Project land use and infrastructure. During construction, the loss of functional drainage areas is limited to less than 1% of baseline and affects only drainage areas that report flows to assessment node SA-5, SA-6 and SB-3. During the operations phase, the same loss of functional drainage areas reporting to local waterbodies (<1% of baseline) is expected as from the construction phase. The reduction in surface water flow at receiving waterbodies is expected to be less than 1% of baseline however this does not consider water intake and discharge. During decommissioning and post-decommissioning, the project site will be remediated which will include re-establishment of drainage patterns to local surface waterbodies, therefore the reduction in surface water flows is anticipated to be <1% and move towards pre-development levels. All expected water level effects on other lakes within the vicinity of the Project are expected to be negligible.

Through implementation of appropriate mitigation measures and follow-up monitoring, Denison anticipates that overprinting of drainage areas altering functional drainage will be controlled throughout all Project phases. Therefore, Denison determined that overprinting of drainage areas is not expected to have residual effects on surface water quantity.

Surface Water Taking – Scenario 2

During construction, the primary effect pathways for surface water taking is due to activities requiring water withdrawal at an anticipated rate of 35 m^3/hr from groundwater and surface water sources causing decreases in flows and lake levels in the LSA and downstream. During operations, this withdrawal rate is anticipated to increase to 40.5 m^3/hr, therefore the operations phase is used as the bounding scenario for the effects assessment considering primarily surface water taking at a rate of 40.5m^3/hr from Whitefish Lake (LA-5) to provide a conservative assessment. Potential hydrogeological effects are assessed in section 7 of the EIS, however, decreases from flow inputs to Whitefish Lake from groundwater sources have been accounted for in the flow modelling and assessment. For all waterbodies and assessment nodes, the reduction in surface water flow was less than 3% of baseline based on the reduced surface water drainage areas and water taking activities. During decommissioning the expected water withdrawal rate is expected to be 35.5 m^3/hr and gradually decrease as the site is remediated, therefore this phase is bounded by the operations phase effects assessment. All expected water level effects on other lakes within the vicinity of the Project are expected to be negligible.

Through implementation of appropriate mitigation measures and follow up monitoring, Denison anticipates that the impact of surface water taking on surface water quantity will be negligible throughout all Project phases. Therefore, Denison determined the impact of surface water taking on flows and lake levels are not expected to have residual effects on surface water quantity.

Surface Water Discharge – Scenario 3

Discharge to the surface water receiving environment is not expected during the construction phase as water will be collected and held in the Clean Waste Rock Pond until the IWWTP is commissioned, therefore potential effects to surface water quantity VC are not expected during this phase of the project. However, during operations and decommissioning, the primary effects pathways to surface water quantity in Whitefish Lake and the downstream surface water environment is from the continuous discharge of effluent from the IWWTP at a rate of 36.5 m^3/hr causing potential increases in flows and lake levels in the LSA and downstream. Discharge during decommissioning is anticipated to continue, however effluent discharge rates are expected to be less than during operations, therefore the assessment for the operations phase is considered bounding. During operations there is anticipated to be a potential minor increase in surface water flow and water levels to LA 5 (Whitefish Lake), and the maximum predicted change in water level was 0.32 cm against the 5th percentile flow in March. All expected water level effects on other lakes within the vicinity of the Project are expected to be negligible.

Through implementation of appropriate mitigation measures and follow up monitoring, Denison anticipates that the impact of surface water discharge on surface water quantity will be negligible throughout all Project phases. Therefore, Denison determined the impact of surface water discharge on flows and lake levels are not expected to have residual effects on surface water quantity.

Future Centuries

During the ‘future centuries’ phase, remediation works will be completed, and the site will be naturalized with drainage patterns flowing to surface waterbodies restored and no water taking or discharge. Therefore, potential effects to the surface water quantity VC are not expected during this part of the project phase.

Finally, the key mitigation measures, proposed by Denison, to avoid or reduces project related effects on surface water quantity during all phases of the project are presented in table 6.14. No follow-up program activities are required related to the assessment of Projects effects on surface water quantity as no residual effects were identified and uncertainty was low. However, continued monitoring of hydrologic conditions of the site is suggested by Denison (table 6.21) for monitoring and update of predictions of assessment of project effects on surface water quantity and support effluent discharge permitting and approvals.

Climate Change

The primary potential climate change effect to the aquatic environment is through the surface water quantity exposure pathway during the operation and decommissioning phases. To assess the climate change effects to the aquatic environment, the analysis qualitatively considered changes to precipitation, surface runoff and evaporation and the resulting water balance within the vicinity of the project based on four project effects scenarios. The four climate change projection scenarios assessed included:

1. Mean precipitation static and increased evaporation – resulting in a marginal decrease in flow rates from the Project.
2. Increased precipitation and evaporation – resulting in either increased or decreased flow rates from the Project.
3. Mean precipitation static and decreased evaporation – resulting in increased flow rates from the Project.
4. Increased precipitation and decreased evaporation – resulting in increased flow rates from the Project.

The Project is expected to have the greatest effect on baseline flow rates during low flow conditions, and projection scenarios 1 and 2 have the potential to result in a condition where flow rates decrease as a result of climate change. Decreases in flow rates due to climate change (scenario 1 and 2) are expected to be marginal and not statistically detectable, therefore climate change effects to water quantity are not anticipated to be significant.

The potential effects of climate change on the frequency and magnitude of extreme weather events were also quantitatively assessed. The PMP at the project site is not anticipated to increase however the magnitude of the one in 100-year, 24-hour return period rainfall event is anticipated to increase from a baseline of 77.9 mm to 88.6 mm, which will require consideration for design of Project water management infrastructure.

Mitigation Measures for Surface Water Quantity

Denison has proposed the following measures to mitigate the potential adverse effects from identified project activities on surface water quantity. CNSC staff have assessed the mitigation measures proposed by Denison and have concluded that they are adequate to manage potential adverse effects to water quantity. See a summary in table 6.14 below.

Table 6.14 Proposed mitigation measures to address effects on surface water quantity

Change in flows or water levels in lakes and river
• Limit and stage the construction footprint (i.e., Project Area).
• Maintain existing drainage patterns with the use of culverts, where applicable.
• Maintain access roads by periodically regrading and ditching to improve water flow, reduce • erosion, and manage vegetation growth.
• Inspect culverts periodically. Remove accumulated material and debris upstream and • downstream of the culverts to prevent erosion, flooding, habitat damage, property damage, • and mobilization of sediment.
• Attenuate peak discharges and augment baseflows to the environment using Project water • storage features (i.e., runoff, process water, contact water, monitoring/effluent ponds).
• Recycle contact water for use as process water.
• Recycle process water for re-use.

Monitoring and Follow-Up Measures

In order to verify the accuracy of the assessment and determine the effectiveness of the mitigation measures, Denison will implement the following EA follow-up measures.

Table 6.15: Follow-up program measures for effects on surface water quantity

Change in flows or water levels in lakes and river
• Continued hydrologic monitoring to provide Project phase information to monitor predictions and support effluent discharge permitting and approvals (i.e., meet approvals for continued surface water quality levels).
The monitoring program should remain consistent with the long-term (2011) hydrological monitoring study at the Project site to allow for the continued establishment of long-term stream flow trends at the site through relationships to long-term operating hydrometric gauging stations in the same watershed.
• Monitoring stations should continue to survey at locations throughout key catchment areas. Hydrometric monitoring at streamflow stations should include measurement of stream discharge and water level survey and maintenance of in-stream data loggers. • Monitoring should continue to include the following: 1. streamflow monitoring 2. lake level monitoring 3. installation and maintenance of stage dataloggers

6.3.2.2 Surface Water Quality

Site Water Management

Denison has identified site water management as a primary project interaction with the environment that required further evaluation throughout the project-related effects assessment. Site water management is described in detail in section 2 of the EIS and is required throughout all phases of the Project. Water is categorized as contact or non-contact water, where contact water is water that has been potentially altered by project activities and interactions and needs to be managed prior to release. Non-contact water has not been altered by project activities and interactions by diversion around the site and does not require management for release to the environment. Throughout the various phases of the Project, site contact water is generated from various sources and activities such as but not limited to drilling, ISR processing, domestic wastewater, industrial wastewater, wellfield runoff, waste rock pad runoff, etc., and will require containment, storage and treatment prior to release from a final discharge point located in the vicinity of the Whitefish Lake Middle (LA-5 North) sample station within Whitefish Lake South. Water management infrastructure (e.g., collection ditches, ponds, pumping, stations) must be put into place by Denison before the initiation of construction activities. During construction contact water will be captured and held in the Clean Waste Rock Pond which contains a volume of 3600 m^3 and is designed to contain water generated throughout the construction Phase without discharging to the environment until the IWWTP is built. Therefore, potential effects to surface water quality are not expected during this project phase. During operations contact water will be collected in the Process Water Pond and Wellfield Runoff ponds before being directed to and treated in the IWWTP. Treated water from the IWWTP will be held in the three Effluent Monitoring and Release Ponds, each with a volume of 3,300 m^3, where effluent will be tested to ensure quality meets regulatory release limits prior to discharge. Effluent will be discharged through a diffuser located approximately 115m offshore in 3m of water, however the final design and location of the diffuser will be confirmed during licensing. During decommissioning water will continue to be pumped through and extracted from the mined-out zone and processed through the processing plant until non-economic uranium concentrations are observed. Water

treatment and effluent discharge to the surface water receiving environment will continue during the decommissioning phase. Non-economic process water will then be treated and injected back to the mined-out zone to remediate the groundwater. This remediation process will continue until groundwater quality meets the decommissioning objectives. Once groundwater remediation is finished, the remaining site water management infrastructure will be decommissioned.

Mobilization of Suspended Materials

During construction, the primary effect pathways for mobilization of suspended materials is due to land disturbance and clearing potentially causing erosion and sedimentation to surface water bodies. Surface water drainage collected as contact water during the construction Phase will be stored in the Clean Waste Rock Pond, and a water and sediment control management system following standardized practices will be in place to mitigate the potential effects of erosion and sedimentation. Therefore, potential effects to surface water quality are not expected during the construction phase. Throughout operation and decommissioning, surface water drainage collected as contact water will be treated within the IWWTP prior to release, ensuring management of total suspended solids (TSS) to levels protective of the environment and aquatic receptors.

Through implementation of appropriate mitigation measures and follow up monitoring, Denison anticipates that the impact from mobilization of suspended materials on surface water quality will be negligible throughout all Project phases. Therefore, Denison determined the impact of mobilization of suspended materials from erosion and sedimentation are not expected to have residual effects on surface water quality.

Controlled Discharge to Receiving Environment

Discharge to the surface water receiving environment is not expected for during the construction phase as water will be collected and held in the Clean Waste Rock Pond until the IWWTP is commissioned, therefore potential effects to surface water quality VC are not expected during this project phase. However, during operations and decommissioning, the primary effects pathways to surface water quality in Whitefish Lake and the downstream environment is from the controlled discharge of effluent from the IWWTP. The project was assessed assuming a conservative continuous average water intake rate of 40.5 m^3/hr and a continuous average water discharge rate of 36.5 m^3/hr. The IWWTP is designed to treat effluent from the ISR process and other sources through a three-stage process including a low pH treatment to precipitate remaining radioactive materials from water, a high pH treatment to adjust acidity and remove remaining precipitates, and a final neutralization step to neutralize and improve water quality for release. The IWWTP technology and treatment process continues to be assessed and optimized through a BATEA study and will be finalized throughout the licensing process.

Denison's assessment for water quality utilized both near-field and far-field modelling to predict concentrations of both radiological and non-radiological COPCs) during operations. For model calibration the near-field model used the ninety-fifth percentile concentrations of measured baseline parameters in the receiving environment, whereas the far-field model used the geometric mean of baseline concentrations. Additional model inputs of baseline data included local inflow rates, site discharge rates and predicted effluent discharge water quality. The predicted upper bound treated effluent concentrations were derived from effluent lab tests and were multiplied by a safety factor of three for most parameters, with the exceptions of cadmium, chromium and selenium where derived concentrations were used. Modelled concentrations of

COPCs in the receiving environment and predicted maximum concentrations of COPCs in effluent were compared to the most conservative long-term federal, provincial, or other jurisdictional water quality guidelines for the protection of aquatic life. These water quality guidelines were selected as screening benchmarks for the Project, to determine where potential exceedances of guidelines exist in effluent quality and the receiving surface water environment. These COPCs were then assessed in Appendix 10A of the EIS to determine risk to human and non-human biota.

For the near-field water quality modelling the analysis was completed for the monthly average, monthly low, and 7Q10 flow scenarios in the near-field receiving environment. This modelling is conducted to determine how COPC concentrations may vary within the mixing zone within Whitefish Lake Middle (LA-5 North) under different flow scenarios (see table 6.16 below). The size of the mixing zone was also estimated using modelling under these various flow scenarios (EIS section 8 table 8.2-11). Based on the predicted maximum concentrations of COPCs in effluent, sulphate, TDS, chloride, arsenic, cadmium, chromium, cobalt, copper, molybdenum, selenium, uranium, zinc, lead-210, polonium-210, radium-226, and thorium-230 concentrations in effluent all exceeded their respective long-term surface water quality guidelines for protection of aquatic life in the receiving environment. However, of these parameters only cadmium and copper were predicted through modelling to exceed long-term surface water quality guidelines in the near-field mixing zone of the receiving environment, while all other guidelines decreased to concentrations below guidelines under all flow conditions. Denison has committed that effluent concentrations will be further refined through the BATEA process under licensing and will meet all federal and provincial regulatory requirements.

Table 6.16 Adapted from EIS section 8: table 8.2-10: Near-field receiving water quality Results

Parameter	Units	Short-term Screening Criteria (background hardness)	Short-term Screening Criteria (Hardness induced [>250 mg/L])	Source	Note	Long-term Screening Criteria (background hardness)	Long-term Screening Criteria with Toxicity Modifier Applied (induced hardness)	Source	Note	Discharge Concentration (max predicted)	LA-5 Well Mixed (7Q10)	LA-5 Well Mixed (Monthly Low)	LA-5 Well Mixed (Average)
General Chemistry, Nutrients and Anions													
Alkalinity	mg/L	--	--	--	--	--	--	--	--	12.4	12.4	12.4	12.4
Ammonia (as N)	mg/L	--	--	--	--	5.74	5.74	SEQG/ CCME	(2)	3.9	0.13	0.11	0.1
Un-Ionized Ammonia	mg/L	--	--	--	--	0.019	0.019	SEQG/ CCME	--	0.0129	0.0004	0.0003	0.0003
Hardness	mg/L	--	--	--	--	--	--	--	(15)	250	9	8	7
Conductivity	µS/cm	--	--	--	--	--	--	--	--	21.7	21.7	21.7	21.7
Nitrate	mg/L	550	550	CCME		13	13	SEQG	--	0.249	0.249	0.249	0.249
pH	pH units	--	--	--	--	6.5-9.0	6.5-9.0	SEQG/ CCME	--	7	7	7	7
Phosphorus	mg/L	--	--	--	--	0.004-0.01	0.004-0.01	CCME	(9)	**0.01**	0.005	0.005	0.005
Sulphate	mg/L	--	--	--	--	128	429	BC MOE	--	**2600**	43	26	19
TDS	mg/L	--	--	--	--	500	500	SEQG	--	**6420**	131	90	74
Temperature	°C	--	--	--	--	narrative	narrative	--	--	16.5	15	15	15
TSS	mg/L	--	--	--	--	background + 5 mg/L	background + 5 mg/L	CCME	--	6	4	4	4
Chloride	mg/L	640	640	SEQG/ CCME		120	120	SEQG/ CCME	--	**600**	10	6	5
Metals													

Parameter	Units	Short-term Screening Criteria (background hardness)	Short-term Screening Criteria (Hardness induced [>250 mg/L])	Source	Note	Long-term Screening Criteria (background hardness)	Long-term Screening Criteria with Toxicity Modifier Applied (induced hardness)	Source	Note	Discharge Concentra-tion (max predicted)	LA-5 Well Mixed (7Q10)	LA-5 Well Mixed (Monthly Low)	LA-5 Well Mixed (Average)
Aluminum	mg/L	--	--	--	--	0.1	0.1	SEQG/ CCME	(1)	0.051	0.01	0.01	0.01
Arsenic	mg/L	--	--	--	--	0.005	0.005	SEQG/ CCME	--	**0.006**	0.0002	0.0002	0.0001
Cadmium	mg/L	0.00011	0.0053	SEQG/ CCME	(3)	0.00004	0.00034	SEQG/ CCME	--	***0.0018***	**0.00005**	0.00004	0.00003
Chromium	mg/L	--	--	--	--	0.001	0.001	SEQG/ CCME	(4)	**0.025**	0.001	0.001	0.001
Cobalt	mg/L	--	--	--	--	0.00078	0.00149	FEQG	(13) (14)	**0.0027**	0.000142	0.000125	0.000119
Copper	mg/L				(5)	0.0002	0.0005	FEQG	(6)	***0.02***	**0.00046**	**0.00031**	**0.00026**
Cyanide	mg/L	--	--	--	--	--	--	--	--	N/A	--	--	--
Iron	mg/L	--	--	--	--	0.3	0.3	SEQG/ CCME	--	0.0039	0.178	0.179	0.180
Lead	mg/L	--	--	--	--	0.001	0.007	SEQG/ CCME		0.0003	0.00005	0.00005	0.00005
Manganese	mg/L	0.501	15	CCME	(7)	0.21	0.64	SEQG/ CCME	(8)	0.03	0.020	0.020	0.020
Mercury	mg/L	--	--	--	--	0.000026	0.000026	CCME	--	0.00001	0.000010	0.000010	0.000010
Molybdenum	mg/L	--	--	--	--	0.073	0.073	CCME		**2.5**	0.04	0.02	0.02
Nickel	mg/L	--	--	--	--	0.025	0.025	CCME		0.0138	0.0003	0.0002	0.0002
Selenium	mg/L	--	--	--	--	0.001	0.001	CCME	--	**0.042**	0.001	0.001	0.000
Strontium	mg/L	--	--	--	--	2.5	2.5	FEQG		1.68	0.04	0.03	0.03

Parameter	Units	Short-term Screening Criteria (background hardness)	Short-term Screening Criteria (Hardness induced [>250 mg/L])	Source	Note	Long-term Screening Criteria (background hardness)	Long-term Screening Criteria with Toxicity Modifier Applied (induced hardness)	Source	Note	Discharge Concentra-tion (max predicted)	LA-5 Well Mixed (7Q10)	LA-5 Well Mixed (Monthly Low)	LA-5 Well Mixed (Average)
Thallium	mg/L	--	--	--	--	0.0008	0.0008	SEQG/ CCME	--	0.0006	0.0002	0.0002	0.0002
Uranium	mg/L	0.033	0.033	CCME		0.015	0.015	SEQG/ CCME	--	***0.057***	0.001	0.001	0.001
Vanadium	mg/L	--	--	--	--	0.12	0.12	FEQG		0.059	0.0011	0.0007	0.00
Zinc	mg/L	0.008	0.204	CCME	(10) (11)	0.013	0.058	CCME	(12)	***0.042***	0.002	0.001	0.001
Radiological													
Lead-210	Bq/L	--	--	--	--	0.2	0.2	HC	--	**0.42**	0.026	0.024	0.023
Polonium-210	Bq/L	--	--	--	--	0.1	0.1	HC	--	**0.15**	0.007	0.006	0.006
Radium-226	Bq/L	--	--	--	--	0.11	0.11	SEQG	--	**0.15**	0.008	0.007	0.007
Thorium-230	Bq/L	--	--	--	--	0.6	0.6	HC	--	**0.9**	0.024	0.019	0.016
Uranium-238	Bq/L	--	--	--	--	3	3	HC	--	0.7	0.013	0.008	0.006
Uranium-234	Bq/L	--	--	--	--	3	3	HC	--	0.7	0.013	0.008	0.006

Notes:

Induced hardness was considered to be >250 mg/L unless otherwise specified.

All parameters listed as total concentrations unless otherwise specified.

Saskatchewan Water Quality Objectives, SEQG on-line (https://envrbrportal.crmp.saskatchewan.ca/seqg-search/), SEQG for the protection of aquatic life were selected, based on total concentrations.

Bold numbers indicate exceedance of long-term criteria based on background hardness.

Underlined numbers indicate exceedance of long-term criteria based on induced hardness.

Italicized numbers indicate exceedance of short-term criteria.

SEQG – Saskatchewan Environmental Quality Guidelines – Water Quality Guidelines for Freshwater Aquatic Life.

CCME – Canadian Council of Ministers of the Environment.

HC – Health Canada.

BC MOE

– British Columbia Ministry of the Environment.

FEQG – Federal Environmental Quality Guidelines.

MDMER – Metal and Diamond Mining Effluent Regulations

DOC – Dissolved organic carbon.

TDS – Total dissolved solids.

TSS – Total suspended solids.

Narrative – Temperature - Maximum Weekly Average Temperature: Thermal additions to receiving waters should be such that the maximum weekly average temperature is not exceeded. Short-term Exposure to Extreme Temperature: Thermal additions to receiving waters should be such that the short-term exposures to maximum temperatures are not exceeded. Exposures should not be so lengthy or frequent as to adversely affect the important species.

A pH of 7 and a temperature of 15ºC were assumed to convert total ammonia to un-ionized ammonia in accordance with CCME (2002).

[1] Long-term criterion for aluminum based on CCME/SEQG of 0.1 mg/L for dissolved aluminum when pH is greater than 6.5.

[2] Total ammonia-N calculated from the total ammonia guideline for an average annual temperature of 15°C and a pH of 7.0, Un-ionized Ammonia from table 1 of temperature and pH, Canadian Water Quality Guidelines for the Protection of Aquatic Life - Ammonia (https://ccme.ca/en/res/ammonia-en-canadian-water-quality-guidelines-for-the-protection-of-aquatic-life.pdf).

[3] Cadmium criteria based on water hardness of >0 to <5.3 mg/L (Site-specific background hardness is 5.26 mg/L (95th percentile of LA-5 and LA-6).

[4] Guideline specific to Chromium VI for conservative comparison to baseline water quality.

[5] Based on hardness of 5.26 mg/L (Short-term equation is $(e^{\{0.979123[\ln(\text{hardness})]-8.64497\}})$ *1000 (SEGQ via AEP 1996b).

[6] Federal Water Quality Guideline for Copper using the Biotic Ligand Model (BLM) Tool and User Manual is 0.0002 mg/L using site-specific background hardness of 5.26 mg/L, DOC of 2.24 mg/L, and pH of 6.61 (95^{th} percentile of LA-5 and LA-6) and 0.0005 mg/L using conditions expected during operations including hardness of 9 mg/L, DOC of 2.24, and pH of 7.

[7] Short Term Guideline is based on dissolved manganese. Benchmark = exp (0.878[ln(hardness)] + 4.76) where the benchmark is expressed in dissolved manganese concentration (µg/L), and hardness is measured as CaCO3 equivalents in mg/L. (Site-specific hardness is 5.26 mg/L (95th percentile of LA-5 and LA-6).

[8] Long-term guideline for manganese based on Scientific Criteria Document for the Development of the Canadian Water Quality Guidelines for the Protection of Aquatic Life - Manganese, appendix B - Canadian Water Quality Guidelines Calculator (pH = 6.61, hardness = 5.26 mg/L.

[9] Framework provides Trigger Ranges for Total Phosphorus (µg/L) - guideline for oligotrophic waterbody 4 - 10 µg/L.

[10] Guideline is based on dissolved zinc.

[11] Short term guideline is based on Benchmark = exp (0.833[ln (hardness mg·L-1)] + 0.240[ln (DOC mg·L-1)] + 0.526). (Site-specific background hardness is 5.26 mg/L, DOC is 2.24 mg/L, pH is 6.61 (95th percentile of LA-5 and LA-6). Note – extrapolated for value outside the hardness range.

[12] Long term guideline is based on CWQG = exp (0.947[ln (hardness mg·L-1)] - 0.815[pH] + 0.398[ln (DOC mg·L-1)] + 4.625). (Site-specific background hardness is 5.26 mg/L, DOC is 2.24 mg/L, pH is 6.61 (95th percentile of LA-5 and LA-6). Note – extrapolated for value outside the hardness range.

[13] Environment Canada 2017. Federal Environmental Quality Guidelines, Cobalt, May. Based on equation and lowest hardness for equation of 52 mg/L.

[14] Environment Canada 2017. Federal Environmental Quality Guidelines (FEQG), Cobalt. Based on equation and hardness of 250 mg/L for equation of FWQG = exp{(0.414[ln(hardness)] – 1.887}.

[15] Hardness value provided here is not the expected hardness in effluent, but was selected as a concentration at which to evaluate a high hardness condition at the edge of the mixing zone for interpretation of modelled results against water quality guidelines.

A regional surface water quality model was also used to predict effects to surface water quality from the discharge of effluent in the far-field downstream environment of the LSA and RSA. This modelling was completed to predict surface water and sediment concentrations in Whitefish Lake Middle (LA-5 North) and downstream, as well as two upstream reference locations Kratchkowsky Lake and Whitefish Lake North (LA-6). Surface water and sediment quality were modeled using IMPACT software. Predicted maximum concentrations of COPCs in the receiving environment and downstream were compared to water quality guidelines for the protection of aquatic life, and copper was the only COPC predicted to potentially exceed water quality guidelines in all waterbodies throughout operations and decommissioning.

Copper was assessed further to determine potential risk to human and non-human biota, and Hazard Quotients (HQs) were calculated for each receptor in each assessed location in the LSA and RSA. HQs equal to or less than one indicate low risk to receptors, whereas HQs greater than one indicate that there is some potential for adverse effects. Denison concluded that there were minor exceedances of screening values protective of aquatic life and some potential risk of adverse effects (HQs > 1) to aquatic receptors from copper concentrations in surface water. This includes benthic invertebrates in all waterbodies including reference locations, and predatory fish in Whitefish Lake Middle and South (LA-5 North and LA-5 South) during operations (see below table 6.11table 6.17). However, these exceedances are minor and unlikely to cause population level effects. Denison anticipates that it is likely that site conditions will change over the course of operations and decommissioning, which will further decrease the risk from copper to aquatic receptors. Increasing hardness and pH concentrations in the receiving environment during operations and decommissioning from effluent deposition are predicted to alter site conditions, and predictive modelling of these altered site conditions indicates no exceedances in the receiving environment at exposure locations for any aquatic receptors due to copper (see below, table 6.18).

Table 6.17 Adapted from EIS appendix 10A: table 6-9A: re-evaluated hazard quotients for copper in aquatic organisms – Baseline conditions

Location	Maximum copper concentration in water (mg/L)	Hazard quotients (unitless) – Baseline conditions					
		Forage fish	Predator fish	Zooplankton	Benthic invertebrate	Phyto-plankton	Aquatic plants
Kratchkowsky Lake (reference)[1]	6.22E-04	0.12	0.80	0.70	**1.49**	0.07	0.03
Whitefish Lake North	6.20E-04	0.12	0.80	0.70	**1.49**	0.07	0.03
Whitefish Lake Middle	8.22E-04	0.16	**1.06**	0.93	**1.97**	0.09	0.04
Whitefish Lake South	8.17E-04	0.16	**1.05**	0.92	**1.96**	0.09	0.04
McGowan Lake	7.50E-04	0.14	0.97	0.85	**1.80**	0.08	0.04
Icelander River	7.49E-04	0.14	0.97	0.84	**1.80**	0.08	0.04
Russell Lake Inlet	7.17E-04	0.14	0.92	0.81	**1.72**	0.08	0.03

Table 6.18 Adapted from EIS appendix 10A: table 6-9B: re-evaluated hazard quotients for copper in aquatic organisms – Site operation conditions

Location	Maximum copper concentration in water (mg/L)	Hazard Quotients (unitless) – Site Operation Conditions					
		Forage fish	Predator fish	Zooplankton	Benthic invertebrate	Phytoplankton	Aquatic plants
Kratchkowsky Lake (reference) [1]	6.22E-04	0.12	0.80	0.70	**1.49**	0.07	0.03
Whitefish Lake North	6.20E-04	0.06	0.34	0.30	0.63	0.04	0.04
Whitefish Lake Middle	8.22E-04	0.08	0.46	0.40	0.84	0.05	0.05
Whitefish Lake South	8.17E-04	0.08	0.45	0.40	0.83	0.05	0.05
McGowan Lake	7.50E-04	0.07	0.42	0.37	0.76	0.04	0.05
Icelander River	7.49E-04	0.07	0.42	0.37	0.76	0.04	0.05
Russell Lake Inlet	7.17E-04	0.07	0.40	0.35	0.73	0.04	0.05

Note:
Bold and shaded value indicates hazard quotient greater than 1.
[1] Kratchkowsky Lake is a reference lake located upstream of the effluent discharge point, and as such, the site operation conditions were the same as baseline conditions.

Denison conservatively determined that surface water quality in the receiving environment is likely to be moderately adversely impacted by the controlled discharge of effluent from the Project throughout the operation and decommissioning phases. While a change from background conditions is predicted to occur, the anticipated residual effects are likely to be local to Whitefish Lake Middle and South (LA-5 North and LA-5 South) and fully reversible upon cessation of effluent deposition, with a return to baseline conditions anticipated following post-decommissioning. Through the application of mitigative measures, follow-up monitoring, and under average flow conditions, Denison anticipates the aquatic environment will likely be resilient to potential changes. However, surface water quality is an intermediate VC and is assessed further as a KI of potential residual adverse effects significance determinations for the receptor VCs Fish and Fish Habitat, Sediment Quality and benthic invertebrates, and Fish Health.

Long-Term Transport of Groundwater Solutes to Whitefish Lake (in Future Centuries)

A ‘future centuries’ scenario was used to assess the long-term future potential effects to surface water quality post-decommissioning from peak concentrations of COPCs in groundwater plumes migrating from the decommissioned project site Phoenix Ore Zone area to surface water. The predicted mass flux of COPCs in groundwater were input into the IMPACT model to predict the maximum surface water and sediment concentrations over time at exposure and reference locations due to additional groundwater inputs. Surface water quality in the receiving environment during the Future Centuries scenario is not expected to exceed surface water quality guidelines due to groundwater plume migration. The results of the numerical modelling support

the conclusion that with the implementation of appropriate mitigation measures during the decommissioning and restoration phase of the Project, the residual effects of the Project on groundwater quality will not result in an adverse effect to surface water quality.

Mitigation Measures for Surface Water Quality

Denison has proposed the following measures in table 6.19 to mitigate the potential adverse effects from identified project activities on surface water quality. CNSC staff have assessed the mitigation measures proposed by Denison and have concluded that they are adequate to manage potential adverse effects to water quality. See a summary in table 6.19 below.

Table 6.19: Proposed mitigation measures to address effects on surface water quality

Change in the concentration of a water quality parameter (or parameters) that exceeds relevant water quality assessment benchmarks
• Develop and implement a Surface Water Management Program that provides an integrated framework to manage water quality, including provision for water management practices for each of the primary site aspects, as well as areas of the Project site where contact water is expected.
• Maximize the recycle and reuse of process water to reduce freshwater intake and release to Whitefish Lake.
• Design the discharge diffuser/outfall to provide effective mixing and dilution and discharge flows that do not detrimentally affect sediments.
• Develop site-specific effluent treatment to treat COPC to appropriate release limits in accordance with provincial standards and licence/permit conditions.
• Discharge effluent under a scenario that will meet provincial and federal discharge criteria as identified through permitting. Scenarios may include: 1. Discharging at a fixed rate while maintaining an appropriate minimum dilution ratio (i.e., discharge when able to meet the required dilution ratio and cease discharge during periods when unable to meet the necessary dilution ratio). 2. Discharging under a variable waste load allocation (i.e., discharge an appropriate effluent volume based on flow in the receiver to maintain minimum dilution ratio). 3. Managing discharge via a hybrid of these (i.e., discharge effluent at a fixed rate to maintain the required dilution ratio, but the fixed rate can be varied on a seasonal basis based on flow).
• Collect and monitor contact water to determine whether treatment is required prior to release to the environment to inform optimal levels of treatment.
• Maintain the water management system in place during decommissioning until such time that water quality is suitable to release to the environment.
• Monitor and manage effluent, including contingency for effluent treatment as may be required, so that water discharge objectives are achieved as defined by applicable provincial and federal regulatory instruments.
• Design and implement an Environmental Code of Practice that defines action levels and appropriate steps to be taken to mitigate elevated concentrations of chemical and radiological constituents in treated effluent discharge to acceptable levels.
• Implement Project-specific monitoring programs (e.g., effluent monitoring plan, environmental monitoring plan) that include monitoring treated effluent, surface water and sediment quality, and applying adaptive management, if necessary.
• Work with the associated communities to develop and implement the Project-specific monitoring programs and a framework to share the results for the purpose of assessing the performance of the water management system.
• Develop and implement a decommissioning and reclamation plan to decommission and transfer the site to the province under the Institutional Control Program.

Monitoring and Follow-Up Measures

In order to verify the accuracy of the assessment and assess the effectiveness of the mitigation measures, Denison will implement the following EA follow-up measures.

Table 6.20: Follow-up program measures for effects on surface water quality

Change in the concentration of a water quality parameter (or parameters) that exceeds relevant water quality assessment benchmarks
• Monitoring to confirm the effluent and receiving water quality meet applicable regulation criteria 1. The monitoring and follow-up program will include measurement of water quality parameters to meet regulatory criteria (i.e., provincial discharge permits, Metal and Diamond Mining Effluent Regulations [MDMER; Government of Canada 2022] and CSA N288.4-19 (CSA Group 2019). At a minimum, this will include collection of non-radiological parameters (e.g., metals, nutrients, hardness, temperature, pH, TDS, TSS, and sulphate) and radiological parameters. 2. Constituent concentrations will be compared to the values used in the EIS and to applicable regulatory criteria or objectives.
• Collecting and recording surface water quality to confirm that source and receiving water quality predictions are consistent with those presented in the EIS o Monitoring will occur within the collection ponds, specifically the Effluent Monitoring and Release Ponds and the receiving waterbody (Whitefish Lake). Water quality monitoring in the natural environment will occur at the point of discharge (near-field) at LA-5 (Whitefish Lake South), at an upstream reference location (Whitefish Lake North [LA-6]) and at downstream locations (far-field locations). The far-field monitoring locations will be located in Whitefish Lake South (LA-5) prior to its discharge to McGowan Lake (LA-1).

6.3.3 Other Views Expressed

6.3.3.1 In-Situ Recovery (ISR) Mining Method & Fluids

ERFN expressed concerns about the In-Situ Recovery (ISR) mining method and its potential environmental impacts.

Members of ERFN are also concerned about the potential escape of mining fluids beyond the freeze wall containment system, potentially contaminating surrounding surface water - key water bodies of concern include Cree Lake and Wheeler River. Given the toxic nature of these mining fluids and the complex flow pathways of ground and surface water in the vicinity, any escape would significantly impact the regional ecosystem and downstream water bodies.

MN-S also noted that ISR is a new mining method in Canada and there are concerns amongst Nation members that potential contamination could impact Whitefish Lake via groundwater and surface water contamination.

6.3.3.2 Aquatic Environment Contamination

Indigenous Nations and communities

ERFN expressed concerns that the project may adversely impact or contaminate the aquatic environment, waterways, fish, and fisheries, affecting their traditional way of life, including water use, fishing, and land harvesting practices tied to Nuhtsiye-kwi Benéne. ERFN indicated that the lack of detailed modeling for the dispersion of radioactive materials if they were to enter Wheeler River raised further concerns. ERFN has also highlighted the importance of safeguarding waterways and fish spawning areas to prevent contamination.

ERFN raised concerns that the presence of molybdenum and sulfate in effluents from the mine could significantly impact the current environment by influencing pH levels and potentially leading to acidification downstream. Additionally, ERFN emphasized the importance of understanding the local hydrogeological setting to assess potential risks associated with water quality.

KML expressed concerns related to the aquatic environment, including baseline data collection and water flow management during all phases of the proposed Project. In addition, MN-S noted that Métis Knowledge should be incorporated into surface water quality monitoring plans.

YNLR shared concerns regarding personal exposure to contamination of surface water. YNLR questioned conclusions derived in the EIS that adverse effects to surface water, and any residual impacts to surface water will be localized. YNLR indicated that abundant clean surface water is a very high priority for the YNLR communities.

BNDN indicated they are concerned about uranium contamination of groundwater and that groundwater contamination could make its way to surface waters. In addition, BNDN indicated concerns that risks to surface water contamination could be reduced through more stringent decommissioning objectives by Denison.

PBCN want to ensure the Treaty Rights of PBCN members are protected, with a focus on the protection of water resources related to the proposed Project. PBCN is particularly concerned about the proposed use of freshwater resources for mining operations and the release of treated effluent into Whitefish Lake. PBCN does not see any assurances in the regulatory documents that the water quality downstream, including water accessed by PBCN communities, will not be compromised. They have requested that stringent guidelines must be added as conditions to any environmental regulatory approval, certificate, permit, or licence granted.

PBCN has expressed interest in co-developing a water quality monitoring program downstream of Whitefish Lake and has requested regular copies of water quality monitoring reports, if the project is approved.

PBCN indicated that they wanted to ensure their citizens Treaty Rights were protected with a focus on the protection of water resources related to the proposed Project.

Federal Authorities

In ECCC's conclusions following the EIS Technical Review, inconsistencies in the modeling which limit confidence in residual effects to water quality were highlighted. This includes the risk of unmitigated residual effects on aquatic life from 1) Denison's analysis of low flow scenarios using 7Q10 to account for the 23-year project lifecycle and 2) not using the latest FEQG standard for copper. ECCC suggested that Denison conduct a sensitivity analysis on the low water flow scenario to account for additional environmental variables, and to reassess the aquatic risk associated with copper in freshwater. ECCC noted that it is unclear whether the model considers scenarios where maximum concentration of COPC might occur. Additionally, the models do not include environmental variables such as changes in hydrology or water/sediment chemistry (i.e., seasonal variability) which could result in incorrect environmental concentration predictions.

ECCC noted that the analysis approach for baseline conditions (e.g., smoothing data over locations and seasons) introduced uncertainty and may limit ability to detect changes related to the Project. Sediment in wetlands was not characterized to determine if it would act as a sink for heavy metals. ECCC recommended additional sampling of surface water, sediment, benthic

invertebrates, and fish/fish habitat and to provide additional mitigation measures to protect wetlands if required. ECCC also noted that they are unable to provide feedback on residual effects from effluent discharge because the calibration of the model has not been validated.

ECCC identified that Denison has used incorrect screening criteria for water and sediment quality, and therefore effluent could be discharged at concentrations that could negatively impact the aquatic environment. The most stringent guidelines were not consistently applied within the EIS. ECCC emphasized the importance of a robust monitoring program given the uncertainty in the assessment of potential impacts to the aquatic environment and adaptive management to address any impacts.

ECCC also recommended that the diffuser design is optimized to site conditions, that water quality criteria for COPCs is maintained, and conclusions from the EIS are verified through monitoring.

6.3.3.3 Water Resource Management

Additionally, ERFN noted that Denison's water recycling program lacks clarity, necessitating further engagement with ERFN to explore the best available technology options. Ensuring transparency, effective communication, and consideration of community perspectives are essential in evaluating and mitigating the environmental implications of this mining method.

One significant concern raised by YNLR revolves around water resource management for the project, specifically the volume of natural lake and groundwater proposed to be used to support the mining operations. This usage could potentially impact stream flows and lead to contamination of water both below and above ground. Additionally, YNLR has highlighted particular worries about the future water quality of Whitefish Lake, Russell Lake, Wheeler River, Geikie River, and Wollaston Lake.

All Nations and communities indicating concerns of the potential impacts from surface water impacts indicated that potential contamination may lead to avoidance behaviour in areas near the proposed Project site. In particular, impacts to surface water could get into fish and aquatic species which many Indigenous Nations and communities who practice rights in the Project Area rely upon for subsistence. The Nations and communities are concerned that any potential contamination could lead to health impacts of Nation their community members and citizens.

Federal Authorities

ECCC noted the importance of the Site Water Management Plan including water that is in contact with all project components (e.g., TSS in road run off, de-icing fluid from airstrip, sewage spills on camp pad) and not restricting the definition of contact water to water that has been in contact only with the wellfield, processing plant terrace, or landfills.

6.3.3.4 Summary of Mitigations and Commitments related to Views Expressed

In-Situ Recovery (ISR) Mining Methods & Fluids

Denison has provided information on the ISR mining method (EIS section 2.2.1) to Indigenous Nations and communities, starting with an engagement workshop about potential mining methods in 2018 to gather feedback on the proposed approach. The project has an Environmental Management System framework which is designed to proactively manage environmental risks. This includes continual monitoring and minimizing and managing potential adverse effects.

Aquatic Environment Contamination & Water Resource Management

Denison has made several commitments to ensuring the mitigation and management of potential adverse effects to ground and surface water (Commitments 7-2 to 7-22 and 8-1 to 8-15). These include, but are not limited to, surface water and groundwater monitoring programs, maximizing the recycling and reuse of process water to reduce freshwater intake and release into Whitefish Lake, developing a groundwater monitoring network with a focus on conditions within and on the outside of the perimeter freeze wall, and continued remediation until groundwater quality in the mining area meets acceptable levels. Denison has committed to no residual effects to groundwater beyond the mining area during operations and during decommissioning activities. Denison has also committed to no effects from changes in groundwater to surface water in the vicinity of the project during the same period.

With respect to safeguarding waterways and fish habitat, Denison has made commitments to mitigate any potential adverse effects on fish and fish habitat. Mitigation measures and follow-up monitoring will be employed to ensure that potential effects on fish and fish habitat will be mitigated and managed, which includes commitments to avoid sensitive habitat to the extent possible, scheduling in-water activities to respect important windows in the fish life cycle (e.g., eggs, juveniles, spawning adults), preparing fish salvage plans to relocate fish prior to in-water work, and designing effluent discharge or freshwater intake infrastructure to prevent entrainment or impingement of fish. Denison has committed to collecting additional aquatic baseline characterization data, including wetlands data, to further refine predictions of risk to fish and fish habitat and assess effectiveness of proposed mitigation measures.

Denison has committed to collaborating with Indigenous Nations and communities to ensure these outcomes. This includes engagement and input on the EMP, EPRP, and the EEM. Note, details of these plans will be developed during the licensing/permitting phase of the process. Denison has also committed to considering local and IK/MK in all areas of the project through continued engagement. Denison provided funding to ERFN and Kineepik Métis Local to complete updated traditional land use studies which were incorporated into the EIS. In addition, YNLR provided Denison with their traditional land use information entitled *An Exploration of Recorded Athabasca Denesųłine ́ Traditional Knowledge, Land Use and Occupancy Information in the Vicinity of Denison Mines Wheeler River Project*. Lastly, Denison signed a funding agreement with MN-S to complete a Métis Knowledge Study, which was shared with Denison in October 2023. Denison revised the EIS to include relevant information in the assessment from these studies.

Denison responded to concerns related to the lack of detailed modeling for radioactive materials into waterways by providing more detailed information in discussion with ERFN and noted that both parties agreed this concern was resolved. Denison has committed to collecting additional baseline data and updating modelling and mitigation measures as necessary. Under licensing requirements (REGDOG 2.9.1), Denison will also be required to further evaluate effluent treatment technologies and refine effluent concentrations released to the environment through a BATEA study, for contaminants of concern such as molybdenum and sulphates. Additionally, Denison has committed to numerous ground and surface water monitoring and mitigation measures, including monitoring predictions for surface water quality (Commitments 7-2 to 7-22 and 8-1 to 8-15).

Regarding concerns about adverse health effects resulting from exposure to contaminated waters, Denison provided additional information and clarification around their approach to assessing and

mitigating these effects. Denison has predicted that any potential effects to surface water quality will be localized to the near-field environment from the project and that significant downstream effects in the Wheeler River system are not anticipated. A Human Health Risk Assessment (HHRA), inclusive of traditional foods, was conducted in appendix 10A of the EIS to evaluate direct and indirect contaminants of concern and determined there would be no significant adverse effects to human health. Denison has also committed to monitoring surface water, sediment, soil samples, fish tissue, benthic invertebrates, and country foods (e.g., blueberries) for radionuclides and non-radionuclides (e.g., metals, chloride, sulfate).

With respect to ECCC concerns regarding limited confidence in the modelling and the recommendation for a sensitivity analysis on flow scenarios to account for the effects of additional environmental variables, CNSC staff have proposed an EA Condition (table 12.1, EA2) which will require that Denison conduct a sensitivity analysis for variable flow scenarios and on sediment coefficients and update the ERA with this information.

CNSC staff propose that Denison be required through a proposed EA Condition (table 12.1, EA2) to collect additional baseline water and sediment quality data prior to disturbance of the baseline and update the modelling with this additional data to address concerns related to modelling uncertainty and ability to detect changes related to the Project, and validation of model calibration. Denison will be required to have a site water management plan and spill response plan to account for management of all potential contact water on site. Denison has also committed that the finalized diffuser design and configuration to be provided during licensing will not change the EA conclusions of risk to aquatic receptors, and that water quality will remain below guidelines (LCH appendix D.2, EP-01).

ECCC also raised concerns related to the use of the most conservative water quality guidelines as screening criteria for water and sediment quality for the assessments in the EIS, with a particular emphasis on use of the FEQG for copper. Denison updated the water and sediment quality assessments to utilize the most stringent environmental quality guidelines in the final EIS, including use of the ECCC FEQG for copper, which resulted in updated conclusions of potential effects to the receiving aquatic environment.

The EMP, EPRP, and EEMP include a surface water monitoring program that is designed to evaluate changes to the aquatic environment that could adversely affect fish, their habitat, and other aquatic biota (e.g., vegetation, invertebrates). Denison has committed to working with Indigenous Nations and communities to develop and implement the monitoring approach and the framework for sharing monitoring results. The monitoring and follow-up program will also measure fish health, including measuring the potential bioaccumulation of non-radiological (e.g., molybdenum, selenium, mercury, and other metals) and radiological parameters. Denison has also committed to monitoring methylmercury (rather than only total mercury), lead, arsenic, and cadmium in fish which will facilitate understanding of any health risks associated with harvesting from the Project Area. Additionally, key indicators of ground and surface water quality will be measured, including pH and sulfate, in all project phases to monitor potential adverse effects on water acidification. Finally, Denison has also committed to conducting a pre-operations EEM study to allow for assessment of potential changes to the environment after the initiation of project activities (commitment 8-49).

6.3.4 CNSC Staff Analysis

6.3.4.1 Surface Water Quantity - Change in flows or water levels in lakes and rivers

CNSC staff reviewed Denison's effect assessment of surface water quantity and the aquatic environment, related to changes in flows and water levels in receiving surface water environment due to project overprinting of drainage areas, surface water taking and surface water discharging as well as climate change. CNSC staff confirmed that Denison conducted a comprehensive analysis of surface water quantity effects and identified mitigation and follow-up monitoring program measures that are acceptable. However, CNSC staff have proposed licensing commitments (LCH appendix D.2, PD-03) for Denison to address during licensing related to proponent's reported values of intensity duration frequency (IDF) and PMP.

CNSC staff and other FIRT participants reviewed the 100-year 24-hour precipitation and PMP values as well as proponent's approach to factoring climate change into the estimates and determined the estimates will need to be updated or revisited during the licensing phase as the final estimates will be required at the detailed design stage of the project. Denison has committed to address this concern through additional analyses, as applicable.

CNSC staff have reviewed Denison's climate change effects assessment to the aquatic environment, related to the changes in surface water quantity in the receiving environment due to climate change. CNSC staff confirmed that Denison conducted a sufficient analysis of these effects on surface water quantity and identified mitigation and follow-up monitoring program measures that are adequate. Climate change effects on water quality were raised through the EA process by the FIRT and Denison concluded that climate change is not anticipated to have significant impact on water quality due to identified design, mitigation and follow-up monitoring program measures. However, CNSC staff have proposed an EA condition that Denison complete a sensitivity analysis as part of the ERA update to assess variable low and high flows, how flow rates may change under future climate conditions, and if this influences the assimilative capacity of the receiving environment and has any potential implications to water quality predictions made during the EA review (see table 12.1, EA2).

CNSC staff concurs with Denison's conclusion that no adverse residual effects were identified related to the assessment of the Project's effects on surface water quantity taking into account identified design, mitigation and follow-up monitoring program measures.

6.3.4.2 Surface Water Quality - Change in the concentration of a water quality parameter (or parameters) that exceeds relevant water quality assessment benchmarks

Mobilization of Suspended Materials

CNSC staff reviewed Denison's effect assessment of surface water quality, and the aquatic environment related to the mobilization of suspended sediments and confirmed that Denison conducted a comprehensive analysis of these effects and that identified mitigation and follow-up monitoring program measures are adequate.

Controlled Discharge to Receiving Environments

CNSC staff reviewed Denison's effects assessment of surface water quality and the aquatic environment, related to the changes in surface water quality in the receiving environment due to

the controlled discharge of treated effluent. CNSC staff confirmed that Denison conducted a sufficient analysis of these effects and identified mitigation and follow-up monitoring program measures that are mostly adequate. However, CNSC staff have proposed an EA Condition for Denison to address during licensing, including some additional baseline data collection and updates to modelling (see table 12.1, EA2).

CNSC staff and other FIRT participants reviewed the baseline water quality data collected in the LSA and RSA and raised concerns related to the quality and quantity of the baseline data, and how this could impact the near-field and far-field models' calibration, accuracy and ability to address natural variability and climate change. FIRT baseline data concerns included poor baseline sampling effort that did not capture consecutive years or seasons of data, pooling of data from all sampled waterbodies into a singular dataset for each parameter, use of the geometric mean versus the arithmetic mean for calculation of parameters, high occurrence of samples below method detection limits, lack of baseline data in wetlands, use of regional sediment coefficients instead of site-specific sediment coefficients in model calibration, and lack of climate change considerations in far-field modelling. Despite these factors, Denison has incorporated a high level of conservatism into their effects assessment such as the assumption of continuous discharges when discharges are more likely to be intermittent, safety factors applied to predicted effluent concentrations of COPCs, use of 95th percentile concentrations of effluent instead of average concentrations, etc. CNSC staff concur that the likelihood of significant adverse effects to the aquatic environment and receptors are low. However, model uncertainty is high, therefore CNSC staff have proposed an EA Condition for Denison to improve confidence in the modelling (see table 12.1, EA2).

As part of the proposed EA Conditions, CNSC staff will recommend that Denison be required to collect additional baseline data for water and sediment quality and update the ERA and near-field water quality modelling with this data to address these concerns, for CNSC review and acceptance prior to any in-water works for construction (see table 12.1, EA2). This is to ensure that ERA predictions of risks to the aquatic environment and receptors are informed by modelling calibrated with a statistically rigorous baseline dataset, which accounts for natural variability within and between locations within the LSA and RSA and minimizes uncertainty in risk predictions. Additionally, CNSC staff have proposed an EA Condition that Denison complete a sensitivity analysis within the IMPACT modelling to assess variable low and high flows, how flow rates may change under future climate conditions, and if this influences the assimilative capacity of the receiving environment and has any potential implications to water quality predictions made during the EA review (see table 12.1, EA2). This sensitivity analysis must be completed after a BATEA study is completed and accepted on the design and construction of the IWWTP system, to ensure effluent discharge rates and quality are fully understood.

Although it is unlikely that additional water and sediment quality baseline data will alter the determination of significant adverse effects, the additional baseline data will improve the quality of future ERAs and further refine predicted levels of risk. If there are any increases to the risk profiles of receptors exceeding EA predictions due to updates from the incorporation of additional baseline data into the ERA, Denison has committed to addressing these concerns through the implementation of additional mitigation measures, monitoring, and/or adaptive management as needed.

Finally, CNSC staff have established a licensing commitment to be completed during licensing to address concerns related to the design of the IWWTP and final discharge point (see LCH

appendix D.2, EP-01). Denison has committed to confirming that the design of the effluent discharge diffuser will not change the environmental assessment conclusions of risk to aquatic receptors. If there are deviations from predicted effluent and near-field surface water concentrations of COPCs and risk to aquatic receptors due to the finalized diffuser design, Denison has committed to identifying and implementing mitigation measures (e.g., treatment) to ensure that the environmental assessment conclusions of risk to aquatic receptors will not change, and that water quality will remain below guidelines. This must also be considered in Denison's EA Follow-Up Program.

Long-Term Transport of Groundwater Solutes to Whitefish Lake (in Future Centuries)

CNSC staff reviewed Denison's effect assessment of surface water quality and the aquatic environment related to the long-term transport of groundwater solutes to Whitefish Lake in the Future Centuries scenario and confirmed that Denison conducted a comprehensive analysis of these effects and that identified mitigation and follow-up monitoring program measures are adequate.

6.3.4.3 Summary of CNSC's assessment of predicted residual effects on surface water quantity and quality

CNSC staff reviewed the assessment of predicted residual effects on the aquatic environment due to changes in surface water quantity and quality from project-related effects. For surface water quantity, assessed project related effects included Project overprinting of drainage areas, surface water taking and surface water discharge. CNSC staff reviewed Denison's conclusions that with the implementation of appropriate design and mitigation measures, and the effects being characterized as low magnitude, localized, and fully reversible, the residual effects on surface water quantity are predicted to be not significant. Denison's conservative assessment determined that the largest predicted changes to stream flow is limited to 3% while changes in lake water levels were predicted to be negligible and remain below the natural range of variability considering waterbodies immediately downstream of the project facility.

For surface water quality, assessed project related effects included mobilization of suspended materials, controlled discharge to the receiving environment, and long-term transport of groundwater solutes to Whitefish Lake in a Future Centuries scenario. CNSC staff reviewed Denison's conclusions that with the implementation of appropriate mitigation measures, and the effects being characterized as low magnitude, localized, and fully reversible, the residual effects on surface water quality from mobilization of sediment and long-term transport of groundwater solutes are predicted to be not significant. CNSC staff verified Denison's determination that surface water quality in the receiving environment is likely to be moderately adversely impacted by the controlled discharge of effluent from the Project throughout the operation and decommissioning phases. However, residual effects are expected to be localized and fully reversible following post-decommissioning, and the aquatic environment will likely be resilient to potential changes. Surface water quality is an intermediate VC and is assessed further as a KI of potential residual adverse effects significance determinations for the receptor VCs Fish and Fish Habitat, Sediment Quality and Benthic Invertebrates, and Fish Health.

CNSC staff reviewed Denison's models and predictions for effects to surface water quantity and quality taking into account input from other federal departments, provincial ministries, Indigenous Nations and communities and the public. CNSC staff confirmed that Denison conducted a sufficient analysis of these effects to determine predicted levels of risk, however

CNSC staff have proposed an EA Condition (table 12.1) that Denison collect additional baseline data and reduce uncertainty in modelling of risk predictions (EA2). CNSC staff reviewed Denison' identified mitigation and follow-up monitoring program measures for the identified effects and have found that they are adequate.

6.3.4.4 Climate Change and the Aquatic Environment

CNSC staff reviewed Denison's climate change effects assessment to the aquatic environment, related to the changes in surface water quantity in the receiving environment due to climate change. CNSC staff confirmed that Denison conducted a sufficient analysis of these effects on surface water quantity and identified mitigation and follow-up monitoring program measures that are adequate. Climate change effects on water quality were raised through the EA process by the FIRT and Denison concluded that climate change is not anticipated to have significant impact on water quality due to identified design, mitigation and follow-up monitoring program measures. However, CNSC staff have proposed an EA Condition that, if accepted, would require that Denison complete a sensitivity analysis as part of the licensing ERA update to assess variable low and high flows, how flow rates may change under future climate conditions, and if this influences the assimilative capacity of the receiving environment and has any potential implications to water quality predictions made during the EA review (see table 12.1, EA2). CNSC staff concur with Denison's conclusion that no significant residual effects were identified related to the assessment of climate change effects on the aquatic environment taking into account identified design, mitigation and follow-up monitoring program measures and implementation of adaptive management.

6.3.5 CNSC Staff Findings and Recommendations

Taking into account the implementation of mitigation measures and recommended follow-up program measures, CNSC staff conclude the Project is not likely to cause adverse effects on surface water quantity related to overprinting of flow contributing drainage areas for site footprint development, surface water withdrawal or taking from Whitefish Lake for purposes of mine process water and site water balance, and surface water discharge to Whitefish Lake for maintenance of mine site water balance.

Taking into account the implementation of mitigation measures and recommended follow-up program measures, CNSC staff conclude the Project is not likely to cause adverse effects to surface water quality from mobilization of suspended materials and long-term transport of groundwater solutes to Whitefish Lake in a Future Centuries scenario.

Considering the implementation of mitigation measures and recommended follow-up program measures, CNSC staff conclude the Project has some potential to cause moderate adverse effects to surface water quality from the controlled discharge to the receiving environment due to copper. However, water quality is an intermediate VC and is assessed further as a KI of potential residual adverse effects significance determinations for the receptor VCs Fish, Fish Habitat, and Fish Health Benthic Invertebrates, Terrestrial Biota, and Human Health. The assessments of project related effects to receptor VCs accounting for changes to surface water quality concluded no significant adverse effects considering the implementation of mitigation measures and follow-up monitoring programs. The effects significance determination table can be found in appendix B.

In order to ensure that the aforementioned assessment conclusions remain valid, CNSC staff recommend that the Commission include the following EA Condition, should it issue a licence.

If accepted, Denison will be required to address EA Condition EA2 in table 12.1 related to IRs carried over from the EA Review into licensing. CNSC's assessment conclusions are contingent on the establishment of these EA Conditions.

6.4 Sediment and Invertebrates

The proposed Project could potentially cause changes to the aquatic benthic environment through:

- changes to sediment quantity and particle size from mobilization of suspended materials impacting benthic habitat
- changes in benthic aquatic habitat availability from overprinting of aquatic habitat during construction and commissioning of the effluent discharge/intake pipeline and diffuser in Whitefish Lake
- changes in sediment quality from the controlled discharge to the receiving environments causing impacts to benthic invertebrate communities
- changes in water levels and flows
- changes in surface water and sediment quality from the long-term transport of groundwater solutes to Whitefish Lake in a 'future centuries' scenario

CNSC staff concurred with Denison's assessment of Project activities that may interact with sediment and benthic invertebrates and cause residual effects during construction, operation, and decommissioning, as detailed below.

6.4.1 Description of sediment quality and benthic invertebrate communities in the aquatic environment

The LSA includes surface waterbodies, lakes, ponds, and streams within the Icelander River and Williams Lake drainage systems, as well as portions of Russell Lake near the inflows from these areas. Sediment samples collected in 2016 from various lakes within the LSA that may potentially be affected by the Project (e.g., McGowan Lake, Whitefish Lake, and Russell Lake) were analyzed for grain size and chemical composition. Finer sediments (silt, clay) can trap pollutants due to their high surface area and tendency to bind contaminants and can stay suspended longer which increases turbidity affecting water quality. Coarser sediments (sand, gravel) settle quickly, creating more stable habitats, but they allow for greater water flow and less contaminant retention. The sediment was primarily silty-clay or sandy-silt, with clay content ranging from 10% to 82% (average 56%), silt from 13% to 55% (average 30%), sand from 0.1% to 77% (average 14%), and total organic carbon from 0.44% to 26% (average 16%). Table 8.4-2 of the EIS contains the summary of baseline benthic sediment soil classification results for lakes within the LSA. All sediment sample concentrations were within sediment quality guidelines for aquatic life protection, providing a baseline to assess potential project impacts on sediment quality (see table 8.4-3 in the EIS for the full results).

Benthic invertebrate communities, which consist of organisms living at the bottom of water bodies such as lakes and rivers, are widely used in environmental monitoring due to their sensitivity to changes in water quality and habitat conditions. These organisms provide valuable information on the ecological health of a water body, as their distribution, abundance, and diversity reflect the cumulative effects of various environmental stressors over time. Benthic invertebrate samples were collected in 2016 in the local study area at lake locations McGowan Lake, Whitefish Lake, and Russell Lake. These communities were found to be typical of

depositional lake habitats, which are areas where fine sediments gradually accumulate due to low water flow. These habitats tend to have soft, muddy bottoms rich in organic material, supporting diverse benthic communities such as chironomids (midges), water fleas, and worms. Because depositional areas can store contaminants more easily, monitoring them helps assess potential long-term effects on sediment quality and aquatic life.

Several indices are commonly used to analyze and interpret benthic community data. These indices help in assessing the ecological integrity of aquatic systems, especially when used in conjunction with other environmental data (e.g., chemical contaminants like metals and radionuclides).

To assess ecological health, several indices were applied to the benthic data (see table 6.22 below for full summary of results):

- **Taxonomic Richness** refers to the total number of different species or families present. High richness indicates a greater variety of species, suggesting a more complex and stable ecosystem, while low richness may imply fewer species and potentially a less resilient or stressed environment. Whitefish Lake South had the highest richness, with 22 families.
- **Simpson's Evenness Index (E)** measures how evenly individuals are distributed among species. A high evenness score suggests that species are evenly distributed within the community, indicating a more balanced and stable ecosystem. A low evenness score means one or a few species dominate, which may signal an imbalanced or stressed environment. McGowan Lake had the highest evenness (E = 0.44), indicating a relatively balanced community.
- **Simpson's Diversity Index (SDI)** measures species richness and evenness. It ranged from 0.65 (Whitefish Lake North, LA-6) to 0.85 (Russell Lake, LAB-1). Higher values indicate greater diversity, suggesting that the ecosystem is more stable because it is less dependent on any single species.
- **Taxa Dominance** indicates the structure of the community based on the relative abundance of species. High dominance occurs when a few species dominate the population, suggesting less diversity and potential vulnerability. In contrast, a more even distribution of species indicates a balanced ecosystem, which is generally more ecologically stable and resilient. McGowan Lake exhibited the most diverse benthic invertebrate community, with Chironomids (44%), Phantom Midges (33%), and water fleas (11%).
- **Benthic Index of Community (B-C Index)** compares the structure of benthic communities between sites. A high B-C Index indicates significant differences in the structure of benthic communities, suggesting environmental variability or disturbance, while a low B-C Index reflects more similar community structures, typically signifying a stable or less disturbed ecosystem. McGowan Lake had a higher B-C Index (0.50), indicating greater variation in community structure compared to Whitefish Lake (0.37–0.39).

The benthic invertebrate endpoints baseline information will allow future comparisons with predicted project effects.

Radionuclide and metal concentrations for caddisfly larvae were also collected from McGowan Lake, Whitefish Lake South, Whitefish Lake North, and Russell Lake. The results are presented in the EIS (table 8.4-5) and will allow for a comparison once site activities take place.

Table 6.22 adapted from EIS: Table 3.11: Summary of benthic invertebrate endpoints for lakes within the local study area

Sample area	Mean Simpson's Diversity	Mean Simpson's Evenness	Mean Family Richness	Mean density (Individuals per m^2)	Bray-Curtis Dissimilarity	Dominant taxa
McGowan Lake (LA-1) (far-field)	0.76	0.44	12	981	0.50	Chironomids 44% Phantom Midges 33% Water Fleas 11%
Whitefish Lake South (LA-5) (near-field)	0.73	0.23	22	9,597	0.39	Water Fleas 55% Chironomids 20%
Whitefish Lake North (LA-6) (upstream reference)	0.65	0.18	17	10,163	0.37	Water Fleas 65% Chironomids 16%
Russell Lake (LAB-1) (far-field)	0.85	0.34	16	3,505	0.71	Chironomids 59% Naidid Worms 19%
Russell Lake (LAB-2) (far-field)	0.82	0.25	21	5,295	0.87	Chironomids 75% Rust Flies 13%

6.4.2 Proponent's Assessment

Denison's assessment considered sediment quality as an intermediate VC, and changes to the intermediate VCs were evaluated to facilitate the assessment of potential effects of the Project on receptor VCs. Sediment quality is assessed as a KI in the potential residual adverse effects significance determinations for the benthic invertebrates receptor VC in this section and other receptor VCs in Fish and Fish Habitat (section 7.1), Terrestrial Biota (section 7.2), the Human Environment (section 7.3), and Indigenous Land and Resource Use (section 7.4).

Denison concluded that the residual effects to sediment quality are unlikely to have significant adverse effects on receptor VCs. Additionally, Denison concluded that the residual effects of the Project are expected to result in no significant adverse effects to benthic invertebrates. More information on each project related effect and the residual effects evaluation can be found below and in the EIS section 8.4.4.

6.4.2.1 Sediment Quantity and Particle Size

Mobilization of Suspended Materials

The primary effect pathway during construction relates to the mobilization of suspended material into natural surface water features as a result of land disturbance and clearing. There is no planned discharge to Whitefish Lake during construction. The mitigation of potential mobilization of suspended material into natural surface water features will be mitigated by Denison using a mine development plan and through the implementation of standard water management and sediment control practices. Water management infrastructure (e.g., collection ditches, ponds, pumping, stations) must be put into place by Denison before the initiation of

construction activities. Surface water drainage collected as contact water during the construction Phase will be stored within management infrastructure. Any releases to the natural environment would require contaminants to be at acceptable levels prior to release (e.g., suspended solids). No downstream effects on natural sediments, or benthic invertebrate habitats are therefore expected.

During operation, mobilization of suspended materials will be managed through the water management infrastructure and the Surface Water Management Program. Releases of contact water to the natural environment will be directed through collection ponds, the industrial wastewater treatment plant (IWWTP), and the Effluent Monitoring and Release Ponds. Discharge will only be permitted to occur when COPCs are at acceptable levels. Management of TSS levels in the final discharge will be implemented to make sure discharge quality can be maintained consistently to avoid effects on sediment quantity and quality and benthic invertebrates. As necessary, Denison may employ active means (e.g., filtering) to achieve low TSS levels in discharge, in addition to passive means such as settling and clarification in the IWWTP to manage TSS in the effluent stream to low levels. No downstream effects on surface waters, natural sediments, and benthic invertebrate habitats are therefore expected.

During decommissioning, the site-wide water management system will continue to operate and Denison will be required to maintain control of the site process and contact water through the IWWTP. Surface drainage during decommissioning activities will continue to be directed to the system of collection ponds, IWWTP, and Effluent Monitoring and Release Ponds minimizing any potential for sedimentation of existing benthic habitat.

Through implementation of appropriate mitigation measures and follow up monitoring, Denison anticipates that the impact from mobilization of suspended materials on sediment quality and particle size will be negligible throughout all Project phases. Therefore, Denison determined the impact of mobilization of suspended materials from erosion and sedimentation are not expected to have residual effects on sediment.

6.4.2.2 Aquatic Habitat

Overprinting of Aquatic Habitat

Overprinting of aquatic habitat is only expected as a result of construction and commissioning of the effluent discharge/intake pipelines and discharge diffuser at Whitefish Lake. Negligible aquatic habitat loss is predicted in Whitefish Lake. The discharge pipeline and diffuser will terminate at an engineered, offshore, submerged, multiport diffuser. It will be designed to maximize the mixing potential and reduce the spatial extent of the mixing zone. The total area of the lake substrate that would be overprinted by the pipeline is expected to be approximately 135 m^2 (which will constitute less than 0.05% of the lake's surface area). The structure will remain in place during operation and decommissioning. The effects on benthic invertebrates and their physical habitat (sediments) will be confined to this area throughout the duration of the Project but will be returned to pre-construction character following removal of the infrastructure. There will be re-establishment of natural sediment distribution patterns in the lake, and recolonization of benthic invertebrates.

Through implementation of appropriate mitigation measures and follow up monitoring, Denison anticipates that the impact from overprinting of aquatic habitat on benthic invertebrates will be negligible throughout all Project phases. Therefore, Denison determined the impact of overprinting of aquatic habitat from construction of the effluent discharge and intake pipelines

and discharge diffuser are not expected to have significant residual adverse effects on benthic invertebrates.

6.4.2.3 Sediment Quality

Controlled Discharge to Receiving Environment

Discharge to the environment is not expected during construction, therefore potential effects of discharge on the Sediment Quality and Benthic Invertebrates VCs are not expected.

The potential effects on benthic invertebrates (organisms living in the sediment) during operations were evaluated through pathways involving surface water and sediment quality, considering both radiological and non-radiological substances. Surface water and sediment quality were modeled using IMPACT, as described in section 6.3.3.2 Surface Water Quality Controlled Discharge to Receiving Environment. This modeling predicted water and sediment concentrations in Whitefish Lake (where treated effluent will be released) and locations further downstream. The predicted maximum concentrations of substances in the sediment were compared to sediment quality guidelines designed to protect aquatic life. The most conservative and/or site-specific screening values were selected from several sources.:

Most predicted concentrations of substances (COPCs) did not exceed sediment quality guidelines. However, molybdenum, selenium and vanadium exceeded REF values from Burnett-Seidel and Liber (2013), though they did not exceed NE2 values, indicating a low risk. Molybdenum and selenium were already identified as COPCs based on surface water screening. There is no sediment screening value for cobalt, however cobalt was identified as a COPC in surface water. The COPCs that were already considered COPCs based on the results of the surface water screening, as well as vanadium based on the results of the sediment screening, were evaluated further in the ERA, considering both water and sediment concentrations.

The ecological risk assessment estimated dose and risk to representative aquatic receptors during all Project phases and included the uptake pathways through Surface Water Quality and Sediment Quality for benthic invertebrates. The potential for ecological effects was assessed by comparing exposure levels to toxicological benchmarks for both surface water (discussed in section 6.3.3.2) and sediment screening values presented above and characterized quantitatively in terms of total HQs. A total HQ greater than 1 indicates adverse effects may be possible for a given ecological receptor and further investigation is warranted.

For the sediment quality pathway, there were no significant adverse effects on benthic invertebrates as a result of releases during all Project phases. There were no predicted exceedances of NE2 values from sediments, therefore estimated total HQs for molybdenum and selenium for benthic invertebrates are predicted to remain below the HQ benchmark of 1. As all estimated total HQs calculated for benthic invertebrates with direct contact to sediment were below 1, this indicates low risk to benthic invertebrates from changes in sediment quality.

For the surface water quality uptake pathway, copper was the only non-radiological COPC where there were minor exceedances of surface water quality screening values protective of aquatic life. This indicates there is some potential risk to benthic invertebrates, in all waterbodies including reference locations during operations from coper concentrations in surface water (see table 6.23 below). However, these exceedances are minor and unlikely to cause population level effects (see section 6.3.3.2 Surface Water Quality Controlled Discharge to Receiving Environment for

additional details). There were no predicted exceedances of the 9.6 mGy/d radiation dose benchmark for any aquatic biota during any Project phase.

Table 6.23: Maximum HQs during Project phases for benthic invertebrates

Location	Maximum HQs during Project phases for benthic invertebrates					
	Arsenic	Cadmium	Chloride	Cobalt	Chromium	Copper
Reference (Kratchkowsky Lake)	7.10E-04	4.68E-02	7.66E-04	5.70E-03	2.30E-04	**1.49**
Whitefish Lake North	7.10E-04	4.68E-02	7.66E-04	5.70E-03	2.30E-04	**1.49**
Whitefish Lake Middle	9.38E-04	6.89E-02	1.45E-02	6.90E-03	2.99E-04	**1.97**
Whitefish Lake South	8.96E-04	6.79E-02	1.45E-02	6.88E-03	2.96E-04	**1.96**
McGowan Lake	8.05E-04	6.13E-02	9.87E-03	6.57E-03	2.77E-04	**1.80**
Russell Lake Inlet	7.69E-04	5.75E-02	7.77E-03	6.36E-03	2.65E-04	**1.72**

Location	Molybdenum	Sulphate	Selenium	Uranium	Vanadium	Zinc
Reference (Kratchkowsky Lake)	3.42E-06	9.42E-04	3.11E-03	1.07E-03	1.54E-03	2.20E-02
Whitefish Lake North	3.42E-06	9.42E-04	3.11E-03	1.07E-03	1.54E-03	2.20E-02
Whitefish Lake Middle	5.80E-04	5.28E-02	2.74E-02	1.33E-02	5.11E-03	3.02E-02
Whitefish Lake South	5.70E-04	5.25E-02	2.63E-02	1.27E-02	4.58E-03	2.98E-02
McGowan Lake	4.17E-04	3.52E-02	1.86E-02	8.84E-03	3.05E-03	2.74E-02
Russell Lake Inlet	3.17E-04	2.73E-02	1.44E-02	6.75E-03	2.50E-03	2.60E-02

Discharge to the aquatic environment of Whitefish Lake during decommissioning is expected, however effluent rates and water quality during this phase are expected to be lower than during operation. Therefore, the analysis of potential effects on sediment quality during the operations phase is considered the bounding scenario for decommissioning due to the influence of surface water quality on sediment quality and benthic invertebrates.

Denison conservatively determined that while there are no anticipated residual adverse effects from changes in sediment quality due to the controlled discharge of effluent from the Project, there is likely to be low risk to benthic invertebrates from changes in surface water quality from copper concentrations in effluent discharge. While a change from background conditions is predicted to occur, the anticipated residual effects are likely to be local to Whitefish Lake Middle and South (LA-5 North and LA-5 South) and fully reversible upon cessation of effluent deposition, with a return to baseline conditions anticipated following post-decommissioning. Through the application of mitigative measures, follow-up monitoring, and under average flow

conditions, Denison anticipates that benthic invertebrate communities will likely be resilient to potential changes. Therefore, residual effects on benthic invertebrates from changes in surface water and sediment quality due to the controlled discharge to the receiving environment are concluded to be not significant.

6.4.2.4 Long-Term Transport of Groundwater Solutes to Whitefish Lake in Future Centuries

A ‘future centuries’ scenario was used to assess the long-term future potential effects to benthic invertebrates post-decommissioning from peak concentrations of COPCs in groundwater plumes migrating from the decommissioned project site Phoenix Ore Zone area to surface water. The results of the numerical modelling support the conclusion that with the implementation of appropriate mitigation during the decommissioning and restoration phase of the Project, the residual effects of the Project on the intermediate Groundwater VC will not result in an adverse effect to surface water and benthic invertebrates.

6.4.2.5 Water Levels and Flow

The projected withdrawal and discharge rates proposed for the Project are the largest influence on the hydrological effects of the Project. Lake levels are expected to deviate less than ±0.01 m due to all Project influences. All Project influences on the environment are expected to return to baseline conditions during post-decommissioning. These changes are within the range of fluctuation of environmental flows and water levels and are unlikely to affect the distribution of sediments as habitat for benthic invertebrates in the LSA.

Through implementation of appropriate mitigation measures and follow up monitoring, Denison anticipates that the impact from changes in water levels and flows on benthic invertebrates will be negligible throughout all Project phases. Therefore, Denison determined the impact of changes to water levels and flows from the water intake and effluent discharge are not expected to have significant residual adverse effects on benthic invertebrates.

6.4.2.6 Mitigation Measures

Denison has proposed the following measures in table 6.18 to mitigate the potential adverse effects from identified project activities on sediment quality and benthic invertebrates. The proposed mitigation measures are consistent with those used to mitigate adverse effects on surface water quantity and quality. CNSC staff have assessed the mitigation measures proposed by Denison and have concluded that they are adequate to manage potential significant adverse effects to sediment quality and benthic invertebrates. See a summary in table 6.24 below.

Table 6.24: Proposed mitigation measures to address effects on sediment quality and benthic invertebrates

Residual effect #1 **Mobilization of suspended materials – Change in sediment quantity and particle size**
• Maintain existing drainage patterns with the use of culverts, where applicable. • Maintain access roads by periodically regrading and ditching to improve water flow, reduce erosion, and manage vegetation growth. • Inspect culverts periodically. Remove accumulated material and debris upstream and downstream of the culverts to prevent erosion, flooding, habitat damage, property damage, and mobilization of sediment. • Attenuate peak discharges and augment baseflows to the environment through the use of Project water storage features (i.e., runoff, process water, contact water, monitoring/effluent ponds). • Develop and implement a Surface Water Management Program that provides an integrated framework to manage water quality and includes provision for water management practices for each of the primary site aspects, as well as areas of the site where there is contact water.
Residual effect #2 **Controlled discharge to receiving environments- Change in sediment quality (Chemical)**

• Design the discharge diffuser/outfall to have the smallest footprint possible while still providing effective mixing and dilution and discharge flows that do not detrimentally affect sediments.
• Develop site-specific effluent treatment to treat COPC to appropriate release limits in accordance with provincial standards and licence/permit conditions.
• Discharge effluent under a scenario that will meet provincial and federal discharge criteria, as identified through permitting. i.e.,
  o Discharging at a fixed rate while maintaining an appropriate minimum dilution ratio.
  o Discharging under a variable waste load allocation (i.e., discharge an appropriate effluent volume based on flow in the receiver to maintain minimum dilution ratio).
  o Managing discharge via a hybrid of the two previous options (i.e., discharge effluent at a fixed rate to maintain the required dilution ratio, but the fixed rate is varied on a seasonal basis based on flow).
• Collect and monitor contact water to determine whether treatment is required prior to release to the environment, informing optimal levels of treatment.
• Maintain the water management system in place during decommissioning until such time that water quality is suitable to release to the environment.
• Monitor and manage effluent, including contingency for effluent treatment as may be required, so that water discharge objectives are achieved, as defined by applicable provincial and federal regulatory instruments.
• Design and implement an Environmental Code of Practice that defines actions levels and appropriate steps to mitigate elevated concentrations of chemical and radiological constituents in treated effluent discharge to acceptable levels.
• Implement Project-specific monitoring programs (e.g., effluent monitoring plan, environmental monitoring plan) that include monitoring treated effluent, surface water, and sediment quality and applying adaptive management if necessary.
• Work with the associated communities to develop and implement the Project-specific monitoring programs and a framework to share the results for the purpose of assessing the performance of the water management system.
• Develop and implement a decommissioning and reclamation plan to decommission and transfer the site to the province under the Institutional Control Program.

Residual effect #3 Overprinting of aquatic habitat- Change in aquatic habitat (Area)
• Design the discharge diffuser/outfall to have the smallest footprint possible while still providing effective mixing and dilution and discharge flows that do not detrimentally affect sediments.
Residual effect #4 Surface water withdrawal and discharge/changes in drainage-Change in water level or flow
• Maximize the recycle and reuse of process water to reduce freshwater intake and release to Whitefish Lake. • Maintain existing drainage patterns with the use of culverts, where applicable.

6.4.2.7 Monitoring and Follow-Up Measures

In order to verify the accuracy of the assessment and assess the effectiveness of the mitigation measures, Denison will implement the following EA follow-up measures.

The sediment quality and benthic invertebrate monitoring program will be considered in conjunction with the surface water quantity (hydrology) and surface water quality monitoring programs.

Table 6.25: Follow-up program measures for effects on sediment quality and benthic invertebrates

Residual effect #1 Change sediment quantity and physical quality (Particle Size)
• collecting and recording surface water quality to confirm that source and receiving water quality predictions for mobilization of solids are consistent with those presented in the EIS • monitoring of TSS in the effluent monitoring ponds and other catchment ponds prior to discharge
Residual effect #2 Change in sediment quality (Chemical)
• Monitoring to confirm that effluent and receiver sediment quality meet applicable regulation criteria. o The monitoring and follow-up program will include measurement of sediment quality parameters to meet regulatory criteria (i.e., provincial discharge permits, MDMER and CSA N288.4). This must include collection of non-radiological parameters (e.g., metals, nutrients, pH, and sulphate), radiological parameters, and physical characteristics (grain size)).
• Monitoring benthic invertebrate community structure and abundance in the near-field discharge area to assess any changes that may be attributable to the Project. o This will include reasonable replication over a geographic area. Metrics assessed will be associated with benthic invertebrate community diversity, evenness, density, taxa richness, and similarity indices. o Sediment and benthic invertebrate monitoring will occur in tandem and sampling locations will be co-located to facilitate comparison of benthic invertebrate community metrics with sediment quality characteristics. o Sediment and benthic invertebrate monitoring in the natural environment will occur at the point of discharge in Whitefish Lake South (near-field), at an upstream reference location (Whitefish Lake North), and at downstream locations (far-field). The far-field monitoring locations will be located in Whitefish Lake South prior to its discharge to McGowan Lake. Constituent concentrations will be compared to the values used in the EIS and to applicable regulatory criteria or objectives.

Residual effect #3 Overprinting of aquatic habitat - Change in aquatic habitat (Area)
No additional follow-up monitoring requirements to those listed above.
Residual effect #4 Surface water withdrawal and discharge/changes in drainage-Change in water level or flow
No additional follow-up monitoring requirements to those listed above and required in section 6.3.3.1 Table 6.9 for Surface Water Quantity.

6.4.3 Other Views Expressed

6.4.3.1 Potential Impacts to Sediment and Benthic Invertebrates

Indigenous Nations and Communities

ERFN noted their concerns that metal concentrations in sediment will have a potential adverse impact to benthic invertebrate composition and abundance. ERFN also raised concerns regarding potential contamination of sediments from effluent release and the potential for adverse impacts to bottom-feeding fish such as White sucker.

Concerning baseline sample collection, ERFN recommended additional sediment samples be taken to get a more representative baseline of sediment makeup and health. Further to this, ERFN raised concerns that sediment baseline conditions were predicted from surface water conditions and requested Denison additional monitoring sites for sediments within Northern Pike spawning habitat.

ERFN recommended that Denison complete benthic invertebrate sampling upstream of South Whitefish Lake to sufficiently characterize the benthic invertebrate community. ERFN recommended that additional benthic invertebrate sampling as benthic invertebrates are sensitive end points in aqueous and sediment metal concentrations.

YNLR raised concerns that sampling be conducted to confirm Denison's statement in the EIS that sediment quality in Whitefish Lake and downstream of the proposed Project is not anticipated to be impacted by, and overlap with, Key Lake operations.

MN-S expressed concern to Denison that Métis Knowledge was not incorporated into sediment monitoring plans for the Project.

BNDN raised concerns that baseline sampling lacked sampling mercury in sediments. BNDN raised this concern as mercury biogeochemistry can adversely impact the environment through receptors such as soil and sediments and requested Denison include mercury as a contaminant of potential concern for sediments.

Federal Authorities

ECCC noted numerous inconsistencies in the modeling which limit confidence in residual effects to water and sediment quality from the Project, and recommends monitoring and follow-up plans to verify the effects and implement adaptive management if required. ECCC also noted that the analysis approach for baseline conditions (e.g., smoothing data over locations and seasons) introduced uncertainty and may limit ability to detect changes related to the Project. Sediment in wetlands was not characterized well enough to determine if it would act as a sink for heavy metals. ECCC recommended additional sampling of sediment and benthic invertebrates and additional mitigation measures to protect wetlands.

6.4.3.2 Summary of Mitigations and Commitments related to Views Expressed

Denison has committed to implementing various mitigation and monitoring measures to limit any adverse effects on sediment and benthic invertebrates (Commitments 8-28 to 8-35). These include monitoring sediment quality and benthic invertebrates to verify accuracy of predicted effects and mitigation measure efficacy, monitoring total suspended solids in effluent ponds prior to discharge, monitoring benthic invertebrate community structure and abundance in near-field discharge areas, monitoring sediment for non-radiological (e.g., metals, nutrients, pH, sulfate), radiological parameters, and physical characteristics, and pairing sediment and invertebrate sampling locations, and including surface water monitoring, to facilitate the identification of trends in the fate and effects of effluent. Denison has also committed to sampling sediment and benthic invertebrates at the point of discharge in Whitefish Lake South, at an upstream reference location (Whitefish Lake North), and a downstream location in Whitefish Lake South prior to its discharge into McGowan Lake.

For specific monitoring and follow-up plans for sediment and benthic invertebrates, Denison has committed to refining and finalizing the approach and metrics following consultation with Indigenous groups, among other relevant groups. Denison has committed to a pre-operational Environmental Effects Monitoring to facilitate a Before-After-Control-Impact study design to monitor the impact of the project on water and sediment quality, benthic invertebrates, and fish health. Denison has also committed to collecting additional aquatic baseline characterization data, including wetlands data, to further refine predictions of risk to the aquatic environment and assess effectiveness of proposed mitigation measures. With regards to concerns from ECCC, Denison will be required through an EA condition to collect additional baseline water and sediment quality data prior to disturbance of the baseline and update the modelling with this additional data to address concerns related to modelling uncertainty and ability to detect changes related to the Project, and validation of model calibration (Table 12.1 EA2). Finally, Denison has also committed to collecting monitoring data on mercury and methylmercury in the aquatic environment over the life of the Project (Commitments 8-42 and 8-44).

Denison has also committed to considering local and IK/MK in all areas of the project through continued engagement. Denison provided funding to ERFN and KML to complete updated traditional land use studies which were incorporated into the EIS. In addition, YNLR provided Denison with their traditional land use information entitled *An Exploration of Recorded Athabasca Denesųłine´ Traditional Knowledge, Land Use and Occupancy Information in the Vicinity of Denison Mines Wheeler River Project*. Lastly, Denison signed a funding agreement with MN-S **to** complete a Métis Knowledge Study, which was shared with Denison in October 2023. Denison revised the EIS to include relevant information in the assessment from these studies.

6.4.4 CNSC Staff Analysis

6.4.4.1 Change in Sediment Quantity and Physical Quality (Particle Size)

CNSC staff reviewed Denison's effect assessment on sediment and benthic invertebrates related to the change in sediment quantity and particle size and confirmed that Denison conducted a comprehensive analysis of these effects and that identified mitigation and follow-up monitoring program measures are adequate.

6.4.4.2 Change in Aquatic Habitat (Area)

CNSC staff reviewed Denison's effect assessment on sediment and benthic invertebrates related to the change in aquatic habitat (area) and confirmed that Denison conducted a comprehensive analysis of these effects and that identified mitigation and follow-up monitoring program measures are adequate.

6.4.4.3 Change in Water Level or Flow

CNSC staff reviewed Denison's effect assessment on sediment and benthic invertebrates related to the change in water level or flow and confirmed that Denison conducted a comprehensive analysis of these effects and that identified mitigation and follow-up monitoring program measures are adequate.

6.4.4.4 Change in Sediment Quality (Chemical)

Controlled Discharge to the Receiving Environment

CNSC staff reviewed Denison's effect assessment on sediment and benthic invertebrates related to the change in sediment quality (chemical) and confirmed that Denison conducted a comprehensive analysis of these effects and that identified mitigation and follow-up monitoring program measures are mostly adequate. However, CNSC staff have proposed several EA Conditions for Denison to address during licensing, including some additional baseline data collection and modelling updates (see table 12.1, EA2).

In the proposed EA conditions, CNSC staff require that Denison collect additional baseline data for water and sediment quality and update the ERA with this data to address these concerns, for CNSC review and acceptance prior to any in-water works for construction (see table 12.1, EA2). Although this baseline data is not anticipated to alter the determination of significant adverse effects, the additional baseline data will inform future environmental risk assessments and strengthen future analysis. Specific concerns regarding sediment baseline data focused on the lack of sediment characterization data in wetlands, which are typically depositional areas that could have higher risk factors for aquatic receptors occupying habitat in these areas, and use of regional sediment coefficients (i.e., Kd values) for model calibration in the ERA, rather than site-specific Kd values calculated from measured data. The proposed EA Condition establishes that Denison will submit an updated ERA incorporating additional baseline water and sediment quality data for CNSC review and acceptance during licensing, prior to any in-water works for construction (see table 12.1EA2). Denison will also validate measured water and sediment quality data against regional Kd values, and once sufficient monitoring data is available, review calculating site-specific Kd values as needed and incorporate site-specific Kd values as part of required ERA updates for licensing. If there are any increases to the risk profiles of receptors exceeding EA predictions due to updates from the incorporation of additional baseline data into the ERA, Denison has committed to addressing these concerns through the implementation of additional mitigation measures, monitoring, and/or adaptive management as needed.

In addition to these requirements, Denison has also committed to collect additional baseline characterization data of wetlands including sediment quality and benthic invertebrate community data (Commitment 8-45), and will include adding mercury and methylmercury to the aquatic environmental sampling plans to confirm there are no unexpected effects of the project on methylmercury levels, and to satisfy stakeholder concerns (Commitment 8-44).

Long-term Transport of Groundwater Solutes to Whitefish Lake (in Future Centuries)

CNSC staff reviewed Denison's effect assessment on sediment quality and benthic invertebrates related to the long-term transport of groundwater solutes to Whitefish Lake in the future centuries scenario, and confirmed that Denison conducted a comprehensive analysis of these effects and that identified mitigation and follow-up monitoring program measures are adequate.

6.4.4.5 Summary of CNSC's assessment on predicted residual effects on sediment quality and benthic invertebrates

CNSC staff reviewed the assessment of predicted residual effects on sediment quality and benthic invertebrates due to change in sediment quantity and particle size, change in sediment quality (chemical), change in aquatic habitat (area), and change in water level or flow. CNSC staff reviewed Denison's conclusions that with the implementation of appropriate mitigation measures and the effects being characterized as low magnitude, localized, and fully reversible, the residual effects on sediment quality and benthic invertebrates are predicted to be not significant. CNSC staff verified Denison's determination that surface water quality in the receiving environment is likely to be moderately adversely impacted by the controlled discharge of effluent from the Project throughout the operation and decommissioning phases and that there are potential low levels of risk to benthic invertebrates from surface water quality. However, residual effects are expected to be localized and fully reversible following Project post-decommissioning, and benthic invertebrate communities will likely be resilient to potential changes (see section 6.3.6 for more details).

CNSC staff reviewed Denison's models and predictions for effects to sediment quality and benthic invertebrates and confirmed that Denison conducted a comprehensive analysis of these effects. Furthermore, CNSC staff reviewed Denison's identified mitigation and follow-up monitoring program measures for the identified effects and have found that they are adequate.

CNSC staff also conducted an effects significance determination for the identified effects, taking into account input from other federal departments, provincial ministries, Indigenous Nations and communities and the public, and determined that the identified changes to sediment quality and benthic invertebrates are expected to be not significant due to the implementation of mitigation measures and not cause significant changes to the sediment quality or benthic invertebrate population health.

6.4.5 CNSC Staff Findings and Recommendations

Taking into account the implementation of mitigation measures and recommended follow-up program measures, CNSC staff conclude the Project is not likely to cause significant adverse effects on sediment quality and benthic invertebrates. The effects significance determination table can be found in appendix B.

In order to ensure that the aforementioned assessment conclusions remain valid, CNSC staff recommend that the Commission include the following EA Condition, should it issue a licence. If accepted, Denison will be required to address EA Condition EA2 in table 12.1 related to IRs carried over from the EA Review into licensing. CNSC's assessment conclusions are contingent on the establishment of these EA Conditions.

6.5 Terrestrial environment

The proposed Project could potentially cause changes to the terrestrial environment. The proposed Project could potentially cause changes to terrain, soil, and organic matter through:

- change in terrain morphology and stability
- change in soil quantity and quality
- change in quantity of organic matter/peat

The proposed Project could potentially cause changes to vegetation and ecosystems through:

- change in the areal extent of habitat types
- change in the areal extent of wetlands
- change in the number of plants of conservation concern
- change in concentrations of constituents of potential concern (COPCs) in vegetation

CNSC staff concurred with Denison's assessment of Project activities that may interact with soil, terrain, organic matter/peat, vegetation and ecosystems, and cause residual effects during all phases of the project, as detailed below.

6.5.1 Description of soil and vegetation in the terrestrial environment

The proposed Project site is located near the Wheeler River and the landscape in the RSA is characterized by gently sloping terrain with long winding ridges and hills, and supports mostly undeveloped forested upland, with lowland, waterbodies, and anthropogenically disturbed land present as well. The region has undergone previous disturbance associated with land use activities such as road development, seismic lines, and mineral exploration. Additionally, fire disturbance is naturally prevalent within the area and vegetation communities are commonly in various stages of post-fire regeneration.

The Athabasca Plain Ecozone, where the Project is located, is predominated by Brunisols. As such, Sandy Dystric Brunisols are the predominate mineral soils within the RSA. These soils are typically acidic, hold low fertility and organic matter content, resulting in relatively shallow rooting depths. Topsoils, representing the soil's uppermost and most bioactive portion, feature only a thin surface organic layer followed by a thin sand-textured horizon. Organic soils are limited in the Project Area, as they are commonly associated with lowland sites occurring within or near wetlands and waterbodies which only account for <1% of the Project Area. Based on these soil characteristics and composition, the soil salvage potential and suitability for reclamation are expected to be fair to poor, reflecting the limitations of the growing substrate to support revegetation. While limited, surface organic materials are salvageable and can be used as an organic amendment during reclamation. Soil samples taken throughout the RSA indicated that metals and radionuclides of potential concern do not exceed soil quality guidelines for environmental and human health.

Upland forests are common in the Boreal Shield and prevalent throughout the RSA (73%). These forests are characterized by open stands of Jack Pine (*Pinus banksiana*) and mixed stands of Jack Pine and Black Spruce (*Picea mariana*). Wetland ecosystems are less common and represent 17% of the RSA, including swamps, bogs, fens, and shallow open water. Waterbodies represent the most common wetland ecosystem, followed by the black spruce treed bog and the Labrador tea shrubby bog. One plant species of conservation concern, Alaskan Clubmoss (*Diphasiastrum sitchense*), was observed in the RSA during baseline surveys, although not close to the Project Area. Alaskan Clubmoss is a low-growing evergreen forb that typically inhabits open transitional

zones between upland jack pine stands and forested bogs. Potential exists for unobserved occurrences of other species.

Several native plant species are harvested and collected for cultural uses by Indigenous Nations and communities, such as berries, rice, wild mint, Labrador tea, and sweet grass. These plants are common within the various vegetation communities and ecosystems in the RSA. Samples of lichen and blueberry leaves, stems, and berries were taken throughout the RSA and analysed for metals and radionuclides of potential concern to inform a risk assessment for humans and terrestrial animals ingesting vegetation and/or berries. The sampling program found that concentrations of metals and radionuclides of potential concern in vegetation were generally consistent across locations with the exception of sites near Highway 914 which exhibited elevated concentrations.

6.5.2 Proponent's Assessment

Denison concluded that the residual effects of the Project are expected to result in no significant adverse effects to soil, vegetation and ecosystems. More information on each project related effect and the residual effects evaluation can be found below and in the EIS sections 9.1 and 9.2.

6.5.2.1 Soil

Change in terrain morphology and stability

Denison predicted residual adverse changes in terrain morphology and stability. Although the RSA is mostly undeveloped, the project is located on terrain that has experienced anthropogenic disturbance associated with previous mining exploration. Most changes to terrain will occur due to major earthworks during the construction and decommissioning phases. There is potential for indirect effects including alteration to overland surface water flow and erosion. Denison noted that project features will be reclaimed during decommissioning, although some features such as the clean waste rock pile may be integrated into the end-landscape. Since the project is sited on terrain that avoids steep or unstable landscape features, the changes are anticipated to be within the range of natural variation. More detailed information can be found in the EIS sections 9.1.5 and 9.1.6.2.

Through implementation of appropriate mitigation measures and follow up monitoring, Denison anticipates that the impact of changes in terrain morphology and stability on soil will be negligible throughout all Project phases. Therefore, Denison determined the impact of changes in terrain morphology and stability from major earthworks are not expected to have significant residual adverse effects on soil.

Change in soil quantity and quality

Denison predicted residual adverse changes in soil quantity and quality. Mineral soil resources will be stripped, salvaged, and stockpiled prior to construction to conserve soil quantity and quality. This process could lead to a loss in soil quantity and changes in soil physical and chemical properties. Open-source dust, process-source dust, and project emissions are predicted to change concentrations of COPC in soil through deposition, although no exceedances of soil quality guidelines are expected. During reclamation, salvaged soil will be redistributed, however, soil suitability for reclamation is expected to be poor which can affect revegetation. Overall, changes are expected to be within the range of natural variation. Denison concluded that taking

into account the mitigation measures, residual effects are not significant. More detailed information can be found in the EIS sections 9.1.5 and 9.1.6.3.

Through implementation of appropriate mitigation measures and follow up monitoring, Denison anticipates that the impact of changes in soil quantity and quality will be negligible throughout all Project phases. Therefore, Denison determined the impact of changes in soil quantity and quality from major earthworks and project emissions are not expected to have significant residual adverse effects on soil.

Change in quantity of organic matter/peat

Denison predicted residual adverse changes in quantity of organic matter/peat. Direct effects are limited since lowland sites with organic matter/peat account for less than 1% of the Project Area. There is the possibility of indirect effects from changes in surface water quality and hydrologic connectivity that could affect peat-forming processes. However, project features will be reclaimed which includes reinstating surface drainage patterns. Conditions that support peat-forming processes are expected to be within the range of natural variation. Denison concluded that taking into account the mitigation measures, residual effects are not significant. More detailed information can be found in the EIS sections 9.1.5 and 9.1.6.4.

Through implementation of appropriate mitigation measures and follow up monitoring, Denison anticipates that the impact from changes in quantity of organic matter/peat on soil will be negligible throughout all Project phases. Therefore, Denison determined the impact of changes in the quantity of organic matter/peat from project activities are not expected to have significant residual adverse effects on soil.

Mitigation Measures for Soil

Denison has proposed the following measures to mitigate the potential adverse effects from identified project activities on soil. CNSC staff have assessed the mitigation measures proposed by Denison and have concluded that they are adequate to manage potential significant adverse effects to soil. See a summary in table 6.26 below.

Table 6.26: Proposed mitigation measures to eliminate, reduce, or control potential adverse effects on soil (prior to residual effects characterization)

Change in terrain morphology and stability
• Project design to minimize footprint and area of physical disturbance.
• Project siting on terrain that avoids steep or unstable landscape features.
• Appropriate setbacks from areas prone to potential instability and areas in proximity to waterbodies and drainage features.
• Siting of project and temporary workspaces and laydown areas on existing cleared or previously disturbed land.
• Implementation of sediment and erosion control measures during all project phases.
• Implementation of surface water management features during all project phases.
• Progressive decommissioning and reclamation to re-instate predominant landscape features, topographical contours, and surface drainage patterns in order to maintain surface drainage continuity and hydrologic connectivity.
Change in soil quantity and quality
• Project design to minimize footprint and area of physical disturbance.

• Sequencing of construction activities to enable salvaging of mineral soil.
• Stripping, salvaging, and stockpiling soil prior to construction following best management practices.
• Implementation of sediment and erosion control measures during all project phases.
• Implementation of surface water management features during all project phases.
• Siting of stockpiling location to reduce soil handling and travel distances and designed to minimize potential for degradation.
• Implementation of a Spill Response Plan to address leaks, spills, or releases that may affect soil quality.
• Implementation of dust suppression measures and mitigation of open-source dust and process-source dust.
• Access and traffic management to limit dust deposition on soil.
• Use of wash bay to clean and decontaminate equipment.
• Reclamation using salvaged soil to provide growing substrate for reestablishment of vegetation.
• Reclamation trials/research at the project to inform and refine the revegetation strategy.
• **Change in quantity of organic matter/peat**
• Project design to minimize footprint and area of physical disturbance.
• Project siting that minimizes areas of wetlands to be cleared.
• Stripping, salvaging, and stockpiling organic matter/peat prior to construction following best management practices.
• Implementation of sediment and erosion control measures during all project phases.
• Implementation of surface water management features during all project phases.
• Management of surface water drainage to facilitate surface drainage continuity and hydrologic continuity to support wetland vegetation and peat-forming processes.
• Sequencing of construction activities to enable salvaging of organic matter.
• Progressive decommissioning and reclamation to re-instate predominant landscape features, topographical contours, and surface drainage patterns in order to maintain surface drainage continuity and hydrologic connectivity.

Monitoring and Follow-Up Measures

In order to verify the accuracy of the assessment and determine the effectiveness of the mitigation measures, Denison will implement the following EA follow-up measures.

Table 6.27: Follow-up program measures for effects on soil

Change in terrain morphology and stability
• Construction monitoring to verify that the project is built to design specifications and meets geotechnical requirements
Change in soil quantity and quality
• Soil monitoring (inventory) during salvage and stockpiling prior to construction
• Periodic soil monitoring of stockpiles during operation to verify stability
• Periodic soil quality monitoring from permanent sampling locations for analysis of COPCs during operation
• Monitoring post-decommissioning to verify the status and final conditions of the reclaimed landscape
Change in quantity of organic matter/peat

• Soil monitoring (inventory) during salvage and stockpiling prior to construction
• Periodic soil monitoring of stockpiles during operation to verify stability
• Periodic soil quality monitoring from permanent sampling locations for analysis of COPCs during operation
• Monitoring post-decommissioning to verify the status and final conditions of the reclaimed landscape

6.5.2.2 Vegetation and ecosystems

Change in the areal extent of habitat types

Denison predicted residual adverse changes in the areal extent of habitat types. Vegetation clearing and grading is expected to result in direct disturbance and loss of habitat. Up to 169.6 ha of habitats within the RSA are anticipated to be cleared, comprised of 24.8 ha that have experienced historic anthropogenic disturbance, 144.5 ha of terrestrial habitats, and 0.5 ha of wetland habitats – the majority of which are common habitats in the RSA. In addition, indirect effects include edge effects, possible introduction and proliferation of invasive plants, and changes in water quantity and quality that can alter moisture regimes. A total of 992.2 ha of habitats within the RSA may experience indirect effects, including up to 851.0 ha of terrestrial habitats and up to 97.7 ha of wetland habitats. In addition, Denison noted that ecosystems within the RSA have experienced frequent fire disturbance as well as historic fragmentation from previous exploration activities. Reclamation is anticipated during decommissioning and habitat types are expected to regenerate over time. Edge effects are expected to decrease as a result of natural encroachment of native species along forest edges. However, some project features will not be reclaimed such as primary access roads, although traffic is reduced at the end of decommissioning. This comes along with reduced risk of introducing and spreading invasive plants. Denison concluded that habitats are not altered to an extent where they are not sustainable or unavailable to contribute to ecological functions. More detailed information can be found in the EIS sections 9.2.4.2.1 and 9.2.6.2.1.

Through implementation of appropriate mitigation measures and follow up monitoring, Denison anticipates that the impact of changes in the areal extent of habitat types on vegetation and ecosystems will be negligible throughout all Project phases. Therefore, Denison determined the impact of changes in the areal extent of habitat types from vegetation clearing and grading are not expected to have significant residual adverse effects on vegetation and ecosystems.

Change in the areal extent of wetlands

Denison predicted residual adverse changes in the areal extent of wetlands. While the project footprint is designed to avoid wetland habitats, up to 0.5 ha of wetlands are expected to be directly disturbed during construction. The wetland type most directly affected is bogs (0.4 ha), followed by fens (0.1 ha). This direct disturbance is expected to be restricted to wetlands located at access road stream crossings and the transmission line corridor. However, the use of single span bridges enables avoidance of direct wetland disturbance during construction associated with the crossings of Kratchkowsky Creek and Hart Creek. In addition, indirect effects include edge effects, possible introduction and proliferation of invasive plants, and changes in water quantity and quality that can alter natural drainage patterns, moisture regimes, and sediment deposition. A total of 97.7 ha of wetlands within the RSA may experience indirect effects, including 49.0 ha of shallow open water, 45.2 ha of bogs, and 3.5 ha of fens. No swamps are anticipated to be affected directly or indirectly. Reclamation is anticipated during decommissioning to re-establish

natural hydrologic conditions and drainage patterns, enabling altered wetlands to regain their structure and functions. Denison noted that while wetlands typically exhibit low resilience to disturbance, wetlands in the area have experienced frequent fire disturbance as well as historic fragmentation. Denison concluded that wetlands are not altered to an extent where they are not sustainable or unavailable to contribute to ecological functions. More detailed information can be found in the EIS sections 9.2.4.2.1 and 9.2.6.4.1.

Through implementation of appropriate mitigation measures and follow up monitoring, Denison anticipates that the impact of changes in the areal extent of wetlands on vegetation and ecosystems will be negligible throughout all Project phases. Therefore, Denison determined the impact of changes in the areal extent of wetlands from construction of project infrastructure, edge effects, invasive plant introduction, and changes in water quantity and quality are not expected to have significant residual adverse effects on vegetation and ecosystems.

Change in the number of plants of conservation concern

Denison predicted residual adverse changes in the number of plants of conservation concern. One plant species of conservation concern, Alaskan Clubmoss (*Diphasiastrum sitchense*), was observed locally abundant in the RSA during baseline surveys. The species is listed as "Vulnerable (S3)" in Saskatchewan, indicating a moderate risk of extinction or extirpation. No listed plant species have been observed close to the project, and therefore no direct disturbance is expected. However, potential exists for unobserved occurrences as the Project Area has been revised since surveys were performed, and because field surveys cannot confirm the absence of plants of conservation concern. The planned pre-clearance and pre-construction surveys are designed to mitigate this uncertainty, with focus on ecosites not encountered during baseline surveys as well as within selected areas that could support listed plants. Listed plants typically inhabit specialized habitats that occur infrequently on the landscape, and once lost, are unlikely to regenerate. Should they be detected during pre-clearance and pre-construction surveys, site- and species-specific mitigation measures will be developed. In addition, indirect effects include edge effects, possible introduction and proliferation of invasive plants, and changes in water quantity and quality that can alter moisture regimes. However, indirectly affected plants may naturally re-establish over time. Denison concluded that plants of conservation concern are not altered to an extent where they are not sustainable or unavailable to contribute to ecological functions. More detailed information can be found in the EIS sections 9.2.4.2.1 and 9.2.6.3.1.

Through implementation of appropriate mitigation measures and follow up monitoring, Denison anticipates that the impact of changes in the number of plants of conservation concern on vegetation and ecosystems will be negligible throughout all Project phases. Therefore, Denison determined the impact of changes in the number of plants of conservation concern from vegetation clearing and infrastructure construction are not expected to have significant residual adverse effects on vegetation and ecosystems.

Change in concentrations of COPCs in vegetation

Denison predicted residual adverse changes in concentrations of COPCs in vegetation. Since vegetation within the Project Area will be cleared, the majority of deposition and uptake of COPCs in vegetation is expected to occur outside of the Project Area within the vegetation LSA, reflecting 992.2 ha of vegetation. These plants can be directly exposed to COPCs in atmospheric emissions and dust, or indirectly through root uptake from contaminated soil or water. Open-source, fugitive dust may arise from traffic on roads and via aircraft and is expected to contain

metals and trace elements originating from oil, grease, hydraulic fluids, fuel additives, and wear of vehicle and equipment parts. In addition, air emissions from fossil fuel combustion and power generation may disperse metals and trace elements into the ambient air. Process-source dust can contain radionuclides originating from ore bodies and mining/process waste materials. Moreover, release of effluent, or leaks and spills, to surface water have the potential to mobilize COPCs into natural waterbodies, which can then be transported to vegetation. Through these pathways, COPCs have the potential to affect plants by reducing plant health, changing plant abundance and ecosystem composition, and potentially changing their nutritional value and toxicity to wildlife. However, changes are expected to be confined along the boundaries of roads and near areas of active soil disturbance, and mitigated through measures such as dust suppression, surface water and waste management.

Denison modelled of the dispersion and uptake of COPCs in tissues of blueberry, lichen, browse, and Labrador tea, considering normal operations. The modelling predicted no significant adverse effects on terrestrial plants from hazardous substances during all project phases. Similarly, there were no exceedances of radiation dose benchmarks for terrestrial plants. To verify these predictions, Denison committed to conduct periodic monitoring of vegetation samples throughout all project phases via collection from ten permanent sampling locations and analysis of COPCs. More detailed information can be found in the EIS sections 9.2.4.2.2 and 9.2.6.2.2, as well as in appendix 10-A (ERA).

Through implementation of appropriate mitigation measures and follow up monitoring, Denison anticipates that the impact of changes in concentrations of COPCs in vegetation will be negligible throughout all Project phases. Therefore, Denison determined the impact of changes in in concentrations of COPCs in vegetation from project emissions are not expected to have significant residual adverse effects on vegetation and ecosystems.

Mitigation Measures for Vegetation and Ecosystems

Denison has proposed the following measures to mitigate the potential adverse effects from identified project activities on vegetation and ecosystems. CNSC staff have assessed the mitigation measures proposed by Denison and have concluded that they are adequate to manage potential significant adverse effects to water quantity. See a summary in table 6.28 below.

Table 6.28 Proposed mitigation measures to eliminate, reduce, or control potential adverse effects on vegetation and ecosystems (prior to residual effects characterization)

Change in the areal extent of habitat types
• Project design to minimize footprint and area of vegetation disturbance
• Invasive plant management to avoid introduction and spread
• Progressive reclamation and ongoing decommissioning when possible
• Ecosystem-based revegetation using suitable native species
Change in the areal extent of wetlands
• Project design to minimize footprint and area of wetland disturbance
• Delineation of wetland boundaries in the proximity of planned disturbance with appropriate setbacks
• Surface water management to facilitate drainage continuity and hydrologic connectivity
Change in the number of plants of conservation concern

• Project design to minimize footprint and avoid disturbance of plants of conservation concern
• Species-specific mitigation measures for identified plants of conservation concern in the vegetation local study area
• Herbicide use avoided within 100 m of plants of conservation concern
Change in concentrations of COPCs in vegetation
• Waste and hazardous materials management to minimize risk of accidental spills and leakage
• Air quality programs to reduce air emissions to the extent practical
• Control of snow melt and runoff to prevent release of contaminated runoff
• Road and traffic management to reduce open source and fugitive dust deposition
• Monitoring of process-source dust
• Avoidance of dust-generating activities during dry and high-wind conditions

Monitoring and Follow-Up Measures

In order to verify the accuracy of the assessment and determine the effectiveness of the mitigation measures, Denison will implement the following EA follow-up measures.

Table 6.29 Follow-up program measures for effects on vegetation and ecosystems

Change in the areal extent of habitat types
• Targeted monitoring and inspection during construction to verify compliance and evaluate success of mitigation measures, e.g., whether mitigation measures have been appropriately applied, maintained, and removed, where necessary
• Periodic vegetation monitoring throughout all project phases
• Periodic invasive plant monitoring within susceptible areas such as roads, stockpiles, and disturbed habitats
• Monitoring of progressive reclamation and revegetation of disturbed areas
Change in the areal extent of wetlands
• Construction monitoring to verify compliance and evaluate success of mitigation measures
• Monitoring of progressive reclamation and revegetation of disturbed areas
Change in the number of plants of conservation concern
• Pre-clearance and pre-construction surveys in the Project Area targeted to ecosites not previously surveyed and ecosites with high potential to support plants of conservation concern
Change in concentrations of COPCs in vegetation
• Periodic vegetation quality monitoring from permanent sampling locations for analysis of COPCs

6.5.3 Other Views Expressed

6.5.3.1 Potential Impacts to Soils and Vegetation

Indigenous Nations and Communities

ERFN raised concerns about Denison's Environmental Risk Assessment, where samples of terrestrial lichens, blueberry and soils showed consistent radionuclide levels when compared to Rio Tinto's Roughrider Project; however, several metal parameters for these samples were elevated in comparison.

YNLR indicated their concerns regarding the Project impacts to area soils in the LSA and RSA, as the extensive seismic network from exploration and proposed Project in Northern Saskatchewan may adversely impact soils, vegetation and wetlands, particularly when assessing edge effects of fragmented habitats. In addition, YNLR raised concerns related to potential impacts to caribou as a result of vegetation regeneration in the Project Area.

BNDN noted that Denison's baseline soil sampling program did not include mercury concentrations in terrestrial and wetland soils downstream of the proposed Project. Including mercury as a potential contaminant of concern in studies would allow for a determination of changes in mercury in soils in the downstream receiving environment.

PBCN raised concerns that the Project may have adverse impacts to vegetation in the proposed Project Area.

6.5.3.2 Revegetation

Indigenous Nations and Communities

ERFN requested that in addition to committing to using seed mix that is certified weed-free for revegetation/reclamation, that Denison should also include plants of medicinal and traditional importance in revegetation/reclamation plans. In addition, ERFN requested Denison prepare the site in ways that will promote natural revegetation of areas that will not need to remain cleared.

In response to a CNSC request for review of the Views Expressed shared, PBCN indicated that it is concerned about the contamination of vegetation and soil, which would affect the traditional foods and livelihoods of its community members. PBCN claims that its members hunt, harvest, trap and gather as well as dry and store traditional foods in proximity to the Project Area. PBCN's experience on other natural resource development projects is that tainting or perceived diminishment of the quality of the land and resources around the proposed Project will result in avoidance of harvesting of country foods by PBCN members. Ongoing monitoring of country foods is critical to establish a scientific baseline of contaminants in traditional foods and build the confidence of PBCN members to facilitate the continued exercise of PBCN's Aboriginal rights to hunt, harvest, trap and gather.

All engaged Nations and communities have indicated concerns that the proposed Project may adversely impact vegetation and plant species. They are particularly concerned that changes to vegetation may adversely impact their ability to harvest traditional and medicinal plants and alter their experience of traditional gathering activities.

6.5.3.3 Summary of Mitigations and Commitments related to Views Expressed

Potential Impacts to Soils and Vegetation

Denison has made commitments to mitigate adverse effects to soil and vegetation, monitor conditions, and conduct reclamation activities during decommissioning. Denison and ERFN have reached an agreement regarding radionuclide concentrations in the ERA. Denison responded to BNDN and confirmed that they will collect background information on total and methyl mercury in sediment from LSA lakes and rivers before site development. Denison has also committed to monitoring total and methyl mercury in fish tissue. As part of the licensing technical review, the following elements will be assessed: establishing baseline mercury concentrations, monitoring sulfate as an indicator for mercury in water, and conducting a Human Health Risk Assessment

(HHRA) if results exceed baseline levels to inform adaptive management and mitigation measures.

Denison has also committed to, wherever possible, avoid wetlands through project design and buffer space. Additional wetland surveys will be conducted to supplement existing information in the LSA, including measuring water and sediment quality, benthic invertebrates, fish and fish habitat prior to construction to produce an updated baseline assessment. These monitoring locations will be further considered as part of the EMP for continued monitoring. Construction and geotechnical monitoring will be implemented in accordance with the Environmental Management System (EMS), which will include erosion and sediment controls, soil and vegetation monitoring and the Preliminary Decommissioning Plan.

Revegetation

Denison has made several commitments related to terrain, soil, and organic matter (Commitments 9-12 to 9-20) and vegetation, ecosystems, and wetlands (Commitments 9-21 to 9-28). This includes salvaging sediment and peat/organic matter before construction, reducing disturbance through all project phases, reclaim the site to an ecological trajectory that aligns with end land uses and regulatory requirements, monitoring progressive reclamation during decommissioning and employing adaptive management if necessary, conducting pre-construction listed plant surveys, and conducting targeted monitoring to ensure mitigation measures are effective for projecting vegetation during the project. Denison will develop the specific seed mixture and reclamation plan through updates to the decommissioning plan and will provide opportunities for interested parties to review and provide input.

6.5.4 CNSC Staff Analysis

6.5.4.1 Soil

Change in terrain morphology and stability

CNSC staff reviewed Denison's effect assessment to terrain morphology and stability, and confirmed that Denison conducted a comprehensive analysis of these effects and that identified mitigation and follow-up monitoring program measures are adequate.

Change in soil quantity and quality

CNSC staff reviewed Denison's effect assessment to soil quantity and quality, and confirmed that Denison conducted a comprehensive analysis of these effects and that identified mitigation measures are adequate. CNSC staff sought clarification with regard to Denison's follow-up monitoring of soil stockpiles. Since Denison plans to use stockpiled soil in reclamation activities, CNSC staff asked whether Denison's periodic monitoring includes analysis of COPCs that could be deposited from dust-generating project activities. Denison clarified that monitoring of COPCs in soil stockpiles is not planned, but the need could be revisited in case COPCs in sources are detected at concentrations exceeding predictions. In addition, Denison proposed to support reclamation research including investigations into soil conditions which may include analysis of COPCs as warranted. CNSC staff verified in the appendix 10A assessment that COPC concentrations in soil on-site from atmospheric deposition are predicted to be below soil quality guidelines for protection of human health and environmental health. In addition, Denison proposed to support research on soil preparation techniques and amendments to inform the

revegetation strategy. CNSC staff note that this research will support reclamation given that soil suitability is expected to be poor, due to the predominance of sandy soils characterized by a thin surface organic layer and low fertility. Taking into account this information, CNSC staff concluded that Denison's follow-up monitoring program measures for the identified effects are adequate.

Change in quantity of organic matter/peat

CNSC staff reviewed Denison's effect assessment to organic matter/peat and confirmed that Denison conducted a comprehensive analysis of these effects and that identified mitigation and follow-up monitoring program measures are adequate.

6.5.4.2 Vegetation and ecosystems

Change in the areal extent of habitat types

CNSC staff reviewed Denison's effect assessment to the areal extent of habitat types and confirmed that Denison conducted a comprehensive analysis of these effects and that identified mitigation and follow-up monitoring program measures are adequate.

Change in the areal extent of wetlands

CNSC staff reviewed Denison's effect assessment to the areal extent of wetlands and noted that direct disturbance is limited to a small area (0.5 ha). CNSC staff confirmed that the directly affected wetland ecosites (black spruce treed bog, Labrador tea shrubby bog, and willow shrubby rich fen) remain abundant throughout the RSA. CNSC staff sought clarification from Denison with regard to the impact of indirect disturbance on comparably rare wetland ecosites that occur only in small areas (< 30 ha) in the RSA. Particularly, CNSC staff noted that for the graminoid bog/fen ecosite (BS19/24), 0.8 ha of a total of 1.2 ha are predicted to be disturbed. Denison clarified with respect to the ecosite BS19/24 that this is not a unique ecosystem and is instead an artifact of mapping uncertainty, as baseline mappers were unable to distinguish between BS19 (graminoid bog) and BS24 (graminoid fen) ecosites within these areas due to a lack of available information (e.g., soil information, vegetation field plots, water quality data). If all BS19, BS24 and BS19/24 were combined into a single combined "graminoid peatland" category, only 3.6 ha of 170.7 ha would be indirectly disturbed. Since the rare wetland ecosites rely on high water tables and existing water bodies, Denison noted that alteration of water quantity would be expected to have the highest potential to cause an adverse effect, and thus maintenance of wetland hydrology is expected to be the most effective mitigation to sustain these wetland ecosites. Denison confirmed that surface drainage continuity and hydrologic connectivity is expected to be maintained through surface water management such as culverts and ditches. The post-construction surface water management monitoring program is expected to identify issues in a timely manner and allow for an adaptive management process. Overall, Denison confirmed that no direct disturbance of rare wetland ecosites is anticipated.

CNSC staff also questioned whether adequate other habitat is available for species impacted by disturbance to rare wetland ecosites. Denison responded that no plants of conservation concern have been observed in rare wetlands, and that these wetlands are not limiting habitat for ungulates, furbearers, woodland caribou, raptors, or migratory breeding birds. Taking into account this information, CNSC staff concluded that Denison's mitigation and follow-up monitoring program measures for the identified effects are adequate.

Change in the number of plants of conservation concern

CNSC staff reviewed Denison's effect assessment to the number of plants of conservation concern and noted that wetlands tend to support a high species diversity and are considered to have a moderate to high potential to support plant species of conservation concern. Thus, CNSC staff asked Denison whether disturbance of rare wetlands would negatively affect sensitive species. Denison responded that the only listed plant species observed during baseline surveys was Alaskan Clubmoss, associated with open jack pine stands and transitional areas between upland and wetland/riparian areas.

Regarding the baseline surveys, CNSC staff recognized uncertainty whether the surveys conducted in 2017 are conservative, as the project footprint had been revised since. Moreover, CNSC staff found that Denison's ecosite factsheets include observations of two provincially listed plant species (Angle-leaved Sundew, Neat Spike-rush) although these were not detected in baseline surveys. Because rare plant surveys were completed only in one summer, they could have missed annual species that may be dormant in the seed bank in some years due to specific seed emergence requirements. Based on these observations, CNSC staff requested more information on potential risks from indirect effects on ecosites with plants of conservation concern as well as the planned pre-construction listed plant surveys. Denison responded that listed plants may be affected indirectly by the introduction and proliferation of invasive plants, dust deposition, edge effects, and changes to water quantity and quality, and referred to several mitigation measures to address these effects. Denison acknowledged that effects on a given listed plant population are dependent on a suite of site-specific factors, including the life requisites of the listed plant species, the species' resilience to disturbance, the size of the population, and the location of the population in relation to project activities. Denison clarified that the pre-construction listed plant surveys will be conducted in ecosites with the potential to support listed plants that may be directly or indirectly affected by the project. This includes ecosites where Alaskan Clubmoss was historically observed, ecosites within the Project Area that were not previously surveyed, and ecosystems known to support Angle-leaved Sundew and Neat Spike-rush populations. Lastly, Denison indicated that in the case that listed plants are identified in the Project Area, site- and species-specific mitigation measures will be developed by a qualified vegetation ecologist. Taking into account this information, CNSC staff concluded that Denison's mitigation and follow-up monitoring program measures for the identified effects are adequate.

Change in concentrations of COPC in vegetation

CNSC staff reviewed Denison's effect assessment to concentrations of COPCs in vegetation, along with the appendix 10A assessment for COPC concentrations in terrestrial vegetation. Appendix 10A assessed terrestrial vegetation as a group at the community level, although different plant types (blueberry, lichen, browse, and Labrador tea) were specifically included as food in the ecological and human health models that estimate exposure from the diet. CNSC staff noted that the exposure pathway for lichen was indicated as direct contact on soil, whereas contact with air would be a more applicable pathway since airborne COPCs can deposit on lichen. CNSC staff also noted that lichen samples collected as part of the 2017 baseline studies frequently contained higher concentrations of COPCs than blueberry. CNSC staff requested Denison to include the exposure pathway of direct deposition (dry and wet) of airborne contaminants on lichen in the quantitative assessment. Denison agreed that the air-to-lichen pathway is the primary exposure route for lichen and clarified that the model had considered this

pathway. Denison updated the tables and conceptual model in the appendix 10A assessment to reflect this.

CNSC staff took into account that Indigenous Nations and communities have raised concerns over potential changes in the quality of berries. CNSC staff reviewed the appendix 10A assessment and noted that it considered relevant potential sources of COPCs including air emissions, fugitive dust, fossil fuel combustion, effluent, and surface runoff, along with COPC potential to partition to soil. CNSC staff confirmed that the assessment determined that there are no exceedances of the 2.4 mGy/d radiation dose benchmark for terrestrial vegetation as per the United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR), representing berries among other plant types, during any phase of the project or in future centuries at the possible exposure locations around Whitefish Lake, McGowan Lake, and Russell Lake. Similarly, no significant adverse effects on vegetation were predicted from exposure to hazardous substances. Aligned with the requirements in REGDOC 2.9.1, section 4.1, Denison indicated that the licensing ERA will be periodically updated with data collected from monitoring programs. CNSC staff confirmed that the vegetation monitoring program will include blueberry samples. The results of the vegetation monitoring program will confirm whether blueberries are accumulating COPCs, and any risks would be identified through the iterative licensing ERA update process. Taking into account this information, CNSC staff concluded that Denison's mitigation and follow-up monitoring program measures for the identified effects are adequate.

6.5.5 CNSC Staff Findings and Recommendations

Taking into account the implementation of mitigation measures and recommended follow-up program measures, CNSC staff conclude the Project is not likely to cause significant adverse effects to soil from changes in terrain morphology and stability, soil quantity and quality, and organic matter/peat.

Taking into account the implementation of mitigation measures and recommended follow-up program measures, CNSC staff conclude the Project is not likely to cause significant adverse effects to vegetation and ecosystems from changes in the areal extent of habitat types, areal extent of wetlands, number of plants of conservation concern, and concentrations of COPCs in vegetation.

The effects significance determination table can be found in appendix B.

7.0 Predicted effects on valued components

Predicted effects on VCs listed in table 3.2 are described in the sections below, with the exception of benthic invertebrates and wetlands which are addressed above in sections 6.4 and 6.5 respectively.

Indigenous Nations and communities identified a number of terrestrial biota species of interest during consultation and CNSC staff considered them during their analysis, where applicable, as defined in table 3.2.

7.1 Fish and fish habitat

The proposed Project could potentially cause changes to fish, fish habitat, and fish health, through:

- change in surface water quality due to mobilization of suspended materials from erosion and sedimentation
- change in fish habitat availability due to overprinting (loss) of fish habitat from project infrastructure
- change in surface water and sediment quality from the controlled discharge of effluent to Whitefish Lake and downstream receiving environments
- change in surface water quantity from water intake and discharge causing changes in flows or water levels in lakes and rivers
- change in surface water quantity, quality, and sediment quality due to long-term transport of groundwater solutes from the remediated ore zone area to Whitefish Lake (in future centuries)
- change in surface water and sediment quality causing changes in the concentration of constituents in fish tissues from uptake by fish through fish life functions (i.e., respiration, ingestion, and absorption)

CNSC staff concurred with the Denison's assessment of Project activities that may interact with fish, fish habitat and fish health, and cause residual effects during all project phases, as detailed below.

7.1.1 Description of the aquatic environment

The LSA is the area where both direct and indirect effects resulting from Project activities can be reasonably measured, and includes the waterbodies of Whitefish Lake North (LA-6), Whitefish Lake Middle (LA-5 North), Whitefish Lake South (LA-5 South), McGowan Lake (LA-1), and the Icelander River that inflows to Russell Lake. The RSA is the area that surrounds and includes the LSA, may experience indirect effects of the Project as well as other activities, in a regional context, and is bounded by the regional watershed including Kratchkowsky Lake (LA-7), Williams Lake and Mardoc Lake (LA-4,) and extends downstream to Russel Lake.

Baseline fish and fish habitat surveys were completed in September 2016 in the LSA and RSA (see table 7.1 below). Fish communities were sampled using gill nets, beach seines, minnow traps, backpack electrofishing and dip netting. Fish were identified to species and assigned an age class, and data on length and weight were measured for all fish at each location, and specimens retained for fish tissue chemical analysis. Large-bodied fish spawning surveys were conducted in Fall 2016 and Spring 2017 in several lake and stream locations (see table 7.2 below).

A total of 13 fish species were recorded sampled throughout the LSA, with no abnormalities recorded and no species at risk identified (see table 8.3-5 below). Fish spawning habitat for several species was recorded throughout the LSA. Most ponds and lakes contained typical nearshore substrates including boulder, cobble, sand and organic matter, as well as submergent vegetation, overhanging vegetation and woody debris, and ponds supported emergent, submergent and floating aquatic macrophyte beds. Streams and rivers were generally stable, braided, meandering, straight or ponded portions characterized by riffles, runs pools and flats, with no barriers to fish migration. Detailed aquatic habitat characterization data can be found in Tables 8.3-3 and 8.3-4 of section 8 of the EIS.

Fish tissue samples for characterization of constituent concentrations in flesh and bone were collected in September 2016 and May and June 2017 to be analysed for radionuclides and trace metals. Five samples from a predator species (i.e., Northern Pike [*Esox lucius*]) and five samples

from a forage species (i.e., White Sucker [*Catostomus commersonii*]) were collected at each sampling location. Lengths, weights, and ages of fish comprising the samples are provided in appendix 8-D Aquatic Environment Baseline Study, as well as detailed results and summary statistics of all constituents sampled in section 8 of the EIS. In McGowan Lake, Whitefish Lake North (LA-6) and Whitefish Lake South (LA-5) all mean total mercury concentrations in Northern Pike and White Sucker tissue were below the Health Canada Guidelines of 0.5 ug/g wet weight. Additionally, all mean selenium concentrations in Northern Pike and White Sucker tissue were below the BC Ministry of the Environment and U.S. Environmental Protection Agency (EPA) guidelines of 4 µg/g dry weight (dw) and 11.3 µg/g dw, respectively (see table 7.4 below).

Table 7.1 Fish, fish habitat, and fish tissues sampling locations and descriptions

Location	Description
SA-1	Fish community and habitat survey location on the stream colloquially known as the Icelander River, which is located downstream of LA-1 (McGowan Lake).
SA-2	Fish community and habitat survey location situated downstream of the outflow from LA-5 (Whitefish Lake South) and upstream of the inflow to LA-1 (McGowan Lake).
SA-4	Fish community and habitat survey location situated upstream of the inflow to LA-6 (Whitefish Lake North), colloquially known as Kratchkowsky Creek.
SA-5	Fish community and habitat survey location situated upstream of the inflow to LA-6 (Whitefish Lake North), colloquially known as Hart Creek.
SA-6	Fish community and habitat survey location situated downstream of the outflow from LA-6 (Whitefish Lake North) and upstream of the inflow to LA-5 (Whitefish Lake South)
LA-1	McGowan Lake
LA-5	Whitefish Lake South
LA-6	Whitefish Lake North

Table 7.2 Adapted from EIS: Table 8.3-2: Summary of fish survey methods within the local study area

Capture Methods	Lake and pond sample stations			Stream sample stations				
	McGowan Lake (LA-1)	Whitefish Lake South (LA-5)	Whitefish Lake North (LA-6)	SA-1	SA-2	SA-4	SA-5	SA-6
Angling	X	X	X	X	-	-	-	-
Electrofishing	-	-	-	X	X	X	X	X
Gill Net	X	X	X	X	X	-	X	X
Minnow Trap	X	X	X	-	-	-	-	-
Seine Net	X	X	-	-	-	-	-	-
Visual	X	X	X	-	-	X	X	X

Table 7.3 Adapted from EIS: Table 8.3-5: Summary of fish survey presence and absence for waterbodies in the local study area

Fish Species	Lake and pond sample stations			Stream sample stations				
	McGowan Lake (LA-1)	Whitefish Lake South (LA-5)	Whitefish Lake North (LA-6)	SA-1	SA-2	SA-4	SA-5	SA-6
Arctic Grayling	-	-	-	X	X	X	-	-
Burbot	-	-	-	X	X	X	X	X
Lake Chub	-	-	-	X	X	X	X	-
Lake Trout	X	X	X	-	-	-	-	-
Lake Whitefish	X	-	-	-	-	-	-	-
Longnose Sucker	X	-	-	X	-	X	X	X
Ninespine Stickleback	-	X	-	-	-	X	X	X
Northern Pike	X	X	X	X	X	X	-	X
Slimy Sculpin	-	-	-	X	X	X	X	-
Spottail Shiner	X	X	X	-	-	X	-	X
Walleye	X	X	X	-	X	-	X	X
White Sucker	X	X	X	X	X	X	X	X
Yellow Perch	X	-	-	-	-	-	-	-

Blue highlighted cells indicate potential spawning habitat is present for the associated species within that waterbody.

X Indicates that the species was either captured or observed.

- Indicates that the species was neither captured nor observed.

Table 7.4 Adapted from EIS: Table 8.5-2: Baseline fish tissue chemistry summary values for waterbodies within the local study area and Russell Lake

Parameter	Statistic	McGowan Lake (LA-1)				Whitefish Lake South (LA-5)				Whitefish Lake North (LA-6)				Russell Lake (LAB)			
		Northern Pike		White Sucker		Northern Pike		White Sucker		Northern Pike		White Sucker		Northern Pike		White Sucker	
		Bone	Tissue	Bone	Tissue	Bone	Tissue	Bone	Tissue	Bone	Tissue	Bone	Tissue	Bone	Tissue	Bone	Tissue
Total Mercury (ug/g)	Min	0.02	0.075	0.01	0.022	0.02	0.047	0.01	0.014	0.03	0.074	0.02	0.024	0.02	0.14	0.01	0.021
	Max	0.2	0.43	0.02	0.068	0.06	0.23	0.03	0.076	0.08	0.3	0.03	0.07	0.14	0.48	0.02	0.043
	Mean	0.06	0.17	0.02	0.038	0.04	0.16	0.02	0.045	0.05	0.19	0.02	0.04	0.05	0.27	0.01	0.027
Selenium (ug/g) wet weight	Min	0.12	0.19	0.13	0.21	0.09	0.15	0.14	0.17	0.11	0.19	0.15	0.18	0.2	0.25	0.32	0.33
	Max	0.2	0.25	0.26	0.3	0.17	0.19	0.23	0.28	0.16	0.23	0.22	0.24	0.27	0.53	0.59	0.56
	Mean	0.16	0.22	0.19	0.27	0.11	0.17	0.19	0.22	0.14	0.21	0.18	0.22	0.23	0.35	0.44	0.44
Selenium (ug/g) dry weight	Min	0.30	0.85	0.27	0.88	0.22	0.71	0.29	0.83	0.22	0.85	0.32	0.84	0.39	1.32	0.81	1.69
	Max	0.53	1.16	0.59	1.48	0.41	0.9	0.50	1.27	0.41	1.04	0.52	1.12	0.69	2.34	1.51	2.15
	Mean	0.41	1.00	0.45	1.29	0.28	0.81	0.41	1.03	0.31	0.92	0.40	0.97	0.52	1.62	1.16	2.66

7.1.2 Proponent's Assessment

Denison concluded that the residual effects of the Project are expected to result in no significant adverse effects to fish, fish habitat and fish health. More information on each project related effect and the residual effects evaluation can be found below and in the EIS sections 8.3 and 8.5.

7.1.2.1 Fish and Fish Habitat

Mobilization of Suspended Materials

Mobilization of suspended materials to the receiving environment was primarily assessed through effects pathways to the intermediate VC surface water quality and is covered in section 8.2 of the EIS and section 6.3 of this report.

During construction, the primary effect pathways for mobilization of suspended materials is due to land disturbance and clearing potentially causing erosion and sedimentation to surface water bodies. Surface water drainage collected as contact water during the construction Phase will be stored in the Clean Waste Rock Pond, and a water and sediment control management system following standardized practices will be in place to mitigate the potential effects of erosion and sedimentation. Therefore, potential effects to surface water quality are not expected during the construction phase. Throughout operations and decommissioning, surface water drainage collected as contact water will be treated within the IWWTP prior to release, ensuring management of TSS to levels protective of the environment and aquatic receptors prior to release. Additional active (e.g., filtering) or passive (e.g., clarification in ponds) may be used as needed to manage TSS to lower concentrations. Through implementation of appropriate mitigation measures and follow up monitoring, Denison anticipates that the impact from mobilization of suspended materials on surface water quality will be negligible throughout all Project phases. Therefore, Denison determined the impacts to surface water quality from the mobilization of suspended materials are not expected to have residual effects on fish and fish habitat.

Overprinting (loss) of Fish Habitat

The primary effect pathway for overprinting of fish habitat occurs during the construction phase from construction and commissioning of the effluent discharge diffuser and water intake pipeline in Whitefish Lake (LA-5). Denison expects approximately 135m^2 of lake substrate would be overprinted by the discharge pipeline and diffuser, resulting in a loss of 0.05% of the lake's surface area, which was concluded to be a negligible loss of aquatic habitat. A Fisheries Act Authorization is not anticipated to be required. The final design and location of the diffuser will be confirmed during licensing, however the multiport diffuser will be located approximately 115m offshore in 3m of water, so as not to impact known Northern Pike spawning habitat in the nearshore. The conceptual design includes a diffuser line with three evenly spaced nozzles, with each nozzle approximately 0.07m in diameter, and a continuous average water discharge rate of 36.5 m^3/hr. The pipeline and diffuser will be present through the operations and decommissioning phases while the water management system continues operating, however the small loss of overprinted habitat will be fully reversible upon cessation of effluent deposition, with a return to baseline conditions anticipated following post-decommissioning.

In addition to the diffuser commissioning, during the construction phase two water crossings will be installed along the road from the Project site to the airstrip, over Kratchkowsky Creek and

over Hart Creek. Both crossings have previously existed, however they were decommissioned, and new crossing structures are proposed to be clear span bridges without in-water supports. Building activities will include vegetation clearing, filling, grading, and installation of footings which is expected to occur in and around water. Impacts to fish habitat will be avoided or conducted over a short duration during appropriate timing windows. Some additional potential effect pathways may arise from increased fishing pressures due to increased access for recreational resources users and overprinting of wetland features at water crossings for access roads and where hydro-line connections are proposed. However, these impacts are expected to be avoidable or mitigated through best management practices resulting in negligible impacts to aquatic habitat.

Through implementation of appropriate mitigation measures and follow up monitoring, Denison anticipates that the impacts of overprinting of fish habitat on fish and fish habitat will be negligible throughout all Project phases. Therefore, Denison determined the impact of overprinting of fish habitat from the construction and commissioning of the effluent discharge diffuser and water intake pipeline is not expected to have significant residual adverse effects on fish and fish habitat.

Controlled Discharge to Receiving Environments

Controlled discharge to the receiving environment was primarily assessed through effects pathways to the intermediate VC surface water quality and is covered in section 8.2 of the EIS and sections 6.3.3.2 and 6.4.3.3 of this report. However, effects to the VC Fish and Fish Habitat were further assessed in appendix 10-A of the EIS based on pathways through surface water and sediment quality for radiological and non-radiological COPCs discharged from the IWWTP. The IWWTP technology and treatment process continues to be assessed and optimized through a BATEA study and will be finalized throughout the licensing process.

Discharge to the surface water receiving environment is not expected during the construction phase, therefore potential effects to surface water and sediment quality and consequently fish and fish habitat are not expected during this project phase. As described in sections 6.3.3.2 and 6.4.3.3, Denison conducted an assessment utilizing both near-field and far-field modelling to predict effects to surface water and sediment quality from the discharge of effluent during operations and decommissioning. The ERA concluded that copper was the only COPC where there were minor exceedances of screening values protective of aquatic life and some potential risk of adverse effects to aquatic receptors from copper concentrations in surface water. However, these exceedances are minor and unlikely to cause population level effects. Additionally, Denison anticipates that it is likely that site conditions will change over the course of operations and decommissioning from baseline, which will further decrease the risk from copper to aquatic receptors. Mercury was not identified as a COPC for further assessment in the ERA as it is not produced as part of the mining processes, and therefore not found in significant concentrations in effluent discharge. Additionally, mercury was not found in detectable concentrations in the receiving environment during surface water quality sampling. However, Denison has committed to further monitoring for mercury and methylmercury in the receiving environment as the Project progresses (Commitments 8-42 and 8-44).

Denison conservatively determined that surface water quality in the receiving environment is likely to be moderately adversely impacted by the controlled discharge of effluent from the Project throughout the operations and decommissioning phases, and that there is likely to be low risk to fish from this pathway. While a change from background conditions is predicted to occur,

the anticipated residual effects are likely to be local to Whitefish Lake Middle and South (LA-5 North and LA-5 South) and fully reversible upon cessation of effluent deposition, with a return to baseline conditions anticipated following post-decommissioning. Through the application of mitigative measures, follow-up monitoring, and under average flow conditions, Denison anticipates that fish and fish habitat will likely be resilient to potential changes. Therefore, residual effects on fish and fish habitat from changes in water and sediment quality due to the controlled discharge to the receiving environment are concluded to be not significant.

Change in Water Levels and Flows

Changes in water levels and flows to the receiving environment were primarily assessed through effects pathways to the intermediate VC surface water quantity and is assessed in section 6.3.2. Changes in lakes, watercourses and wetland water levels are expected to be negligible, and all Project effects are anticipated to be local and fully reversible following post-decommissioning. Through implementation of appropriate mitigation measures and follow up monitoring, Denison anticipates that changes in water levels and flows on water quantity will be negligible throughout all Project phases. Therefore, Denison determined the impact to water quantity from changes in water levels and flows is not expected to have significant residual adverse effects on fish and fish habitat.

Long-Term Transport of Groundwater Solutes to Whitefish Lake (in Future Centuries)

A "Future Centuries" scenario was used to assess the long-term future potential effects to surface water quantity and quality post-decommissioning from peak concentrations of COPCs in groundwater plumes migrating from the decommissioned project site Phoenix Ore Zone area to surface water. Changes in the receiving environment were primary assessed through effects pathways to the intermediate VCs surface water quantity and quality and is covered in sections 6.3.3.1 and 6.3.3.2 of this report and sections 8.1 and 8.2 of the EIS.

Denison concluded there are no anticipated residual effects to surface water quantity or quality from the future centuries scenario and therefore will not result in adverse effects to fish and fish habitat.

The proposed mitigation measures and monitoring program for fish and fish habitat should be considered in conjunction mitigation measures and monitoring programs for surface water quantity (hydrology), surface water quality, sediment quality and benthic invertebrates, and fish health monitoring programs, as it is specifically tied to these monitoring programs from the perspective of pathways of effects.

Mitigation Measures for Fish and Fish Habitat

Denison has proposed the following measures in table 7.5 to mitigate the potential adverse effects from identified project activities on fish and fish habitat. CNSC staff have assessed the mitigation measures proposed by Denison and have concluded that they are adequate to manage potential significant adverse effects to fish and fish habitat. See a summary in table 7.5 below.

Table 7.5: Proposed mitigation measures to address effects on fish and fish habitat

Change in fish habitat
• Avoid more sensitive habitats (spawning, nursery and overwintering habitats) to the extent practicable.
• Adhere, as applicable, to the Interim Code of Practice: End-of-Pipe Fish Protection Screens for Small Water Intakes in Freshwater (DFO 2020a).
• Adhere, as applicable, to the *Interim Code of Practice for Temporary Cofferdams and Diversion Channels* (DFO 2020b).
• Adhere, as applicable, to the *Interim Code of Practice for Temporary Stream Crossings* (DFO 2020c).
• Plan in-water works, undertakings, or activities to respect timing windows to protect fish and fish habitat, including their eggs, juveniles, spawning adults, the organisms upon which they feed, and the areas where they migrate. In-water works should be deferred based on the specific waterbody and known species that inhabit the waterbody (*Saskatchewan Restricted Activity Timing Windows for the Protection of Fish and Fish Habitat* [DFO 2020d]). o Spring spawning species (Northern Saskatchewan – Lake Sturgeon Absent) – avoid work between May 1 and July 15. o Fall spawning species (Northern Saskatchewan – Lake Trout present) – avoid work between September 1 and July 15). o Fall spawning species (Northern Saskatchewan – Lake Trout absent) – avoid work between October 1 and July 15).
• In discussion with responsible authorities, prepare a fish salvage plan to relocate fish prior to in-water works.
• Design treated effluent discharge or freshwater intake infrastructure to prevent entrainment or impingement of fish.
• Workforce members will be transported to/from site via a fly-in/fly-out rotation and will, therefore, not use ground travel options during shift changes, which will eliminate fishing on local lakes during commutes to/from the site and during time off work. Denison site vehicles will not be available for recreational purposes. While at the Project site and off duty, workers may opt to fish local waterbodies. To protect sustainable use of resources, only catch and release of fish will be encouraged, and fish storage or cooking facilities will not be provided.
Change in flows or water levels in lakes and rivers
• Limit and stage the construction footprint (i.e., Project Area).
• Maintain existing drainage patterns with the use of culverts, where applicable.

• Maintain access roads by periodically regrading and ditching to improve water flow, reduce erosion, and manage vegetation growth.
• Inspect culverts periodically. Remove accumulated material and debris upstream and downstream of the culverts to prevent erosion, flooding, habitat damage, property damage, and mobilization of sediment
• Attenuate peak discharges and augment baseflows to the environment using Project water storage features (i.e., runoff, process water, contact water, monitoring/effluent ponds).
• Recycle contact water for use as process water.
• Recycle process water for re-use.
Change in the water quality
• Develop and implement a Surface Water Management Program that provides an integrated framework to manage water quality, including provision for water management practices for each of the primary site aspects, as well as areas of the Project site where contact water is expected.
• Maximize the recycle and reuse of process water to reduce freshwater intake and release to Whitefish Lake.
• Design the discharge diffuser/outfall to provide effective mixing and dilution and discharge flows that do not detrimentally affect sediments.
• Develop site-specific effluent treatment to treat COPC to appropriate release limits in accordance with provincial standards and licence/permit conditions.
• Discharge effluent under a scenario that will meet provincial and federal discharge criteria as identified through permitting. Scenarios may include: 1. Discharging at a fixed rate while maintaining an appropriate minimum dilution ratio (i.e., discharge when able to meet the required dilution ratio and cease discharge during periods when unable to meet the necessary dilution ratio); 2. Discharging under a variable waste load allocation (i.e., discharge an appropriate effluent volume based on flow in the receiver to maintain minimum dilution ratio); and, 3. Managing discharge via a hybrid of these (i.e., discharge effluent at a fixed rate to maintain the required dilution ratio, but the fixed rate can be varied on a seasonal basis based on flow).
• Collect and monitor contact water to determine whether treatment is required prior to release to the environment to inform optimal levels of treatment.
• Maintain the water management system in place during decommissioning until such time that water quality is suitable to release to the environment.

• Monitor and manage effluent, including contingency for effluent treatment as may be required, so that water discharge objectives are achieved as defined by applicable provincial and federal regulatory instruments.
• Design and implement an Environmental Code of Practice that defines action levels and appropriate steps to be taken to mitigate elevated concentrations of chemical and radiological constituents in treated effluent discharge to acceptable levels.
• Implement Project-specific monitoring programs (e.g., effluent monitoring plan, environmental monitoring plan) that include monitoring treated effluent, surface water and sediment quality, and applying adaptive management, if necessary.
• Work with the associated communities to develop and implement the Project-specific monitoring programs and a framework to share the results for the purpose of assessing the performance of the water management system.
• Develop and implement a decommissioning and reclamation plan to decommission and transfer the site to the province under the Institutional Control Program.

Monitoring and Follow-Up Measures

In order to verify the accuracy of the assessment and determine the effectiveness of the mitigation measures, Denison will implement the following EA follow-up measures.

Table 7.6: Follow-up program measures for effects on fish and fish habitat

Change in fish habitat
• Monitoring for changes in fish communities/populations within the Project LSA 1. Assessment through comparison of construction, operation, and decommissioning results to pre-development conditions, as well as through contemporaneous comparison of "exposure area" versus "reference area" data. a. In this context an "exposure area" is an area downstream of potential mine influence and a "reference area" is an area outside of potential mine influence. b. Where possible, the reference area would be located in the same drainage, upstream of mine influence where conditions closely mimic those downstream as is possible and where there is no, or reduced likelihood that exposure and reference fish populations can co-mingle.
• Monitoring for changes in physical fish habitat within the receiving environment of LA-5 o Fish and fish habitat monitoring will include collection of metrics associated with species presence, abundance, and life history parameters (e.g., survival, condition, growth) to meet applicable agency guidance (i.e., MDMER and CSA N288.4-19 [CSA Group 2019]).
Change in flows or water levels in lakes and rivers

• Continued hydrologic monitoring to provide Project phase information to monitor predictions and support effluent discharge permitting and approvals (i.e., meet approvals for continued surface water quality levels).
• The monitoring program should remain consistent with the long-term (2011) hydrological monitoring study at the Project site to allow for the continued establishment of long-term streamflow trends at the site through relationships to long-term operating hydrometric gauging stations in the same watershed.
• Monitoring stations should continue to survey at locations throughout key catchment areas. Hydrometric monitoring at streamflow stations should include measurement of stream discharge and water level survey and maintenance of in-stream data loggers. • Monitoring should continue to include the following: 1. streamflow monitoring 2. lake level monitoring 3. installation and maintenance of stage dataloggers
Change in the water quality
• Monitoring to confirm the effluent and receiving water quality meet applicable regulation criteria 1. The monitoring and follow-up program will include measurement of water quality parameters to meet regulatory criteria (i.e., provincial discharge permits, Metal and Diamond Mining Effluent Regulations [MDMER; Government of Canada 2022] and CSA N288.4-19 (CSA Group 2019). At a minimum, this will include collection of non-radiological parameters (e.g., metals, nutrients, hardness, temperature, pH, TDS, TSS, and sulphate) and radiological parameters. 2. Constituent concentrations will be compared to the values used in the EIS and to applicable regulatory criteria or objectives.
• Collecting and recording surface water quality to confirm that source and receiving water quality predictions are consistent with those presented in the EIS o Monitoring will occur within the collection ponds, specifically the Effluent Monitoring and Release Ponds and the receiving waterbody (Whitefish Lake). Water quality monitoring in the natural environment will occur at the point of discharge (near-field) at LA-5 (Whitefish Lake South), at an upstream reference location (Whitefish Lake North [LA-6]) and at downstream locations (far-field locations). The far-field monitoring locations will be located in Whitefish Lake South (LA-5) prior to its discharge to McGowan Lake (LA-1).

7.1.2.2 Fish Health

Mobilization of Suspended Materials

Mobilization of suspended materials to the receiving environment was primarily assessed through effects pathways to the intermediate VC surface water quality and is covered in section 8.2 of the EIS and sections 6.3.3.2 and 7.1.3.1 of this report. No additional effects to the fish health VC were identified from mobilization of suspended materials., therefore it was concluded that through mitigation measures for the control of suspended material release to Whitefish Lake

and downstream, mobilization of suspended materials is not expected to impact water quality and will not have significant residual adverse effects on fish health. Through implementation of appropriate mitigation measures and follow up monitoring, Denison anticipates that the impacts of the mobilization of sediment on water quality will be negligible throughout all Project phases. Therefore, Denison determined the impact to water quality from the of mobilization of sediment is not expected to have significant residual adverse effects on fish health.

Controlled Discharge to Receiving Environments

Controlled discharge to the receiving environment was primarily assessed through effects pathways to the intermediate VCs surface water and sediment quality and is covered in Sections 8.2 and 8.4 of the EIS and sections 6.3.3.2, 6.4.3.3 and 7.1.3.1 of this report. However, effects to the VC fish health were further assessed in appendix 10-A based on pathways for surface water and sediment quality, and changes in the concentration of constituents in fish tissues for radiological and non-radiological COPCs discharged from IWWTP. The IWWTP technology and treatment process continues to be assessed and optimized through a BATEA study and will be finalized throughout the licensing process.

COPCs in the aquatic environment have the potential to be taken up by fish through fish life functions (i.e., respiration, ingestion, and absorption), therefore concentrations of COPCs in fish tissue were also assessed in appendix 10A. Bioaccumulation of COPCs in tissue from direct contact or uptake of water and sediment by aquatic receptors are modelled using Bioaccumulation Factors (BAFs) based on surface water concentrations, which was conducted according to standardized practices. To determine risk to aquatic receptors, total exposure concentrations from water and sediment pathways are determined for each aquatic receptor for each COPC. These exposure concentrations for each COPC are then compared to screening criteria (i.e., toxicity reference values) for the protection of aquatic life specific to each COPC and aquatic receptor, to calculate HQs. HQs equal to or less than one indicates low risk to receptors, whereas HQs greater than one indicate that there is some potential for adverse effects. This process is repeated in each water body assessed throughout the LSA and RSA.

For selenium, where bioaccumulation in fish tissue is a primary concern identified by the FIRT, screening criteria specific to bioaccumulation included the US EPA criterion for selenium in fish muscle tissue of 8.5 µg/g dw for large-bodied fish included in this assessment (i.e., Northern Pike and White Sucker). To address FIRT concerns, the appendix 10A assessment was also updated to utilize the Federal Environmental Quality Guideline (FEQG) for selenium of 6.7 µg/g dw for whole body and 14.7 µg/g dw for egg-ovary concentrations developed by ECCC, as additional screening criteria. Utilizing species-specific average BAFs, measured baseline fish tissue concentrations, and predicted maximum water concentrations of selenium during the operations phase of the Project, the predicted average muscle tissue concentrations for both fish species were calculated. From these predicted muscle concentrations, predicted whole body and egg-ovary fish tissue concentrations of selenium were calculated for Northern Pike and White Sucker using site-specific moisture content, and species-specific conversion factors. Predicted average muscle, whole body, and egg-ovary fish tissue concentrations of selenium were then compared to the US EPA and FEQG guidelines to determine risk to fish species from selenium (see below, table 7.7). There were no predicted exceedances of fish tissue guidelines in any locations for all project phases (HQs <1), and no significant residual adverse effects anticipated from changes in the constituent concentrations in fish tissues due to controlled discharge to the receiving environment.

Table 7.7 Adapted from appendix-10A ERA section 6.3.1: Table 6-4: Calculated whole body and egg-ovary

Guidelines (µg/g dw)			8.5	6.7	14.7
Fish species		Muscle	Muscle	Whole body	Egg-ovary
	Lake	µg/g fw	µg/g dw	µg/g dw	µg/g dw
Northern Pike	Reference	1.89E-01	8.58E-01	0.68	1.61
	Whitefish Lake North	1.86E-01	8.45E-01	0.67	1.59
	Whitefish Lake Middle	1.57E+00	7.13E+00	5.61	13.40
	Whitefish Lake South	1.51E+00	6.86E+00	5.40	12.89
	McGowan Lake	1.02E+00	4.63E+00	3.65	8.71
	Russell Lake	8.12E-01	3.69E+00	2.90	6.93
White Sucker	Reference	1.46E-01	6.23E-01	0.46	0.62
	Whitefish Lake North	1.43E-01	6.10E-01	0.46	0.61
	Whitefish Lake Middle	1.74E+00	7.42E+00	5.54	7.42
	Whitefish Lake South	1.66E+00	7.08E+00	5.28	7.08
	McGowan Lake	1.06E+00	4.52E+00	3.37	4.52
	Russell Lake	8.06E-01	3.44E+00	2.57	3.44

Denison concluded that there were no predicted exceedances of the 9.6 mGy/d radiation dose benchmark for aquatic biota in the Project Area, LSA, or RSA during any phase of the Project. Copper was the only non-radiological COPC where there were minor exceedances of surface water quality screening values protective of aquatic life and some potential risk to aquatic receptors including benthic invertebrates, in all waterbodies including reference locations, and predatory fish in Whitefish Lake Middle and South (LA-5 North and LA-5 South) during operations (see below table 7.8). However, these exceedances are minor and unlikely to cause population level effects. Additionally, Denison anticipates that it is likely that site conditions will change over the course of operations and decommissioning, which will further decrease the risk from copper to aquatic receptors. Increasing hardness and pH concentrations in the receiving environment during operations and decommissioning from effluent deposition are predicted to alter site conditions, and predictive modelling of these altered site conditions indicates no exceedances in the receiving environment at exposure locations for any aquatic receptors due to copper (See below, table 7.9). All other estimated total HQs calculated for fish were less than one, including those calculated for invertebrates with direct contact to sediment against sediment screening criteria, indicating low risk to fish health and other aquatic receptors (see EIS section 8.5.4.2.2: table 8.5-4: Estimated Non-radiological Total Risk to Fish Ecological Receptors).

Table 7.8 Adapted from EIS appendix 10A: Table 6-9A: Re-Evaluated Hazard Quotients for Copper in Aquatic Organisms – Baseline Conditions

Location	Maximum copper concentration in water (mg/L)	Hazard quotients (unitless) – Baseline conditions					
		Forage fish	Predator fish	Zoo-plankton	Benthic Invertebrates	Phyto-plankton	Aquatic plants
Kratchkowsky Lake (reference) [1]	6.22E-04	0.12	0.80	0.70	**1.49**	0.07	0.03
Whitefish Lake North	6.20E-04	0.12	0.80	0.70	**1.49**	0.07	0.03
Whitefish Lake Middle	8.22E-04	0.16	**1.06**	0.93	**1.97**	0.09	0.04
Whitefish Lake South	8.17E-04	0.16	**1.05**	0.92	**1.96**	0.09	0.04
McGowan Lake	7.50E-04	0.14	0.97	0.85	**1.80**	0.08	0.04
Icelander River	7.49E-04	0.14	0.97	0.84	**1.80**	0.08	0.04
Russell Lake Inlet	7.17E-04	0.14	0.92	0.81	**1.72**	0.08	0.03

Table 7.9 Adapted from EIS appendix 10A: Table 6-9B: Re-evaluated hazard quotients for copper in aquatic organisms – Site operation conditions

Location	Maximum Copper Concentration in Water (mg/L)	Hazard Quotients (unitless) – Site Operation Conditions					
		Forage Fish	Predator Fish	Zoo-plankton	Benthic Invertebrate	Phyto-plankton	Aquatic Plants
Kratchkowsky Lake (reference) [1]	6.22E-04	0.12	0.80	0.70	**1.49**	0.07	0.03
Whitefish Lake North	6.20E-04	0.06	0.34	0.30	0.63	0.04	0.04
Whitefish Lake Middle	8.22E-04	0.08	0.46	0.40	0.84	0.05	0.05
Whitefish Lake South	8.17E-04	0.08	0.45	0.40	0.83	0.05	0.05
McGowan Lake	7.50E-04	0.07	0.42	0.37	0.76	0.04	0.05
Icelander River	7.49E-04	0.07	0.42	0.37	0.76	0.04	0.05
Russell Lake Inlet	7.17E-04	0.07	0.40	0.35	0.73	0.04	0.05

Note:

Bold and shaded value indicates HQ greater than 1.

[1] Kratchkowsky Lake is a reference lake located upstream of the effluent discharge point, and as such, the site operation conditions were the same as baseline conditions.

Concerns related to mercury and methylmercury bioaccumulation in aquatic receptors were raised by the FIRT during the EIS review process. Denison confirmed that mercury was not identified as a COPC for further assessment in appendix 10A as it is not produced as part of the mining processes, and therefore not found in significant concentrations in effluent discharge. Additionally, mercury was not found in detectable concentrations in the receiving environment during surface water quality sampling. However, nutrient enrichment from treated effluent has the potential to cause changes to mercury concentrations in the environment, and Denison has acknowledged that there is potential for increased methylmercury production from existing mercury in the receiving environment. Therefore, Denison has committed to further monitoring for mercury and methylmercury in the receiving environment as the Project progresses.

Denison conservatively determined that surface water quality in the receiving environment is likely to be moderately adversely impacted by the controlled discharge of effluent from the Project throughout the operation and decommissioning phases. While there are no anticipated residual adverse effects from changes in fish tissue concentrations of constituents or sediment

quality, there is likely to be low risk to fish health from changes in surface water quality from copper concentrations in effluent discharge. While a change from background conditions is predicted to occur, the anticipated residual effects are likely to be local to Whitefish Lake Middle and South (LA-5 North and LA-5 South) and fully reversible upon cessation of effluent deposition, with a return to baseline conditions anticipated following post-decommissioning. Through the application of mitigative measures, follow-up monitoring, and under average flow conditions, Denison anticipates the fish health will likely be resilient to potential changes. Therefore, residual effects on fish health from changes in surface water and sediment quality due to the controlled discharge to the receiving environment are concluded to be not significant.

Long-Term Transport of Groundwater Solutes to Whitefish Lake (in Future Centuries)

A "future centuries" scenario was used to assess the long-term future potential effects to surface water quantity and quality post-decommissioning from peak concentrations of COPCs in groundwater plumes migrating from the decommissioned project site Phoenix Ore Zone area to surface water. Changes in the receiving environment were primarily assessed through effects pathways to the intermediate VCs surface water quantity and quality and sediment quality, and is covered in sections 6.3.3.1, 6.3.3.2, and 7.1.3.1 of this report and sections 8.1, 8.2, and 8.4 of the EIS.

There are no anticipated residual effects to surface water or sediment quality from the future centuries scenario, and therefore will not result in adverse effects to fish health.

The proposed mitigation measures and monitoring program for fish health should be considered in conjunction mitigation measures and monitoring programs for surface water quantity (hydrology), surface water quality, sediment quality and benthic invertebrates, and fish and fish habitat monitoring programs, as it is specifically tied to these monitoring programs from the perspective of pathways of effects.

Mitigation Measures for Fish Health

Denison has proposed the following measures in table 7.11 to mitigate the potential adverse effects from identified project activities on fish health. CNSC staff have assessed the mitigation measures proposed by Denison and have concluded that they are adequate to manage potential significant adverse effects to health. See a summary in table 7.10 below.

Table 7.10: Proposed mitigation measures to address effects on fish health

Change in water quality
• Inspect culverts periodically. Remove accumulated material and debris upstream and downstream of the culverts to prevent erosion, flooding, habitat damage, property damage, and mobilization of sediment.
• Develop and implement a Surface Water Management Program that provides an integrated framework to manage water quality, including provision for water management practices for each of the primary site aspects, as well as areas of the Project site where contact is expected.
• Maximize the recycle and reuse of process water to reduce freshwater intake and release to Whitefish Lake
• Design the discharge diffuser/outfall to provide the smallest footprint possible while still achieving effective mixing and dilution, and to provide discharge flows that do not adversely effect sediments.
• Develop site-specific effluent treatment to treat COPC to appropriate release limits in accordance with provincial standards and licence/permit conditions.
• Discharge effluent under a scenario that will meet provincial and federal discharge criteria as identified through permitting. Scenarios may include: o Discharging at a fixed rate while maintaining an appropriate minimum dilution ratio (i.e., discharge when able to meet the required dilution ratio and cease discharge during periods when unable to meet the necessary dilution ratio); o Discharging under a variable waste load allocation (i.e., discharge an appropriate effluent volume based on flow in the receiver to maintain minimum dilution ratio); and o Managing discharge via a hybrid of these (i.e., discharge effluent at a fixed rate to maintain the required dilution ratio, but the fixed rate can be varied on a seasonal basis based on flow).
• Collect and monitor contact water to determine whether treatment is required prior to release to the environment to inform optimal levels of treatment.
• Maintain the water management system in place during decommissioning until such time that water quality is suitable to release to the environment.
• Monitor and manage effluent, including contingency for effluent treatment as may be required, so that water discharge objectives are achieved as defined by applicable provincial and federal regulatory instruments.

• Design and implement an Environmental Code of Practice that defines action levels and appropriate steps to be taken to mitigate elevated concentrations of chemical and radiological constituents in treated effluent discharge to acceptable levels.
• Implement Project-specific monitoring programs (e.g., effluent monitoring plan, environmental monitoring plan) that include monitoring treated effluent, surface water and sediment quality, and applying adaptive management, if necessary.
• Work with the associated communities to develop and implement the Project-specific monitoring programs and a framework to share the results for the purpose of assessing the performance of the water management system.
• Develop and implement a decommissioning and reclamation plan to decommission and transfer the site to the province under the Institutional Control Program.
Change in sediment quality
• Maintain existing drainage patterns with the use of culverts, where applicable.
• Maintain access roads by periodically regrading and ditching to improve water flow, reduce erosion, and manage vegetation growth.
• Attenuate peak discharges and augment baseflows to the environment through the use of Project water storage features (i.e., runoff, process water, contact water, monitoring/effluent ponds).
Change in the concentration of constituents in fish tissues
• Mitigation measures for this potential residual effect are consistent with mitigation measures already listed for the protection of surface water quality and sediment quality

Monitoring and Follow-Up Measures

In order to verify the accuracy of the assessment and determine the effectiveness of the mitigation measures, Denison will implement the following EA follow-up measures.

Table 7.11: Follow-up program measures for effects on fish health

Change in water quality
• Monitoring to confirm the effluent and receiving water quality meet applicable regulation criteria 1. The monitoring and follow-up program will include measurement of water quality parameters to meet regulatory criteria (i.e., provincial discharge permits, Metal and Diamond Mining Effluent Regulations [MDMER; Government of Canada 2022] and CSA N288.4-19 (CSA Group 2019). At a minimum, this will include collection of

non-radiological parameters (e.g., metals, nutrients, hardness, temperature, pH, TDS, TSS, and sulphate) and radiological parameters.

2. Constituent concentrations will be compared to the values used in the EIS and to applicable regulatory criteria or objectives.

- Collecting and recording surface water quality to confirm that source and receiving water quality predictions are consistent with those presented in the EIS
  - Monitoring will occur within the collection ponds, specifically the Effluent Monitoring and Release Ponds and the receiving waterbody (Whitefish Lake). Water quality monitoring in the natural environment will occur at the point of discharge (near-field) at LA-5 (Whitefish Lake South), at an upstream reference location (Whitefish Lake North [LA-6]) and at downstream locations (far-field locations). The far-field monitoring locations will be located in Whitefish Lake South (LA-5) prior to its discharge to McGowan Lake (LA-1).

Change in sediment quality

- Monitoring of TSS in the effluent monitoring ponds and other catchment ponds prior to discharge

- Monitoring to confirm that effluent and receiver sediment quality meet applicable regulation criteria.
  - The monitoring and follow-up program will include measurement of sediment quality parameters to meet regulatory criteria (i.e., provincial discharge permits, MDMER and CSA N288.4). This must include collection of non-radiological parameters (e.g., metals, nutrients, pH, and sulphate), radiological parameters, and physical characteristics (grain size)).

- Monitoring benthic invertebrate community structure and abundance in the near-field discharge area to assess any changes that may be attributable to the Project.
  - This will include reasonable replication over a geographic area. Metrics assessed will be associated with benthic invertebrate community diversity, evenness, density, taxa richness, and similarity indices.
  - Sediment and benthic invertebrate monitoring will occur in tandem and sampling locations will be co-located to facilitate comparison of benthic invertebrate community metrics with sediment quality characteristics.
  - Sediment and benthic invertebrate monitoring in the natural environment will occur at the point of discharge in Whitefish Lake South (near-field), at an upstream reference location (Whitefish Lake North), and at downstream locations (far-field). The far-field monitoring locations will be located in Whitefish Lake South prior to its discharge to McGowan Lake. Constituent concentrations will be compared to the values used in the EIS and to applicable regulatory criteria or objectives.

Change in the concentration of constituents in fish tissues

- Monitoring changes in fish tissue concentrations of COPC that may be attributable to the Project:
  - The monitoring program will include measurements of fish health for comparison to baseline data and regulatory criteria (i.e., Canadian Tissue Residue Guidelines for the Protection of Wildlife Consumers of Aquatic Biota [e.g., CCME 2000], MDMER [Government of Canada 2022], CSA N288.4-19 (CSA Group 2019), and applicable United States Environmental Protection Agency criteria (e.g., US EPA 2021). This will include the collection of additional pre-mining fish tissue concentration data as needed.
  - The collection of representative fish species from multiple trophic levels and size classes to investigate the bioaccumulation potential of non-radiological (e.g., molybdenum, selenium, total mercury, methylmercury and other metals) and radiological parameters.
  - The assessment of fish for their general health condition through assessment of condition and growth metrics consistent with those described in current or updated MDMER EEM technical guidance (e.g., Environment Canada 2012).

- Indigenous Nations and communities have expressed concerns related to mercury and increased methylmercury bioaccumulation in fish tissues due to project-related effects, therefore Denison has committed to additional monitoring:
  - Monitoring mercury and methylmercury in the aquatic environment over the life of the Project to determine the potential changes in mercury concentrations in fish tissue over time.
  - Assess health risks from fish consumption by comparing fish tissue data collected during operation from the monitoring program against applicable human health risk-based maximum permissible concentrations.

7.1.3 Other Views Expressed

7.1.3.1 Potential Impacts to Fish and Fish Habitat

Indigenous Nations and Communities

ERFN had expressed concerns that the Project has the potential to adversely impact the aquatic environment including water bodies and fish and fish habitat within. ERFN noted that given the potential for accidental releases, and concerns noted about the potential for impacts to groundwater and surface water that fish and fish habitat, including fish spawning areas, could be negatively impacted. Specifically, ERFN inquired about effluent discharge outlets and the protections that would be incorporated to ensure bottom-feeding fish are excluded from the outlet mixing zone.

YNLR indicated that if any impacts to fish and fish habitat are a result of the project that they would like to see habitat offsetting occur. Similarly, PBCN raised concerns that the Project may have adverse impacts to local fish populations in and around Whitefish Lake.

BNDN indicated their concerns that spills, leaks and other accidents and malfunctions will be managed to mitigate potential impacts to fish and fish habitat.

Federal Authorities

ECCC requested that the selenium in fish tissue assessment be updated to use the ECCC FEQG of 6.7ug/g dry weight fish whole body tissue for selenium. With respect to the commitment to a pre-operational Environmental Effects Monitoring (EEM) study of selenium in fish tissue, ECCC also recommended that whole-body, egg-ovary, and muscle selenium concentrations are measured.

While DFO concluded that they did not anticipate a Fisheries Act Authorization would be required based on the currently proposed project, should the project be approved, they recommended that Denison review DFO's Projects Near Water website as plans are refined to ensure effects to fish and fish habitat can be avoided and mitigated to comply with the *Fisheries Act*. Denison should do their due diligence and document this analysis for their records. In cases where risks to fish and fish habitat cannot be avoided, the project does not fall within water bodies where DFO's review isn't required, or the scope of the project is not entirely covered under a code of practice, it is recommended that Denison submit a request for review.

7.1.3.2 Fish and Fish Habitat Studies and Monitoring

Indigenous Nations and Communities

MN-S noted they were seeking Métis Knowledge to be included in fish and fish habitat monitoring and they questioned if Whitefish Lake North would be a reference area for monitoring fish health.

YNLR indicated they would like to be involved in any fish monitoring programs related to fish health given the importance of fish to YNLR members.

BNDN raised concerns that Denison undertake additional spring and fall fish sampling as the sampling effort to obtain species diversity and abundance of the fish community was noted as low. In addition, BNDN requested that results from EEM concerning fish tissue sampling are shared with the engaged Indigenous Nations and communities.

All engaged Indigenous Nations and communities on the Project raised concerns on the proposed Project's potential to adversely impact fish and fish habitat. Given that the Nations and communities of Northern Saskatchewan fish as part of traditional practices and rely on fish for subsistence, it is important that any potential impacts to fish and fish habitat are avoided and mitigated to allow for the continuation of traditional activities and consumption by Indigenous Nations and communities.

Federal Authorities

ECCC highlighted inconsistencies in the modeling, advising it limited confidence in residual effects to water and sediment quality, which can adversely affect aquatic life, including fish and fish habitat.

ECCC suggested that Denison conduct a sensitivity analysis on the low water flow scenario to account for additional environmental variables, and to re-assess the aquatic risk associated with copper in freshwater. ECCC recommended Denison conduct a sensitivity analysis for water quality predictions during different precipitation extremes, and that discharge is limited during periods of very low flow to reduce impacts in the receiving environment.

ECCC also notes that they are unable to provide feedback on residual effects from effluent discharge because the calibration of the model has not been validated.

The models do not include environmental variables such as changes in hydrology or water/sediment chemistry which could result in incorrect environmental concentration predictions and the analysis approach for baseline conditions (e.g., smoothing data over locations and seasons) introduced uncertainty and may limit ability to detect changes related to the Project. ECCC recommended additional sampling of surface water, sediment, benthic invertebrates, and fish/fish habitat and to provide additional mitigation measures to protect wetlands. Overall, ECCC recommends monitoring and follow-up plans to verify the effects of the Project on the aquatic environment and the implementation of adaptive management, if required.

7.1.3.3 Summary of Mitigations and Commitments related to Views Expressed

Potential Impacts to Fish and Fish Habitat

Denison has made commitments to mitigate any potential adverse effects on fish and fish habitat. Mitigation measures and follow-up monitoring will be employed to ensure that potential effects on fish and fish habitat will be mitigated and managed, which includes commitments to avoid sensitive habitat to the extent possible, scheduling in-water activities to respect important windows in the fish life cycle (e.g., eggs, juveniles, spawning adults), and preparing fish salvage plans to relocate fish prior to in-water work.

With respect to accidental releases and effluent, mitigation and monitoring approaches include, but are not limited to, designing effluent discharge or freshwater intake infrastructure to prevent entrainment or impingement of fish, designing the discharge diffuser/outfall to have the smallest footprint possible, developing site-specific effluent treatment to treat COPC to appropriate release limits, discharging effluent under a scenario that meets provincial and federal discharge criteria, monitoring and managing effluent to ensure these objectives are achieved, and designing and implementing an Environmental Code of Practice that defines actions levels and appropriate steps to mitigate elevated concentrations of chemical and radiological constituents in treated effluent discharge to acceptable levels. Denison will also develop and implement a Surface Water Management Program, which will include collecting and monitoring contact water to determine if treatment is required. This program will mitigate changes to water and sediment quality that could affect fish or fish habitat. Finally, Denison will also develop and implement a Spill Management Plan which demonstrates how Denison will respond in the event of a spill. This ensures that Denison will appropriately and timely respond to a spill and reduce any potential impacts to the environment.

With respect to concerns regarding effluent discharge and potential concerns about fish health and fish habitat, effluent will be discharged through a diffuser located approximately 115m offshore in 3m of water. Continuous water intake and discharge is not expected through the operation or decommissioning phases; however, the project was assessed assuming a continuous average water discharge rate of 36.5 m^3/hr for a conservative assessment. Denison's assessment of potential risk to aquatic receptors concluded that while assuming a continuous discharge there would be no significant adverse health effects to aquatic receptors, including benthic (i.e., bottom-feeding) fish. This assessment was updated to utilize the ECCC FEQG for the selenium bioaccumulation assessment and found no risk to aquatic receptors. Denison's assessment included an adequate level of conservatism and will be further refined through requirements for additional baseline data characterization and updated modelling.

Denison is required to develop an Environmental Management System, including an Emergency Preparedness and Response Program (ERPR) and EPP. The EPRP would identify how the

project prepares for and addresses emergencies that affect the health and safety of persons, the environment, and the protection of property. The EPP would provide a framework for environmental monitoring and management plans and demonstrate compliance with environmental regulatory requirements and performance targets. Note, details of these plans will be developed during the licensing/permitting phase of the process.

Denison has identified areas where a habitat offset may be necessary under the Province of Saskatchewan offsetting framework, however this is focused on terrestrial habitat and biota (e.g., ungulates, furbearers, caribou, birds) and does not address the YNLR concern about aquatic habitat offsetting for fish and fish habitat. Based on the comment responses, this mitigation measure was not satisfactorily settled between Denison and YNLR.

Fish and Fish Habitat Studies and Monitoring

Denison will conduct fish and fish habitat monitoring and follow-up to verify the accuracy of predicted effects and effectiveness of mitigation measures. Fish and fish habitat monitoring will entail measuring species presence, abundance, and life history traits (e.g., survival, condition, growth) over the duration of the project's lifecycle. These measurements will be compared among the construction, operation, and decommissioning time periods with the pre-development time period to assess changes to fish and fish habitat. This monitoring will also co-occur with additional monitoring for water quality, sediment quality, benthic invertebrate, and fish health sampling.

Denison has committed to working with its Indigenous communities of interest to develop and implement the monitoring approach and the framework for sharing monitoring results. This commitment includes collaborating with ERFN and KML on developing a monitoring regime suited to each of their interests and needs (Commitment 10). As part of these programs, Denison will share information in an agreed-upon fashion, including the results of fish tissue monitoring. It is expected that the data collected through these monitoring regimes would also be relevant to other Indigenous Nations. Denison noted BNDN's concern about including fall and spring fish sampling, though they contend that the existing sampling effort provided a sufficient baseline for conducting effects assessments. However, they have made a commitment to implement targeted aquatic surveys prior to site development to capture changes in fish health (e.g., growth, condition, reproduction) at the site, at a reference site, and future effluent site therefore implementing a Before-After-Control-Impact monitoring design. Denison has also committed to collecting additional aquatic baseline characterization data, including wetlands data, to further refine predictions of risk to fish and fish habitat and assess effectiveness of proposed mitigation measures.

The FIRT also raised concerns related to mercury and methylmercury concentrations in the receiving environment and for project related activities to increase the risk for bioaccumulation of methylmercury in fish tissues. Denison has committed to monitoring mercury and methylmercury in the aquatic environment over the life of the Project to determine the potential changes in mercury concentrations in fish tissue over time (Commitments 8-42 and 8-44). Denison will assess health risks from fish consumption by comparing fish tissue data collected during operations from the monitoring program against applicable human health risk-based maximum permissible concentrations. As part of the country food monitoring document developed to support operational licensing, any site-specific contaminant criteria or trigger mechanisms will be developed in consultation with Indigenous Nations and communities.

With respect to ECCC concerns regarding limited confidence in the modelling and the recommendation for a sensitivity analysis on flow scenarios to account for the effects of additional environmental variables, CNSC staff have recommended EA Conditions that would require that Denison conduct a sensitivity analysis for variable flow scenarios and on sediment coefficients and update the licensing ERA with this information(see table 12.1, EA2).

The CNSC have also proposed an EA Condition, which, if accepted, Denison would be required to collect additional baseline water and sediment quality data prior to disturbance of the baseline and update the modelling with this additional data to address concerns related to modelling uncertainty and ability to detect changes related to the Project, and validation of model calibration (see table 12.1, EA2). Denison has committed to have a site water management plan and spill response plan to account for management of all potential contact water on site. Denison has also committed that the finalized diffuser design and configuration to be provided during licensing will not change the EA conclusions of risk to aquatic receptors, and that water quality will remain below guidelines.

7.1.4 CNSC Staff's Analysis

7.1.4.1 Change in Fish Habitat

Overprinting (loss) of Fish Habitat

CNSC staff reviewed Denison's effect assessment to fish and fish habitat from the overprinting of fish habitat and found that Denison conducted a comprehensive analysis of these effects and that identified mitigation and follow-up monitoring program measures are adequate. Denison has committed to collecting additional baseline fish habitat characterization data within wetlands to inform future assessments and improve follow-up monitoring programs (commitment 8-46).

7.1.4.2 Change in Flows or Water levels in Lakes and Rivers

Change in Water Levels and Flows

CNSC staff reviewed Denison's effect assessment of surface water quantity to fish and fish habitat due to changes in flows and water levels in receiving surface water environment considering all phases of the project including additional potential effects due to climate change. CNSC staff confirmed that Denison conducted a comprehensive analysis of surface water quantity effects and identified mitigation and follow-up monitoring program measures that are acceptable, as detailed in section 6.3.4.1. CNSC staff have proposed EA Conditions (table 12.1, EA2) for Denison to address during licensing.

CNSC staff concurs with Denison's conclusion that no significant residual effects were identified related to the assessment of Projects effects on fish and fish habitat from changes in flows or water levels taking into account identified design, mitigation and follow-up monitoring program measures.

7.1.4.3 Change in the Water Quality

Mobilization of Suspended Materials

CNSC staff reviewed Denison's effect assessment of surface water quality to fish, fish habitat, and fish health from the mobilization of suspended sediments and confirmed that Denison conducted a comprehensive analysis of these effects, and that identified mitigation and follow-up monitoring program measures are adequate.

Controlled Discharge to Receiving Environments

CNSC staff reviewed Denison's effects assessment of surface water quality to fish, fish habitat, and fish health from changes in surface water quality in the receiving environment due to the controlled discharge of treated effluent. CNSC staff confirmed that Denison conducted a sufficient analysis of these effects and identified mitigation and follow-up monitoring program measures that are mostly adequate, as detailed in section 6.3.4.2. However, CNSC staff have proposed several EA Conditions for Denison to address during licensing, including some additional baseline data collection and modelling updates, which are outlined in table 12.1 (EA2).

Long-Term Transport of Groundwater Solutes to Whitefish Lake (in Future Centuries)

CNSC staff reviewed Denison's effect assessment of surface water quality to fish, fish habitat, and fish health from the long-term transport of groundwater solutes to Whitefish Lake in the Future Centuries scenario and confirmed that Denison conducted a comprehensive analysis of these effects and that identified mitigation and follow-up monitoring program measures are adequate.

7.1.4.4 Change in the Sediment Quality

Controlled Discharge to Receiving Environments

CNSC staff reviewed Denison's effect assessment on sediment quality to fish, fish habitat, and fish health from the change in sediment quality due to the controlled discharge of treated effluent. CNSC staff confirmed that Denison conducted a sufficient analysis of these effects and identified mitigation and follow-up monitoring program measures that are mostly adequate, as detailed in section 6.4.4.4. However, CNSC staff have proposed several EA Conditions for Denison to address during licensing, including some additional baseline data collection and modelling updates, which are outlined in table 12.1.

Long-Term Transport of Groundwater Solutes to Whitefish Lake (in Future Centuries)

CNSC staff reviewed Denison's effect assessment of sediment quality to fish, fish habitat, and fish health from the long-term transport of groundwater solutes to Whitefish Lake in the Future Centuries scenario and confirmed that Denison conducted a comprehensive analysis of these effects and that identified mitigation and follow-up monitoring program measures are adequate.

7.1.4.5 Change in the Concentration of Constituents in Fish Tissues

Controlled Discharge to Receiving Environments

CNSC staff reviewed Denison's effect assessment to fish health from the change in concentrations of constituents in fish tissues due to the controlled discharge of treated effluent. CNSC staff confirmed that Denison conducted a sufficient analysis of these effects and identified mitigation and follow-up monitoring program measures that are adequate. However, CNSC staff

have proposed EA Conditions (table 12.1) for Denison to address during licensing improve the quality of future licensing ERAs and further refine predicted levels of risk to aquatic receptors.

The FIRT raised concerns related to bioaccumulation of selenium in fish tissues and the use of the recently published FEQGs for whole body and egg-ovary fish tissue concentrations of selenium. The FEQGs for selenium have a high degree of conservatism and were published in 2022. The FIRT strongly recommended the use of the FEQG for comparison against model predicted selenium concentrations in fish tissue during operations, to conservatively determine if there as any risk to fish health. Denison updated the assessment in appendix 10A to address FIRT concerns and utilize the FEQG in the assessment, including an additional uncertainty assessment utilizing upper and lower bound fish tissue concentrations of selenium to reduce uncertainty and improve confidence in the assessment.

The FIRT also raised concerns related to mercury and methylmercury concentrations in the receiving environment and for project related activities to increase the risk for bioaccumulation of methylmercury in fish tissues. The CNSC agrees with Denison's conclusions that risk from mercury and methylmercury is low, as baseline surface water sampling did not identify measurable concentrations of total mercury in the LSA or RSA, and effluent concentrations of mercury are negligible. However, the CNSC supports Denison's assessment that conditions that could increase mercury methylation processes have the potential to occur due to effluent deposition (e.g., nutrient enrichment). Denison has committed to monitoring mercury and methylmercury in the aquatic environment over the life of the Project to determine the potential changes in mercury concentrations in fish tissue over time (see section 7.1.2.2.5 , table 7.12: Follow-up program measures for effects on Fish Health). Denison will assess health risks from fish consumption by comparing fish tissue data collected during operations from the monitoring program against applicable human health risk-based maximum permissible concentrations. As part of the country food monitoring document developed to support operational licensing, any site-specific contaminant criteria or trigger mechanisms will be developed in consultation with Indigenous Nations and communities.

The proposed EA Condition to collect additional baseline data for water and sediment quality and update the licensing ERA with this data to address FIRT concerns regarding surface water and sediment quality data are unlikely to alter the determination of significant adverse effects to fish health from changes in concentrations of constituents in fish tissues (table 12.1, EA2). However, if there are any increases to the risk profiles of receptors exceeding EA predictions due to updates from the incorporation of additional baseline data into the licensing ERA, Denison has committed to addressing these concerns through the implementation of additional mitigation measures, monitoring, and/or adaptive management as needed.

7.1.5 CNSC Staff Findings and Recommendations

Taking into account the implementation of mitigation measures and recommended follow-up program measures, CNSC staff conclude the Project is not likely to cause significant adverse effects on fish and fish habitat from changes in fish habitat (habitat overprinting), changes in flows or water levels in lakes and rivers, or from changes in surface water quality due to the mobilization of suspended materials, controlled discharge to the receiving environment, or the long-term transport of groundwater solutes to Whitefish Lake in a future centuries scenario.

Taking into account the implementation of mitigation measures and recommended follow-up program measures, CNSC staff conclude the Project is not likely to cause significant adverse

effects on fish health from changes in water and sediment quality, and changes in constituent concentrations in fish tissues due to the mobilization of suspended materials, controlled discharge to the receiving environment, or the long-term transport of groundwater solutes to Whitefish Lake in a future centuries scenario.

The effects significance determination table can be found in appendix B.

In order to ensure that the aforementioned assessment conclusions remain valid, CNSC staff recommend that the Commission include the following EA Condition, should it issue a licence. If accepted, Denison will be required to address EA Condition EA2 in table 12.1 related to IRs carried over from the EA Review into licensing. CNSC's assessment conclusions are contingent on the establishment of these EA Conditions.

7.2 Terrestrial Biota

The proposed Project could potentially cause changes to terrestrial biota, through:

- alteration and/or loss of habitat, due to disturbance (e.g., fragmentation, noise, dust deposition) or removal to the extent that the area is functionally unsuitable for wildlife, during all Project phases
- change in mortality, both directly (e.g., collisions, entrapment) and indirectly (e.g., changes in predator-prey dynamics, increased competition, or decreased health) during all Project phases

CNSC staff concurred with Denison's assessment of Project activities that may interact with terrestrial biota and cause residual effects during all project phases, as detailed below.

7.2.1 Description of the environment for terrestrial biota and species at risk

The area surrounding the Project provides habitat for various terrestrial biota, including mammals, amphibians, arthropods, and birds, including several federal and provincial species at risk (SAR), which are explicitly assessed in the Project's EIS and its Appendices. A list of terrestrial biota assessed as valued components is included in table 7.14.

Furbearers are represented by Wolverine (*Gulo gulo*), Pine Marten (*Martes americana*), Mink (*Neovison vison*), and Muskrat (*Ondatra zibethicus*), whose fur is commonly harvested as economic resource. Baseline studies confirmed the presence of Pine Marten, Mink, and Muskrat, but did not detect Wolverine. Pine Marten trails were observed in several ecosites, most commonly in jack pine – black spruce/feathermoss, whereas Mink trails were prevalent on creek transects including bogs and fens. Muskrat signs were common in surveyed waterbodies across the Wildlife LSA and Terrestrial RSA. Wolverine are distributed within the Project region, although they occur at low densities and occupy large home ranges and avoid human footprints and linear features, which could have prevented their detection during baseline studies.

Moose (*Alces alces*), representing ungulates in the assessment, occur across the Terrestrial RSA in several ecosites, including regenerating forest, black spruce treed bog, transects in riparian habitats, and on hand-cut lines, as observed in baseline studies. Overall Moose density in the Project region is relatively low, but comparable to other northern boreal shield regions. Moose generally benefit from young forest regenerated post-disturbance from fires and some anthropogenic activities, such as logging. In recent years, Moose populations were observed to be declining, possibly due to combination of factors such as habitat alteration and loss, disease,

and increased predation and hunting pressure. Moose are highly valued by subsistence and sport hunters.

Woodland Caribou (*Rangifer tarandus caribou*) were documented in the Wildlife LSA and Terrestrial RSA during baseline surveys, although no observations were in the Project Area. Woodland Caribou trails were commonly observed in ecosites with black spruce, jack pine, feathermoss, blueberry and lichen. Baseline studies also confirmed the presence of terrestrial and arboreal lichen, which constitutes up to 70% of the year-round diet of caribou. Notably, the Project is located in the SK1 Boreal Shield Conservation Unit range where the total anthropogenic disturbance should not exceed 5% while maintaining a minimum of 40% undisturbed habitat in the range, as per the Amended Recovery Strategy for the Woodland Caribou, Boreal Population, in Canada (hereafter, also referred to as "federal recovery strategy").

Arthropods, represented by three species at risk, were not specifically observed in the Project Area, although the Project is located within their range. The Nine-spotted Lady Beetle (*Coccinella novemnotata*) and the Transverse Lady Beetle (*Coccinella transversoguttata*) are habitat generalists that use a diverse range of habitats, including open to semi-open forests, grasslands, and riparian areas. The Yellow-banded Bumble Bee (*Bombus terricola*) is also a habitat generalist frequenting boreal habitats, mixed woodlands, and montane meadows. All three arthropod species have experienced population declines.

Amphibians are represented by the Northern Leopard Frog (*Lithobates pipiens*), a species at risk not detected during baseline surveys but assumed to be present due to its range overlapping with the Project. The Northern Leopard Frog relies on suitable habitat for overwintering (e.g., rivers, streams, deep lake ponds), breeding and larval development (e.g., shallow, open aquatic habitats), and summering (e.g., shallow marshes, upland meadows) in relatively close proximity.

Bats observed in the Project region include two species at risk, Little Brown Myotis (*Myotis lucifugus*) and Northern Myotis (*Myotis septentrionalis*), as well as Hoary Bat (*Lasiurus cinereus*) and Western Small-footed Bat (*Myotis ciliolabrum*). Bats require overwintering hibernacula that are sufficiently cool and humid, and summering areas that provide foraging areas and suitable locations for roosting and maternity colonies.

Various bird species are present in the environment, represented by raptors, migratory breeding birds and a total of eight avian species at risk. Bald Eagle (*Haliaeetus leucocephalus*) and Osprey (*Pandion haliaetus*) as well as several of their nests were observed in the Terrestrial RSA. Bald Eagle primarily nest in large trees near waterbodies with a high abundance of fish, while Osprey also use rocky outcrops, artificial platforms, and power poles for nesting in habitats ranging from boreal forest to temperate coasts. More than 20 species of waterbirds and waterfowl were recorded in the Wildlife LSA and Terrestrial RSA, preferring smaller interconnected waterbodies. Waterbirds and waterfowl require open water features for foraging opportunities and suitable upland nesting habitat for upland nesting guilds. Upland game birds detected in the Terrestrial RSA include species of grouse and ptarmigan. Breeding songbird surveys detected 36 avian species, with highest species richness in regenerated, tree-dominated or shrubby ecosites. Among the eight avian species at risk, Barn Swallow (*Hirundo rustica*), Common Nighthawk (*Chordeiles minor*), Horned Grebe (*Podiceps auratus*), Rusty Blackbird (*Euphagus carolinus*) and Olive-sided Flycatcher (*Contopus cooperi*) were observed during baseline surveys. While not detected, Bank Swallow (*Riparia riparia*), Short-eared Owl (*Asio flammeus*), and Yellow Rail (*Coturnicops noveboracensis*) are assessed due to their range overlapping with the Project. Collectively, these species at risk birds represent various diets (e.g., insectivore, omnivore) and

habitats (e.g., woodland, burned forests, open grasslands, wetlands, anthropogenic features). For example, Common Nighthawk prefers regenerating forest and cleared areas; Short-eared Owl, Yellow Rail, and Rusty Blackbird prefer shrubby, graminoid, and open bog and fen habitat types; and, Olive-sided Flycatcher prefers coniferous and mixed-wood forest edges, forest openings, and burned forests with standing trees and snags.

Lastly, it should be noted that various other terrestrial biota inhabit the environment surrounding the Project, which were not specifically assessed as valued components. CNSC staff found this approach to be acceptable, since it is not practical or necessary to specifically assess all species present or likely to be present on a site as long as representative species or groups are chosen for the assessment.

More information is available in the Appendices of Denison's EIS: appendix 9-B, *Terrestrial Environment, Wildlife and Vegetation Baseline Inventory*, and appendix 9-C, *Annex Report, Soil, Vegetation and Wildlife*. CNSC staff also reviewed an updated 2024 Omnia Terrestrial Environment Wildlife and Vegetation Baseline Inventory Report, provided by Denison in April 2025[3].

Table 7.14: Terrestrial biota considered in the Wheeler River environmental assessment; federal and provincial species at risk status provided as applicable

Category	Species	Federal status[1]	Provincial status[2]
Furbearers	Wolverine	Special concern	S2
	Pine Marten	-	S4
	Mink	-	S5
	Muskrat	-	S5
Ungulates	Moose	-	S5
Caribou	Woodland Caribou	Threatened	S3
Arthropods	Nine-spotted Lady Beetle	Endangered	S4
	Transverse Lady Beetle	Special concern	S4
	Yellow-banded Bumble Bee	Special concern	S4
Amphibians	Northern Leopard Frog	Special concern	S3
Bats	Little Brown Myotis	Endangered	S4B, S4N
	Northern Myotis	Endangered	S3
Birds	Bank Swallow	Threatened	S4B, S5M
	Barn Swallow	Threatened	S4B
	Common Nighthawk	Special concern	S4B
	Horned Grebe	Special concern	S5B
	Olive-sided Flycatcher	Special concern	S4B
	Rusty Blackbird	Special concern	S3B, SUN
	Short-eared Owl	Special concern	S3B, S2N

[3] Omnia Ecological Services - Terrestrial Environment – Wildlife and Vegetation Baseline Inventory – 2024 Report Updated. Provided April 2025

	Yellow Rail	Special concern	S3B
	Waterbirds and waterfowl	-	N/A
	Upland game birds	-	N/A
	Migratory songbirds	-	N/A
	Bald Eagle	-	S5B, S5N, S4N
	Osprey	-	S2B, S2M

[1] As provided in *Species at Risk Act* (S.C. 2002, c. 29), Schedule 1, List of Wildlife Species at Risk, https://laws.justice.gc.ca/eng/acts/s-15.3/page-10.html
[2] As defined in Saskatchewan; S2 = imperiled/very rare, S3 = vulnerable/rare to uncommon, S4 = apparently secure, S5 = secure/common; https://biodiversity.sk.ca/ranking.htm

7.2.2 Proponent's Assessment

Denison concluded that the residual effects of the Project are expected to result in no significant adverse effects to terrestrial biota. More information on each project related effect and the residual effects evaluation can be found below and in the EIS sections 9.3, and 9.4.

7.2.2.1 General approach used by Denison

Denison's assessment of "alteration and/or loss of habitat" includes both direct and indirect changes. Direct loss relates to habitat disturbance or removal to the extent that it is unsuitable for wildlife use, while alteration addresses indirect disturbance that reduces suitability, such as edge effects, fragmentation, or sensory disturbances (e.g., noise, dust, light). One key element of Denison's residual effects assessment is the determination of "available habitat" as a summary of the ecosite habitat types that a species is assumed to use during all seasons, informed by baseline studies and literature reviews among other information. From this, direct habitat loss is calculated as the area of available habitat that is lost due to site clearing and ground disturbance in the Project Area. Alteration is quantified by applying a species-specific buffer around the Project Area that is intended to capture indirect effects including sensory disturbances.

Denison's assessment of "change in mortality" considers both direct and indirect sources that can affect populations, such as collisions, entrapment, incidental take, changes in predator-prey dynamics, competition for resources, changes in health, or increased hunter access.

7.2.2.2 Furbearers, ungulates and caribou

Furbearers (Wolverine, Pine Marten, Mink, Muskrat)

Alteration and/or loss of habitat

Denison predicted residual adverse changes in the alteration and/or loss of habitat of Wolverine, Pine Marten, Mink, and Muskrat. The Project is expected to affect available furbearer habitat directly through habitat loss from site clearing, and indirectly through habitat alteration around the Project Area (1,000 m buffer for wolverine, 500 m buffer for Pine Marten, Mink, and Muskrat). On the scale of the Terrestrial RSA, direct habitat loss and indirect habitat alteration are 0.5% and 7.7% for Wolverine, 0.5% and 3.9% for Pine Marten, 0.02% and 2.5% for Mink, and 0.001% and 1% for Muskrat, respectively. Denison noted that Wolverine do not require specific habitat types as long as prey is available, that Pine Marten can persist at lower population levels, and that Mink and Muskrat habitat is already limited in the Project Area resulting in only minor loss. Denison expects that progressive reclamation will regenerate habitat

over the longer-term, and that alteration will cease once sensory disturbances diminish in post-decommissioning. Denison concluded that alteration and/or loss of available furbearer habitat is not expected to result in a change that will alter furbearer habitat integrity to the point where it would not be able to sustain the regional furbearer population. More detailed information can be found in the EIS section 9.3.6.3.1.

Change in mortality

Denison predicted residual adverse changes in mortality of furbearers. Direct mortality can occur from interactions with Project components, including vehicle collisions, entrapment in snow berms, and destruction or abandonment of den sites. These effects will be mitigated through pre-clearing wildlife surveys, implementing breaks in snowbanks, and speed limits. Indirect mortality may occur from decreased health and competition for resources. In addition, increased access for people may result in more harvesting or trapping, although Denison noted that the area is remote with gated access control. Denison concluded that the Project is not expected to result in a change to furbearer mortality that will alter the integrity of regional populations to the point where they could not be sustained. More detailed information can be found in the EIS section 9.3.6.3.2.

Through implementation of appropriate mitigation measures and follow up monitoring, Denison anticipates that the impacts from the alteration and/or loss of habitat and change in mortality on furbearers will be negligible throughout all Project phases. Therefore, Denison determined the alteration and/or loss of habitat and the change in mortality from direct and indirect sources is not expected to have significant residual adverse effects on furbearers.

Ungulates (Moose)

Alteration and/or loss of habitat

Denison predicted residual adverse changes in the alteration and/or loss of habitat of Moose. The Project is expected to affect available Moose habitat directly through habitat loss from site clearing, and indirectly through habitat alteration around the Project Area (500 m buffer). On the scale of the Terrestrial RSA, 0.5% of available Moose habitat will be lost and 3.9% may experience alteration from sensory disturbance such as noise or dust. Denison noted that Moose densities are generally low on the regional scale despite available regenerating habitat for forage, indicating that habitat is not limiting. Since Moose prefer habitat of regenerating forage after disturbance, Denison expects that progressive reclamation will provide suitable forage habitat in the Project Area within a few years after revegetation. Alteration is also expected to cease once sensory disturbances diminish in post-decommissioning. Denison concluded that alteration and/or loss of available Moose habitat is not expected to result in a change that will alter Moose habitat integrity to the point where it would not be able to sustain the regional Moose population. More detailed information can be found in the EIS section 9.3.6.2.1.

Change in mortality

Denison predicted residual adverse changes in mortality of Moose. Direct mortality can occur from interactions with Project components, including vehicle collisions and entrapment in snowbanks along roads, which will be mitigated through speed limits, exclusion fences, and road management. Indirect mortality may occur from increased access of hunters and predators, and sensory disturbances that can cause stress. Hunting is limited by draw and resident regular licences, and mitigation measures will be in place to reduce sensory disturbances from noise and

dust. Denison concluded that the Project is not expected to result in a change in Moose mortality that will alter the integrity of the regional Moose population to the point where it could not be sustained. More detailed information can be found in the EIS section 9.3.6.2.2.

Through implementation of appropriate mitigation measures and follow up monitoring, Denison anticipates that the impacts from the alteration and/or loss of habitat and change in mortality on ungulates will be negligible throughout all Project phases. Therefore, Denison determined the alteration and/or loss of habitat and the change in mortality from direct and indirect sources is not expected to have significant residual adverse effects on ungulates.

Caribou (Woodland Caribou)

Alteration and/or loss of habitat

Denison predicted residual adverse changes in the alteration and/or loss of habitat of Woodland Caribou. The Project is expected to affect available Woodland Caribou habitat directly through habitat loss from site clearing, and indirectly through habitat alteration around the Project Area (500 m buffer). On the scale of the Terrestrial RSA, 0.5% of available Woodland Caribou habitat will be lost and 3.8% may experience alteration from sensory disturbance. Denison notes that disturbed forests may not provide suitable caribou habitat for up to 20 years, until terrestrial and arboreal lichen have reestablished. However, Denison stated that the Woodland Caribou population in SK1 is stable and overall disturbance in the conservation unit remains below the federal recovery strategy threshold required to sustain viable populations. While Denison's assessment assumed Woodland Caribou to be present in the study areas throughout all seasons and life stages including all life requisite attributes (forage, refuge, calving), in appendix 9-F, *Supplemental Information*, Denison illustrated the location of seasonal Woodland Caribou observations in relation to potential calving, foraging, and refuge habitat. Taking into account the mitigation measures, as outlined in appendix 9-E, *Caribou Management Framework*, Denison concluded that alteration and/or loss of available Woodland Caribou habitat is not expected to result in a change that will alter Woodland Caribou habitat integrity to the point where it would not be able to sustain the regional population. More detailed information can be found in the EIS section 9.3.6.4.1.

Change in mortality

Denison predicted residual adverse changes in mortality of Woodland Caribou. Direct mortality can occur from interactions with Project components, including vehicle collisions, although no caribou-vehicle collisions have been reported in the province. Indirect mortality may occur from apparent competition with alternative prey species that support a higher density of shared predators and facilitated predation by wolves through linear features. Sensory disturbances from noise, dust, or light can increase stress levels and reduce health. Denison listed various mitigation measures such as traffic management, employee education, exclusion fencing, and the reclamation of trails and roads that facilitate predator movement. Denison concluded that the Project is not expected to result in a change in Woodland Caribou mortality that will alter the integrity of the regional population to the point where it could not be sustained. More detailed information can be found in the EIS section 9.3.6.4.2.

Through implementation of appropriate mitigation measures and follow up monitoring, Denison anticipates that the impacts from the alteration and/or loss of habitat and change in mortality on caribou will be negligible throughout all Project phases. Therefore, Denison determined the

alteration and/or loss of habitat and the change in mortality from direct and indirect sources is not expected to have significant residual adverse effects on caribou.

Mitigation Measures for furbearers, ungulates and caribou

Denison has proposed the following measures to mitigate the potential adverse effects from identified project activities on furbearers, ungulates and caribou. CNSC staff have assessed the mitigation measures proposed by Denison and have concluded that they are adequate to manage potential significant adverse effects to terrestrial biota. See a summary in table 7.15 below.

Table 7.15 Proposed mitigation measures to address effects on furbearers, ungulates, and caribou

Alteration and/or loss of habitat
• Reduced Project footprint that is primarily located within previously disturbed areas
• Timing of clearing and other works to avoid disturbance during sensitive time periods (e.g., denning and calving periods)
• Pre-disturbance surveys to identify sensitive wildlife habitat features or presence of species at risk, in accordance with the Wildlife Monitoring Plan   ○ Species-specific pre-clearance surveys for Wolverine and Woodland Caribou
• Development of Woodland Caribou offsetting plan to satisfy the requirements of the Province of Saskatchewan offsetting framework
• Development of wildlife monitoring plan to address wildlife-specific mitigation measures
• Progressive reclamation during operation and ongoing decommissioning when possible, following the Reclamation and Closure Plan
• Dust suppression techniques to limit deposition on vegetation and waterbodies (e.g., stack height design, access control, wash bay, road watering, traffic control)
• Use of high-quality, low sound emission equipment and regular maintenance
• Lighting focussed on work sites
• Sediment and erosion control measures along with routine inspections and management
• Bulk storage tanks for processing chemicals will sit inside appropriately designed and sized secondary containment basins
• Contaminated waste properly contained on double-lined waste pad with leak detection and monitoring
Change in mortality
• Road signage (e.g., speed limits, wildlife crossings) to minimize wildlife-vehicle collisions
• Vegetation management along roads to reduce attractiveness to wildlife and maintain sightlines
• Contaminated areas such as waste ponds and pads and landfill will be fenced to avoid contact with wildlife
• Waste collected and temporarily stored in wildlife-proof containers to avoid attracting scavengers that increase risk for human-wildlife interactions
• Policies implemented to prohibit staff to feed, approach, or harass wildlife species
• Wildlife education and awareness training for employees and contractors
• Exclusion fencing around buildings and other Project components for deterrence and prevention of wildlife entrapment
• Project site and access roads will be designed to minimize sightlines for predators

• Ditches and culverts along roads designed and maintained to minimize pooling of water as roadside pools may attract wildlife
• Air emissions reduced to the extent practical through implementation of air emissions management and monitoring

Monitoring and Follow-Up Measures

In order to verify the accuracy of the assessment and determine the effectiveness of the mitigation measures, Denison will implement the following EA follow-up measures.

Table 7.16 Follow-up program measures for effects on furbearers, ungulates, and caribou

Alteration and/or loss of habitat, and change in mortality
• Routine monitoring of wildlife species throughout the life of the Project in accordance with the Wildlife Monitoring Plans
• Progressive reclamation and revegetation of disturbed areas monitored in accordance with the Reclamation and Closure Plan

7.2.2.3 Arthropods (Nine-spotted Lady Beetle, Transverse Lady Beetle, Yellow-banded Bumble Bee)

Alteration and/or loss of habitat

Denison predicted residual adverse changes in the alteration and/or loss of habitat of Nine-spotted Lady Beetle, Transverse Lady Beetle, and Yellow-banded Bumble Bee from various project activities. Denison did not perform detailed calculations for habitat loss and alteration as information for arthropods was provided in response to an IR and is thus not included in the main EIS but in appendix 9-D. Denison stated that mitigation measures designed for soil and vegetation also address effects on arthropods as they limit the loss or disruption of their habitat. In addition, herbicide use for vegetation management will be limited to the Project footprint and only applied if necessary. Denison concluded that alteration and/or loss of available arthropod habitat is not expected to result in a change that will alter arthropod habitat integrity to the point where it is not sustainable to contribute to ecological functions. More detailed information can be found in the appendix 9-D, section 5.

Change in mortality

Denison predicted residual adverse changes in mortality of Nine-spotted Lady Beetle, Transverse Lady Beetle, and Yellow-banded Bumble Bee from various project activities. As noted above, species-specific mitigation measures will be used to address effects. Denison concluded that the change in mortality is not expected to alter the integrity of the regional arthropod populations to the point where they are not sustainable or available to contribute to ecological functions. More detailed information can be found in the appendix 9-D, section 5.

Through implementation of appropriate mitigation measures and follow up monitoring, Denison anticipates that the impacts from the alteration and/or loss of habitat and change in mortality on arthropods will be negligible throughout all Project phases. Therefore, Denison determined the alteration and/or loss of habitat and the change in mortality from direct and indirect sources is not expected to have significant residual adverse effects on arthropods.

Mitigation Measures for arthropods

Denison has proposed the following measures to mitigate the potential adverse effects from identified project activities on arthropods. CNSC staff have assessed the mitigation measures proposed by Denison and have concluded that they are adequate to manage potential significant adverse effects to arthropods. See a summary in table 7.17 below.

Table 7.17 Proposed mitigation measures to address effects on arthropods

Alteration and/or loss of habitat
• Project Area reduced to the extent safely practicable to reduce habitat disturbance and noise
• Project footprint mostly developed within previously disturbed areas to minimize additional habitat disturbance
• Progressive reclamation completed where possible
Change in mortality
• Herbicide use as part of vegetation management limited to immediate Project footprint and applied by licensed professional when necessary

Monitoring and Follow-Up Measures

In order to verify the accuracy of the assessment and determine the effectiveness of the mitigation measures, Denison will implement the following EA follow-up measures.

Table 7.18 Follow-up program measures for effects on arthropods

Alteration and/or loss of habitat, and change in mortality
• Progress and success of progressive reclamation assessed annually

7.2.2.4 Amphibians (Northern Leopard Frog)

Alteration and/or loss of habitat

Denison predicted residual adverse changes in the alteration and/or loss of habitat of Northern Leopard Frog from various project activities. Denison did not perform detailed calculations for habitat loss and alteration as information for Northern Leopard Frog was not initially included in the main EIS but added in appendix 9-D. Denison stated that mitigation measures designed for wetlands also address effects on amphibians as they limit the loss or disruption of their habitat. In addition, species-specific pre-disturbance surveys will be conducted to identify habitat such as breeding ponds to implement setbacks and buffers as appropriate. Denison concluded that alteration and/or loss of available amphibian habitat is not expected to result in a change that will alter habitat integrity to the point where it is not sustainable to contribute to ecological functions. More detailed information can be found in the appendix 9-D, section 5.

Change in mortality

Denison predicted residual adverse changes in mortality of Northern Leopard Frog from various project activities. As noted above, species-specific mitigation measures will be used to address effects. Denison concluded that the change in mortality is not expected to alter the integrity of the regional Northern Leopard Frog populations to the point where they are not sustainable or

available to contribute to ecological functions. More detailed information can be found in the appendix 9-D, section 5.

Through implementation of appropriate mitigation measures and follow up monitoring, Denison anticipates that the impacts from the alteration and/or loss of habitat and change in mortality on amphibians will be negligible throughout all Project phases. Therefore, Denison determined the alteration and/or loss of habitat and the change in mortality from direct and indirect sources is not expected to have significant residual adverse effects on amphibians.

Mitigation Measures for amphibians

Denison has proposed the following measures to mitigate the potential adverse effects from identified project activities on amphibians. CNSC staff have assessed the mitigation measures proposed by Denison and have concluded that they are adequate to manage potential significant adverse effects to amphibians. See a summary in table 7.19 below.

Table 7.19 Proposed mitigation measures to address effects on amphibians

Alteration and/or loss of habitat
• Project Area reduced to the extent safely practicable to reduce habitat disturbance and noise
• Project footprint mostly developed within previously disturbed areas to minimize additional habitat disturbance
• Progressive reclamation completed where possible
• Locations of site-specific habitat features communicated to Project personnel and implementation of requirements to limit disturbance
• Vehicle traffic and construction restricted to approved access routes and work areas and will not cross or enter a watercourse or wetland
Change in mortality
• Pre-disturbance surveys to identify site-specific habitat features (e.g., breeding ponds) and implement setbacks or timing windows
• Implementation of applicable activity restrictions as per the Saskatchewan Activity Restriction Guidelines for Sensitive Species (SARGSS)
• Appropriate setback and buffer distances from wetland features where Northern Leopard Frog is known to occur

Monitoring and Follow-Up Measures

In order to verify the accuracy of the assessment and determine the effectiveness of the mitigation measures, Denison will implement the following EA follow-up measures.

Table 7.20 Follow-up program measures for effects on amphibians

Alteration and/or loss of habitat, and change in mortality
• Progress and success of progressive reclamation assessed annually
• Routine monitoring of wildlife species throughout the life of the Project in accordance with the Wildlife Monitoring Plans

7.2.2.5 Bats (Little Brown Myotis, Northern Myotis)

Alteration and/or loss of habitat

Denison predicted residual adverse changes in the alteration and/or loss of habitat of Little Brown Myotis and Northern Myotis from various project activities. Denison did not perform detailed calculations for habitat loss and alteration as information for bats was provided in response to an IR and is thus not included in the main EIS but in appendix 9-D and appendix 9-F. Denison stated that based on the terrain, vegetation, and ecosystem information available, there are no hibernacula anticipated in the Project Area. Terrain is low relief with no rocky outcrops or bedrock at surface for cave habitats, and there are no man-made structures such as mine openings or buildings with stable and specific temperatures. In appendix 9-F, Denison assessed existing ecosites for their potential for maternity roosts (e.g., presence of larger diameter trees), and identified small areas (<49 ha) of suitable potential roost habitat in the Project Area. Several mitigation measures are proposed to address effects, most notably the pre-clearance surveys specific to Little Brown Myotis and Northern Myotis that will identify maternal roosting sites and hibernacula with implementation of appropriate setbacks and clearance timing windows. Denison concluded that alteration and/or loss of available bat habitat is not expected to result in a change that will alter habitat integrity to the point where it is not sustainable to contribute to ecological functions. More detailed information can be found in the appendix 9-D, section 5, and appendix 9-F, section 2.3.

Notably, Denison provided a supplemental memo to CNSC in October 2024[4] that described additional bat species, Hoary Bat and Western Small-footed Bat, observed in 2024. In a supplemental response, Denison explained that the assessment for bat species at risk is representative of the additional two species given they occupy the same ecological niche and have similar life histories, and thus the assessment conclusions equally apply to the additional bat species.

Change in mortality

Denison predicted residual adverse changes in mortality of Little Brown Myotis and Northern Myotis from various project activities. As noted above, species-specific mitigation measures will be used to address effects. Denison concluded that the change in mortality is not expected to alter the integrity of the regional bat populations to the point where they are not sustainable or available to contribute to ecological functions. More detailed information can be found in the appendix 9-D, section 5.

Through implementation of appropriate mitigation measures and follow up monitoring, Denison anticipates that the impacts from the alteration and/or loss of habitat and change in mortality on bats will be negligible throughout all Project phases. Therefore, Denison determined the alteration and/or loss of habitat and the change in mortality from direct and indirect sources is not expected to have significant residual adverse effects on bats.

Mitigation Measures for bats

Denison has proposed the following measures to mitigate the potential adverse effects from identified project activities on bats. CNSC staff have assessed the mitigation measures proposed

[4] Omnia memo, RE: Denison Wheeler 2024 Replicate Bat Surveys, dated 29 Oct. 2024

by Denison and have concluded that they are adequate to manage potential significant adverse effects to bats. See a summary in table 7.21 below.

Table 7.21 Proposed mitigation measures to address effects on bats

Alteration and/or loss of habitat
• Vegetation clearing outside of roosting periods, when practical
• Locations of site-specific habitat features communicated to Project personnel and implementation of requirements to limit disturbance
Change in mortality
• Pre-disturbance surveys to identify site-specific habitat features (e.g., roosting sites, hibernacula) and implement setbacks or timing windows
• If a maternal roosting site is identified on the Project footprint, implementation of exclusionary methods following the summer maternity roost seasons
• Specific exclusion methods to prevent access to buildings or other infrastructure

Monitoring and Follow-Up Measures

In order to verify the accuracy of the assessment and determine the effectiveness of the mitigation measures, Denison will implement the following EA follow-up measures.

Table 7.22 Follow-up program measures for effects on bats

Alteration and/or loss of habitat, and change in mortality
• Routine monitoring of wildlife species throughout the life of the Project in accordance with the Wildlife Monitoring Plans

7.2.2.6 Birds (Bank Swallow, Barn Swallow, Common Nighthawk, Horned Grebe, Olive-sided Flycatcher, Rusty Blackbird, Short-eared Owl, Yellow Rail, waterbirds and waterfowl, upland game birds, migratory songbirds, Bald Eagle, Osprey)

Alteration and/or loss of habitat

Denison predicted residual adverse changes in the alteration and/or loss of habitat for all bird species from various project activities. For the raptors Bald Eagle and Osprey, direct habitat loss was calculated based on site clearing, while alteration of available habitat was quantified by applying a 1,000 m buffer around the Project Area to account for sensory disturbance. On the scale of the Terrestrial RSA, the assessment resulted in 0.4% raptor habitat lost and 6.5% altered. These effects will be mitigated through progressive restoration, although differences may exist between habitat types for the time frame for vegetation regeneration. Since both raptor species prefer tall mature trees within upland forest near waterbodies, habitat is assumed to become available when mature trees offer potential nesting habitat after post-decommissioning.

Denison grouped waterbirds and waterfowl, upland game birds, and migratory songbirds as “migratory breeding birds”. Direct habitat loss was calculated based on site clearing, while alteration of available habitat was quantified by applying a buffer (1,000 m for waterbirds and waterfowl, 500 m for upland game birds and migratory songbirds) around the Project Area to account for sensory disturbance. On the scale of the Terrestrial RSA, the assessment resulted

in 0.0002% waterbirds and waterfowl habitat lost and 1.6% altered, 0.5% upland game bird habitat lost and 3.8% altered, and 0.5% migratory songbird habitat lost and 3.6% altered. These effects will be mitigated through progressive restoration, although differences may exist between habitat types for the time frame for vegetation regeneration. While avian species that prefer regenerating vegetation types would have suitable habitat available for their use earlier, regeneration of disturbed areas into mature forests is expected to extend beyond post-decommissioning.

For bird species at risk, Denison performed detailed calculations for habitat loss and alteration for five species initially included in the EIS (Common Nighthawk, Olive-sided Flycatcher, Rusty Blackbird, Short-eared Owl, Yellow Rail), and provided additional information for three species (Bank Swallow, Barn Swallow, Horned Grebe) in EIS appendix 9-D in response to an IR. The assessment considered the direct loss of habitat and the indirect alteration (500 m buffer to account for sensory disturbances, habitat fragmentation, and edge effects) of habitat during all Project phases. On the scale of the Terrestrial RSA, direct habitat loss and alteration, respectively, were assessed as 0.4% and 3.6% for Common Nighthawk, 0.01% and 2.9% for Short-eared Owl, 0.02% and 2.4% for Yellow Rail, 0.02% and 2.4% for Rusty Blackbird, and 0.5% and 3.8% for Olive-sided Flycatcher. Given the habitat-based assessment methodology, Denison stated that the assessed species can serve as surrogates for other bird species at risk that use the same habitat types, e.g., Yellow Rail for Horned Grebe, and Common Nighthawk for Barn Swallow; however, species-specific mitigation measures will be applied as outlined in EIS appendix 9-D, section 3.3.4. Habitat loss and alteration will be mitigated through progressive restoration, although differences may exist between habitat types for the time frame for vegetation regeneration. Revegetated areas are anticipated to become available habitat within a few years of revegetation for some species that prefer habitat following disturbance at an early seral stage. Denison stated that while all bird species at risk are expected to be sensitive to changes in their environment, only a limited number of individuals is expected to interact with the Project and displaced individuals are expected to relocate to available habitat elsewhere.

Denison concluded that alteration and/or loss of available bird habitat is not expected to result in a change that will alter habitat integrity to the point where it would not be able to sustain regional populations. More detailed information can be found in EIS sections 9.4.6.2.1, 9.4.6.3.1, and 9.4.6.4.1, and EIS appendix 9-D, section 5.

Change in mortality

Denison predicted residual adverse changes in mortality of all bird species from various project activities. Potential sources of direct mortality include incidental take during site clearing and vegetation management, collisions with vehicles, equipment, airplanes, buildings or power transmission lines, and electrocution on energized equipment. All birds are vulnerable to incidental take, but particularly those that build inconspicuous nests on the ground (e.g., Common Nighthawk) or nest on structures that require routine maintenance. Denison assessed that raptors are less susceptible to incidental take as they prefer nesting in tall trees or on power poles, and also less vulnerable to collisions as they quickly maneuver in flight. In turn, species that use roadside habitats may be more susceptible to collisions. Larger-bodied flocking birds are considered highest risk for bird strikes with aircraft or collisions with power lines. Short-eared Owl and Olive-sided Flycatcher may be vulnerable to incidental take during Project-related site clearing and vegetation management due to their nesting preferences. In contrast, habitat for

Yellow Rail and Rusty Blackbird is limited in the Project Area, resulting in lower probability of direct mortality.

As for indirect sources of mortality, these include nest failure or abandonment due to sensory disturbance, disorientation by artificial light at night, and changes in predator-prey dynamics. Avian species are typically more sensitive to sensory disturbance during the breeding season. Mitigation measures will be in place to limit interactions between birds and potential sources of direct and indirect mortality. Moreover, Denison noted that displaced individuals are expected to relocate to areas of available habitat which limits interactions with the Project that could cause mortality. Available habitat is not considered to be a limiting factor within the region. Thus, occurrences of mortality are expected to be isolated and infrequent events given the implementation of mitigation measures.

Denison concluded that the change in mortality is not expected to alter the integrity of the regional bird populations to the point where they could not be sustained. More detailed information can be found in EIS sections 9.4.6.2.2, 9.4.6.3.2, and 9.4.6.4.2, and EIS appendix 9-D, section 5.

Through implementation of appropriate mitigation measures and follow up monitoring, Denison anticipates that the impacts from the alteration and/or loss of habitat and change in mortality on birds will be negligible throughout all Project phases. Therefore, Denison determined the alteration and/or loss of habitat and the change in mortality from direct and indirect sources is not expected to have significant residual adverse effects on birds.

Mitigation Measures for birds

Denison has proposed the following measures to mitigate the potential adverse effects from identified project activities on birds. CNSC staff have assessed the mitigation measures proposed by Denison and have concluded that they are adequate to manage potential significant adverse effects to birds. See a summary in table 7.23 below.

Table 7.23 Proposed mitigation measures to address effects on birds

Alteration and/or loss of habitat
• Project Area reduced to the extent safely practicable to reduce habitat disturbance and noise
• Project footprint mostly developed within previously disturbed areas to minimize additional habitat disturbance
• Progressive reclamation completed where possible
• Noise management to minimize disturbance especially during sensitive time periods
• Dust suppression to limit deposition on vegetation and waterbodies
• Directed, shielded, low or task lighting focussed on work sites
• Sediment and erosion control such as fencing or vegetated barriers
Change in mortality
• Site clearing and other works that involve disturbance of vegetation or soil conducted outside of the nesting season when practicable, taking into account individual breeding and nesting seasons for each species at risk
• Pre-disturbance nest surveys prior to the commencement of any vegetation clearing or soil disturbance

• Active nests and suspected nest locations protected with setback buffer consistent with regulatory guidelines
• Relatively short power transmission line (approx. 7 km) constructed from existing provincial power line adjacent to Highway 914
• Deflectors on power transmission lines to discourage nesting
• Infrastructure maintained to exclude birds, including solid and flexible barriers
• Physical, visual, and auditory deterrents and exclusion methods to discourage avian use and prevent entrapment
• Wildlife education and training for employees and contractors including avian deterrent techniques and waste management
• Road and traffic management to reduce attractiveness of roadside habitat and minimize collisions

Monitoring and Follow-Up Measures

In order to verify the accuracy of the assessment and determine the effectiveness of the mitigation measures, Denison will implement the following EA follow-up measures.

Table 7.24 Follow-up program measures for effects on birds

Alteration and/or loss of habitat, and change in mortality
• Routine monitoring of wildlife species throughout the life of the Project in accordance with the Wildlife Monitoring Plans
• Monitoring avian mortality related to avian use of waste and water facilities, as well as mortality events associated with interactions with access roads and transmission lines
• Progressive reclamation and revegetation of disturbed areas monitored in accordance with the Reclamation and Closure Plan

7.2.3 Other Views Expressed

7.2.3.1 Wildlife & Habitat

Indigenous Nations and Communities

ERFN expressed several concerns on the topic of wildlife and wildlife habitat. First, they emphasize the importance of documenting caribou and moose calving locations and participating in mitigation efforts. The loss of wetland areas and lichen could significantly impact habitat and food availability during critical life stages for these species. Additionally, noise generated by Project-related activities may affect ungulates. ERFN noted concerns that increased access to Cree Lake could adversely impact caribou and moose populations.

YNLR specifically focused on the extensive seismic network's potential effects on vegetation and wetlands. They also highlight the impact of seismic cut lines on land, wildlife, and future land users. Linear disruptions are a concern, affecting ungulates, furbearers, Woodland Caribou, raptors, migratory breeding birds, and species at risk.

Additionally, YNLR questioned the adequacy of the EIS in addressing project-specific concerns related to Woodland Caribou range and Moose. Lastly, community Elders express their worry that future generations may not experience an abundance of wildlife. They emphasized the need to consider IK in the protection of Woodland Caribou.

Métis Nation – Saskatchewan requested they be involved in the development of Wildlife Monitoring and Woodland Caribou Management Plans given the importance of Woodland Caribou to MN-S citizens.

BNDN shared many concerns relating to wildlife and wildlife habitat as a result of the proposed Project. BNDN's concerns regarding wildlife included ingestion of contaminants of potential concern, increased likelihood of human-wildlife road collisions, and interaction of wildlife with areas storing hazardous substances. BNDN noted that concerns related to wildlife have a direct impact on their citizens as the abundance of wildlife present for harvesting may be reduced, as well as concerns of traditional users that wildlife may be contaminated as a result of the proposed Project activities and operation.

In response to a CNSC request for review of the Views Expressed shared, PBCN indicated that they are concerned that changes to air and noise quality may disrupt wildlife of up to a considerable distance away from the Proposed Project.

7.2.3.2 Furbearers

Indigenous Nations and Communities

ERFN noted that many important furbearing species (e.g., Lynx, Muskrat, Fisher, Otter, Mink, etc.) were erroneously omitted from the wildlife valued component given these are culturally important species. Further, ERFN believed that monitoring changes in wetland aerial extent alone (as a single monitoring point) was insufficient, given that wetlands serve as key lifecycle habitats for species of concern, including furbearing species such as Beaver and Mink.

YNLR raised concern that given all the residual effects noted across the VCs contained in the EIS that impacts to furbearing wildlife species was noted as non-significant. YNLR indicated they disagree with this assessment conclusion.

BNDN noted that they possess significant IK on furbearing wildlife species and requested to be meaningfully involved in the development of wildlife monitoring and management plans to impart IK to Denison.

7.2.3.3 Woodland Caribou

Indigenous Nations and Communities

ERFN indicated to Denison that reclamation priorities should include meeting objectives for Woodland Caribou and that any work related to Woodland Caribou must consider the federal recovery strategy for the species.

YNLR raised concerns to Denison that the Woodland Caribou Offset Plan and restoration are insufficient to YNLR citizens given the methodology used and lack of details provided on where the offsets will occur.

MN-S was concerned that the RSA selected for assessment of wildlife did not encompass a sufficient area to consider Woodland Caribou. In addition, MN-S noted their concerns that Denison has not incorporated sufficient Métis Knowledge into their Woodland Caribou Management Plan and requested Denison further engage on this issue and to include Northern Regions 1 and 3 representatives in the development of a Woodland Caribou Management Plan for the Project.

BNDN requested Denison better present the extent of Woodland Caribou habitat alteration and/or loss from the proposed Project by implementing a 5 km avoidance buffer to suitable habitat to more accurately reflect the impacts to Woodland Caribou as a result of the Project.

PBCN raised questions of what the impacts to Woodland Caribou will be as a result from various residual effects noted for the Project. In response to a CNSC request for review of the Views Expressed shared, PBCN requested an opportunity to review and comment on all caribou mitigation and offsetting plans to ensure the disruption to the exercise of PBCN's aboriginal rights to hunt Woodland Caribou is minimized.

Federal Authorities

ECCC does not agree with the conclusion that the Project will have no significant residual adverse effects on boreal Woodland Caribou. Residual adverse effects with medium risk, based on medium consequence and high likelihood, to the recovery of boreal Woodland Caribou are expected to occur from Project activities if mitigations, including offsetting, are insufficient or not aligned with the objectives of the recovery strategy. Given the ecological context of boreal Woodland Caribou, any loss of critical habitat is a significant risk to the species and the species' ability to recover.

The regional study area is too small to capture cumulative effects on Woodland Caribou. The calculations and effects assessments have not followed Scientific Assessment to Support the Identification of Critical Habitat for Woodland Caribou (*Rangifer tarandus caribou*), Boreal Population, in Canada (Environment Canada, 2011) or the Amended Recovery Strategy for Woodland Caribou (*Rangifer tarandus caribou*), Boreal Population, in Canada. ECCC recommends that Denison assess effects at the scale which is representative of the SK1 range. ECCC recommends updating the assessment of residual and cumulative effects to boreal Woodland Caribou and providing further mitigations, including offsetting, commensurate with risks.

ECCC notes that the current level of detail in the Caribou Management Framework is insufficient to determine if offsetting amount, location, timing and methods will achieve the goal of no net loss and be aligned with the goals of the amended recovery strategy for boreal Woodland Caribou. Based on the information presented in the final EIS, ECCC's analysis is that the offsetting requirement should be much greater than 4:1, and there is a medium level of risk. It is ECCC's expert advice that a detailed mitigation plan is required (e.g., the Caribou Management Framework) that addresses the removal of critical habitat in the SK1 range during the construction, operations, closure and post closure phases as well as the permanent removal of some critical habitat that will not be reforested as a result of this Project (e.g., some access roads). The plan should include details on all parts of the mitigation hierarchy, including avoidance, on-site restoration, mitigations and offsetting.

ECCC recommends that Denison work with the Province of Saskatchewan to ensure that the final mitigation plan (i.e., the Caribou Management Framework) will adequately address the loss of critical habitat. Denison is also encouraged to consult ECCC and interested Indigenous communities as part of developing the final off-site mitigation plan.

7.2.3.4 Amphibians and Birds

Indigenous Nations and Communities

ERFN indicated that high disturbance activities should consider Rusty Blackbirds to determine setback distances during sensitive timing windows. In addition, ERFN and YNLR indicated their concerns that amphibians were not included in the EIS as part of a valued component or key indicator species given amphibians were included in wildlife surveys.

YNLR noted concerns that bird species were grouped together incorrectly given their widely varying habitat requirements. This concerned YNLR members as potential impacts to bird species based on Project effects may be inaccurate. YNLR noted that impacts to forest bird species the presence of significant seismic lines and edge effects to habitat may be underestimated.

MN-S noted that Denison should include five years of upland game bird harvest and harvest effort to accurately reflect trends in game bird management in and around the proposed Project Area.

BNDN raised concern that Barn Swallow was not chosen as a key indicator species given they have distinct habitat types and exhibit distinct breeding behaviour. BNDN noted that this was an error by Denison as the unique habitat requirements make it a good indicator species. BNDN also requested that Horned Grebe be an indicator species for the purposes of the EIS.

Federal Authorities

ECCC recommended additional baseline studies on bats as there is currently insufficient information to make adequate comparisons of bat use at baseline and during construction, operation, and post-construction. ECCC also deemed mitigations for Common Nighthawk insufficient and recommended additional measures to address potential nest destruction or mortality from vehicle collisions.

Overall, ECCC does not recommend the use of nest searches or pre-clearing surveys for active bird nests during the breeding season as a mitigation. In most habitats, detection probably is very low but the risk of disturbing a nest is high. Flushing birds from their nests has detrimental effects on the species' population, including increasing the risk of predation of eggs or young. ECCC recommends non-invasive techniques, such as an area search for evidence of nesting (e.g., presence of birds in breeding habitat through observation of singing birds, alarm calls, distraction displays) using non-intrusive search methods to prevent disturbance (e.g., point count surveys). ECCC also recommends using a scientifically sound approach that considers the available bird habitats, what migratory bird species are likely to occur in those habitats, and the time periods when they would likely be present.

ECCC noted that Denison has not committed to avoiding vegetation clearing during the breeding bird season, and associated timing window for each breeding bird species.

7.2.3.5 Mitigation and Management Commitments

Wildlife & Habitat

Denison has made numerous commitments to mitigate any adverse effects on wildlife and wildlife habitat (Commitments 9-1 to 9-5 9-11, 9-29 to 9-37). This includes reducing the project footprint and placing the footprint primarily within previously disturbed areas to minimize habitat loss and alteration, timing activities to avoid disturbing wildlife during sensitive periods, and conducting pre-clearing wildlife surveys to identify sensitive wildlife habitat features or the

presence of species at risk. To reduce noise and disturbance associated with the project, Denison has committed to using high-quality, low sound emitting equipment and conducting regular maintenance, situating noise generating equipment behind on-site obstructions, monitoring sound levels during operation. To reduce attracting ungulates to roadways in the winter, Denison has committed to using gravel or sand, instead of salt, whenever possible. Denison will also prohibit employees and contractors from feeding, approaching, or harassing wildlife within the Project Area and installing appropriate road signage to minimize wildlife-vehicle collisions. To mitigate adverse effects related to the operating airstrip and flights, Denison has committed to maintaining direct flight paths, leaving the area as quickly and safely as possible, and adjusting flight paths based on Woodland Caribou observations/important locations.

CNSC staff advised Denison to clarify how IK/MK on Moose calving sites and corridors in the RSA is incorporated into the residual effects assessment. Denison explained that the sites identified by IK/MK were explicitly considered in the assessment as indicated by their identification as overlapping with the Terrestrial RSA, however, the areas were not expressly discussed in the residual effects assessment because there is no anticipated spatial overlap of those areas with direct or indirect Project effects. In addition, Denison provided maps that show Woodland Caribou's seasonal use of terrestrial habitat within the study areas, along with habitat potential for different life history requirements, including forage, refuge, and calving. CNSC staff noted that this information also addresses ERFN's concerns on the importance of documenting Woodland Caribou lifecycle habitat and calving locations. On this note, CNSC staff acknowledged Denison's response that summarized IK of Woodland Caribou signs in the Terrestrial RSA.

With respect to particular concerns, CNSC staff noted that ERFN expressed apprehensions regarding whether industrial activities could cumulatively contribute to landscape fragmentation. CNSC staff confirmed that industrial activities with the potential to reduce habitat connectivity were captured. Denison's assessment included infrastructure such as roads, trails, highway 914, and power transmission corridors, as well as considered exploration and mining activities that come along with line cutting and access development. Denison also mentioned that the Project is not expected to affect movement patterns across the landscape as it does not spatially overlap with known wildlife corridors, and therefore habitat connectivity is not expected to be affected. Additionally, Denison acknowledged that ERFN identified a wildlife corridor between Cree Lake and Russel Lake used by several species, including Woodland Caribou, although it only overlaps with the southern portion of the Terrestrial RSA about 6 km south of the Project Area. Denison concluded that there are no barriers preventing Woodland Caribou from moving throughout the Terrestrial RSA through the habitat types that offer a similar level of quality for the various life requisites for this species; therefore, effects on connectivity are not expected.

CNSC staff also acknowledged ERFN's concern about interactive cumulative effects of forest fires and climate change with additional industrial activity. CNSC staff noted that Denison's cumulative effects assessment recognized that natural disturbances such as fires have the potential to affect terrestrial habitat, and that the Project is located within the Boreal Shield Ecozone which experiences a largely natural fire regime that results in much of the vegetation within the RSA (70.6%) being comprised of post-fire regeneration. CNSC staff acknowledge that the interaction of forest fires and climate change can adversely affect terrestrial biota and their habitat. However, CNSC staff also note that the currently already highly fire-disturbed forest habitats provide habitat for several terrestrial biota including species at risk.

The seismic line activity in the region were considered in the terrestrial environmental assessments (section 9, the Existing Environment, Residual Effects Characterization, and Cumulative Effects Assessment sections). The lines were considered low-quality or no habitat, depending on the species being assessed and their habitat requirements. CNSC staff noted YNLR's concerns on the cumulative effects of extensive seismic cutlines on Woodland Caribou. Despite Woodland Caribou not seemingly avoiding existing linear features, such as roads, trails, and transmission lines, in the area, Denison applied a 500 m buffer for habitat alteration for Woodland Caribou in accordance with guidance in the federal recovery strategy. CNSC staff acknowledged that the cumulative effects assessment may not have included all seismic cutlines on the landscape, but noted that the federal recovery strategy defines anthropogenically disturbed habitat as "anthropogenic disturbance visible on Landsat at a scale of 1:50,000, including habitat within a 500 m buffer of the anthropogenic disturbance." Not all linear disturbances, especially narrower lines, may be visible on Landsat imagery at a scale of 1:50,000. That said, CNSC staff acknowledged that Denison proactively initiated research to provide field-based findings on the effectiveness of linear features mitigation and effects on predator/prey movements. This field program will deploy and monitor the effectiveness of five different linear feature treatment types across nine locations. Denison also stated that legacy roads and trails are expected to be the primary candidate features for habitat offsets and restoration activities.

With respect to BNDN's concerns, CNSC staff note that potential effects on wildlife as the result of exposure to COPCs, including dietary pathways, were assessed in appendix 10A of the EIS. HQs associated with the exposure pathways analyses were below the benchmark of 1 for all COPCs, indicating negligible risk. Furthermore, Denison committed that contaminated areas such as waste ponds and pads and landfill will be fenced to avoid contact with wildlife. Waste will be collected and temporarily stored in wildlife-proof containers to avoid attracting scavengers that increase risk for human-wildlife interactions. Lastly, road signage (e.g., speed limits, wildlife crossings) will be installed to minimize wildlife-vehicle collisions.

Furbearers

In the final EIS, Denison has included furbearers (Wolverine, Pine Marten, Mink, and Muskrat) as VCs. CNSC staff note that it is not practical or necessary to specifically assess all species present at a site, as long as representative species are chosen for the assessment that reflect the main exposure pathways, feeding habits, habitats, etc., and particularly those associated with the highest exposures. The protection of the selected species then provides reasonable assurance that all species are protected. With respect to ERFN's furbearing species of importance, the ERA directly assessed risk to Lynx *(Lynx canadensis),* Muskrat, and Mink. Fisher and Northern River Otter *(Lontra canadensi)* were also selected as representative species but assessed through the surrogates of Lynx and Mink, respectively.

Denison has also committed to, wherever possible, avoiding wetlands through project design and ensuring buffer space. Furthermore, Denison committed to the monitoring of terrestrial wildlife including small mammals, furbearers, ungulates, and species at risk. Regarding BNDN's note, Denison stated that the Biodiversity Management Plan is responsive to commitments made to Indigenous Nations and communities through agreements and ongoing engagement. Inclusion of IK/MK and Local Knowledge alongside western scientific knowledge has been considered throughout the Biodiversity Management Plan.

Woodland Caribou

Denison has included IK/MK throughout the EIS, including in section 9.3 Ungulates, Furbearers, and Woodland Caribou, section 9.4 Raptors, Migratory Breeding Birds, and Bird Species at Risk, and the Woodland Caribou Management Framework. Denison also conducted a cumulative effects assessment, which included the highway extension projects, on the atmosphere, acoustics, geology, groundwater, aquatic environment, terrestrial environment, human health, land and resource use, quality of life and economics. Throughout the process, Denison and ERFN worked together to resolve outstanding concerns, including those related to wildfires and wildlife habitat, and reached an agreement on these issues. Denison provided funding to ERFN and KML to complete updated traditional land use studies which were incorporated into the EIS. In addition, YNLR provided Denison with their traditional land use study entitled *An Exploration of Recorded Athabasca Denesųłine´ Traditional Knowledge, Land Use and Occupancy Information in the Vicinity of Denison Mines Wheeler River Project*. Denison also signed a funding agreement with MN-S to complete a Métis Knowledge Study, which was shared with Denison in October 2023. Denison revised the EIS to include relevant information in the assessment from this study. Denison has also acknowledged the need to further discuss cumulative effects with YNLR and has committed to meeting to discuss.

Denison has committed to a Wildlife Management Plan for terrestrial and avian species and a Woodland Caribou Management Plan (Commitment 9-2), which will identify all sensitive periods and habitat types and identify applicable no-disturbance setback buffers to be adhered to during all project activities. In addition to performing species-specific surveys as per their plan submitted for licensing, Denison has also committed to non-species-specific pre-disturbance wildlife surveys (Commitment 9-3) and using results to inform the design and delineation/establishment of setback distances, work delays, and other mitigation measures. During the construction, operation, and decommissioning phases of the project there will be targeted monitoring programs of wildlife, and adaptive management process will be implemented if mitigation measures are ineffective. Management plans will be living documents and updated based on monitoring results, consultations, regulatory/legislative changes, and updated best management practices or science. Denison has also committed to working with its Indigenous communities of interest to develop and implement the monitoring approach and the framework for sharing monitoring results. This commitment includes collaborating with ERFN and KML on developing a monitoring regime suited to each of their interests and needs (Commitment 10).

Denison has committed to a habitat offsetting plan to satisfy the requirements of the Province of Saskatchewan offsetting framework to fulfil objectives of the Woodland Caribou Recovery Strategy. The Woodland Caribou Management Framework was based on discussions between Denison and the Saskatchewan Ministry of Environment, and Denison incorporated IK provided by Indigenous Nations and communities in the framework.

With respect to the Woodland Caribou Management Framework, CNSC staff requested Denison to demonstrate consistency with the federal recovery strategy for Woodland Caribou, boreal population, in particular the application of avoidance and minimization measures for predicted effects to caribou and its critical habitat. The CNSC determined that it is the responsible authority for EAs under the *Canadian Environmental Assessment Act*, 2012 (CEAA 2012) for this Project, and is therefore responsible for ensuring that the requirements of SARA are met. This includes applicable recovery strategies and actions plans for species at risk (ss.79(1) and (2) SARA), like the Amended Recovery Strategy for the Woodland Caribou, Boreal Population, in Canada. Thus, CNSC staff recommend an EA Condition that requires Denison to meet the

federal recovery strategy. It is anticipated that Denison will revise the Caribou Management Framework based on guidance provided by ECCC in order to address ECCC's concerns described above and to ensure alignment with the goals of the federal amended recovery strategy for boreal Woodland Caribou.

As part of decommissioning, Denison has made a commitment to reclaim the affected portions of the Project Area and establish conditions that will support a restoration trajectory to pre-disturbance conditions (Commitment 9-1), therefore restoring wildlife habitat. After decommissioning, all project components will be removed, and site activities will be limited to monitoring and inspections.

Amphibians and Birds

Denison conducted an assessment for the Rusty Blackbird through its SAR appendix 9-D to the EIS. Several mitigation measures are outlined for Rusty Blackbird that address ERFN's concerns. These include the commitment to conduct site clearing and other works that involve disturbance of vegetation and/or soil outside of the Rusty Blackbird nesting season, when practical, and/or conducting pre-clearance surveys targeted to Rusty Blackbird. Active and/or suspected nests will be protected with a no-disturbance setback buffer consistent with regulatory guidelines.

With respect to BNDN's concern, Denison noted that Common Nighthawk, a nocturnal aerial insectivore, fills a similar niche as the Barn Swallow, a diurnal aerial insectivore, and therefore protecting habitat for the Common Nighthawk will also protect Barn Swallow habitat. Denison also developed a SAR appendix 9-D that includes the life history requirements, expected Project effects, proposed mitigation measures and anticipated residual effects on Barn Swallows and Horned Grebe. Denison provided rationale about the surrogate selection for several species at risk birds, including barn swallow and horned grebe, and elaborated on the habitat-based assessment approach that supports the use of surrogates that are known to utilize the same habitat types. Notably, the SAR appendix 9-D lists and individually assesses all bird species at risk.

Denison provided background information and context for the grouping of bird species in the EIS, including clarifying the choice of valued components and key indicators based on scientific, Indigenous and local knowledge, and community interests regarding potential project effects. With relevance to YNLR's concerns, Denison's assessment approach was focused on the key habitat types (i.e., habitat-based assessment) that all migratory bird species, regardless of guild, would be expected to use on a seasonal or year-round basis depending on the species. As such, the EA considered the potential effects on all available habitat types used by these key indicator species and mitigation measures will address all migratory bird species regardless of focal species/guild. Furthermore, wildlife mortality monitoring would be undertaken as required, continuously throughout the life of the Project. Mortality events associated with interactions with access and transmission lines will be documented and reported to the Saskatchewan Ministry of Environment.

Furthermore, this appendix 9-D also included amphibian SAR which was a concern of ERFN and YNLR. For amphibians, Denison specifically assessed the Northern Leopard Frog. Furthermore, through the Biodiversity Management Plan, Denison committed to continue to conduct nocturnal amphibian call surveys at representative ecosites and wetlands.

With respect to MN-S' comment, Denison included over five years of game bird harvest data on annual grouse harvests in section 9.4.3, table 9.4-3 of the EIS.

CNSC staff have considered advice from ECCC, including recommendations related to baseline studies on bats. Although CNSC staff determined Denison's effect assessment for bats to be adequate, and mitigation measures to be appropriate, concerns remained with respect to the baseline data. Specifically, CNSC staff required the baseline data for bat species at risk to be of sufficient sample size and duration to obtain a basic understanding of within- and between-year variability and to allow for statistically robust comparison to assess potential impacts over the lifecycle of the Project. CNSC staff thus proposed the establishment of an EA Condition to require Denison to conduct at least one more year of additional bat baseline surveys. Further details are in Section 7.2.4.6.

CNSC staff further noted ECCC's concerns about insufficient mitigation measures related to Common Nighthawk. Denison provided various mitigation measures for Common Nighthawk in the SAR appendix 9-D, including conducting site clearing outside of its nesting season, conducting pre-clearance surveys, and establishing no disturbance setback buffers for active or suspected breeding and roosting locations consistent with regulatory guidelines. Moreover, Denison will implement a Road and Traffic Management Plan which will include reduction of traffic volume, implementation of speed limits, installing visible signage at locations with potential for wildlife crossings (including avian species), communication and reporting of wildlife collisions, and maintenance of ditches and culverts. To address the extent of ECCC's concerns regarding nest destruction, CNSC staff carried forward comments to the Pre-Clearance Wildlife Monitoring Plan, outlining an expectation for Denison to include any open and already cleared areas into the pre-clearance survey target areas for Common Nighthawk. Moreover, CNSC staff strongly recommended that Denison not perform any vegetation clearing during the breeding season and not employ intrusive pre-clearance search methods, aligning with ECCC's advice above.

7.2.4 CNSC Staff's Analysis

7.2.4.1 Furbearers (Wolverine, Pine Marten, Mink, Muskrat)

Alteration and/or loss of habitat

CNSC staff reviewed Denison's effect assessment for alteration and/or loss of habitat to Pine Marten, Mink, and Muskrat, and confirmed that Denison conducted a comprehensive analysis of these effects and that identified mitigation and follow-up monitoring program measures are adequate.

With respect to Wolverine, CNSC staff noted that the species occupies large home ranges and, therefore, needs vast tracts of undisturbed land to maintain viable populations. The residual effect assessment estimated that 8.2% of available Wolverine habitat within the Terrestrial RSA may be altered or lost, with limited rationale provided with respect to whether the habitat altered or lost may affect Wolverines' home ranges and/or impact the required habitat size to maintain populations. Taking into account the fact that Wolverine is a species at risk, CNSC staff asked Denison to provide additional information on whether the lost and/or altered Wolverine habitat overlaps with Wolverine home ranges, and on whether the remaining, available, undisturbed habitat size is suitable to maintain populations. Denison responded that while Wolverine was not observed during baseline studies for the Project, it is assumed that the Project may overlap with Wolverine home ranges. Denison noted that Wolverine occur in low densities across all forest stand and vegetation types but are generally absent from areas of human development and activities. Also, Denison explained that most of the Project footprint is already disturbed through

previous exploration activities which is accounted for in the estimate of habitat loss. Denison's effect conclusions take into account no Wolverine observations during baseline surveys, the small Project footprint, and the typically large size of a Wolverine home range.

CNSC staff also noted ECCC's IR for Denison to describe any important Wolverine habitat feature (i.e., dens) that may be lost as a result of the Project, and to assess the need for pre-clearing surveys to identify any denning sites. Denison responded that no Wolverine dens were identified during any of the baseline studies, and that it is not anticipated that denning sites will be lost and/or altered because there are no specific landscape features typically used by Wolverine as potential denning sites located in the Project footprint. Denison added that pre-clearance surveys will be completed to identify all sensitive wildlife habitat features, including Wolverine denning sites. CNSC staff verified that the methodology and timing of the pre-clearance surveys (or sometimes called pre-disturbance) were provided in the EIS, tailored to Wolverine.

While Denison has committed to routinely monitoring wildlife species throughout the project lifecycle (Commitment 9-31) and has stated that ongoing monitoring for species at risk will be detailed in the Environmental Management Program documentation, this information is currently outstanding. Given that Wolverine is a listed species at risk in Schedule 1 of SARA, CNSC staff propose an EA condition (table 12.1 EA5) (table 12.1 EA that requires Denison to provide the plans for follow-up monitoring for all listed wildlife species including Wolverine and their critical habitat over the project's lifecycle. CNSC staff expect that the measures taken to monitor adverse effects are consistent with applicable recovery strategies or action plans, are appropriate to detect adverse effects and to verify the effectiveness of mitigation measures, as well as identify circumstances under which corrective measures may be needed.

Taking into account this information, and the proposed EA condition, CNSC staff concluded that Denison's mitigation and follow-up monitoring program measures for the identified effects on Wolverine are adequate.

Change in mortality

CNSC staff reviewed Denison's effect assessment for change in mortality to Wolverine, Pine Marten, Mink, and Muskrat, and confirmed that Denison conducted a comprehensive analysis of these effects and that identified mitigation and follow-up monitoring program measures are adequate.

7.2.4.2 Ungulates (Moose)

Alteration and*/or loss of habitat*

CNSC staff reviewed Denison's effect assessment for alteration and/or loss of habitat to Moose and acknowledged the concerns from ERFN about declining Moose populations. CNSC staff requested more information from Denison on how to mitigate any residual project impacts. Denison responded that mitigations to minimize potential effects on Moose include minimizing the extent of the Project Area and associated disturbances to the extent practicable, standard mitigation measures to minimize air emissions, dust, light and noise, exclusion fencing around waste pads and ponds, and measures to minimize direct mortality from vehicle collisions through driver training and safety practices. Moreover, CNSC staff advised Denison to clarify how IK/MK on Moose calving sites and corridors in the RSA is incorporated into the residual effects assessment. Denison explained that the sites identified by Indigenous Nations and communities

through sharing of IK/MK were explicitly considered in the assessment as indicated by their identification as overlapping with the Terrestrial RSA, however, the areas were not expressly discussed in the residual effects assessment because there is no anticipated spatial overlap of those areas with direct or indirect Project effects. Taking into account this information, CNSC staff concluded that Denison's effect assessment, mitigation and follow-up monitoring program measures for the identified effects on Moose are adequate.

Change in mortality

CNSC staff reviewed Denison's effect assessment for change in mortality to Moose and confirmed that Denison conducted a comprehensive analysis of these effects and that identified mitigation and follow-up monitoring program measures are adequate.

7.2.4.3 Caribou (Woodland Caribou)

Alteration and/or loss of habitat

CNSC staff reviewed Denison's effect assessment for alteration and/or loss of habitat to Woodland Caribou, and had several questions with regard to baseline data, habitat disturbance, and mitigation measures.

CNSC staff noted that Denison's baseline surveys included: (1) a winter track count survey to assess presence, abundance, feeding activity, and ecosite affiliation; (2) a pellet group/browse availability survey to detect presence and abundance of caribou, and frequency of occurrence and abundance of lichen; and (3) a covert camera survey to determine presence and use of linear features (e.g., roads, trails, and hand-cut lines). From the initial information provided, CNSC staff determined that it was unclear if, or how, any data on seasonal and spatial use of habitat was considered in the residual effect analysis, for example summer/winter home ranges or sensitive life stages including calving (e.g., location of calving sites). Thus, CNSC staff asked Denison to provide a summary of available baseline data on habitat use during all seasons and life stages. Denison responded that the baseline data collection program was not specifically designed to collect seasonal caribou habitat use but to document caribou presence, and that the EIS conservatively assumed caribou to be present in the study areas throughout all seasons and life stages. In addition, Denison provided updated maps in appendix 9-F, section 2.1, that show caribou's seasonal use of terrestrial habitat within the study areas, along with habitat potential for different life history requirements, including forage, refuge, and calving. CNSC staff noted that this information also addresses ERFN's concerns on the importance of documenting caribou lifecycle habitat and calving locations. On this note, CNSC staff acknowledged Denison's response that summarized IK of caribou signs in the Terrestrial RSA.

CNSC staff also noted that forest fires can directly alter Woodland Caribou habitat, making it unsuitable through loss of mature conifer stands, loss of lichens and other forage plants, and barriers to movement. Boreal Woodland Caribou generally do not return to burned areas for several decades until the forest is old enough to support lichens and other food sources, although they may make limited use of burned areas to feed on new growth. CNSC staff questioned whether the ecosites BS3 and BS7 (regenerating forest types) represent suitable habitat for Woodland Caribou year-round. Thus, CNSC staff asked Denison to provide further information on the suitability of ecosites BS3 and BS7 for Woodland Caribou in different life stages and to consider the connectivity of habitat patches in the residual effect analysis. Denison responded that caribou were observed within these regenerating ecosites during baseline studies and

therefore to be inclusive of all life stages, they were included in the "available habitat" for Woodland Caribou. Denison also explained that effects on habitat connectivity and fragmentation were considered in the habitat-based effects assessment within the context of habitat loss and alteration. Moreover, with respect to connectivity, Denison stated that Woodland Caribou move broadly across the landscape, and to date, western science has not identified any known corridors used specifically by woodland caribou in the SK1 range. Denison acknowledged that ERFN identified a wildlife corridor between Cree Lake and Russel Lake used by several species, including Woodland Caribou, although it only overlaps with the southern portion of the Terrestrial RSA about 6 km south of the Project Area. Denison concluded that there are no barriers preventing Woodland Caribou from moving throughout the Terrestrial RSA through the habitat types that offer a similar level of quality for the various life requisites for this species; therefore, effects on connectivity are not expected.

For sensory disturbance, CNSC staff concurred with ECCC's identification of a gap in the assessment of noise impacts on caribou from the Project air strip and associated air traffic. Denison was asked to provide additional information on the timing and frequency of air traffic and mitigation measures. Denison responded that that the anticipated aircraft traffic at the Project airstrip is expected to include approximately five flights per week during operation, and opportunities to optimize the flight schedule will be completed as the Project advances. Denison also committed to operate the airstrip and flights in a safe manner and will also seek to minimize interactions with wildlife by following guidance and best practice from the Province of Saskatchewan and other jurisdictions. Mitigation measures likely to be incorporated into the operation of the airstrip, with respect to air traffic, would include, as safety allows, maintaining direct approach and departure flight paths, obtaining appropriate altitudes, and leaving the area as quickly as is safely reasonable. Flight paths can be adjusted based on the location of caribou observations or known important areas during sensitive periods, when safe and practical to do so.

CNSC staff and ECCC also inquired about the methods to be used for pre-disturbance surveys for Woodland Caribou and other species at risk. Denison clarified that the pre-clearance surveys are intended to identify sensitive wildlife features that would require specific mitigation measures to avoid or minimize adverse effects. The methods will be tailored to species at risk, including Woodland Caribou, that may potentially be using habitats at certain times of the year. For example, in the event the sweeps are conducted during the winter period, methods would include snow tracking to identify Woodland Caribou presence based on tracks and feeding craters observed within the study areas, based on survey protocols provided by the Government of Saskatchewan. The surveys would be conducted within 7 days prior to disturbance activities, year-round, so that sensitive features can be identified, and appropriate mitigation measures (e.g., avoidance, timing delay) can be developed and implemented, as appropriate. Denison also committed to regular monitoring of the effects on wildlife, as per the Wildlife Management Plan, and to initiate an adaptive management process and additional mitigation measures if needed. CNSC staff verified that the caribou-specific pre-disturbance survey methods are included in appendix 9-D, table 4-1 of the EIS.

CNSC staff also noted YNLR's concerns on the cumulative effects of extensive seismic cutlines on caribou. In response to ECCC's IR to analyze disturbance for caribou at the SK1 range level, Denison stated that the Project would be adding 0.001% of anthropogenic disturbance at the scale of the SK1, based on the Project Area plus a 500 m buffer to account for sensory disturbance. Despite Woodland Caribou not seemingly avoiding existing linear features, such as

roads, trails, and transmission lines, in the area, Denison applied a 500 m buffer for habitat alteration for caribou in accordance with guidance in the federal recovery strategy. CNSC staff acknowledged that the cumulative effects assessment may not have included all seismic cutlines on the landscape, but noted that the federal recovery strategy (page 49) defines anthropogenically disturbed habitat as "anthropogenic disturbance visible on Landsat at a scale of 1:50,000, including habitat within a 500 m buffer of the anthropogenic disturbance." Not all linear disturbances, especially narrower lines, may be visible on Landsat imagery at a scale of 1:50,000. That said, CNSC staff acknowledged that Denison proactively initiated research to provide field-based findings on the effectiveness of linear features mitigation and effects on predator/prey movements. This field program will deploy and monitor the effectiveness of five different linear feature treatment types across nine locations. Denison also stated that legacy roads and trails are expected to be the primary candidate features for habitat offsets and restoration activities.

With respect to Denison's Woodland Caribou Management Framework (appendix 9-E) the CNSC is the responsible authority for EAs under the *Canadian Environmental Assessment Act*, 2012 (CEAA 2012) for the Project, and the CNSC is therefore responsible for ensuring that the requirements of the SARA are met. This includes applicable recovery strategies and action plans for species at risk (ss.79(1) and (2) SARA), like the Amended Recovery Strategy for the Woodland Caribou, Boreal Population, in Canada. Given this CNSC staff concurred with ECCC's request to demonstrate consistency with the federal recovery strategy for Woodland Caribou, boreal population, in particular the application of avoidance and minimization measures for predicted effects to caribou and its critical habitat. Denison's Framework is an evergreen document and will be consistent with the management goals of the Saskatchewan Ministry of Environment for the SK1 caribou conservation unit, however, the range plan for SK1 is under development. CNSC staff acknowledged Denison's commitment to develop an offsetting plan to satisfy the requirements of the Province of Saskatchewan offsetting framework and recommend an EA Condition (table 12.1 EA5) that requires Denison to meet the federal recovery strategy.

Furthermore, while Denison has committed to routinely monitoring wildlife species throughout the project lifecycle (Commitment 9-31) and has stated that ongoing monitoring for species at risk will be detailed in the Environmental Management Program documentation, this information is currently outstanding. Given that Woodland Caribou is a listed species at risk in Schedule 1 of SARA, CNSC staff propose an EA condition (table 12.1 EA5) that requires Denison to provide the plans for follow-up monitoring for all listed wildlife species including Woodland Caribou and their critical habitat over the project's lifecycle. CNSC staff expect that the measures taken to monitor adverse effects are consistent with applicable recovery strategies or action plans, are appropriate to detect adverse effects and to verify the effectiveness of mitigation measures, as well as identify circumstances under which corrective measures may be needed.

Taking into account this information and the EA Conditions for Denison to meet the federal recovery strategy and provide monitoring plans, CNSC staff concluded that Denison's assessment and mitigation measures for the identified effects on caribou habitat alteration and/or loss of habitat are adequate.

Change in mortality

CNSC staff reviewed Denison's effect assessment for change in mortality to Woodland Caribou and reflected on potential toxicity of dietary exposure. With respect to the caribou's primary food source, lichen (up to 70% of the year-round diet), CNSC staff noted that lichen can be

exposed to airborne contaminants and dust deposition at distances of 1-40 km. CNSC staff requested more information from Denison to justify how the potential for contamination of the food source "lichen" is reflected in the applied buffers for sensory disturbance. Denison responded that potential effects on caribou as the result of exposure to COPCs, including dietary pathways inclusive of lichen, were in EIS appendix 10-A. HQs associated with the exposure pathways analyses were below the benchmark of 1 for all COPCs. However, when consulting the ERA, CNSC staff found that the ecological model for caribou assumed a diet comprised of 50% browse, 20% lichen and 30% macrophytes. CNSC staff requested additional evidence from Denison to support that those caribou who may have higher consumption rates of lichen (e.g., 70%) as part of their diet, will remain protected. In response, Denison performed modelling for a second Woodland Caribou receptor assuming a diet of 70% lichen, 20% browse, and 10% macrophytes. Compared with the caribou with the lower lichen diet (50% browse, 20% lichen and 30% macrophytes), the predicted total radiological dose for the Woodland Caribou with the higher (70%) lichen diet increased but remained well below the 2.4 mGy/d radiation dose benchmark for terrestrial biota as per the UNSCEAR, 2008. All HQs for both the Woodland Caribou with the lower and higher lichen diet were below the benchmark of 1 for all COPCs.

CNSC staff acknowledged ECCC's request for more information on the impacts of predation and apparent competition for Woodland Caribou. Denison responded that these effects are qualitatively discussed based on current knowledge of Woodland Caribou mortality in or around the Project study areas (i.e., the existing studies describe wolf predation and hunting). Denison acknowledged that Black Bear (*Ursus americanus)* may also prey on Woodland Caribou, however, this would be expected to follow the same effect pathways. The available information indicated relatively low predator (e.g., Wolf and Black Bear) densities in the area and spatial separation between caribous and predators. Further, Denison stated that apparent competition only plays a minor role because these northern ecoregions are of low productivity where Woodland Caribou may compete with only one ungulate species (i.e., Moose) and therefore, caribou and wolf dynamics do not follow general habitat- or disturbance-mediated apparent competition models.

Taking into account this information, CNSC staff concluded that Denison's assessment and mitigation measures for the identified effects on Woodland Caribou mortality are adequate.

7.2.4.4 Arthropods (Nine-spotted Lady Beetle, Transverse Lady Beetle, Yellow-banded Bumble Bee)

Alteration and/or loss of habitat

CNSC staff reviewed Denison's effect assessment for alteration and/or loss of habitat to Nine-spotted Lady Beetle, Transverse Lady Beetle, and Yellow-banded Bumble Bee, which was completed in response to an IR from ECCC that pointed out that these three arthropod species at risk have ranges overlapping with the Project Area. In response, Denison provided an overview of the species' life history requirements, species-specific mitigation measures, and assessments of residual and cumulative effects in appendix 9-D. CNSC staff noted that all three species are habitat generalists that use a diverse range of habitats. Specifically, Denison stated that the Nine-spotted Lady Beetle and Transverse Lady Beetle do not display strong site fidelity. Therefore, CNSC staff determined that habitat should not be a limiting factor on a regional scale. CNSC staff also found Denison's statement appropriate that mitigation measures designed for soil, vegetation, and ecosystems are expected to mitigate adverse effects on arthropods related to limiting the loss and/or disruption of suitable habitat for these species.

While Denison has committed to routinely monitoring wildlife species throughout the project lifecycle (Commitment 9-31) and has stated that ongoing monitoring for species at risk will be detailed in the Environmental Management Program documentation, this information is currently outstanding. Given that all three arthropods are listed species at risk in Schedule 1 of SARA, CNSC staff propose an EA condition (table 12.1 EA5) that requires Denison to provide the plans for follow-up monitoring for all listed wildlife species including the three arthropods and their critical habitat over the project's lifecycle. CNSC staff expect that the measures taken to monitor adverse effects are consistent with applicable recovery strategies or action plans, are appropriate to detect adverse effects and to verify the effectiveness of mitigation measures, as well as identify circumstances under which corrective measures may be needed.

Taking into account this information, and the proposed EA Condition, CNSC staff concluded that Denison conducted a comprehensive analysis of these effects and that identified mitigation measures are adequate.

Change in mortality

CNSC staff reviewed Denison's effect assessment for change in mortality to Nine-spotted Lady Beetle, Transverse Lady Beetle, and Yellow-banded Bumble Bee, and noted that there are no historical observations of the three species in the Terrestrial RSA. Because it is still possible that these species inhabit the Project Area, CNSC staff concur with Denison's proposed mitigation measure to limit herbicide use, as part of vegetation management, to the immediate Project footprint and to rely on licensed professional applicators. Taking into account this information, CNSC staff concluded that interactions between arthropods and sources of mortality are limited, and that Denison conducted a comprehensive analysis of these effects and that identified mitigation measures are adequate.

7.2.4.5 Amphibians (Northern Leopard Frog)

Alteration and/or loss of habitat

CNSC staff reviewed Denison's effect assessment for alteration and/or loss of habitat to Northern Leopard Frog, and noted that the species uses three distinct habitats that could be present in the Terrestrial RSA: overwintering waterbodies, breeding and larval waterbodies, and summering areas. Although Northern Leopard Frog was not detected during baseline surveys, CNSC staff acknowledged that Denison will conduct pre-clearance surveys specific to the species in potentially suitable habitats (e.g., wetlands, riparian sites, bogs, fens). If detected, appropriate setbacks will be established and activity restrictions implemented. CNSC staff concur with these species-specific mitigation measures, as well as with Denison's statement that mitigation measures designed for the wetlands are also expected to mitigate adverse effects on the Northern Leopard Frog primarily related to limiting the loss and/or disruption of suitable habitat for these species.

While Denison has committed to routinely monitoring wildlife species throughout the project lifecycle (Commitment 9-31) and has stated that ongoing monitoring for species at risk will be detailed in the Environmental Management Program documentation, this information is currently outstanding. Given that Northern Leopard Frog is a listed species at risk in Schedule 1 of SARA, CNSC staff propose an EA condition (table 12.1 EA5) that requires Denison to provide the plans for follow-up monitoring for all listed wildlife species including Northern Leopard Frog and their critical habitat over the project's lifecycle. CNSC staff expect that the measures taken to

monitor adverse effects are consistent with applicable recovery strategies or action plans, are appropriate to detect adverse effects and to verify the effectiveness of mitigation measures, as well as identify circumstances under which corrective measures may be needed.

Taking into account this information, and the proposed EA Condition, CNSC staff concluded that Denison conducted a comprehensive analysis of these effects and that identified mitigation measures are adequate.

Change in mortality

CNSC staff reviewed Denison's effect assessment for change in mortality to Northern Leopard Frog and noted that the species was not observed during baseline studies. Because it is still possible that it inhabits the Project Area, CNSC staff concur with Denison's proposed pre-clearance surveys as well as the implementation of setbacks and buffers, in order to limit direct or indirect mortality. Specifically, if any features (e.g., breeding and overwintering habitat) are observed, applicable activity restrictions according to the SARGSS will be implemented in discussion with the Saskatchewan Ministry of Environment. Moreover, Denison stated that vehicle traffic and construction activities will be restricted to the approved access routes and work areas and will not cross or enter a watercourse or wetland. CNSC staff find this measure appropriate to limit frog-vehicle collisions. Taking into account this information, CNSC staff concluded that interactions between amphibians and sources of mortality are limited, and that Denison conducted a comprehensive analysis of these effects and that identified mitigation measures are adequate.

7.2.4.6 Bats (Little Brown Myotis, Northern Myotis)

Alteration and/or loss of habitat

CNSC staff reviewed Denison's effect assessment for alteration and/or loss of habitat to Little Brown Myotis and Northern Myotis, which was completed in response to an IR from ECCC that pointed out that Denison initially did not do an effects assessment of either of these bat species despite confirmed presence based on acoustic baseline surveys. CNSC staff concurred with ECCC's request to describe, map, and assess effects on suitable bat hibernacula and/or maternal roost habitat. Denison submitted information on life history requirements, the expected Project effects, proposed mitigation measures, and anticipated residual effects to bats in appendix 9-D, and mapped existing ecosites for their potential for maternity roosts in appendix 9-F. Further, Denison provided a series of 16 maps that show habitat potential specifically for four different life stages (i.e., forage, overwintering hibernacula, maternity roost, and summer roost) for both bat species at risk, along with appropriate justification for how habitat potential was determined. CNSC staff acknowledged that only small areas (<49 ha) of suitable potential roost habitat were identified in the Project Area.

Although CNSC staff determined Denison's effect assessment for bats to be adequate, and mitigation measures to be appropriate, concerns remained with respect to the baseline data (i.e., existing environment for bats). Denison's initial baseline assessment for bats was based on acoustic surveys completed between July 22-23, 2019, with 61 survey points sampled across five ecosite types. CNSC staff and ECCC noted that data from 2 consecutive days in the same month is not an accepted method to document baseline. Denison was requested to use a scientifically defensible method to document baseline occurrences associated with suitable habitat. Specifically, CNSC staff required the baseline data for bat species at risk to be of sufficient

sample size and duration to obtain a basic understanding of within- and between-year variability and to allow for statistically robust comparison to assess potential impacts over the lifecycle of the Project. Denison committed to conduct additional pre-construction baseline surveys that build on the 2019 surveys and will characterize bat presence (occupancy), diversity, and relative abundance, allowing for spatial and temporal comparison between the 2019 baseline data and pre-construction baseline data. As supporting information, Denison provided a supplemental memo that described additional bat surveys conducted on June 18-22 and July 26-28, 2024. When reviewing this information, CNSC staff noted variability within and across years. For example, no bats were detected in June 2024, and 2 additional bat species were detected in July 2024: Hoary Bat and Western Small-footed Bat. In a supplemental response, Denison explained that the assessment for bat species at risk is representative of the additional 2 species given they occupy the same ecological niche and have similar life histories, and thus the habitat-based assessment approach and conclusions equally apply to the additional bat species. CNSC staff reviewed the additional information and concluded that Denison's justification is acceptable, and that the species-specific mitigation measures for bats are applicable to the newly detected species and remain adequate.

Taking into account this information, CNSC staff concluded that Denison conducted a comprehensive analysis of effects on bats and that identified mitigation measures are adequate. Nevertheless, given the notable variability within and across years, and the 5-year gap between baseline data collected in 2019 and 2024, CNSC staff concluded that there is considerable uncertainty in this data, and thus, CNSC staff propose the establishment of an EA Condition (table 12.1 EA4) to require Denison to conduct at least one more year of additional bat baseline surveys in ideally consecutive years and to formally demonstrate that the baseline data is sufficient to obtain a basic understanding of within-year and between-year variation for bat species. CNSC staff's expectation is that the surveys follow standard accepted methodologies and protocols with appropriate justification for any modifications. The surveys are to be conducted during both June and July, replicating existing sampling points as appropriate and incorporating additional sampling points located in areas that would be cleared during site preparation activities. Furthermore, Denison is expected to assess, based on the resulting baseline data, whether the EA predictions and conclusions remain valid, as well as update the ERA accordingly.

Furthermore, while Denison has committed to routinely monitoring wildlife species throughout the project lifecycle (Commitment 9-31) and has stated that ongoing monitoring for species at risk will be detailed in the Environmental Management Program documentation, this information is currently outstanding. Given that Little Brown Myotis and Northern Myotis are listed species at risk in Schedule 1 of SARA, CNSC staff propose an EA condition (table 12.1 EA5) that requires Denison to provide the plans for follow-up monitoring for all listed wildlife species including these bat species and their critical habitat over the project's lifecycle. CNSC staff expect that the measures taken to monitor adverse effects are consistent with applicable recovery strategies or action plans, are appropriate to detect adverse effects and to verify the effectiveness of mitigation measures, as well as identify circumstances under which corrective measures may be needed.

Change in mortality

CNSC staff reviewed Denison's effect assessment for change in mortality to Little Brown Myotis and Northern Myotis, and along with ECCC requested more information on pre-

clearance surveys. In response, Denison explained that the pre-clearance surveys are designed to identify potential hibernacula or roosting sites. For instance, target areas include treed areas with focus on large snags, tree cavities, as well as old-growth forests. If features are identified in the Project footprint, appropriate setbacks and/or timing windows will be implemented. For example, should a roosting bat be discovered, the area will be afforded protection from clearing for 24 hours and re-surveyed. The area will only be cleared if no bats are discovered. If many roosting bats are recorded, compensation will be considered (e.g., bat houses). Denison also stated that results from these surveys and continuous monitoring will be used in the adaptive management process.

With respect to mitigation measures, CNSC staff also noted ECCC's comment on the potential for bat species at risk to be attracted to and use mine infrastructure for nesting, roosting, or foraging. To a request for more details on mitigation measures and adaptive management, Denison responded by adding specific exclusion measures to their mitigation measures. Denison elaborated that buildings and other Project infrastructure will be designed and maintained to exclude bats as much as possible, for example through installing solid barriers (e.g., corner slope panels, wooden panels) or flexible barriers (e.g., netting, tarps or geotextiles) under roof eaves or other exterior surfaces. The results of mitigation measures implemented, and any associated bat observations will be considered in an adaptive management process.

With this in mind, CNSC staff reviewed the proposed species-specific mitigation measures and additionally noted that vegetation clearing activities will occur outside of roosting periods, when practical. On this note, CNSC staff also considered ECCC's request for Denison to provide important roosting dates for bat species at risk in the Project Area. Denison responded that the activity timing windows will be adjusted to include the April/May maternity roosting period and the July/August nursery roosting period, to the extent practicable. Denison also reiterated that the pre-clearance surveys will identify all sensitive wildlife habitat features, including potential roosting trees (e.g., hollow trees, trees with defects, trees with cavities, and tree stumps). Should potential roosting trees be detected, consultations with the regulators will be initiated, and appropriate mitigation measures will be designed and implemented.

Taking into account this information, CNSC staff concluded that interactions between bats and sources of mortality are limited, and that Denison conducted a comprehensive analysis of these effects and that identified mitigation measures are adequate.

7.2.4.7 Birds (Bank Swallow, Barn Swallow, Common Nighthawk, Horned Grebe, Olive-sided Flycatcher, Rusty Blackbird, Short-eared Owl, Yellow Rail, waterbirds and waterfowl, upland game birds, migratory songbirds, Bald Eagle, Osprey)

Alteration and/or loss of habitat

CNSC staff reviewed Denison's effect assessment for alteration and/or loss of habitat to birds, and together with ECCC, had several questions regarding bird species at risk to ensure they are appropriately assessed. ECCC requested Denison to identify all species at risk listed on Schedule 1 of the *Species at Risk Act* and their critical habitat that are likely to be affected by the Project, as well as to describe how they may be adversely affected by the Project, and which species-specific mitigation measures will be implemented. In response, Denison referred to the new appendix 9-D which includes a list of all bird species at risk potentially occurring in the Project study areas, a summary of the life history requirements, the expected Project effects, proposed

species-specific mitigation measures, and anticipated residual effects on these listed species. Relatedly, ECCC sought further justification for the habitat models for each avian species at risk. Denison clarified that the assessment was habitat-based, and that species were conservatively assumed to be present and breeding in the Project study areas.

Regarding the selection of VCs, CNSC staff and ECCC also inquired about Denison's rationale for the selection of surrogate species for species at risk birds to ensure these are appropriate and conservative, but at the same time recommended that each species at risk should be assessed individually. Denison provided more rationale about the surrogate selection for several species at risk birds, including Common Nighthawk, Barn Swallow, and Horned Grebe, and elaborated on the habitat-based assessment approach that supports the use of surrogates that are known to utilize the same habitat types. Denison also referred to the new appendix 9-D which lists and individually assesses all bird species at risk, as well as provided appendix 9-F, section 2.2, that discusses nesting habitat requirements and the results of the habitat-based assessment.

At the more granular VC level, CNSC staff concurred with ECCC's request to Denison to identify focal species/guilds for each key indicator species for migratory breeding birds, noting that indicator species should be demonstrably sensitive to the potential effect of interest, and suitable for inferring effects on other species. ECCC also asked for further discussion on impacts to different focal species/guilds, taking into account important features or habitat types. Denison responded that the assessment approach was focused on the key habitat types (i.e., habitat-based assessment) that all migratory bird species, regardless of guild, would be expected to use on a seasonal or year-round basis depending on the species. As such, the EA considered the potential effects on all available habitat types used by these key indicator species and mitigation measures will address all migratory bird species regardless of focal species/guild. Denison clarified that no important migratory bird habitat features were identified within the Project Area during the baseline surveys. Denison updated the EIS so that discussion regarding guilds/focal species was carried forward within the effects assessment and specifically within the context of the habitat-based assessment to link habitat-related effects to bird species identified in the study areas. CNSC staff noted that ECCC found this response to be acceptable and advised Denison to consider any trends and changes to the avian community during pre-construction, construction, and operational monitoring, including the key indicator species which are representative of other species that may be more difficult to monitor for implementation of adaptive management.

Further, CNSC staff and ECCC noted that baseline studies for birds only covered short time frames, i.e., a single year of breeding songbird point counts and aerial waterfowl surveys including avian species at risk, which could compromise interpretation of post-construction monitoring data if birds may have been unusually scarce or abundant in the surveyed year. Denison was requested to supplement the bird baseline data collected during 2017 with additional pre-construction field data or existing post-2017 data/modelling to provide a comprehensive baseline. Denison responded that the data collected as part of the baseline studies for birds was focused on the habitat types and areas most likely to be disturbed as a result of the Project. Denison also considered supplemental avian data received from records from the Saskatchewan Breeding Bird Atlas that represents bird observations from 2019. A summary of the total number of individuals observed for each species across all plots was provided in EIS appendix 9-F. Following the final submission of the EIS, CNSC staff received further 2024 baseline data on breeding songbirds as well as aerial waterfowl and raptors through the submission of the 2024 Terrestrial Environment Wildlife and Vegetation Baseline Inventory

report[5]. Notably, these 2024 surveys confirmed the presence of the Rusty Blackbird, a species at risk bird that had not been previously observed in the Project Area. As requested by ECCC, this data was collected prior to construction and included breeding songbird point count call survey data from a total of 101 survey points across 21 ecosites. A total of 304 songbird pairs were observed. CNSC staff acknowledged ECCC's advice that data collected during construction and operational monitoring should be compared with baseline data to test predictions on impacts from the Project, and whether mitigation measures are effective. CNSC staff concluded that the additional bird baseline data from 2024 contributes to a more robust characterization of baseline.

Yet, while Denison has committed to routinely monitoring avian species throughout the project lifecycle (Commitment 9-34) and has stated that ongoing monitoring for species at risk will be detailed in the Environmental Management Program documentation, this information is currently outstanding. Given that several birds are listed species at risk in Schedule 1 of SARA, CNSC staff propose an EA condition (table 12.1 EA5) that requires Denison to provide the plans for follow-up monitoring for all listed wildlife species including birds and their critical habitat over the project's lifecycle. CNSC staff expect that the measures taken to monitor adverse effects are consistent with applicable recovery strategies or action plans, are appropriate to detect adverse effects and to verify the effectiveness of mitigation measures, as well as identify circumstances under which corrective measures may be needed.

With respect to the assessment of lost habitat, CNSC staff agreed with ECCC's request for further information on the habitat types considered as available habitat for migratory songbirds, noting that all Project Areas, except some anthropogenic features and open water, would be considered available habitat for migratory songbirds. Denison responded that ecosites with low use/suitability (i.e., open fen, graminoid bog, graminoid fen) were excluded from the description of available habitat for migratory songbirds, further stating that including these low suitability habitat types to the analysis would not alter the findings of the analysis. ECCC countered that the methods used to determine available habitat may underrepresent rare ecosite types that were not sampled or were sparsely sampled, including ecosite types that may be important for species at risk. In response, Denison updated the EIS to include all habitat ecosite types.

Furthermore, CNSC staff noted ECCC's ask for updated information on the available habitat for Common Nighthawk, noting that the species also uses rock outcrops that can be within forested areas. Denison responded that rocky outcrops were not reported during the baseline studies and that pre-clearance surveys will be completed where Common Nighthawks are suspected of nesting. CNSC staff carried forward ECCC's advice through the review of the Pre-Clearance Wildlife Monitoring Plan, outlining the expectation for Denison to include any open and already cleared areas into the pre-clearance survey target areas for Common Nighthawk. ECCC further added that active terrestrial nest searches for birds, including avian species at risk, are generally not recommended because they are likely to cause disruption to breeding activities. ECCC also advised that, if conducted in simple habitats as outlined in the Guidelines to avoid harm to migratory birds, nest searches should be conducted as close to the clearing or construction dates as possible. CNSC staff carried forward ECCC's advice through the review of the Pre-Clearance Wildlife Monitoring Plan, strongly recommending to Denison to not perform any vegetation

[5] Omnia Ecological Services - Terrestrial Environment – Wildlife and Vegetation Baseline Inventory – 2024 Report Updated. Provided April 2025

clearing during the breeding bird season, as well as to not employ intrusive pre-clearance search methods (e.g., nest searches).

In terms of alteration of habitat, a particular concern was sensory disturbance to birds. CNSC staff agreed with ECCC's inquiry on how light pollution and noise would be monitored and managed. Denison committed to implement measures to manage effects of light pollution and noise on migratory birds and species at risk. For light, measures include using low lighting and/or task lighting (e.g., downturned shaded fixtures to prevent sky-lighting or bird disorientation), putting building lighting on sensors or timers, and potentially using a higher lumen/watt ratio on all new buildings or building expansions. For noise, measures include not using the concrete batching plant and crusher during nighttime hours, directing the generator discharge openings away from sensitive features, and collecting sound level measurements from the identified sources once they are operating. Denison also stated that noise monitoring plans will be implemented to confirm that the Project is compliant with the federal and provincial guidelines. Should monitoring show noise levels surpass modelled sound levels, Denison will implement corrective action to identify noise sources and reduce sound levels. CNSC staff found these mitigation measures to the adequate to address sensory disturbance.

Another concern was about erosion control and how sediment will be prevented from entering waters frequented by migratory birds or species at risk. Denison responded that erosion control measures include the installation of silt fences, straw wattles, and/or erosion control blankets to prevent erosion and limit sediment transport. Additionally, vegetated barriers will be maintained between Project components and wetland features, as much as practical. Denison clarified that routine inspections and management would be completed to document the effectiveness of the erosion control measures, and replacement of these structures would be completed as required.

Taking into account all of this information, and the proposed EA Condition, CNSC staff concluded that Denison conducted a comprehensive analysis of these effects on birds and that identified mitigation measures are adequate.

Change in mortality

CNSC staff reviewed Denison's effect assessment for change in mortality to birds and noted that exposure to hazardous materials through contact with contaminated waste ponds could affect avian health and contribute to mortality. CNSC staff and ECCC asked Denison to determine if there is a risk to wildlife that may access these areas and to identify the potential toxicity of water management ponds to aquatic migratory birds and species at risk. Denison responded that the water management ponds collect event driven runoff and will not hold standing water for a prolonged time, and that water quality is expected to be relatively good as it would largely comprise precipitation and runoff from natural surfaces. Denison considered that the ponds with potential bird use include the process water pond, and effluent monitoring and release ponds. Denison compared the expected water quality to the Canadian Council of Ministers of the Environment (CCME) water quality guidelines (WQG) for the protection of livestock, resulting in most parameters being below the guideline values except for selenium, molybdenum, and sulphate. Given mitigation measures to deter exposure, Denison concluded that birds and other wildlife that may contact or ingest this water are not expected to be at risk. CNSC staff requested Denison to provide an explanation for the appropriateness and conservatism of using this guideline for avian receptors. Denison responded that the CCME livestock guidelines are intended to protect both birds and mammals and are based on toxicological data from the most sensitive livestock species considering sensitive life stages. As such, Denison stated that the

livestock guidelines are considered sufficiently protective in the unlikely case that birds land on and drink from the process water pond or the effluent monitoring and release ponds. CNSC staff verified that the CCME livestock guideline was derived based on both avian and mammalian livestock data and preferentially considers long-term tests conducted on sensitive life stages. At least 2 studies on 2 or more avian species are required for guideline development. Nevertheless, CNSC staff and ECCC asked Denison to ensure adequate mitigation measures are implemented to minimize exposure of birds to waste ponds. Denison noted that numerous mitigation measures will be implemented to minimize the potential for avian exposure to pond water, including physical, visual, and auditory deterrent techniques, but also stated that birds are expected to avoid the area during construction and operation due to noise, light, vibration, and dust, and due to more preferrable habitat elsewhere. CNSC staff concurred that birds are mobile receptors and are not expected to spend significant time in waste ponds. CNSC staff deemed the mitigation measures including avian deterrence measures such as deflectors on poles, physical, visual, and/or auditory deterrents and exclusion measures to be appropriate to limit interaction with waste ponds.

With respect to bird species at risk, CNSC staff requested that Denison provide a discussion on mitigation measures regarding their effectiveness in minimizing mortality for bird species at risk, for which effects on a few individuals would not be acceptable. In response, Denison prepared EIS appendix 9-D that includes species-specific mitigation measures and their effectiveness, that Denison is proposing to implement during the Project to mitigate adverse effects on bird species at risk. The appendix 9-D also included species-specific timing windows and setback distances in response to ECCC's request. This also addressed a concern about how vegetation clearing related to site development will be conducted to minimize risk to migratory birds and species at risk. Denison noted that site clearing and other works that involve disturbance of vegetation and/or soil will be completed during least-risk timing windows for migratory birds and species at risk (i.e., winter), where practical, to avoid disturbance during sensitive time periods. Denison confirmed that pre-clearance surveys will be conducted, and set-back buffers implemented, as needed. If nests or tree cavities should be encountered during pre-construction surveys or ongoing monitoring activities, any subsequent Project activities will be in accordance with the *Migratory Birds Regulations, 2022*.

Specifically, with respect to the Common Nighthawk, ECCC noted that the species nests on the roadsides of access roads within the Project Area, and thus asked Denison to develop mitigation plans appropriate for avoiding collisions with vehicles, when and where nighthawks are observed foraging near or roosting on gravel roads. Denison responded that a Road and Traffic Management Plan will be implemented, and mitigation measures will include reduction of traffic volume, implementation of speed limits, installing visible signage at locations with potential for wildlife crossings (including avian species), communication and reporting of wildlife collisions, and maintenance of ditches and culverts. CNSC staff determined that this mitigation is acceptable to limit potential for interactions between the Project activities and Common Nighthawk and their habitat.

Lastly, CNSC staff concurred with ECCC's statement that Project impacts related to mortality of birds, such as collisions with the transmission line, mortality along roads, and use of waste and water management facilities should be monitored during all phases of the Project and adaptively managed. To address this, ECCC requested Denison to provide details on the follow-up program to monitor impacts to avian mortality. Denison responded that a Wildlife Monitoring Plan with details on the monitoring and follow-up programs will be developed, and that wildlife mortality

monitoring would be undertaken as required, continuously throughout the life of the Project. All mortalities would require follow-up to determine if anything can be done to prevent similar mortalities from occurring in the future. Data related to avian mortalities would be compiled to identify trends over time and to determine the cause of mortalities and identify if any further mitigation would be appropriate. Additionally, mortality related to avian use of waste and water facilities, as well as mortality events associated with interactions with access and transmission lines will be documented and reported to the Saskatchewan Ministry of Environment.

Taking into account this information, CNSC staff concluded that interactions between birds and sources of mortality are limited, and that Denison conducted a comprehensive analysis of these effects and that identified mitigation measures are adequate.

7.2.5 CNSC Staff Findings and Recommendations

Taking into account the implementation of mitigation measures and recommended follow-up program measures for the terrestrial biota assessed in this section, including: furbearers, ungulates, caribou, arthropods, amphibians, bats and birds, CNSC staff conclude the Project is not likely to cause significant adverse effects.

The conclusion is inclusive of terrestrial species at risk listed under Schedule 1 of SARA. CNSC staff will work with ECCC to ensure that measures taken by Denison will be consistent with applicable recovery strategies for the identified species at risk.

The effects significance determination table can be found in appendix B.

In order to ensure that the aforementioned assessment conclusions remain valid, CNSC staff recommend that the Commission include the following EA Conditions, should it issue a licence. If accepted, Denison will be required to address the EA Conditions EA3, EA4, and EA5 in table12.1 related to IRs carried over from the EA Review into licensing. CNSC staff's assessment conclusions are contingent on the establishment of the EA Conditions EA3, EA4, and EA5 for all listed species at risk, and particularly for Woodland Caribou and bats.

7.3 Human Environment

The proposed Project could potentially cause changes to the human environment, through:

- air emissions during all project phases potentially exposing human receptors to air constituents through inhalation, and indirectly through incidental soil contact/ingestion of constituents that deposit to soil, and/or through the terrestrial food chain (i.e., traditional foods diet)
- release of COPCs in treated effluent to receiving surface waters potentially exposing human receptors to the treated effluent releases through drinking water, consuming fish, and incidental dermal contact of water and sediment while swimming in the LSA and RSA
- external exposures to radiation from air, water, soil, and sediment
- long-term transport of groundwater solutes to Whitefish Lake in future centuries

CNSC staff concurred with Denison's assessment of Project activities that may interact the human environment and cause residual effects during all phases of the project, as detailed below.

7.3.1 Description of the human environment

The main land use activities in the area by Indigenous Nations and other land users are hunting, trapping, fishing, and firewood gathering. There are recreational and traditional resource user leases in the area. The nearest traditional resource user lease is located approximately 12 km away from the Project Area and the nearest recreational lease is located approximately 2.5 km away. Water in the Project Area drains towards Russell Lake, the Wheeler River, and ultimately into Wollaston Lake.

Indigenous Nations and local communities have identified the importance of protecting the existing environment in the LSA and RSA. The Wheeler River, for instance, is considered both culturally and economically important to ERFN and is an area where traditional land activities such as hunting, fishing, and trapping occur year-round. For more information related to this, see section 7.3.

7.3.2 Proponent's Assessment

For non-radiological COPCs, Denison concluded that residual effects on human health are predicted to be not significant. The only scenario that required a residual effects characterization was exposure of the fisher/trapper receptor to selenium through fish ingestion; however, the conservatism in the traditional foods diet would indicate that the overall risk from the Project is low.
Denison concluded that the residual effects of the Project are expected to result in no significant adverse effects to human health. More information on the results of the HHRA along with the residual effects characterization and determination of significance can be found below and in appendix 10-A of the EIS.

No potential for a residual effect to human health with respect to radiological COPCs from the Project were identified via the considered exposure pathways in the HHRA.

7.3.2.1 Human Health: Non-Radiological and Radiological COPCs

Denison evaluated the potential effects of COPCs on human receptors in a human health risk assessment (HHRA) within the EIS appendix 10-A assessment. The assessment was prepared to be compliant with the requirements for an ERA as outlined in section 4.1 of CNSC's 2020 Regulatory Document-2.9.1: *Environmental Principles, Assessments and Protection Measure*s. The human receptors selected for the HHRA included:

- camp worker (non-Nuclear Energy Worker) during all Project phases
- seasonal resident during all Project phases
- recreational fisher/hunter during all Project phases
- fisher/trapper during all Project phases
- future permanent resident in the future centuries

Risk estimates were calculated to determine the potential for adverse effects on the selected human receptors via the exposure pathways identified (e.g., consumption of traditional foods, inhalation, dermal contact, etc.). For non-radiological COPCs, the risk was quantified based on calculations of HQs and an incremental lifetime cancer risk (ILCRs) for non-carcinogens and carcinogens, respectively. The potential for adverse effects for non-carcinogens was considered negligible if the HQ < 0.2 per medium (e.g., water, soil, food, air). Cancer risks were deemed to be "essentially negligible" (de minimis) if the estimated ILCR was ≤ 1x10-05. HQs were

calculated for baseline HQs (existing risk prior to the Project), Project total HQs (the Project risk in addition to the baseline risk), as well as Project incremental HQs (the Project risk only with baseline component removed). The estimated non-radiological HQs are summarized in table 10.1-8 of EIS section 10.1.6.1.4.

With respect to non-radiological COPCs, Denison identified selenium exposure via fish ingestion as a potential residual effect to the fisher/trapper at Russell Lake. All other non-radiological COPCs assessed in the HHRA (cadmium, copper, chromium, cobalt, molybdenum, uranium, and zinc) were determined to not have potential residual effects during all phases of the Project.

Denison rated the magnitude of this residual effect as "moderate". This rating was generally defined as: a HQ of greater than 0.2 per exposure pathway, ILCR level is greater than $1x10^{-05}$, or radiation dose greater than the regulatory public dose limit of 1 mSv/year. The Project incremental HQ (i.e., excluding existing baseline risk) for selenium via fish ingestion (northern pike and white sucker) by the fisher/trapper was predicted to be 0.93. Denison concluded that the overall risk from the Project for this exposure scenario would be low based on the conservative assumptions made regarding the traditional foods diet for this receptor group. The Project incremental HQs were below 0.2 for all other non-carcinogens (cadmium, copper, chromium, cobalt, molybdenum, uranium, and zinc) during all phases of the Project for the pathways examined, including consumption of terrestrial and riparian biota harvested in the Project area. The assessment specifically assumed that all fish consumed in the fisher/trapper's diet would be obtained from Russell Lake, which is considered conservative as it is more likely that someone would fish from many different lakes including those outside of the RSA.

With respect to radiological COPCs, radionuclides of the uranium-238 decay series (U-238, U-234, thorium-230 [Th-230], radium-226 [Ra-226], Pb-210, polonium-210 [Po-210]) and radon were included as COPCs. Due to public and regulatory interest, these radionuclides were considered for modeling without conducting a formal screening.

Denison assessed predicted radiological doses to on- and off-site human receptor groups in the HHRA, and the estimated total dose for each receptor was compared directly to dose limits. The incremental radiation dose to all human receptors is predicted to be below the regulatory public dose limit of 1 mSv/year and the dose constraint of 0.3 mSv/year during all Project phases and in the future centuries. The maximum incremental radiological dose for an off-site receptor, the fisher/trapper at Russell Lake, is predicted to be 0.06 mSv/year. Po-210 is the primary radiological COPC contributing to the receptor total dose due to ingestion of fish from Russell Lake (inlet) and ingestion of biota (mallard and woodland caribou) harvested in the area around Russell Lake, which eat from the aquatic environment. A camp worker (i.e., non-nuclear energy worker) was selected as an on-site receptor. The incremental radiological dose to the camp worker is predicted to be 0.16 mSv/year during operations, with radon as the main contributor to total dose. The assessment is conservative in that it assumes that the camp worker spends 100% of the time indoors. Outdoor radon concentrations are expected to dissipate quickly, and exposures are negligible, whereas indoor radon exposures tend to be higher as they accumulate inside buildings.

Based on their assessment, Denison identified potential for a residual adverse effect to human health from exposure to selenium from the Project. However, the conservative assumptions made in characterizing the Traditional Foods diet indicate that the overall risk from the Project is low, and Denison concluded no significant adverse effects to human health are anticipated. For all other COPCs (non-radiological and radiological), through implementation of appropriate

mitigation measures and follow up monitoring for potential effects from air and liquid emissions from the Project Denison anticipates that the impact from non-radiological and radiological COPCs on human health will be negligible throughout all Project phases. Denison concluded that the predicted exposures to the identified human receptors from Project-related COPCs within atmospheric and liquid emissions are not expected to have significant residual adverse effects on human health.

Mitigation Measures for Human Health

Denison has concluded that no additional VC specific mitigation measures are warranted. See a summary in table 6.24 below.

Table 6.24 Proposed mitigation measures to address effects on human health

Exposure to non-radiological and radiological COPCs
• Mitigation measures refer to Project-specific mitigation and can include, but are not limited to, engineering design features and responses, best management practices, management plans, emergency response programs, and training
• Mitigation measures for the human health VC focus on mitigating potential effects to air and liquid emissions from the Project. Therefore, the mitigation measures found in tables 6.3 and 6.4 for air quality and table 6.13 for water quality for mitigating potential project-related effects are applicable for human health. There have been no further additional human health VC-specific mitigation measures identified

Monitoring and Follow-Up Measures

In order to verify the accuracy of the assessment, Denison will implement country foods-specific (e.g., blueberries, fish) monitoring and EA follow-up measures. See a summary in table 6.25 below. Future environmental monitoring will focus on providing data to improve model predictions through the phases of the Project, as well as verify model predictions informing the HHRA.

Table 6.25 Follow-up program measures for effects on human health

Exposure to non-radiological and radiological COPCs
• Denison is implementing an environmental monitoring program (EMP) consistent with the requirements and guidance in CSA N288.4-19: *Environmental monitoring programs at nuclear facilities and uranium mines and mills*, as well as integrate engagement with local communities to ensure the environmental monitoring plan reflects the interests of the Indigenous Nations and communities. Monitoring data will focus on verifying the predictions made by the ERA, refining the models used in the ERA through all phases of the Project, and reducing the uncertainty in the predictions made by the ERA. The EMP will include collection of various media types including surface water, blueberries, and fish tissue samples and will take Traditional Foods into consideration. Monitoring locations will be focused in the areas of Whitefish Lake, McGowan Lake and Russell Lake. Monitoring COPCs would include those identified as COPCs in the ERA, including metals and uranium-238 series radionuclides, and chloride and sulphate in lake waters. Monitoring could extend to include other COPCs for other purposes, such as meeting regulatory requirements for monitoring, or addressing COPCs of public interest based on experience at other uranium mines and process plants.

- Denison has committed to assessing health risks from fish consumption by comparing fish tissue data of relevant COPCs collected from the monitoring program during operations against applicable human health risk-based maximum permissible concentrations. Further, Denison will be developing a Traditional Foods monitoring document in consultation with Indigenous Nations and communities (Commitment 8-44).

7.3.2.2 Human Health (Nuclear Energy Workers): Radiological Exposures

Doses to nuclear energy workers (NEWs) are conservatively estimated by Denison for construction, operations and decommissioning phases of the Project. Predicted doses to NEWs across all phases of the Project are below CNSC's effective and equivalent dose limits. The effective dose limits for nuclear energy workers are, 50 mSv for a one-year dosimetry period and 100 mSv for a five-year dosimetry period.

During construction of the Project, workers on the wellfield will be exposed to radiation from ore cuttings stored in drums at the well head. Drillers will be exposed to low levels of radon in outdoor air due to venting at the wellfield. Total effective doses to drillers on the wellfield during construction will be bounded by those estimated for drillers during operations.

During operation of the Project, workers will be occupationally exposed to radiation sources in several work areas in the process of drilling, lixiviant recovery, and processing of yellowcake. Expected exposure pathways are through inhalation of dust and radon, as well as external exposure to gamma radiation from process solids and liquids containing radionuclides of the Uranium-238 decay chain:

- Wellfield operators are estimated to have total effective doses ranging from 0.16 to 0.64 mSv/year.
- Drillers on the wellfield are estimated to have a maximum total effective dose of 10.26 mSv/year.
- Plant operators at the precipitate removal area, yellowcake precipitation, water treatment, and drying area are estimated to have total effective doses ranging from 1.66 to 14.88 mSv/year.
- Geologists and geotech loggers are estimated to have a maximum total effective dose of 10.97 mSv/year.
- The equipment operator at the special waste pad, the precipitate pond, and industrial landfill is estimated to have a maximum total effective dose of 6.11 mSv/year.
- Plant operators involved in packaging of nuclear substances are estimated to have a maximum total effective dose of 11.78 mSv/year.

Remediation of the mining area is expected to involve less exposure to nuclear substances than the original drilling of wells into the ore zone, since no ore cuttings are created at this time, and since UBS is not being extracted. The freeze wall wells were not extended into the ore zone and should have no radioactive contamination. The wellfield, waste pads, ponds, water treatment location, and process plant area are expected to be contaminated by nuclear substances; therefore, workers remediating these areas will be potentially exposed to radiation and to radioactive dust. Direct contact with radionuclides is also possible through direct handling of contaminated materials. Levels of radioactive contamination in these areas during decommissioning are expected to be no greater than during operations and therefore doses to workers are bounded by those estimated during the operations phase.

Through implementation of appropriate mitigation measures and follow up monitoring, Denison anticipates that the impact from radiological COPCs on NEWs' health will be negligible throughout all Project phases. Therefore, Denison determined that the radiological COPC to NEWs from occupational exposures due to work activities are not expected to have significant residual adverse effects on NEWs' health.

7.3.2.3 Human Health (Workers): Non-Radiological Exposures

NEWs and other workers on-site (ISR mine and processing plant) will be protected from non-radiological exposures through the Health and Safety Program. Conventional workplace hazards will be managed through a conventional health and safety plan, in compliance with applicable federal and provincial legislation, through all phases of the Project. As such, Denison concluded that conventional workplace hazards are expected to be negligible. Through implementation of appropriate mitigation measures and follow up monitoring, Denison anticipates that the impact from conventional workplace hazards on worker health will be negligible throughout all Project phases. Therefore, Denison determined that non-radiological exposures to human receptors from conventional workplace hazards are not expected to have significant residual adverse effects on worker health.

Mitigation Measures for Worker Health

Table 6.24 Proposed mitigation measures to address effects on NEWs Health

NEWs exposure to radiological COPCs
• Several mitigations have been assumed and will be important in keeping doses ALARA: o Doses from external sources can be most effectively reduced by maximizing distances or minimizing time at close distance o External doses from ore cuttings at the special waste pad were assumed to be mitigated by a berm around the pad, which provides shielding. However, this area is a potentially substantial source of external dose, and work inside the berm will be minimized o For the drying and packaging/loading areas of the ISR plant, the equipment sources of dust will be enclosed under negative pressure. Workers will be in the room outside the enclosure, where air exchange is maintained at 6 exchanges per hour. Doses from inhalation of uranium dust will be controlled by monitoring of dust levels and managing worker time in these areas to keep doses ALARA o Dust inhalation is also a potentially substantial component of worker dose at the core shack. At this location, dust levels will be monitored and time in the shack will be managed to control dose from inhalation of ore dust. An administrative level of respirable dust equal to one quarter of the ACGIH TLV of 270 microgram per cubic metre (µg/m3) has been assumed. It may be possible to increase air exchange in the core shack, above the planned six exchanges per hour, should this be necessary. This would also reduce radon exposure in the core shack o Radon levels will be monitored in the precipitate removal and yellowcake precipitation areas of the ISR plant, and in the core shack, to support management of radon exposure and dose
• Manage work sequence and schedule to avoid prolonged exposures to the identified sources, especially those identified as being important to worker dose. Doses can be most effectively reduced by reducing exposure times and maximizing distances from the source, as well as by use of protective shielding

- Worker health is managed under the Radiation Protection Program (RPP), which is a worker health and safety plan specifically for radiation exposures. The RPP designates the roles and responsibilities of Denison and contractors, specifies the radiation dose limits, action levels and administrative levels, describes procedures to monitor and manage worker exposures (dust and radon monitoring, personal dose monitoring), and describes the processes for training and record-keeping. The successful implementation of the RPP, in conjunction with in-design measures described for the various project activities, is key to maintaining acceptably low doses of radiation exposure to workers during all phases of the Project

Follow-Up Measures for Human Health (Nuclear Energy Workers): Radiological contaminants

Denison highlighted that the monitoring of radiation exposure to workers throughout all phases of the Project is a key component of the RPP. In accordance with the RPP, workers who have a reasonable likelihood of exceeding an effective dose of 1 mSv per year are classified as NEWs, and are subject to personal dose monitoring, reporting, and information requirements as per the *Radiation Protection Regulations*. Dosimetry services licensed by the CNSC will be used to measure and monitor the doses of radiation received by and committed to NEWs who have a reasonable probability of receiving one or both of:

- an effective dose greater than 5 mSv in a one-year dosimetry period
- an equivalent dose to the skin, or to the skin of the hands and feet, that is greater than 50 mSv in a one-year dosimetry period

Personal dosimeters to be used include those for external gamma exposure. Personal alpha dosimetry may also be used to monitor worker exposures in areas where workers will be exposed to uranium and decay products. A bioassay program may be implemented to monitor internal exposure of workers.

In addition to personal dose monitoring, area monitoring for gamma radiation, radon and radioactive dust in air will be performed in work areas where higher exposures are expected. This will provide information for estimating doses in these areas to facilitate safe work planning. Action levels and administrative levels for exposure will be defined, and monitoring data will be compared to these levels, to make sure that corrective action can be taken as needed to maintain worker doses ALARA.

7.3.3 Other Views Expressed

7.3.3.1 Potential Impacts to Human Health

Indigenous Nation and Communities

ERFN had indicated they are broadly concerned that potential impacts from the proposed Project and cumulative effects in the region will adversely impact community health. General concerns regarding health are due to the potential impacts from contaminants of potential concern being present in receiving environments and impacting ERFN citizens via pathways of effects. Specifically, ERFN raised concerns that Denison noted exceedances in air quality parameters but these parameters were not brought forward into the EIS appendix 10A Human Health Risk Assessment (HHRA) for the Project. ERFN also raised concerns that the HHRA should include vulnerable populations such as pregnant women, youth and Elders to determine potential impacts to area residents.

YNLR raised concerns that Denison's conclusions regarding cumulative effects, including for human health, were non-significant given the residual effects noted across the valued components contained within the EIS.

MN-S indicated they did not feel Denison sufficiently incorporated Métis Knowledge to inform the Project's monitoring and management plans including for human health.

BNDN raised concerns that the Environmental Risk Assessment completed by Denison includes an assessment of mercury biogeochemical cycling and the potential impacts to human health.

PBCN raised concerns on the proposed Project's potential adverse impacts to human health. PBCN is concerned about the potential residual effect on human health from exposure to selenium, which has been identified by Denison in the EIS, and other COPCs. In response to a CNSC request for review of the Views Expressed shared, PBCN noted that there is no commitment to any monitoring of selenium or any other COPC including, but not limited to, uranium, arsenic, cadmium other heavy metals or chemicals in the accumulation in fish and mammals or the bioaccumulation in plants, berries or fungus. PBCN members derive large portions of their diet from country food. To ensure the safety and well-being of PBCN members who rely on the surrounding ecosystem for subsistence harvesting, it is essential to establish a comprehensive tissue sampling program to monitor COPC downstream of the Proposed Project.

All engaged Nations on the proposed Project have indicated concerns linking potential adverse environmental impacts on various valued components that could negatively impact human health. Given the potential for contaminants of potential concern to adversely impact environmental receptors (i.e., water, fish, traditional medicines and plants, wild game, etc.) and given the traditional use of community members and citizens of Indigenous Nations and communities in the Project Area, any pathways that may impact human health are concerning to Indigenous Nations and communities potentially impacted by the proposed Project.

Federal Authorities

Health Canada highlighted the importance of monitoring baselines related to mercury, selenium, lead, and other COPCs to track trends and re-assess human health risks if increases are observed in the environment. Health Canada also noted that methylmercury should be included in monitoring to confirm concentrations in country foods, that appropriate health-based toxicological reference values (e.g., provisional tolerable daily intake [pTDI] value of 0.2 µg/kg body weight [bw] per day) be used, and that dietary data and consumption rates are verified through engagement with local and Indigenous communities via an updated dietary survey. Health Canada recommended that health risks of mercury exposure should be assessed using local fish consumption rates and the pTDI value of 0.2 µg/kg bw per day.

Health Canada suggested using adaptive management in the country food monitoring and mitigation plans. This recommendation includes that the preliminary monitoring plan has decision criteria/thresholds/benchmarks for initiating action if monitoring results show an increase of COPCs in the environment.

7.3.3.2 Summary of Mitigations and Commitments related to Views Expressed

Potential Impacts to Human Health

Denison has made several commitments to mitigate and monitor any potential pathways resulting in adverse effects to human health (Commitments 8-44, and 10-10 to 10-18, & 11-8). Denison

conducted a predictive HHRA in the EIS appendix 10A, inclusive of traditional foods, to evaluate direct and indirect effects to contaminants of concern and determined there would be no significant adverse effects to human health. Denison has also committed to monitoring surface and groundwater, sediment, soil samples, fish tissue, benthic invertebrates, and country foods (e.g., blueberries) for radionuclides (e.g., uranium-238 series) and non-radionuclides (e.g., metals, chloride, sulfate). This monitoring will also be applied to verify predictions made by the ERA, refine models and reduce uncertainty in the ERA predictions. This monitoring will take place in Whitefish Lake, McGowan Lake, and Russell Lake.

Potential Impacts to Receiving Environment

Denison has committed to collaborating with Indigenous Nations and communities, including engagement and input on the EMP, EPRP, and the EEMs. Note, details of these plans will be developed during the licensing/permitting phase of the process. This commitment includes considering local and IK/MK in all areas of the project through continued engagement. Denison provided funding to ERFN and KML to complete updated traditional land use studies which were incorporated into the EIS. In addition, Denison received a traditional land use study from YNLR entitled *An Exploration of Recorded Athabasca Denesųłine´ Traditional Knowledge, Land Use and Occupancy Information in the Vicinity of Denison Mines Wheeler River Project*. Denison also signed a funding agreement with MN-S to complete a Métis Knowledge Study, which was shared with Denison in October 2023. Denison revised the EIS to include relevant information in the assessment from these studies.

The EMP, EPRP, and EEMP include a surface water monitoring program that is designed to evaluate changes to the aquatic environment that could adversely affect fish, their habitat, and other aquatic biota (e.g., vegetation, benthic invertebrates). The monitoring and follow-up program will also measure fish health, including the potential bioaccumulation of non-radiological (e.g., molybdenum, selenium, mercury, and other metals) and radiological parameters. Denison has committed to monitoring methylmercury (rather than only total mercury), lead, arsenic, and cadmium in fish which will facilitate understanding of any health risks associated with harvesting from the Project Area. Additionally, key indicators of ground and surface water quality will be measured, including pH and sulfate, in all project phases to monitor potential adverse effects on water acidification.

7.3.4 CNSC Staff's Analysis

7.3.4.1 Human Health (Public) - Non-Radiological COPCs:

CNSC staff reviewed Denison's effect assessment to human health from non-radiological COPCs and found that Denison conducted a comprehensive analysis of these effects and that identified mitigation and follow-up monitoring program measures are adequate. Denison identified a potential residual effect from the HHRA in appendix 10A for non-radiological COPCs was selenium exposure to the fisher/trapper receptor at Russell Lake. CNSC staff questioned whether this exceedance of selenium could be more pronounced for human receptors assessed closer to the operation, such as at McGowan or Whitefish Lakes. CNSC staff recommended that an assessment of a receptor located at lakes closer to the project during operation (McGowan, Whitefish) may need to be considered to ensure there are negligible risks. Denison responded that a human receptor (Recreational fisher/hunter) was assessed at McGowan Lake in the HHRA. No unacceptable risk was identified for the Recreational fisher/hunter at McGowan Lake due to releases from the Project. Further, based on Indigenous

and Local Knowledge, use of the area near Whitefish Lake for fishing, hunting, gathering is limited. CNSC staff reviewed Denison's response and concluded that this IR was adequately addressed.

During the EIS review, CNSC staff also noted that there is an elevated risk of selenosis in exposed individuals given that the fisher/trapper receptor will likely be exposed to higher concentrations of selenium from the consumption of fish at Russell Lake. This potential for selenosis would be further exacerbated in individuals who consume fish taken from other lakes closer to the mining operation. Denison responded that based on current predictions in lakes where fish consumption is assumed to occur (McGowan Lake and Russell Lake), fish tissue concentrations for selenium are expected to be below the BC Ministry of Environment's 2014 Ambient Water Quality Guidelines for Selenium limit, indicating people eating fish from these lakes would likely be protected from selenosis. This analysis showed that risk to human health (selenosis) will be negligible. CNSC staff found this response to be acceptable. However, CNSC staff recommended that should it be determined that selenium concentrations are increasing in the environment at such levels as there may be in an impact to the environment or human health, installation of a selenium removal circuit into the effluent treatment process should be considered. Denison responded that any further selenium abatement technologies will be considered through the BATEA process during licensing. During the licensing process, CNSC staff will review the BATEA to verify that the proposed wastewater treatment system design further considers selenium effluent treatment technologies to ensure selenium in effluent is ALARA.

Human Health - Radiological Contaminants:

CNSC staff reviewed Denison's effect assessment to human health from radiological COPCs and found that Denison conducted a comprehensive analysis of these effects and that identified mitigation and follow-up monitoring program measures are adequate. In the HHRA, Denison had compared the predicted radon exposure to a camp worker against an air concentration limit of 60 Bq/m^3 in the EIS, stating this was a CNSC limit. CNSC staff sought further clarification on this, as there is no such CNSC limit. Denison subsequently revised the EIS and reported the effective dose assessment results for the camp worker from all radionuclides combined, including radon progeny, and compared to the corresponding effective dose limit of 1 mSv/year.

CNSC staff also reviewed Denison's assessment of workers' occupational exposures in the draft EIS and sought clarification through a number of IRs.

CNSC staff raised a comment regarding equivalent dose limit for the lens of an eye for NEWs. Denison clarified the correct dose limit for NEWs for the lens of the eye as 50 mSv in a one-year dosimetry period. CNSC staff requested further details regarding the control measures for air exchanges in the core shack. In response, the engineering design of the core shack including control measures to reduce core shack workers' exposures were also committed to be included in the detailed design, with the core shack HVAC design criteria to be provided to the CNSC during Project licensing. CNSC staff sought further clarifications regarding the dose calculations used in the exposure scenarios assessed. The technical bases for internal and external dose calculations were provided by Denison accordingly, and the modeling was reviewed by CNSC staff. Worker dose assessments were conservatively modelled without reliance on use of respiratory protection in response to CNSC staff's request to modify the exposure scenarios and assumptions (i.e., remove the use of a respirator). Finally, Denison also clarified the values for Th-230 and U-238 and the rationale as to why they are not in equilibrium in response to

questions from CNSC staff on the methodology used in selecting these COPCs. Denison's responses to the IRs were accepted by CNSC staff and incorporated in the final EIS, along with revised supporting worker dose assessments.

7.3.5 CNSC Staff Findings and Recommendations

Taking into account the implementation of mitigation measures and recommended follow-up program measures, CNSC staff conclude the Project is not likely to cause significant adverse effects on human health from changes in changes in non-radiological and radiological COPCs from Project air and liquid emissions.

Taking into account the implementation of mitigation measures and recommended follow-up program measures, CNSC staff conclude the Project is not likely to cause significant adverse effects on NEWs and worker health from radiological COPCs and conventional safety hazards due to occupational activities. A summary of the effects Significance Determination table can be found in appendix B and there are no issues requiring follow-up for this component area.

7.4 Indigenous uses: Current use of lands and resources for traditional purposes

Understanding the current use of land and resources for traditional purposes by Indigenous peoples requires the knowledge of the traditional and contemporary Indigenous land use activities of Indigenous Nations and communities, including hunting, trapping, fishing, gathering and cultural/ceremonial activities carried out by First Nations and Métis peoples for traditional purposes in the Project Area, as well as the LSA and RSA (as defined earlier in section 2.3).

The proposed Project may cause changes to Indigenous Land and Resource Use (ILRU) for traditional purposes by Indigenous peoples, including fishing, hunting, gathering, trapping and the use of lands and resources for cultural and ceremonial purposes (referred to as Heritage resources). These adverse effects, may result from changes to the environment through:

- changes in quality and quantity of hunting, fishing, trapping, and gathering activities as a result of the Project
- changes in access to lands and waters available to conduct traditional harvesting and cultural activities as a result of the Project
- changes in the number of known heritage resources including any of those of historical, cultural, archaeological, paleontological or architectural significance as a result of the Project

CNSC staff concurred with Denison's assessment of Project activities that may interact with ILRU and cause residual effects during all project phases, as detailed below.

7.4.1 Description of the existing environment

More than 80% of people who live in Northern Saskatchewan Administration District (NAD) self-identify as Indigenous peoples (Statistics Canada 2022). A map of Indigenous communities and organizations can be seen earlier in section 2.3, figure 2.7.

There are no permanent communities that are located within the immediate proximity of the Project Area. The closest community by road is the Northern Village of Pinehouse (NVP), which is located approximately 260 km south of the Project. Further, ERFN reserves lands of Slush

Lake 192 and Barkwell Bay 192 are located approximately 15 to 40 km away from the Project respectively, while the ERFN reserves lands of Haultain Lake 192 and Mawdsley Lake 192 are located approximately 90 km south of the Project off Highway #914.

Highway #914, locally referred to as the Key Lake highway, runs from the community of Pinehouse, north to Cameco's Key Lake and McArthur River mine sites and serves as a primary transportation route for these operating mine sites. Access to the provincial Highway #914 north of the Key Lake Operation is controlled by Cameco at the Key Lake gatehouse, although some Indigenous land users also access the area past the gatehouse to the northwest via the decommissioned Fox Lake road.

The study areas for ILRU were based on the combined extent of the related atmospheric environment component (air quality, acoustic environment), human health, terrestrial, water quality, and fish and fish habitat VCs.

The LSA and RSA are accessed and used by Indigenous Nations and communities for traditional and/or cultural and ceremonial activities. The primary Indigenous land use activities carried out within the LSA and broader RSA by Indigenous land users include hunting, trapping, fishing, and berry picking. There are also recreational and traditional resource user leases in the LSA and RSA. In addition, there are also important cultural heritage sites in the LSA and RSA, such as archaeological sites, historic travel and canoe routes, seasonal camps and traplines, all of which have cultural significance to Indigenous Nations and communities. All of the potentially impacted Indigenous Nations and communities have identified the importance of protecting the existing environment within the LSA and RSA so that they can continue to hunt, trap, and fish and carry out their traditional activities safely into the future.

7.4.1.1 English River First Nation

The Project is located within the Ancestral Lands of ERFN that stretch from the Churchill River in south to Wapata Lake in northeastern Saskatchewan. The IK that is contained within Denison's EIS was also shared with the CNSC by ERFN for the purposes of the EA process.

This information indicates that the LSA and RSA are important hunting areas for large game such as moose and gathering areas for berries and medicinal plants. ERFN maintains a culture camp in the RSA at kilometre 160 of Highway #914, approximately 100 km south of the project where the highway crosses the Haultain river. ERFN land users gather at the culture camp several times a year with Elders and youth to carry out land use activities such as berry picking, fishing, moose hunting, cultural teachings, and other activities. Moose hunting locations and Woodland Caribou harvesting sites were mapped along the Wheeler River mine site access road and adjacent to the Key Lake highway corridor in the LSA and RSA. The heaviest concentration of contemporary harvesting by ERFN in the region is between the Haultain Lake reserve lands and the McArthur River mine, and on both sides of the Key Lake highway located within LSA/RSA. Closer to the Project site, ERFN IK study participants identified fishing locations in the LSA at Russell Lake and in the smaller lakes and creeks close to the Project site. Plant and berry harvesting areas were also mapped in the LSA around the Fox Lake Road close to the proposed Project site and near the Wheeler River bridge. ERFN also documented a multi-generational history of trapping in the RSA east of the proposed Project, and these same trails are now used currently for subsistence hunting. ERFN reported that Lynx, Muskrat, Fisher, Fox, Otter, and Mink were trapped in the RSA within the last 10 years. ERFN also mapped 61 cultural sites overall in the region, with 10 of those occurring within the LSA. Cultural sites mapped

included a birth site, historic family village sites, historically significant sites, ERFN recreation areas, and culturally significant travel routes to ERFN.

7.4.1.2 Kineepik Métis Local #9

The Project is located within KML traditional lands and occupancy area, which covers approximately 15,000 km^2 and extends 250 km north of Cree Lake, west of Knee Lake, east to Russell Lake and south down to Emmeline Lake located between Beauval and La Ronge (NVP 2011). KML's cultural camp is located at kilometre 67 north of the community, which is along Highway #914. Hunting, fishing, and harvesting areas were primarily documented throughout the RSA, north along the Haultin River system and parallel to Highway #914. KML's land use and occupancy study results show dense moose harvesting sites along Highway #914 south of the Key Lake Mine gate within the RSA, as well as other large game harvesting sites noted around Cree and Russell lakes, but in very low concentrations. Trapping occurs closer to the community, and on the Churchill River system and Gordon Lake, neither of which are located within the RSA. Pinehouse is a strong fishing community with access to hundreds of lakes and rivers in the region. Commercial fishing takes place along several lakes along the Churchill River system while subsistence fishing has been documented on the waterbodies around the Key Lake Mine and the Wheeler River system west of the Key Lake at the Wheeler River bridge within the LSA. KML members also utilize the broader RSA to collect and gather berries and other edible/medicinal plants. Land use and occupancy studies also recorded birth, death, and burial sites, heritage cabins, and settlements in the region although none of these were recorded within the PA, LSA or north of the Key Lake Mine.

7.4.1.3 Athabasca Denesųliné

The Black Lake (Treaty 8), Fond du Lac (Treaty 8), and Hatchet Lake Denesųliné First Nations (Treaty 10) are collectively termed the Athabasca Denesųliné (AD) and are represented by the Ya'Thi Néné Lands and Resources Office. Hatchet Lake Denesųliné First Nation is the closest AD First Nation to the Project and is located approximately 150 km to the northeast, downstream from the Project.

YNLR asserts that Treaty Rights are practiced within the LSA, RSA and downstream in the Wheeler River in Northern Saskatchewan and that the Project Area overlaps the southern extent of the AD's traditional territory, in Nuhenéné. The information shared with CNSC by YNLR (in Denison's EIS and in meetings) indicates that AD members access and use the RSA for hunting, fishing, trapping and gathering activities, and that there are important cultural and spiritual sites located in the RSA. Barren-ground Caribou (*Rangifer tarandus groenlandicus*) is one of the most important resources for the AD people and members continue to harvest Barren-ground Caribou for subsistence and cultural purposes. Although the Barren-ground Caribou herds have not travelled into the Project Area recently, YNLR also indicated that other large game species harvested in the RSA include Woodland Caribou, Moose, and Black Bear, while smaller game harvested include Porcupine and Rabbit. Fishing harvesting also takes place primarily within the RSA, although some fishing was also present downstream of the Project in the LSA in the Wheeler River and Keefe Lakein the RSA. Other traditional land use activities practiced by YNLR members in the RSA include the gathering of berries, medicines, firewood and use of overnight sites as well as historical travel routes. Current sites, such as cabins, were not documented in the PA or LSA. Camping sites and navigation routes were documented based on historic use of the LSA by the Hatchet Lake Denesųliné First Nation.

The land use insights presented within this summary are based on an amalgamation of existing information from YNLR's IK Land Use and Occupancy database, which originates from a variety of projects varying in purpose, each with differing objectives and geographic scope. Consequently, these insights were not specific to the Project and not based on a focused Athabasca Denesųłiné Knowledge, Land Use, and Occupancy Study which may have generated additional insights.

7.4.1.4 Métis Nation-Saskatchewan

The Project site is located within Métis Northern Region 1 (NR-1), close to the border of Northern Regions 2 and 3 (NR-2 and NR-3) and within the Homeland of the Métis. The Métis Nation in Saskatchewan claims Aboriginal title to much of Northwestern Saskatchewan, including the Project area, through a claim filed in 1994 which remains before the courts. Métis Citizens have strong ties and interest in the LSA and RSA, including but not limited to those Citizens from MN-S Locals in NR-1 and NR-3, and Métis communities (e.g., Pinehouse, Beauval, Ile-a-La-Crosse) with whom Denison and CNSC have been engaging with. Access to the Project is via road traveling through NR-3.

The Métis Knowledge Study (MKS) was a preliminary survey of Métis land users that was provided to Denison and the CNSC by MN-S included information in the form of interviews, maps, and tables on the traditional use and occupancy, trail and travel networks, seasonal camps and harvesting areas throughout NR-1 and NR-3 in proximity to the proposed Project. The study provided by MN-S identified hunting, fishing and plant harvesting sites, as well as commercial fishing sites[6], in the LSA and RSA near Cree Lake and the Key Lake highway corridor. In addition, the MN-S also shared that there are culturally important current use and historical sites located in the RSA, including transportation travel routes, seasonal campsites, and gathering sites. Following the MKS submitted, MN-S has provided further mapping and other information from subsequent interviews with land users and continues to conduct such information-gathering activities. Lands within the LSA and RSA are used for knowledge transfer, Métis teachings, hunting, fishing (including commercial fishing)[6] and plant harvesting. These cultural activities are related directly to the Métis people's traditional dietary habits, dependence on traditional foods, commercial activities[6], and harvesting for medicinal purposes. They are also important for maintaining and restoring the Métis connection to their Homeland after generations of impacts of colonialism, residential schools, and land-exclusion practices against the Métis.

7.4.1.5 Other Indigenous Nations and Communities

Lac La Ronge Indian Band (LLRIB, Treaty 6), Peter Ballantyne Cree Nation (PBCN, Treaty 6) and Birch Narrows Dene Nation (BNDN, Treaty 10) have all showed interest in the Project and have shared with Denison and the CNSC that the Project may have the potential to impact land users in the region. All three Nations have shared concerns around potential adverse impacts to the ability to hunt, fish, and trap for food and/or the ability to carry out traditional uses including

[6] MN-S has indicated citizens undertake commercial fishing activities at Russell Lake near the Project site. However, no specific details on commercial harvesting, including evidence of a commercial harvesting license issued by the Province of Saskatchewan that is held by a MN-S citizen(s), has been provided to the CNSC to date.

cultural, spiritual or other important sites near the proposed Project Area and the Nation(s) may have land users in the LSA and RSA. CNSC staff are not currently aware of any ILRU that is carried out near the Project Area or within the LSA by LLRIB or BNDN, but both Nations have indicated that they do utilize the region to hunt, trap, fish and gather and carry out ceremonial purposes. CNSC has been made aware by PBCN that they have conducted interviews with community members to document and update their land use in the Project Area however, no specific traditional land use sites in the LSA have been shared to date. PBCN has shared a traditional territory land use map that claims culturally specific values and general harvesting activities that historically have occurred within the LSA and RSA. The CNSC is open to learning more on each Nations' ILRU in the region should individual Indigenous Nations be willing to share additional Indigenous land use information specific to the Project Area, including in the LSA and RSA.

Information on how the CNSC has been consulting and engaging with the identified Indigenous Nations and communities is included in the Consultation Report, located in appendix C of the CMD.

7.4.2 Proponent's assessment

Denison's assessment on ILRU included both the direct and indirect effects of the Project on the biophysical environment, which in turn may potentially impact access to, and/or the quality and quantity of areas used for hunting, fishing, trapping and gathering activities, and the use of lands and resources for cultural and ceremonial purposes. These changes were assessed based on the spatial (PA, LSA and RSA) and temporal nature (construction, operation, and decommissioning) of these potential interactions between Project components and activities and the ILRU VC. The pathway analysis identified potential Project-related effects on ILRU and identified mitigation measures for these potential Project-related effects and determined whether the potential Project-related effects could be sufficiently mitigated such that they are not expected to cause a residual adverse effect.

In relation to access to and/or the quality and quantity of hunting, fishing, trapping and gathering activities, Denison did not predict any residual effects from the project due to changes in the biophysical environment, after the implementation of proposed mitigation and follow-up monitoring program measures. Within the Project Area, restrictions to land available to conduct ILRU are expected to begin in construction, continue through operation and end when reclamation of disturbed areas is completed in decommissioning. Denison determined that the Project will likely result in localized and temporal disturbances to ILRU within the Project Area and temporarily into the LSA. To minimize the quantity of land that is disturbed by the Project, Denison has reduced the proposed Project footprint to be developed within previously disturbed areas, including utilising roads currently used for exploration activities. Effects on resource availability to terrestrial resources including plants, furbearers, and large game were determined to be low in magnitude and reversible, as most large game hunting and gathering within the Project Area is sparse to infrequent and most of the hunting takes place outside the LSA. The land available for trapping in fur block N-18 will be reduced by 1.70 km^2 due to the Project footprint and area less than 1/10,000 of N-18 total land area. Access restrictions north of the Key Lake gate also mean that land use within the PA and LSA will be restricted to lease holders (e.g., cabin owners) and select Indigenous Nations and communities. Effects on resource availability of terrestrial wildlife and plant species were, therefore, not expected to affect subsistence

hunting, trapping, and gathering because the effects were anticipated to be of low magnitude and reversible.

In relation to the potential effects on aquatic resources availability to surface water, fish, and aquatic furbearers were also assessed by Denison for ILRU. Project-induced changes to fish are expected to be low in magnitude and the abundance and distribution of fish species were not expected to be detectable due the project. Workforce members will be transported to/from site via a fly-in/fly-out rotation and will, therefore will reduce fishing pressure on local lakes. While at the Project site and off duty, workers may opt to fish local waterbodies, however, to protect sustainable use of resources, only catch and release of fish will be encouraged, and fish storage, cooking facilities and boats will not be provided. Given the limited trapping for aquatic furbearers (Beaver and Muskrat) in the PA and for traditional purposes, and the availability of relevant species throughout the LSA and RSA, use of aquatic furbearers for traditional purposes are not expected to be altered due to the Project. Water withdrawals and discharge from groundwater or surface water were also assessed and modelled. The Project will source fresh water from a shallow groundwater well but may draw from both a groundwater source and a surface water source. Potential effects are predicted to begin in construction, continue through operation while camp facilities are still in operation, and decline in decommissioning as infrastructure is removed.

Indigenous land and resource users are concerned about the potential exposure to contamination of hazardous waste to surface water and groundwater due to ISR mining, plants and soils due to air emissions, and overall, impacts to traditional foods; these concerns may thus impact perceptions around the overall quality of the resource use. Potential effects are predicted to begin in operation and cease when reclamation activities have been completed in decommissioning when Project components are removed, and activities cease. Some perceptions may be strong enough to cause land users to avoid practicing ILRU activities in areas proximal to the Project due to perceived health concerns. A human health risk assessment was conducted to consider both radiological and non-radiological risks to humans, including Indigenous resource harvesters who consume high proportion of traditional foods close to the Project site. The human health risk assessment predicted no radiological exceedances, and only one COPC exceedance (selenium) could potentially arise in the unlikely circumstance that fish were only consumed in large quantities from Russell Lake. Denison has committed to monitoring the health risks from fish consumption by comparing fish tissue data collected during operation from the monitoring program against applicable human health risk-based maximum permissible concentrations. Indigenous Nations and communities have also expressed concerns related to mercury and increased methylmercury bioaccumulation in fish tissues due to project-related effects, therefore Denison has committed to additional monitoring for mercury and methylmercury in the aquatic environment to the list of COPC's over the life of the project to in order to monitor changes in mercury concentrations in fish tissue over time. Changes in fish tissues concentrations will be assessed through comparison of construction, operation, and decommissioning results to pre-development baseline conditions.

Denison also assessed the potential effect of changes in access to cultural and heritage resources and considered both the spatial and temporal boundaries in determining the potential effects to known Heritage Resources. Construction and other activities associated with the Project have the potential to impact or disturb these archaeological sites. To help assess heritage potential, TLU maps from ERFN, KML, and YNLR were reviewed by Denison to identify records of cultural and land use practices in the PA. Potential Project-related effects for Heritage Resources were

limited to the areas where ground disturbance will occur which is primarily in the immediate PA. Two Heritage Resource Impact Assessments (HRIAs) were completed to identify any heritage resources that may be affected by the Project and two heritage resources were identified in the PA during the baseline studies. Both sites were single artifact finds and were considered to have low interpretive value by the province of Saskatchewan's Heritage Conservation Branch (HCB). Denison determined that given the low number of Heritage Resources within the PA, LSA, and RSA, the likelihood of this residual effect is considered low and residual effects on heritage resources will occur infrequently. Any changes to the Project (i.e., expansion of the Project Area or the addition of new infrastructure including airstrip) that might affect heritage resources will be required under the *Heritage Property Act* to be submitted to the HCB for their review, and additional HRIAs may be required.

While it is difficult to predict individual perceptions on the suitability of land proximal to the Project for ILRU, Indigenous land users may also experience indirect effects through disturbances from traffic, noise, air quality changes, changes related to the relationship to the land, and increased competition for resources due to increased traffic in the area as was included in Denison's assessment. Denison deemed changes to the perceived experience of land users would be limited to a small number of individuals and that proven mitigation measures will be applied to traffic disturbances, noise, air quality, and increased competition for resources and therefore the effects are expected to be localized and reversible. Denison's potential effects were predicted to begin in construction, continue through operations, and cease when reclamation activities have been completed in decommissioning when Project components are removed, and activities cease. Denison determined the residual adverse effects for the perceived suitability of lands and resources are expected to be low in magnitude, limited in geographic extent, and reversible, and the conclusion relative to changes to ILRU is not significant. Denison proposed mitigation strategies that have been successful in similar settings and other mining operation across Northern Saskatchewan such as management of noise, traffic, dust, and competition for resources and additional engagement on ISR mining has been proposed. Denison has committed to working with Indigenous Nations and communities to maintaining positive relations and will be open to discissions on any issues or concerns that arise due to these potential disturbances.

7.4.3 Other Views expressed

7.4.3.1 Indigenous Land Use

ERFN had expressed concern about Denison's understanding of their land use. Specifically, there is a discrepancy between individual and collectively held rights, inaccurately represented as "limited" or "absent" in the study. ERFN also emphasizes that their actual current use of the land is much more extensive than portrayed. Additionally, Denison's portrayal of the ERFN community through Bobby John's trapline and land use has raised concerns but has since been updated for the final EIS. Former ERFN Chief McIntyre also spoke of the origins of local place names and the presence of important cultural sites in the Project Area:

> *"Since 1906, the area where you're working has been Treaty 10 land…[and] those lands were the primary area of ERFN and contain burial sites and birth sites of ERFN members. The Dene name of the Wheeler River, Russell Lake and Cree Lake all come from the Denésuliné of English River. The Elders have always expressed that it's a primary area of ERFN. One of our late Elders was born north of there in 1922. Our traditional gathering place is there."*

KML had expressed concerns around other activities impacting their land use practices and traditional economic activity resulting from cumulative impacts from historical legacy exploration and mining. There is concern that they will inherit severe impacts from increased development and access to their territory. Current regulation of hunting, fishing, tourism, resource development and increased human traffic will affect and limit their ability to practice protected rights.

The MN-S study completed in 2023 identifies potential changes to harvesting and related activities for MN-S members, including but not limited to hunting, fishing, including commercial fishing, gathering, trapping, and related travel and camping. The Métis Knowledge Study was completed using in-person interviews with 9 Métis Citizens who previously worked and lived in NR1 and NR3 and who had strong kinship and familial ties to NR1 and/or NR3 and were able to share Métis knowledge learned through oral history. These hunting, fishing, trapping, gathering, harvesting and related[7] activities detailed in the Métis Knowledge Study were focused on the Churchill River Watershed, Cree Lake, near existing mine sites (Key and McArthur River) and the proposed Project site. Other activities relate directly to traditional dietary habits, dependence on traditional/country foods and harvesting for medicinal purposes. Specific areas mentioned include the Churchill River area, Cree Lake (both in RSA) and the Key Lake highway corridor in the LSA.

MN-S has expressed concern regarding sensory disturbances that may occur during land and resource use activities. These disturbances may include visual and auditory impacts resulting from mining and exploration activities in the region, increased road traffic, and changes to the visual environment.

MN-S is also concerned about reduced engagement in land and resource use activities, diminished access to previously accessible areas, and Project impacts on health of traditionally harvested populations. This reduction in participation may be attributed to perceived environmental risks, impacts on traditional food sources, and increased involvement in mining activities. The activities associated with this project may adversely affect the safety, both real and perceived, of consuming, or commercially harvesting, species that have been traditionally harvested by MN-S members in the LSA and broader RSA.

YNLR has shared concerns about personal exposure to contamination of surface and groundwater, soils, waste sources, and fish species. Such exposure could lead to avoidance of areas adjacent to the Project, potentially limiting access to Treaty-protected activities. Furthermore, YNLR expresses fears related to uranium exploration and mining contamination of water and traditional foods. These perceived risks could impact culturally important natural resources, potentially leading residents to avoid accessing the general area. Ensuring the protection of ecological systems that support traditional land use activities is crucial, including considerations during the decommissioning of the mines. YNLR also expressed concerns with Denison's representation of the Dene's key traditional and cultural activities. Particularly that the Athabasca Déné do not utilize the area around the proposed Project for traditional purposes.

MN-S has indicated citizens undertake commercial fishing activities at Russell Lake near the Project site. However, no specific details on commercial harvesting, including evidence of a commercial harvesting license issued by the Province of Saskatchewan that is held by a MN-S citizen(s), has been provided to the CNSC to date.

BNDN expressed concerns in Draft EIS that IK and Land Use from BNDN has not yet been included or considered in Denison's EIS and that a fulsome consideration of BNDN's IK and Land Use was needed to assess the impacts the Project may have on BNDN's rights and interests and contribute to a baseline of ecological knowledge and cultural use in the area.

LLRIB shared concerns around potential adverse impacts to the ability to hunt, fish and trap for food and/or the ability to carry out traditional uses including cultural, spiritual or other important sites near the proposed Project Area and may have land users in the RSA.

PBCN is concerned that Denison is not providing enough capacity funding to support meaningful engagement on the Project to complete a project specific Land Use study. PBCN was unable to determine potential impacts to PBCN Aboriginal and Treaty Rights through independent and objective review of the project impacts on PBCN's land use in the region. PBCN has also raised concerns around the use of the draft territory map shared with CNSC and Denison. Denison has used the information from this map to support the draft EIS, but this is a draft and not wholly indicative of PBCN's land use in the area and going to share more detailed information when it becomes available with the CNSC and Denison so that they can better understand PBCN's land use in relation to the Project.

In response to a CNSC request for review of the Views Expressed shared, PBCN indicated that it was also concerned about the quality and quantity of resources that PBCN members rely on for subsistence, including wildlife, vegetation, and water. PBCN claims that its members exercise Aboriginal and Treaty rights in the Project Area including hunting, trapping, gathering and cultural activities including, but not limited to, gathering medicinal plants; hunting moose and caribou; harvesting duck, mallard and geese; trapping lynx; harvesting chaga and rat root.

7.4.3.2 Landscape Fragmentation and Terrestrial Environment

ERFN had expressed concerns around cumulative effects of industry fragmenting the landscape impacting environment and community health as well as ability to practice traditional activities through harvesting, trapping, fishing or hunting. ERFN had expressed concerns around decommissioning, remediation and the reclamation process at the end of the mining process. There are questions about the management of financial guarantees, cavities and wells once mining is complete. This could result in long-term effects on the land and the potential for these effects to negatively affect traditional lifeways.

KML had shared concerns with respect to severe impacts from increased development and access to their territory. Current regulation of hunting, fishing, tourism, resources development and increased human traffic may affect and limit their ability to practice protected rights within the RSA.

MN-S is concerned with increased pressure on terrestrial species and supporting habitats, and the decreased quality and quantity of species and supporting habitats (Moose and Woodland Caribou), which could lead to a noticeable decline in both the quality and quantity of these resources for Métis citizens for harvesting.

YNLR has emphasized the lack of significance associated with the residual and cumulative effects assessments of all ecological VCs. YNLR raised concerns that they submitted on the Draft EIS that Denison did not undertake project specific work of the information shared with Denison, specifically around Woodland Caribou and Moose ranges for the RSA. Some community Elders are concerned that future generations will not have an abundance of wildlife

required for harvesting and want to ensure that YNLR IKis considered in the protection of Woodland Caribou and their habitat. YNLR also firmly believes that the addition of the Denison mine, along with its associated disturbances, will have cumulative effects on wildlife, especially Woodland Caribou. YNLR is concerned about the lack of significance associated with the residual and cumulative effects assessments of all ecological VCs as it is crisscrossed with many kilometers of cut lines through the LSA, RSA and beyond. YNLR has also expressed concerns around linear disruptions impacting Moose, furbearers, raptors, migratory breeding birds, other species at risk.

BNDN shared concerns that the avoidance buffer for Moose and Woodland Caribou is not large enough. The anthropogenic disturbance can affect ungulate habitat selection and result in habitat avoidance. BNDN is also concerned that species at risk and endangered species were observed during baseline studies but were excluded in the EIS or were not listed as key indicators.

LLRIB expressed concern for incorporation of chemical and pollutants into the aquatic environment and the effects to water quality and health of aquatic species.

PBCN is concerned about the risk of contamination as well as the perceived risk of contamination to vegetation, fish, wildlife, soils and traditional foods and the avoidance of harvesting of traditional foods by PBCN members. It is critical that Denison, the CNSC and provincial regulators continue to monitor traditional foods to build confidence of PBCN members to facilitate the continued exercise of PBCN's Aboriginal rights to hunt, harvest, fish and gather. PBCN is also concerned with the Project creating disruptions and disturbances to wildlife species in the region including large game such as Moose and Woodland Caribou.

PAGC has raised concerns that the Athabasca region has a history of mismanaged mining operations, as shown by the 38 abandoned mines in the Athabasca region.

7.4.3.3 Surface water and Groundwater Contamination and Use

At the initial Project stage ERFN expressed concerns that the project may adversely impact or contaminate the aquatic environment, waterways, fish, and fisheries, affecting their traditional way of life, including water use, fishing, and land harvesting practices tied to "Nuhtsiye-kwi Benéne" (Traditional Lands). Specifically, ERFN was concerned by the potential risk of hazardous materials from the project contaminating the surrounding environment, particularly in the event of underground spills to groundwater aquifer that may not be immediately visible or detectable. ERFN also highlighted the importance of safeguarding waterways and fish spawning areas to prevent contamination. Furthermore, members of ERFN perceive risks associated with the nuclear industry, including catastrophic accidents, which could significantly impact their way of life and connection to Nuhtsiye-kwi Benéne.

ERFN initially expressed concerns that the presence of molybdenum and sulfate in effluents from the mine could significantly impact the current environment by influencing pH levels and potentially leading to acidification downstream. ERFN has emphasized the importance of understanding the local hydrogeological setting to assess potential risks associated with water quality and groundwater flow. Additionally, Denison's water recycle program was not clearly defined and engagement with ERFN should be considered in the search for the best available technology.

KML community members noted concerns around perceived risks resulting from the lack of confidence that mining will be able to recover solutions which could impact groundwater quality.

KML also expressed concerns the aquatic environment, including baseline collection and water flow management was completed.

YNLR shares similar concerns, particularly regarding personal exposure to contamination of surface and groundwater, soils, waste sources, and fish species. These apprehensions could lead to avoidance of areas adjacent to the project and potentially limit access to Treaty-protected activities such as fishing for traditional purposes. Concerns were raised around future water quality for Whitefish Lake, Russell Lake, and downstream watershed of the Wheeler River, Geikie River and into Wollaston Lake. YNLR also has concerns around water resource management for the project as the volume of natural lake and ground water proposed to be used to support the project. This could impact stream flows and contamination of water below and above ground.

MN-S has raised concerns about potential leaks and contamination in bedrock, and contamination from effluent (including selenium), particularly the impact on Whitefish Lake and downstream impacts to Russell Lake. MN-S also raised concerns that the basement rock is potentially permeable and has concerns that hazardous materials will remain contained within the freeze wall.

BNDN has shared concerns that Denison's sampling effort for identifying the species diversity and relative abundance of the fish community is low and that an additional round of spring and fall baseline sampling should take place. BNDN is concerned that background mercury concentrations in water and fish can be elevated in unexpected and remote locations and Denison's lack of assessment and analysis of baseline mercury concentrations and mercury cycling that could be induced by the Project. BNDN is very concerned that Denison has portrayed their groundwater contamination model with an inappropriate level of confidence. Water quantities used for the Project may also be greater than modelled.

PBCN has concerns around the contamination on waterways downstream due to effluent from the mine entering the waterways that flow downstream into the south end of Wollaston Lake. PBCN is particularly concerned about the proposed use of freshwater for mining operations and release of effluent into Whitefish Lake. PBCN also has expressed concerns and would like to better understand of what specific steps the CNSC is taking to monitor any potential failure of the freeze wall and the whether the CNSC is requiring financial assurance from Denison. PBCN has also expressed concerns that Denison has not consulted with PBCN on water quality impacts to the downstream environment of the project site into the southeastern end of Wollaston Lake.

In response to a CNSC request for review of the Views Expressed shared, PBCN expressed an interest in participating in the environmental committee overseeing the BATEA study.

7.4.3.4 Increased access and use

At the initial Project stage ERFN expressed concerns that increased access to the Cree Lake area could adversely impact caribou and Moose populations, potentially affecting members' ability to engage in traditional hunting practices. Specifically, ERFN is concerned about Province of Saskatchewan's plan to redesign and provide unimpeded road access to the north, which may lead to an influx of people into the Cree Lake area to set up cabins and fishing lodges. This influx into the area may threaten the region's remoteness, tranquility, and the quality of fishing. Moreover, it could erode the practice of traditional activities and subsistence harvesting. ERFN also expressed concerns that mine truck traffic would impact access to blueberry harvesting areas and impact the berries themselves, that access to hunting areas would be cut off, and that

potential mine contamination could impact Moose, Woodland Caribou, and/or fish in the area. ERFN expressed concerns about Denison's understanding of their current land use. Specifically, there was a discrepancy between individual and collectively held rights, inaccurately represented as "limited" or "absent" in the study. ERFN emphasized that use of the land is much more extensive than initially portrayed. An ERFN Trapper stated that more cabins are being built in the area which *"has affected me because there are more boats on the lakes. More boats on the lakes leads to more overfishing, anglers also cut access trails to lakes."*

KML identified that increased access and traffic as a primary concern potentially impacting their ability to practice subsistence harvesting. KML also requested additional information on how Denison and the Province of Saskatchewan plan to address the HWY #914 extension road in the future and its implications for increased traffic through their community if it is advanced. KML raised a concern with Denison to clarify that they are not representing other Métis locals/communities. KML is the closest Métis Local and community to the Project therefore should be considered one of the primary impacted communities for the Project.

MN-S have also flagged increased traffic and land use pressures as a concern with respect to hunting for large game of its members. As more people travel to and from the project sites additional pressures may be placed by hunters and fisherman on the natural resources that its citizens rely upon to feed their families. MN-S believes Denison should consider limiting non-Indigenous Project staff from hunting, fishing, trapping and gathering around the Project Area. MN-S also would like Denison to allow Métis employees cultural leave for land and resource activities during times of the year designated for harvesting activities and provide access to employees for harvesting activities during time off.

YNLR have also flagged increased traffic and land use pressures as a concern with respect to hunting for large game of its members. As more people travel to and from the project sites additional pressures may be placed by hunters and fisherman on the natural resources that its citizens rely upon to feed their families.

BNDN has shared concerns regarding increased fishing pressure in Whitefish Lake from employees working at the Project site and increased ability for visitors due to improved access could negatively impact fish populations. This could have negative consequences on the population structure of fish in the lake as well as the ability of BNDN members to exercise fishing rights.

7.4.3.5 Indigenous and Treaty Rights

ERFN expressed concerns about safeguarding the community's collective rights to hunt, fish, and harvest. Additionally, ERFN raised concerns about the potential blocking of Fox Lake Road by the Project—a road that holds contemporary cultural significance as a gathering place for ERFN people. ERFN raised issue with Denison's understanding of ERFN's use in the area with individual vs. collectively held rights inaccurately represented. Denison has used "limited" or "absent" when referring to Indigenous Lands and Resource Use in the Study Areas which diminishes the actual amount of use by ERFN members.

ERFN expressed concerns regarding the protection of the community's collective rights to hunt, fish and harvest and want to ensure all Rights will remain unchanged. ERFN also feels they have a stronger land claim than other Indigenous Nations and communities within the Project Area and want to ensure ERFN Treaty Rights and interests are protected and prioritized. ERFN

maintains a cultural camp at Kilometre 160 of Highway 914 where the highway crosses the Haultain River. Former ERFN Chief McIntyre expressed the importance of the cultural camp.

> "*For many years I've invited (the media) to come to our gathering on the Key Lake road, to showcase and impress on the world that we're still using those areas."*

The KML community identified increased access to the area as a concern, potentially impacting their ability to practice subsistence harvesting. KML requested additional information on how Denison and the Province plan to address increased traffic on the roads and safety risks to community members when harvesting due to increased traffic. KML also had concerns from cumulative impacts of historical legacy exploration and mining practices and safety of food gathering in a safe method around growing projects and mineral exploration activities in the region. KML is concerned that cumulative impacts of substantial and growing projects and mineral exploration activity in the region will severely limit their ability to practice continued and use of the region north of the Haultain River.

MN-S Métis Knowledge Study identifies potential changes to harvesting and related activities for MN-S citizens, including but not limited to hunting, fishing, gathering, and trapping. Indicators for this Valued Component also encompass possible changes to travel and access routes to areas designated for these activities, as well as to cabins and campsites used during these land and resource use activities. MN-S has shared they have trepidations about the increased pressure on species and their supporting habitats, which could lead to a noticeable decline in both the quality and quantity of these resources. The activities associated with this project may adversely affect the safety, both real and perceived, of consuming species that have been traditionally harvested by MN-S members.

YNLR also shared similar concerns stemming from cumulative effects resulting from various industrial developments across the broader region. These cumulative impacts have left residents with shrinking usable areas to exercise their rights. YNLR specifically emphasizes the importance of reflecting Treaty Rights related to fishing, hunting, and trapping in the EIS. YNLR and the Athabasca Denesųłiné also expressed concerns and apprehension about potential adverse impacts from the Project or indirect effects of human activity within the Project Area. These impacts could disrupt both Aboriginal and Treaty rights related to hunting, fishing, trapping, and gathering for future generations.

BNDN members continue to exercise our Treaty and Aboriginal rights including hunting, trapping, fishing, plant gathering and cultural/spiritual practices in the immediate area of the Project and throughout our Ancestral Lands.

LLRIB has shared concerns around potential adverse impacts to the ability to hunt, fish and trap for food and/or the ability to carry out traditional uses including cultural, spiritual or other important sites within the direct boundary of the proposed project and downriver. LLRIB has encouraged Denison to reach out to LLRIB to engage LLRIB members and land users who may be potentially impacted.

PBCN has raised concerns and claim that the Project has potential impacts on PBCN's ability to exercise Aboriginal and Treaty Rights. The Crown and Denison needs to engage PBCN meaningfully to ensure impacts to PBCN as an interested Indigenous Nation and community are identified, assessed, mitigated and, where appropriate, reasonably accommodated.

In response to a CNSC request for review of the Views Expressed shared, PBCN indicated that they are concerned with the failure of the Crown and Denison to consider PBCN's comments

and concerns on the basis that the EIS contains general mitigation measures. PBCN has stated that this approach is both inaccurate and inconsistent with the Crown's own policies on Indigenous consultation and engagement. This approach disregards the essential requirement of meaningful consultation. The mitigation measures set out in the EIS were developed prior to PBCN expressing interest on the Project and as previously noted, do not incorporate any Indigenous or community knowledge provided by PBCN. PBCN claims that measures developed unilaterally by Denison do not meet the standards required under the Crown's duty to consult. It is imperative that PBCN be actively involved in the evaluation of mitigation measures to ensure they are responsive to the actual and potential impacts on PBCN's Aboriginal and Treaty rights.

PAGC has also shared concerns around potential adverse impacts to the ability to hunt, fish and trap for food and/or the ability to carry out traditional uses including cultural, spiritual or other important sites.

7.4.3.6 Increase in Transportation Infrastructure & Use

ERFN has concerns that noise from the Project has potential to affect human health and change animal behaviors

KML raised concerns related to highway impacts and cumulative road use. Specifically, they worry about the potential effects of the Project and pressures on the existing highway due to increased truck traffic and a lack of stringent oversight and safety concerns. These activities may elevate the risk of heavy haul vehicle incidents involving land users and potentially reduce access to emergency services for the community members. KML would like to ensure safety processes for community members and comprehensive maintenance plans for the road should be thoroughly discussed with the community and implemented to provide the protection of both the environment and the well-being of the closest impacted community.

7.4.3.7 Environmental Monitoring

ERFN would like to be included in all environmental monitoring so they can ensure their ancestral homelands of "Nuhtsiye-kwi Benéne" are being protected.

MN-S has indicated they would like to be more involved in the environmental monitoring programs and ensure they are inclusive of Métis citizens and knowledge throughout the lifetime of the project. MN-S' involvement and inclusions in measures can help confirm the efficacy of mitigation measures, monitoring of harvest species, protection of water quality, and ensure Métis land and resource use interests.

YNLR has concerns around the uncertainties around Denison's proposed monitoring plans and want to ensure that YNLR is involved in the design, implementation and reporting of all monitoring programs for the Project. Their primary concerns and interest involve water quality and the terrestrial environment with a strong interest in protecting the woodland caribou and their habitat.

BNDN is concerned that there is no engagement with BNDN on the environmental management, monitoring and remediation programs. BNDN is concerned that the Project is reliant on burning

diesel to supply project activities. The project should consider Best Available Technologies to reduce the Project's GHG emissions.

PBCN has interest in being involved in the development and implementation of water quality monitoring and sampling programs in the downstream aquatic environment to ensure the watershed is being protected.

In response to a CNSC request for review of the Views Expressed shared, PBCN expressed interest in participating in tissue sampling programs with a focus on fish tissue sampling, mammal tissue sampling and bioaccumulation in plants and fungus. PBCN has urged Denison and CNSC to develop:

- a fish tissue sampling program for grayling, walleye, northern pike, and lake trout)
- a mammal monitoring program centered around commonly harvested mammals, such as moose, deer, and beaver with a focus on organs and tissues that may store contaminants, such as liver and kidney
- a plant monitoring program centered around key medicinal plants, berries, and mushrooms, all of which are crucial for PBCN's traditional health practices with a focus on leaf, root, and fungal tissue to assess levels of contaminants absorbed from the soil and water

PBCN is also interested in participating in the environmental committee overseeing this project, as well as the BATEA study.

7.4.3.8 Community Health and Socio-Economic

ERFN had expressed apprehension about potential negative effects on community health resulting from the project. During interviews, community members highlighted significant perceived health impacts arising from cumulative environmental and wildlife effects within ERFN Traditional Territory. These impacts have implications for overall well-being, leading to negative psycho-social consequences and perceived risk that traditional foods are not safe to eat. ERFN also expressed concern that potential effects on the Traditional Economy are underestimated and erosion of traditional economic practices from cumulative effects of resource projects will occur. ERFN is concerned that the socio-economic data from census desktop studies are not accurate.

KML had raised the concern that the community is currently in need of funding for education and training to reach a standard of knowledge in STEM and mining to take advantage of economic opportunities from the project. KML had also raised concerns around language and cultural loss to the community over the years due to the uranium mining industry and being able to continue to speak their language and practice their culture at the mine sites. They have expressed concerns that racial discrimination in hiring for projects in the area has led to detrimental effects against the cultural norms and language of the community. KML had also raised the concern regarding women being offered limited opportunities due to work schedules.

MN-S has indicated that Metis citizens who use the LSA have the potential for economic loss due the projects. Economics is a primary Valued Component for MN-S and includes how the project will impact changes to employment, education and training, and impacts on the traditional Métis economy. MN-S has also raised concerns with quality-of-life valued component that includes changes to Métis kinship and cultural practices, festivals, Métis gatherings, and the

use of cultural sites for personal practice or for the purpose of knowledge sharing with future generations. Furthermore, the proposed project may have an impact on the methods of communication, access to technology and the ability to travel for supporting kinship ties. MN-S has also raised concerns with the loss to the Métis title claim from the extraction of the Project resource and the loss of socio-economic opportunities which could result from the development of the Project resource prior to the recognition of Métis title.

BNDN is concerned that Denison has not identified the community as a LSA community. This results in lack of eligibility for priority employment, training or contracting opportunities. BNDN has raised concerns that a transient workforce from the proposed Project will impact the quality of life of BNDN members.

PBCN wants to ensure Treaty Rights of members are protected (with a focus on water) and that socio-economic and cultural rights and well-being of PBCN members are protected. In response to a CNSC request for review of the Views Expressed shared, PBCN also reiterated that it is concerned about bioaccumulation in animal tissue and medicinal plants that are hunted trapped and gathered by PBCN members.

7.4.3.9 Summary of Mitigations and Commitments related to Views Expressed

In addition to Denison's responses, mitigations, accommodations and commitments to Indigenous Nations and communities, CNSC staff's responses to concerns raised by Indigenous Nations and communities are addressed in section X of the Consultation Report, in the responses to Issues and Concerns (appendix X of the CMD) and will be included as in a supplemental submission to in advance of the Part 2 hearing.

7.4.4 CNSC Staff Analysis

CNSC staff reviewed Denison's assessment of potential effects to ILRU due to decreased access and to the quality and quantity of hunting, fishing, trapping and gathering activities, including ceremonial practices, during all phases of the Project and considered the views shared by Indigenous Nations and communities. CNSC staff have also reviewed and considered all of the IK/MK and local knowledge that was provided in Denison's EIS, as well as TK/MK documents and maps that have been shared directly with CNSC staff that were requested to remain confidential.

CNSC staff have also travelled to the Project site and region on several occasions, visited multiple cultural camps, met and engaged directly with a number Indigenous land users, Elders, and leadership from several Indigenous Nations and communities with rights and interested related to the Project to hear and respond to their concerns. In addition, CNSC staff have also reviewed the mitigation measures that were proposed and applied by Denison in atmospheric and acoustic environment, geology and groundwater, aquatic environment, terrestrial environment, and human health sections as well as the mitigation and follow-up commitments made by Denison for the Project.

The Project's effects to ILRU are predicted to be indirect effects to the quality of the perceived experience may be affected due to hazards related to road safety, waste and the perceived risk to the contamination of traditional foods. The effects of potential changes to the health of Indigenous Nations and communities were assessed for issues related to changes in air quality, noise levels, visual quality, human health and perceived risk to the contamination of traditional foods. When taking into consideration the combined magnitude, geographic extent, duration, and

context of the potential residual adverse effects on Indigenous health, and the mitigation measures to address effects on exposure to the traditional land user, CNSC staff have determined that the magnitude of these residual effects are expected to be low.

If granted a licence by the CNSC, Denison is required to implement an EMP consistent with Canadian Standards Association for nuclear facilities and uranium mines. The environmental monitoring program will focus on providing data to verify the predictions made by the ERA, to refine the models used in the ERA, and to reduce the uncertainty in the predictions made by the ERA. The EMP will include collection of surface water, sediment, plants, and soil samples as well as fish tissue, benthic invertebrates, and traditional foods in collaboration with potentially affected Indigenous Nations and communities.

The Projects effects of potential changes to the physical and cultural heritage of Indigenous Nations and communities were also assessed for issues related to the loss, change, or alteration of archaeological and heritage resources of the current use of lands and resources for traditional purposes of culturally/spiritually sites. When considering the mitigation measures proposed and applied to Heritage Resources, CNSC staff conclude that there will be no residual adverse effects to changes in access to cultural and heritage resources for ceremonial purposes. With respect to potential effects on other cultural resources including archaeology, and considering Indigenous Nations and communities' views, CNSC staff have found that Denison's mitigation measures listed and their commitments to follow the guidance under the *Saskatchewan's Heritage Property Act* (Government of Saskatchewan 2017) pertaining to archaeology sites, built heritage sites and structures of historical and/or architectural interest, and paleontological sites will mitigate any potential effects. Denison has completed the required archaeology assessments in accordance with provincial regulations and has also committed to developing a Heritage Resources Management Plan (HRMP) to help protect and mitigate any potential effects of the Project to Heritage Resources with potentially affected Indigenous Nations and communities to ensure the Project effects are being monitored and appropriately mitigated.

In conclusion, CNSC staff reviewed Denison's assessment of potential impacts on ILRU due to decreased access and to the quality and quantity of hunting, fishing, trapping and gathering activities and perceived changes to the environment and on heritage resources. The Project effects resulting from changes to the biophysical environment are predicted to be primarily indirect effects.

7.4.5 CNSC Staff Findings and Recommendations

Taking into account the implementation of mitigation measures and recommended follow-up program measures, as well as input received from Indigenous Nations and communities, CNSC staff conclude that there are grounds for the Commission to find that the Project is not likely to cause significant adverse effects on access to and quality and quantity of hunting, fishing, trapping and harvesting activities, or effects on access to cultural sites of importance to Indigenous peoples. The effects significance determination table for ILRU can be found in appendix B.

CNSC remains committed to working with Indigenous Nations and communities to collaborate on follow-up and monitoring activities for the Project, as well as enhance engagement, outreach and information sharing regarding uranium mining and related environmental, health, safety and regulatory measures to mitigate and protect ILRU in the Project Area region and build trust with Indigenous Nations and communities moving forward.

8.0 Other effects considered

8.1 Effects of accidents and malfunctions

8.1.1 Proponent's Assessment

Denison carried out an assessment of effects of potential radiological and conventional accidents and malfunctions on human health, safety, and/or biophysical environment in consideration of all mine-life phases focusing on the Project site, the site access road and specific off-site locations along the mine-related transportation route of interest to Indigenous peoples. The assessment followed a risk-based approach whereby 70 potential project-related hazards were identified, screened, and evaluated qualitatively, taking into account design features and mitigation measures. Seven accident and malfunction scenarios initially identified with moderate or high risk were carried forward for more detailed quantitative assessment, including risk characterization. table 8.1 below outlines seven bounding accident and malfunction scenarios and Denison's proposed mitigation measures, including their risk characterization.

Table 8.1 Bounding accidents and malfunctions, proposed mitigation measures, and risk characterization

Type of accident and malfunction	Description	Mitigation measures	Risk characterization
Vehicle accident and aquatic release of radioactivity	Identified as a bounding potential accident during operation, where an accident of a vehicle transporting packed uranium concentrate, including a rollover, collision, or run off road at or near a water crossing could potentially result in a release of uranium concentrate into the surface water at this location and cause potential effects on surface water quality, sediment quality, aquatic species, wildlife, and human health.	Mitigation measures proposed by Denison include: • traffic control measures such as speed limits • travel management plans • spill and emergency response planning • driver training	Probability: highly unlikely Severity of consequence: moderate Overall risk: low
Vehicle accident and aquatic release of fuel and hazardous chemicals	Identified as a bounding potential accident during construction, operation, and decommissioning, where an accident of a vehicle transporting fuel and hazardous chemicals, including a rollover, collision, or run off road at or near a water crossing could potentially result in aquatic release of fuel, hazardous chemicals, and reagents into surface water and cause potential effects on surface water quality, sediment quality, aquatic species, wildlife, and human health.	Mitigation measures proposed by Denison include: • traffic control measures such as speed limits • travel management plans • spill and emergency response planning • driver training	Probability: unlikely Severity of consequence: moderate Overall risk: low
Loss of freeze capacity	Identified as a bounding potential accident during operation, whereby a loss of containment of mining solution would occur due to loss of freeze capacity. If this occurs, the mining fluids could migrate into the local groundwater environment and cause contamination of groundwater.	Mitigation measures proposed by Denison include: • ensuring the freeze plant is maintained in good working order • maintaining the structural stability of the freeze wall with great effort • maintaining inward hydraulic gradient created by the recovery wells pumps	Probability: highly unlikely Severity of consequence: major Overall risk: moderate
Failure of freeze wall	Identified as a bounding potential accident during operation whereby the freeze wall could be damaged due to earth movement during major events such as earthquakes. This accidental scenario could result in	Mitigation measures proposed by Denison include: • monitoring of groundwater and freeze wall thickness	Probability: highly unlikely

Type of accident and malfunction	Description	Mitigation measures	Risk characterization
	the migration of mining fluids into the local groundwater environment and cause contamination of groundwater.	• pumping both within the freeze wall and outside the freeze wall if the accident occurs • maintaining inward hydraulic gradient created by the recovery wells pumps	Severity of consequence: major Overall risk: moderate
Process vessel and piping system failure	Identified as a bounding potential accident during operation, which could result in the release of radon from storage tank and cause potential effects on human health and the environment.	Mitigation measures proposed by Denison include: • adequate engineering design control • visual inspections • regular and preventive inspection, testing, and maintenance programs • personnel training and orientation • development and implementation of the Occupational Health and Safety Program, including specific plans, procedures and PPE • emergency response and spill response planning • building ventilation • full containment of the processing plant; and • ambient monitoring	Probability: likely Severity of consequence: minor Overall risk: low
Facility fire and/or explosion, and release of radioactivity and uranium concentrate powder to the atmosphere	Identified as a bounding potential accident during operation, whereby a fire and/or explosion within the processing plant could result in the release of radioactivity and uranium concentrate powder to atmosphere and cause potential effects on air quality and human health.	Mitigation measures proposed by Denison include: • adequate engineering design control • implementation of regular and preventive inspection, testing, and maintenance programs • implementation of personnel training and orientation • development and implementation of the Occupational Health and Safety Program, including specific plans, procedures, and PPE • implementation of fire safety plan and firefighting systems; and • ambient monitoring	Probability: highly likely Severity of consequence: moderate Overall risk: low

Type of accident and malfunction	Description	Mitigation measures	Risk characterization
Vehicle accident and terrestrial release of radioactivity and chemicals	Identified as a bounding potential accident during construction, operation, and decommissioning, whereby vehicle accident including collision, rollover, and run off road could result in terrestrial release of radioactivity and chemicals and cause potential effects on groundwater, soils, vegetation, wildlife and human health.	Mitigation measures proposed by Denison include: • traffic control measures such as speed limits • transportation management plans • spill and emergency response planning • driver training • limiting wildlife access to spill locations • cleaning up spills immediately to a pre-determined level • preventing runoff and release to surface water; and • preventing penetration to groundwater	Probability: likely Severity of consequence: minor Overall risk: low

Of the seven scenarios assessed, taking into account proposed mitigation measures, five scenarios were determined to be low risk. The loss of freeze capacity and failure of the freeze wall scenarios were deemed to be of moderate risk; however, given the high unlikeliness of these two scenarios and consideration of their design features, this level of risk was deemed to be tolerable, and no further mitigation was deemed necessary.

Overall, based on the assessment of accidents and malfunctions, Denison anticipated that potential effects could be addressed through engineering design and compliance with industry best practices that reduce risks associated with the hazard scenarios to ALARA. Based on this assessment, the risks were characterized as tolerable.

8.1.2 Other Views Expressed

8.1.2.1 Spills

ERFN raised concerns around a spill that occurred at the Wheeler River site during feasibility testing. ERFN perceived this as reminiscent of a spill that previously occurred at Cameco's Key Lake facility, which was concerning to its members. ERFN raised other concerns related to the possibility of underground spills, discrete spills on site and spills arising from a vehicular accident. ERFN is concerned that in these scenarios, underground spills may go undetected and potentially contaminate the surrounding environment, while discrete spills and spills arising from vehicular accidents may contaminate waterbodies near the proposed Project Area.

KML noted that it expects that Denison and the community will co-develop capacity to engage in emergency responses related to a number of emergency scenarios, including spill responses.

BNDN identified that the EIS lacked details on how spills and other accidents and malfunctions would be addressed. Specifically, BNDN requested additional information regarding the development of spill prevention programs and monitoring and remediation for accidents and malfunctions and requested that they be consulted on the development of a Spill Response Plan.

PBCN raised concerns and questions regarding the potential impacts to country foods and harvesting activities, from potential spills. PBCN also wishes to be kept informed of any spills and be included in all spill contingency planning and responses.

8.1.2.2 Malfunction Transparency

ERFN raised issue with missing information on how malfunctions were evaluated, with limited discussion of food web dynamics for the aquatic section of the EIS. In addition, ERFN asserted that Denison must consider all worker safety risks and potential consequences associated with accidents and malfunctions and questioned how Denison will use IK in its monitoring and/or response to an accident or malfunction.

BNDN noted an interest in being consulted during permitting or remedial activities, as they relate to any accidents and malfunctions.

8.1.2.3 Denison's Accidents & Malfunctions Program (Emergency Management)

ERFN highlighted deficiencies in Denison's Accidents and Malfunctions program, emphasizing insufficient information provided during engagement sessions, a lack of contingency planning, and deferred responses to as-yet-undrafted documents.

Meanwhile, KML focused on waste and emergency management plans, advocating for community engagement to prevent dilution of access to essential services. KML seeks consultation and engagement strategies that resonate with community members' capacity to understand environmental incident management. KML also indicated their concern of vehicle accidents related to increased road use and how any accident/incident may further strain emergency services for the community.

MN-S expressed an interest in obtaining information on transportation accidents within the Emergency Preparedness and Response Program.

8.1.2.4 Perceived Risk

All engaged Indigenous Nations and communities on the proposed Project have indicated that potential contamination from accidents and malfunctions may impact traditional land users' perception of health and safety of plants and animals. These perceptions may lead to avoidance behaviours and impact their enjoyment of, and connection to the land.

8.1.2.5 Summary of Mitigations and Commitments related to Views Expressed

Spills

Denison has committed to mitigating potential adverse effects from spills and accidents at the Project through a number of commitments (Commitments 12-30, 12-31, 2-10, 2-19, 9-30, 12-20). Measures include developing contingency, emergency response, and spill prevention plans, managing hazardous substances safely, and ensuring secondary containment for chemicals.

Denison will develop specific plans to reduce the likelihood and severity of accidents and fires and may provide support and training to local emergency services. Further, Denison will develop an Emergency Response Plan for transporting hazardous goods and with regards to impacts on country foods and harvesting activities, mitigation measures include immediate cleanup of spills, limiting wildlife access, preventing runoff and groundwater penetration, and prohibiting storage or refueling within 100 m of waterbodies.

CNSC staff have confirmed through conversations with ERFN that many of their concerns have been addressed through engagement and technical discussions with Denison.

Malfunction Transparency, Accidents & Malfunctions Program and Emergency Management

Denison has committed to addressing emergency management concerns through the Emergency Preparedness and Response Program. Enhanced information sharing will address deficiencies highlighted by ERFN. Comprehensive contingency plans will outline actions for accidents or malfunctions. Robust waste and emergency management plans will meet high standards, including source elimination, operational planning, and follow-up monitoring. Community engagement strategies will ensure access to essential services and meaningful consultation.

Measures to mitigate increased road use and vehicle accidents include scheduling high-traffic activities outside peak hours and controlling sound exposure. Detailed transportation accident information will be included in the Emergency Preparedness and Response Program. Denison will develop an Environmental Management System (EMS) incorporating a comprehensive emergency management and monitoring plan in collaboration with ERFN and KML.

CNSC staff are satisfied with Denison's noise baseline studies to support increased traffic and noise, and potential impacts on wildlife behavior and traditional hunting activities.

8.1.3 CNSC Staff's Analysis

CNSC staff reviewed Denison's effect assessment of accidents and malfunctions and found that Denison conducted a comprehensive analysis of these effects and that identified mitigation and follow-up monitoring program measures are adequate. Potential accidents and malfunctions during construction, operation, and decommissioning of the project and their health, safety, and environmental effects were identified, characterized, and evaluated by Denison through a systematic approach. CNSC staff concurs with Denison's approach for accidents and malfunctions assessment, which includes hazard identification and analysis associated with construction, operation, and decommissioning of the project, screening of hazards, and assessments of bounding accidents and malfunctions. CNSC staff also concur with Denison's conclusion that the risk of the project associated with accidents and malfunctions is characterized as tolerable, taking into account the design features, the proposed mitigation measures, and the emergency response procedures.

8.1.4 CNSC Staff Findings and Recommendations

Taking into account the implementation of mitigation measures and emergency response procedures, and the views and concerns expressed by Indigenous Nations and communities, CNSC staff conclude that Denison's assessment of potential accidents and malfunctions associated with the Project are not likely to cause significant adverse effects on health, safety of workers and the public, and on the environment.

There are no issues requiring follow-up for this component area. CNSC staff will work with Denison to ensure Denison communicates spills, and other accidents and malfunctions to identified Indigenous Nations and communities on the Project and provide follow-up engagement activities as part of their Spill Management and Emergency Response Plan.

8.2 Effects of the environment on the project

Pursuant to section 19(1) (h) of CEAA 2012, the EA of a designated Project must take into account any change to the Project that may be caused by the environment, such as natural hazards and climate change. These factors may damage project components and increase the potential for accidents and malfunctions (section 8.1).

8.2.1 Proponent's Assessment

Denison carried out an assessment of potential adverse effects of environment on the Project. The assessment focuses on the effects of potentially significant natural hazards and climate change on the Project. Accidents and malfunctions, which are not caused by natural hazards, are assessed separately in section 8.1.

8.2.1.1 Assessment of Effects of Natural Hazards

Potential effects of natural hazards on the Project were identified and evaluated with following steps:

- identifying and describing the existing environmental conditions related to natural hazards that may affect the Project
- describing the implications that a natural hazard may have on the performance and environmental consequences of the Project
- selecting appropriate mitigation measures to address reasonable risks through the adaptive management process

As part of the EA process, Denison identified the following major environmental factors/conditions, project components which may be impacted, and the corresponding design features of the Project to mitigate any effects on the Project and where applicable, proposed mitigation measures, as presented in table 8.2 below.

Table 8.2 Potential effects of the environment on the Project

Environmental factor/condition	Project component or activity	Design features and where applicable, proposed mitigation measures
Seismic events	Mine and mill buildings, infrastructures, and equipment	The Project is located in a low seismic hazard zone of Canada. It is unlikely that a major seismic event would occur in the area of the Project. Denison will appropriately design all buildings and other mine and mill infrastructures to meet the standards of the National Building Code of Canada, which are expected to mitigate the potential of any risk from seismic events.
Forest Fires	Mine and mill buildings, infrastructures, equipment	Forest fires are likely in the project location. Denison will appropriately design facilities and operate the site in accordance with Fire Protection Program to be developed specific to the project. Denison will consider the projected increase of forest fire frequency and severity due to climate change. Denison will also have Emergency Response Program that will include information on how to prevent and suppress forest fires near the Project that include fire guards, on-site emergency response equipment and fire water system. This information has not yet been provided and will be reviewed during future phases of CNSC's regulatory processes, prior to licensing to operate. Denison's EPRP for the Project will provide detail and clarity regarding fire response plans for all fire related hazards.
Major precipitation events (e.g., severe rainstorms, snowmelts or flooding)	Mine buildings and site infrastructures (e.g., water management infrastructure)	Denison will design water management infrastructure to meet the requirements of ECCC's Environmental Code of Practice for Metal Mines. Denison will design site surface drainage system for the project to divert clean surface runoff away from developed Project Area and capture, collect, and divert contact water runoff to impound areas identified as site runoff ponds or collection areas. Denison will design wellfield runoff pond as well as process ponds and pads in the Project Area to accommodate PMP. Denison will select suitable equipment and design systems for the Project to enable operation during heavy precipitation events. Denison will have an Emergency Preparedness and Response PEPRP program for the Project that will include information on planning for and responding to severe weather events.

Environmental factor/condition	Project component or activity	Design features and where applicable, proposed mitigation measures
		Denison will monitor weather forecasts, make back-up power available through diesel generators as well as implement health and safety polices and training programs to cope with major precipitation events.
Drought	Site water supply and water management	Denison will select suitable equipment and design systems for the Project to enable operation during drought. Denison intends to recycle process water, thereby reducing the demand for a fresh water supply and water withdrawal during drought.
Extreme high air temperatures	Mine and mill buildings, equipment and machinery	Denison will select suitable equipment and design systems for the Project to enable operation under extreme high temperatures. Denison will have an EPRP for the Project that will include information on planning for and responding to severe weather events. Denison will monitor weather forecasts, make back-up power available through diesel generators as well as implement health and safety polices and training programs to cope with severe weather events.
Extreme low air temperatures	Mine and mill buildings, infrastructures, equipment and machinery	Denison will select suitable equipment and design systems for the Project to enable operation under extreme low temperatures. Denison will have an EPRP for the Project that will include information on planning for and responding to severe weather events. Denison will monitor weather forecasts, make back-up power available through diesel generators as well as implement health and safety polices and training programs to cope with severe weather events.
Extreme high winds	Mine and mill buildings, infrastructures, and equipment	Denison will select suitable equipment and design systems for the Project to enable operation under high wind events. Denison will have an EPRP for the Project that will include information on planning for and responding to severe weather events. Denison will monitor weather forecasts, make back-up power available through diesel generators as well as implement health and safety polices and training programs to cope with severe weather events.

In summary, Denison expects that potential effects of the environment on the project, particularly for seismic events, forest fires, and extreme weather events, including major precipitation events (e.g., severe rainstorms, snowmelts or flooding), drought, extreme temperatures and extreme high winds, can be addressed through engineering best practices and compliance with current regulations and building codes.

Denison will design site water management infrastructures for contact water (runoff generated from areas of the wellfield and processing plant) to convey and store 24-hour PMP extreme precipitation event with sufficient design freeboard. The design of non-contact water collection and conveyance system will be based on the 100-year 24hr event design criteria. There is a potential for forest fires to occur during the life of the Project due to its location, however, Denison is proposing design features and measures to mitigate the effects of forest fires should they occur.

Based on this assessment, adverse effect of these events on the project's components and activities is unlikely.

Assessment of Effects of Climate Change

Denison carried out an assessment of potential adverse effects of climate change on the Project. The assessment focused on the effects of climate related natural hazards on the Project with consideration of climate change.

The climate change assessment was conducted using climate change projection data based on an ensemble of 24 different Global Climate Models (GCMs) of Coupled Model Intercomparison Project Phase 5 (CMIP5) obtained from Climate Atlas of Canada. The climate model projections data comprises statistically downscaled simulated historical (1976-2005), near term (2021-2050) and far-term (2051-2081) time horizons at project location. Two emission scenarios, represented by representative concentration pathways (RCPs): RCP 4.5 (moderate emission) and RCP8.5 (high emission), that cover the expected 38 years life of the project were considered. The climate variables that are considered for assessment include precipitation (total, maximum one day and heavy), temperature (mean, maximum and minimum), the number of very hot and cold days and growing degree days and are selected inline with climate related natural hazards identified in table 8.2.

The assessment indicated that under RCP4.5 and RCP8.5 emission scenarios, mean and maximum annual temperatures are predicted to increase approximately 2°C by mid century, and 3°C to 5°C by 2080. The number of very hot days (>30°C) is expected to increase from one day per year (historical mean) to one to two weeks per year by 2080 whilst the number of very cold days is predicted to decrease due to predicted increase in minimum temperatures. The prediction indicated that total precipitation is not expected to change substantially over time and extreme rain events (1-day maximum rain events) are expected to show small increase (<5 mm) under both emission scenarios. The predicted temperature increases are expected to result in more growing days for forage and crops, but increased evaporation could cause water stress and potentially decreased productivity. Overall, climate model prediction indicate future climate conditions over the life of the Project will likely include warmer, snowier winters and longer, hotter summers under RCP4.5 and RCP8.5. With the regard to effects on the project, Denison deduced that it is not clear if the increased trend in total and extreme precipitation events will produce local climatic conditions that will affect the Project due to the uncertainty around projected precipitation. However, forest fire frequency, severity, and extent are expected to increase in in the Project Area due to the influence

of climate change on factors affecting fire occurrence, such as lightning, fuel moisture, temperature, precipitation, and vegetation.

Overall, based on the assessment of effects of climate change factors that will affect the project, Denison expected that potential effects will be addressed through consideration of the predicted changes in climate conditions that could occur during its lifecycle into the design features and mitigation measures identified in table 8.1and the project will be designed using engineering best practices and meeting current regulations and building codes. The design of site water management infrastructure for contact water using the PMP event as design criteria is expected to adequately consider uncertainty related to climate change and provides adequate provisions to manage any potential increase in extreme precipitation events. Denison will also incorporate additional climate change provisions into the 1:100-year design storm event in the design of non-contact water collection and conveyance system. Denison also will apply adaptive management that includes monitoring climate factors so that they can proactively mitigate or prevent adverse climate effects on the Project if unforeseen effects on the Project occur from longer and more severe forest fire seasons associated with climate change, or increased frequency or severity of extreme weather (e.g., ice storms, snowstorms, flooding). Based on this assessment, adverse effects from climate change on the project's components and activities are unlikely.

8.2.2 Other Views Expressed

8.2.2.1 Effects of the Environment

Indigenous Nations and Communities

ERFN raised concerns that habitats in and around the proposed Project Area may be permanently altered as a result of increasing wildfire, which interacts with the potential cumulative impacts resulting from climate change. ERFN noted that Denison should implement meaningful and realistic approaches to minimizing greenhouse gas emissions from its operation to reduce the proposed Project's impact on climate change. ERFN requests that Denison provide additional information on fire mitigation and suppression activities. ERFN also noted that permafrost was not adequately delineated within the proposed Project Area to determine climate change impacts on permafrost.

KML indicated they expected Denison to engage with the community to develop capacity for emergency response activities such as firefighting and that this was a priority for the community.

YNLR asserted that wildlife, such as predators, have been impacting the SK1 Caribou population due to its altering of available habitat. The cumulative impacts, including from wildfire in Northern Saskatchewan is, a concern of YNLR.

MN-S requested Denison provide information on how the Project will be designed to exceed current regulations with respect to flood and fire-proofing given changing climatic conditions in Northern Saskatchewan. Additionally, MN-S suggested that Denison should develop a Project-specific climate change model to account for changing environmental conditions, such as groundwater recharge rates, in the proposed Project Area as a result of climate change.

BNDN raised concerns about how Denison would evaluate cumulative effects from dust and poor air quality from wildfire. Specifically, BNDN community members were concerned with how Denison will implement adaptive management strategies to deal with air quality parameter

exceedances during wildfire events. BNDN also requested that Denison develop a greenhouse gas emissions/carbon offsetting plan to mitigate the Project's impact to climate change.

Federal Authorities

ECCC requested that Denison consider potential future climate-change related precipitation extremes in IDF calculations and demonstrate the resilience of the project. ECCC also requested that Denison clarify if climate change has been considered in the PMP values or discussed how potential increases in PMP have been considered in the Project design, as not considering climate change could result in inappropriate mitigation or follow-up programs that lead to residual effects on water quality and quantity.

8.2.2.2 Summary of Mitigations and Commitments related to Views Expressed

Denison has committed to reducing the Project footprint and Project Area to the extent practical, and developing within previously disturbed areas, to reduce habitat loss in the area. Denison has also conducted a cumulative effects assessment, which included the highway extension projects, on the atmosphere, acoustics, geology, groundwater, aquatic environment, terrestrial environment, human health, land and resource use, quality of life and economics. Throughout the process, Denison and ERFN worked together to resolve outstanding concerns, including those related to wildfires and wildlife habitat, and reached an agreement on these issues.

Denison has stated they support KML's vision for emergency response, where it makes sense and is possible, and will continue discussions. Denison has committed to prioritizing Indigenous and non-Indigenous communities within the LSA for employment and training opportunities. If employment opportunities cannot be filled by Indigenous and non-Indigenous communities' priority for employment and training will then focus on Indigenous and non-Indigenous residents of the RSA and then beyond.

Denison has shared information on the potential effects of wildfire in the study area and will develop an EPRP. The EPRP will address forest fires and extreme weather that may occur, and Denison developed an adaptive air quality management program and addresses the potential impact on human health in the EPRP, including dust and air quality.

Denison also committed to revisiting the estimates of the IDF curves as per CNSC's recommendations to consult *CSA PLUS 4013:19 (2019) Technical guide: Development, interpretation and use of rainfall intensity- duration-frequency (IDF) information: Guideline for Canadian water resources practitioners* regarding the consideration of future changes in short-duration precipitation extremes, as applicable, for the licensing phase. Specifically, Denison agrees to provide the requested information related to the IDF (1 in 100 year 24-hour rainfall) and demonstrate climate change resilience of the project. Denison suggests that a sensitivity analysis on water quality predictions for low and high precipitation scenarios, including the potential influences of climate change can be completed as part of licensing and as applicable to REGDOC-2.9.2.

8.2.3 CNSC Staff's Analysis

CNSC staff reviewed Denison's assessment of effects of the environment on the Project and found that Denison conducted a comprehensive analysis of these effects and that identified mitigation and follow-up monitoring program measures are adequate. CNSC staff confirm that Denison has identified all relevant natural hazards at the project site that include seismic events, forest fires and extreme weather events, described their potential impact on the project performance, and identified

appropriate design features and mitigation measures to address the potential effects. Denison's assessment also includes climate change considerations in design features and mitigation measures to account for effects of future modification of climate sensitive natural hazards.

8.2.3.1 Seismic Events

In the review of Denison's assessment, CNSC staff advanced 1 IR related to effects of seismic events on the Project and requested that Denison provide an assessment of seismic events on the mine-induced voids stability and the resulted effects on the mine operation and post decommissioning. Denison satisfactorily responded to the request. CNSC staff have found that Denison's proposed design features and mitigation measures are expected to mitigate the potential of any risk from seismic events and to be acceptable.

8.2.3.2 Forest Fires

CNSC staff reviewed Denison's assessment of effects of forest fires on the project that included consideration of climate change. CNSC staff confirmed that Denison conducted a sufficient assessment of forest fires at the project site and that the identified design features and mitigation measures are acceptable and will be adequately addressed through the CNSC's regulatory processes.

Provincially, under Section 20(1) of Province of Saskatchewan's *The Wildfire Act*, northern industrial and commercial operations must prepare and submit to the minister for consideration a wildfire prevention and preparedness plan. The province has indicated that there were no outstanding review comments related to this topic area and that they will review the facility's emergency response plan as part of permitting, under the *Environmental Management and Protection Act, 2010*.

As part of the CNSC's licensing process CNSC staff reviewed Denison's preliminary fire protection program and fire protection assessments. Once available, CNSC staff will review the updated fire protection assessments to verify that Denison has met all applicable regulatory requirements, including those outlined in CNSC regulatory documents and referenced codes and standards, as well as detailed fire protection design and construction documents.

Given the federal and provincial regulatory oversight related to fire protection, CNSC staff are satisfied with Denison's assessment of forest fires.

8.2.3.3 Extreme Weather Events

CNSC staff reviewed Denison's assessment of effects of extreme weather events on the project and confirmed that Denison conducted a sufficient assessment of the relevant extreme weather events at the project site and that identified design features and mitigation measures are adequate. Denison plans to design water management infrastructures based on the 100-year return period precipitation event and PMP extreme rainfall event that consider uncertainty related to climate change. These design criteria are acceptable to CNSC staff to ensure adequate capacity for surface drainage facilities (e.g., ditches and culverts) and water storage systems (e.g., process water and wellfield ponds) for managing surface runoff generated during extreme precipitation events expected during the lifetime of the project. In the review of the Denison's assessment, CNSC staff and other FIRT participants reviewed Denison's estimates of the 24-hour 100-year precipitation and PMP as well as Denison's approach to factoring climate change

into the estimates and reiterated the estimates to be updated or revisited during licensing phase, as the final estimates are required at detailed design stage of the project. Denison has committed to address this concern through additional analyses, as applicable (related to Commitment 8-50).

8.2.3.4 Climate Change

Denison's climate change assessment identified the relevant climate variables and used appropriate emission scenarios and assessment time scales based on current ensemble GCMs future predictions that take in to account the lifetime of the project. CNSC staff reviewed Denison's plan to consider the predicted changes in climate conditions that could occur during its lifecycle into the design features and mitigation measures and have found them to be acceptable to mitigate the potential effect of climate change. CNSC staff requested Denison to provide more information on likelihood and consequences of pertinent climate related hazards on the project components and activities by completing a climate risk and resilience assessment during licensing phase. Denison has committed to address this concern through additional assessment (commitment 8-50).

8.2.4 CNSC Staff Findings and Recommendations

CNSC staff are satisfied with Denison's assessment of Effects of the Environment on the Project related to natural hazards and climate change pertinent to the project and that the proposed design features, mitigation measures and response measures are appropriate to account for the potential effects of the environment on the Project.

The Project is not likely to cause significant adverse effects on health, safety of workers and the public, and on the environment taking into account the implementation of mitigation measures, design considerations, emergency preparedness and response program, and the views and concerns expressed by Indigenous Nations and communities.

There are no issues requiring follow-up for this component area.

8.3 Cumulative environmental effects

The proposed Project could cause cumulative effects, in combination with the environmental effects of past, existing and reasonably foreseeable projects or activities, on the following VCs (only includes the VCs where cumulative effects from the reasonably foreseeable developments (RFD) have been identified):

- air quality, noise and GHG emissions
- surface water quality
- soil and terrain
- vegetation and ecosystems
- terrestrial biota

Denison's cumulative effects assessment evaluated the contribution of effects from the Project in combination with previous, existing, and RFDs or activities in the region that may overlap spatially (i.e., in the same geographic area) and temporally (i.e., over time) (table 8.3). RFDs can be defined as activities in the region that have not yet been approved, developments and activities that are currently under application review, or that have officially entered a regulatory application process.

Denison's cumulative effects assessment considered all primary pathways that were likely to result in detectable changes in measurements indicators and subsequent residual effects on VCs after the implementation of environmental design features and mitigation.

Table 8.3 Past, existing, and future projects included in the cumulative effects assessment

Physical Activity	Description
Historical activities and past projects	
Various completed roads	Highway 914, as well as winter roads, mine access and haul roads, as well as exploration roads and trails
Existing and reasonably foreseeable future projects	
Cameco Key Lake Operation	Existing Mines and Mills
Cameco McArthur River Operation	
Cigar Lake Mine	
Highway 914 All Weather Road	Ministry of Highways and Infrastructure proposes to extend Highway 914 by approximately 51 km, between Cameco McArthur River Operation and Highway 905, to approximately 8 km southeast of the Cameco Cigar Lake mine site
Other Activities	Lodge and outfitter camps, campgrounds and recreational sites, ecological reserves, Indigenous land use activities

Denison also considered two other potential projects for this cumulative effects assessment: Cameco's Millennium Mine, a federal EA under the Canadian Environmental Assessment Act (1992), which was never completed; and, mining of the Wheeler River Gryphon deposit, which is still in prefeasibility stage. At the time of assessment, neither project was expected to be carried out in the reasonably foreseeable future. More detailed information on Denison's cumulative effects assessment methodology can be found in EIS section 5.9. Air quality, Noise and GHG emissions

8.3.1 Air Quality and Noise

8.3.1.1 Proponent's assessment of environmental effects and mitigation

The project site will be accessed from Highway 914. Highway 914 is approximately 3.4 km (direct) from the site, or approximately 5 km from a proposed access road. The cumulative effects assessment assumed that Cameco McArthur River Operation and Key Lake sites would be in Care and Maintenance mode, so there would be no truck traffic between the sites on Highway 914. During operations, however, road traffic will result in an incremental noise which may add to the cumulative effects at sensitive locations near the highway.

The average daily traffic between Key Lake and the project site is expected to increase by 23% during construction and 30% during operation. An air dispersion model and emissions from traffic associated with the project were considered. Cameco's operations were not included in model, but conservative regional background concentrations from the Saskatchewan Air Quality Modelling Guideline and the La Loche monitoring station were used for particulate matter, NO2, SO2, and CO. The La Loche monitoring station is located near anthropogenic sources, while the project is in a remote area removed from anthropogenic sources. Accordingly, emissions to air from traffic associated with Cameco's operations are captured by the regional background concentrations used in the air dispersion model and are considered in the assessment of Project-related effects.

Mitigation measures proposed by Denison are detailed in tables 6.2 and 6.3, and EA Follow-Up Program measures in section 6.1.2.4.

8.3.2 CNSC staff analysis and findings

CNSC staff reviewed Denison's cumulative effects assessment for air quality and noise. and confirmed that Denison conducted a comprehensive analysis of these effects and that identified mitigation and follow-up monitoring program measures are adequate. CNSC staff verified that Denison had identified applicable projects and activities that could cumulatively interact with the project effects. The analysis considered climate change impacts and emissions to air from project activities and traffic associated with Cameco's operations, which are captured by the regional background concentrations used in the air dispersion model.

CNSC staff agree with Denison's conclusions that the risk is low with no cumulative effects anticipated. In addition, CNSC is satisfied with Denison's cumulative effects assessment as it relates to how Denison considered and addressed concerns regarding cumulative effects raised by Indigenous Nations.

With respect to noise, CNSC staff reviewed Denison's cumulative effects assessment for noise and confirmed that Denison conducted a comprehensive assessment of these effects. Applicable reasonably foreseeable projects and activities that could cumulatively interact with the proposed Project have been assessed, including but not limited to climate change and noise from project works and traffic on Highway 914 associated with Cameco operations. These cumulative effects did not change the predicted noise levels when added on a logarithmic basis, and therefore do not change the assessment results based on Health Canada guidelines.

CNSC staff conclude that there are no anticipated cumulative effects to the atmospheric environment. The Project's follow up monitoring will verify these conclusions.

8.3.3 Surface Water Quality

8.3.3.1 Proponent's assessment of environmental effects and mitigation

Potential cumulative effects to the aquatic environment and the receptor VCs fish, fish habitat, and fish health are through the surface water and sediment quality exposure pathways during the operation and decommissioning phases. Therefore, cumulative effects were primarily assessed through effects to the intermediate VCs surface water quantity, quality and sediment quality

Project interactions to surface water quantity are expected to be highly localized to Whitefish Lake (LA-5) with no downstream effects. Denison assessed the potential for existing projects (Cigar Lake Mine, Key Lake Operation and McArthur River Operation) to interact with the

surface water quantity VC. Denison concluded these existing projects to be spatially outside of the LSA of the proposed Project, and therefore will not have any meaningful cumulative effect on surface water quantity. To assess the cumulative effects to the aquatic environment, the analysis considered surface water releases and the movement of contaminants to sediments from both the Project and the nearby Key Lake Operation throughout all phases of the Project. The assessment considered the potential interaction of the Project treated effluent releases with Cameco's existing water releases, which include treated effluent released into David Creek, treated groundwater, and diverted surface water into the McDonald Creek drainage.

There is the potential for spatial overlap with the Key Lake Operation, which is also located in a watershed that ultimately drains to Russel Lake (within the RSA). Discharges from Key Lake are received by the David Creek, McDonald Creek, and Outlet Creek drainages which join the Wheeler River and then flow into Russel Lake. There will also be some temporal overlap between the Key Lake Operation and the Project during the "future centuries" phase, which refers to the period after decommissioning, as outlined in the Key Lake Extension Project EIS (EIS, Cameco 2020). In this phase, there is potential for increased contaminant transport via groundwater to surface water, continuing up to 10,000 years after the operation ceases and the site is reclaimed.

However, impacts on the aquatic environment from the Key Lake Operation are expected to remain localized and will not extend into the Wheeler River system or Russell Lake. The changes in surface water quality due to the Key Lake Operation are not expected to overlap spatially with those from the Project, either during the operation, decommissioning or in the "future centuries" phases. As a result, Denison concluded no significant adverse residual cumulative effects to fish, fish habitat or fish health from changes in surface water quantity, quality, and sediment quality are anticipated. More detailed information can be found in EIS section 8.1.7, 8.2.7, 8.3.7, 8.4.7 and 8.5.7.

Mitigation measures proposed by Denison are detailed in tables 6.14, 6.19, 6.24, 7.5 and 7.10 and EA Follow-Up Program measures in table 6.15, 6.20, 6.25, 7.6 and 7.11.

8.3.4 CNSC staff analysis and findings

CNSC staff reviewed Denison's cumulative effects assessment for the surface water quantity and quality, sediment quality and benthic invertebrates, as well as fish, fish habitat and fish health. CNSC staff confirmed that Denison conducted a comprehensive analysis of these effects and that identified mitigation and follow-up monitoring program measures are adequate. CNSC staff verified that Denison had identified applicable projects and activities that could cumulatively interact with the Project effects. CNSC staff agree with Denison's conclusions that existing projects have no meaningful cumulative effect on surface water quantity. For the effects assessment of surface water quality, the analysis considered surface water releases and the movement of contaminants to sediments from both the Project and the nearby Key Lake operation across all phases of the Project.

CNSC staff agree with Denison's conclusions that the risk is low, as impacts on the aquatic environment from the Key Lake Operation are expected to remain localized and not extend into the Wheeler River system or Russell Lake. The changes in surface water quality due to the Key Lake Operation are not expected to overlap spatially with those from the Project, either during operation and decommissioning or in the "future centuries" phase.

CNSC staff conclude that there are no anticipated cumulative effects to the aquatic environment, including surface water quantity and quality, sediment quality and benthic invertebrates, fish, fish habitat or fish health. The Project's follow up monitoring will verify the effectiveness of mitigation measures.

8.3.5 Terrestrial Environment

8.3.5.1 Proponent's assessment of environmental effects and mitigation

Denison's cumulative effects assessment considered whether residual adverse effects will overlap spatially and/or temporally with the same residual adverse effects resulting from other past, present, and reasonably foreseeable projects or activities. Denison also considered that climate change can affect landscape patterns and could contribute to cumulative effects.

Soil and terrain

The assessment considered proposed and foreseeable seismic and geologic/mineral explorations, the completed Cree Lake winter access trail development, ongoing highway 914 road maintenance, recreation and harvesting activities, and traditional land use. Potential cumulative effects are associated with clearing of vegetation, stripping and salvaging of soil, and surficial earthworks, although Denison concludes that these are expected to be within the natural range of variation.

For soil and organic matter/peat, warmer seasonal temperatures and longer summers can change evapotranspiration and soil-moisture regimes, as well as cause an increase in fire disturbance. Possible consequences are more areas of exposed and unvegetated soil which increases erosion potential, as well as altered vegetation cover and decomposition rates which can result in the conversion of organic to mineral soils. Increased fire disturbance can also increase the potential for burning organic matter and peat and can alter the conditions for peat-forming processes. However, Denison stated that the Brunisolic soils and organic soils in the RSA are adapted to periodic fire disturbance and seasonal variations in temperature and precipitation. While isolated changes in soil mineralization and fertility patterns are possible, effects on soil and organic matter during the life of the Project are not expected to exceed the natural range of variability.

For terrain, warmer seasonal temperatures and longer summers can change the distribution of cryosolic soil and permafrost terrain, and their thawing may result in subsidence and other changes in surface drainage patterns, permanence, and soil moisture regime. Over time, these changes may indirectly affect landscape patterns and processes, including erosion potential and terrain stability. However, Denison noted that large areas of continuous cryosolic soil and permafrost terrain do not occur in the RSA, and therefore adverse effects on the Project Area are not expected.

Denison concluded that the cumulative effects for soil, terrain, and organic matter/peat are not significant. Additional mitigation measures were not considered necessary to avoid or minimize the predicted cumulative effects. More detailed information can be found in EIS section 9.1.7.

Mitigation measures proposed by Denison are detailed in table 6.20, and EA Follow-Up Program measures in table 6.21.

Vegetation and ecosystems

Denison stated that for vegetation and ecosystems, the effects of past and existing projects and activities are captured in the baseline conditions (i.e., existing disturbance), and thus, the focus is on cumulative effects as a result of ongoing and reasonably foreseeable future projects. The assessment considered infrastructure and maintenance activities (e.g., Cree Lake winter trail, highway 914, transmission line), mineral exploration and other resource use (e.g., line cutting, drilling, access development), Indigenous land use activities (e.g., harvesting), and recreational activities (e.g., lodges, tourism). Potential cumulative effects are associated with vegetation clearing, edge effects, the introduction and proliferation of invasive plants, dust and contaminant deposition.

With respect to climate change, Denison stated that the effects on vegetation are complex and are expected to affect vegetation species and communities differently, depending on their identity and resilience to anticipated change. Broadly, warmer and drier conditions can increase fire disturbance which can result in more regenerating seral stages of vegetation on the landscape. Longer, warmer summers and winters can alter the distribution and degree of insect pest infestations, while at the same time increasing vegetation growth rates. Yet, changes in precipitation and increased temperature can lead to more evapotranspiration that can reduce water availability, particularly in wetlands.

Denison stated that ecosystems within the Terrestrial RSA are common throughout the Boreal Shield Ecozone and expected to be resilient to disturbances and climate change due to their adaptation to disturbance, vast distribution, and genetic diversity. In fact, most of the vegetation in the Terrestrial RSA is comprised of post-fire regeneration. Most of the vegetation lost or altered within the Terrestrial RSA has the potential to regenerate over time after the source of the disturbance has ceased. Furthermore, accumulated COPC deposited on above-ground plant tissue or on soil is expected to be fully reversible over the long-term through natural attenuation processes.

Denison concluded that the cumulative effects for vegetation and ecosystems, listed plant species, and wetlands are not significant. Additional mitigation measures were not considered necessary to avoid or minimize the predicted cumulative effects. More detailed information can be found in EIS section 9.2.7.

Mitigation measures proposed by Denison are detailed in table 6.22, and EA Follow-Up Program measures in table 6.23.

8.3.5.2 CNSC staff analysis and findings

CNSC staff reviewed Denison's cumulative effects assessment for the terrestrial environment and confirmed that Denison conducted a comprehensive analysis of these effects. CNSC staff verified that Denison had identified applicable projects and activities that could cumulatively interact with the Project effects. It was noted that the Wheeler River (Gryphon) Project is located relatively close, within the Terrestrial RSA. However, Denison stated that the Gryphon deposit is an exploration phase property and is inherently captured as such in the cumulative effects assessment because the levels of disturbance from these activities to date are captured with the characterization of existing conditions. CNSC staff found this assumption reasonable for soil, vegetation and ecosystems. Moreover, CNSC staff deemed Denison's proposed mitigation,

monitoring, and follow-up measures as appropriate to address potential cumulative effects on soil, vegetation and ecosystems. Notably, these include monitoring of soil during salvaging and stockpiling, routine monitoring of vegetation and invasive plants throughout the life of the Project, pre-construction listed plant surveys, and progressive reclamation and revegetation.

CNSC staff conclude that there are no anticipated cumulative effects to the terrestrial environment. The Project's follow up monitoring will verify the effectiveness of mitigation measures.

8.3.6 Terrestrial Biota

8.3.6.1 Proponent's assessment of environmental effects and mitigation

Denison's cumulative effects assessment considered whether residual adverse effects will overlap spatially and/or temporally with the same residual adverse effects resulting from other past, present, and reasonably foreseeable projects or activities. These included infrastructure use and maintenance activities (e.g., old exploration roads and trails, Highway 914, and power transmission lines), exploration and mining activities (e.g., line cutting, drilling, and access development), Indigenous and other land use activities, and lodges, outfitters, tourist and recreational activities. Denison stated that additional mitigation measures were not considered necessary to avoid or minimize the predicted cumulative effects.

For the residual effect "alteration and/or loss of habitat", Denison stated that mining exploration and development are expected to be responsible for most of the ongoing and future habitat loss and alteration within the Terrestrial RSA. While the spatial and temporal extent of these activities is unknown, it is anticipated that all future exploration and development will be conducted in accordance with all applicable provincial and federal approval processes and will implement proven mitigation measures. Denison also stated that natural disturbances such as fires have the potential to affect habitat within the Terrestrial RSA, which could be worsened by climate change due to increased frequency, severity, and extent. The Terrestrial RSA is known to experience a largely natural fire regime that results in much of the vegetation being a result of post-fire regeneration. Available habitat is reasonably resilient to stress and to regenerate within a few years of a disturbance (e.g., vegetation clearing, forest fire). For example, Wolverine and Pine Marten populations can maintain viable populations in revegetating forest stands. Bird species at risk have been exposed to historic and ongoing anthropogenic and natural disturbances throughout their ranges, including within the Terrestrial RSA. Yet, for Woodland Caribou, disturbed forest habitats may not provide suitable habitat until 20 years after the disturbance ceases when terrestrial and arboreal lichen have re-established. For Woodland Caribou, it is also relevant to consider that in the SK1 Boreal Shield Conservation Unit range the total anthropogenic disturbance should not exceed 5% while maintaining a minimum of 40% undisturbed habitat in the range. Denison stated that currently, 3% of the range are affected by anthropogenic disturbances, and that the Project is estimated to add 0.001% disturbance at the SK1 scale, which remains below the 5% threshold. Most areas of cleared vegetation, as the result of the Project and other past, current, or reasonably foreseeable projects or activities, are anticipated to be reclaimed and/or revegetated and are expected to recover to a safe, stable, and self-sustaining condition. Denison's assessment concluded that the cumulative effect of alteration and/or loss of habitat is not expected to alter the integrity of habitat within the Terrestrial RSA to the point where it is not sustainable or available to contribute to ecological functions for the terrestrial biota. Denison concluded that residual effects are not significant.

For the residual effect “change in mortality”, Denison noted that approved projects and activities have the potential to result in a change in mortality through increased vehicle activity, ease of access, and human-wildlife interactions, among others. However, these projects and activities are expected to follow mitigation measures, best management practices, and applicable regulations and legislation that are effective at maintaining mortality within the range of natural variability and management guidelines. Denison’s assessment concluded that the cumulative effect of change in mortality is not expected to alter the integrity of the regional terrestrial biota populations to the point where they are not sustainable or available to contribute to ecological functions. Denison concluded that residual effects are not significant.

More detailed information can be found in EIS sections 9.3.7 and 9.4.7, and appendix 9-D, section 5.

Mitigation measures related to terrestrial biota are detailed in tables 7.15, 7.17, 7.19, 7.21 and 7.23 . EA Follow-Up Program measures are detailed in tables 7.16, 7.18, 7.20, 7.22, and 7.24.

8.3.6.2 CNSC staff analysis and findings

CNSC staff reviewed Denison’s cumulative effects assessment for terrestrial biota and confirmed that Denison conducted a comprehensive analysis of cumulative effects and that identified mitigation measures are adequate. This takes into account the assumption that future anthropogenic exploration and development will be conducted in accordance with all applicable provincial and federal approval processes and will follow best management practices and implement effective mitigation measures.

CNSC staff conclude that there are no anticipated cumulative effects to the terrestrial biota. The Project’s follow up monitoring will verify the effectiveness of mitigation measures.

8.3.6.3 Views expressed

8.3.6.4 Cumulative Effects on the Environment

MN-S noted to Denison that the final EIS must assess cumulative impacts to changes in vegetation and determine the potential impacts from contaminants of potential concern.

ERFN also raised concerns about decreasing wildlife numbers and increased access to the area, both of which have been incorporated into the cumulative effects assessment. Furthermore, ERFN expressed worry that forest fires, compounded by cumulative effects from industry and climate change, could permanently alter wildlife habitat.

ERFN has expressed concerns around cumulative effects through climate change and vulnerability of northern environments on permafrost.

YNLR shared concerns about the residual and cumulative effects assessments for all ecological VCs, which they consider a high priority. YNLR believe that adding this mine, with its associated disturbances, will cumulatively impact wildlife—especially Woodland Caribou — given the existing network of seismic cut lines throughout the landscape. YNLR firmly believes that the addition of this mine, along with its associated disturbances, will have adverse cumulative effects on wildlife, especially Woodland Caribou.

PBCN is concerned about the future development of Denison’s nearby Gryphon deposit, which Denison has identified as 1 of the 2 target deposits in the area and potential cumulative effects of the future mining of the deposit on the surrounding environment and the PBCN communities

located downstream of these projects. The cumulative effects assessment only provided a cursory reference to the Gryphon deposit and PBCN is concerned that assessment did not adequately evaluate the cumulative impacts of future phases of this project and of the neighbouring projects.

In discussions with CNSC staff, PBCN requested additional information on the following topics: whether Denison was required to collect baseline data; the Crown's assessment of cumulative effects related to animal density, migration, denning and other activities; as well as the requirement for wildlife surveys at regular intervals, so as to measure the impact of the construction and operation of the Project on wildlife.

Additional concerns related to terrestrial biota, along with staff's assessment of these topics, are included in more detail in section 7.2.4.1.

8.3.6.5 Cumulative effects on Indigenous Rights and Interests

ERFN has concerns that cumulative impacts of substantial and growing projects and mineral exploration activity will severely limit their ability to practice continued use of the region north of the Haultain River.

ERFN's Nuhtsiye-kwi Benéne has been subject to decades of uranium mining and other development. ERFN therefore views the cumulative and long-term impacts of uranium mining, other development, and other environmental changes in Nuhtsiye-kwi Benéne on the ERFN community as a key consideration in the Project and in future impact assessments in the region. One Elder from ERFN summed up his experience as follows:

> *"Well, basically we were in an isolated community before the roads came in, and so on and so forth, and basically, we had used the rivers and the lake systems for our transportation, and some of the areas that had been fly-in areas, where the people used to gather and hunt, and trap at the same time. In the last, I would say 30 to 40 years that has changed dramatically, in terms of the road access to these areas, roads being built because of corporations and because of development. As well, the areas where people used to hunt and trap, there is the construction of roads, the 914, that's Key Lake Road, that goes right across the Churchill River."*

KML are concerned that cumulative impacts of substantial and growing projects and mineral exploration activity will severely limit their ability to practice continued and use of the region north of the Haultain River.

KML discusses cumulative effects in region on land use by its citizens. YNLR expressed concern resulting from cumulative effects of all industrial developments which have left residents with shrinking usable area to exercise their Aboriginal and Treaty rights to hunt, fish, trap and gather.

KML has issues with cumulative impacts from historical legacy exploration, current exploration activities and current mining practices which have left land users with impacts and shrinking land base in which to practice their rights. Based on being the nearest community south of the uranium mining and having partnered with Cameo Corporation, KML noted they have a unique perspective on the cumulative effects of uranium mining (KML and Limnos Environmental 2022). Historical activities are an important consideration for the community, which noted:

> *"We have issues on cumulative impacts from historical legacy exploration and mining practices. Not specific to Denison, Cameco or Orano our land users have often found*

> *remnants of past poor exploration practices that are now affecting our continued land use. The abandoned camps and industrial waste left with no community known program for cleanup are the most significant of these remnants" (KML and NVP 2022).*

KML had also raised additional concerns regarding the Province of Saskatchewan proposing an expansion of HWY # 914, which could further exacerbate impacts.

MN-S raises cumulative effects in region on land use by its citizens and on ecosystem health.

YNLR discusses cumulative effects in the region on land use by its community members. YNLR raised concerns regarding cumulative effects of all industrial developments which have left residents with shrinking usable area to exercise their Aboriginal and Treaty rights to hunt, fish, trap and gather.

BNDN is concerned that the EIS does not take cumulative effects of Cameco's operations in Northern Saskatchewan into consideration when completing the atmospheric environment assessment. BNDN indicated they expect to be kept informed of future potential mining activities on the Project Area which Denison may be considering, including the Gryphon Property, as future activities on the property may also have impacts on BNDN's Treaty and Aboriginal Rights and interests.

8.3.6.6 Summary of Mitigations and Commitments related to Views Expressed

With respect to particular concerns, CNSC staff noted that ERFN expressed apprehensions regarding whether industrial activities could cumulatively contribute to landscape fragmentation. CNSC staff confirmed that industrial activities with the potential to reduce habitat connectivity were captured. Denison's assessment included infrastructure such as roads, trails, highway 914, and power transmission corridors, as well as considered exploration and mining activities that come along with line cutting and access development. CNSC staff concurred with Denison's description that all these activities can contribute to habitat loss and alteration due to sensory disturbances. CNSC staff verified that the assessment discussed Project-related habitat fragmentation and edge effects as sources of habitat alteration. Denison stated that past and ongoing anthropogenic development have altered the RSA resulting currently in 1.5% of habitat loss. While Denison's assessment did not specifically quantify the connectivity of isolated habitat patches, CNSC staff found Denison's conclusions that suitable habitat remains abundant in the RSA for all terrestrial biota to be well supported by the available habitat-based assessment data. Denison also mentioned that the Project is not expected to affect movement patterns across the landscape as it does not spatially overlap with known wildlife corridors, and therefore habitat connectivity is not expected to be affected. Additionally, CNSC staff acknowledged Denison's study of wildlife use of linear features (e.g., road, trail, cutline) that detected moose and woodland caribou using these features, among other species, providing supporting evidence for functional connectivity. Lastly, CNSC staff concurred with Denison's statement that during post-decommissioning, fragmentation and edge effects are expected to decrease over time as vegetation regeneration and tree growth create a gradual structural transition throughout disturbed areas and along forest edges. Therefore, CNSC staff concluded that Denison's cumulative effects assessment has appropriately considered landscape fragmentation for terrestrial biota.

CNSC staff also acknowledged ERFN's concern about interactive cumulative effects of forest fires and climate change with additional industrial activity. CNSC staff noted that Denison's cumulative effects assessment recognized that natural disturbances such as fires have the

potential to affect terrestrial habitat, and that the Project is located within the Boreal Shield Ecozone which experiences a largely natural fire regime that results in much of the vegetation within the RSA (70.6%) being comprised of post-fire regeneration. Denison also stated that additional forest fire disturbance is likely to occur in the future, and its frequency, severity, and extent are expected to increase with a changing climate. CNSC staff acknowledge that the interaction of forest fires and climate change can adversely affect terrestrial biota and their habitat. However, CNSC staff also note that the currently already highly fire-disturbed forest habitats provide habitat for several terrestrial biota including species at risk. Therefore, CNSC staff concluded that Denison's cumulative effects assessment has appropriately considered the interacting effects of forest fires and climate change.

As described in more detail above in sub-section 7.2.4.7, CNSC staff noted YNLR's concerns on the cumulative effects of extensive seismic cutlines on caribou. CNSC staff acknowledged that the cumulative effects assessment may not have included all seismic cutlines on the landscape but noted that the federal recovery strategy defines anthropogenically disturbed habitat as "anthropogenic disturbance visible on Landsat at a scale of 1:50,000, including habitat within a 500 m buffer of the anthropogenic disturbance." Not all linear disturbances, especially narrower lines, may be visible on Landsat imagery at a scale of 1:50,000. CNSC staff took into account that caribou do not seemingly avoid existing linear features, such as roads, trails, and transmission lines, and that legacy roads and trails are expected to be the primary candidate features for habitat offsets and restoration activities. CNSC staff also noted that the Project would be adding 0.001% of anthropogenic disturbance at the scale of the SK1. Therefore, CNSC staff concluded that Denison's cumulative effects assessment has appropriately considered the effects of cutlines on caribou. Yet, with relevance to the restoration and offsetting measures, CNSC staff proposed an EA Condition that requires Denison to meet the Government of Canada's Amended Recovery Strategy for Woodland Caribou (*Rangifer tarandus caribou*), Boreal Population, in Canada. CNSC staff are satisfied that EA3 in table 12.1 requiring Denison to meet the Government of Canada's Amended Recovery Strategy for Woodland Caribou (*Rangifer tarandus caribou*), Boreal Population, in Canada addresses concerns raised by Indigenous Nations related to cumulative effects to caribou habitat.

CNSC is satisfied with how Denison considered and addressed concerns raised by Indigenous Nations related to cumulative effects to the atmospheric, aquatic and terrestrial environment, as well as terrestrial biota.

9.0 Indigenous consultation and assessment of impacts to Indigenous and/or Treaty rights

The common law duty to consult with Indigenous Nations and communities applies when the Crown contemplates actions that may adversely affect potential or established Indigenous and/or Treaty rights. The CNSC, as an agent of the Crown recognizes the obligation to fulfill the duty to consult and where appropriate accommodate and ensures that it considers Indigenous peoples' potential or established Indigenous and/or treaty rights pursuant to section 35 of the *Constitution Act*, 1982 when it makes EA decisions under CEAA 2012 and licensing decisions under the NSCA.

This section of the EA report summarizes the Indigenous consultation and engagement activities conducted to date by CNSC staff and Denison to date. As noted earlier, the full details and

records related to consultation and engagement activities with Indigenous Nations and communities are contained in the Consultation Report, appended to the CMD as appendix C.

9.1 Asserted or Established Indigenous and/or Treaty Rights in the Project Area

The Project falls within the boundaries of Treaty 10 of 1906, which covers the northeast quadrant of Saskatchewan, and is bordered by Manitoba and the Northwest Territories to the east and north, while the south and west border extends to central Saskatchewan and Alberta. Treaty 10 (1906) includes the signatories of seven First Nations and contains a provision that establishes treaty rights to hunt, fish and trap throughout the Treaty territory. Signatories of Treaty 10 include: ERFN, Birch Narrows Dene Nation, Buffalo River Dene Nation, Hatchet Lake First Nation, Canoe Lake Cree First Nation, Barren Lands First Nation and Northlands First Nation.

No communities or settlements are located within the immediate proximity of the Wheeler River property. Travelling by existing roads, the closest community to the Project is 260 km away. Calculated using a straight line, the closest communities are approximately 150 km from the site. The federal lands within a 100 km radius of the Project Area are First Nation reserve lands which do not contain permanent residences and belong to ERFN.

This determination is a preliminary assessment that can be adjusted based on information received from Indigenous Nations and communities throughout the lifecycle of the Project, should it proceed.

9.2 CNSC Staff-led Consultation Activities with Indigenous Nations and Communities

To fulfill the CNSC's consultation obligations for a decision rendered under the NSCA and CEAA 2012 on the Project, CNSC staff sent early notification of the expected Wheeler River application to Indigenous Nations and communities and since have provided multiple opportunities for consultation, engagement and collaboration with Indigenous Nations and communities regarding their concerns and interests related to the Project. CNSC staff provided opportunities for dialogue through multiple phone calls, correspondence, and meetings with leadership and community representatives, as well as through the provision of funding and capacity support. CNSC staff have also encouraged and facilitated the participation of the identified Indigenous Nations and communities in the CNSC's EA process, as well as the Commission's public hearing process to advise the Commission of any concerns they may have and proposed resolution to those concerns. Additional information about the specific consultation and engagement activities with each Indigenous Nation and community can be found in section 4 of the Consultation Report.

9.2.1 EA Specific Consultation and Engagement Activities

CNSC staff provided a number of project specific opportunities for participation in the CEAA 2012 EA process, as described in *Public Participation in Environmental Assessment under the Canadian Environmental Assessment Act, 2012*.

These included:

- an opportunity to review and comment on the PD and inform the scoping decision
- an opportunity to review and comment on the draft EIS

- opportunity for participation in the FIRT
- review and inform the CNSC regarding Denison's responses to comments and concerns
- participation in technical discussions
- invitations for sharing of IK for inclusion and consideration in CNSC documentation
- collaboration on input into the EA report and subsequently, CNSC staff's Consultation Report
- the development and signing of Terms of Reference for consultation on the project and collaboration on the EA and regulatory review process for the Project
- discuss mitigation measures and commitments to address concerns raised including potential impacts on rights and interests

These opportunities are reflected in table 1.1, along with links to information on the Registry.

9.3 CNSC Staff Findings and Recommendations

CNSC staff have aimed to conduct a thorough consultation and regulatory process for the Denison Project. All identified Indigenous Nations and communities were provided with multiple opportunities to participate in the EA and regulatory review and consultation process and funding was offered to support their participation. Indigenous Nations and communities who have raised issues and concerns related to the Project were offered opportunities to collaboratively develop sections of the Consultation Report, this EA report and issues tracking tables contained within the Consultation Report.

CNSC staff will also continue to engage and collaborate with all identified and interested Indigenous Nations and communities to address and respond to any outstanding concerns with regards to the Project. CNSC staff will involve Denison in these discussions and consultation activities as appropriate.

CNSC staff's conclusions and recommendations with regards to consultation and potential impacts to Indigenous and/or Treaty Rights will be provided as part of CNSC staff's supplemental submission, prior to Part 2 of the hearing.

10.0 Public engagement and information disclosure

This section of the report is focused on CNSC staff's EA-specific communications and public engagement activities, as well as Denison's public engagement and information disclosure activities that reflect intended guidance of REGDOC 3.2.1 and 3.2.2. Details on all public engagement activities conducted by Denison and CNSC staff with respect to the Project are provided in section 4 and appendix C of staff's CMD.

Pursuant to section 24 of CEAA 2012, as responsible authority, the CNSC must ensure that the public is provided with an opportunity to participate in the EA of a designated project. For CNSC-led EAs, CEAA 2012 does not prescribe when and for which EA steps the opportunities are to be provided. The breadth and timing of public participation is at the discretion of the CNSC.

The CNSC provided 3 formal opportunities for the public, Indigenous Nations and communities, and government reviewers to participate in the EA process for the Project. Notices of these opportunities to participate were posted on the Registry, the CNSC's website, and sent out

directly via the Project distribution list, which included interested Indigenous Nations and communities and members of the public who requested Project updates. During these opportunities, comments were solicited on:

- the Wheeler River Project Description (May 31 to June 30 2019)
- the Wheeler River draft EIS (November 21 2022 to February 18 2023)
- the Wheeler River EA Report (this report, August 12 to October 24 2025)

In addition to the formal opportunities for participation, CNSC staff responded to inquiries (telephone calls and e-mails) as they were received, throughout the duration of the EA process. CNSC staff also maintained the project Registry, posting regular project updates and bulletins, all relevant documentation as it was received, and sent these updates via email to the distribution list.

This EA report includes the CNSC's findings and recommendations and, as demonstrated in previous sections of the report, was informed by comments received from the public, Indigenous Nations and communities, and government reviewers.

10.1 Denison-led public participation activities

From 2016 to 2025, Denison held several public information sessions and site tours across Northern Saskatchewan. Denison also organized other forms of Wheeler River Project-specific engagement and outreach activities, including but not limited to:

- posting and publishing of information, including key milestone events and engagement activities, on a Project-specific website
- posting of project-related information through its social media accounts on X, Facebook, LinkedIn, and Instagram
- technical workshops/information sessions for interested communities
- site visits to the Wheeler River Project site
- open houses and public events
- virtual meetings (TEAMS, Zoom) in 2020-2021 due to COVID-19 pandemic
- in-person leadership meetings with elected officials, including mayors and councillors
- emails and letters to communities and interested parties, including notifications of the draft EIS submissions and responses to questions submitted

Denison developed project materials and Executive Summaries of the Draft EIS in additional languages, including Cree, and Dene. In addition, interviews and meetings were conducted with regional businesses, municipalities, and other interested parties. Denison also completed public outreach and communications using radio stations, digital and social media, local print media, community newsletters and by mail, to reach a variety of audiences.

10.2 CNSC attended public participation activities

The NSCA mandates the CNSC to disseminate objective scientific, technical and regulatory information to the public concerning its activities and the activities it regulates. CNSC staff fulfilled this mandate to the public in a variety of ways, including in-person outreach events and open houses, virtual webinars, Project specific update emails and bulletins, social media, and funding opportunities throughout the regulatory process. In-person engagement for the Project was often conducted in collaboration with Denison and the Province of Saskatchewan, specifically Saskatchewan Ministry of Environment (SME), and SKEAB, who also have key

oversight roles and provide interested parties with information relevant to provincial regulatory approvals related to uranium mining and milling.

10.2.1 Open houses and outreach events

Over the regulatory review process, CNSC staff participated in 2 public outreach and open house events in Northern Saskatchewan with Denison and the province of Saskatchewan on the Project. Travel restrictions resulting from the COVID-19 pandemic prevented CNSC staff from completing in-person outreach events in 2020 and 2021. The community outreach events took place on May 29 to June 1 of 2022 and October 23 to 25 of 2023.

The main topics raised to CNSC staff by attendees at these open house events were:

- positive economic opportunities associated with the Project for the broader region
- concerns that certain communities may have more opportunity for jobs and economic benefits than others in the region
- safety concerns with respect to increased truck traffic on the roads and opportunities for improvements to roads across the north
- questions around transportation routes and concerns around potential spills, accidents and malfunctions
- requests for more information about existing ISR mining facilities around the world and how they compare to the proposed Project
- concerns around surface water and groundwater contamination due to the Project
- concerns for the protection of the environment, including water, fish, and wildlife
- request for additional environmental monitoring in the local area by communities
- concerns around freeze wall and the decommissioning of reclamation for the project
- questions on job and training opportunities for young people in the north
- questions regarding whether public concerns will be taken into consideration when the Commission is making a decision on this project

CNSC staff also participated in a number of other in-person relationship building events with Indigenous Nations and communities and the public across Northern Saskatchewan, including 2 culture camps and 3 Elders gatherings from 2022 to 2025.

Updates to the NSEQC

In addition to open houses and outreach events, the Northern Saskatchewan Environmental Quality Committee (NSEQC) was identified as potentially having an interest in the Project. The NSEQC has representatives from the majority of the northern municipalities and First Nation communities located in the NAD. CNSC staff participated in 5 NSEQC meetings that took place from 2022-2025 to provide updates to the NSEQC on the Project.

The main concerns discussed and raised by NSEQC members at the events included the following:

- specific questions on ISR mining and how safe it is in relation to other mining methods
- opportunities for northern communities and businesses to be involved
- concerns with respect to downstream effects on water and fish and communities
- questions on other mines in the region and cumulative effects due to exploration

Webinars

CNSC staff also hosted 1 webinar for the Project on September 13, 2023. This webinar provided an overview of CNSC's regulatory review process for licensing and EA, provided an update on the Project, provided information on how to get involved in the process and allowed time for questions from attendees. In total 51 people participated in the first webinar. The webinar was also recorded, for those who were unable to attend.

Questions and concerns discussed and raised by members of the public at this webinar included the following:

- general timelines of upcoming public review periods, including the draft EIS and final EIS documents and Commission hearings
- CNSC integrated regulatory approach for EA and licensing
- what determines whether a nuclear project assessment is conducted under CEAA 2012 or IAAC legislation
- harmonization of the provincial and federal EAs

10.2.2 Email Updates

CNSC staff provided regular updates to all who participated and/or expressed an interest in the regulatory review process for the proposed Project. Email updates were sent at each stage of the process, with links to additional information posted to the project Registry and the CNSC website. Project bulletins were sent in the spring (April) and winter (December) of 2023 and summer (August) of 2024, which included Project updates, major milestones, details on next steps of the process, as well as information on how to stay informed and contact information for CNSC staff. Another Project Bulletin is planned for summer of 2025.

10.2.3 CNSC Participant Funding Program

CNSC staff encourage the public to participate in the CNSC's regulatory process and Commission hearings. The CNSC offered assistance to interested members of the public, Indigenous Nations and communities, and other interested parties, through the CNSC's Participant Funding Program (PFP), to review and participate in the CNSC's regulatory process for the Project. The CNSC supported 3 separate participation opportunities in the EA through its PFP.

On January of 2022, the CNSC announced it was offering up to $250,000 under its PFP to assist participation of members of the public, Indigenous Nations and communities, and other interested parties in the in the review of Denison's draft EIS. A total of $404,723 was awarded for this phase of funding to the following 7 recipients:

- Birch Narrows Dene Nation
- English River First Nation
- Ya'thi Néné Land and Resource Office
- Peter Ballantyne Cree Nation
- Métis Nation-Saskatchewan
- Kineepik Metis Local #9
- Prince Albert Grand Council

In January of 2023, CNSC announced it was awarding $88,780 to ERFN to support its participation in the FIRT for the Project and its continued participation in the EA process.

In February of 2025, the CNSC announced it was offering up to $250,000 under PFP to assist to assist participation of members of the public, Indigenous Nations and communities, and other interested parties in the remaining steps of the EA process, licence application review and Commission hearing. Based on recommendations from the Funding Review Committee, the CNSC awarded a total of $548,350 for the second phase to the following recipients:

- Birch Narrows Dene Nation
- English River First Nation
- Ya'thi Néné Land and Resource Office
- Peter Ballantyne Cree Nation
- Métis Nation-Saskatchewan
- Kineepik Metis Local #9
- Lac La Ronge Indian Band
- Saskatchewan Environmental Society
- Nuclear Transparency Project
- Mining Watch Canada

11.0 Monitoring and Follow-up Programs

The purpose of the monitoring and follow-up programs are to verify the accuracy of predictions in the EA, determine the efficacy of the mitigation measures in place to reduce adverse environmental impacts from the Project, ensure regulatory compliance, and communicate findings with Indigenous Nations and communities, government organizations, and other interested parties.

Denison has provided high level information regarding their proposed monitoring and follow-up program details in the EIS, which was reviewed by the FIRT and refined in response to IRs. The information Denison has shared regarding proposed monitoring and follow-up programs are conceptual, and detailed programs will be developed as the Project designs are finalized and the licensing process advances.

Denison will be expected to provide finalized EA follow-up program details once a licence is granted. This information should be consistent with the information provided in the EIS and supplementary documentation (including proposed mitigation plans, commitments, etc.). Denison's monitoring and follow-up programs will be integrated into the Environmental Management System (EMS) framework, and carried out by the programs, plans, and procedures within the EMS throughout all phases of the project (construction, operation, decommissioning, post-decommissioning). Conceptual monitoring and follow-up programs have been developed for the following valued components and their respective sections of the EIS:

1. Air quality and noise (section 6 Atmospheric and Acoustic Environment)
2. Geology and groundwater (section 7 Geology and Groundwater)
3. Surface water quantity, surface water quality, fish and fish habitat, sediment quality and benthic invertebrates, fish health (section 8 Aquatic Environment)
4. Terrain, soil, organic matter/peat, vegetation and ecosystems, listed plant species, wetlands, ungulates, furbearers, woodland caribou, raptors, migratory breeding birds, bird species at risk (section 9 Terrestrial Environment)
5. Human health and worker health and safety (section 10 Human Health)
6. Indigenous land and resource use, other land and resource use, heritage resources (section 11 Land and Resource Use)

7. Cultural expression, community well-being, infrastructure and service (section 12 Quality of Life)
8. Economy (section 12 Economics)

A summary of all conceptual monitoring and follow-up programs can also be found in appendix 16-C of the EIS.

From an information management perspective, Denison has committed to ensuring data is stored securely in a database for analysis, and reporting on and submitting results to regulatory agencies. A process for sharing monitoring and follow-up program data will be developed to provide timely and transparent sharing of information with government departments, Indigenous Nations and communities, and interested parties.

Denison has committed to conducting monitoring and follow-up programs using an adaptive management approach, so that monitoring results inform the continued mitigation and monitoring of the Project. Denison has also committed to proactive engagement with interested parties and Indigenous Nations and communities on the monitoring and follow-up programs. This includes developing a protocol for sharing of information with the expectation that information collected will be integrated into the adaptive management process. Denison has also conducted outreach and information sharing with Indigenous Nations and communities to explain how the outcomes of the EA process will be monitored and reported on during the licensing and oversight process and will influence environmental monitoring.

As the monitoring and follow-up programs are currently conceptual, Denison has assumed responsibility for the execution of all proposed activities, including funding. However, as the programs become finalized there will be more defined roles and responsibilities for regulatory agencies and Indigenous Nations and communities in the design, implementation, and evaluation of these programs.

In accordance with the LCH, Denison will report to CNSC staff on environmental monitoring, including requirements in the monitoring and follow-up programs, each quarter, as well as an annual compliance report by March 31 of each year, covering the monitoring data for the 12-month period from January 1 to December 31 of the previous year. CNSC staff review these reports to verify compliance with regulatory requirements set in the regulations and their licensing basis.

CNSC staff will review the detailed follow-up and monitoring plans as they are developed, to ensure consistency with the commitments and predictions provided throughout the EA process, and to ensure that measures are in place to prevent any potential adverse environmental effects from the Project.

12.0 CNSC staff findings and recommendations

In preparing this report, CNSC staff took into account Denison's EIS, its responses to IRs and comments, and the views of government agencies, Indigenous Nations and communities, and the public.

The environmental effects of the Wheeler River Project and their significance have been determined using assessment methods and analytical tools that reflect current accepted practices of environmental and socio-economic assessment practitioners, including consideration of potential accidents and malfunctions and the potential for cumulative effects and IK/MK shared.

CNSC staff assessed the likelihood of the Project to cause significant adverse environmental effects, following the application of mitigation measures, in accordance with the CNSC Generic Guidelines, CNSC REGDOC-2.9.1, and the Impact Assessment Agency's (formerly the Canadian Environmental Assessment Agency) *Operational Policy Statement: Determining Whether a Designated Project is Likely to Cause Significant Adverse Environmental Effects under CEAA 2012*. CNSC staff's findings regarding significant adverse effects are contingent on the establishment of the EA Conditions listed in table 12.1.

CNSC staff recommend that:

- the Commission conclude that, taking into account the implementation of proposed mitigation and follow-up monitoring program measures, the Project is not likely to cause significant adverse environmental effects as defined by CEAA 2012. CNSC staff also recommend that:
    - the Commission's decision should be based on the description of effects under subsections 5(1) and 5(2) of CEAA 2012, as well as the scope of factors defined in paragraphs 19(1) (a) to (h) of CEAA 2012, as determined in the Commission's decision on the scope of the EA for Wheeler River of March 8, 2017
    - the 5 EA Conditions listed in table 12.1 below and described in sections 6 and 7, along with Denison's commitments, as identified and included in the document titled "Denison Mines Corp. Commitments Register (Version 5, December 2024)" become enforceable conditions that are set out in the licence and in the Commission's decision.

Table 12.1: List of proposed EA Conditions

EA Condition Numbers	EA report chapter	EA Condition
EA1 Licence Conditions Handbook (LCH) section G.5 and related appendix D.1	Environmental Protection, Geology and Groundwater (see section 6.2 of the EA report)	The licensee shall conduct further characterization and assessment of geological and hydrogeological conditions and update the groundwater flow and contaminant transport models and the EA follow-up monitoring programs and mitigation measures as necessary.
EA2 LCH section G.5 and related appendix D.1	Environmental Protection, Aquatic Environment (see section 6.3)	1. The licensee shall collect additional baseline water and sediment quality data to supplement existing baseline characterization data. 2. The licensee shall update the ERA and near-field water quality modelling with the additional baseline data collected. 3. The licensee shall review the option of calculating site-specific sediment coefficients (i.e. Kd values) for use in future licensing phase ERAs.
EA3	Environmental Protection,	The licensee shall submit a woodland caribou mitigation and offset plan based on site-specific information to evaluate effects to woodland caribou and includes a plan for habitat offsetting.

EA Condition Numbers	EA report chapter	EA Condition
LCH section G.5 and related appendix D.1	Terrestrial Biota (see section 7.2)	The plan must ensure that measures are taken to avoid or lessen any adverse effects to woodland caribou and monitor those effects. The plan shall be consistent with the Government of Canada's Amended Recovery Strategy for Woodland Caribou (*Rangifer tarandus caribou*), Boreal Population, in Canada.
EA4 LCH section G.5 and related appendix D.1	Environmental Protection, Terrestrial Biota (see section 7.2)	The licensee shall conduct additional bat baseline surveys to supplement existing baseline characterization data in order to obtain a basic understanding of within-year and between-year variation for bat species, and to inform the environmental risk assessment.
EA5 LCH section G.5 and related appendix D.1	Environmental Protection, Terrestrial Biota (see section 7.2)	The licensee shall submit plans for the monitoring of adverse effects of the project on listed wildlife species and their critical habitat over the lifecycle of the project.

Further licence conditions can be found in section 1.2.3 of the CMD and section G (General) of the licence and the associated LCH.

CNSC staff are proposing a Licence Condition for Indigenous engagement which includes requirements for Denison to report annually on their engagement activities and progress on implementing their commitments to Indigenous Nations and communities. The proposed Licence Condition includes EA follow up actions that address issues and concerns raised by Indigenous Nations related to their practice of Aboriginal and treaty rights as outlined in section 35 of the *Constitution Act*, 1982.

For commitments specific to Indigenous Nations and communities, additional information can be found in the LCH and Consultation Report.

Appendix A. Environmental effects rating criteria

Table A.1 - General Assessment criteria for significance determination

Effect criteria rating definitions			
Residual adverse effect criteria	**Low**	**Moderate**	**High**
Magnitude* severity of the adverse effect*	VC-Specific	VC-Specific	VC-Specific
Geographic extent spatial reach of the adverse effect	Site-specific Within the Project Study Area	Local Within the LSA	Regional Within the Regional Study Area
Duration length of time a VC would be affected by the adverse effect	Short-term/Temporary Effects that occur within the construction phase OR that occur within one generation or recovery cycle of the environmental component CULR**: Effect lasts less than one complete seasonal round (<1 year)	Medium-term Effects that extend through the operation and decommissioning phases (from 2 to 50 years) OR that extend to one or 2 generations or recovery cycles of the environmental component CULR**: Effect lasts less than one generation of land users (< 25 years)	Long-term Effects that extend into abandonment and beyond (>300 years) OR that extend for 2 or more generations or recovery cycles of the environmental component CULR**: Effects last for more than one generation of land users (> 25 years)
Frequency rate of recurrence of the adverse effect	Once Occurs once during any phase of the Project	Intermittent Occurs occasionally or at intermittent intervals during any phase of the Project	Continuous Occurs continuously during any phase of the Project
Reversibility degree to which the environmental conditions can recover after the adverse effect occurs	Reversible Reversible within the lifetime of the Project, or after project decommissioning and reclamation	Partially Reversible Partially reversible within the lifetime of the Project or after project decommissioning and reclamation	Irreversible Persists after project decommissioning and reclamation
Timing*** consideration for the time of year that a project activity is undertaken	Inconsequential Timing of predicted project activities is not expected to affect sensitive activities	Moderate Timing of predicted project activities may affect some sensitive activities	Unfavorable Timing of predicted project activities will affect some sensitive activities

*Magnitude effects rating definitions are VC-specific. The list of VCs and the definitions of the effects ratings for each are to be determined on a Project-specific basis.

**CULR = Current Use of Lands and Resources for traditional purposes

*** Timing is a VC-specific consideration, applied to fish and fish habitat, where disturbance may occur during sensitive life stages, and for the current use of lands and resources for traditional purposes, which may be affected seasonally by changes to the environment.

Table A.2 - Description of magnitude ratings for CNSC-identified VCs specific to Wheeler River Project

VC	Magnitude Ratings		
	Low	**Moderate**	**High**
Fish and fish habitat	Little to no effect on fish health or fish populations in the receiving environment	Measurable effect on fish health or fish populations in receiving environment, but one which would not likely result in changes to the regional status of fish populations and health	Measurable effect on fish health or fish populations in the receiving environment which could result in changes to the regional status of fish populations and health
Migratory birds	Little or no effects on migratory birds or unique migratory bird habitats	Detectable change on many individual migratory birds or unique migratory bird habitats, but one which would not likely change the status of the regional populations or availability of unique habitats	Detectable change on the majority of migratory birds or unique migratory bird habitats which would result in changes to the status of regional populations or availability of unique habitats
Indigenous uses: Current use of land and resources for traditional purposes	The effect results in a change to locations or resources, experience, or use of locations or resources for traditional purposes, but the activity and use by an Indigenous Nation or community could be practiced in the same or similar manner as before	The effect results in a change to locations or resources, experience, or use of locations or resources for traditional purposes, and preferred locations or means to practice the activity and use by an Indigenous Nation or community may be modified or limited	The effect results in a change to locations or resources, experience, or use of locations or resources for traditional purposes, and the activity can no longer be carried out by an Indigenous Nation or community in its preferred manner and locations
Human health (including Indigenous peoples health)	The effect results in a change in health status, but the change would be negligible or low and exposure	The effect results in a change in health status, with exposures below but nearing health-based standards	The effect results in a change in health status, with exposures above health-based standards

VC	Magnitude Ratings		
	Low	**Moderate**	**High**
	does not approach health-based standards		
Transboundary environmental effects: GHG **emissions**	Emissions are detectable but within normal variability of baseline	Emissions would cause an increase relative to baseline but are within regulatory limits and objectives	Emissions would singly or as a substantial contribution in combination with other sources cause exceedances of objectives or standards beyond the Project boundaries

Appendix B. Significance Determination Tables

Table B-1 Summary of significance determination for predicted residual adverse effects from Wheeler River Project

Predicted degree of residual effect							
Residual adverse effect	**Magnitude**	**Geographical extent**	**Duration**	**Frequency**	**Reversibility**	**Timing**	**Significance of residual effect**
Valued component – Fish and fish habitat							
Change in Aquatic Habitat	**Low** The change in available benthic invertebrate habitat by the overprinting of substrates in LA-5 constitutes less than 0.05% of the surface area of the waterbody.	**Low** Local The effects are expected to be limited to the LSA, specifically a small portion of LA-5.	**Moderate** Medium-term The effects are expected to last between 3 to 38 years (i.e., effects expected during construction through to the end of post-decommissioning).	**High** Continuous This is considered as a continuous effect.	**Fully Reversible** Following decommissioning and removal of the pipeline and diffuser, the available habitat will be restored to natural conditions due to lake currents and sediment transport dynamics.	**Unfavourable** As overprinting of habitat is considered continuous through all Project phases, timing of project activities could affect some sensitive life stages and biological processes (i.e. breeding seasons) of aquatic receptors.	**Not Significant** The Benthic Invertebrates and Fish and Fish Habitat VCs have a high resiliency with respect to physical disturbance in the context of a small, localized area being altered or disturbed. It is not expected that the ecological integrity of the areas adjacent to the infrastructure will be affected and, as such, will provide for sources of re-distribution and recolonization

Predicted degree of residual effect							
Residual adverse effect	**Magnitude**	**Geographical extent**	**Duration**	**Frequency**	**Reversibility**	**Timing**	**Significance of residual effect**
							following post-decommissioning.
Change in flows or water levels	**Low** Under all scenarios, the Project-related change in hydrology (flows or levels) compared to baseline conditions, is less than 5% of baseline conditions, and generally less than 3%.	**Moderate** Local The effects are expected to be limited to the LSA, specifically the lakes within close proximity to the Project site (i.e., LA-5, LA-6, and LA-1)	**Moderate** Medium-term The effects are expected to last between 3 to 38 years (i.e., effects expected during construction through to the end of post-decommissioning).	**High** Continuous Although the mine is unlikely to require water taking on a continuous basis, this has been assessed as a bounding scenario and, as such, must be considered as a continuous effect.	**Fully Reversible** Surface water hydrology is expected to return to pre-development levels following post-decommissioning.	**Unfavourable** As water intake is considered continuous through all Project phases, timing of project activities could affect some sensitive life stages and biological processes (i.e. breeding seasons) of aquatic receptors.	**Not Significant** Surface water flow regimes are variable, and it is this variability that provides for morphological form to be maintained and for ecological reliance (i.e., benthic invertebrate and fish habitat, movement, and life-cycle success). Some change to environmental flows is tolerated by benthic invertebrate communities and fish populations.
Change in surface water quality	**Moderate** The magnitude of the residual effect is predicted to be low to moderate overall. All	**Moderate** Local The geographic extent of the residual effect is predicted to occur in	**Moderate** Medium-term The residual effect is expected to last between 3 to 38 years	**High** Continuously For the purposes of this EIS, a conservative scenario	**Fully Reversible** Surface water quality is expected to return to pre-development levels following post-	**Unfavourable** For the purposes of this EIS and identifying the conservative	**Not significant** Benthic invertebrate and fish health are expected to be resilient to changes

Predicted degree of residual effect							
Residual adverse effect	**Magnitude**	**Geographical extent**	**Duration**	**Frequency**	**Reversibility**	**Timing**	**Significance of residual effect**
	constituents in effluent with the exception of copper are expected to remain below criteria for the protection of aquatic life and human health. Copper exceeds the FEQG guidelines and has minor exceedances of HQ benchmarks (HQ >1) for predatory fish in Whitefish Lake South (LA-5) and benthic invertebrates in all waterbodies. These exceedances are minor and unlikely to cause population level effects, and receptors are predicted to be resilient to site changes over time.	Whitefish Lake South (LA-5) with low possibility of some downstream effects for copper.	(i.e., effect expected during construction through to the end of post-decommissioning).	was identified, with effluent discharge being considered as continuous during operation and decommissioning.	decommissioning as Project-related sources will cease to operate.	scenario, effluent discharge is expected to be continuous through all Project phases, therefore timing of project activities could affect some sensitive life stages and biological processes (i.e. breeding seasons) of aquatic receptors.	in surface water quality in the context of this assessment, as COPC meet protective criteria even at the extreme low water scenario. Therefore, under applicable mitigative measures and average flow conditions, the contextual resilience of the aquatic system to respond to change is considered to be great.
Changes in sediment quality	**Low** The magnitude of the residual effects associated with the Project are expected to be low as constituents that may be introduced as part of Project activities are anticipated to remain	**Low** Local The geographic extent of the residual effects is predicted to be local as effects are anticipated to be confined to the immediate waterbody adjacent to the Project	**Moderate** Medium-term Effects are expected to last between 3 to 38 years (i.e., effects expected during construction through	**High** Continuous For the purposes of this EIS and identifying the conservative scenario, effluent discharge has been considered as	**Fully Reversible** Sediment quality is expected to return to pre-development levels following post-decommissioning as Project-related sources will cease to operate.	**Unfavourable** For the purposes of this EIS and identifying the conservative scenario, effluent discharge is expected to be continuous through	**Not Significant** COPC meet protective criteria under the bounding scenario, therefore under applicable mitigative measures the resilience of the aquatic system to

Predicted degree of residual effect							
Residual adverse effect	**Magnitude**	**Geographical extent**	**Duration**	**Frequency**	**Reversibility**	**Timing**	**Significance of residual effect**
	below criteria for the protection of aquatic life, or below risk HQs.	(Whitefish Lake) and the estimated mixing zone is less than 5 m, facilitating an effluent discharge configuration that promotes mixing.	to the end of post-decommissioning).	continuous during operation and decommissioning.		all Project phases, therefore timing of project activities could affect some sensitive life stages and biological processes (i.e. breeding seasons) of aquatic receptors.	respond to change is considered to be great.
Sediment Quantity and Physical Quality (Particle Size)	**Low** Using design-based mitigation through water balance and best practices or erosion and sediment control planning, the potential for an increase of suspended solids to the natural environment is predicted to be low.	**Moderate** Local The effects are expected to be limited to the waterbodies (LA-5) and stream crossings associated with the Project Area and the discharge location at LA-5, which is in the LSA.	**Moderate** Medium-term The effects are expected to last for the duration of the Project through to post-decommissioning.	**Moderate** Continuous Although mobilization of suspended materials will occur at the greatest magnitude during construction, a much smaller continuous source is considered as part of effluent discharge to LA-5.	**Fully Reversible** Following cessation of discharge to the natural environment and reclamation of the site during post-decommissioning, the potential for mobilization of suspended materials to the natural environment is expected to stop and the natural processes associated with sediment mobilization and deposition are then expected to characterize the benthic environment within the LSA.	**Unfavourable** As mobilization of suspended materials is expected to be continuous through all Project phases, timing of project activities could affect some sensitive life stages and biological processes (i.e. breeding seasons) of aquatic receptors.	**Not Significant** There is a low probability of the residual effect following proper implementation of the erosion and sediment control plan and design-based water management and water treatment prior to discharge to the environment.

Predicted degree of residual effect							
Residual adverse effect	**Magnitude**	**Geographical extent**	**Duration**	**Frequency**	**Reversibility**	**Timing**	**Significance of residual effect**
Changes in concentrations of constituents in fish tissues	**Low** The magnitude of the residual effects associated with the Project is predicted to be low as constituents that may be introduced as part of Project activities are expected to remain below criteria for the protection of aquatic life or below risk HQs.	**Moderate** Local The geographic extent of the residual effects is predicted to be confined to the immediate waterbody adjacent to the Project (i.e., Whitefish Lake). The estimated mixing zone is less than 5 m, implementing an effluent discharge configuration that promotes mixing.	**Moderate** Medium-term Effects are expected to last between 3 to 38 years (i.e., effects expected during construction through to the end of post-decommissioning).	**High** Continuously For the purposes of this EIS, a conservative scenario was identified, with effluent discharge being considered as continuous during operation and decommissioning.	**Fully Reversible** Water quality and sediment quality are expected to return to pre-development levels following post-decommissioning as Project-related sources will cease to operate. As a result, exposure to COPC by fish will cease, reversing the potential for uptake of these constituents to fish tissues.	**Unfavourable** For the purposes of this EIS and identifying the conservative scenario, effluent discharge is expected to be continuous through all Project phases, therefore timing of project activities could affect some sensitive life stages and biological processes (i.e. breeding seasons) of aquatic receptors.	**Not Significant** Fish health is expected to be resilient to changes in fish tissue concentrations in the context of this assessment as COPC meet protective criteria even at the extreme low water scenario.
Valued component – Vegetation and ecosystems including wetlands							
Change in the areal extent of habitat types	**Low** Direct disturbance of 169.6 ha of habitats, reflecting 0.4% of habitats on the scale of the RSA. This includes 24.8 ha anthropogenically disturbed habitats, 144.5	**Low-Moderate** Local Direct effects are limited to the Project Area, while indirect effects (e.g., edge effects, spread of invasive plants) may	**High** Long-term Effects will occur during construction and will last into post-decommissioning.	**Moderate** Intermittent Direct effects will primarily occur during construction. Habitat alteration by indirect effects is anticipated to occur	**Moderate** Partially reversible Progressive restoration and reclamation are expected to result in habitats regenerating over time. However,	**Timing** Inconsequential The timing of project activities is not expected to have an effect.	**Not significant** The majority of terrestrial habitats predicted to be disturbed are common across the RSA. Moreover, habitats have been historically disturbed

Predicted degree of residual effect							
Residual adverse effect	**Magnitude**	**Geographical extent**	**Duration**	**Frequency**	**Reversibility**	**Timing**	**Significance of residual effect**
	ha terrestrial habitats, and 0.5 ha wetlands. Indirect disturbance of 992.2 ha of habitats, reflecting 2.5% of habitats on the scale of the RSA.	extend into the local study area.		frequently during all project phases and can last into post-decommissioning.	some features, such as access roads, are not expected to be reclaimed.		from fires and existing anthropogenic activities. Reclamation is anticipated to re-establish habitats, although it may take a few decades for regeneration of forests. Mitigation measures are adequate to address direct and indirect effects on terrestrial habitats.
Change in the areal extent of wetlands	**Low** Direct disturbance of 0.5 ha of wetlands, reflecting less than 0.1% of wetlands on the scale of the RSA. Indirect disturbance of 97.7 ha of wetlands, reflecting 1.5% of wetlands on the scale of the RSA.	**Low-Moderate** Local Direct effects are limited to the Project Area, while indirect effects (e.g., changes in surface drainage patterns and hydrologic connectivity) may extend into the local study area.	**High** Long-term Effects will occur during construction and will last into post-decommissioning.	**Moderate** Intermittent Direct effects will primarily occur during construction. Wetland alteration by indirect effects is anticipated to occur frequently during all project phases and can last into post-decommissioning.	**Moderate** Partially reversible Reclamation will occur during decommissioning. Surface drainage patterns will be reinstated to re-establish hydrologic connectivity. However, wetlands can exhibit low resilience and high susceptibility to	**Timing** Inconsequential The timing of project activities is not expected to have an effect.	**Not significant** The project footprint has limited overlap with wetland ecosites. Direct disturbance affects wetlands that are common in the RSA. Rare ecosites may be indirectly disturbed, although these are not limiting habitat for rare plants or for ungulates,

Predicted degree of residual effect							
Residual adverse effect	**Magnitude**	**Geographical extent**	**Duration**	**Frequency**	**Reversibility**	**Timing**	**Significance of residual effect**
					disturbance, and some ecosites may not fully return to a pre-disturbed state, although they may regain equivalent functions.		furbearers, woodland caribou, raptors, or migratory breeding birds. Mitigation measures are adequate to address direct and indirect effects on wetlands.
Change in the number of plants of conservation concern	**Low** No listed plant species have been observed in the Project Area, although potential exists for unobserved occurrences. The listed species Alaskan Clubmoss was observed locally abundantly during baseline surveys in the RSA, reflective of its provincial ranking (S3) of lower conservation priority.	**Low-Moderate** Local Direct effects are limited to the Project Area, while indirect effects (e.g., edge effects, spread of invasive plants) may extend into the local study area.	**High** Long-term Effects will occur during construction and will last into post-decommissioning. Directly disturbed listed plants are unlikely to regenerate and may be lost permanently.	**Moderate** Intermittent Direct effects will primarily occur during construction. Alteration by indirect effects is anticipated to occur frequently during all project phases and can last into post-decommissioning.	**Moderate** Partially reversible Listed plants are unlikely to return once lost from a specific location. However, indirectly disturbed plants by dust or edge effects may regenerate over time if enough individuals are preserved in a population.	**Timing** Inconsequential The timing of project activities is not expected to have an effect.	**Not significant** Plants of conservation concern typically inhabit specialist habitat and have low resilience to disturbance. To mitigate uncertainty, pre-construction listed plant surveys will be conducted. Mitigation measures are adequate to address direct and indirect effects on plants of conservation concern.

Predicted degree of residual effect							
Residual adverse effect	**Magnitude**	**Geographical extent**	**Duration**	**Frequency**	**Reversibility**	**Timing**	**Significance of residual effect**
Change in concentrations of Constituents of Potential Concern (COPC) in vegetation	**Low** Deposition and uptake of COPC is predicted to occur within up to 992.2 ha of vegetation, reflecting 2.5% of vegetation on the scale of the RSA.	**Moderate** Local Vegetation in the Project Area will be cleared and therefore not affected by COPC. COPC exposure is expected in the local study area, particularly along roads and near areas of soil disturbance.	**High** Long-term Accumulation in soil and plant tissues can lead to prolonged exposure. Some COPC degrade slowly and may remain elevated in soil for many years.	**High** Continuous Exposure is frequent throughout the project phases and can last into post-decommissioning until COPC concentrations have degraded to background levels.	**Low** Reversible COPC levels in vegetation are expected to return to background, although this may take a long time depending on degradation rates.	**Timing** Moderate Uptake rates of COPC in vegetation can vary seasonally. Moreover, the timing of activities resulting in dust and air emissions can affect COPC dispersion and deposition on vegetation depending on atmospheric conditions (e.g., wind direction, speed, precipitation).	**Not significant** Vegetation has been disturbed from historic anthropogenic activities, resulting in some COPC being detected at elevated concentrations during baseline surveys, particularly near the highway. The EIS appendix 10A assessment concluded that the risk of COPC in terrestrial vegetation is negligible. A follow-up vegetation sampling program for COPC will be conducted periodically to identify possible accumulation of COPC in plant tissues (lichen, blueberry).

Predicted degree of residual effect							
Residual adverse effect	**Magnitude**	**Geographical extent**	**Duration**	**Frequency**	**Reversibility**	**Timing**	**Significance of residual effect**
Valued component – Terrestrial biota including Species at Risk							
Furbearers: Alteration and/or loss of habitat	**Low-Moderate** Available habitat altered or lost within the RSA: Wolverine up to 8.2%; Pine Marten up to 4.4%; Mink up to 2.5%; Muskrat up to 1%. The “moderate” rating is based on Wolverine.	**Low-Moderate** Local Direct loss limited to Project Area. Indirect effects may extend into the LSA.	**High** Long-term Effects last throughout all Project phases and into post-decommissioning as areas are reclaimed and revegetated.	**High** Continuous While habitat loss is initially through vegetation clearing during construction, habitat alteration is predicted to be continuous throughout all Project phases until post-decommissioning.	**Low** Reversible Effect predicted to be reversible as reclamation of disturbed areas is proposed to achieve baseline conditions.	**Moderate** Timing of project activities can affect some sensitive life stages, which is particularly relevant for Wolverine, a species at risk. However, no Wolverine or dens were observed during baseline studies. Project activities will be assessed for their potential to disturb or remove habitat.	**Not significant** Alteration and/or loss of habitat is expected for furbearers, but these are addressed through appropriate mitigation measures. Wolverine require larger, undisturbed areas, but habitat is not restricted to specific vegetation cover types and is more dependent on available food sources. Notably, pre-clearing surveys will be performed for Wolverine prior to disturbance. For example, methods will include searching prominent topographic features such as rock outcropping or downed forest trees and debris where

Predicted degree of residual effect							
Residual adverse effect	**Magnitude**	**Geographical extent**	**Duration**	**Frequency**	**Reversibility**	**Timing**	**Significance of residual effect**
							wolverine may establish denning sites. In the event the sweeps are conducted during the winter period, methods related to snow tracking would identify Wolverine presence based on tracks and potential denning sites in the snow pack within ravines or drainages within the forested areas within the study areas.
Furbearers: Change in mortality	**Low-Moderate** Possibility of direct and indirect mortality through, e.g., vehicle collisions, competition, increased stress. Species at risk (Wolverine) are more sensitive to mortality events.	**Low-High** Regional The change in direct mortality is expected to occur mainly within the Project Area; however, indirect mortality may extend into the Terrestrial RSA, e.g., on Highway 914 and within wolverine home range.	**Moderate** Medium-term Mortality may occur during all phases of the Project. Limited effects during post-decommissioning.	**Moderate** Intermittent While the possibility for a change in direct and indirect mortality exists throughout all Project phases, the actual mortality events are expected to occur sporadically and are therefore intermittent.	**Low** Reversible Change in mortality is expected to diminish to baseline conditions following post-decommissioning.	**Low** Inconsequential Project activities will be assessed for their potential to disturb or remove habitat, and clearing will be completed during least-risk timing windows (e.g., outside denning windows).	**Not significant** Several mitigation measures are proposed that are expected to limit interactions between furbearers and sources of mortality. Examples include speed limits and exclusion fences preventing access to Project components.

Predicted degree of residual effect							
Residual adverse effect	**Magnitude**	**Geographical extent**	**Duration**	**Frequency**	**Reversibility**	**Timing**	**Significance of residual effect**
							With regard to the species at risk Wolverine, it is noted that they avoid human footprint types and linear features, therefore vehicle collisions are comparably unlikely. No wolverine signs were detected during baseline studies.
Ungulates: Alteration and/or loss of habitat	**Low** Up to 4.4% of available Moose habitat within the RSA may be altered or lost (0.5% direct loss; 3.9% indirect effect, e.g., noise or dust).	**Low-Moderate** Local Direct loss limited to Project Area. Indirect effects may extend into the LSA.	**Moderate** Medium-term Effects last throughout the Project phase and into post-decommissioning as areas are reclaimed. However, rating reflects that Moose benefit from regenerating forests.	**High** Continuous While habitat loss is initially through vegetation clearing during construction, habitat alteration is predicted to be continuous throughout all Project phases until post-decommissioning.	**Low** Reversible Progressive and final reclamation of disturbed areas is proposed to achieve baseline conditions. Revegetated areas are expected to become available Moose habitat within a few years of revegetation.	**Moderate** Timing of project activities can affect some sensitive life stages, but Project activities will be assessed for their potential to disturb or remove habitat.	**Not significant** The regional moose population has generally low densities and habitat is not limiting. Moose are known to prefer habitat following disturbance due to a proliferation of preferred forage. Appropriate mitigation measures are proposed.

Predicted degree of residual effect							
Residual adverse effect	**Magnitude**	**Geographical extent**	**Duration**	**Frequency**	**Reversibility**	**Timing**	**Significance of residual effect**
Ungulates: Change in mortality	**Low** Possibility of direct and indirect mortality through, e.g., vehicle collisions, predator access, increased stress.	**Low-High** Regional The change in direct mortality is expected to occur mainly within the Project Area; however, indirect mortality may extend into the Terrestrial RSA.	**Moderate** Medium-term Mortality may occur during all phases of the Project. Limited effects during post-decommissioning.	**Moderate** Intermittent While the possibility for a change in direct and indirect mortality exists throughout all Project phases, the actual mortality events are expected to occur sporadically and are therefore intermittent.	**Low** Reversible Change in mortality is expected to diminish to baseline conditions following post-decommissioning.	**Low** Inconsequential Project activities will be assessed for their potential to disturb or remove habitat, and clearing will be completed during least-risk timing windows.	**Not significant** Several mitigation measures are proposed that are expected to limit interactions between Moose and sources of mortality. Examples are speed limits and exclusion fences preventing access to Project components.
Caribou: Alteration and/or loss of habitat	**Low** Up to 4.3% of available Woodland Caribou habitat within the RSA may be altered or lost (0.5% direct loss; 3.8% indirect effect, e.g., noise or dust).	**Low-Moderate** Local Direct loss limited to Project Area. Indirect effects may extend into the LSA. The Project's incremental increase of the disturbance at the SK1 Range is 0.001%.	**High** Long-term Effects last throughout all Project phases and into post-decommissioning as areas are reclaimed. Forest habitats experiencing anthropogenic disturbances may not provide suitable Woodland Caribou habitat until 20 years after the disturbance ceases to allow for	**High** Continuous While habitat loss is initially through vegetation clearing during construction, habitat alteration is predicted to be continuous throughout all Project phases until post-decommissioning.	**Low** Reversible Reclamation of disturbed areas is proposed to achieve baseline conditions.	**Moderate** Timing of project activities can affect some sensitive life stages, which is particularly relevant for Woodland Caribou, a species at risk. Project activities will be assessed for their potential to disturb or remove habitat. For example, timing of air traffic is considered to	**Not significant** Woodland Caribou are a federal and provincial species at risk that is present and uses habitat within the RSA. Potential habitat disturbance is expected to be appropriately addressed through mitigation, offsetting, and/or other measures necessary to meet

Predicted degree of residual effect							
Residual adverse effect	**Magnitude**	**Geographical extent**	**Duration**	**Frequency**	**Reversibility**	**Timing**	**Significance of residual effect**
			establishment of their primary food source, terrestrial and arboreal lichen.			minimize sensory disturbance from airplane noise.	the Government of Canada's Amended Recovery Strategy for Woodland Caribou (*Rangifer tarandus caribou*), Boreal Population, in Canada. An EA Condition (see table 12.1 EA3) to meet the federal recovery strategy is proposed accordingly.
Caribou: Change in mortality	**Moderate** Possibility of direct and indirect mortality through, e.g., vehicle collisions, predation, increased stress. Species at risk (Woodland Caribou) are more sensitive to mortality events.	**Low-High** Regional The change in direct mortality is expected to occur mainly within the Project Area; however, indirect mortality may extend into the Terrestrial RSA, due to size of home range.	**Moderate** Medium-term Mortality may occur during all phases of the Project. Limited effects during post-decommissioning.	**Moderate** Intermittent While the possibility for a change in direct and indirect mortality exists throughout all Project phases, the actual mortality events are expected to occur sporadically and are therefore intermittent.	**Low** Reversible Change in mortality is expected to diminish to baseline conditions following post-decommissioning.	**Low** Inconsequential Habitat clearing will be completed during least-risk timing windows (e.g., outside calving periods). Pre-clearing surveys will be performed for caribou signs prior to disturbance.	**Not significant** The Woodland Caribou population in the region is reported to be stable. However, caribou populations naturally occur at low densities, reproduce slowly and are extremely sensitive to even minor changes in mortality rates. Several mitigation measures are proposed that are expected to limit

Predicted degree of residual effect							
Residual adverse effect	**Magnitude**	**Geographical extent**	**Duration**	**Frequency**	**Reversibility**	**Timing**	**Significance of residual effect**
							interactions between caribou and sources of mortality. Dietary exposure to COPC in lichen is no concern.
Arthropods: Alteration and/or loss of habitat	**Low** All three species are habitat generalists that use a diverse range of habitats. Therefore, habitat should not be limiting on a regional scale.	**Low-Moderate** Local Direct loss limited to Project Area. Indirect effects may extend into the LSA.	**High** Long-term Effects last throughout all Project phases and into post-decommissioning as areas are reclaimed.	**High** Continuous While habitat loss is initially through vegetation clearing during construction, habitat alteration is predicted to be continuous throughout all Project phases until post-decommissioning.	**Low** Reversible Reclamation of disturbed areas is proposed to achieve baseline conditions.	**Moderate** Timing of project activities can affect some sensitive life stages, but Project activities will be assessed for their potential to disturb or remove habitat.	**Not significant** Alteration and/or loss of habitat is expected for arthropods, but these are addressed through appropriate mitigation measures, including those for soil and vegetation.
Arthropods: Change in mortality	**Low** There are no historical observations of the three species in the Terrestrial RSA.	**Low-Moderate** Local The change in direct mortality is expected to occur mainly within the Project Area. Indirect mortality may extend into the LSA based on	**Moderate** Medium-term Mortality may occur during all phases of the Project. Limited effects during post-decommissioning.	**Moderate** Intermittent While the possibility for a change in direct and indirect mortality exists throughout all Project phases, the actual mortality events are expected to occur sporadically	**Low** Reversible Change in mortality is expected to diminish to baseline conditions following post-decommissioning.	**Low** Inconsequential Habitat clearing will be completed during least-risk timing windows. Herbicides will be used by licensed professional applicators which	**Not significant** Several mitigation measures are proposed that are expected to limit interactions between arthropods and sources of mortality. For example, herbicide use as part

Predicted degree of residual effect							
Residual adverse effect	**Magnitude**	**Geographical extent**	**Duration**	**Frequency**	**Reversibility**	**Timing**	**Significance of residual effect**
		alteration of terrestrial habitats.		and are therefore intermittent.		would be familiar with timing considerations.	of vegetation management will be limited to the immediate Project footprint and only when necessary.
Amphibians: Alteration and/or loss of habitat	**Moderate** Amphibians rely on specific habitats that must be in proximity with suitable dispersal corridors interconnecting them (e.g., riparian areas and waterways). Wetland and riparian areas are present in the study areas.	**Low-Moderate** Local Direct loss limited to Project Area. Indirect effects may extend into the LSA.	**High** Long-term Effects last throughout all Project phases and into post-decommissioning as areas are reclaimed.	**High** Continuous While habitat loss is initially through vegetation clearing during construction, habitat alteration is predicted to be continuous throughout all Project phases until post-decommissioning.	**Low** **Reversible** Reclamation of disturbed areas is proposed to achieve baseline conditions. A small area of wetlands will be disturbed which may not fully return to a pre-disturbed state, but is likely to regain equivalent ecological function.	**Moderate** Timing of project activities can affect some sensitive life stages (e.g., breeding, larval development), but Project activities will be assessed for their potential to disturb or remove habitat.	**Not significant** Alteration and/or loss of habitat is expected for amphibians, but these are addressed through appropriate mitigation measures, including those for wetlands. For locations of site-specific habitat features used by Northern Leopard Frog, a requirement to limit disturbance in will be implemented.
Amphibians: Change in mortality	**Low** Northern Leopard Frog was not detected during baseline surveys, but might be present in the	**Low-Moderate** Local The change in direct mortality is expected to	**Moderate** Medium-term Mortality may occur during all phases of	**Moderate** Intermittent While the possibility for a change in direct	**Low** Reversible Change in mortality is expected to diminish	**Low** Inconsequential Habitat clearing will be completed	**Not significant** Several mitigation measures are proposed that are expected to limit

Predicted degree of residual effect							
Residual adverse effect	**Magnitude**	**Geographical extent**	**Duration**	**Frequency**	**Reversibility**	**Timing**	**Significance of residual effect**
	study areas as suitable habitat is available.	occur mainly within the Project Area. Indirect mortality may extend into the LSA based on alteration of wetland habitats. Amphibians do not move long distances.	the Project. Limited effects during post-decommissioning.	and indirect mortality exists throughout all Project phases, the actual mortality events are expected to occur sporadically and are therefore intermittent.	to baseline conditions following post-decommissioning.	during least-risk timing windows. Activity restrictions for overwintering and breeding habitat if observed during pre-clearance surveys.	interactions between amphibians and sources of mortality. Pre-disturbance clearance surveys will be conducted to identify site-specific habitat features (e.g., breeding ponds) and implement setbacks and/or timing windows. Vehicles and construction activities will not cross or enter wetlands.
Bats: Alteration and/or loss of habitat	**Moderate** A total of four bat species were detected in the region, of which two are species at risk which would be particularly sensitive to habitat loss. Bats have specific habitat requirements for their lifecycle; hibernacula and maternity sites are main limiting habitat features. A small area of potential roosting habitat was	**Low-Moderate** Local Direct loss limited to Project Area. Indirect effects may extend into the LSA.	**High** Long-term Effects last throughout all Project phases and into post-decommissioning as areas are reclaimed.	**High** Continuous While habitat loss is initially through vegetation clearing during construction, habitat alteration is predicted to be continuous throughout all Project phases until post-decommissioning.	**Low** Reversible Reclamation of disturbed areas is proposed to achieve baseline conditions.	**Moderate** Timing of project activities can affect some sensitive life stages, especially hibernation and roosting. However, vegetation clearing will occur outside of roosting periods.	**Not significant** Alteration and/or loss of potential habitat is expected for bats, but with respect to limiting habitat, there are no hibernacula anticipated in the Project Area (i.e., caves, mines, buildings with stable and specific temperatures), and

Predicted degree of residual effect							
Residual adverse effect	**Magnitude**	**Geographical extent**	**Duration**	**Frequency**	**Reversibility**	**Timing**	**Significance of residual effect**
	identified in the Project Area.						only small areas (<49 ha) of suitable potential roost habitat was identified in the Project Area. All habitat potential specifically for four different life stages (i.e., forage, overwintering hibernacula, maternity roost, and summer roost) was identified and mapped. Mitigation measures (e.g., vegetation clearing outside of sensitive time periods) are deemed effective in limiting habitat loss and alteration.
Bats: Change in mortality	**Moderate** Possibility of direct and indirect mortality. Species at risk bats are more sensitive to mortality events.	**Low-Moderate** Local The change in direct mortality is expected to occur mainly within the Project Area. Indirect mortality may extend	**Moderate** Medium-term Mortality may occur during all phases of the Project. Limited	**Moderate** Intermittent While the possibility for a change in direct and indirect mortality exists throughout all Project phases, the	**Low** **Reversible** Change in mortality is expected to diminish to baseline conditions	**Low** Inconsequential Habitat clearing will be completed during least-risk timing windows. Pre-disturbance	**Not significant** Several mitigation measures are proposed that are expected to limit interactions between bats and sources of

Predicted degree of residual effect							
Residual adverse effect	**Magnitude**	**Geographical extent**	**Duration**	**Frequency**	**Reversibility**	**Timing**	**Significance of residual effect**
		into the LSA based on alteration of terrestrial habitats.	effects during post-decommissioning.	actual mortality events are expected to occur sporadically and are therefore intermittent.	following post-decommissioning.	clearance surveys will be completed to identify habitat features such as maternal roosting sites and hibernacula.	mortality. Notably, pre-clearance surveys will identify bats or bat features that require setbacks or activity restrictions. Exclusion methods will prevent access to buildings and other infrastructure.
Valued component – Migratory birds including Species at Risk							
Raptors and migratory breeding birds: Alteration and/or loss of habitat	**Low-Moderate** Up to 6.9% of available raptor habitat within the RSA may be altered or lost (0.4% direct loss; 6.5% indirect effect) which drives the "moderate" rating. The amount of habitat altered or lost in the RSA for migratory breeding birds is up to 1.6% for waterbirds and waterfowl, up to 4.3% for upland game birds, and up to 4.1% for migratory songbirds.	**Low-Moderate** Local Direct loss limited to Project Area. Indirect effects may extend into the LSA.	**High** Long-term Effects last throughout all Project phases and into post-decommissioning as areas are reclaimed.	**High** Continuous While habitat loss is initially through vegetation clearing during construction, habitat alteration is predicted to be continuous throughout all Project phases until post-decommissioning.	**Low** Reversible Reclamation of disturbed areas is proposed to achieve baseline conditions. The loss of different habitats may affect bird groups differently based on their habitat needs (e.g., upland/lowland, regenerated/mature forest). For example, raptor species prefer tall mature trees within upland forest	**Moderate** Timing of project activities can affect some sensitive life stages. Setback distances are outlined in the SARGSS for many nesting and breeding birds for certain time periods.	**Not significant** Alteration and/or loss of potential habitat is expected for raptors and migratory breeding birds. Both raptors and migratory breeding birds have been exposed to historic and ongoing anthropogenic and natural disturbances throughout their ranges. Population declines have been documented for

Predicted degree of residual effect							
Residual adverse effect	**Magnitude**	**Geographical extent**	**Duration**	**Frequency**	**Reversibility**	**Timing**	**Significance of residual effect**
					habitat near waterbodies. Revegetated areas are anticipated to become available after post-decommissioning when mature trees offer nesting habitat.		some songbirds and waterbirds across North America. Osprey has provincial at-risk status (refer to table 1), but it not federally designated as species at risk. Suitable habitat for all species remains available throughout the RSA and is expected to be able to support any displaced individuals. Displacement will be temporary since the Project Area is planned to be reclaimed to baseline conditions.
Raptors and migratory breeding birds: Change in mortality	**Moderate** Possibility of direct and indirect mortality through, e.g., vehicle collisions, nest failure, or abandonment.	**Low-High** Regional The change in direct mortality is expected to occur mainly within the Project Area. However,	**Moderate** Medium-term Mortality may occur during all phases of the Project. Limited	**Moderate** Intermittent While the possibility for a change in direct and indirect mortality exists throughout all Project phases, the	**Low** Reversible Change in mortality is expected to diminish to baseline conditions	**Low** Inconsequential Habitat clearing will be completed during least-risk timing windows.	**Not significant** Observations of Bald Eagle and Osprey, as well as active nest sites for both species, have been recorded within

Predicted degree of residual effect							
Residual adverse effect	**Magnitude**	**Geographical extent**	**Duration**	**Frequency**	**Reversibility**	**Timing**	**Significance of residual effect**
		indirect mortality may extend into the Terrestrial RSA.	effects during post-decommissioning.	actual mortality events are expected to occur sporadically and are therefore intermittent.	following post-decommissioning.		the Project study areas. Likewise, several waterbirds and waterfowl, upland game birds, and migratory songbirds were recorded. However, birds are expected to avoid the area during construction and operation due to noise, light, and dust, and due to more preferrable habitat off-site. Several mitigation measures are proposed that are expected to limit interactions between birds and sources of mortality. Moreover, the SARGSS specify setback distances for several species including Bald Eagle, Osprey, several waterbirds and songbirds, and some game birds.

Predicted degree of residual effect							
Residual adverse effect	**Magnitude**	**Geographical extent**	**Duration**	**Frequency**	**Reversibility**	**Timing**	**Significance of residual effect**
Bird species at risk: Alteration and/or loss of habitat	**Low** The amount of habitat altered or lost in the RSA for bird species at risk is up to 4.7% for Common Nighthawk, up to 2.9% for Short-eared Owl, up to 2.4% for Yellow Rail, up to 2.4% for Rusty Blackbird, and up to 4.3% for Olive-sided Flycatcher. Calculations were not provided for other species at risk birds but are expected to be captured in this range due to similar habitat requirements and the assessment's habitat-based approach.	**Low-Moderate** Local Direct loss limited to Project Area. Indirect effects may extend into the LSA.	**High** Long-term Effects last throughout all Project phases and into post-decommissioning as areas are reclaimed.	**High** Continuous While habitat loss is initially through vegetation clearing during construction, habitat alteration is predicted to be continuous throughout all Project phases until post-decommissioning.	**Low** Reversible Reclamation of disturbed areas is proposed to achieve baseline conditions. The loss of different habitats may affect bird groups differently based on their habitat needs (e.g., upland/lowland, regenerated/mature forest). While some wetland types may not recover, other suitable wetlands are likely available.	**Moderate** Timing of project activities can affect some sensitive life stages, but Project activities will be assessed for their potential to disturb or remove habitat.	**Not significant** Alteration and/or loss of potential habitat is expected for bird species at risk. While Common Nighthawk, Rusty Blackbird, and Olive-sided Flycatcher were detected in the study areas, Short-eared Owl and Yellow Rail were not observed. Suitable habitat for all species remains available throughout the RSA and is expected to be able to support any displaced individuals. Displacement will be temporary since the Project Area is planned to be reclaimed to baseline conditions.

Predicted degree of residual effect							
Residual adverse effect	**Magnitude**	**Geographical extent**	**Duration**	**Frequency**	**Reversibility**	**Timing**	**Significance of residual effect**
Bird species at risk: Change in mortality	**Moderate** Possibility of direct and indirect mortality. Species at risk birds are more sensitive to mortality events.	**Low-High** Regional The change in direct mortality is expected to occur mainly within the Project Area. However, indirect mortality may extend into the Terrestrial RSA.	**Moderate** Medium-term Mortality may occur during all phases of the Project. Limited effects during post-decommissioning.	**Moderate** Intermittent While the possibility for a change in direct and indirect mortality exists throughout all Project phases, the actual mortality events are expected to occur sporadically and are therefore intermittent.	**Low** Reversible Change in mortality is expected to diminish to baseline conditions following post-decommissioning.	**Low** Inconsequential Habitat clearing will be completed during least-risk timing windows, outside of bird species at risk nesting season when practical. Pre-disturbance clearance surveys will be completed to identify the presence of nests.	**Not significant** Populations of listed species are less resilient to changes in mortality, however, several mitigation measures are proposed that are expected to limit interactions between birds and sources of mortality. Notably, pre-clearance surveys will identify bird species at risk nests that require setbacks or activity restrictions. Various physical, visual, and/or auditory deterrents and exclusion measures will be employed that will limit bird interactions with Project components and activities such as waste and water management ponds, roads and traffic,

Predicted degree of residual effect							
Residual adverse effect	**Magnitude**	**Geographical extent**	**Duration**	**Frequency**	**Reversibility**	**Timing**	**Significance of residual effect**
							and transmission lines.
Valued component – Human health (including Indigenous peoples health)							
Exposure to air and water non-radiological contaminants (except Selenium) by inhalation and ingestion	**Low** No residual adverse effects anticipated after application of mitigation and follow-up monitoring measures.	N/A	N/A	N/A	N/A	N/A	**Not significant** No residual adverse effects carried into significance assessment.
Exposure to air and water radiological contaminants by inhalation and ingestion	**Low** No residual adverse effects anticipated after application of mitigation and follow-up monitoring measures.	N/A	N/A	N/A	N/A	N/A	**Not significant** No residual adverse effects carried into significance assessment.
Exposure of the Fisher/Trapper receptor to Selenium at Russell Lake via fish ingestion	**Moderate** The Project's incremental HQ (with baseline removed) is higher than 0.2 for the fisher/trapper for selenium due to ingestion of fish (the predicted HQ is 0.93).	**Low** Russell Lake is not located within the Project Area, but rather in the RSA. The geographic extent of any direct effects is predicted to be confined	**Moderate** Medium-term Effects are expected to last during the time that treated effluent is released into the aquatic environment (receiving waterbody	**High** Continuous Treated effluent discharge has been considered as continuous over the operation and decommissioning	**Low** Reversible The exposure of the fisher/trapper to selenium at levels that will result in an HQ greater than 0.2 will only occur during the	**Low** Inconsequential For the purposes of this EIS and identifying the conservative scenario, effluent discharge is	**Not significant** There is a moderate to high probability that this residual effect will occur; however, the likelihood may be overestimated due to

Predicted degree of residual effect							
Residual adverse effect	**Magnitude**	**Geographical extent**	**Duration**	**Frequency**	**Reversibility**	**Timing**	**Significance of residual effect**
	The effect can result in a change in health status (e.g., Indigenous Peoples health), with exposures above health- based standards.	to the immediate waterbody adjacent to the Project (i.e., Whitefish Lake).	is Whitefish Lake) during the operation and decommissioning phases of the Project. No effluent will be released during construction nor post-decommissioning phases of the Project.	phases of the Project.	operation and decommissioning phases of the Project. During the 'future centuries', remediation works will be completed, and the site naturalized. Thus, exposure will be reduced during post-decommissioning and beyond.	expected to be continuous through all Project phases, therefore timing of project activities could affect some traditional activities in the Project Area such as fishing. However, Russell Lake is not located within the Project Area, but rather further away in the RSA.	conservatism in the exposure assessment. Further, Denison has committed to assessing health risks from fish consumption during operations. CNSC staff conclude that this residual effect is not likely to cause significant adverse effects to human health as the magnitude of effects are expected to be low.
Valued component – Indigenous uses: Current use of lands and resources for traditional purposes							
Changes to access of and/or quality and quantity of hunting, fishing, trapping, and ceremonial gathering activities in the Project Area as a	**Moderate** A loss of access to the Project Area is expecting for the surface lease area. The effect results in a change to locations or resources, experience, or use of locations or resources for traditional purposes, and preferred	**Moderate** Local Effect predicted to be in the Project siting area but may extend into the LSA as construction takes place in the short term due to increase in traffic etc. so some land	**Moderate** Medium-term Access to the Project Area is expected to be restricted at the Denison gate to the project site and is expected to last between 3 to 38 years (i.e., effect expected	**High** Continuous Effect predicted to occur to start during construction (1-3 years) and continuously during operations, and decommissioning.	**Moderate** Partially Reversible Effect predicted to be reversible as the access to the Project Area would be permitted for hunting, fishing and trapping post-decommissioning for	**Moderate** Timing of project activities may affect some traditional activities in the Project Area including moose harvesting, fishing and berry picking but mitigation	**Not Significant** The Project may change the availability and distribution of resources for hunting, fishing and gathering for the Project Area and to a lesser extent as there

Predicted degree of residual effect							
Residual adverse effect	**Magnitude**	**Geographical extent**	**Duration**	**Frequency**	**Reversibility**	**Timing**	**Significance of residual effect**
result of the project.	locations or means to practice the activity and use by an Indigenous group may be modified or limited. However, Indigenous Nations and communities are able to continue to utilize both the LSA and RSA for traditional activities.	users may choose to stay away from LSA.	during construction through to the end of post-decommissioning) when the lands are expected to return to province through Institutional Control Program (ICP)		traditional activities once it enters provincial Institutional Control Program (ICP)	measures will reduce these activities during the cultural harvesting seasons where possible.	will be restricted access. However, there is limited ILRU in the Project Area and the changes in the availability of resources are not expected to affect the ability of Indigenous Nations and communities to hunt, fish or gather plants in the LSA or RSA.
Changes to access of and/or quality and quantity of hunting, fishing, trapping, and ceremonial gathering activities in the Regional Study Area (LSA/RSA) as a result of the project.	**Low** A loss of access to the LSA/RSA is not expected and Indigenous Nations and communities should continue to have full access to the LSA and RSA to hunt, fish, and trap and carry out ceremonial and traditional gathering and activities in the same or similar manner.	**Moderate** Local Effects are predicted to extend into the LSA along the Key Lake haul road only and will not extend into the RSA.	**Moderate** Medium-term Access to LSA/RSA is not expected to be restricted but the Project is expected to last between 3 to 38 years (i.e., effect expected during construction through to the end of post-decommissioning when the lands are	**High** Continuous Effect predicted to occur to start during construction (1-3 years) and continuously during operations, and decommissioning	**Low** Reversible Effect predicted to be reversible as the access to the LSA and RSA would be permitted for hunting, fishing and trapping for traditional activities.	**Low** Inconsequential Timing of project activities that take place are not expected to affect hunting, fishing and harvesting activities in the LSA or RSA.	**Not Significant** It is expected that changes to access of and/or quality and quantity of hunting, fishing, trapping, and ceremonial gathering activities in the LSA/RSA as a result of the project will be Not Significant

Predicted degree of residual effect							
Residual adverse effect	**Magnitude**	**Geographical extent**	**Duration**	**Frequency**	**Reversibility**	**Timing**	**Significance of residual effect**
			expected to so may potentially impact use of LSA due to mine.				
Changes in access to cultural and heritage resources including any of those of historical, archaeological, paleontological or architectural significance	**Low** The effect results in a change to locations or experience, or use of locations or for traditional purposes, but the activity and use by an Indigenous group could be practiced in the same or similar manner as before**.**	**Low** Site-Specific The change could be direct but will only likely take place in the Project study area as no other areas outside the lease areas should be disturbed during construction, operations and decommissioning activities.	**High** Long-term Any change to a historical, archaeological, paleontological or architectural significance likely be permanent.	**Moderate** Intermittent While the possibility for a change exists throughout all Project phases, the actual change events are expected to occur sporadically and primarily take place during the construction phase of the project (1-3 years) during ground disturbance activities and are therefore deemed intermittent.	**High** Irreversible Any destruction or heritage resources that take place would likely be permanent and therefore deemed not reversible.	**Low** Inconsequential The timing of predicted project activities is not expected to affect sensitive activities to changes to a historical, archaeological, paleontological or architectural significance.	**Not significant** The Project may change the availability of a historical, archaeological, paleontological or architectural significance sites in the Project Area. However, there are limited Heritage resources known to exist in the Project Area and the identified mitigation and follow-up monitoring program measures, including the Wheeler River Uranium Project Heritage Resources Management Plan, were deemed adequate.

Predicted degree of residual effect							
Residual adverse effect	**Magnitude**	**Geographical extent**	**Duration**	**Frequency**	**Reversibility**	**Timing**	**Significance of residual effect**
Fear and Avoidance and/or Perceived contamination of animals, water and plants (traditional foods) near the Wheeler River area causing avoidance behaviour due to low trust in quality of harvested resources.	**Moderate** The effect may result in a modification or change to a harvesting location(s) and/or experience, or use of preferred locations or resources for traditional purposes, by Indigenous Nations and communities due to perceived risks of contamination.	**Low to Moderate** Local Fear and avoidance behaviour is generally expected to be limited to around the Project site but some land users perceived risks may extend into the LSA.	**Moderate to High** Medium-term to Long-term Perceived risk and fear and avoidance behavior is generally expected to last the life of construction, operations and through decommissioning although some land users may feel comfortable continuing to hunt, fish and trapping in the LSA while the project in ongoing.	**High** Continual Effect predicted to occur continuously during all phases of the Project.	**Moderate** Partially Reversible Some land users will be open to learning more from monitoring programs and testing results and be confident with harvesting game, fish and plants again while others may avoid the area and find new areas to hunt, fish, trap etc.	**Low** Inconsequential Denison has committed to engaging with Indigenous Nations and communities on Project Follow-up Monitoring Programs in order to help address concerns raised regarding fear and avoidance behaviours.	**Not significant** Denison has committed to engaging with Indigenous in their Project Follow-up Monitoring Programs in order to help address concerns raised regarding fear and avoidance behaviours.
(Sensory) Noise, traffic, and dust from construction and operation activities degrades the sensory experience of being on the land, causing	**Moderate** The effect may result in a modification or change to a harvesting location(s) and/or experience, or use of preferred locations or resources for traditional purposes, by Indigenous Nations and communities	**Low to Moderate** Local The primary sensory disturbances are expected to take place at the Project Area although may extend into the LSA due to increased boundary traffic and access to site	**Moderate** Medium-term Sensory disturbances are expected to be primarily during the construction phase (years 1-3) yet may extend into the operations phase due	**High** Continuous Effect predicted to occur continuously during all phases of the Project although initial construction will likely have a greater impact due to	**Low** Reversible Effect predicted to be reversible after the project is decommissioned.	**Moderate** Timing of project activities may affect some sensory experiences including traditional activities in the Project Area including moose harvesting and berry picking but	**Not significant** Denison has committed to a number of mitigation measures regarding noise, traffic and sensory disturbances to ensure monitoring is taking place and has committed to work

Predicted degree of residual effect							
Residual adverse effect	**Magnitude**	**Geographical extent**	**Duration**	**Frequency**	**Reversibility**	**Timing**	**Significance of residual effect**
avoidance of the area for traditional land use and ceremonial activities	due to sensory disturbance	primarily during construction activity.	to increased traffic to and from the site.	increase in human activity to the site		mitigation measures will help to reduce these sensory experiences during the cultural harvesting seasons where possible.	with Indigenous Nations and communities to understand when cultural important periods relative to harvest times culture camps are taking place to reduce potential sensory impacts.
Valued component – Transboundary environmental effects							
GHG emissions	**Low** Emissions from the Project would result in 0.041% of provincial emissions and 0.0043% of total national emissions, therefore no residual adverse effects anticipated after application of mitigation and follow-up monitoring measures.	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**Not significant** No residual adverse effects carried into significance assessment.

Appendix C. Acronyms

µg/m³	Micrograms per cubic meter
^{210}Pb	Lead-210
^{226}Ra	Radium-226
^{230}Th	Thorium-230
ACGIH	American Conference of Governmental Hygienists
ALARA	As Low As Reasonably Achievable
BAF	Bioaccumulation Factors
BATEA	Best Available Technology Economically Achievable
B-C Index	Benthic Index of Community
BC MOE	British Columbia Ministry of the Environment.
BNDN	Birch Narrows Dene Nation
CAAQS	Canadian Ambient Air Quality Standards
CCME	Canadian Council of Ministers of the Environment.
Cd	Cadmium
CEAA	*Canadian Environmental Assessment Act* (1992)
CEAA 2012	Canadian Environmental Assessment Act, 2012
CMD	Commission Member Document
CNSC	Canadian Nuclear Safety Commission
CNWA	Canadian Navigable Waters Act
Co	Cobalt
CO_2	carbon dioxide
COPC	constituents of potential concern
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
CSA	Canadian Standards Association
CSM	Conceptual Site Model
dBA	A-weighted decibels
Denison	Denison Mines Corp.
DFO	Fisheries and Oceans
DOC	Dissolved organic carbon.
EA	Environmental Assessment
EC	Electrical conductivity
ECCC	Environment and Climate Change Canada
EEM	Environmental Effects Monitoring
EEMP	Environmental Effects Monitoring Programs
EEMP	Environmental Effects Monitoring Programs
EIS	Environmental Impact Statement
EMP	Environmental Management Plan
EMS	Environmental Management System
EP	Environmental Protection
EPA	Environmental Protection Agency
EPP	Environmental Protection Plan
EPR	Environmental Protection Review
EPRP	Emergency Preparedness and Response Program
EPRP	Emergency Preparedness and Response Plan
ERFN	English River First Nation
FA	Federal authorities
FEFLOW	Subsurface flow and transport model
FEQG	Environmental Quality Guideline

FEQG	Federal Environmental Quality Guidelines.
FIRT	Federal-Indigenous Review Team
FWQG	Federal Water Quality Guideline
GCM	Global Climate Models
GHG	Greenhouse gas
GWMP	Groundwater Monitoring Program
GWR	Groundwater Regional
% HA	Percentage Highly Annoyed
%Ha	Percentage hectares
HC	Health Canada.
HCB	Heritage Conservation Branch
HHRA	Human Health Risk Assessment
HQ	Hazard Quotients
HRIA	Heritage Resource Impact Assessments
IAA	Impact Assessment Act
IDF	Intensity duration frequency
ILCR	Incremental lifetime cancer risk
ILRU	Indigenous Land and Resource Use
IR	Indigenous Land and Resource Use
IRs	Information requests
ISR	*In-situ* recovery
IWWTP	Industrial Wastewater Treatment Plant
KI	Key Indicators
KML	Kineepik Métis Local of Pinehouse
LCH	Licence conditions handbook
LLRIB	Lac La Ronge Indian Band
LNG	Liquefied natural gas
LSA	Local study area
LUC	Land Use Change
masl	Metres above sea level
MDMER	Metal and Diamond Mining Effluent Regulations
MF	Manitou Falls Group
Mfa	Read Formation
MFb	Bird Formation
MFc	Collins Formation
MFd	Dunlop Formation
MK	Métis Knowledge
MN-S	Métis Nation of Saskatchewan
MOE	Ministry of the Environment
mSv	Millisievert
MW	Megawatt
NEW	Nuclear Energy Workers
NO_2	Nitrogen Dioxide
NRCan	Natural Resources Canada
NSCA	*Nuclear Safety and Control Act*
NSEQC	Northern Saskatchewan Environmental Quality Committee
NVP	The Northern Village of Pinehouse
ORP	Oxidation-Reduction Potential
PAGC	Prince Albert Grand Council
PBCN	Peter Ballantyne Cree Nation
PD	Project Description

PFP	Participant Funding Program
PHREEQC	A computer program used to perform a wide variety of aqueous geochemical calculations.
PMP	Probable Maximum Precipitation
PPE	Personal Protective Equipment
Registry	The Canadian Impact Assessment Registry
RFD	reasonably foreseeable developments
Rights Impact Assessments	Rights Impact Assessments
RPP,	reasonably foreseeable developments
RSA	Regional study area
SACC	Strategic Assessment of Climate Change
SARA	*Species at Risk Act*
SARGSS	Saskatchewan Activity Restriction Guidelines for Sensitive Species
SDI	Simpson's Evenness Index
Se	Selenium
SEQG	Saskatchewan Environmental Quality Guidelines
SK MOE	Saskatchewan Ministry of the Environment
SKEAB	Saskatchewan Environmental Assessment Branch
SO_2	Sulfur Dioxide
SSA	Site study area
TC	Transport Canada
TDS	total dissolved solids
IK	Indigenous Knowledge
TLU	Traditional Land Use
TLV	Threshold Limit Values
TSP	Total suspended particles
TSS	Total suspended solids
U_3O_8	tri-uranium octoxide
UBS	Uranium bearing solution
UNSCEAR	United Nations Scientific Committee on the Effects of Atomic Radiation
VC	Valued component
VWP	Vibrating Wire Piezometers
YNLR	Ya'thi Néné Land and Resource Office

APPENDIX C: Consultation Report

Canada's Nuclear Regulator

Indigenous Consultation Report:

Wheeler River Project

August 2025

Edoc: 7531539 (word)

Edoc: 7559028 (PDF)

Canadian Nuclear Safety Commission
Commission canadienne de sûreté nucléaire

Canada

Signed/Signé le
11 August 2025 / 11 aout 2025

AdamLevine

Adam Levine, on behalf of Julia Cropley
Director General
Strategic Planning Directorate

Directrice générale
Direction de la planification stratégique

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Executive Summary

The Canadian Nuclear Safety Commission (CNSC) staff would like to acknowledge that the Denison Wheeler River Project ("the Project") is situated within Treaty 10 Territory, the homeland of the Métis, and within the traditional territories of the Dene, Cree, and Métis peoples. Treaty 10 (1906) covers the northeast quadrant of Saskatchewan and is bordered by Manitoba and Northwest Territories to the east and north, while the south and west border extends to central Saskatchewan and Alberta. Treaty 10 (1906) includes the signatories of seven First Nations and contains a provision that establishes treaty rights to hunt, fish and trap throughout the Treaty territory. Signatories of Treaty 10 include: English River First Nation, Birch Narrows Dene Nation, Buffalo River Dene Nation, Hatchet Lake First Nation, Canoe Lake Cree First Nation, Barren Lands First Nation and Northlands First Nation.

In support of *Commission Member Document 25-H9 Submission from CNSC Staff on Licence Application for Site Preparation and Construction for the Wheeler River Mine and Mill* (CMD) and *Environmental Assessment Report: Wheeler River Project* (EA Report), CNSC staff have developed this Consultation Report, which details consultation and engagement activities on the Project. This report is CNSC staff's *Indigenous Consultation Report for the Denison Wheeler River Project* (the "Consultation Report"). It provides key information and recommendations to date, as well as next steps regarding the Indigenous consultation and engagement activities conducted by CNSC staff in relation to the Denison EA and Licence to Prepare a Site and Construct application. The Consultation Report also provides information about Denison's engagement activities to date as per the requirements and guidance of *REGDOC-3.2.2, Indigenous Engagement* [1] and will form part of CNSC staff's submissions and recommendations to the Commission.

In 2019, CNSC staff provided early notification to Indigenous Nations and communities, that Denison had submitted a project description to develop an in-situ recovery (ISR) uranium mine in the Eastern Athabasca Basin in northern Saskatchewan, 4km west of Highway 914 and approximately 600 km north of Saskatoon. Since that time, CNSC staff have conducted a thorough consultation and regulatory process for Denison's Wheeler River Environmental Assessment (EA) and Licence to Prepare a Site and Construct Application ("the Application").

CNSC staff worked to collaboratively draft key sections of this report with identified Indigenous Nations and communities, including issues tracking tables, summary of consultation and engagement activities, rights impact assessments, and the conclusions section. The Indigenous Nation and community specific consultation activities sections (Sections 4.1 to 4.8) specify the sections of the report that were shared with each Indigenous Nation and community based on their Rights, interests and level of consultation and engagement with the CNSC in relation to the Project.

CNSC staff are committed to working with each Indigenous Nation and community and Denison to strive to achieve a consensus and resolution for any outstanding issues or concerns related to the Project, in advance of the Part 2 hearing scheduled for December 8th, 2025.

An update on consultation efforts with all identified Indigenous Nations and communities as well as updated issues tracking tables and Rights Impact Assessments (RIAs), will be submitted to the Commission as part of the CNSC staff's supplemental submission prior to the Denison Wheeler River Part 2 hearing. This submission will include CNSC staff's conclusions and recommendations with regards to consultation and impacts to Indigenous and/or Treaty Rights. Information will also be included regarding the outcomes of CNSC staff's efforts which aims to achieve consensus and secure the free, prior and informed consent (FPIC) of potentially impacted Indigenous Nations and communities on the proposed Project.

1 INTRODUCTION

The Consultation Report was created in addition to and in support of the CMD and EA Report for the Denison Wheeler River Project (the "Project"). CNSC staff's *Indigenous Consultation Report for the Denison Wheeler River Project* (the "Consultation Report") provides key information, and details regarding Indigenous consultation and engagement activities conducted by CNSC staff in relation to the regulatory process for the Project. The Consultation Report also provides information about Denison's engagement activities to date as per the requirements of *REGDOC-3.2.2: Indigenous Engagement*.

The CNSC's approach to consultation and engagement with Indigenous Nations and communities is guided by the Duty to Consult and accommodate, as required by subsection 35(1) of the *Constitution Act, 1982* [2], *United Nations Declaration on the Rights of Indigenous Peoples Act* (UNDA) [3] and the CNSC's commitment to Reconciliation, as discussed below.

CNSC staff acknowledge that at the time of publishing this Consultation Report, some Indigenous Nations and communities have outstanding concerns including concerns of potential effects to Indigenous and/or Treaty rights (see Section 4 and Appendix A for additional details). CNSC staff are committed to working with the engaged Indigenous Nations and communities through further consultation on the Project to identify potential additional commitments and mitigations to address the concerns related to the Project, as appropriate. CNSC staff aim to achieve consensus and resolution for any outstanding issues or concerns related to the Project.

CNSC staff note that there will be a two-part hearing for the Project and Part 2 of the hearing will focus on the interventions received. To provide additional time to collaborate and consult with Indigenous Nations and communities, CNSC staff will be submitting a supplemental submission to the Commission in advance of the Part 2 hearing.

This supplemental submission will include an update on CNSC staff's consultation activities, Rights Impact Assessments (RIAs) with English River First Nation (ERFN), Kineepik Métis Local (KML), Ya'thi Nene Lands and Resources (YNLR) and Métis Nation – Saskatchewan (MN-S), updated issues tracking tables, updated consultation log, Denison's engagement activities, conclusions, and recommendations with regards to the Duty to Consult and, where appropriate, accommodate. Information will also be included about the outcomes of CNSC staff's efforts to strive to achieve consensus and secure the Free, Prior and Informed Consent (FPIC) of potentially impacted Indigenous Nations and communities on the proposed Project.

CNSC staff note that requirements and conditions related to the specific commitments made by Denison to Indigenous Nations and communities are captured in a proposed Licence Condition on Indigenous Engagement and related Licence Condition Handbook text.

1.1 Duty to Consult and, where appropriate, Accommodate

The common-law duty to consult and, where appropriate, accommodate Indigenous Nations and communities applies when the Crown contemplates actions that may adversely affect potential or established Indigenous and/or Treaty rights. The Commission, as an agent of the Crown, must ensure that all licence decisions under the *Nuclear Safety and Control Act* (NSCA) [4] and

decisions under other applicable legislation, uphold the honour of the Crown and consider Indigenous peoples' potential or established Indigenous and/or treaty Rights, pursuant to section 35 of the *Constitution Act, 1982* [2]. CNSC staff work in collaboration and consultation with potentially impacted Indigenous Nations and communities to assess potential impacts on Rights and propose mitigation or accommodation measures to address identified impacts.

At the outset of a licence application and/or environmental assessment, CNSC staff conduct an initial assessment to determine whether there is a common law duty to consult obligation for the CNSC. If the duty to consult is triggered, the CNSC then assesses the depth of the duty to consult and, where appropriate, accommodate.

The CNSC's approach to assessing the preliminary depth of the duty to consult is in line with the process and policies outlined in the *Aboriginal Consultation and Accommodation - Updated Guidelines for Federal Officials to Fulfill the Duty to Consult* [5]. In order to assess the potential depth of consultation, the CNSC uses resources such as Crown-Indigenous Relations and Northern Affairs Canada's *Aboriginal and Treaty Rights Information System* (ATRIS) [6], information regarding Indigenous and Treaty Rights shared by Indigenous Nations and communities through interventions or submissions, as well as information gathered and submitted by proponents or licensees as outlined in *REGDOC-3.2.2: Indigenous Engagement* [1]. As the CNSC is not a Rights-determining body, the CNSC does not conduct a strength of claim analysis. The CNSC does not have the authority to confirm, establish or deny the existence of Indigenous and/or treaty Rights as claimed or asserted by Indigenous Nations and communities. Rather, using the sources of data listed above, the CNSC assesses the potential severity of the potential impacts of the proposed project on potential or established rights to determine what depth of consultation may be required to adequately discharge the duty to consult and, where appropriate, accommodate.

CNSC staff continuously evaluate and update the assessment of the depth of the Duty to Consult and, where appropriate, accommodate, as additional information is made available. This can include information provided by Indigenous Nations and communities with regards to the nature and extent of their Rights that may be impacted by the Project, as well as based on CNSC staff's technical assessment of the Project's potential impacts on people, the environment and Indigenous Nations and communities. CNSC staff ensure that the approach to consultation is commensurate with the assessed depth of consultation and is flexible based on the specific needs of each Indigenous Nation and community.

The CNSC sets out requirements and guidance for licensees and applicants whose proposed projects may raise the Crown's duty to consult in *REGDOC-3.2.2: Indigenous Engagement*. While the CNSC cannot delegate its duty to consult obligation, procedural aspects of the consultation process can be carried out by proponents in support of meeting the CNSC's consultation obligations, where appropriate. For this matter, the CNSC will be considering the engagement undertaken by Denison and proposed mitigations or accommodation, when assessing whether the Duty to Consult and, where appropriate, accommodate has been met.

1.2 United Nations Declaration on the Rights of Indigenous Peoples

The *United Nations Declaration on the Rights of Indigenous Peoples* (UN Declaration) [7] is an international human rights instrument that recognizes the human Rights of Indigenous peoples around the world. On June 21, 2021, the *United Nations Declaration on the Rights of Indigenous Peoples Act* (UNDA) [3] received Royal Assent and came into force in Canada. This legislation provides a framework for the Government of Canada to work with Indigenous peoples to implement the UN Declaration at the Federal level.

The CNSC is committed to supporting the Government of Canada's whole-of-government approach to implementing UNDA, and the *2023-2028 UNDA Action Plan* [8] (*UNDA Action Plan*), where it intersects with the CNSC's mandate. The principle of free, prior and informed consent (FPIC) is an integral aspect of UNDA that is reflected in the *2023-2028 UNDA Action Plan* [8]. The CNSC is working to advance reconciliation and build meaningful, long-term partnerships with Indigenous peoples, communities and organizations. CNSC's approach to reconciliation is guided by the principles of the *United Nations Declaration on the Rights of Indigenous Peoples Act* (UNDA) [3], is focused on establishing strong relationships through consistent and meaningful consultation and engagement. CNSC continues to collaborate with other federal departments and agencies to inform the implementation of the Government of Canada's *United Nations Declaration on the Rights of Indigenous Peoples Act* (UNDA) and related government Action Plan. This includes working in consultation and cooperation with our Indigenous partners and relevant federal departments and agencies to support the implementation of measures in the UNDA Action Plan that intersect with the CNSC's mandate.

Measure #32 in the Shared Priorities chapter of the UNDA action plan commits to "the development of guidance for engaging with Indigenous Peoples on natural resources projects in order to obtain free, prior and informed consent, consistent with Articles 18, 19, 20, 27, 28, 29, and 32 of the United Nations Declaration on the Rights of Indigenous Peoples.". This measure is being led by Natural Resources Canada (NRCan), with the support of various federal departments of agencies, and is currently in the planning phase.

The CNSC is currently using the following sources of guidance on FPIC:

- *Principles respecting the Government of Canada's relationship with Indigenous peoples* [9], principle #6

"The Government of Canada recognizes that meaningful engagement with Indigenous peoples aims to secure their free, prior, and informed consent when Canada proposes to take actions which impact them and their Rights, including their lands, territories and resources."

- *Backgrounder: United Nations Declaration on the Rights of Indigenous Peoples Act* [10]- FPIC section:

"More specifically, FPIC describes processes that are free from manipulation or coercion, informed by adequate and timely information, and occur sufficiently prior to a decision so that Indigenous Rights and interests can be incorporated or addressed effectively as part of

> *the decision making process - all as part of meaningfully aiming to secure the consent of affected Indigenous peoples.*
>
> *FPIC is about working together in partnership and respect. In many ways, it reflects the ideals behind the relationship with Indigenous peoples, by striving to achieve consensus as parties work together in good faith on decisions that impact Indigenous Rights and interests. Despite what some have suggested, it is not about having a veto over government decision making".*

The CNSC's approach to consultation and engagement with Indigenous peoples is mindful of and incorporates the principles articulated in UNDA. The CNSC strives to achieve consensus and secure the free, prior and informed consent (FPIC) of potentially impacted Indigenous Nations and communities on the proposed Project through collaborative consultation approaches that allow for open dialogue and provides opportunities to understand, document, and address the concerns of Indigenous Nations and communities, including measures to avoid or minimize potential impacts to their Rights and interests, to the greatest extent possible. Concerns raised by Indigenous Nations and communities, including related to consent or lack of consent for a project, are considered as part of the consultation process including the public hearing and the Commission's decision-making process. The CNSC provides funding through the Participant Funding Program (PFP) and the Indigenous and Stakeholder Capacity Fund (ISCF) to support meaningful participation in Commission proceedings and the CNSC's ongoing regulatory work. The CNSC also actively seeks to understand, support and follow an impacted Nation's approach to reaching their position on FPIC for a proposed project and looks to adapt its processes and procedures based on the Nation's processes, laws, customs and requests, where possible. The CNSC's goal is to ensure that the consultation process is robust and works to establish a clear, transparent and collaborative approach to seeking the FPIC of potentially impacted Nations and supporting them in clearly communicating their process and position with regards to consent for the proposed Project to the Commission to inform its decision-making on the Project.

The CNSC is also committed to continuing to evolve its approaches to align with best practices and guidance that emerge through Court decisions and the whole-of-government implementation of UNDA, and the *UNDA Action Plan*, including activities outlined by Indigenous Nations and communities that relate to their FPIC process. CNSC is ensuring that its consultation and regulatory processes uphold and are consistent with the principles of UNDRIP and are adapted to any changes in case law, policies and action plan measures in relation to implanting UNDRIP in the Canadian context. This includes initiating formal consultation on proposed updates and amendments in 2025 to the CNSC's *REGDOC-3.2.2: Indigenous Engagement* to provide nuclear proponents and licensees with further guidance and clarity with regards to how their approach to engagement and partnership with Indigenous Nations can align with UNDA.

As part of CNSC staff's supplemental submission to the Commission in support of the Part 2 hearing, CNSC staff will outline the process and position of each potentially impacted Nation with regards to their FPIC for the Project, should this information be shared with CNSC staff. In addition, potentially impacted Indigenous Nations or communities that wish to express their views directly to the Commission regarding their process and position on their FPIC in relation to the proposed Project, are encouraged to use the opportunity through their written and/or oral

interventions. This will help assist and inform the Commission's decision-making in relation to the Project.

1.2.1 Role of the Proponent

CNSC staff encourages all nuclear proponents and licensees to pro-actively work with Indigenous Nations and communities who are potentially impacted by their projects to establish a mutually agreeable process which aims to secure the potentially impacted Nation's FPIC for their proposed project and communicate the process and any outcomes of the FPIC process to the CNSC to help inform CNSC staff's recommendations to the Commission.

CNSC staff acknowledge that some Indigenous Nations and communities have raised concerns regarding FPIC and have requested that Denison aim to secure FPIC, specific to the Denison Wheeler River Project. CNSC staff have discussed these concerns with Denison and have encouraged Denison to work collaboratively with potentially impacted Indigenous Nations and communities to address the concerns related to FPIC. Given the DTC and seeking of FPIC is the responsibility of the Crown, the CNSC has conducted consultation activities in a manner that strives to obtain FPIC, while Denison's engagement and collaboration activities have supported the Crown's efforts in this regard.

1.3 CNSC's Commitment to Reconciliation

The CNSC's approach to reconciliation focuses on establishing ongoing collaborative relationships through consistent and meaningful engagement and consultation, and it aims to build capacity and seek to improve opportunities for the participation of Indigenous Nations and communities in decision making and regulatory oversight activities throughout the full lifecycle of nuclear facilities and projects located in their territories.

The CNSC is committed to listening actively, establishing regular dialogue, and understanding the perspectives and values shared by Indigenous Nations and communities. Feedback from Indigenous Nations and communities, along with priorities identified by each Nation, guide how the CNSC identifies key areas of focus for implementing action and change.

The following initiatives are some of our key reconciliation areas:

- Formalizing Terms of Reference (TOR) for long-term engagement with Indigenous Nations and communities.
- Incorporating and reflecting Traditional Knowledge and Métis Knowledge and ceremony into the CNSC's regulatory processes and assessments.
- Reducing financial and capacity barriers to participate in the full lifecycle of the CNSC's regulatory activities.
- Updating regulatory documents and expectations to better reflect Indigenous Nations and communities' perspectives and the principles of UNDA.
- Increasing CNSC staff's Indigenous cultural competency and awareness.

- Collaborating with Indigenous Nations on monitoring, oversight and follow-up activities in relation to nuclear facilities and activities in their territory to ensure that their communities are safe and territories, rights and interests are protected.

Additional information about the key initiatives with regards to the CNSC's reconciliation initiatives can be found on the CNSC website here: *Reconciliation*

1.4 Identification of Indigenous Nations and communities

CNSC staff have identified the Indigenous Nations and communities with potential or established Indigenous and/or treaty Rights that may be adversely affected by the Wheeler River Project. The Indigenous Nations and communities have been identified based on analysis conducted using Crown Indigenous Relations and Northern Affairs Canada (CIRNAC) ATRIS [6] and other mapping and database tools, as well as through a review of existing CNSC and publicly available resources including CNSC records and previous interventions and submissions by Indigenous Nations and communities who may have expressed interest in the Project area in the past.

CNSC staff identified the following Indigenous Nations and communities who have Indigenous and/or Treaty Rights in the area where the Wheeler River Project is proposed (collectively, the "potentially impacted Indigenous Nations and communities"):

- English River First Nation
- Kineepik Métis Local #9
- Ya'thi Nené Lands and Resource Office which represents the communities of Hatchet Lake First Nation, Black Lake First Nation and Fond du Lac First Nation as well as the municipalities of Camsell Portage, Uranium City, Stony Rapids and Wollaston Lake
- Métis Nation-Saskatchewan

In addition, based on the information reviewed and received to date, CNSC staff have identified the following Indigenous Nations and communities that have expressed an interest in the Wheeler River Project (collectively, the "interested Indigenous Nations and communities"):

- Lac La Ronge Indian Band
- Peter Ballantyne Cree Nation
- Birch Narrows Dene Nation
- Prince Albert Grand Council

The potentially impacted Indigenous Nations and communities and the interested Indigenous Nations and communities collectively will be referred to as the "identified Indigenous Nations and communities."

CNSC also originally identified Buffalo River Dene Nation and Meadow Lake Tribal Council for purposes of this Project however, Buffalo River Dene Nation and Meadow Lake Tribal Council have not responded to previous correspondence and have not indicated an interest in the Project

to date, therefore no consultation and engagement activities with these representative Nations are described in the Consultation Report.

This determination is a preliminary assessment that can be adjusted based on information received from Indigenous Nations and communities throughout the lifecycle of the Wheeler River Project, should it proceed.

1.5 CNSC staff's approach to consultation for the Denison Wheeler River Project

CNSC staff have been consulting and engaging with potentially impacted or interested Indigenous Nations and communities with regards to the Denison Wheeler River Project on an on-going basis since 2019 as part of the federal EA under the *Canadian Environmental Assessment Act* 2012 [11] (CEAA 2012) and the Licence to Prepare a Site and Construct Application under the NSCA review processes. Consultation efforts during the EA and Licensing assessment process include, but are not limited to letters, emails, telephone calls, regular meetings, community meetings, community tours, meetings with leadership, funding support, technical discussions, review and comment periods and collaboration on reporting and assessments. These efforts will be further explained below as well in Section 4 and Appendix B of this report. Invitations to review and provide comments during key points of the process were provided as well as opportunities to apply for funding through CNSC's Participant Funding Program (PFP) and the Indigenous and Stakeholder and Capacity Fund (ISCF).

CNSC staff have ensured that the consultation and engagement process for the Wheeler River Project took into consideration recent changes and evolution of best practices and case law. This includes UNDA, the CNSC's commitment to reconciliation and Principles Respecting the Government of Canada's Relationship with Indigenous Peoples [9]. CNSC staff also acknowledge that should the Denison Wheeler River Project proceed through the licensing stages with an approved EA and licence application, there will be a continued obligation on the CNSC continue to consult and engage Indigenous Nations and communities over the lifecycle of the Denison Wheeler River Project, should it proceed. Specifically, for the Denison EA and Licence to Prepare a Site and Construct Application, based on CNSC staff's assessment as described in Section 1.1 above, CNSC staff determined that the application for both the EA and Licensing raised the CNSC's legal duty to consult and, where appropriate, accommodate, potentially affected Indigenous Nations and communities.

CNSC staff sought information from potentially impacted Indigenous Nations and communities about the nature of their Indigenous and/or Treaty Rights protected under section 35 of the *Constitution Act, 1982*, how they may be impacted by the Project and potential measures, commitments and/or conditions to meaningfully address potential impacts and concerns identified by the Nations. As part of this process, CNSC staff considered information provided by the Indigenous Nations and communities as well as by Denison about the potential impacts of the Project, in an effort to understand the nature, scope and extent of any adverse impacts on Indigenous Nations and communities rights and interests and potential measures to address those impacts and concerns, as well as the FPIC process and position of each potentially impacted Nation.

Following current best practises and approaches for consultation and in an effort to ensure potentially impacted Indigenous Nations and communities were able to present their views in a collaborative and meaningful way with respect to potential impacts of the Project on their Rights and interest, CNSC staff have sought the input of potentially impacted Nations in relation to Nation-specific Rights Impact Assessments (RIA) to help ensure that the Project's potential impacts on their rights and interests are thoroughly considered, assessed and addressed as part of the consultation process and recommendations to the Commission. RIAs specific to the Project are being developed with potentially impacted Indigenous Nations and communities including ERFN, KML, YNLR and MN-S.

CNSC staff have consulted the identified Indigenous Nations and communities about the Project with consideration of the Government of Canada and CNSC's commitments to Reconciliation. CNSC staff also considered the principles of UNDA with the goal of working to achieve consensus and secure the FPIC of potentially impacted Indigenous Nations and communities on the proposed Project. Staff conducted the following consultation activities with the identified Indigenous Nations and communities:

- Providing early notification in April 2019 regarding the submission of Denison's project description followed by notification letters including information on Denison's proposed Wheeler River Project and next steps in the regulatory process and offering opportunities for early consultation and engagement with the identified Indigenous Nations and communities to discuss the Project.
- Offering to discuss how each Indigenous Nation and community would like to be consulted and create an approach to consultation that would be meaningful and mutually agreeable, including the development of project specific consultation protocols and arrangements.
- Responding to and working with potentially impacted Indigenous Nations and communities and Denison to address issues and concerns raised, while striving to achieve a consensus on each issue.
- Monitoring and providing feedback on Denison's engagement activities, including support for and inclusion of Traditional and Métis Knowledge, Land Use data and the perspectives of Indigenous Nations in communities in their Environmental Impact Statement (EIS), Indigenous Engagement Reports and other submissions and studies based on the requirements of *CEAA, 2012* and *REGDOC 3.2.2: Indigenous Engagement*.
- Ensuring that Denison responded to and addressed all comments and concerns raised by Indigenous Nations in relation to their EIS and other submissions.
- Collaborating on issues tracking tables, which are included in Appendix A. An issues tracking table was created for each engaged Indigenous Nation or community who has raised a concern related to the Project. The issues tracking tables outline the issues and concerns raised and responses and status of the issue.
- Providing opportunities to comment on and review the draft Environmental Impact Statement (EIS) and technical documents.

- Providing funding and capacity support through the consultation and engagement process through the CNSC's PFP and ISCF funding programs.
- Providing information and consulting on the CNSC staff's technical review and assessment of Denison's application and related programs, documents and reports.
- Providing opportunities for the potentially impacted Indigenous Nations and communities to participate in the Federal and Indigenous Review Team (FIRT) for the Denison Wheeler River federal EA process.
- Seeking to understand and confirm each impacted Nations specific position with regards to its FPIC for the Project and their community specific FPIC process, where appropriate.
- Collaborating on the drafting of CNSC staff's Consultation Report with each identified Indigenous Nation and community who has raised concerns related to the Wheeler River Project to ensure the views of each Indigenous Nation and community are reflected, including where there are disagreements, and proposed measures and commitments by CNSC staff and Denison to address the issues and concerns raised to date.
- Completing RIAs, including discussions on the mitigations, commitments and potential accommodations to address potential impacts on rights, with input from potentially impacted Indigenous Nations and communities including ERFN, KML, YNLR and MN-S, in response to concerns raised about the potential for the application to impact their Rights and interests.
- Supporting and encouraging participation in the regulatory review process including all phases of the EA and licensing review and the Commission hearing, through interventions for the Denison Wheeler River Project.

CNSC staff and Denison have also committed to providing opportunities for Indigenous Nations and communities to continue to participate in the regulatory process throughout the lifecycle of the Wheeler River Project, should the Project proceed. This includes committing to work together with the identified Indigenous Nations and communities through the lifecycle of this Project to address any issues and concerns as they arise. Denison has offered and funded opportunities for Indigenous Nations and communities to conduct Traditional and Métis Knowledge studies that have been incorporated throughout the regulatory process and CNSC will continue to be open in considering funding for studies and initiatives that could help to inform future stages of the Project, should it proceed.

CNSC staff will continue to consult with the identified Indigenous Nations and communities regarding the commitments that are made throughout this process by both CNSC staff and Denison. CNSC staff note that based on the outcomes of CNSC staff's consultation activities and Denison's engagement activities:

- CNSC staff are proposing a Licence Condition on Indigenous engagement which includes requirements for Denison to report annually on their engagement activities and progress on implementing their commitments to Indigenous Nations and communities.

- CNSC staff commitments will be captured in a final commitment list for each potentially impacted Indigenous Nation and community in the supplemental submission, to be provided to the Commission in advance of the Part 2 Commission hearing.

Details regarding CNSC staff's consultation activities to date with regards to the Denison Wheeler River Project is found in Section 4 of this report.

CNSC staff acknowledge that at the time of publishing this Indigenous Consultation Report, some Indigenous Nations and communities have outstanding concerns with regards to the Project (see Appendix A issues tracking tables for additional details). CNSC staff are committed to working with each Indigenous Nation and Denison with the aim to secure consensus on the Project, including the outstanding issues and concerns in scope of the Project, in advance of the Part 2 hearing.

CNSC staff will provide a supplemental submission to the Commission in advance of the Part 2 Commission hearing on the status of CNSC's staff's consultation efforts, Denison's engagement, the outcomes from the CNSC's efforts to aim to secure consensus on key issues and FPIC on the Project of potentially impacted Nations, concerns and any key measures and commitments to address any potential impacts as the result of the Project.

2 ASSERTED OR ESTABLISHED INDIGENOUS AND/OR TREATY RIGHTS IN THE PROJECT AREA

The Denison Wheeler River Project is a proposed in situ recovery (ISR) uranium mine and processing plant in northern Saskatchewan, Canada. It is located in Saskatchewan's Athabasca Basin approximately 4 km west of Highway 914. The Project falls within the boundaries of Treaty 10, the Nuhtsiye-kwi Benene (Ancestral Lands) of English River First Nation, the traditional territory of the Kineepik Metis Local #9, the homeland of the Metis and the Nuhenene, the traditional territory of the Athabasca Denesuline.

The Wheeler River Project is situated within Treaty 10 Territory, the homeland of the Métis, and within the traditional territories of the Dene, Cree, and Métis peoples. Treaty 10 (1906) covers the northeast quadrant of Saskatchewan and is bordered by Manitoba and Northwest Territories to the east and north, while the south and west border extends to central Saskatchewan and Alberta. Treaty 10 (1906) includes the signatories of seven First Nations and contains a provision that establishes treaty rights to hunt, fish and trap throughout the Treaty territory. Treaty 10 includes the seven First Nations listed below. Treaty 10 contains the following provision that establishes treaty rights to hunt, trap, and fish:

"And His Majesty the King hereby agrees with the said Indians that they shall have the right to pursue their usual vocations of hunting, trapping and fishing throughout the territory surrendered as heretofore described, subject to such regulations as may from time to time be made by the government of the country acting under the authority of His Majesty and saving and excepting such tracts as may be required or as may be taken up from time to time for settlement, mining, lumbering, trading or other purposes."

Signatories of Treaty 10:

1. Birch Narrows First Nation (SK)
2. Buffalo River Dene Nation (SK)
3. Canoe Lake Cree First Nation (SK)
4. English River First Nation (SK)
5. Hatchet Lake First Nation (SK)
6. Barren Lands First Nation (MB)
7. Northlands First Nation (MB)

No communities are located within the immediate proximity of the Wheeler River property. Travelling by existing roads, the closest community to the Project is approximately 260km away. Calculated using a straight line, the closest communities are approximately 150km from the site. The federal lands within a 100km radius of the Wheeler River Project area are First Nation reserve lands which do not contain permanent residences [12]. These reserve lands belong to ERFN.

Figure 1: Table Showing the Distances Between the Project and the 5 Closest First Nations Reserves

Federal Land Type	Name	Distance from Project (km)
First Nation	English River First Nation Slush Lake Reserve No. 192Q	16
First Nation	English River Barkwell Bay Indian Reserve 192I	39
First Nation	English River First Nation Mawdsley Lake Reserve No. 192R	91
First Nation	English River Haultain Lake Indian Reserve 192K	94
First Nation	Cree Lake Indian Reserve 192G	98

Figure 2: Showing the Saskatchewan Treaty Locations in Relation to the Project Site

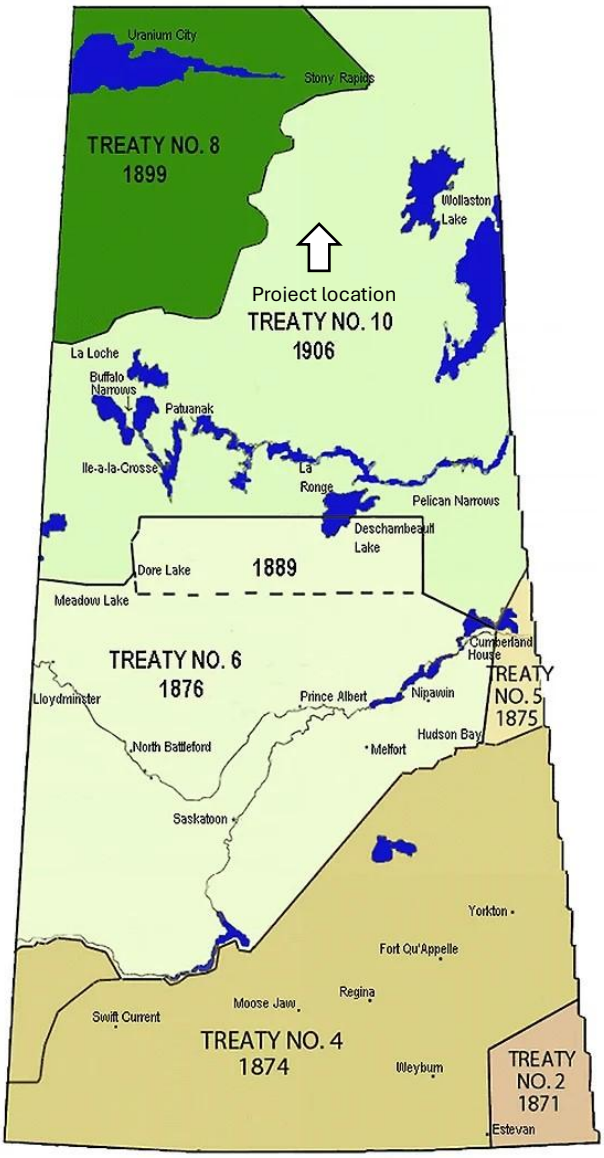
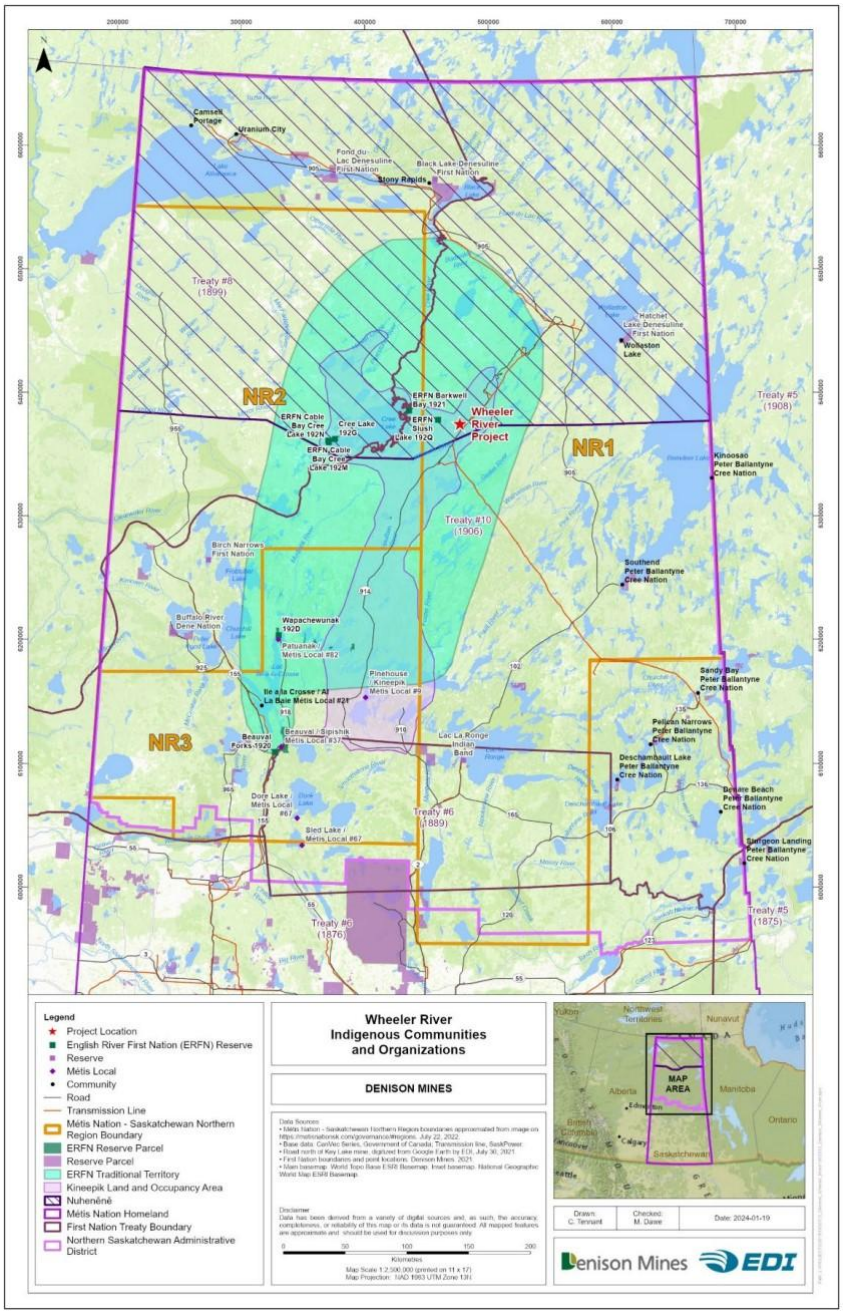


Figure 3: Map Showing the Project Site in Relation to Proximate Indigenous Nations and Communities *[12]*



3 PARTICIPANT FUNDING PROGRAM

In order to support the participation of the identified Indigenous Nations and communities in all phases of the Denison Wheeler River regulatory review process, CNSC staff made funding available through the CNSC's PFP to all identified Indigenous Nations and communities on

multiple occasions. In total, since providing early notification regarding the proposed Wheeler River Project, the CNSC has allocated $966,342 as shown in Table 1, to support the participation of the identified Indigenous Nations and communities in the Wheeler River regulatory review process which included funding for English River First Nation participating in the Federal Indigenous Review Team (FIRT) for the Project. Additional funding was provided to members of the public and interested parties, as described in the *Commission Member Document 25-H9 Submission from CNSC Staff on Licence Application for Site Preparation and Construction for the Wheeler River Mine and Mill.*

Two stages of funding have been made available:

- Stage 1 - Participant funding to support the initial review of Denison's environmental impact statement (EIS) review document and participate in meetings and workshops with CNSC staff. This participant funding opportunity was open for applications from January 10 to March 14, 2022.
- Stage 2 - Participant funding to support the final stages of the Wheeler River regulatory review process and participate in the public Commission hearings. This participant funding opportunity was open for applications from February 3 to April 4, 2025.

Table 1: Participant funding approved for the Wheeler River Project

Indigenous Nation or community	Stage 1 approved funding	FIRT Participation Funding	Stage 2 approved funding	Total approved funding
English River First Nation	$92,158	$88,780	$75,814	$256,752
Kineepik Métis Local #9	$64,000	N/A	$65,800	$129,800
Ya'thi Nene Lands and Resources	$82,125	N/A	$90,160	$172,285
Métis Nation - Saskatchewan	$55,000	N/A	$94,477	$149,477
Birch Narrows Dene Nation	$47,440	N/A	$56,166	$103,606
Peter Ballantyne Cree Nation	$45,000	N/A	$45,422	$90,422
Lac La Ronge Indian Band	Did not apply	N/A	$45,000	$45,000
Prince Albert Grand Council	$19,000	N/A	Did not apply	$19,000

4 CNSC STAFF'S CONSULTATION AND ENGAGEMENT ACTIVITIES

To fulfill the CNSC's consultation obligations for the decision under the NSCA and CEAA 2012 on the Wheeler River Project, CNSC staff sent early notification of the expected Wheeler River Project application in April 2019 to the identified Indigenous Nations and communities and since then have provided multiple opportunities for consultation, dialogue and collaboration with Indigenous Nations and communities regarding their concerns and interests related to the Project. CNSC staff provided opportunities for dialogue through multiple phone calls, correspondence, and meetings with leadership and community representatives, as well as through the provision of funding and capacity support. CNSC staff have also encouraged the identified Indigenous Nations and communities to participate in the Commission's public hearing process to advise the Commission of any concerns they may have and proposed resolutions to those concerns. Additional information about the specific consultation and engagement activities with each identified Indigenous Nation and community is provided in the subsections below.

CNSC staff provided regular updates to each identified Indigenous Nation and community as part of its consultation process, to keep them informed of key developments in relation to the regulatory review process for the Project and to solicit their feedback and perspectives on the Project, the potential impacts to their Indigenous and/or Treaty Rights, as well as the regulatory review and consultation processes. CNSC staff offered opportunities for a collaborative approach with the Indigenous Nations and communities with respect to reviewing and commenting on relevant sections of this Consultation Report, including the issues tracking tables in Appendix A. In addition, CNSC staff continue to work with each potentially impacted Indigenous Nation to solicit feedback on the Nation specific RIAs for the Project including discussions on how concerns about potential impacts to rights and interests can be addressed.

CNSC staff are completing ongoing consultation with Indigenous Nations and communities that may result in additional mitigation, accommodation, and/or follow-up measures by CNSC, the province, and/or Denison. The CNSC is committed to working with the identified Indigenous Nations and communities through further consultation and engagement on the Project to identify additional commitments, mitigations and a path forward to addressing the concerns related to the Project, as appropriate. The final commitments list will be included in the CNSC's supplemental submission to the Commission.

In summary, CNSC staff are committed to:

- Continuing to collaborate with Indigenous Nations and communities on ongoing oversight of Denison's commitments to address concerns and recommendations identified
- Continuous engagement and discussions on ongoing environmental monitoring programs such as site specific Independent Environmental Monitoring Program (IEMP) and the regional Eastern Athabasca Regional Monitoring Program (EARMP) results
- Engaging directly with interested Indigenous Nations and communities on the Uranium Mines and Mills Regulatory Oversight Reports (ROR) each year, in order to support Nation's participation in this process and ensure the sites within Indigenous Nations and

communities' traditional territories are operating safely and adhering to all licence conditions and regulations
- Sharing environmental compliance and performance reports, environmental risk assessments, and other health related studies with interested Indigenous Nations and communities
- Ongoing engagement, communication, information sharing and collaboration with Indigenous Nations and communities through long-term engagement TOR's
- Continuing ongoing community visits and engagements with community members and leadership

CNSC staff have also been consulting and engaging with the identified Indigenous Nations and communities on an ongoing basis concerning other nuclear projects and activities in northern Saskatchewan. The CNSC has Terms of Reference (TORs) for long-term engagement in place with English River First Nation and Ya'thi Nene Lands and Resources. CNSC staff are developing a TOR for long-term engagement with Kineepik Métis Local within the 2025 calendar year. The CNSC has also offered to develop a TOR for long-term engagement with the Métis Nation – Saskatchewan.

The TORs provide a forum for collaboration and a structure for regular meetings and dialogue to address areas of interest or concern regarding CNSC-regulated facilities and activities, including the Denison Wheeler River Project, that are located within Indigenous Nations' traditional territories.

During these reoccurring meetings, CNSC staff provided updates specific to the Project, and had consultations and discussions regarding interests, concerns and potential impacts on Indigenous and/or Treaty Rights in relation to the Wheeler River Project. CNSC staff have both offered and held multiple Denison-specific meetings to discuss issues of concern, and to collaborate proactively on an approach to consultation and engagement for the Project. In addition to the Nations whom CNSC has established TORs with, CNSC continues to offer and have regular meetings and discussions on the Project with the identified Indigenous Nations and communities including KML, MN-S, LLRIB, PBCN and BNDN.

CNSC staff also developed a TOR for Consultation on the Project with ERFN in December 2021 which outlined a collaborative and mutually agreeable approach to the consultation, regulatory review and the assessment processes for the Project. This included opportunities for ERFN's participation in the technical review of the draft EIS and their participation in the Federal Indigenous Review Team (FIRT), reviews of responses to information requests, and collaborating on the RIA process. CNSC staff offered this same process to KML, YNLR and MN-S but due to capacity constraints, MN-S and KML indicated that they would prefer to keep consulting and engaging on the Project during regular monthly meetings and did not require the development of a project specific Terms of Reference. YNLR decided to continue working on the Project through our long-term engagement TOR and when needed, project-specific meetings.

Table 2 below contains a summary of the key correspondence and opportunities to participate in the consultation and regulatory process for the Denison Wheeler River Project since early notification of the Wheeler River application was provided to Indigenous Nations and communities in April 2019.

Appendix B includes copies of the key correspondence associated with the consultation activities listed in Tables 2. CNSC staff have included general correspondence with all identified Indigenous Nations and communities, such as examples of notifications at key project milestones, notices about funding opportunities and outreach events. Appendix B also includes correspondence associated with the consultation and engagement activities listed in Tables 3 through Table 10. This includes offers to meet and consult on the Denison Wheeler River Project, opportunities to review and collaborate on CNSC documents and issues, concerns, comments or questions received and CNSC staff responses.

Table 2: Summary of the general correspondence and opportunities to participate in the consultation and regulatory process for the Project

Date	Indigenous Nation or community	Correspondence / Activity
April 2019	English River First Nation Hatchet Lake First Nation Black Lake First Nation Fond du Lac First Nation Métis Nation-Saskatchewan Birch Narrows Dene Nation Ya'Thi Nené Lands and Resources Prince Albert Grand Council	On April 9, 2019, CNSC staff sent an email correspondence providing advance notice of the Denison Mines Corp. (Denison) proposed Wheeler River Project to the identified Indigenous Nations and communities. On April 15, 2019, CNSC staff sent a letter via email with further information regarding the proposed Project and provided information about early and ongoing engagement and consultation opportunities which included opportunities to meet.
May 2019	English River First Nation Hatchet Lake First Nation Black Lake First Nation Fond du Lac First Nation Métis Nation-Saskatchewan Birch Narrows Dene Nation Ya'Thi Nené Lands and Resources	On May 31, 2019, CNSC staff informed the identified Indigenous Nations and communities of the submission of the Wheeler River Project description and offered the opportunity to provide comments.

	Prince Albert Grand Council	
December 2019	English River First Nation Hatchet Lake First Nation Black Lake First Nation Fond du Lac First Nation Métis Nation-Saskatchewan Birch Narrows Dene Nation Ya'Thi Nené Lands and Resources Prince Albert Grand Council	On December 24, 2019, CNSC staff provided an update about the Commission's decision on the scope of the EA for the proposed Wheeler River Project along with the Record of Decision. CNSC staff indicated that there will be a formal letter regarding the decision, next steps in the EA process and information related to PFP opportunities.
March 2020	All identified Indigenous Nations and communities	On March 20, 2020, CNSC staff sent notification letters to engaged Indigenous Nations and communities that the CNSC finalized the scope of factors to be considered in the EA of the Wheeler River Project proposed by Denison. The letter also outlines invitation to consult, next steps in the EA process and information on PFP opportunities as well as the current status of the Project noting that Denison decided to place a hold on EA activities related to the Project.
February 2021	All identified Indigenous Nations and communities	On February 15, 2021, CNSC staff sent letters providing notification of the resumption of EA activities for the Wheeler River Project.
March 2021 and April 2021	English River First Nation	On March 26 and April 12, 2021, CNSC staff sent a follow up email to the

	Ya'thi Nené Lands and Resources Métis Nation – Saskatchewan Birch Narrows Dene Nation	February letter with an offer to meeting to consult on next steps of the EA process.
January 2022	All identified Indigenous Nations and communities	On January 10, 2022, CNSC staff sent a PFP notice to all Indigenous Nations and communities for the opportunity to review the draft EIS for the Wheeler River Project proposed by Denison.
March 2022	All identified Indigenous Nations and communities	On March 9, 2022, CNSC staff sent a reminder that funding through the PFP is available to assist Indigenous Nations and communities to review the draft Environmental Impact Statement (EIS) for the Wheeler River Project.
June 2022	All identified Indigenous Nations and communities	On June 13, 2022, CNSC staff sent letters notifying the identified Indigenous Nations and communities about Denison's Application for a Nuclear Substances and Radiation Devices licence for the Wheeler River Project. It outlines that the application is for the temporary storage and use of natural uranium and will follow with a test to determine the feasibility of the proposed in-situ recovery mining methodology at the Wheeler River Property.
August 2022	All identified Indigenous Nations and communities	On August 5, 2022, CNSC staff sent a follow up to the letters sent in June to notify

		the identified Indigenous Nations and communities that a Nuclear Substances and Radiation Devices (NSRD) licence was granted to Denison from August 3, 2022, to December 21, 2023, to allow Denison to complete a feasibility field test.
August 2022	All identified Indigenous Nations and communities	On August 24, 2022, CNSC staff sent a notice to invite Indigenous Nations and communities to a webinar on Denison Mine's proposed Wheeler River Project on September 13, 2022.
October 2022	All identified Indigenous Nations and communities	On October 24, 2022, CNSC staff sent an update on the Wheeler River Project's Environmental Assessment process. CNSC staff identified that Denison submitted the draft EIS and supporting documents to the CNSC on October 21, 2022. CNSC will begin a conformity review and if it passes, a notification will be sent out to signify that the 90-day public comment period is open for comments.
November 2022	Kineepik Métis Local Métis Nation-Saskatchewan English River First Nation Ya'Thi Nené Lands and Resources Office	On November 10, 2022, CNSC staff sent a letter on CNSC staff's position regarding UNDRIP and its role within CNSC's work as a follow-up to a meeting with interested Nations regarding the CNSC's

		annual Regulatory Oversight Report on Uranium Mines and Mills.
November 2022	All identified Indigenous Nations and communities	On November 21. 2022, CNSC staff sent an update on the completion of Denison's draft EIS submission and that it has been posted to the Canadian Impact Assessment Registry along with an executive summary, appendices and technical support documents. With that, the 90-day public comment period is open until February 18, 2023, to allow Indigenous Nations and communities, members of the public, and other government departments and agencies to submit their comments in writing to the CNSC.
January 2023	All identified Indigenous Nations and communities	On January 18, 2023, CNSC staff sent a reminder email including the comment period deadline for the draft EIS review.
April 2023	All identified Indigenous Nations and communities	On April 26, 2023, CNSC staff emailed the April Spring Project Bulletin to all identified Indigenous Nations and communities.
August 2023	All identified Indigenous Nations and communities	On August 31, 2023, CNSC staff provided an update on Denison's resubmission on responses to information requests (IRs) for the proposed Wheeler River EIS.

December 2023	All identified Indigenous Nations and communities	On December 8, 2023, CNSC staff sent a Winter Project Bulletin to all identified Indigenous Nations and communities.
February 2024	All identified Indigenous Nations and communities	On February 23, 2024, CNSC staff provided an update on Denison's revised draft EIS package for the proposed Wheeler River Project. CNSC staff determined that the outstanding IR's had been closed, supporting submissions are adequate and the EIS will continue to the next phase of EIS Technical Review phase. CNSC staff provided next steps of the technical review, stating that there will be a review by the Federal Indigenous Review Team (FIRT) from February 21, 2024, to May 20, 2024.
August 2024	All identified Indigenous Nations and communities	On August 23, 2024, CNSC staff sent the Summer Project Bulletin to all identified Indigenous Nations and communities.
September 2024	Kineepik Métis Local Métis Nation-Saskatchewan English River First Nation Ya'Thi Nené Lands and Resources Office	On September 18th, 2024, CNSC staff held an in-person UMM Regulatory Oversight Report (ROR) Engagement Session in Saskatoon and invited the potentially impacted Indigenous Nations and communities to discuss ongoing projects and updates for northern Saskatchewan. This

		included an update on the Denison Wheeler River Project and EA process.
October 2024	All identified Indigenous Nations and communities	On October 18, 2024, CNSC staff sent an update on the Wheeler River EIS technical review and provided the timeline for outstanding IRs.
November 2024	All identified Indigenous Nations and communities	On November 4, 2024, CNSC staff provided an update on Denison's outstanding IRs and indicated the submission passed the completeness check phase. On November 22, 2024, CNSC staff sent another update that all IRs had been accepted, and the CNSC's final EIS submission review process had begun.
December 2024	All identified Indigenous Nations and communities	On December 24, 2024, CNSC staff provided an update that the Final EIS for the Denison Wheeler River Project had been accepted including next steps of the EA and regulatory review process.
January 2025	All identified Indigenous Nations and communities	On January 22, 2025, CNSC staff sent letters to all identified Indigenous Nations and communities on next steps in the consultation and regulatory review process following the acceptance of the final EIS. This included opportunities for input into the EA report, the Consultation Report and CNSC staff's Commission

		Member Document (CMD).
February 2025	All identified Indigenous Nations and communities	On February 3, 2025, CNSC staff sent a notice that the CNSC is offering participant funding to participate in the final stages of the regulatory review process for the Wheeler River Project including participation in the public Commission hearing.
March 2025	All identified Indigenous Nations and communities	On March 6, 2025, CNSC staff sent a notice that the CNSC announced hearing dates for a two-part public hearing on the licensing and EA decision for the Wheeler River mine and mill Project in October 2025 and December 2025.

4.1 Consultation Activities with English River First Nation

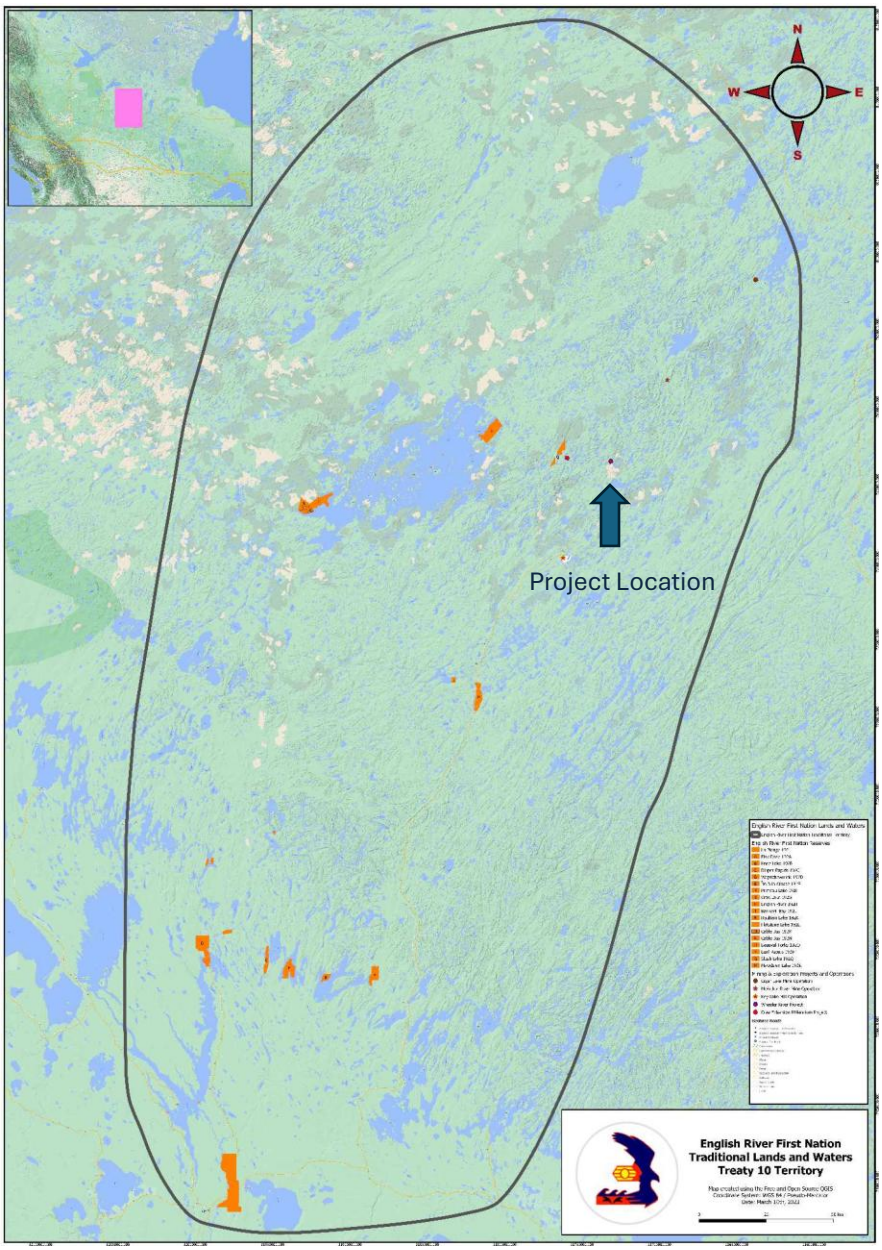
English River First Nation has reviewed and provided feedback on Section 4.1 of the Consultation Report. CNSC staff note that in 2023, ERFN shared a letter of support with CNSC for the Denison Wheeler River Project including their consent for the Project to proceed.

4.1.1 Background on English River First Nation

Figure 4: The English River First Nation Logo

ERFN is a Dene and Cree First Nation and is a signatory of Treaty 10. ERFN has 19 reserves located throughout northern Saskatchewan with an overall population of 1,600 members with 778 members living on reserve. The closest reserve to the Project is Slush Lake Reserve No. 192Q which is approximately 16 km from the Project site. Barkwell Bay Reserve No. 192I is approximately 39 km northwest of the site. ERFN is a First Nation whose members have used and occupied their ancestral lands in northern Saskatchewan for thousands of years to sustain themselves, to carry out their livelihood, and to practise and pass down their culture. In its Dene language, ERFN refers to its ancestral lands as Nuhtsiye-kwi Benéne. ERFN's use of the Nuhtsiye-kwi Benéne, and the corresponding responsibility to protect Nuhtsiye-kwi Benéne for future generations, is inherent and sacred. ERFN is also a member of Meadow Lake Tribal Council (MLTC). The MLTC represents 9 different First Nations that are signatories to three different treaty areas (6, 8, and 10) in northwest Saskatchewan. ERFN's principal reserve is located in the hamlet of Patuanak which is located 90 km north of Highway 165, near Beauval on a peninsula of land between Lac Ile-a-la-Crosse in northwestern Saskatchewan. The Wheeler River Project is located within both the traditional and treaty territory of ERFN and ERFN maintains that it is the most directly impacted First Nation in relation to the proposed Project.

Figure 5: Map Showing the English River First Nation Traditional Lands and Waters Territory in Relation to the Project Site



4.1.2 CNSC's Consultation Activities with English River First Nation

In December 2021, CNSC staff and ERFN signed a project specific TOR for consultation, which outlined a collaborative and mutually agreeable approach to consultations as part of the regulatory review and assessment process for the Project. This included opportunities for ERFN participation in the consultation process for the Project including ERFN's technical review of the draft EIS and their participation in the Federal Indigenous Review Team (FIRT), reviews of responses to information requests, and collaborating on the RIA process. CNSC staff and ERFN have a long history of engagement and collaboration and in June 2024 signed a TOR for long-term engagement that was celebrated with a Sweat and Feast Ceremony.

Since beginning the regulatory review process for Denison's proposed Wheeler River Project in 2019, the CNSC and ERFN have held monthly meetings which are used to provide updates, discuss, engage and consult on the Wheeler River Project. In addition, ERFN participated in the FIRT for the Project. Denison provided funding for ERFN to complete a Traditional Knowledge Study and Health and Socio-Economic Study Results which produced two summary reports which complemented a land use map from 2017 that was shared with Denison to gain an understanding of the extent and distribution of land use in the project area. ERFN has shared both studies with CNSC staff. CNSC staff have collaborated with ERFN in reflecting and including the information shared from these studies to support CNSC staff's review of Denison's Environmental Impact Statement (EIS), as well as drafting the CNSC's reports, assessments and recommendations to the Commission.

CNSC and ERFN have had ongoing discussions to address project specific concerns and potential impacts to their Indigenous and/or Treaty Rights. ERFN has previously expressed concerns in relation to technical elements of the project which are summarized in Appendix A.1 issues tracking table.

CNSC staff have worked with ERFN and Denison to respond to all of the Nation's concerns, questions and comments and ERFN has concluded that they are satisfied with CNSC's consultation process to date as well as Denison's engagement on the Project. In September 2023, Denison and ERFN signed a Shared Prosperity Agreement (SPA) [13] which addresses the interests of the Nation and aims to contribute to advancing reconciliation with ERFN. In 2023, ERFN shared a letter of support with CNSC for the Denison Wheeler River Project including their consent for the Project to proceed.

Key correspondence related to the consultation activities below is included in Appendix B.2.

Table 3: Summary of the key consultation activities with English River First Nation

Date	Consultation Activity
April 2019–June 2019	CNSC staff sent an email and follow up letter to ERFN to provide early notification of the Denison Wheeler River Project. Emails and phone calls were conducted to provide an update on the Notice of Commencement of project activities and to discuss the comment period on the project description. CNSC staff provided opportunities to meet to discuss further. ERFN sent CNSC a letter to confirm their traditional territory and that they are impacted by the Project.
July 2019 – December 2019	CNSC staff and ERFN had a phone call to discuss the upcoming ERFN election and to postpone the upcoming meetings to 2020 after the election takes place. ERFN raised a concern regarding releases from the Cameco Key Lake mine and CNSC staff directed

	ERFN to the project officer for that site to respond to their concerns.
January 2020-June 2020	CNSC sent ERFN an email and follow-up letter regarding Denison pausing the EA process as well as information regarding the scope of the EA for the Project.
July 2020-December 2020	No activity occurred during this period as the Project was on hold.
January 2021-June 2021	CNSC sent an email and follow up letter to provide ERFN with notification of resumption of the EA activities including an opportunity to meet and discuss the Project. CNSC staff participated in Denison-led meetings where there was a signing of a collaboration agreement between Denison and ERFN to work together on the regulatory process, overview of the project to the community and overview of the project to high school students. CNSC staff also had a meeting with ERFN to provide a presentation on the EA process and timelines, including the opportunities for consultation and collaboration throughout. Another meeting was held to discuss opportunities for a Project-specific Terms of Reference and other opportunities to collaborate on the EA and regulatory review process were provided.
July 2021-December 2021	ERFN provided an update to CNSC staff on ERFN's work with Denison and informed the CNSC that the Human Health Risk Assessment (HHRA) will use information from a 2017 diet study completed with ERFN community members, and to advise that they have set up an 'Ancestral lands' committee. ERFN raised concerns on impacts to traditional ways of life as a result of this Project and they do not favour short-term employment opportunities that may lead to disrupting their lifestyle longer term. CNSC and ERFN had a meeting to discuss and respond to questions on the RIA and EA process for the Project. Regular meetings were established between ERFN and CNSC during this time. The project-specific TOR for consultation on the Project was signed in December 2021 by ERFN's Chief and CNSC.
January 2022 – June 2022	CNSC staff emailed ERFN the PFP funding notice to support the review the draft EIS and a follow up meeting was scheduled to discuss the funding opportunity and community needs related to supporting the EIS review process.

	Regular touchpoints between ERFN and CNSC continued and ERFN shared a Traditional Knowledge Study and Socio-economic study completed with Denison and the CNSC. On June 1st, 2022, CNSC staff attended a Denison-led community tour where CNSC staff visited the communities of Patuanak, La Plonge, Beauval and Pinehouse alongside Denison to answer any questions regarding the regulatory and consultation processes.
July 2022 – December 2022	CNSC staff and ERFN continued regular monthly meetings and discussions regarding the Project. CNSC staff sent an email to ERFN to provide notice of the Denison Nuclear Substances and Radiation Devices (NSRD) Licence. Emails were sent confirming the submission of the Wheeler River draft EIS and next steps of the process including the start of the public comment period. In September 2022, CNSC staff visited ERFN's Culture Camp to have an in-person meeting with Elders, land users and leadership regarding the Denison Wheeler River Project.
January 2023 – June 2023	CNSC staff met with ERFN to discuss how Traditional Knowledge will be incorporated into CNSC staff's technical review. During the monthly meetings CNSC staff and ERFN continued discussions regarding process timelines, the CNSC's licensing process and project updates. ERFN advised CNSC staff that they were collaborating with Denison on developing specific sections of the draft EIS. In addition, ERFN provided comments on the draft EIS through the FIRT review process. ERFN informed CNSC staff that community discussions were taking place on the Project's potential impacts to their rights, as well as discussions regarding the EIS timelines. ERFN raised concerns regarding contamination and how that would impact ERFN's treaty rights as well as concerns regarding the land use within the draft EIS being overrepresented by one individual from the community. These concerns were shared and addressed by Denison. ERFN confirmed the issues have been addressed. In June 2023, CNSC staff attended an in-person meeting hosted by Denison where ERFN shared stories regarding the history and legacy of residential schools and their impacts on ERFN community members.
July 2023 – December 2023	CNSC staff completed a 'What We Heard' Report in relation to ERFN's Traditional Knowledge Study and shared the report with ERFN for comment and confirmation of accuracy. ERFN advised

	CNSC staff that the 'What We Heard' Report regarding ERFN's Traditional Knowledge study for the Project was accepted with no additional comments. CNSC staff and ERFN also discussed planning for upcoming outreach and engagement sessions. Meetings between ERFN and CNSC were paused briefly after unmarked graves were found at the Beauval residential school. In October 2023, ERFN sent CNSC staff a letter of consent and support regarding the Project. ERFN conducted a successful community ratification vote for the Wheeler River Project and agreement with Denison.
January 2024 – June 2024	CNSC staff continued regular meetings with ERFN to provide updates on the technical review of the IR responses for the EIS. CNSC provided updates on tentative timelines shared by Denison for the next draft of the EIS and upcoming work on the RIA with ERFN. ERFN shared concerns on potential overreach of other communities claiming rights in the Project area which could impede and dilute ERFN's rights. In April 2024, ERFN hosted CNSC staff for a traditional Sweat and Feast Ceremony to celebrate the signing of the TOR and beginning the formalized relationship in a good way. CNSC staff and ERFN held an in-person meeting in Saskatoon to provide updates and walk through concerns raised to date. In June 2024, the TOR for long-term engagement was officially signed to formalize the long-standing relationship with ERFN. In June 2024, CNSC staff shared a copy of the issues tracking table with ERFN for their review and comment.
July 2024 – December 2024	CNSC staff continued regular meetings with ERFN to provide updates on the submission and acceptance of the Final EIS. CNSC staff held the first TOR meeting with ERFN on September 19th, 2024 in Saskatoon. CNSC staff also sent a notification to ERFN regarding the renewal of the NSRD Licence at the Wheeler River site prior to the decision.
January 2025 – June 2025	In January 2025, ERFN sent CNSC a letter expressing their positive views of the Denison project as well as a request for timing of the upcoming hearing. Also in January 2025, CNSC staff sent ERFN a letter advising them of the acceptance of the Final EIS as well as providing an overview of the next steps for consultation on the project in advance of the Commission hearings. In February 2025, CNSC responded to ERFN's January letter.

	CNSC staff held an in-person meeting with ERFN in March 2025 where project updates and next steps were provided. In April 2025, CNSC staff shared documents for ERFN review and comment including relevant sections from the Consultation Report and the EA report. In June 2025, CNSC staff shared an updated copy of the issues tracking table with ERFN for their review and comment.

4.1.3 Key Issues and concerns raised by English River First Nation

Key issues and concerns raised by ERFN specific to the Denison Wheeler River Project to date are summarized below. The detailed issues tracking table for ERFN is found in Appendix A.1. The specific row where the issue is discussed in Appendix A.1 is listed beside each bullet. Refer to this row in Appendix A.1 for additional context regarding the issue, CNSC staff's response and current status of the issue.

1. Concerns about the need to protect the environment including concerns around the following topics:
    a. Concern around potential spills especially those similar to past incidents at the Cameco Key Lake mill
    b. Concern over the toxic nature of mining fluids which could affect the water downstream of the project site
    c. Concern around the new mining method being proposed: In-Situ Recovery (ISR)
    d. Concern regarding cumulative effects with multiple mines being in the area
    e. Concern about habitat loss for species like caribou and moose as well as changes in wetlands affecting the lifecycle of several species
    f. Concern regarding noise and it affecting air quality, animal behaviour and human health
2. Concerns regarding impact on the traditional economy including concerns around the following topics:
    a. Concern around the project may reduce access to traditional practises such as hunting, fishing and trapping, undermining their cultural connection to the land
    b. Concern around the project having negative pyscho-social impacts including secondary health effects, sexual health, substance abuse and mental health
    c. Concern underestimates the impact on their traditional economy and lifestyle
3. Concerns regarding community and social issues including concerns around the following topics:

a. Concern was mentioned regarding misrepresentation of land use by Denison in the EIS but has since been resolved
b. Concerns have been raised about Fox Lake road, its potential blockage by the project and the influx of people entering the region due to increased access, which could disrupt traditional practises
c. Concern about potential overreach of other communities, and ERFN rights and concerns being diluted

4. Concerns regarding the regulatory process and oversight including concerns around the following topics:
    a. Concern regarding the lack of trust in the Province of Saskatchewan's regulatory process and requests reassurance that the CNSC will uphold high standards of oversight
    b. Concern about the long-term environmental impact of the project's decommissioning, including the management of hazardous waste, radioactive materials and financial guarantees
5. Concerns regarding the cultural and social impacts including concerns around the following topics:
    a. Concern that the project could lead to a diminished connection to the land, affecting the communities cultural practise and way of life
    b. Concern around broader impacts to community health, including how changes to their traditional territory affect their overall well-being
6. Concerns regarding licensing and past decisions including concerns around the following topic:
    a. ERFN is frustrated with the recent licensing decisions at other facilities in northern Saskatchewan, particularly regarding safety vs. Indigenous rights. They feel the decision-making process has not sufficiently considered Indigenous perspectives or the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP)

These concerns have been responded to and addressed by both Denison and CNSC staff through the consultation and engagement process including clear technical responses and discussions, agreements, mitigations and accommodation measures. CNSC staff's key responses and proposed commitments are outlined below.

4.1.4 CNSC Staff's Response

CNSC staff acknowledge the issues and concerns that ERFN has raised to date related to the Denison Wheeler River Project. CNSC staff have worked to understand, assess and address the concerns to the greatest extent possible by having focused discussions, providing detailed responses, reflecting ERFN's views in CNSC's documentation and discussing the Wheeler River Project at regularly scheduled meetings with ERFN to better understand their concerns and identify commitments, mitigations and a path forward to addressing the concerns. CNSC's staff view is that the approach to consultation conducted for the Project has been in line with best practises and is flexible based on the specific needs and requests of each potentially impacted Indigenous Nation and community. CNSC staff will continue to monitor Denison's engagement through the lifecycle of the Project, if approved and ensure that Denison is addressing ERFN's

questions, concerns and requests, as per *REGDOC-3.2.2, Indigenous Engagement*. CNSC staff have and will continue to provide opportunities for ERFN to provide input and feedback on how they would like to be consulted for the Project and what would be meaningful for them.

CNSC staff have made initial commitments (listed below) to address the concerns raised to date. These commitments are currently being proposed and CNSC will want to discuss these further with ERFN. CNSC staff are committed to working with ERFN through the RIA process and further consultation on the Project to identify additional commitments, mitigations and a path forward to addressing the concerns related to the Project, as appropriate. The outcomes of this and a final commitments list will be included in the CNSC's supplemental submission to the Commission.

Information regarding specific responses to each of ERFN's concerns are included in the issues tracking table found in Appendix A.1.

In summary, CNSC staff are committed to:

- Continuing to discuss the requests for mitigation and accommodation that ERFN has raised, including with Denison as appropriate
- Collaborating on monitoring, oversight and engagement with ERFN including collaborating with ERFN on CNSC's Independent Environmental Monitoring Program (IEMP) near the Denison site
- Ongoing engagement, communication, information sharing and collaboration with ERFN as per the TOR for long-term engagement between the CNSC and ERFN
- Oversight of Denison's commitments to ERFN
- Oversight of Denison's engagement with ERFN
- Continuing ongoing community visits and engagement with ERFN community members and leadership

CNSC staff encourage Denison to continue discussions and collaboration with ERFN to address any concerns that may arise. CNSC staff anticipate receiving an update from Denison on their engagement efforts in an IER to be filed on the record, as part of the upcoming Commission hearings.

CNSC staff are committed to working with ERFN through the RIA process and further consultation on the Project. CNSC staff have worked with ERFN and Denison to respond to all of the Nation's concerns, questions and comments and ERFN has concluded that they are satisfied with CNSC's consultation process to date as well as Denison's engagement on the project. ERFN has communicated to both Denison and CNSC staff that the Nation supports and consents to the Project. Denison's commitments to ERFN are summarized in Section 5, and further information will be included in the CNSC's supplemental submission to the Commission. CNSC looks forward to continuing to work with ERFN through our long-term engagement TOR and throughout the lifecycle of the Project, if approved.

Information regarding specific responses to each of ERFN's concerns are included in the issues tracking table found in Appendix A.1.

4.1.5 Conclusions

CNSC staff are committed to continuing to consult, engage, and work collaboratively with ERFN and Denison in advance of the Denison Wheeler River Part 2 hearing to address any outstanding concerns, should they arise. This includes work on the RIA drafting process. Updated information about the potential impacts of the Denison Wheeler River Project on ERFN's Indigenous and/or Treaty Rights and mitigation and/or accommodation measures to address any identified impacts will be included in the supplemental submission, to be submitted to the Commission prior to the Wheeler River Part 2 hearing.

4.2 Consultation Activities with Kineepik Métis Local #9

Kineepik Métis Local #9 has reviewed and provided feedback on Section 4.2 of the Consultation Report. CNSC staff note that in 2024, KML shared a letter of support with CNSC for the Denison Wheeler River Project including their consent for the Project to proceed.

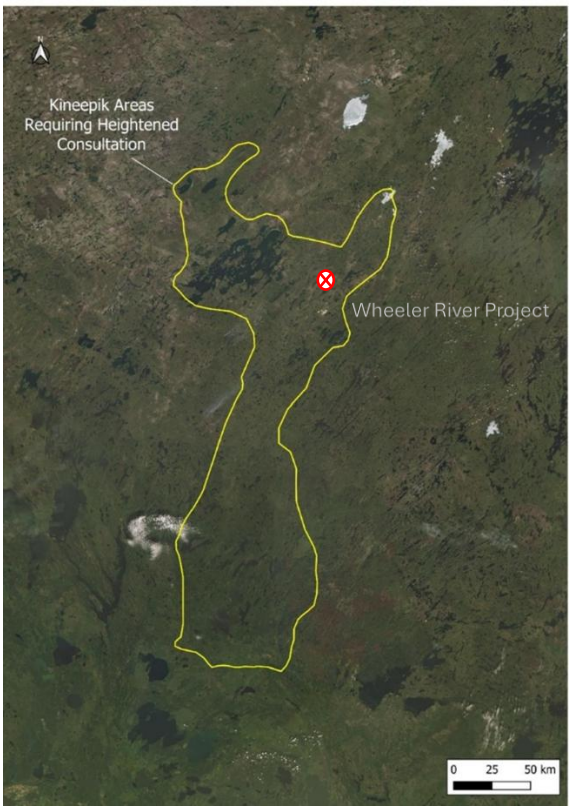
4.2.1 Background on Kineepik Métis Local #9

Figure 6: The Kineepik Métis Local #9 Logo

Kineepik Métis Local (KML) is a Métis Local operating in the Northern Village of Pinehouse (NVP) which is located within the boundaries set out by the Northern Administrative District and is further supported by the Métis Nation – Saskatchewan (MN-S). When the Project was applied for in 2019, KML was represented by the MN-S for consultation and engagement obligations, however, in late 2021, KML informed the CNSC, Denison and the MN-S that the community had decided to represent themselves for the purposes of consultation on the Wheeler River Project and has been working directly with the CNSC and Denison since that time. KML is responsible for all industrial activity that occurs within their traditional territory including nuclear projects. The letter is included in Appendix B.3.

KML community members are considered Woodland Cree, Woodland Dene and Woodland Métis, although historical documents indicate that members of KML came from a diverse range of Métis, First Nations and other backgrounds. The NVP and the Denison Wheeler River Project is located within the digitally mapped traditional territory of Indigenous peoples of KML. They have used the lands surrounding the Missinippi (Churchill River) watershed for gathering food, shelter and material supplies since time immemorial. The NVP is located approximately 235 km southwest of the Project and has direct access to the provincial highway 914. KML has expressed interest in other uranium mining in the area including formalizing partnerships with Cameco Corporation (Cameco) and Orano Canada (Orano) in 2012 with a collaboration agreement.

Figure 7: Map of Kineepik Métis Locals Land and Occupancy Area in Relation to the Project Site



4.2.2 CNSC's Consultation Activities with Kineepik Métis Local

In early 2022 following KML's decision to represent themselves for consultation on the Project, CNSC worked directly with KML to understand how they would like to be consulted moving forward which included scheduling monthly meetings, participating in the draft EIS technical review phase, reviews of responses to information requests, and collaborating on the RIA process. In 2024, KML expressed an interest in developing a TOR for long-term engagement with the CNSC. KML and CNSC staff continue to work towards finalizing the arrangement and are aiming to having the arrangement signed in 2025. CNSC staff offered a project-specific TOR

to KML, but due to capacity constraints, KML indicated that they would prefer to keep consulting and engaging on the Project during regular monthly meetings.

Since 2022, CNSC staff and KML have been meeting monthly to discuss the Project and regulatory process, including addressing any outstanding concerns that KML has in relation to the Project.

Denison provided funding for KML to complete a land use mapping initiative which built on land use mapping that was completed by KML in 2011. In 2022, KML also prepared a document to voice their perspectives on the Project, including valued components that KML identified as priorities to be included and assessed as part of the EIS. KML has shared both of these studies with the CNSC. CNSC staff have collaborated with KML in reflecting and including the information shared from these studies to support CNSC staff's review of Denison's EIS, as well as drafting the CNSC's reports, assessments and recommendations to the Commission.

CNSC staff and KML have had ongoing discussions to address project specific concerns and potential impacts to their Indigenous and/or Treaty Rights. KML has previously expressed concerns in relation to technical elements of the project which are summarized in Appendix A.2 issues tracking table.

CNSC staff have worked with KML and Denison to respond to all of the Nation's concerns, questions and comments and KML has concluded that they are satisfied with CNSC's consultation process to date as well as Denison's engagement on the project. In July 2024, Denison and KML along with the NVP, signed a Mutual Benefits Agreement (MBA) and Community Benefit Agreement (CBA) [14] which focuses on community development initiatives. KML shared a letter of support with CNSC for the Denison Wheeler River Project including their consent for the project to proceed.

Key correspondence related to the consultation activities below is included in Appendix B.3.

Table 4: Summary of the key consultation activities with Kineepik Métis Local

Date	Consultation Activity
April 2019–June 2019	Consultation and engagement activities with KML were conducted through MN-S during this time period. See Table 6 for key consultation and engagement with MN-S, including KML, during this time.
July 2019 – December 2019	KML participated in a tour of the Wheeler River Project site with Denison, CNSC and MN-S in August 2019 to learn about the Project. CNSC staff and KML had a meeting to discuss the environmental assessment and licensing process for new proposed uranium mine and mill projects.

January 2020-June 2020	CNSC sent KML an email and follow-up letter regarding Denison pausing the EA process as well as information regarding the scope of the EA.
July 2020-December 2020	No activity occurred during this period as the project was on hold.
January 2021-June 2021	CNSC sent an email and follow-up letter to provide KML notification of resumption of EA activities, including an opportunity to meet. CNSC sent KML an email follow-up to outlining next steps in the EA and regulatory process.
July 2021-December 2021	In November 2021, KML sent an email and letter to the CNSC to request that KML represent themselves going forward for consultation and engagement purposes for the Wheeler River Project and terminated the consultation delegation they had with MN-S. MN-S, Denison and the Province of Saskatchewan were also made aware of this request. CNSC staff worked with KML to set up regular meetings to address concerns and give updates on the regulatory process for the Project. A digital version of a TLU study that KML completed was shared with the CNSC.
January 2022 – June 2022	CNSC staff continued regular monthly meetings with KML to discuss the PFP funding opportunities to support their participation in the process, the review of the draft EIS, the EA process, timelines, and opportunities for KML to be involved and collaborate with the CNSC throughout the process. Follow up meetings were scheduled to discuss the FIRT process, a project-specific TOR and concerns regarding cumulative effects. KML submitted a PFP funding application to support their review of the draft EIS. On May 11th, 2022, CNSC staff attended a community workshop virtually that KML hosted where CNSC provided information on the CNSC including updates on the Project and regulatory review process. Interest was raised from KML to invite CNSC staff to participate in-person sessions with their community in the future, if allowed due to COVID precautions. On June 1st, 2022, CNSC staff attended a Denison-led community tour where CNSC visited the communities of Patuanak, La Plonge, Beauval and Pinehouse alongside Denison to answer any questions regarding the Project and the regulatory review process.
July 2022 – December 2022	CNSC and KML continued regular monthly meetings regarding the Project. CNSC staff sent an email to KML to provide notice of the Denison Nuclear Substances and Radiation Devices (NSRD) Licence.

	Emails were sent confirming the submission of the Wheeler River draft EIS and next steps of the process including the start of the public comment period. In September 2022, CNSC staff visited KML's Culture Camp where CNSC staff met with Elders, land users and community members to discuss the Project as well as participate in community activities. In October 2022, KML informed the CNSC that they signed an exploration agreement with Denison for the Wheeler River Project.
January 2023 – June 2023	CNSC staff met with KML to continue regular scheduled meetings to discuss timelines, licensing process and project updates as well as the ongoing EA and technical review. KML raised the need for more capacity within the community to support on nuclear related projects as well as the importance of Science, Technology, Engineering and Mathematics (STEM) within the community and educating community youth. KML submitted comments on the draft EIS to the CNSC as part of the public comment period. CNSC completed a 'What We Heard' Report (WWHR) on the Traditional Knowledge Study received from KML and shared the report with KML for comment and confirmation of accuracy. In June 2023, CNSC staff attended and participated in the KML Elders Gathering where CNSC staff spoke directly with Elders and land users in the community regarding the Wheeler River Project and the regulatory review process. KML community members raised concerns regarding poor road maintenance on highways around Pinehouse towards the proposed project site. There were concerns of increased traffic potentially causing more accidents and emergencies on the road.
July 2023 – December 2023	KML provided feedback to the CNSC on the WWHR related to KML's Traditional Knowledge study and CNSC staff incorporated the feedback into a finalized version of the report that was shared with CNSC specialists for awareness and consideration to help inform their technical review of the draft EIS. During regular meetings CNSC and KML continued to discuss the Project, the regulatory process, the licensing process and KML's interest in non-designated projects.

	In October 2023, CNSC participated in community meetings in Pinehouse to provide Project updates and answer questions and concerns. KML shared a summary with CNSC staff regarding the community meetings and Elders gathering event.
January 2024 – June 2024	CNSC staff continued regular meetings with KML to provide updates on the technical review of the IR responses regarding the draft EIS. CNSC staff provided updates on tentative timelines shared by Denison for the next draft of the EIS and upcoming RIA work with KML. CNSC staff provided information on the Wheeler River licensing sufficiency check and discussed preparations for upcoming outreach and engagement activities including an Elder's gathering in the Pinehouse community. CNSC staff also discussed potentially signing a long-term engagement TOR with KML. In June 2024, KML provided CNSC a letter of consent and support for the Project. CNSC also participated in the KML Elders Gathering in the community of Pinehouse and speak directly with Elders and land users regarding the Project and related updates on the status of the regulatory review process.
July 2024 – December 2024	CNSC staff continued regular meetings with KML to provide updates on the status of the regulatory review process including the submission and acceptance of the Final EIS. CNSC staff sent a notification to KML regarding the renewal of the NSRD Licence at the Wheeler River site prior to the decision. In July 2024, KML let CNSC staff know that they had signed an Impact Benefit Agreement (IBA) with Denison for the purposes of the Wheeler River Project. In July 2024, CNSC staff shared a copy of the issues tracking table with KML for their review and comment. In December 2024, CNSC staff attended the Pinehouse in-person annual event where updates were given by Denison regarding the Project and KML provided a traditional meal to participants.
January 2025 – June 2025	CNSC staff sent KML a letter in January 2025 advising them of the acceptance of the Final EIS as well as explaining the next steps for consultation on the project in advance of the Commission hearings. CNSC staff held an in-person meeting with KML in March 2025 where project updates and information on next steps were provided.

	In March 2025, CNSC staff held a virtual meeting with KML to discuss the TOR for long-term engagement with a goal of completing the TOR in the 2025 calendar year. In April 2025, CNSC staff shared documents for KML to review and provide comments including relevant sections from CNSC staff's Consultation Report and the EA report. In June 2025, CNSC staff shared an updated copy of the issues tracking table with KML for their review and comment.

4.2.3 Key issues and concerns raised by Kineepik Métis Local #9

Key issues and concerns raised by KML specific to the Denison Wheeler River Project to date are summarized below. The detailed issues tracking table for KML is found in Appendix A.2. The specific row where the issue is discussed in Appendix A.2 is listed beside each bullet. Refer to this row in Appendix A.2 for additional context regarding the issue, CNSC staff's response and current status of the issue.

1. Concern about waste and emergency management including concerns around the following topics:
    a. Concern around community consultation to ensure the community proper access to emergency services, if an emergency were to occur
    b. Concern regarding waste and ensuring that it is handled properly to avoid any emergencies or spills in the community
    c. KML seeks a better solution for waste management, water flow control and protection of groundwater quality
2. Concern about aquatic and groundwater quality including concerns around the following topics:
    a. Concerns about baseline collection and water flow management in relation to the aquatic environment
    b. Community members lack confidence in the new mining method and its ability to protect groundwater. There is also a concern regarding legacy projects contaminating the groundwater in the area
    c. Concern regarding the cumulative effects of multiple projects, including potential impacts on water flow, highway usage and land access
3. Concerns about the surrounding highways and road maintenance including concerns around the following topics:
    a. Concerns about increased highway activity, particularly from heavy haul vehicles and the lack of oversight from the Province
    b. The proposed highway 914 expansion could pose safety risks and may limit access to emergency services
    c. Concern about more vehicles being on the road causing noise and dust to negatively affect other drivers and wildlife in the area

4. Concerns about maintaining culture and land use including concerns around the following topics:
    a. Concerns about the loss of land access for traditional practices, the impact of increased development and the threat to cultural impacts including language loss
    b. Concerned that increasing projects and mineral exploration will severely limit their ability to continue using the land north of the Haultain River for traditional practises
    c. Concerned about new mining methods, environmental contamination and the projects potential to limit the community's ability to use the land
    d. Concern about the potential negative effects on Denison's hiring practises on the ability of community members to practice their culture and speak Cree language, if employed at the project site
    e. Concern about increased access to the area could restrict KML's ability to engage in subsistence harvesting
5. Concerns about ongoing engagement and communication including concerns around the following topics:
    a. KML emphasizes the importance of conveying Western knowledge in a way that is understandable and relatable to the community
    b. Concern that post-project, there will be a lack of ongoing engagement with regulators. KML desires a long-term relationship with the CNSC to ensure discussions on uranium projects continue
    c. Concern regarding the Provinces duty to consult process including the delegation to proponents
    d. There are uncertainties regarding the Provinces EA process including the incorporation of Métis Knowledge throughout that process
6. Concerns about community wellbeing including concerns around the following topics:
    a. Concerns about racial discrimination in the hiring process and limited opportunities for women due to restrictive work schedules
    b. KML identifies the need for funding to support community education and training, particularly in STEM and mining, to ensure community members can access economic opportunities arising from the project
7. Concerns about the new mining method Denison is proposing fearing potential environmental contamination and the community's inability to fully understand the technology and its impacts

These concerns have been responded to and addressed by both Denison and CNSC staff through the consultation and engagement process including clear technical responses and discussions, agreements, mitigations and accommodation measures. CNSC staff's key responses and proposed commitments are outlined below.

4.2.4 CNSC Staff's Response

CNSC staff acknowledge the issues and concerns that KML has raised to date related to the Denison Wheeler River Project. CNSC staff have worked to understand, assess and address the concerns to the greatest extent possible through consultation activities, having focused discussions, providing detailed responses, reflecting KML's views in CNSC's documentation and discussing the Project at regularly scheduled meetings with KML to better understand their concerns and identify a path forward to addressing them through commitments and mitigations, as necessary. CNSC's staff view is that the approach to consultation conducted for the Denison Wheeler River Project has been in line with best practises and is flexible based on the specific needs and requests of each potentially impacted Indigenous Nation and community. CNSC will continue to monitor Denison's engagement throughout the lifecycle of the Project, if approved and ensure that Denison is addressing KML's questions, concerns and requests, as per *REGDOC-3.2.2, Indigenous Engagement.* CNSC staff have and will continue to provide opportunities for KML to provide input and feedback on how they would like to be consulted for the Project and what would be meaningful for them.

CNSC staff have made initial commitments (listed below) to address the concerns raised to date. These commitments are currently being proposed and CNSC are committed to discussing these further with KML. CNSC staff are committed to working with KML through the RIA process and further consultation on the Project to identify any additional commitments, mitigations and a path forward to addressing the concerns related to the Project, as appropriate. The outcomes of this and a final commitments list will be included in the CNSC's supplemental submission to the Commission.

Information regarding specific responses to each of KML's concerns are included in the issues tracking table found in Appendix A.2.

In summary, CNSC staff are committed to:

- Continuing to discuss the requests for mitigation and accommodation that KML has raised, including with Denison as appropriate
- Collaborating on monitoring, oversight and engagement with KML, including collaborating with KML on CNSC's Independent Environmental Monitoring Program (IEMP) near the Denison site
- Ongoing engagement and collaboration with KML through the proposed TOR for long-term engagement between CNSC and KML
- Oversight of Denison's commitments to KML
- Oversight of Denison's engagement with KML
- Continuing ongoing community visits and engagement with KML

CNSC staff encourage Denison to continue discussions and collaboration with KML to address any concerns that may arise. CNSC staff anticipate receiving an update from Denison on their engagement efforts in an IER to be filed on the record, as part of the upcoming Commission hearings.

CNSC staff are committed to working with KML through the RIA process and further consultation on the Project. CNSC staff have worked with KML and Denison to respond to all of the KML's concerns, questions and comments and KML has concluded that they are satisfied

with CNSC's consultation process to date as well as Denison's engagement on the Project. KML has clearly communicated to both the CNSC and Denison that they support and consent to the Project. Denison's commitments to KML are summarized in Section 5 and further information will be included in the CNSC's supplemental submission to the Commission. CNSC looks forward to continuing work with KML through a proposed TOR for long-term engagement and throughout the lifecycle of this Project, if approved.

Information regarding specific responses to each of KML's concerns are included in the issues tracking table found in Appendix A.2.

4.2.5 Conclusions

CNSC staff are committed to continuing to engage, consult and work collaboratively with KML and Denison in advance of the Denison Wheeler River Part 2 Commission hearing to address any outstanding concerns, should they arise. This includes work on the RIA drafting process. Updated information about potential impacts of the Denison Wheeler River Project on KML's Indigenous and/or Treaty Rights and mitigation and/or accommodation measures to address any identified impacts will be included in the supplemental submission, to be submitted to the Commission prior to the Wheeler River Part 2 hearing.

4.3 Consultation Activities with Ya'Thi Néné Lands and Resources

Ya'thi Néné Lands and Resources has reviewed and provided feedback on Section 4.3 of the Consultation Report. CNSC staff note that the issues and concerns listed in Section 4.3.3 are views of Ya'thi Néné Lands and Resources.

4.3.1 Background on Ya'Thi Néné Lands and Resources

Figure 8: The Ya'thi Néné Lands and Resources Logo

Ya'Thi Néné Lands and Resources (YNLR) was created as a not-for-profit organization to be the first point of contact between industry, government and the local residents of the Athabasca

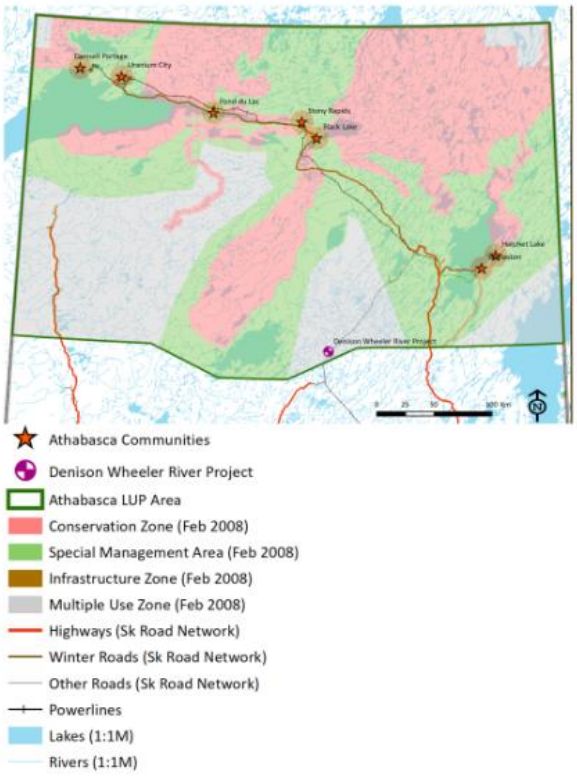
Region in Northern Saskatchewan. YNLR has been mandated by the Athabasca Denesuliné communities of Black Lake, Fond du Lac and Hatchet Lake First Nations and the Hamlets of Stony Rapids, Wollaston Post, Uranium City and Camsell Portage to represent their interests and conduct consultation and engagement activities with government and industries conducting activities in the Athabasca Basin and their traditional territories.

CNSC staff have identified Hatchet Lake, Black Lake and Fond du Lac First Nations as having Indigenous and/or Treaty Rights in the proposed Wheeler River Project area. Hatchet Lake First Nation (HLFN) is a signatory of Treaty 10, and their Reserve IR 220 is situated on the southeastern shore of Wollaston Lake, known in Dene as "Axe" Lake approximately 145 km northeast from the Project. The population of HLFN is 1,880 with 1,421 living on reserve. Black Lake First Nation (BLFN), formerly known as Stony Rapids Indian Band, is a signatory of Treaty 8 and is approximately 180 km north of the Project. BLFN members practice commercial and private hunting, fishing and trapping on a year-round basis. Fond du Lac First Nation (FLFN) is a signatory of Treaty 8 and is approximately 227 km northwest from the Project. FLFN's hunting, fishing and trapping practices continue to this day. Economic development for this community includes commercial fishing, trapping, and mining.

HLFN, BLFN and FLFN are members of the Athabasca Denesuliné First Nations. Athabasca Denesuliné lays claim to a wide area that encompasses parts of northern Saskatchewan, northern Manitoba, southern Nunavut, and southern Northwest Territories. The Project is situated within the claimed traditional territory of the Athabasca Denesuliné. Furthermore, the Project is located within the requested consultation territory of the Athabasca Denesuliné communities.

CNSC has been directed by the First Nations and communities represented by YNLR to consult and engage with YNLR leadership as the sole representative for the Athabasca Denesuliné First Nations for the Project.

Figure 9: Map Showing the Traditional Territory (Nuhenéné) in the Vicinity of the Project Site



4.3.2 CNSC's Consultation Activities with Ya'thi Néné Lands and Resources

CNSC staff and YNLR have a long history of engagement and collaboration and in June 2022 signed a TOR for long-term engagement which formalized the relationship with the Athabasca Denesuliné communities. Since the beginning of the regulatory review process for Denison's proposed Wheeler River Project in 2019, CNSC and YNLR have held regular meetings which are used to provide updates, discuss issues and concerns, engage and consult on the Project. As part of the regular meetings CNSC staff provided updates to YNLR representatives on the Project, the regulatory review process and responded to questions and concerns that were raised. CNSC staff offered a project-specific TOR to YNLR but YNLR decided to continue working on the Project through our long-term engagement TOR and when needed, project-specific meetings.

For the purposes of the Project, YNLR provided a report to CNSC and Denison titled *An Exploration of Recorded Athabasca Denesuliné Traditional Knowledge, Land Use and Occupancy Information in the Vicinity of Denison Mines Wheeler River Project*. The report summarized traditional knowledge and land use occupancy information collected for various other projects and initiatives, documenting Athabasca Denesuliné use in the Project area, although it was not considered a site-specific study, the Athabasca Denesuliné have participated in many traditional knowledge studies since the 1970s and the study provided to CNSC and Denison with valuable information with regards to the traditional land use activities of the Athabasca Denesuliné near the Project with the goal of informing the regulatory and consultation

process. The study documents the importance of caribou to the Athabasca Denesuliné, their history, and maps showing land use and occupancy sites and traditional knowledge with the Nuhenéné, which is the traditional territory of Athabasca Denesuliné. Denison included the results of the study in the draft and Final EIS. CNSC staff have collaborated with YNLR in reflecting and including the information shared from the study to support CNSC staff's review of Denison's EIS, as well as drafting CNSC staff's reports, assessments and recommendations to the Commission. CNSC staff drafted a What We Heard Report (WWHR) based on the study received which was shared with YNLR for review and confirmation of accuracy.

CNSC and YNLR have had ongoing discussions to discuss and address project specific concerns and potential impacts to their Indigenous and/or Treaty Rights. YNLR has also expressed concerns on technical elements of the project which will be included in Appendix A.3 issues tracking table. In October 2022, Denison and YNLR signed a Exploration Agreement [15] which expressed intention for both parties to build a long-term relationship.

Key correspondence related to the consultation activities below is included in Appendix B.4.

Table 5: Summary of the key consultation activities with Ya'thi Néné Lands and Resources

Date	Consultation Activity
April 2019–June 2019	CNSC staff sent an email and follow up letter to YNLR to provide early notification of the Denison Wheeler River Project. Emails were sent to YNLR to provide an update on the Notice of Commencement of project activities and to discuss the comment period on the Project Description (PD). CNSC staff provided opportunities to meet to discuss the proposed Project and regulatory review process further. CNSC staff discussed the comment period on the PD, and process for consultation with Athabasca Denesuliné communities. At the time these notifications also included HLFN, BLFN, and FLFN directly in addition to YNLR.
July 2019 – December 2019	CNSC sent an email to YNLR regarding the Commission decision on the scope of the EA for the Project. CNSC staff also had a discussion with YNLR regarding Denison's engagement with YNLR, potential outreach by CNSC staff on the project, and YNLR's plan to gather land use data related to the Project.
January 2020-June 2020	CNSC sent YNLR an email and follow-up letter regarding Denison pausing the EA process as well as information regarding the scope of the EA.
July 2020-December 2020	No activity occurred during this period as the Project was on hold.
January 2021-June 2021	CNSC staff sent an email and follow-up letter to provide YNLR notification of resumption of the EA process, including an

	opportunity to meet and discuss the next steps in the regulatory review process. CNSC staff sent an email to YNLR to offer to meet in spring 2021 to consult on next steps of the EA process. A meeting took place with YNLR to discuss the EA process and a path forward on how they would like to be involved. In the June 2021 meeting, CNSC offered and had discussions with YNLR about signing a project-specific TOR for consultation on the Project including next steps of where to become involved.
July 2021-December 2021	Following the June 2021 meeting, CNSC followed up with YNLR to begin coordinating regular meetings on the Project moving forward.
January 2022 – June 2022	CNSC staff sent emails to YNLR regarding an opportunity to apply for PFP to support the review of Denison's draft EIS including correspondence from CNSC to YNLR to schedule a meeting and discuss the coordination of upcoming meetings. A meeting took place between CNSC and YNLR to discuss their traditional land use data related to the Project site, ISR field test updates, questions/concerns related to the Project and updates on the EA process. CNSC staff sent YNLR emails regarding the coordination of follow-up meetings. CNSC staff met with YNLR in June 2022. YNLR raised concerns regarding the Project's potential impacts on water and requested information and responses from Denison to help address their concern. In June 2022, CNSC and YNLR signed a long-term TOR for engagement including the establishment of regular meetings between CNSC and YNLR.
July 2022 – December 2022	CNSC staff sent an email to YNLR to provide notice of the Denison Nuclear Substances and Radiation Devices (NSRD) Licence application. Emails were sent confirming the submission of the Wheeler River draft EIS and next steps of the process including the commencement of the public comment period. In September 2022, CNSC and YNLR had a regular meeting in-person in Saskatoon where the Project was discussed as part of the agenda. An update was given on the project and the regulatory review process was discussed. YNLR applied for funding through the PFP to support their review of the draft EIS for the Project.

January 2023 – June 2023	In January 2023, CNSC staff and YNLR had a regular meeting in-person in Saskatoon where the Project was discussed. Topics discussed included regulatory review process timelines, the licensing process and project updates as well as the ongoing EA and technical review process. YNLR raised a concern regarding the length of licence terms and asked if Denison would also be applying for a 20-year licence similar to the Cameco sites in Northern Saskatchewan. CNSC sent an email reminder to YNLR of the public comment period deadline for the draft EIS review. YNLR sent the CNSC an email to request an extension for submitting comments. CNSC responded to confirm the extension on the comment period. YNLR submitted comments on the draft EIS. In March 2023, CNSC staff and YNLR held an in-person meeting with a specific focus on the Project. CNSC staff provided updates on the EA process and YNLR's comments on the draft EIS were also discussed. Also in March 2023, CNSC staff and YNLR held a virtual regular meeting where updates on the Project were provided.
July 2023 – December 2023	CNSC staff completed a 'What We Heard' Report (WWHR) on the Traditional Knowledge Study completed by YNLR for the Project. CNSC staff shared the draft report with YNLR for comment and confirmation of accuracy. YNLR reviewed and provided feedback on the report to CNSC staff. In August 2023, CNSC staff and YNLR held a meeting where updated on the EA process were provided. YNLR presented on their work related to cumulative effects and the SK-1 woodland caribou region for CNSC's awareness.
January 2024 – June 2024	CNSC staff met with YNLR technical staff to discuss the Project and answer any questions regarding the technical review of the draft EIS. In May 2024, YNLR sent CNSC and the Province of Saskatchewan a letter detailing concerns regarding all three major uranium projects proposed in northern Saskatchewan – NexGen Rook I, Denison Wheeler River and Fission Patterson Lake South. Concerns mentioned included consultation, cumulative effects, water quality and environmental monitoring. CNSC staff held follow up meetings with YNLR to discuss and address the concerns included in the letter related to the CNSC's processes and mandate. YNLR included CNSC on correspondence with Denison regarding their concerns regarding the Project.

July 2024 – December 2024	CNSC staff had conversations and meetings with YNLR in July 2024 to discuss Environment Climate Change Canada's (ECCC) comments on their cumulative effects model and CNSC provided information on CNSC's cumulative effects methodology. A meeting occurred between CNSC, ECCC and YNLR to discuss cumulative effects assessment requirements within CEAA 2012. In August 2024, CNSC staff shared a copy of the Project specific issues tracking table with YNLR for their review and comment. In September 2024, CNSC staff and YNLR had a regular meeting in-person in Saskatoon where the Project was discussed, including an update on the Project, the regulatory review process and timelines.
January 2025 – June 2025	CNSC staff sent YNLR a letter in January 2025 advising them of the acceptance of the Final EIS as well as explaining the next steps for consultation process on the Project in advance of the Commission hearings. CNSC staff held a meeting with YNLR in February 2025 to discuss the next steps for the regulatory review process. In March 2025, CNSC staff and YNLR had a regular meeting virtually where updates on the Project were provided and next steps on the regulatory process were discussed. In April 2025, CNSC staff shared documents for YNLR review and comment including an updated copy of relevant sections of CNSC staff's Consultation Report as well as the EA Report. In May 2025, CNSC staff and YNLR had a regular meeting in-person in Saskatoon where CNSC Subject Matter Experts were invited to provide more detail and answer questions on technical concerns raised by YNLR regarding the Project. In June 2025, CNSC staff shared an updated copy of the issues tracking table with YNLR for their review and comment.

4.3.3 Key issues and concerns raised by Ya'Thi Néné Lands and Resources

Key issues and concerns raised by YNLR specific to the Denison Wheeler River Project to date are summarized below. The detailed issues tracking table for YNLR is found in Appendix A.3. The specific row where the issue is discussed in Appendix A.3 is listed beside each bullet. Refer

to this row in Appendix A.3 for additional context regarding the issue, CNSC staff's response and the current status of the issue.

1. Concerns about water resource management including concerns around the following topics:
    a. Concern about the large volume of natural lake and groundwater proposed for use in the project, potentially affecting stream flows and contaminating both surface and groundwater
    b. Concern about potential contamination of water, soils and fish species, which could lead to avoidance of areas surrounding the project and reduced access to traditional activities such as fishing, hunting and trapping
2. Concerns about ecological and cumulative effects including concerns around the following topics:
    a. Concern about the cumulative impacts of the project on wildlife especially woodland caribou. The area is already heavily disturbed by seismic cut lines, and the addition of the project could further fragment habitats. Other wildlife concerns include impacts on vegetation, wetlands, ungulates, furbearers, raptors, migratory birds, and species at risk
    b. Concern about the cumulative effects of various industrial developments, which have already reduced the available land for exercising Indigenous rights. This has led to concerns about shrinking usable areas for traditional activities.
3. Concerns about environmental monitoring and consultation including concerns around the following topics:
    a. Concern about the uncertainties surrounding Denison's proposed monitoring plans and insists on being involved in the design, implementation and reporting of these programs
    b. Concern that more robust monitoring is needed in the project area, if approved. YNLR emphasizes the importance of sustainability and protecting cultural traditions for future generations
    c. Concern that Denison has not adequately responded to all of YNLR's concerns raised in the EIS. Furthermore, opportunities to provide clarity or additional details were limited
4. Concerns about impacts on traditional land use including concerns around the following topics:
    a. Concern that the project will disrupt access to traditional lands and resources, which are vital for their cultural and subsistence activities. This includes concerns about the contamination of resources that are culturally important and the potential for diminished access to wildlife and fish
    b. Concern that the project could interfere with Aboriginal and/or Treaty rights to hunt, fish, trap and gather
5. Concerns about the project representation including concerns around the following topics:
    a. Concern that Denison has misrepresented the impacts on wildlife, specifically caribou and moose ranges within the EIS
    b. Concern regarding how Denison has represented the Athabasca Denesuliné First Nations particularly HLFN, misclassifying them as

Indigenous Communities instead of Indigenous Communities of Interest, which diminishes the importance of their traditional land use

6. Concerns about sustainability and future generations including concerns around the following topics:
    a. YNLR wants to ensure that the project is fully sustainable, with respect to cultural rights, environmental protection and socioeconomic equity. There is a strong desire to protect ecological systems that support traditional activities
    b. Elders are concerned about the future availability of wildlife and want traditional knowledge to be incorporated into the protection efforts for species like woodland caribou, ensuring that future generations have access to abundant wildlife for subsistence

YNLR has made a number of requests for accommodation and mitigation measures, including a cumulative effects assessment of northern Saskatchewan, a caribou habitat offset plan and greater involvement in the environmental monitoring and follow up program. CNSC staff's key responses and commitments are outlined below.

4.3.4 CNSC Staff's Response

CNSC staff acknowledge the issues and concerns that YNLR has raised to date related to the Project. CNSC staff have worked to understand, assess and address the concerns to the greatest extent possible through consultation having focused discussions, providing detailed responses, reflecting YNLR's views in CNSC's documentation, communicating YNLR's concerns to Denison and discussing the Project at regular meetings with YNLR to better understand their concerns and identify commitments, mitigations and a path forward to addressing them. CNSC staff's view is that the approach to consultation conducted for the Project has been in line with best practises and is flexible based on the specific needs and requests of each potentially impacted Indigenous Nation and community or organization, including YNLR. CNSC staff will continue to monitor Denison's engagement through the lifecycle of the Project, if approved and ensure that Denison is following through on their commitments to YNLR including addressing YNLR's questions, concerns and requests, as per *REGDOC-3.2.2, Indigenous Engagement.* CNSC staff have and will continue to provide opportunities for YNLR to provide input and feedback on how they would like to be consulted and engaged for the full life-cycle of the Project and what would be meaningful for them.

CNSC staff have made initial commitments (listed below) to address the concerns raised to date. These commitments are currently being proposed and CNSC are committed to discussing these further with YNLR. CNSC staff are committed to working with YNLR through the RIA process and further consultation on the Project to identify additional commitments, mitigations and a path forward to addressing their concerns related to the Project, as appropriate. The outcomes of these consultations and a final commitment list will be included in the CNSC's supplemental submission to the Commission.

Information regarding specific responses to each of YNLR's concerns are included in the issues tracking table found in Appendix A.3.

In summary, CNSC staff are committed to:

- Continuing to discuss the requests for mitigation and accommodation that YNLR has raised, including with Denison as appropriate
- Collaborating with YNLR on CNSC's Independent Environmental Monitoring Program (IEMP) near the Denison site
- Collaborating with YNLR on future studies in the Project area regarding monitoring and/or cumulative effects as part of ongoing oversight of the Project, ongoing engagement and consultation with YNLR in relation to the Project as per the TOR for long-term engagement between the CNSC and YNLR
- Collaboration with YNLR on ongoing oversight regarding protection of the environment and their Rights and interests in the Athabasca basin
- Oversight of Denison's commitments to YNLR
- Oversight of Denison's engagement with YNLR

CNSC staff encourage Denison to continue discussions, engagement and collaboration with YNLR to address any concerns that may arise. CNSC staff anticipate receiving an update from Denison on their engagement efforts in an IER to be filed on the record, as part of the upcoming Commission hearings.

CNSC staff are committed to working with YNLR through the RIA process and further consultation on the Project. Denison's commitments to YNLR are summarized in Section 5 which will be included in the CNSC's supplemental submission to the Commission. CNSC looks forward to continuing to work with YNLR through our long-term engagement TOR and throughout the lifecycle of the Project, if approved.

4.3.5 Conclusions

CNSC staff are committed to continuing to consult, engage and work collaboratively with YNLR and Denison in advance of the Denison Wheeler River Part 2 Commission hearing to address any outstanding concerns, should they arise. This includes work on the RIA drafting process. Updated information about potential impacts of the Denison Wheeler River Project on YNLR's Indigenous and/or Treaty Rights and mitigation and/or accommodation measures to address any identified impacts will be included in the supplemental submission, to be submitted to the Commission prior to the Wheeler River Part 2 hearing. CNSC staff will also continue to work with YNLR regarding their FPIC process and efforts to work towards seeking their consent for the project.

4.4 Consultation Activities with Métis Nation-Saskatchewan

Métis Nation - Saskatchewan has reviewed and provided feedback on Section 4.4 of the Consultation Report. CNSC staff note that the issues and concerns listed in Section 4.4.3 and views expressed listed in Section 4.4.4 are views of the Métis Nation – Saskatchewan. CNSC

provided flexibility regarding timelines for receiving MN-S' comments and suggested edits where additional time was required for MN-S to complete their review and provide input.

4.4.1 Background on Métis Nation-Saskatchewan

Figure 10: The Métis Nation - Saskatchewan Logo

Métis Nation - Saskatchewan is a government that represents Métis citizens in Saskatchewan. The Métis Nation Legislative Assembly (MNLA) is the governing authority of MN-S, made up of the Presidents of Métis Locals and the Provincial Métis Council. The MNLA has the authority to enact legislation, regulations, rules and resolutions governing the affairs and conduct of the Métis in Saskatchewan.

The Métis emerged as a distinct people/Nation in the historic Northwest during the course of the 18th & 19th centuries prior to Canada becoming a formal nation state. While the initial offspring of these unions were individuals who possessed mixed ancestry, the gradual establishment of distinct Métis communities, outside of First Nations and European cultures and settlements, as well as the subsequent inter-marriages between Métis women and Métis men, resulted in the genesis of a new Indigenous people – the Métis. The definition of Métis as adopted by Métis Nation–Saskatchewan is: "a person who self identifies as Métis, is of historic Métis Nation ancestry, is distinct from other Aboriginal peoples, and is accepted by the Métis Nation."

The Métis Nation grounds its assertion of Aboriginal nationhood on well-recognized international principles, including a shared history, common culture (song, dance, dress, national symbols, etc.), unique language (Michif, with various regional dialects), extensive kinship connections from Ontario westward, a distinct way of life, traditional territory, and a collective consciousness. The area known as the "historic Métis Nation Homeland" includes the three prairie provinces and extends into Ontario, British Columbia, Northwest Territories and the northern United States. [16]

The Métis are recognized in the Canadian Constitution Act, 1982 "Section 35 the existing Treaty and aboriginal rights of the aboriginal peoples of Canada are hereby recognized and affirmed;" In this Act, "aboriginal peoples of Canada" includes Indian, Inuit and Métis peoples.

CNSC staff have identified MN-S Northern Region I (NR-1) and Northern Region III (NR-3) as potentially having Indigenous Rights in the area where the Wheeler River Project is proposed defining them as a potentially impacted Indigenous Nation or community. NR-1 serves Métis citizens from the far-north of Saskatchewan including the communities of Uranium City, Stony Rapids and La Ronge. NR-3 serves Métis citizens in the communities of Ile a la Crosse, Beauval and Pinehouse.

CNSC has been advised that MN-S represents the interests of Métis citizens across the province and are the single point of contact for consultation and engagement for the purposes of the Denison Wheeler River Project. Consultations must take place with the Métis government structures that are elected and supported by the Métis people. CNSC staff work through the MN-S and the respective Region(s) unless the Region(s) or locals have clearly delegated that the MN-S will represent them for the purposes of consultation for a project.

In 2019, CNSC received a delegation letter stating that Sipisishk (Beauval) Métis Local #37, Kineepik (Pinehouse) Métis Local #9, A la Baie (Ile a la Crosse) Métis Local #21, Patuanak Métis Local #82, Dore/Sled Lake Métis Local delegate the duty to consult for the purposes of the Wheeler River Project to the MN-S on their behalf. In 2020, the CNSC President sent a letter to MN-S reaffirming the commitment that CNSC staff will explicitly include the MN-S as an entity with potential interest in this Project in its consultation efforts. Since 2019, CNSC staff have been consulting MN-S directly on the Project. Further information is included in Appendix B.5 of this report.

In late 2021, Kineepik Métis Local (KML) sent formal correspondence to MN-S, CNSC staff, and Denison indicating that they had decided to represent themselves for the purposes of consultation and engagement for the Project, as opposed to through the MN-S. Since that time, KML has been engaging directly with the CNSC on the Project. KML has indicated that it is responsible for taking the lead for consultation and engagement in relation to all industrial activity that occurs within their traditional territory including nuclear projects.

Figure 11: Map Showing the Métis Regions in the Vicinity of the Project Site

4.4.2 CNSC's Consultation Activities with Métis Nation - Saskatchewan

CNSC staff and MN-S have a long history of engagement, consultation and collaboration on nuclear projects in the province and have been engaging and consulting MN-S on the Project since 2019. CNSC staff have offered to develop with MN-S a Terms of Reference for long-term engagement and a project-specific TOR for consultation on the Project, but to date no arrangement has been finalized between the parties, however, CNSC staff remain open to and interested in developing mutually agreeable protocols that outline how the CNSC and MN-S engage and collaborate on nuclear projects in Saskatchewan. CNSC staff and MN-S have been meeting monthly to discuss the Denison Wheeler River Project including working towards understanding, assessing and addressing the concerns that MN-S has raised with regards to the Project.

Denison entered into a capacity funding agreement with MN-S which included funding for MN-S to complete a Métis Knowledge Study. In 2023, MN-S completed *The Wheeler River Project: Métis Knowledge Study Report* which was shared with Denison and the CNSC. Denison included the results from the study in the EIS. CNSC staff have collaborated with MN-S in reflecting and including the information shared from the study to support CNSC staff's review of the Denison EIS, as well as drafting CNSC staff's reports, assessments and recommendations to the

Commission. CNSC staff drafted a What We Heard Report (WWHR) based on the study received which was shared with MN-S for review and confirmation of accuracy

CNSC staff and MN-S have had ongoing discussions to discuss and address project specific concerns and potential impacts to their Indigenous Rights. MN-S has expressed concerns in relation the Project which will be included in Appendix A.4 issues tracking table.

Key correspondence related to the consultation activities below is included in Appendix B.5.

Table 6: Summary of the key consultation activities with Métis Nation - Saskatchewan

Date	Consultation Activity
April 2019–June 2019	CNSC staff sent an email and follow up letter to MN-S to provide early notification of the Denison Wheeler River Project. CNSC staff sent emails to MN-S to provide an update on the Notice of Commencement of the regulatory review process for the Project and to discuss the comment period on the Project Description (PD). CNSC staff offered opportunities to MN-S to meet to discuss further. Meeting and phone calls with MN-S to discuss the comment period on the PD and to learn about the preferred process and approach for consultation with MN-S and Métis regions and locals potentially affected by the Project.
July 2019 – December 2019	CNSC staff held a virtual meeting with MN-S and the respective MN-S regions to discuss CNSC regulations for uranium mining as well as the environmental review process for the Project. CNSC staff had a meeting with MN-S to discuss their governance structure and delegation of duty to consult from locals and regions to MN-S, and discussions on who the CNSC should consult with. CNSC sent an email to MN-S regarding the Commission's decision on the scope of the EA. CNSC staff participated in a tour of the Wheeler River site with MN-S. CNSC received a designation letter from MN-S on behalf of the NR-3 Métis Locals designating consultation to MN-S.
January 2020-June 2020	Email from CNSC staff to MN-S to clarify that the Project is being conducted under CEAA, 2012 and not the Impact Assessment Act, 2019.

	CNSC sent MN-S an email and follow-up letter regarding Denison pausing the EA process as well as information regarding the scope of the EA. The MN-S wrote a letter to the CNSC with concerns that the MN-S, on its own behalf and on behalf of several potentially impacted Métis communities, was not identified as an Indigenous group with potential interest in Denison's Project and describing MN-S' necessary role in consultation. The CNSC responded to the MN-S confirming that it is committed to continuing to consult and engaging with MN-S and, the potentially impacted Métis communities in Northern Regions 1,2, and 3 in relation to the Project.
July 2020-December 2020	No activity occurred during this period as the project was on hold.
January 2021-June 2021	CNSC sent an email and follow-up letter to provide MN-S notification of resumption of the EA process including an invitation to meet and continue consultation activities for the Project. CNSC staff met with MN-S on five different occasions during this time period to discuss their concerns regarding the Project, their relationship with Denison and funding opportunities. These meetings also included information on opportunities where MN-S could become involved throughout the regulatory process. CNSC staff participated in a tri-party meeting on June 25th, 2021, and included MN-S, CNSC staff and Denison to discuss MN-S' concerns and to support the process to rebuild trust and the relationship between MN-S and Denison. MN-S met with CNSC staff to discuss their concerns about the relationship between MN-S and Denison. CNSC sent an email follow-up to outline next steps in the EA process and the CNSC's efforts to follow-up with Denison on their concerns.
July 2021-December 2021	MN-S shared their concerns in follow-up to the tri-party meeting with Denison and CNSC. MN-S indicated that they had ongoing concerns regarding their relationship with Denison. CNSC met with MN-S on six different occasions during this time period. In a meeting with the CNSC, MN-S shared that their capacity remains an issue, along with concerns that Denison may be fast-tracking aspects of the process and not allowing time for MN-S to complete a Traditional Knowledge study. CNSC staff followed up with Denison to ensure Denison was taking action to follow up and address the concerns raised with MN-S. CNSC staff

	confirmed that Denison followed up with MN-S to work to respond to and address the concerns. CNSC offered and had discussions with MN-S about signing a project-specific TOR for consultation on the Project. CNSC continued to hold monthly meetings with MN-S to receive input on how MN-S would like to be consulted and engaged on the Project. In November 2021, KML sent an email and letter to the MN-S, CNSC staff, and Denison to request that KML represent themselves going forward for consultation and engagement purposes for the Project as the most directly affected Metis local in relation to the Project, and terminated the consultation delegation they had with MN-S.
January 2022 – June 2022	CNSC emailed a letter to MN-S regarding the PFP funding notice to support MN-S' review and comments on the draft EIS. CNSC emailed a letter informing MN-S of the upcoming feasibility field test, which is under Nuclear Substances and Radiation Devices Licence Application review. CNSC staff met with MN-S on five different occasions during this time period. Concerns were raised regarding timelines, capacity funding/agreements with Denison and upcoming community meetings being organized by Denison which were held without MN-S' direct participation. In-person community meetings took place May 30th – June 2nd where CNSC staff and Denison visited Patuanak, La Plonge, Beauval and Pinehouse. CNSC staff provided updates on the regulatory review process for the Project and answered questions raised by the participants. Due to capacity constraints, these meetings went ahead without MN-S' involvement.
July 2022 – December 2022	CNSC staff sent an email to MN-S to provide notice of the Denison Nuclear Substances and Radiation Devices (NSRD) Licence application. Emails were sent confirming the submission of the Wheeler River draft EIS and next steps of the process including the start of the public comment period. CNSC staff met with MN-S on five different occasions during this time period to provide updates on the licensing processes and draft EIS review period for the Project.

	MN-S informed the CNSC that Denison had agreed to fund a Métis Knowledge Study for MN-S to complete in relation to the Project.
January 2023 – June 2023	CNSC staff met regularly with MN-S to provide an overview of the CNSC's EA and licensing processes, and to provide updates on timelines, and to discuss MN-S' concerns regarding incorporation of MN-S' IK study into the draft EIS. CNSC staff met with MN-S on nine different occasions during this time period to provide Project updates and discuss and respond to MN-S' concerns. CNSC staff conducted outreach sessions on the Project with MN-S including representatives from MN-S regions NR-1 and NR-3 where CNSC participated virtually. MN-S participants raised concerns regarding historical contamination at Cameco sites in Northern Saskatchewan, and concerns regarding wildlife harvesting in the area. CNSC sent an email reminder to MN-S of the public comment period deadline for the draft EIS review. MN-S submitted comments on the draft EIS. MN-S and CNSC staff participated in the Elder's gathering at Pinehouse during the week of June 19th, 2023.
July 2023 – December 2023	CNSC staff met with MN-S on five different occasions over this time period. After the first round of technical review of the draft EIS, CNSC staff provided an update on the completeness check for the draft EIS and Denison's responses to Information Requests (IRs). CNSC staff shared that there would be a second round of technical review on the draft EIS. In July 2023, CNSC staff participated in outreach activities including the MN-S Back to Batoche event, which is an annual large gathering of Métis Citizens from across Saskatchewan. In October 2023, CNSC staff visited the communities of Ile a la Crosse and Beauval to have meetings with community members, provide updates and answer questions and concerns regarding the Project and the regulatory process. MN-S sent an email to the CNSC to share an update on the MN-S Métis Knowledge Study. In a meeting between MN-S and the CNSC, MN-S shared that they submitted the draft TLU to Denison for consideration and inclusion in the next version of the draft EIS.

	In late 2023, CNSC staff provided a MN-S with an update on the EA timelines and process. CNSC confirmed that Denison had incorporated MN-S' TLU study into their updated draft EIS submission.
January 2024 – June 2024	CNSC staff met with MN-S on four different occasions over this time period. MN-S shared the draft TLU with CNSC for review and consideration. CNSC staff drafted a What We Heard Report summarizing the results of the TLU study and shared the draft with MN-S for review and input. The CNSC sent a notification to MN-S that the revised EIS had passed the completeness check and CNSC staff would be moving to the technical review phase which included Denison's responses to comments received from the public and Indigenous Nations and communities. In a meeting with MN-S, the CNSC shared an update on the EA process and discussed PFP funding opportunities to support their participation in the next phase of the regulatory process. MN-S shared that they were planning on having licensing and technical discussions with Denison in June 2024. MN-S raised concerns regarding Denison's engagement to date but did not raise any specific concerns with regards to the CNSC's approach to consultation and engagement at the time. MN-S and CNSC staff participated in the annual Elder's gathering at Pinehouse during the week of June 17th, 2024.
July 2024 – December 2024	CNSC staff met with MN-S on three different occasions over this time period. The CNSC shared the project specific issues and concerns table for review by MN-S and also provided an update on the status of the EA process and PFP funding opportunity. No comments were received from MN-S on the issues and concerns tables for the Project. CNSC staff and MN-S met in October 2024 to provide an update on the EA and licensing process for the Project and seek MN-S' feedback, concerns or comments. In follow-up to this meeting, MN-S sent an email to the CNSC to clarify language that was used during the meeting around MN-S' willingness to engage with Denison. MN-S stated that they are willing to have consent-based discussions with Denison through a meaningful consultation process. CNSC committed to adjusting how it described MN-S' position regarding engagement with Denison, as necessary. MN-S raised no other concerns regarding the Project or the consultation process during this time.

	In August 2024, CNSC staff shared a copy of the project specific issues tracking tables with MN-S for their review and comment. MN-S and CNSC met at the end of 2024 to discuss next steps of the EA and licensing process including the finalization of the EIS.
January 2025 – June 2025	In a meeting with MN-S, the CNSC provided an update on the final EIS, next steps and review process, including drafting the CNSC staff's EA report, consultation report and opportunities for participant funding. CNSC staff provided an overview of different options for MN-S' continued participation and input in the remaining steps of the regulatory process. CNSC staff sent MN-S a letter in January 2025 advising them of the acceptance of the Final EIS as well as explaining the next steps for consultation on the project in advance of the Commission hearings. The letter requested for MN-S input and feedback with regards to the proposed next steps for consultation on the project and how the CNSC and MN-S can work together to assess and address any remaining concerns in relation to the Project. MN-S sent letters to CNSC staff in February 2025 regarding concerns they had with the Provincial EA process for this Project. MN-S sent two additional letters directed to the CNSC outlining their outstanding concerns on the Project and consultation process, including concerns that the consultation process did not provide a reasonable approach to seeking MN-S' consent. CNSC formally responded to these letters on April 2nd and April 17th. In April 2025, CNSC staff shared CNSC documents for MN-S to review and comment including relevant sections of CNSC staff's Consultation Report as well as the EA Report. MN-S requested additional time to complete the review, which CNSC provided to MN-S as requested. CNSC staff and MN-S had three separate meetings to discuss the outstanding concerns raised by the MN-S and discussed potential options to address them. In the discussions, MN-S did not share specific details on the concerns raised in the letters sent to the CNSC during the meetings. As a follow-up, CNSC offered to coordinate a meeting with CNSC Subject Matter Experts to discuss and address any outstanding technical concerns related to the Project. MN-S accepted this offer in May 2025 where a meeting was coordinated on May 26th, 2025, to discuss technical concerns with CNSC experts. During the meeting MN-S indicated that they

	were not prepared to have those discussions at the meeting as originally planned and delayed these discussions to another planned meeting in June 2025. CNSC has formally responded to MN-S based on the letters received and offered to coordinate a meeting with MN-S leadership and with Denison should that be of interest to discuss MN-S' outstanding concerns and options to collaborate on solutions and mutually agreeable path forward. MN-S responded indicating that they would only be able to meet following their election process which ended in June 2025. The MN-S agreed to a working meeting which took place on May 26th prior to the leadership meeting which took place on June 19th. In June 2025, CNSC staff met with MN-S staff and regional leadership in-person to discuss MN-S' outstanding concerns on the Project and to collaborate on a path forward. CNSC staff also shared an updated copy of the issues tracking table with MN-S for their review and comment.

4.4.3 Key issues and concerns raised by Métis Nation-Saskatchewan

Key issues and concerns raised by MN-S specific to the Denison Wheeler River Project to date are summarized below. The detailed issues tracking table for MN-S is found in Appendix A.4. The specific row where the issue is discussed in Appendix A.4 is listed beside each bullet. Refer to this row in Appendix A.4 for additional context regarding the issue, CNSC staff's response and the current status of the issue.

1. Concerns about contamination risks including concerns around the following topics:
    a. Concern about potential leaks and contamination in bedrock, and contamination from effluent (including selenium), particularly the impact on Whitefish Lake and downstream impacts to Russell Lake.
    b. Concern that the basement rock is impermeable and that hazardous materials will be fully contained by the frozen curtain walls.
    c. Concern regarding fear and avoidance of the area for harvesting, fishing, hunting and trapping for traditional, subsistence, family subsistence, community support, ceremonial, and commercial purposes. The MN-S states that these avoidance and stigma impacts are similar to the Cluff Lake legacy impacts, where Métis harvesting, fishing, hunting and trapping have been substantially impacted by fear and avoidance. The MN-S has requested

opportunities to study the avoidance and stigma effects of Cluff Lake to better understand the potential impacts of the Project.

2. Concerns about cumulative effects including concerns around the following topics:
    a. Concern that the cumulative effects assessment does not account for past environmental and social impacts that persist today.
    b. Concern that the scope of the cumulative effects assessment is not sufficient to capture all impacts, such as woodland caribou and to consider Métis perspectives.
3. Concerns about future monitoring including concerns around the following topics:
    a. MN-S emphasized the need for MN-S involvement in monitoring programs and want Métis members to be trained to sample, analyze and understand environmental data.
    b. Concern on Métis being involved throughout the lifespan on the Project, including through closure.
4. Concern about engagement and consultation including concerns around the following topics:
    a. Concern and dissatisfaction with Denison's engagement including misleading logs, lack of outreach, failing to meet created expectations and insufficient consultation on project activities.
    b. Concern on Denison's communication with municipalities instead of MN-S directly.
    c. Concern that no specific efforts have been made by CNSC and Denison to consider MN-S' position through the lens of free, prior, and informed consent (FPIC).
    d. Concern about the lack of engagement regarding potential impacts on Métis traditional use activities and cultural practises. MN-S feels that the perspectives and concerns of NR-1 and NR-3 have been overlooked.
5. Concerns about traditional cultural and land use including concerns around the following topics:
    a. Concern about the effects of uranium mining on future generations
    b. Concern that the project will have significant adverse effects on the Métis and specifically the Métis land claim.
    c. Concern that the Project will adversely affect the animals, lands and waters of the Métis homeland, including ecosystem and population level impacts which could significantly impact Métis harvesting, fishing, trapping and hunting. Such impacts could include effectively extinguishing Métis commercial fishing rights through harvester avoidance and market stigma of fish with the potential of contamination.
6. Concerns about economic opportunities and socioeconomics, including related to Métis title claim including concerns around the following topics:
    a. Concern over the lack of concrete economic benefits for Métis communities, limited training opportunities and insufficient support for Métis people to participate in the workforce.

b. Concern over the socioeconomic stress that the project will bring on Métis communities.
c. Loss of the socio-economic value to the Métis including hiring, nosiness and economic sovereignty opportunities, and ability for the MN-S to prioritize and consider all impacts and benefits if the MN-S could determine how and when the Project proceeded following recognition of the Métis title claim.
d. Loss of the value of the economic resource from the Métis title claim if the Métis title claim is recognized.

7. Concerns about long-term project impacts including concerns around the following topics:
a. Concerns over potential impacts on community cohesion, health services, caribou populations and the broader terrestrial ecosystem. Also concerned about the impacts of increased traffic and noise.
b. Concerns about waste disposal methods, hazardous waste storage and long-term reclamation, fearing contamination and potential abandonment without proper remediation. Additionally, post-decommissioning impacts on animal populations and the ability to harvest, including avoidance effects, are also a concern.

MN-S has made a number of requests for accommodation and mitigation measures, including a systematic study to examine Métis avoidance of uranium mine sites and methods to address such avoidance behaviours, community interviews specific with Métis knowledge holders on the topic of basement rock permeability, a socioeconomic study, freezing through the basement rock under the deposit, a zero selenium release and zero contaminant release standard, automatic suspension of operations based on exceedances, and Métis involvement in expanded including in relation to regional monitoring programs. The MN-S has also stated that proper accommodation can only occur through a consent-based process in which the MN-S can fully consider Project impacts. CNSC staff's key responses and commitments are outlined below in Section 4.4.5.

4.4.4 MN-S Views Expressed

Beginning in February 2025, MN-S has raised a number of concerns and issues that had not been indicated to the CNSC during previous consultation and engagement on the Project. These include, but are not limited to:

- Loss of the value of the economic resource from the Métis title claim once the Métis title claim is recognized.
- Loss of the socio-economic value to the Métis including hiring, business and economic sovereignty opportunities, and ability for the MN-S to prioritize and consider all impacts and benefits if the MN-S could determine how and when the Project proceeded following recognition of the Métis title claim.
- Concern that the project will adversely affect the animals, lands and waters of the Métis Homeland, including ecosystem and population level impacts which could significantly impact Métis harvesting, fishing, trapping and hunting. Such impacts could include effectively extinguishing Métis commercial fishing rights through harvester avoidance and market stigma of fish with the potential of contamination.

On April 30th, 2025, MN-S was provided an opportunity to review the Consultation and EA Report sections by the CNSC. CNSC encouraged MN-S feedback regarding the content drafted in this section and provided flexibility regarding timelines for receiving MN-S' comments and suggested edits where additional time was required for MN-S to complete. The views expressed in Section 4.4.4 are those of the MN-S.

The MN-S has informed CNSC of the 2023 Métis Nation within Saskatchewan Self-Government Recognition and Implementation Agreement between the MN-S and His Majesty the King in Right of Canada, including specifically Canada's recognition, in Section 5.02(e)(ii) of the MN-S as the exclusive representative of Métis rights in the context of the Crown's duty to consult and accommodate. The MN-S has described to the CNSC how MN-S Citizens may elect to become members of the community-Locals in which they reside, but that such elections are not required. Within the community of Pinehouse, approximately 40% of the locally resident MN-S Citizens are not members of KML. This statement is provided by MN-S not KML. Finally, membership of Métis Locals is based on the location of current residence, not a Citizen's historic connections; Métis share rights across Northern Saskatchewan, and many members of Locals outside of Northern Saskatchewan continue to be connected with the communities of Northern Saskatchewan and continue to exercise their Métis rights within Northern Saskatchewan.

In this context, the MN-S has asserted that its authority and responsibility to represent Métis rights within Northern Saskatchewan cannot be diminished or altered by the conduct of a single Local. The MN-S has also noted that even considering the CNSC's Region-first approach, KML is not a "Region". The CNSC has never considered or stated that "KML is a Region of MN-S" and does not work with MN-S through a "Region-first approach." CNSC works with KML through a separate consultation process based on KML's request included in Appendix B.3 and B.5.

CNSC and MN-S have been meeting monthly to discuss the Denison Wheeler River Project including working towards understanding, assessing and addressing the concerns that MN-S has raised with regards to the Project. MN-S does not view the monthly meetings as constituting MN-S representation of its right and interests.

4.4.5 CNSC Staff's Response

CNSC staff acknowledge the issues and concerns that MN-S has raised to date related to the Project. CNSC staff have worked to understand, assess and address the concerns to the greatest extent possible through consultation, having focused discussions, providing detailed responses, reflecting MN-S' views in CNSC staff's documentation, communicating MN-S' concerns to Denison and discussing the Project at regular scheduled meetings with MN-S to better understand their concerns and identify commitments, mitigations and a path forward to addressing the concerns. CNSC staff's view is that the approach to consultation conducted for the Project has been in line with best practises and is flexible based on the specific needs and requests of each potentially impacted Indigenous Nation and community, including MN-S. CNSC will continue to monitor Denison's commitments to MN-S and engagement through the

lifecycle of the Project, if approved and ensure that Denison is addressing MN-S' questions, concerns and requests, as per *REGDOC-3.2.2, Indigenous Engagement.*

Since 2019, CNSC staff have been consulting and engaging with MN-S staff through monthly meetings on the Project. CNSC have met with MN-S on 46 different occasions from January 2021 until May 2025, with each meeting and discussion focused on providing information and updates on the Project and regulatory review process, seeking MN-S' input on the approach to consultation and engagement, seeking MN-S' input on concerns they may have with regards to the Project and potential impacts on their rights and interests, as well as options to respond to and address their concerns. CNSC staff have approached consultation with MN-S, its regions and locals based on the MN-S' governance structure, as well as direction and requests received by MN-S and its locals. The CNSC does not take a region-first approach to consultation with MN-S and has worked directly with MN-S, in addition to the regions and locals as appropriate throughout the consultation and regulatory review process. Throughout the process the CNSC consistently worked with MN-S to address their concerns including engagement and communications with Denison. CNSC staff were not informed of MN-S' views that regular meetings and consultation activities between the CNSC and MN-S did not constitute representing MN-S rights and interests as it relates to the Project until MN-S raised this position in May 2025.

CNSC staff have made initial commitments (listed below) to address the concerns raised to date. These commitments are currently being proposed and CNSC are committed to discussing these further with MN-S. CNSC staff are committed to working with MN-S through the RIA process and further consultation on the Project to identify additional commitments, mitigations and a path forward to addressing the concerns related to the Project, as appropriate in order to work towards consensus on the key issues and in relation to the Project. The outcomes of this and a final commitments list will be included in the CNSC's supplemental submission to the Commission.

Information regarding specific responses to each of MN-S' concerns are included in the issues tracking table found in Appendix A.4.

In summary, CNSC staff are committed to:

- Continuing to collaborate with the MN-S on understanding their FPIC process and position on the Project
- Continuing to discuss, respond to and address their technical and environmental concerns related to the Project
- Continuing to discuss the requests for mitigation and accommodation measures that MN-S has raised, including with Denison as appropriate
- Collaborating with MN-S on CNSC's Independent Environmental Monitoring Program (IEMP) near the Denison site
- Collaborating with MN-S on potential follow-up and monitoring studies, workshops and monitoring programs within the Project area as part of the oversight and monitoring of the Project

- Ongoing engagement, information sharing and consultation with MN-S for the full life cycle of the Project including discussions and collaboration on ongoing oversight of commitments and protection of the environment including the protection of Métis rights
- Oversight of Denison's commitments to MN-S
- Collaboration on reporting to the Commission with MN-S

CNSC staff encourage Denison to continue discussions and collaboration with MN-S to address their outstanding concerns. CNSC staff anticipate receiving an update from Denison on their engagement efforts in an IER to be filed on the record, as per the upcoming Commission hearings.

CNSC staff are committed to working with MN-S through continued consultation in advance of the Commission hearing, including collaboration on the development of a MN-S specific RIA for the Project and working collaboratively to understand, respond to and address their concerns to the greatest extent possible. Denison's commitments to MN-S are summarized in Section 5 which will be included in CNSC staff's supplemental submission to the Commission. CNSC staff have and will continue to provide opportunities for MN-S to provide input and feedback on how they would like to be consulted and engaged for the full life cycle of the Project and what would be meaningful for them. CNSC looks forward to continuing to work with MN-S throughout the lifecycle of this Project, if approved.

4.4.6 Conclusions

CNSC staff are committed to continuing to consult, engage and work collaboratively with MN-S and Denison in advance of the Denison Wheeler River Part-2 Commission hearing to address any outstanding concerns and work towards consensus on the concerns and Project. This includes collaboration on a MN-S specific RIA which will provide updated information about potential impacts of the Denison Wheeler River Project on MN-S' Indigenous Rights and mitigation and/or accommodation measures to address any identified impacts will be included in the supplemental submission, to be submitted to the Commission prior to the Wheeler River Part-2 hearing. CNSC staff will also continue to work with MN-S to understand and support their FPIC process and engage in efforts to work towards seeking their consent for the Project, where possible.

4.5 Engagement Activities with Lac La Ronge Indian Band

Lac La Ronge Indian Band has reviewed and provided feedback on Section 4.5 of the Consultation Report. CNSC staff note that the issues and concerns listed in Section 4.5.2 are views of the Lac La Ronge Indian Band. CNSC staff provided flexibility regarding timelines for receiving LLRIB's comments and suggested edits where additional time was required for LLRIB to complete their review and provide input.

4.5.1 Background on Lac La Ronge Indian Band

Figure 12: The Lac La Ronge Indian Band Logo

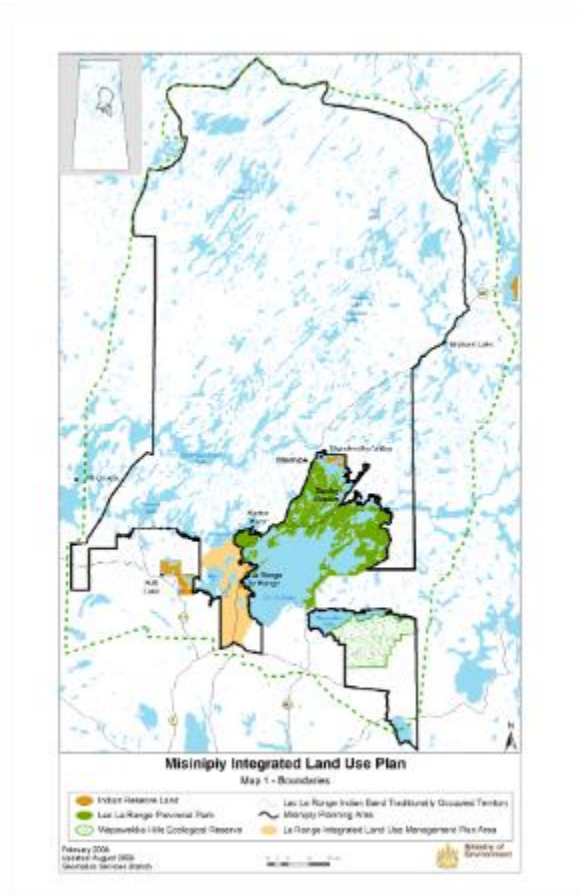
Located in north-central Saskatchewan, Lac La Ronge Indian Band (LLRIB) is the largest First Nation in Saskatchewan and one of the 10 largest in Canada, with a population of 12,168, as of March 31st, 2024. The LLRIB reserve lands extend from rich farmlands in central Saskatchewan, through the boreal forest to the Churchill River and beyond. The central administration office for LLRIB is in La Ronge, 241 km north of Prince Albert, on the edge of the Pre-Cambrian Shield.

The LLRIB is a signatory to Treaty 6 and has several reserves, including Hall Lake, Stanley Mission, Grandmother's Bay and others. The administrative centre for LLRIB is located adjacent to La Ronge and Air Ronge. In terms of direct linear distance, the LLRIB central office is located 265 km away from the Project, and in terms of travel distance by existing transportation route, 480 km away from the Project site.

CNSC staff have been engaging with LLRIB in relation to the Project since 2022, when the Nation expressed interest in the Project. Initially, CNSC staff did not identify LLRIB as a Nation with potential rights or interests in relation to the Project, as the Project is not within LLRIB's known traditional or treaty territory based on publicly available data (Figure 11). CNSC staff also have limited information on LLRIB's use in the Project area. LLRIB has stated that the publicly available information is not current and that future discussions and clarifications of the boundary area defining each Nation's traditional territory still need to be discussed with LLRIB members. LLRIB has underscored limitations in including updated traditional territory information for the Project, as Denison and the CNSC have noted that the Project is outside of LLRIB's traditional and treaty territory, based on the latest information available to the CNSC.

Since 2022, LLRIB has been included in all key correspondence and engagement and participation opportunities for the regulatory processes listed in Table 2. LLRIB has expressed concerns about the Project and these are noted in Appendix A.5 issues tracking table. Key correspondence related to the engagement activities listed below can be found in Appendix B.6.

Figure 13: Map Showing the Lac La Ronge Indian Bands Land Use which is Currently Under Review by LLRIB)



The Denison Wheeler River Project is not visible on the map provided by LLRIB

Table 7: Summary of the key engagement activities with Lac La Ronge Indian Band

Date	Engagement Activity
January 2022 – June 2022	CNSC staff emailed LLRIB regarding the PFP opportunity to support the review of Denison's draft EIS for the Project. LLRIB did not apply for funding at that time. CNSC staff emailed a letter informing LLRIB of the upcoming feasibility field test, which is under a Nuclear Substances and Radiation Devices Licence Application review.
July 2022 – December 2022	CNSC staff sent an email to LLRIB providing notice of the Denison Nuclear Substances and Radiation Devices (NSRD) Licence Application. CNSC staff confirmed submission of the draft EIS and outlined next steps to LLRIB, including notification of the commencement of the public comment period.
January 2023 – June 2023	In January 2023, LLRIB phoned CNSC staff, indicating that Denison had not consulted the Nation on the Project and that the Nation did not receive a duty to consult notice from the Province

	of Saskatchewan either. LLRIB also expressed an interest in being involved in the consultation and regulatory process going forward. CNSC staff sent a reminder to LLRIB of the public comment period deadline for the draft EIS review via email. LLRIB submitted comments on the draft EIS during the public comment period. In February 2023, CNSC staff met with LLRIB to provide an overview of the Project, as well as the CNSC's mandate and regulatory processes. The meeting provided an opportunity to address any questions that LLRIB might have regarding the Project. LLRIB raised concerns about Denison not engaging LLRIB on the Project. CNSC staff informed Denison that LLRIB was interested in being engaged on the Project and requested that Denison follow up with the Nation. CNSC staff also provided LLRIB with an update on the regulatory process for the Project through the CNSC's Wheeler River Project bulletin.
July 2023 – December 2023	CNSC staff provided an update on the completeness check for the draft EIS, as well as updates on the status of the EA and regulatory process.
January 2024 – June 2024	CNSC staff notified LLRIB that the revised draft EIS had passed the completeness check and that the CNSC would be initiating the technical review phase, which includes a review of the proponent's responses to public and Indigenous Nations and communities' comments on the draft EIS.
July 2024 – December 2024	CNSC staff shared the August CNSC Project bulletin with LLRIB for their awareness. CNSC staff sent a notification letter to LLRIB regarding the renewal of the NSRD Licence at the Wheeler River site prior to the Commission's decision.
January 2025 – June 2025	In January 2025, CNSC staff sent a notification letter to LLRIB regarding the CNSC's acceptance of the final EIS. This letter also outlined next steps in the consultation process. In April 2025, in response CNSC staff's January letter, LLRIB expressed interest in becoming more involved in the regulatory and consultation processes for the Project. In early April, CNSC staff met with LLRIB to provide Project updates and outline remaining steps in the regulatory process leading up to the Commission hearing. LLRIB raised concerns about Denison's level of engagement, emphasizing potential impacts on traditional territory and environmental safety issues. CNSC staff responded to the

	concerns raised and communicated them to Denison, requesting that Denison follow up with LLRIB. In May 2025, CNSC staff shared documents for LLRIB's review and comment, including an updated copy of relevant sections of CNSC staff's Consultation Report, as well as the EA report. In June 2025, CNSC staff shared a copy of the Project specific issues tracking table with LLRIB for their review and comment.

4.5.2 Key issues and concerns raised by Lac La Ronge Indian Band and CNSC Staff's Response

During a meeting between CNSC staff and LLRIB in February 2023, LLRIB noted that the proposed Project could impact their members' hunting, trapping, fishing and cultural and spiritual rights. LLRIB also expressed these concerns in comments on the draft EIS in 2023. LLRIB has expressed dissatisfaction with Denison's engagement and responses to their concerns to date.

In April 2025, LLRIB underscored that Denison had not yet adequately addressed their concerns. LLRIB expressed a desire for more meaningful engagement on the part of Denison, noting that Denison had mis-represented the Nation's traditional territory. LLRIB also raised concerns about impacts to their traditional territory, particularly regarding the risks to woodland caribou and potential water contamination that could impact the Churchill River. To date, LLRIB has not provided CNSC staff or Denison with specific information regarding their land use and practice of rights in the proposed Project area.

CNSC staff noted the concerns that LLRIB identified and remains open to facilitating further discussions to better understand and respond to LLRIB's Project-specific concerns. This includes working collaboratively to resolve these concerns, including those relating to Denison's level of engagement. CNSC staff will continue to monitor Denison's engagement throughout the lifecycle of the Project, if approved. CNSC staff have provided and will continue to provide opportunities for LLRIB to provide input and feedback on how they would like to be consulted on the Project in ways that are meaningful to them.

Since LLRIB expressed interest in the Project in 2022, CNSC staff have continued to keep LLRIB informed of the regulatory process for the Project and provided opportunities to meet and discuss any comments or concerns. The detailed issues tracking table for LLRIB can be found in Appendix A.5. In Appendix A.5, the specific row discussing the issue is listed beside each bullet. Please refer to this row in Appendix A.5 for additional context on the issue, CNSC staff's response and the issue's status.

4.5.3 Conclusions

It is the view of CNSC staff that LLRIB's questions and concerns have been considered and addressed. To date, LLRIB has not provided specific information demonstrating that the Project could lead to impacts on their rights and interests. CNSC staff remain committed to engaging and sharing Project-related information with LLRIB going forward.

4.6 Engagement Activities with Peter Ballantyne Cree Nation

Peter Ballantyne Cree Nation has reviewed and provided feedback on Section 4.6 of the Consultation Report. CNSC staff note that the issues and concerns listed in Section 4.6.2 and the views expressed listed in Section 4.6.3 are views of PBCN. CNSC staff provided flexibility on timelines for receiving PBCN's comments and suggested edits when PBCN required additional time to review and provide input.

4.6.1 Background on Peter Ballantyne Cree Nation

Figure 14: The Peter Ballantyne Cree Nation Logo

Peter Ballantyne Cree Nation (PBCN) is a Woodland Cree First Nation in northern Saskatchewan consisting of eight communities: Denare Beach, Deschambault Lake, Kinoosao, Pelican Narrows, Prince Albert, Sandy Bay, Southend and Sturgeon Landing. PBCN are called Assin'skowitiniwak or Rockey Cree, where Assin'skowitiniwak means "people of the rocky area". PBCN is a signatory of Treaty 6.

Denison undertook an analysis of PBCN communities and their distances to the proposed Project area. In terms of direct linear distance and travel distance by existing transportation routes (i.e., road and vehicle distances) to the project location, Denison provided the following information:

- Amisk Lake (Denare Beach): direct linear distance = 375 km; travel distance by existing transportation routes = 750 km.
- Deschambault Lake: direct linear distance = 310 km; travel distance by existing transportation routes = 650 km.
- Kinoosao: direct linear distance = 200 km; travel distance by existing transportation routes = 1,520 km.
- Pelican Narrows: direct linear distance = 296 km; travel distance by existing transportation routes = 715 km.
- Prince Albert: direct linear distance = 485 km; travel distance by existing transportation routes = 615 km.
- Sandy Bay: direct linear distance = 287 km; travel distance by existing transportation routes = 785 km.
- Southend: direct linear distance = 180 km; travel distance by existing transportation routes = 700 km.
- Sturgeon Landing: direct linear distance = 425 km; travel distance by existing transportation routes = 850 km. [12]

PBCN first expressed interest in the Project in 2022 when applying for funding through CNSC's PFP to support reviewing the draft EIS. PBCN received funding that year and submitted a summary letter to CNSC staff, outlining high-level concerns about the Project (for further details on the letter, please see Appendix B.7). CNSC staff began engaging with PBCN directly on the Project that same year.

Initially, CNSC staff did not identify PBCN as a Nation with potential rights or interests for this Project. Based on the data and information available at the time, CNSC staff's assessment was that the Project was not within PBCN's traditional territory or within an area of interest connected to PBCN's rights and interests directly. Based on additional information shared by PBCN in November 2024, CNSC staff acknowledge that the Project is located on the western edge of PBCN's claimed traditional territory. However, specific and detailed information regarding PBCN's traditional land use activities in the Project area have not been shared with CNSC staff to date. PBCN's draft traditional territory map remains confidential to the public and therefore cannot be included in CNSC staff's public reports.

Since 2023, CNSC staff have included PBCN on all key correspondence and have provided opportunities for engagement and participation in the regulatory process, as noted in Table 2 of this Consultation Report. PBCN has expressed concerns about the Project and those can be found in the issues tracking table, in Appendix A.6. Key correspondence related to the engagement activities listed below can be found in Appendix B.7.

Table 8: Summary of the key engagement activities with Peter Ballantyne Cree Nation

Date	Engagement Activity
January 2022 – June 2022	PBCN applied and received PFP funding to review the draft EIS for the Project.

	CNSC staff emailed a letter informing PBCN of the upcoming feasibility field test, which is under Nuclear Substances and Radiation Devices Licence Application review.
July 2022 – December 2022	CNSC staff emailed PBCN, providing notice of the Denison Nuclear Substances and Radiation Devices (NSRD) Licence. CNSC staff confirmed submission of the Wheeler River draft EIS and outlined next steps of the process via email, notifying PBCN when the public comment period would start.
January 2023 – June 2023	PBCN phoned CNSC staff in February 2023, signalling interest in the Project, informing CNSC staff that the Nation would be providing comments on the draft EIS, and requesting a two-week extension for the comment period. CNSC staff granted that extension. CNSC staff emailed PBCN, reminding the Nation of the public comment period deadline for the draft EIS review. PBCN submitted comments on the draft EIS, which were included in a summary letter to CNSC staff. In May 2023, CNSC staff offered to meet with PBCN to discuss their comments on the draft EIS. In June 2023, CNSC staff met with PBCN in-person in Saskatoon to provide an introduction on the CNSC's mandate and regulatory processes, as well as information on the Project. The meeting provided an opportunity for PBCN to ask and receive answers to questions they had regarding the Project and regulatory process. CNSC staff and PBCN also discussed PBCN's comments on the draft EIS. PBCN expressed concerns that they were not included in the consultation and regulatory process from the beginning of the process in 2019 and noted potential impacts on water downstream from the Project. PBCN shared information on their land use and traditional territory and shared a map with the CNSC, noting that the map was preliminary and was in the process of being updated.
July 2023 – December 2023	CNSC staff provided an update on the EIS completeness check for Wheeler River, as well as an update on the EA process to PBCN. PBCN expressed concerns regarding funding needs. CNSC provided clarity regarding use of existing funds awarded through the CNSC's PFP to PBCN to facilitate their engagement on the Project. In October 2023, PBCN sent a letter to CNSC expressing concerns about the Project and frustrations with Denison and the CNSC's

	lack of meaningful engagement. CNSC staff responded to the letter, indicating an interest in discussing PBCN's concerns and learning more about the Nation's perspective regarding potential impacts to rights, interests and traditional territory in relation to the Project. In November 2023, CNSC staff met with PBCN to discuss ongoing concerns. CNSC staff reiterated the need for more information from PBCN to facilitate CNSC staff's understanding of rights and interests that could be impacted, specifically including information regarding PBCN's land use in the Project area. CNSC staff suggested having technical discussions with PBCN and CNSC Subject Matter Experts (SMEs) to discuss PBCN's concerns regarding potential impacts on water, including downstream impacts. In December 2023, PBCN sent a letter to CNSC staff confirming preferred next steps for engagement on the Project.
January 2024 – June 2024	CNSC staff and PBCN corresponded via email to discuss PFP funding and next steps for engagement. In January 2024, CNSC staff met with PBCN to discuss outstanding funding still available to PBCN for the purposes of engagement. CNSC staff followed up via email, providing details on the funding amount that was still available, offering to meet with PBCN to discuss their concerns. CNSC staff also requested an updated traditional territory and land use map from PBCN. From February 2024 to September 2024, PBCN worked with consultants to interview PBCN members and develop an evidence-based map of its traditional territory, with a specific focus on the Project area and the Athabasca Shield region. CNSC staff notified PBCN that the draft EIS had passed the CNSC staff's completeness check and that the CNSC would initiate the technical review phase, which involves the proponent responding to public and Indigenous Nations and communities' comments on the draft EIS.
July 2024 – December 2024	In October 2024, PBCN sent a letter to CNSC staff asking for a meeting to share information regarding land use and discuss next steps on engagement. In October 2024, PBCN and CNSC staff met to provide Project-related updates. During that meeting, PBCN provided an overview of their updated traditional territory map. The Province of Saskatchewan was also in attendance. Based on the information

	that PBCN shared, there was no clear indication of traditional land use activities in the Project area. In November 2024, PBCN sent CNSC staff a letter that included preliminary land use information relating to PBCN's rights and territory. CNSC followed up with PBCN, requesting further information regarding land use and rights specific to the Project area. PBCN shared a list and a map outlining land and resource use activities conducted within their traditional territory. However, all of the locations in the list and map shared were outside of the Project area. CNSC staff sent a letter to PBCN, notifying the Nation of the NSRD Licence renewal at the Wheeler River site prior to the Commission's decision.
January 2025 – June 2025	In January 2025, CNSC staff sent a letter to PBCN notifying the Nation of the CNSC's acceptance of the final EIS and outlining next steps on the consultation and regulatory processes in advance of the Commission hearings. In February 2025, CNSC staff, the Province of Saskatchewan and PBCN met to discuss the Saskatchewan EA process, the CNSC EA process and monitoring. During the meeting, PBCN expressed frustrations with the provincial and federal monitoring strategies. CNSC staff provided information on how PBCN could become involved in monitoring, if the Project is approved. In March 2025, CNSC staff and PBCN met in-person in Saskatoon to provide updates on the status of the regulatory process, request further land use information from PBCN specific to the Project, discuss the concerns PBCN has raised to date and discuss next steps for the regulatory review process. CNSC Subject Matter Experts attended to provide additional information and help responding to and addressing PBCN's concerns regarding the Project's impacts on water, the ISR mining method and environmental monitoring downstream from the Project area. PBCN did not provide any additional land use or traditional use data specific to the Project area during the meeting. In May 2025, PBCN sent CNSC staff a letter that included a Project-specific map illustrating PBCN members' general use for hunting, trapping and fishing in areas overlapping the Project area. CNSC staff also shared documents for PBCN's review and comment, including an updated copy of relevant sections of CNSC staff's Consultation Report, as well as the EA report.

	In June 2025, CNSC staff met with PBCN in-person in Saskatoon to discuss PBCN's engagement with Denison, outstanding concerns and overview of monitoring initiatives and options for collaboration on addressing PBCN's concerns regarding downstream impacts from the Project. CNSC staff and PBCN also discussed PBCN's claims regarding traditional land use in and around the Project area. PBCN committed to providing more specific information regarding their use and rights in relation to the Project area. CNSC staff also shared a copy of the Project specific issues tracking table with PBCN for their review and comment.

4.6.2 Key issues and concerns raised by Peter Ballantyne Cree Nation

In June 2023 PBCN shared that community members may be impacted by this Project through downstream effects and that PBCN has known traditional territory and has exercised Indigenous Rights in and around the Project site. However, PBCN has not shared with CNSC staff specific information or data demonstrating PBCN land use in and around the proposed Project area to date.

In October 2023 PBCN expressed frustration about Denison and the CNSC's lack of meaningful engagement on the Project, including issues regarding capacity funding constraints. CNSC staff responded, indicating that the CNSC was interested in learning more about PBCN's land use in the Project area and in continuing to meet with PBCN to understand and address concerns raised to date. Through the PFP, CNSC has awarded funding to support PBCN's review of the draft EIS and engage with the CNSC in relation to the Project and the regulatory review process.

In March 2025, CNSC and PBCN held an in-person meeting in Saskatoon, during which PBCN raised concerns regarding water and downstream impacts, impacts on wildlife, the ISR mining method and the monitoring of potential downstream impacts. CNSC SMEs attended the meeting to provide additional information and clarification, in order to help address the concerns raised to date. PBCN provided a list of questions prior to the meeting to help guide the discussion. CNSC SMEs responded to PBCN's questions during the meeting.

4.6.3 PBCN Views Expressed

On May 7th, 2025, CNSC staff offered PBCN the opportunity to review a draft of the Consultation and EA Report sections. CNSC staff encouraged PBCN to provide feedback and input and offered flexibility on timelines for receiving comments and suggested edits. The views expressed in section 4.6.3 are PBCN's.

CNSC staff began engaging with PBCN directly in 2022, when PBCN expressed an interest in the Project. In March 2023, PBCN sent a letter to the CNSC, indicating that PBCN is an

impacted Indigenous Nation exercising Aboriginal and Treaty rights in the Project area. The letter, contained in Appendix B.7, outlines PBCN's rationale as to why they are an impacted Nation exercising Aboriginal and Treaty rights in the Project area. PBCN expressed frustration that the CNSC and Denison had not identified them as a Nation with potential rights or interests in relation to the Project originally. This frustration is reiterated in a May 15, 2025, letter to the CNSC. Further context on this correspondence can be found in Appendix B.7.

In October 2023, PBCN sent a letter stating that the Project will have negative impacts on PBCN members gathering medicinal plants; increase access by non-PBCN members to PBCN's remote hunting and trapping lands; and negatively impact PBCN's furblock, located near the Project. From February 2024 to September 2024, PBCN worked with a third-party consultant to interview PBCN members and develop an evidence-based map of the Nation's traditional territory. In November 2024, PBCN sent a letter to CNSC identifying specific species that PBCN members hunt, trap or gather around the Project site, as well as important areas for cultural activities located near the Project site. The species and traditional activities included but were not limited to gathering medicinal plants; hunting moose and caribou; harvesting duck, mallard and geese; trapping lynx; harvesting chaga and rat root; and using the Project area as a teaching area and for food storage. In addition to those maps, PBCN shared a Project-specific map in May 2025, illustrating where PBCN members exercise Aboriginal and Treaty rights related to hunting, trapping and fishing and showing overlap with the Project area. For further details, please see Appendix B.7.

PBCN is concerned that the CNSC has not assessed the impacts of the Wheeler River Project on PBCN's rights, generally, and PBCN's Aboriginal rights relating to harvesting, fishing and gathering, specifically. Additionally, PBCN is seeking answers on how the information the Nation has provided could be meaningfully incorporated into the regulatory process; how specific mitigation strategies might be developed to minimize impacts on PBCN's Aboriginal and Treaty rights; and what accommodation measures would be required to offset those impacts.

4.6.4 CNSC Staff's Response

Upon receiving PBCN's expression of interest in the Project in 2022, CNSC staff have continued to keep PBCN informed of the Project and provided ongoing opportunities to meet and discuss their comments, questions and/or concerns. The detailed issues tracking table for PBCN can be found in Appendix A.6. Appendix A.6 lists the specific row discussing each issue beside each bullet. Please refer to this row in Appendix A.6 for additional context on the issue, CNSC staff's response and the issue's status.

CNSC has reviewed the land use information, maps, claims and data that PBCN has shared to date. Based on the information shared to date, CNSC staff's assessment is that PBCN has not identified specific land and traditional uses or cultural sites that the Project could impact directly. A majority of the specific land use information provided to date indicates that PBCN members have traditional land use in and around Reindeer Lake and potentially near Wollaston Lake, located approximately 110 and 150 kilometres in a straight line, respectively, from the Project site and impacted areas.

Based on the information shared regarding PBCN members' historical and contemporary use, such as specific locations and impacts to PBCN's Aboriginal and/or Treaty Rights, CNSC staff have assessed that the Project is unlikely to have any direct impacts on PBCN's ability to exercise rights in their territory. However, CNSC staff remain open to engaging with PBCN on issues and concerns and to receiving additional information detailing rights and interests relating to the proposed Project. CNSC staff are committed to continuing to work with PBCN to address their concerns and requests together, including involving PBCN in Project-related regional monitoring activities. CNSC staff have provided and will continue to provide opportunities for PBCN to provide input and feedback on how they would like to be engaged on the Project in ways that are meaningful to them.

4.6.5 Conclusions

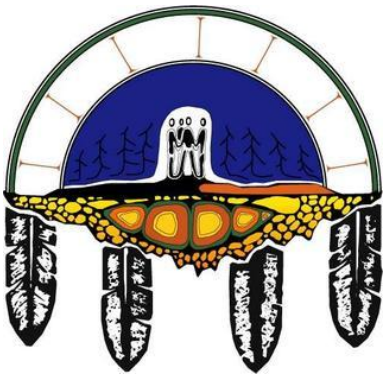
CNSC staff will continue to engage with PBCN, responding and addressing the Nation's Project-related questions and concerns and cultivating a better understanding of PBCN's land use within the Project area. CNSC staff remain committed to engaging and sharing Project-related information with PBCN and are open to receiving any new information PBCN is willing to provide regarding land use in the Project area and collaborating on options to address their concerns including project specific and regional monitoring activities. Any new information received that is pertinent to consultation and engagement activities will be reflected in a supplementary report prior to the Part 2 Commission hearing.

4.7 Engagement Activities with Birch Narrows Dene Nation

Birch Narrows Dene Nation has reviewed and provided feedback on Section 4.7 of the Consultation Report. CNSC staff note that the issues and concerns listed in Section 4.7.2 and the views expressed listed in Section 4.7.3 are views of BNDN. CNSC staff provided flexibility on timelines for receiving BNDN's comments and suggested edits when BNDN required additional time to review and provide input.

4.7.1 Background on Birch Narrows Dene Nation

Figure 15: The Birch Narrows Dene Nation Logo



Birch Narrows Dene Nation (BNDN) is a signatory of Treaty 10 and is situated in northern Saskatchewan north of Buffalo Narrows on Wasekamio Lake, with their main community being in Turnor Lake, Saskatchewan. BNDN is approximately 2,693 hectares in size and has a total registered population of 708 members, with 409 members living on-reserve and 299 members living at locations off-reserve. BNDN is also a member of Meadow Lake Tribal Council (MLTC). The MLTC represents 9 different First Nations that are signatories to three different treaty areas (6, 8, and 10) in northwest Saskatchewan.

BNDN has reserve lands at three sites: 1) Turnor Lake 193B, which adjoins the Northern Hamlet of Turnor Lake; 2) Churchill Lake 193A, which contains the historic site of Clear Lake at the junction of Churchill Lake and Frobisher Lake; 3) and Turnor Lake 194, which is on Peter Pond east of Dillion. In terms of direct linear distance, BNDN is located 230 km away from the Project site. In terms of travel distance by existing transportation routes, BNDN is located approximately 570 km away from the Project site.

CNSC staff have kept BNDN informed of Project-related developments since 2019. Once BNDN expressed official interest in the Project in 2021, CNSC staff sent BNDN all key correspondence and provided opportunities for engagement and participation in the regulatory process. Table 2 includes a summary of correspondence between CNSC staff and BNDN. The issues tracking table in Appendix A.7 provides an overview of BNDN's concerns about the project. Appendix B.8 includes key correspondence related to engagement activities in Table 9.

Table 9: Summary of the key engagement activities with Birch Narrows Dene Nation

Date	Engagement Activity
April 2019–June 2019	CNSC staff sent an email and follow-up letter to BNDN, providing early notification of the Project. CNSC staff emailed BNDN, providing updates on the Notice of Commencement of the regulatory process and offering to discuss the Project description comment period. CNSC staff offered to meet with BNDN.
July 2019 –December 2019	CNSC emailed BNDN, notifying the Nation of the Commission's decision on the scoping of the EA.

January 2020-June 2020	CNSC emailed and sent a follow-up letter to BNDN regarding Denison pausing the EA process and outlining the scope of the EA.
July 2020-December 2020	No activity occurred during this period, as the Project was on hold.
January 2021-June 2021	CNSC staff sent an email and follow-up letter to BNDN, notifying the Nation that EA activities and Project engagement activities had resumed. CNSC staff emailed BNDN, offering to coordinate meetings to engage on next steps in the EA process, if of interest. In May 2021, BNDN sent a letter via email to CNSC staff, expressing interest in being engaged on the Project. CNSC staff responded to the letter and offered to organize a meeting to discuss the Project. BNDN did not respond to the CNSC's offer to meet.
July 2021-December 2021	No activity occurred during this period, as there were no Project updates to provide and BNDN did not respond to CNSC's meeting request.
January 2022 – June 2022	CNSC staff emailed BNDN a letter which included information on the PFP funding notice. CNSC staff sent a follow-up reminder about the PFP funding opportunity via email. BNDN applied for PFP funding and was awarded funds to support their review of the draft EIS. CNSC staff sent a letter informing BNDN of the Denison proposed feasibility field test, which was under a Nuclear Substances and Radiation Devices Licence Application review.
July 2022 – December 2022	CNSC staff also emailed BNDN, providing notice of the Denison Nuclear Substances and Radiation Devices (NSRD) Licence. CNSC emailed BNDN, confirming the submission of the draft EIS and outlining next steps in the process, including the commencement of the public comment period.
January 2023 – June 2023	In February 2023, CNSC staff met with BNDN in-person in Saskatoon to discuss multiple projects and related regulatory processes. An update on the Wheeler River Project was provided. BNDN informed the CNSC that their technical review of the Wheeler River Project EIS was underway, and that the formal comments and concerns would be submitted via a written submission.

	BNDN requested an extension for their submission of comments on the draft EIS and CNSC staff granted that extension. BNDN submitted comments on the draft EIS to CNSC staff. There were 90 comments in total, coupled with recommendations highlighting the Project's environmental and Indigenous rights impacts and consultation deficiencies.
July 2023 – December 2023	CNSC staff updated BNDN on the CNSC's draft EIS completeness check and shared the December project bulletin for BNDN's awareness.
January 2024 – June 2024	CNSC staff notified BNDN that Denison had passed the revised draft EIS completeness check and that CNSC staff would initiate the technical review phase, which includes reviewing the proponent's responses to public and Indigenous Nations and communities' comments from the public comment period.
July 2024 – December 2024	CNSC staff shared the August project bulletin with BNDN and provided Project-related updates during the months of October, November and December. CNSC staff sent a letter to BNDN, notifying the Nation of the renewal of the NSRD Licence at the Wheeler River site prior to the Commission's decision.
January 2025 – June 2025	In January 2025, CNSC staff sent a letter to BNDN advising the Nation of the CNSC's acceptance of the Final EIS and outlining next steps in the consultation process in advance of the Commission hearings. CNSC staff informed BNDN of the PFP funding notice. In May 2025, BNDN sent a letter to CNSC staff and Denison indicating that they do not support the Project and have outstanding concerns. CNSC responded to this letter on June 25th, 2025, with an offer to meet and continue discussing BNDN's outstanding concerns on the Project. CNSC staff also shared documents for BNDN's review and comment, including an updated copy of relevant sections of CNSC staff's Consultation Report, as well as the EA report. In June 2025, CNSC staff shared a copy of the Project specific issues tracking table with BNDN for their review and comment.

4.7.2 Key issues and concerns raised by Birch Narrows Dene Nation

BNDN's key issues and concerns about the Project are summarized below. BNDN raised these concerns in their March 2023 submission on the draft EIS. Appendix A.7 contains the detailed issues tracking table for BNDN. The specific row discussing the issue can be found in Appendix A.7 and is listed beside each bullet. Please refer to Appendix A.7 for additional context on the issue, CNSC staff's response and the issue's status.

1. Concerns about Traditional Knowledge and cultural heritage including concerns about the following topics:
    a. Concerns Denison's EIS does not include Traditional Knowledge.
2. Concerns about workforce and socio-economic impacts, including concerns about the following topics:
    a. Concerns that the transient Project workforce will negatively affect community members' quality of life. BNDN wants to ensure that appropriate measures are taken to protect traditional practices.
3. Concerns about the local study area and community involvement, including concerns about the following topics:
    a. Concerns that BNDN is being excluded from the local study area, affecting their eligibility for priority employment, training and contracting opportunities.
    b. Concerns that Denison has not engaged BNDN on environmental management, monitoring or remediation programs.
4. Concerns about water including concerns about the following topics:
    a. Concerns about inadequate assessments of mercury contamination and groundwater risks, particularly a lack of confidence in Denison's contamination model, potential leaks and underestimations of water usage.
5. Concerns about environmental impacts and potentially impacted species, including concerns about the following topics:
    a. Concerns that fish sampling efforts are inadequate and recommendations for additional sampling.
    b. Concerns that the avoidance buffer for moose and woodland caribou is too small, potentially leading to habitat avoidance.
    c. Concerns that species at risk were excluded from the EIS or not listed as key indicators.
    d. Concerns that the EIS overlooks the cumulative effects of Cameco's operations on atmospheric impacts.
6. Concerns about emissions, including concerns about the following topics:
    a. Concerns about the Project's reliance on burning diesel for operations and recommendations that Denison consider best available technologies to reduce greenhouse gas emissions.
7. Concerns about the consultation and engagement process for the following topics:

a. Concerns that neither the CNSC nor Denison have met the Duty to Consult and that neither have put accommodation measures in place to offset impacts to BNDN's rights and the environment.

4.7.3 BNDN's Views Expressed

BNDN's primary concern is that Denison continues to tell BNDN that they are not directly impacted and are warranted a lower level of consultation and accommodation than other groups. BNDN states that Denison mischaracterizes BNDN as not being part of "Indigenous Communities of Interest with reserves and residential communities most proximal to the Project". BNDN is closer to the Project than other communities who have signed accommodation agreements; and further holds Aboriginal and Treaty rights that are impacted by the Project.

BNDN has assessed Denison's responses to BNDN's technical comments and have categorized adequacy of the responses as follows:

- Addressed: 30
- Provisionally Addressed: 5
- Partially Addressed: 7
- Not Addressed: 64

BNDN continues to have concerns that Denison and CNSC dismiss BNDN's use and connection to the Project site. BNDN claims that the Project is located within BNDN's treaty and ancestral lands where members have deep ancestral ties and continue to exercise rights to this day. In BNDN's view, Denison and CNSC requiring less consultation and accommodation than other communities is unacceptable and wrong. BNDN highlights that Denison and CNSC are not in a position to define BNDNs territory or land use. To date, no funding has been provided for BNDN to collect or document site specific Traditional Knowledge, land use, or cultural heritage sites in the Project area.

4.7.4 CNSC Staff's Response

Since 2019, CNSC staff have continued to engage with BNDN and keep them informed of the Project, providing opportunities to meet and discuss any comments or concerns.

CNSC staff have continued to offer to meet with BNDN to understand, respond to and address BNDN's concerns. To date, BNDN has not provided the CNSC or Denison with specific information regarding their land use and exercise of rights in the proposed Project area. CNSC staff have provided and will continue to provide opportunities for BNDN to provide input and feedback on how they would like to be engaged on the Project in ways that are meaningful to them. CNSC staff have reviewed BNDN's draft EIS submission and responded to it and are satisfied with Denison's responses to the concerns raised during the public comment submission. CNSC staff are also committed to collaborating with BNDN on project related monitoring and follow-up activities should that be of interest to BNDN. CNSC will continue to monitor Denison's engagement throughout the lifecycle of the Project, if approved. Additional context on these issues can be found in the issues tracking table in Appendix A.7.

4.7.5 Conclusion

CNSC staff will continue to respond and address BNDN's Project-related questions and concerns and will continue to engage with BNDN to better understand the Nation's land use and rights practices within the Project area. CNSC staff remain committed to engaging with BNDN and working together to understand, respond to and address their concerns related to the Project.

4.8 Engagement Activities with Prince Albert Grand Council

Prince Albert Grand Council has reviewed and provided feedback on Section 4.8 of the Consultation Report. CNSC staff note that the issues and concerns listed in Section 4.8.2 and the views expressed listed in Section 4.8.3 are views of PAGC. CNSC staff provided flexibility on timelines for receiving PAGC's comments and suggested edits when PAGC required additional time to review and provide input.

4.8.1 Background on Prince Albert Grand Council

Figure 16: The Prince Albert Grand Councils Logo

Prince Albert Grand Council (PAGC) is a political organization representing 12 First Nations, including Hatchet Lake First Nation (HLFN), Black Lake First Nation (BLFN), and Fond du Lac First Nation (FLFN). Originally a tribal council/political alliance that became the Prince Albert District Chiefs (PADC), the alliance was later formally renamed as the Prince Albert Tribal Council (PATC), eventually becoming known as the PAGC.

The PAGC vision and mission focuses on the protection and implementation of the Treaties that First Nations and the Crown signed. The PAGC is committed to supporting its member First Nations to achieve and implement independent, progressive self-governments and improve quality of life for constituents through appropriate and productive social and economic strategies.

CNSC staff have worked with PAGC in the past on other projects that might interest their member First Nations. Since 2019, CNSC staff have included PAGC on the key correspondence for the Wheeler River Project, offering opportunities for engagement and participation in the

regulatory process. These activities are listed in Table 2. The issues tracking table in Appendix A.8 lists the concerns about the Project that PAGC has raised since that time.

For this Project's consultation and engagement processes, CNSC staff have worked closely with YNLR in lieu of PAGC and have been consulting and engaging some PAGC member Nations including Hatchet Lake First Nation (HLFN), Black Lake First Nation (BLFN) and Fond du Lac First Nation (FLFN) through the YNLR who has been delegated the consultation authority to represent the Nations for the Wheeler River Project. Table 10 lists key engagement activities with PAGC.

Table 10: Summary of the key engagement activities with Prince Albert Grand Council

Date	Engagement Activity
April 2019–June 2019	CNSC staff emailed and sent a follow-up letter to PAGC, providing early notification of the Project. CNSC staff emailed PAGC, providing an update on the Notice of Commencement of the regulatory review process and offering to provide information on the project description comment period. CNSC staff offered to meet with PAGC to discuss.
July 2019 – December 2019	CNSC staff emailed PAGC about the Commission's decision on the scoping of the EA.
January 2020-June 2020	CNSC emailed and sent a follow-up letter to PAGC, notifying the organization that Denison had paused the EA process and providing information on the scope of the EA.
July 2020-December 2020	No activity occurred during this period as the Project was on hold.
January 2021-June 2021	CNSC staff emailed and sent a follow-up letter to PAGC, providing notice that the EA process had resumed and inviting the organization to engage.
July 2021-December 2021	No activity occurred during this period as there were no Project updates.
January 2022 – June 2022	CNSC emailed PAGC about an opportunity to apply for PFP funding to facilitate the organization's review of the draft EIS.
July 2022 – December 2022	CNSC staff sent a follow-up email to PAGC about the PFP funding opportunity. PAGC applied for and was awarded funding to facilitate their review. CNSC staff emailed PAGC, providing notice of Denison's Nuclear Substances and Radiation Devices Licence application. CNSC staff emailed PAGC, confirming submission of the draft EIS and outlining next steps in the process, including the commencement of the public comment period.

January 2023 – June 2023	CNSC staff sent an email reminder to PAGC about the public comment period deadline for the draft EIS review. PAGC provided comments on the draft EIS.
July 2023 – December 2023	CNSC staff provided an update on CNSC staff's completeness check for the draft EIS. CNSC also shared the December Project bulletin with PAGC.
January 2024 – June 2024	CNSC staff notified PAGC that the revised draft EIS had passed the completeness check and the CNSC would initiate the technical review phase, which includes the proponent's response to public and Indigenous Nations and communities' comments from the public comment period. PAGC reached out to CNSC staff to enquire about remaining funds for the Project.
July 2024 – December 2024	CNSC staff shared the August Project bulletin with PAGC as well as Project updates in the months of October, November and December. Updates dealt with the federal EA process and the CNSC's acceptance of the final EIS.
January 2025 – June 2025	In May 2025, CNSC staff shared documents for PAGC's review and comment, including an updated copy of relevant sections of CNSC staff's Consultation Report, as well as the EA report. In June 2025, CNSC staff informed PAGC of the PFP funding notice. CNSC staff also shared a copy of the Project specific issues tracking table with PAGC for their review and comment.

4.8.2 Key issues and concerns raised by Prince Albert Grand Council and CNSC Staff's Response

PAGC's issues and concerns with the Project are summarized below. PAGC raised these concerns in their March 2023 submission on the draft EIS. The detailed issues tracking table for PAGC can be found in Appendix A.8. The specific row discussing the issue can be found in Appendix A.8 and is listed beside each bullet. Please refer to Appendix A.8 for additional context on the issue, CNSC staff's response and the issue's status.

PAGC identified concerns about the potential loss of caribou, wolverine and other culturally significant animals due to human disturbances on their populations, specifically animals listed as threatened or endangered in the Species at Risk Act (SARA). PAGC also expressed concerns about Indigenous partnerships and economic benefits stemming from the Project. PAGC voiced a desire for equity-based participation in the workforce, with training opportunities enabling Indigenous peoples to work in management roles. PAGC highlighted the importance of including Traditional Knowledge in all aspects of the regulatory process, especially to monitor changes to

caribou habitats. PAGC noted concerns about increased road traffic and disturbances to the area that could impact caribou.

Since 2019, CNSC staff have continued to engage with PAGC, keeping the organization informed of Project-related updates and providing opportunities to meet and discuss any comments or concerns. CNSC staff have reviewed PAGC's draft EIS submission and responded to it and are satisfied with Denison's responses to the concerns raised during the public comment submission.

CNSC staff have continued to offer to meet with PAGC, in view of cultivating a better understanding of the concerns that PAGC has raised and to work together to address them. CNSC staff have provided and will continue to provide opportunities for PAGC to provide input and feedback on how they would like to be engaged on the Project in ways that are meaningful to them. CNSC will continue to monitor Denison's engagement throughout the lifecycle of the Project, if approved. Additional context on these issues can be found in the issues tracking table in Appendix A.8.

4.8.3 Conclusions

It is the view of CNSC staff that PAGC's questions and concerns have been considered and addressed. CNSC staff remain committed to continuing to engage and share Project-related information with PAGC.

5 ENGAGEMENT LED BY DENISON

REGDOC-3.2.2: Indigenous Engagement sets out requirements and guidance for licensees whose projects may raise the Crown's duty to consult. While the Crown cannot delegate the Duty to Consult and is ultimately responsible for ensuring the discharge of the Duty to Consult, and where appropriate, accommodate, is fulfilled, the Commission will consider the engagement undertaken by Denison when determining whether consultation has been adequate. The information collected by Denison, including measures proposed by Denison to avoid, mitigate, or offset potential adverse impacts from the Wheeler River Project are used to support the CNSC in meeting its consultation obligations.

CNSC staff have determined that *REGDOC-3.2.2: Indigenous Engagement* was required in relation to the Project. Since starting the regulatory review process in 2019 Denison has submitted to the CNSC multiple versions and updates of their Indigenous engagement report, covering the period between July 2016 and June 2024. CNSC staff have reviewed each version of the report and provided feedback and held regular discussions and meetings with Denison to assist in the monitoring of progress with regards to Denison's engagement activities and meeting the requirements and expectations outlined in *REGDOC-3.2.2: Indigenous Engagement*.

CNSC staff note that Denison has been engaging the identified Indigenous Nations and communities by holding meetings, hosting open houses, community tours and visits, conducting workshops, site visits and ceremonies, sharing newsletters and discussing issues and concerns including potential options to mitigate and address the concerns raised to date. Denison has

offered capacity funding agreements to assist Indigenous Nations and communities in their engagement with Denison, where appropriate. Denison has also supported multiple Traditional and Métis Knowledge and Land Use studies and integrated the results of the studies, knowledge and wisdom shared by the Nations into their Environmental Impact Statement (EIS) and technical documents submitted to the CNSC. Denison has long-standing relationships and agreements with many of the identified Indigenous Nations and communities including a Shared Prosperity Agreement [13] with ERFN and the Mutual Benefits Agreement (MBA) and Community Benefit Agreement (CBA) [14] with KML and the Northern Village of Pinehouse (NVP).

Denison provides regular updates to CNSC staff regarding its engagement activities and has sought to include the CNSC in its engagement activities, where appropriate and agreed to by each Indigenous Nation or community. CNSC staff acknowledge that Indigenous Nations and communities have raised concerns through Denison's engagement process about the Wheeler River Project, including the potential for impacts on hunting, fishing and harvesting Rights in the areas surrounding the Project site, the need to involve Indigenous Nations and communities in environmental monitoring programs and to reflect their knowledge and perspectives. Denison continues to work with and engage with these Indigenous Nations and communities to develop a path forward which includes proposed mitigations, accommodations and commitments as part of the regulatory process for this Project.

Denison has included commitments to the identified Indigenous Nations and communities as part of the federal EA process. The commitments are included but not limited to the following topics and range in scope depending on the Indigenous Nation identified:

- Ongoing engagement throughout the lifecycle of Project, if approved
- Opportunities for document review throughout each phase of the Project including decommissioning
- Participation in environmental monitoring
- Prioritize Indigenous and non-Indigenous communities in the Local Study Area (LSA) for employment and training opportunities
- Committed to maintaining positive relationships with Indigenous Nations and communities
- Committed to considering local and traditional knowledge in all facets of the Project

Further information on CNSC and Denison's commitments will be included in the CNSC's supplemental submission to the Commission.

Denison continues to work to support and maintain relationships with Indigenous Nations and communities and is working to address items of concern related to the Project. Denison has been responsive to questions, concerns and comments and has met CNSC staff's expectations with regards to their approach and process for considering, responding to, addressing comments, questions and concerns raised by Indigenous Nations and communities and reporting updates to the CNSC, to date. CNSC staff encourage Denison to continue engagement and dialogue related to outstanding issues and concerns raised by Indigenous Nations and communities, including proposed mitigation measures and commitments, to address any potential impacts to Indigenous and/or Treaty Rights, as appropriate. CNSC staff's final conclusions and assessment on

Denison's engagement related to the Denison Wheeler River Project will be included as part of the supplemental submission prior to Part 2 of the hearing.

6 ASSESSMENTS OF IMPACTS TO INDIGENOUS AND/OR TREATY RIGHTS

In support of the CNSC's consultation obligations and process for Denison's Wheeler River EA and Licence to Prepare a Site and Construct Application, CNSC staff will complete RIAs in collaboration with the Indigenous Nations and communities that have provided information and data demonstrating that their rights and interests, including traditional land use, cultural sites, archaeology, cabins, and trapping lines that could be directly impacted by the Project including: English River First Nation, Kineepik Métis Local, Ya'thi Nené Lands and Resources and the Métis Nation – Saskatchewan. All other identified Indigenous Nations and communities including: Lac La Ronge Indian Band, Peter Ballantyne Cree Nation and Birch Narrows Dene Nation, have not shared specific information and data through Denison's engagement or CNSC staff's consultation activities and process, that identified any direct potential impacts to their Indigenous and/or Treaty Rights in the vicinity of the Project, to date.

The purpose of an RIA is to assess the potential impacts and their potential severity as a result of a proposed Project on the exercise of Indigenous and/or Treaty Rights of an Indigenous Nation or community. The RIA is based on existing information on historical and contemporary traditional land use and rights practices in the Project area, including Traditional and Métis Knowledge, perspectives and views when provided and shared by the Indigenous Nation or community. The RIA also helps to summarize any potential mitigation and/or accommodation measures committed to by the proponent, the CNSC, or other parties as appropriate, that could help avoid, mitigate, reduce or accommodate any identified impacts, and communicate the process, outcomes and recommendations in a collaborative way to the Commission in support of meeting the Crown's Duty to Consult and accommodate obligations to potentially impacted Nations and its decision-making process.

As described in Section 4, CNSC staff have had discussions and consulted with English River First Nation, Kineepik Métis Local, Ya'thi Nené Lands and Resources and the Métis Nation – Saskatchewan regarding the proposed approach to assessing potential impacts on their Indigenous and/or Treaty Rights in relation to the Project.

Through discussions and consultation with English River First Nation, Kineepik Métis Local, Ya'thi Nené Lands and Resources and the Métis Nation – Saskatchewan, it was determined that CNSC staff would take the lead on drafting the Nation specific RIAs for the Project and provide a draft to each Nation for their review, and input. This process is part of and supports ongoing consultation regarding the Project with the aim of assessing and identifying potential impacts and measures and commitments to address them to the greatest extent possible. No concerns were raised regarding this approach or the proposed RIA framework by ERFN, KML, YNLR or MN-S.

In order to provide additional time for CNSC staff and the Nations to review and/or collaborate on the drafting and finalization of the RIAs, the assessments, and related conclusions and

recommendations will be included as part of CNSC staff's supplemental submission which will be submitted to the Commission in advance of the Part 2 hearing.

In addition, CNSC staff are open to conducting additional RIAs with other Indigenous Nations who provide specific evidence-based data and information demonstrating land use and rights practices that could be directly impacted by the Project.

7 CONCLUSIONS AND NEXT STEPS

CNSC staff have conducted a thorough consultation and regulatory process for Denison's Wheeler River Project. All identified Indigenous Nations and communities were provided with multiple opportunities to participate in the regulatory review and consultation and engagement process. CNSC staff supported each Nation through offering funding to support their participation, as well as by making CNSC SMEs available to respond to and address any questions or concerns raised. Indigenous Nations and communities who have raised issues and concerns in relation to the Project were offered opportunities to collaboratively develop sections of the Consultation Report and issues tracking tables.

CNSC staff will continue to monitor and assess Denison's engagement activities throughout the regulatory review process as per *REGDOC-3.2.2: Indigenous Engagement*. CNSC staff's conclusions and assessment related to Denison's engagement related to the Project will be included in the supplemental submissions prior to the Part 2 hearing.

Additionally, CNSC staff continue to work collaboratively with the English River First Nation, Kineepik Métis Local, Ya'thi Nené Lands and Resources and the Métis Nation – Saskatchewan on Nation specific RIAs for the Project. The completed assessments will include CNSC staff and the Indigenous Nation's views on potential impacts on Indigenous and/or Treaty Rights and mitigation and/or accommodation measures to address any identified impacts.

The RIAs, issues tracking tables and additional consultation activities will help inform CNSC staff's conclusions and recommendations to the Commission with regards to the adequacy of consultation and engagement for the Project. This information will be provided as part of a supplemental Commission Member Document submission, prior to the Part 2 hearing.

Finally, CNSC staff continue to work, consult and engage with all identified Indigenous Nations and communities to understand, assess and address all outstanding concerns with regards to the Project and regulatory process to date. CNSC staff will provide further updates on CNSC staff's ongoing consultation and engagement efforts in the supplemental report to the Commission as part of the Part 2 Commission hearing process. CNSC staff's final assessment, conclusions and recommendations with regards to the adequacy of consultation will also be summarized in the supplemental submission and include any feedback and perspectives shared by Indigenous Nations in their submissions to the Commission and any additional information shared with CNSC staff.

References

[1] Canadian Nuclear Safety Commission, "REGDOC-3.2.2 - Indigenous Engagement, Version 1.2," Published February 2022.

[2] Statues of Canada, The Consitution Act, 1987, Current to January 1, 2021.

[3] Government of Canada, "United Nations Declaration on the Rights of Indigenous Peoples Act, (S.C. 2021, c. 14)".

[4] Statues of Canada, Nuclear Safety and Control Act, S.C. 1997 c.9, last amended on 01 January 2017.

[5] Minister of the Department of Aboriginal Affairs and Northern Development Canada, Aboriginal Consultation and Accommodation - Updated Guidlines for Federal Officials to Fulfill the Duty to Consult, March 2011.

[6] Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC), "Aboriginal and Treaty Rights Information System (ATRIS)", [Online]. Available: Aboriginal and Treaty Rights Information System

[7] The United Nations, "United Nations Declaration on the Rights of Indigenous Peoples" September 2007.

[8] United Nations Declaration on the Rights of Indigenous Peoples Act Implementation Secretariat, "The Untied Nations Declaration on the Rights of Indigenous Peoples Act Action Plan," Department of Justice Canada, 2023.

[9] Government of Canada, "Principles respecting the Government of Canada's relationship with Indigenous Peoples," 2018.

[10] Government of Canada, "Backgrounder: United Nations Declaration on the RIghts of Indigenous Peoples Act," [Online] Available: Backgrounder: United Nations Declaration on the Rights of Indigenous Peoples Act

[11] Impact Assessment Agency of Canada, "Canadian Environmental Assessment Act," 2012.

[12] Denison Mines Corp., "Denison Mines Wheeler River Project: Final Environmental Impact Statement," Impact Assessment Agency of Canada, November 2024.

[13] Denison Mines Corp., "Denison Announces Signing of Landmark Shared Prosperity Agreement with English River First Nation," [Online] Available: Denison Announces

Signing of Landmark Shared Prosperity Agreement with English River First Nation | Denison Mines Corp.

[14] Denison Mines Corp., "Denison Announces Signing of Wheeler River Benefit Agreements with Kineepik Métis Local #9 and the Village of Pinehouse Lake," [Online] Available: Denison Announces Signing of Wheeler River Benefit Agreements with Kineepik Métis Local #9 and the Village of Pinehouse Lake | Denison Mines Corp.

[15] Denison Mines Corp., "Denison Announces Exploration Agreement with the Ya'thi Néné Lands and Reources Office, the Athabasca Nations, and Communities of the Nuhenéné," [Online] Avalable: Denison Announces Exploration Agreement with the Ya'thi Néné Lands and Resources Office, the Athabasca Nations, and Communities of the Nuhenéné | Denison Mines Corp.

[16] Metis Nation - Saskatchewan, "Métis Nation - Saskatchewan Website".

[17] Impact Assessment Agency of Canada, "Technical Guide for Assessing Cumulative Environmental Effects under the Canadian Environmental Assessment Act, 2012," 2018.

Appendix D: Regulatory Commitments

This section will contain the same information as appendix D in the draft LCH; this should both help to avoid confusion for readers between the 2 appendices (as the LCH appendix is referenced throughout certain sections of the document) while also having all of the relevant information directly in the CMD. This section will be kept with this text until LCH appendix D is complete (post EVP review, as EVP input will be required before appendix D can be finalized).

D1: Environmental Assessment Conditions

Condition Number	EA Condition	Closure Criteria Requirements	Timeline Required By
EA1	The licensee shall conduct further characterization and assessment of geological and hydrogeological conditions and update the groundwater flow and contaminant transport models and the EA follow-up monitoring programs and mitigation measures as necessary.	Submission for review and acceptance by a person authorized by the Commission of an updated geological and hydrogeological assessment to the CNSC that: • Uses additional characterization data collected throughout the construction phase and updates the assessment of hydraulic conductivity, effective porosity, dispersivity, and geological structure within the desilicified zone. • Addresses IRs (IRs 89, 89-R1, 53, 78, 96 and 97) carried over from the EA review to licensing. • If the additional characterization data and assessment demonstrates variation from data used in the EIS, update the groundwater flow and contaminant transport models with additional available data. Submission for review and acceptance by a person authorized by the Commission an updated EA Follow-up Monitoring Program and mitigation measures if assessment and modelling results indicate additional monitoring and mitigation measures are required.	Licence to operate application.

Condition Number	EA Condition	Closure Criteria Requirements	Timeline Required By
EA2	1) The licensee shall collect additional baseline water and sediment quality data to supplement existing baseline characterization data. 2) The licensee shall update the ERA and near-field water quality modelling with the additional baseline data collected. 3) The licensee shall review the option of calculating site-specific Kd values for use in future licensing phase ERAs.	To address Part 1 of the condition: • Conduct sampling of additional pre-construction baseline water and sediment quality characterization data. • Review and acceptance by a person authorized by the Commission of finalized effluent concentrations derived from the BATEA, ensuring and that these concentrations are within the bounds of the EA, and the environmental risk assessment. • Review and acceptance by a person authorized by the Commission of the methodologies for power analyses and any additional supporting statistical analyses for water and sediment quality data. To address Part 2 of the condition: • Review and acceptance by a person authorized by the Commission of an updated ERA that: ○ Conducts a sensitivity analysis on regional sediment coefficients utilized in the IMPACT modelling and updates ERA conclusions as needed. ○ Incorporates the results of the power analysis and any additional supporting statistical analyses for the water and sediment quality data. ○ Incorporates the additional pre-construction baseline data collected into the IMPACT modelling. ○ Conducts a sensitivity analysis on low (7Q10 low flow, monthly low flow, and monthly average flow) and high receiving environment water flows.	Prior to in-water works.

Condition Number	EA Condition	Closure Criteria Requirements	Timeline Required By
		○ Updates IMPACT modelling using the results of the sensitivity analysis to provide an assessment of impacts to water quality from changes in low and high flows and climate change. ○ Completes supplementary validation of model performance against additional collected monitoring data including validation of regional sediment coefficients against measured data where possible. ○ Addresses IRs (IR-101, 107, 113, 113-R1, 115, 115-R1, 124, 194, 198, and 199) carried over from the EA review to licensing and adequately addresses CNSC staff technical comments from the previous ERA review. ○ Addresses information requests in EA4. Review and acceptance by a person authorized by the Commission of updated near-field water quality modelling incorporating the additional pre-construction baseline data collected.	

Condition Number	EA Condition	Closure Criteria Requirements	Timeline Required By
		To address part 3 of the condition: • After collecting additional site-specific data and conducting the validation of regional sediment coefficients against measured data, where possible Denison shall calculate site-specific sediment coefficients for future ERA updates. Review and acceptance by a person authorized by the Commission of the methodology for calculating site-specific sediment coefficients, which may incorporate both site-specific and regional data.	Licence to operate application unless changes to timeline expectations are accepted by a person authorized by the Commission.
EA3	The licensee shall submit a woodland caribou mitigation and offset plan based on site-specific information to evaluate effects to woodland caribou and includes a plan for habitat offsetting. The plan must ensure that measures are taken to avoid or lessen any adverse effects to woodland caribou and monitor those effects. The plan shall be consistent with the Government of Canada's Amended Recovery Strategy for Woodland Caribou (*Rangifer tarandus*	Review and acceptance by a person authorized by the Commission of a draft woodland caribou mitigation and offsetting plan to the CNSC that: • Discusses overall consistency with the federal Amended Recovery Strategy for Woodland Caribou. • Describes the residual adverse effects on caribou including details on the loss of critical habitat and biophysical features. • Provides details of the mitigation hierarchy, including avoidance, minimization, on-site restoration, and offsetting measures. • Provides details on monitoring for the effectiveness of proposed mitigation measures. Regarding offsetting, the plan may include the proposed: • Offsetting ratio amounts (in hectares) • Methodologies and associated benefits, uncertainties, and risks • Locations including habitat types	Prior to the commencement of site preparation activities.

Condition Number	EA Condition	Closure Criteria Requirements	Timeline Required By
	caribou), Boreal Population, in Canada.	• Timing • Ownership • Justification of how the offsetting achieves no net loss of critical habitat • Contingency measures • Commitment on progress reporting including information to be provided and frequency • Statement on quality assurance and quality control	
		Review and acceptance by a person authorized by the Commission of a finalized woodland caribou mitigation and offsetting plan to the CNSC that builds on the draft plan and: • Provides an offset description, offset ownership, offset assessment, and contingency measures for offsetting. • Progress made on the implementation of offsetting • Summary of changes made to items proposed in the draft plan. • Adequately addresses CNSC technical comments that were deemed to be appropriate to be deferred to the finalized plan. • Includes a commitment for regular review and update through the life of the project.	Licence to operate application.
EA4	The licensee shall conduct additional bat baseline surveys to supplement existing baseline characterization data in order to obtain a basic understanding of	Review and acceptance by a person authorized by the Commission of a report to the CNSC that: • Outlines the methodology, timing, and locations for additional bat baseline surveys with appropriate justification. • Provides the results of the additional bat baseline surveys.	Prior to the commencement of site preparation activities.

Condition Number	EA Condition	Closure Criteria Requirements	Timeline Required By
	within-year and between-year variation for bat species, and to inform the environmental risk assessment.	• Discusses validity of the EA predictions and conclusions based on the new data. • Demonstrates that the baseline data is sufficient to obtain a basic understanding of within-year and between-year variation for bat species.	
		Review and acceptance by a person authorized by the Commission of the next ERA update as per EA2 requirements that incorporates the data from the additional bat baseline surveys and updates the ERA conclusions accordingly.	Submit as part of the next ERA update, related to condition EA2.
EA5	The licensee shall submit plans for the monitoring of adverse effects of the project on listed wildlife species and their critical habitat over the lifecycle of the project.	Review and acceptance by a person authorized by the Commission of detailed plans for the monitoring for adverse effects of the Project on all listed wildlife species identified in the EIS and their critical habitat. The monitoring plan design must: • Demonstrate consistency with any applicable recovery strategy or action plan for each species, or other guidance with appropriate justification. • Enable detection of each predicted adverse effects of the project on each species. • Enable verification of the effectiveness of implemented mitigation measures for each adverse effect of the project on each species. • Enable collection of data that allows for a statistically robust comparison to assess potential impacts on listed species over the lifecycle of the project.	Prior to the commencement of site preparation activities.

Condition Number	EA Condition	Closure Criteria Requirements	Timeline Required By
		• Contain at least the following information for each species: objective; target areas/sampling points; monitoring techniques; timing; frequency. • Identify the circumstances under which corrective measures may be needed to address any issue or problem identified through the monitoring. • Include a commitment for progress reporting and associated level of information and frequency.	
		Review and acceptance by a person authorized by the Commission of updated detailed monitoring plans to address subsequent project phases for all listed wildlife species and a report to the CNSC that includes: • Summary of monitoring results for each listed species. • Discussion of detected adverse effects. • Evaluation of detected versus predicted effects as well as the effectiveness of mitigation measures to address adverse effects. • Any corrective measures taken to address unanticipated or greater than predicted effects. • Review for consistency with any updated applicable recovery strategy or action plans. • Review of list of species for consistency with Schedule 1 of SARA. • Proposed changes to the monitoring plans.	Prior to the commencement of activities under subsequent licences (e.g., licence to operate, license to decommission).

D2: Regulatory Commitments

Commitment Number	Description of Requirement	Closure Criteria for the Requirement	Timeline Required By
PD-01	The licensee shall provide the detailed design of the monitoring wells for the freeze wall.	Review and acceptance by a person authorized by the Commission of a detailed freeze wall monitoring well design that provides well locations including geographical coordinates and a map with locations.	Prior to freeze wall construction.
PD-02	The licensee shall provide the detailed design of the ISR wellfield, including surface infrastructure.	Review and acceptance by a person authorized by the Commission of a detailed ISR wellfield design that: • Provides detailed design specifications of surface infrastructure including pumphouses, pipes and controls. • Provides well patterns, distance between wells and well orientations.	Prior to wellfield construction.
PD-03	The licensee shall provide: 1) The detailed site surface water management plan incorporating an updated Probable Maximum Precipitation (PMP) assessment. 2) The climate change resiliency assessment of the Project.	Review and acceptance by a person authorized by the Commission of a detailed site surface water management plan that: • Provides a PMP assessment that uses a historical storm events database that includes the most recent extreme storm events and meteorological data. • Addresses IR-104 carried over from the EA review to licensing. • Incorporates results of the updated PMP assessment and the 100 year 24-hour rainfall event. • Provides the detailed design of site grading, ditches, culverts, and runoff ponds.	Prior to construction activities for site water management infrastructure.

Commitment Number	Description of Requirement	Closure Criteria for the Requirement	Timeline Required By
		• Provides a map as well as drawings of the final design and locations of the surface water management infrastructure. Review and acceptance by a person authorized by the Commission of a climate change resilience assessment that provides an assessment of climate vulnerabilities of project infrastructures and operations/activities and the proposed adaptation measures over the Project lifetime.	
PD-04	The licensee shall provide detailed design for the mill as further detailed information is available.	Review and acceptance by a person authorized by the Commission of a detailed design of the mill that incorporates: • Human performance considerations • Containment structures • Considerations to the potential impacts to the environment, as needed	Prior to commencing the mill construction.
PD-05	The licensee shall provide the detailed requirements for the various cementitious-based materials to be used, with regards to their rheological properties, durability and resistance to aggressive environments, integration into the overall design, and QA/QC.	Review and acceptance by a person authorized by the Commission of the detailed requirements as outlined in a formal request for information submitted to Denison (email K. Gorzkowski to R. Nagel and B. England subject: Design Criteria Comments, sent May 13, 2025).	Prior to construction activities.

Commitment Number	Description of Requirement	Closure Criteria for the Requirement	Timeline Required By
EP-01	The licensee shall: 1) Provide a detailed diffuser design and assessment to ensure environmental conclusions of risk to aquatic receptors will not change. 2) Incorporate the results of updated near-field modelling in the detailed diffuser design and assessment into the finalized BATEA and ERA updates as needed.	Review and acceptance by a person authorized by the Commission of a detailed diffuser design and assessment to CNSC staff that: • Provides the detailed diffuser design specifications and engineering drawings. • Provides the final location including geographical coordinates and a map of the final discharge location. • Provides updated near-field water quality modelling using detailed diffuser design specifications, finalized effluent concentrations derived from the BATEA, and additional measured pre-construction baseline data. Incorporate the detailed diffuser design and assessment results into the BATEA and ERA as needed. Addresses IR-110 carried over from the EA review to licensing.	Prior to in-water works.
EP-02	The licensee shall provide the finalized Best Available Technology Economically Achievable (BATEA) assessment.	Review and acceptance by a person authorized by the Commission of a final version of the BATEA that: • Includes effluent conductivity and TDS values that are technically feasible, and addresses IR-18 carried over to licensing. • Incorporates results and conclusions of the ERA update for in-water works. • Incorporates the results of the finalized diffuser design and updated near-field modelling from EP-01.	Licence to operate application.

Commitment Number	Description of Requirement	Closure Criteria for the Requirement	Timeline Required By
EMFP-01	The licensee shall provide updated fire protection design criteria.	Review and acceptance by a person authorized by the Commission of an update to the criteria with additions that may include: • Passive fire protection measures such as automatic sprinklers. • How the proposed structures will mitigate the effects of wildfires.	Prior to construction activities.

PART 2

Part 2 of this CMD provides all relevant information pertaining directly to the licence, including:

1) The proposed licence; and
2) The draft licence conditions handbook.

Proposed Licence

URANIUM MINE LICENCE
DENISON MINE CORP.
WHEELER RIVER PROJECT

I) LICENCE NUMBER: UML-MINEMILL-WHEELER-00/20##

II) LICENSEE: Pursuant to section 24 of the *Nuclear Safety and Control Act*, this licence is issued to:

Denison Mine Corp.
345 4th Avenue South
Saskatoon, SK
Canada, S7K 1N3

III) LICENCE PERIOD: This licence is valid from XXXX to XXXX, unless suspended, amended, revoked or replaced.

IV) LICENSED ACTIVITIES:

This licence authorizes the licensee to:

a) prepare site and construct a nuclear facility (hereinafter, "the facility") for the mining of uranium ore and the production of uranium concentrate at a site known as the Wheeler River Project in the province of Saskatchewan, as shown on the drawing referenced in appendix A to this licence

b) possess, use and store nuclear substances and radiation devices that are required for or associated with laboratory studies, field studies, fixed gauge use and borehole logging devices.

DRAFT

V) EXPLANATORY NOTES:

a) Unless otherwise provided for in this licence, words and expressions used in this licence have the same meaning as in the *Nuclear Safety and Control Act* and its associated Regulations.

b) The Wheeler River Operations Licence Conditions Handbook (LCH) identifies the criteria used to meet the conditions of this licence. The LCH also provides information regarding delegation of authority and document version control.

VI) CONDITIONS:

G. GENERAL

G.1 Licensing Basis for Licensed Activities

The licensee shall conduct the activities described in Part IV of this licence in accordance with the licensing basis, defined as:

(i) the regulatory requirements set out in the applicable laws and regulations

(ii) the conditions and safety and control measures described in the facility's or activity's licence and the documents directly referenced in that licence

(iii) the safety and control measures described in the licence application and the documents needed to support that licence application

unless otherwise approved in writing by the Canadian Nuclear Safety Commission (hereinafter "the Commission").

G.2 Notification of Changes

The licensee shall give written notification of changes to the facility or its operation, including deviation from design, operating conditions, policies, programs and methods referred to in the licensing basis.

G.3 Financial Guarantee

The licensee shall maintain a financial guarantee for decommissioning that is acceptable to the Commission.

G.4 Public Information and Disclosure

The licensee shall implement and maintain a public information and disclosure program.

G.5 Environmental Assessment Conditions and Commitments

The licensee shall implement the Wheeler River Project Environmental Assessment (EA) conditions and regulatory commitments.

G.6 Indigenous Engagement

The licensee shall implement and maintain an Indigenous engagement program.

1. MANAGEMENT SYSTEM

1.1 Management System

The licensee shall implement and maintain a management system.

2. HUMAN PERFORMANCE MANAGEMENT

2.1 Training Program

The licensee shall implement and maintain a training program.

3. OPERATING PERFORMANCE

3.1 Operations Program

The licensee shall implement and maintain an operating program, which includes a set of operating limits.

3.2 Reporting Requirements

The licensee shall implement and maintain a program for reporting to the Commission or a person authorized by the Commission.

3.3 Nuclear Substances and Radiation Devices

The licensee shall implement and maintain a program for nuclear substances and radiation devices.

4. SAFETY ANALYSIS

4.1 Safety Analysis Program

The licensee shall implement and maintain a safety analysis program.

5. PHYSICAL DESIGN

5.1 Design Program

The licensee shall implement and maintain a design program.

6. FITNESS FOR SERVICE

6.1 Fitness for Service Program

The licensee shall implement and maintain a fitness for service program.

7. *RADIATION PROTECTION*

7.1 Radiation Protection Program

The licensee shall implement and maintain a radiation protection program, which includes a set of action levels. When the licensee becomes aware that an action level has been reached, the licensee shall notify the Commission within 24 hours.

8. *CONVENTIONAL HEALTH AND SAFETY*

8.1 Conventional Health and Safety Program

The licensee shall implement and maintain a conventional health and safety program.

9. *ENVIRONMENTAL PROTECTION*

9.1 Environmental Protection Program

The licensee shall implement and maintain an environmental protection program, which includes a set of action levels. When the licensee becomes aware that an action level has been reached, the licensee shall notify the Commission within 24 hours.

10. EMERGENCY MANAGEMENT AND FIRE PROTECTION

10.1 Emergency Preparedness Program

The licensee shall implement and maintain an emergency preparedness program.

10.2 Fire Protection Program

The licensee shall implement and maintain a fire protection program.

11. WASTE MANAGEMENT

11.1 Waste Management Program

The licensee shall implement and maintain a waste management program.

11.2 Decommissioning Plan

The Licensee shall maintain a decommissioning plan

12. SECURITY

12.1 Security Program

The licensee shall implement and maintain a security program.

13. SAFEGUARDS AND NON-PROLIFERATION

13.1 Safeguards Program

The licensee shall implement and maintain a safeguards program.

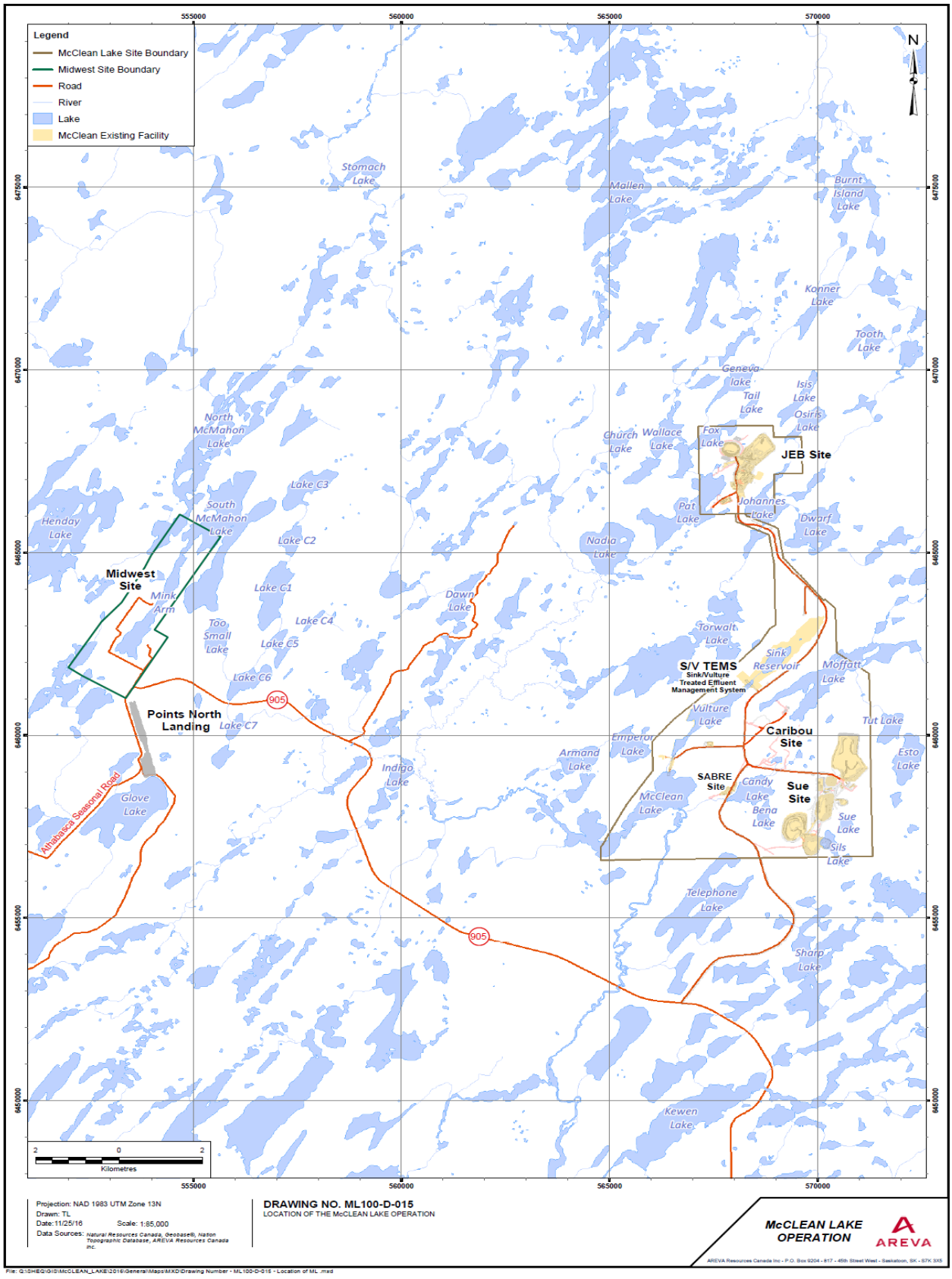
14.

SIGNED at OTTAWA, this _____ day of _____, 2025.

_____
Mr. Tremblay, President
on behalf of the Canadian Nuclear Safety Commission

APPENDIX A

LOCATION OF THE WHEELER RIVER OPERATION


Legend
McClean Lake Site Boundary
Midwest Site Boundary
Road
River
Lake
McClean Existing Facility
N
555000
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565000
570000
6475000
6470000
6465000
6460000
6455000
6450000
Stomach Lake
Mallen Lake
Burnt Island Lake
Konner Lake
Tooth Lake
Geneva Lake
Tail Lake
Isis Lake
Osiris Lake
Fox Lake
Church Lake
Wallace Lake
JEB Site
North McMahon Lake
South McMahon Lake
Henday Lake
Lake C3
Lake C2
Lake C1
Lake C4
Lake C5
Lake C6
Lake C7
Midwest Site
Mink Arm
Too Small Lake
Points North Landing
905
Athabasca Seasonal Road
Glove Lake
Indigo Lake
Dawn Lake
Nadia Lake
Pat Lake
Johannes Lake
Dwarf Lake
Torwalt Lake
Sink Reservoir
Moffatt Lake
S/V TEMS
Sink/Vulture Treated Effluent Management System
Vulture Lake
Caribou Site
Tut Lake
Esto Lake
Emperor Lake
Armand Lake
SABRE Site
Candy Lake
Sue Site
McClean Lake
Bena Lake
Sue Lake
Sils Lake
Telephone Lake
Sharp Lake
Kewen Lake
2 0 2
Kilometres
Projection: NAD 1983 UTM Zone 13N
Drawn: TL
Date: 11/25/16
Scale: 1:85,000
Data Sources: Natural Resources Canada, Geobase®, Nation Topographic Database, AREVA Resources Canada Inc.
DRAWING NO. ML100-D-015
LOCATION OF THE McCLEAN LAKE OPERATION
McCLEAN LAKE OPERATION
AREVA
AREVA Resources Canada Inc - P.O. Box 9204 - 817 - 45th Street West - Saskatoon, SK - S7K 3X5
File: G:\SHEQ\GIS\McCLEAN_LAKE\2016\General\Maps\MXD\Drawing Number - ML100-D-015 - Location of ML .mxd

Draft Licence Conditions Handbook

Canada's Nuclear Regulator

e-Doc 7560298 (Word)
e-Doc XXXXX (PDF)

LICENCE CONDITIONS HANDBOOK

LCH-MINE-WHEELER.00/20XX

WHEELER RIVER PROJECT
URANIUM MINE AND MILL LICENCE

UML-MINEMILL-WHEELER.00/20XX

Revision 0

Canadian Nuclear Safety Commission
Commission canadienne de sûreté nucléaire

Canada

Licence Conditions Handbook **Effective: Month X, 20XX**

LCH-MILLMILL-WHEELER.00/20XX,
Revision 0

DRAFT

Wheeler River Mine and Mill Project

Uranium Mine Licence

UML-MINEMILL-WHEELER.00/20XX
(Month XX, 20XX)

SIGNED at OTTAWA this X day of Month 20XX

_____

Patrick Burton, Director
Uranium Mines and Mills Division
Directorate of Nuclear Cycle and Facilities Regulation
CANADIAN NUCLEAR SAFETY COMMISSION

Revision History:

Effective Date	Revision	Section(s) Changed	Description of the Changes	DCR e-Doc
Month X, 20XX	0	N/A	Original Document.	xxxxx (Word) xxxxx (PDF)

DRAFT

TABLE OF CONTENTS

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PART I - INTRODUCTION

The purpose of the licence conditions handbook (LCH) is to identify and clarify the relevant parts of the licensing basis for each licence condition (LC). This will help ensure that the licensee will maintain facility operations in accordance with the licence and the intent of the licensing basis. The LCH also provides information regarding delegation of authority, document version control and conflict resolution. The LCH should be read in conjunction with the licence.

The LCH has three parts under each LC: the Preamble, Compliance Verification Criteria (CVC), and Guidance. The Preamble explains the regulatory context, background, and/or history related to the LC. CVC are used by Canadian Nuclear Safety Commission (CNSC) staff to oversee compliance with the LC. Guidance is non-mandatory information, including direction, on how to comply with the LC.

The statement “a person authorized by the Commission” in the LCs or the LCH indicates that the Commission may delegate certain authority to CNSC staff. Unless otherwise specified, the delegation of authority by the Commission to act as a person authorized by the Commission (Delegated Officer) is only applied to incumbents in the following positions:

- Director, Uranium Mines and Mills Division
- Director General, Directorate of Nuclear Cycle and Facilities Regulation
- Executive Vice-President and Chief Regulatory Operations Officer, Regulatory Operations Branch.

PART II – FRAMEWORK FOR EACH LICENCE CONDITION

G. GENERAL

G.1 Licensing Basis for Licensed Activities

The licensee shall conduct the activities described in Part IV of this licence in accordance with the licensing basis, defined as:

(i) the regulatory requirements set out in the applicable laws and regulations;
(ii) the conditions and safety and control measures described in the facility's or activity's licence and the documents directly referenced in that licence;
(iii) the safety and control measures described in the licence application and the documents needed to support that licence application;

unless otherwise approved in writing by the Canadian Nuclear Safety Commission (hereinafter "the Commission").

Preamble

Licence condition G.1 requires activities (defined in Part IV of the licence) be conducted in accordance with the licensing basis. Further information on the licensing basis is available in CNSC regulatory document, REGDOC-3.5.3 *Regulatory Fundamentals*.

The licensing basis, established by the Commission at the time the licence is issued, sets the boundary conditions for a regulated activity, and establishes the basis for the CNSC's compliance program for that regulated activity.

Part (i) of licence condition G.1 includes, but is not limited to, the following:

- *Nuclear Safety and Control Act* (NSCA)
- *Uranium Mines and Mills Regulations*
- *Radiation Protection Regulations*
- *Nuclear Substances and Radiation Devices Regulations*
- *General Nuclear Safety and Control Regulations*
- *Metal and Diamond Mining Effluent Regulations*
- Canada/International Atomic Energy Agency (IAEA) Safeguards Agreements

The safety and control measures mentioned under Parts (ii) and (iii) of licence condition G.1 have the potential to affect the health and safety of people, the environment, security or international obligations to which Canada agrees. These measures may be found in high-level programmatic documents but might also be found in lower-level supporting documentation. Safety and control measures can also be found in licensing basis publications such as CNSC regulatory documents, CSA Group standards or licensee documentation submitted in support of a licence.

The CNSC licence authorizes Denison Mines Corporation (Denison) to conduct the following undertakings at the Wheeler River Project, for which the CNSC provides regulatory oversight:

- Prepare site and construct the Wheeler River Project, consisting of the production wellfield, freeze wall infrastructure, the mill, and water treatment infrastructure
- disposal of contaminated drilling wastes, including off-site
- storage of clean waste rock, potentially acid generating rock and low-grade mineralized waste rock
- possession, storage, transfer, importation, use and disposal of nuclear substances and radiation devices.

An environmental assessment carried out in 20XX (e-Doc XXXXX) evaluated the environmental effects from the operation of the mine at an annual production rate up to XX million kilograms of uranium per year. Note that the licence associated with this version of the LCH does not authorize the operation of the Wheeler River Project and therefore does not authorize production.

Compliance Verification Criteria

Licensing Basis Documents

Key licensing basis documents are listed in Appendix B and C in addition to tables under the most relevant LC. All "shall" or normative statements in licensing basis publications are considered CVC unless stated otherwise. If any "should" or informative statements in licensing basis publications are also considered CVC, this is provided under the most relevant LC.

In the event of any inconsistency between two elements of the licensing basis, the licensee shall consult CNSC staff to determine the approach to resolve the issue.

Regulatory commitments listed in Appendix D are part of the licensing basis and considered CVC. Each of the commitments require CNSC staff approval before activities listed under the commitment can be started.

For operational activities that are not in accordance with the licensing basis, the licensee shall take action as soon as practicable to return to a state that is compliant with the licensing basis, taking into account the risk significance of the situation. Reporting requirements are outlined in REGDOC-3.1.2, *Reporting Requirements, Volume I: Non-Power Reactor Class I Nuclear Facilities and Uranium Mines and Mills* and discussed under LC 3.2 of this LCH.

Changes to documentation or activities that result in operational activities not being in accordance with the licensing basis must be approved by the Commission prior to implementation.

Guidance

When the licensee becomes aware that a proposed change or activity might not be in accordance with the licensing basis, it should first seek direction from CNSC staff regarding the potential acceptability of this change or activity. The licensee should take into account that certain types of proposed changes might require significant lead times before CNSC staff can make recommendations and/or the Commission can properly consider them. Guidance for notifications to the CNSC related to licensee changes are discussed under LC G.2.

G.2 Notification of Changes

The licensee shall give written notification of changes to the facility or its operation, including deviation from design, operating conditions, policies, programs and methods referred to in the licensing basis.

Preamble

During the course of licensed activities it is expected that the licensee may make changes to implement improvements or to address changes in operational needs. While making these changes, it is imperative the licensee remains within the bounds of the licensing basis.

Appendix B provides a list of licensee documents that require notification of change. CNSC staff track the current version of these licensee documents separate from the LCH (e-Doc XXXXX).

Compliance Verification Criteria

Licensee Documents that Require Notification of Change

Changes to the design, operating conditions, policies, programs and methods that have the potential to be outside of the licensing basis require prior written notification to the CNSC. CNSC staff will confirm the change remains within the licensing basis and notify the licensee prior to implementation of the change by the licensee. The licensee shall allow sufficient time for the CNSC to review the change proportionate to its complexity and the importance of the safety and control measures being affected. Regular communication between the CNSC and the licensee should ensure that there is adequate time for CNSC staff to review and evaluate information provided in prior written notifications in advance of any of these proposed changes being implemented. It remains the responsibility of the licensee to ensure that the Wheeler River Mine and Mill Project continues to operate within the bounds of the licencing basis.

Prior written notification shall include:

- a description of the change
- the rationale for the change
- expected duration (if not a permanent change)
- an explanation from the licensee supporting the conclusion that the change remains in accordance with the licensing basis.

Ongoing regular communication shall be maintained between the CNSC and licensee.

Guidance

A list of criteria to determine if a change would be in accordance with the licensing basis is provided in Appendix A of CNSC process document *Overview of: Assessing licensee changes to documents or operations* (e-Doc 4055483).

GENERAL

G.3 Financial Guarantee

The licensee shall maintain a financial guarantee for decommissioning that is acceptable to the Commission.

Preamble

The licensee is responsible for all costs of decommissioning at the facility. All such costs are included in the licensee's decommissioning cost estimates and are covered by the licensee's financial guarantee for decommissioning. The licensee's decommissioning cost estimate is provided in the facility's preliminary decommissioning plan. The facility's current financial guarantee is covered by specific financial instruments as listed below.

The latest revision of the preliminary decommissioning plan (PDP) and estimation of the cost of decommissioning were finalized in 2024.

Compliance Verification Criteria

Licensing Basis Publications

Source	Document Title	Document Number
CSA Group	Decommissioning of Facilities Containing Nuclear Substances	N294:19
CNSC	Decommissioning	REDOC-2.11.2
CNSC	Financial Guarantees for Decommissioning of Nuclear Facilities and Termination of Licensed Activities	REGDOC-3.3.1

Licensee Documents that Require Notification of Change

Source	Document Title	Prior Notification Required
Denison	Facility Licensing Manual	Yes
Denison	Preliminary Decommissioning Plan and Preliminary Decommissioning Cost Estimate	Yes

The financial guarantee for decommissioning the Wheeler River Project shall be reviewed and revised by the licensee every five years; when requested by the Commission; or following a revision of the Preliminary Decommissioning Plan or Preliminary Decommissioning Cost Estimate that significantly impacts the financial guarantee. The current preliminary decommissioning plan and preliminary decommissioning cost estimate are dated December 2024.

The licensee shall submit a written report to the Commission confirming that the financial instruments continue to meet the acceptance criteria of section 3 of REGDOC 3.3.1. Any change to the type of financial instrument requires prior notification to the CNSC. The licensee shall submit this report by the end of March of each year, or at any time as the Commission may request.

Guidance

There is no guidance provided for this licence condition.

G.4 Public Information and Disclosure

The licensee shall implement and maintain a public information and disclosure program.

Preamble

The public information and disclosure program ensures that information related to the health and safety of persons and the environment and other issues associated with the lifecycle of the nuclear facility is effectively communicated to the public. In addition, the program shall include a commitment to and protocol for ongoing, timely communications regarding emissions, effluent releases, unplanned events and other incidents and activities related to the licensed facility that may be of interest to the public.

Compliance Verification Criteria

Licensing Basis Publications

Source	Document Title	Document Number
CNSC	Public Information and Disclosure	REGDOC-3.2.1
CNSC	Indigenous Engagement, Version 1.2	REGDOC-3.2.2

Licensee Documents that Require Notification of Change

Source	Document Title	Prior Notification Required
Denison	Facility Licensing Manual	Yes
Denison	Public and Indigenous Information Program	Yes

G.5 Environmental Assessment Conditions and Commitments

The licensee shall implement the Wheeler River Project Environmental Assessment (EA) conditions and regulatory commitments.

Preamble

The licensee's Wheeler River Project EA conditions and the Commitments Registry identifies EA regulatory commitments, including mitigation measures and follow-up program measures, made by Denison during the EA review process pursuant to the Canadian Environmental Assessment Act (CEAA) 2012. CNSC staff will conduct compliance verification activities to verify and confirm that the EA regulatory commitments are being adequately implemented.

Compliance Verification Criteria

The licensee shall implement EA conditions and regulatory commitments as outlined in the Wheeler River Project Commitments Registry that are applicable to construction and pre-operation activities. This does not apply to Denison commitments that are outside the scope of the CNSC's mandate. Other Denison commitments not applicable to the site preparations, construction and pre-operation activities will be addressed in subsequent licensing phases.

The list of EA conditions prescribed by the Commission are found in appendix D.1.

Licensee Documents that Require Notification of Change

Source	Document Title	Prior Notification Required
Denison	Facility Licensing Manual	Yes
Denison	Public and Indigenous Information Program	Yes
Denison	Commitments Registry	Yes

Guidance

The licensee should engage with the Indigenous Nations and communities with potential impacts to the licensed activities on the progress of the EA conditions and commitments and should share information where possible.

Guidance Publications

Source	Document Title	Document Number
CNSC	Indigenous Engagement, Version 1.2	REGDOC-3.2.2

GENERAL

G.6 Indigenous Engagement

The licensee shall implement and maintain an Indigenous engagement program.

Preamble

The Wheeler River site resides on lands in which many Indigenous Nations and communities have a vested interest and rights. The site is situated within historic Treaty 10 (1906) and Homeland of the Métis and is within the traditional territories of the Dene, Cree, and Métis peoples.

This licence condition requires the creation, submission and implementation of a program to ensure ongoing Indigenous engagement by Denison on the Wheeler River project. As per section 6 of REGDOC-3.2.2, *Indigenous Engagement*, licensees may be required to continue to engage Indigenous Nations and communities after an Environmental Assessment or licensing decision. Licensees may also be required to update the CNSC about their ongoing Indigenous engagement activities – for example, the status of the implementation and effectiveness of mitigation, accommodation measures and commitments to Indigenous Nations and communities.

CNSC staff identified Indigenous Nations and communities who have interests and Indigenous and/or Treaty rights in the area where the Wheeler River Project is located (herein referred to as "identified Indigenous Nations and communities"). The following Indigenous Nations and communities were identified as having Indigenous and/or Treaty rights that may be potentially impacted by the Wheeler River Project:

- English River First Nation (ERFN)
- Kineepik Métis Local (KML)
- Black Lake First Nation, Fond du Lac Denesuline First Nation and Hatchet Lake First Nation, which are represented by Ya'thi Nene Lands and Resource Office (YNLR)
- Métis Nation – Saskatchewan (MN-S)

The following Indigenous Nations and communities were identified as having interest in the Wheeler River Project (herein referred to as "interested Indigenous Nations and communities"):

- Lac La Ronge Indian Band (LLRIB)
- Peter Ballantyne Cree Nation (PBCN)
- Birch Narrows Dene Nation (BNDN)
- Prince Albert Grand Council (PAGC)

For the purposes of this Licence Condition, the term "identified Indigenous Nations and communities" refers specifically to the Indigenous Nations and communities listed above who have demonstrated Indigenous and/or Treaty rights in the Project area.

Compliance Verification Criteria

In developing the Wheeler River-specific Indigenous Engagement Program required by this licence condition, the licensee should engage with and seek feedback from the identified Indigenous Nations and communities.

GENERAL

The engagement program shall identify specific engagement, activities, commitments and definitions. The development of the engagement program should be a collaborative process between the licensee and the identified Indigenous Nations and communities and tailored to Indigenous Nation and communities' rights, interests and preferences for engagement and communications.

The ongoing engagement in accordance with the engagement program shall be carried out with the identified Indigenous Nations and communities. If an Indigenous Nation and/or community is non-responsive, the licensee shall continue to share information and provide opportunities for engagement, unless the Indigenous Nation and/or community specifically declines the engagement opportunities and requests that Denison stop sharing information regarding the Wheeler River Project. The licensee shall make efforts to involve the interested identified Indigenous Nations and communities in the engagement program, where appropriate, and shall report on these efforts as part of annual reporting on the engagement program.

To ensure ongoing engagement, the licensee's program shall provide for collaboration and engagement with the identified Indigenous Nations and communities on the following:

1. Make reasonable efforts to collaborate with Indigenous Nations and communities to identify and implement approaches to engagement and communication that takes into consideration the knowledge, needs, protocols, language, preferences and interests of each Indigenous Nation and community.
2. Provide knowledge sharing opportunities such as site visits, workshops and information sessions or alternate communication and engagement activities as expressed by Indigenous Nations and communities.
3. Collaborate with Indigenous Nations and communities in relation to monitoring and follow-up activities related to the Wheeler River Project. Monitoring and follow-up activities will stainclude both operational activities and commitments made through the federal EA process including, but not limited to, EA conditions related to environmental monitoring, caribou mitigation, emergency management, baseline data gathering and other follow-up activities that relate directly to concerns raised by Indigenous Nations and communities during the EA and regulatory review process for the Project.
4. Respond to questions, concerns or comments from Indigenous Nations and communities regarding the Wheeler River Project and work collaboratively to reflect feedback and Indigenous Knowledge within the licensee's activities, as appropriate.

Additionally, CNSC staff acknowledge that Denison has made commitments to Indigenous Nations and Communities through the EA and regulatory review process. The licensee shall fulfill their commitments described in the Commitments Registry. The commitments made by Denison that do not fall within the CNSC's mandate and authority will not form part of the compliance verification criteria. However, the CNSC encourages Denison to provide summary updates on progress in meeting all commitments made to Indigenous Nations and communities through annual reporting in relation to their Wheeler River Indigenous Engagement Program.

GENERAL

Reporting Requirements

As part of the Annual Compliance Monitoring Report discussed under LC 3.2 below, the licensee shall submit to the CNSC information on engagement activities it has undertaken with the identified Indigenous Nations and communities during the reporting year as part of its engagement program. The development of this content should be a collaborative process between the licensee and the identified Indigenous Nations and communities. It is acknowledged that an Indigenous Nation or community may share information with the licensee in confidence. The licensee should work with the Indigenous Nation or community to ensure this information is not disclosed and the Indigenous Nation or community is comfortable with the level of detail communicated within the report.

This reporting shall describe:

- The name of the Indigenous Nation or community.
- The method(s), date(s), location(s), and topics of engagement activities with the Indigenous Nation or community.
- Engagement efforts undertaken within the year in relation to identified and interested Indigenous Nations and communities
- An update on the commitments (items 1 through 4 above) along with any relevant information and context regarding the status of, timelines, and process made on the initiatives and commitments.
- A summary of any issues, interests, or concerns raised, including those in relation to any potential impacts on identified or established Indigenous and/or Treaty rights.
- The measures taken, or that will be taken, to address or respond to the issues or concerns. Alternatively, an explanation as to why no further action is required to address or respond to issues or concerns shall be provided.
- A description of any changes to project activities and/or programs to address and incorporate the measures taken to respond to issues ort concerns, or to incorporate knowledge and feedback from Indigenous Nations and communities.
- Discussion of relevant corporate policies and programs with respect to Indigenous initiatives.

Licensee Documents that Require Notification of Change

Source	Document Title	Prior Notification Required
Denison	Facility Licensing Manual	Yes
Denison	Public and Indigenous Information Program	Yes
Denison	Commitments Registry	Yes

GENERAL

Guidance

Guidance Publications

Source	Document Title	Document Number
CNSC	Public Information and Disclosure	REGDOC-3.2.1
CNSC	Indigenous Engagement, Version 1.2	REGDOC-3.2.2

1. MANAGEMENT SYSTEM

Licence Condition 1.1

The licensee shall implement and maintain a management system.

Preamble

The "management system" safety and control area covers the framework which establishes the processes and programs required to ensure an organization achieves its safety objectives, continuously monitors its performance against these objectives and fosters a healthy safety culture.

The management system must satisfy the requirements set out in the NSCA, regulations made pursuant to the NSCA, the licence and the measures necessary to ensure that safety is of paramount consideration in implementation of the management system. An adequately established and implemented management system provides the evidence that the licensing basis remains valid.

Compliance Verification Criteria

Licensing Basis Publications

Source	Document Title	Document Number
CSA Group	Management System Requirements for Nuclear Facilities (except sections identified under other license conditions)	N286-12
CNSC	Safety Culture	REGDOC-2.1.2

Licensee Documents that Require Notification of Change

Source	Document Title	Prior Notification Required
Denison	Facility Licensing Manual	Yes
Denison	Management System Program	Yes

Guidance

Guidance Publications

Source	Document Title	Document Number
CNSC	Management System	REGDOC-2.1.1

2. HUMAN PERFORMANCE MANAGEMENT

Licence Condition 2.1

The licensee shall implement and maintain a training program.

Preamble

The "human performance management" safety and control area covers activities that enable effective human performance through the development and implementation of processes that ensure a sufficient number of licensee workers are in all relevant job areas and have the necessary knowledge, skills, procedures and tools in place to safely perform their duties.

Compliance Verification Criteria

Licensing Basis Publications

Source	Document Title	Document Number
CNSC	Personnel Training, Version 2	REGDOC-2.2.2

Licensee Documents that Require Notification of Change

Source	Document Title	Prior Notification Required
Denison	Facility Licensing Manual	Yes
Denison	Training Management Program	Yes

Guidance

Guidance Publications

Source	Document Title	Document Number
CNSC	Human Factors	REGDOC-2.2.1

3. OPERATING PERFORMANCE

Licence Condition 3.1

The licensee shall implement and maintain an operating program, which includes a set of operating limits.

Preamble

The "operating performance" safety and control area includes an overall review of the conduct of the licensed activities and the activities that enable effective performance.

Compliance Verification Criteria

Licensing Basis Publications

Source	Document Title	Document Number
CSA Group	Management System Requirements for Nuclear Facilities	N286-12

Licensee Documents that Require Notification of Change

Source	Document Title	Prior Notification Required
Denison	Facility Licensing Manual	Yes
Denison	Environmental Code of Practice	Yes
Denison	Radiation Code of Practice	Yes
Denison	Management System Program	Yes
Denison	Waste Management Program	Yes
Denison	Facility and Equipment Management Program	Yes

Guidance

There is no guidance provided for this licence condition.

Licence Condition 3.2

The licensee shall implement and maintain a program for reporting to the Commission or a person authorized by the Commission.

Preamble

This LC requires the licensee to implement and maintain a process for reporting information to the CNSC. This includes monitoring results, changes to facilities or approved activities, performance assessments and the occurrence of unusual events. Sections 29 and 30 of the *General Nuclear Safety and Control Regulations,* section 38 of the *Nuclear Substance Radiation Devices Regulations* and section 16 of the *Radiation Protection Regulations* provides further insight into reportable events.

Compliance Verification Criteria

Licensing Basis Publications

Source	Document Title	Document Number
CNSC	Reporting Requirements, Volume I: Non-Power Reactor Class I Nuclear Facilities and Uranium Mines and Mills*	REGDOC-3.1.2

The licensee shall report to the CNSC any effluent concentrations that reach or exceed the discharge limits in the *Metal and Diamond Mining Effluent Regulations* in addition to requirements outlined in CNSC's REGDOC-3.1.2.

The licensee shall submit to the CNSC within 90 days after the end of each quarter of a calendar year, the results for that quarter of the monitoring requirements within the:

- monitoring of worker exposure in the radiation protection program
- effluent and emissions plan
- environmental monitoring plan

Results from the above monitoring programs are also to include quality assurance and quality control information. More frequent reporting may be requested on a case-by-case basis.

The licensee shall submit to the CNSC an annual compliance report by March 31 of each year, covering the operation for the 12-month period from January 1 to December 31 of the previous year.

Guidance

Guidance Publications

Source	Document Title
CNSC/SK	CNSC – Saskatchewan Harmonized Annual Reporting Requirements, August 2010

OPERATING PERFORMANCE

Licence Condition 3.3

The licensee shall implement and maintain a program for nuclear substances and radiation devices.

Preamble

Licensees must ensure they receive CNSC authorization before the possession, use, storage, transfer, or disposal of nuclear substances and radiation devices, except as specified in the tables for this section. It is the responsibility of the licensee to ensure that they have CNSC authorization for the import or export of any nuclear substances and radiation devices.

The possession limits for unsealed nuclear substances does not apply to natural uranium and its decay products which originate in the Wheeler River Project's mining or milling activities.

It is also important to note that there is no possession limit on the number of sealed nuclear sources or radiation devices.

Compliance Verification Criteria

Licensing Basis Publications

Source	Document Title	Document Number
CNSC	Licence Application Guide: Nuclear Substances and Radiation Devices, version 2 (excluding section 2)	REGDOC-1.6.1

Licensee Documents that Require Notification of Change

Source	Document Title	Prior Notification Required
Denison	Radiation Protection Program (Appendix B- Authorized Nuclear Substances and Nuclear Devices Lists)	Yes

The authorized possession limits for unsealed nuclear substances are:

Nuclear Substance	Maximum Total Quantity in Possession
Uranium	**Current quantity**

The maximum authorized quantity of nuclear substances per sealed source is:

Nuclear Substance	Maximum Quantity per Sealed Source

The authorized make and model of radiation devices and the maximum quantity of nuclear substance per each device are:

Radiation Device Make and Model	Nuclear Substance	Maximum Quantity per Radiation Device

Note: Includes provision for replacement sources for these radiation devices.

The management of nuclear substances and radiation devices will be evaluated against:

3.3.1 A radioisotope safety poster approved by the Commission or a person authorized by the Commission, which corresponds to the classification of the area, room or enclosure, is posted in a readily visible location in areas, rooms or enclosures where these listed nuclear substances are handled.

3.3.2 When in storage, radioactive nuclear substances or radiation devices are accessible only to persons authorized by the licensee; the dose rate at any occupied location outside the storage area, room or enclosure resulting from the substances or devices in storage does not exceed 2.5 µSv/h and measures are in place to ensure that the dose limits in the *Radiation Protection Regulations* are not exceeded as a result of the substances or devices in storage.

Guidance

There is no guidance provided for this licence condition.

4. SAFETY ANALYSIS

Licence Condition 4.1

The licensee shall implement and maintain a safety analysis program.

Preamble

The "safety analysis" safety and control area includes the systematic evaluation of the potential hazards associated with the proposed activity or facility and considers the effectiveness of preventative measures and strategies in reducing the effects of such hazards.

Compliance Verification Criteria

Licensee Documents that Require Notification of Change

Source	Document Title	Prior Notification Required
Denison	Facility Licensing Manual	Yes
Denison	Facility and Equipment Management Program	Yes
Denison	Waste Management Program	Yes
Denison	Health and Safety Management Program	Yes
Denison	Radiation Protection Program	Yes
Denison	Environmental Management Program	Yes

The safety analysis program will be evaluated against the following principles:

4.1.1 A process has been implemented and maintained to identify, assess, and eliminate or control health and safety and environmental risks associated with existing and new processes or changes to work procedures, equipment, organizational structure, staffing, products, services and suppliers.

4.1.2 Risks to health, safety and the environment have been identified, assessed, eliminated or controlled for existing and new processes or for changes to work procedures, equipment, organizational structure, staffing, products, services and suppliers.

4.1.3 Appropriate methodologies are used to identify potential hazards and consider the effectiveness of preventative measures and strategies in reducing the effects of such hazards.

4.1.4 Modeling is regularly updated using measured values to replace important assumptions and to increase the certainty of predicted long-term behaviour of contaminants.

Job hazard assessments are conducted when planning non-routine and complex work activities.

Guidance

Guidance Publications

Source	Document Title	CNSC e-Access Document Number
CNSC	Safety Analysis for Class 1B Nuclear Facilities*	REGDOC-2.4.4

* REGDOC not applicable to uranium mines and mills but added as guidance as there is information, such as appendix C, which provides information on events that can be considered within a safety analysis program.

5. PHYSICAL DESIGN

Licence Condition 5.1

The licensee shall implement and maintain a design program.

Preamble

The "physical design" safety and control area relates to activities that impact the ability of structures, systems and components to meet and maintain their design basis given new information arising over time and taking changes in the external environment into account.

The design basis is the range of conditions and events taken into account in the design of structures, systems and components of a facility according to established criteria, such that the facility can withstand them without exceeding authorized limits for the planned operation of safety systems.

Compliance Verification Criteria

Licensing Basis Publications

Source	Document Title	Document Number
CNSC	Design of Uranium Mines and Mills: Ventilation Systems*	REGDOC-2.5.4
CSA Group	Management System Requirements for Nuclear Facilities	N286-12
NRC	National Building Code of Canada 2020	N/A

** Applicable when applying for a CNSC licence to prepare a site for and construct, operate or decommission a uranium mine or mill.*

Licensee Documents that Require Notification of Change

Source	Document Title	Prior Notification Required
Denison	Facility Licensing Manual	Yes
Denison	Facility Description Manual	Yes
Denison	Facility and Equipment Management Program	Yes

Guidance

Guidance Publications

Source	Document Title	Document Number
CNSC	General Design Considerations: Human Factors	REGDOC-2.5.1

6. FITNESS FOR SERVICE

Licence Condition 6.1

The licensee shall implement and maintain a fitness for service program.

Preamble

The "fitness for service" safety and control area covers activities that impact the physical condition of structures, systems and components to ensure that they remain effective over time. This area includes programs that ensure equipment is available to perform its intended design function when called upon to do so.

Compliance Verification Criteria

Licensing Basis Publications

Source	Document Title	Document Number
CSA Group	Management System Requirements for Nuclear Facilities	N286-12
CNSC	Aging Management	REGDOC-2.6.3

Licensee Documents that Require Notification of Change

Source	Document Title	Prior Notification Required
Denison	Facility Licensing Manual	Yes
Denison	Facility and Equipment Management Program	Yes

The fitness for service program will also be assessed against:

6.1.1 Systems, equipment, and devices are maintained in good working order such that they can perform their design function.

6.1.2 Instruments, controls and associated indicators are maintained operational and in calibration. Method and interval of calibrations are defined, and records of calibrations are kept.

6.1.3 Preventative and corrective maintenance processes and systems have been implemented and are maintained.

6.1.4 Regular inspection and testing of critical infrastructure and equipment are carried out.

6.1.5 A process has been implemented to identify, plan and schedule maintenance activities.

6.1.6 Maintenance, testing, surveillance and inspection backlogs are monitored and minimized.

6.1.7 Methods are used to show the current acceptance and operating status, and to prevent the use of systems, equipment or devices that are inaccurate, uncalibrated or not in working order.

6.1.8 When deviations beyond accuracy limits are found or suspected, their consequence on past results, and on present performance is evaluated.

6.1.9 A process exists to verify that changes to calibration, testing and maintenance requirements due to system and equipment modifications and replacements are implemented.

Guidance

There is no guidance provided for this licence condition.

7. RADIATION PROTECTION

Licence Condition 7.1

> The licensee shall implement and maintain a radiation protection program, which includes a set of action levels. When the licensee becomes aware that an action level has been reached, the licensee shall notify the Commission within 24 hours.

Preamble

The "radiation protection" safety and control area covers the implementation of a radiation protection program in accordance with the *Radiation Protection Regulations*. This program must ensure that contamination and radiation doses received are monitored, controlled, and kept as low as reasonably achievable (ALARA), with social and economic factors being taken into account.

Compliance Verification Criteria

Licensing Basis Publications

Source	Document Title	Document Number
CSA Group	Selection, use and care of respirators	Z94.4-18

Licensee Documents that Require Notification of Change

Source	Document Title	Prior Notification Required
Denison	Radiation Protection Program	Yes
Denison	Radiation Code of Practice	Yes
Denison	Radiation Protection Plan	Yes
Denison	ALARA Plan	Yes
Denison	Facility Licensing Manual	Yes

The radiation protection (RP) program will be assessed against the following principles:

7.1.1 Radiological conditions are monitored and sources of internal and external radiation exposures are controlled. Access and work in radiological areas are controlled so that collective and individual radiation exposures are kept in accordance with the ALARA principle.

7.1.2 RP instrumentation and equipment are calibrated, maintained and used so that radiation levels are accurately determined. Uncalibrated equipment is removed from use.

7.1.3 The personal dosimetry program ensures that external and internal radiation doses to individuals are accurately determined and recorded.

7.1.4 Appropriate contamination control measures are implemented to control and minimize the contamination of areas, equipment and personnel.

7.1.5 Effective decontamination control measures are implemented to control and prevent the contamination of areas, equipment and personnel.

Action levels (AL) are designed to alert licensees before regulatory dose limits are reached. By definition, if an AL referred to in a licence is reached, a loss of control of some part of the associated RP program may have occurred and specific action is required, as defined in the *Radiation Protection Regulations*, the licence and the applicable code of practice.

Action Level	Dose (mSv)
Monthly	1.17 – NEW 0.3 – Pregnant NEW 0.08 – Non-NEW
Quarterly	3.5 – NEW 0.9 – Pregnant NEW 0.23 – Non-NEW
Annual	14 – NEW 0.9 – Pregnant NEW 0.9 – Non-NEW

The licensee is expected to review and, if necessary, revise the ALs specified above at least once every five years in order to validate their effectiveness. The results of such reviews should be provided to the CNSC.

Guidance

Guidance Publications

Source	Document Title	Document Number
CNSC	Radiation Protection	REGDOC-2.7.1
CNSC	Dosimetry, Volume I: Ascertaining Occupational Dose	REGDOC-2.7.2
CNSC	Preparing Codes of Practice to Control Radiation Doses at Uranium Mines and Mills	G-218

8. CONVENTIONAL HEALTH AND SAFETY

Licence Condition 8.1

The licensee shall implement and maintain a conventional health and safety program.

Preamble

The "conventional health and safety" safety and control area covers the implementation of a program to manage workplace safety hazards and to protect personnel and equipment.

The regulation of non-radiological health and safety at uranium mines and mills is governed by the *Canada Labour Code Part II*, which is administered by Employment and Social Development Canada (ESDC). However, the *Saskatchewan Uranium Mines and Mills Exclusion Regulations* (SOR/2001-115) defer the regulation of occupational health and safety in Saskatchewan uranium mines and mills to the province of Saskatchewan in accordance with the requirements of *The Mines Regulations, 2018* Part II *Revised Regulations of Saskatchewan*.

The CNSC also has regulatory responsibilities for the oversight of the protection of the health and safety of workers. The CNSC harmonizes its oversight of conventional health and safety with the Saskatchewan Ministry of Labour Relations and Workplace Safety.

Compliance Verification Criteria

Licensing Basis Publications

Source	Document Title	Document Number
CSA Group	Selection, use and care of respirators	Z94.4-18

Licensee Documents that Require Notification of Change

Source	Document Title	Notification Requirements
Denison	Facility Licensing Manual	Yes
Denison	Health and Safety Management Program	Yes

The conventional health and safety program will be assessed against the following principles:

8.1.1 Housekeeping standards have been identified and are enforced to ensure that work areas are kept clean and organized.

8.1.2 Facilities, processes and procedures have been implemented to ensure the safe management of hazardous materials.

8.1.3 Employees and contractors actively participate in the management of conventional health and safety.

CONVENTIONAL HEALTH AND SAFETY

8.1.4 Management verifies that employees and contractors actively participate in the management of health and safety in their workplace.

8.1.5 A process has been established and maintained to monitor, measure and record conventional health and safety performance and the effectiveness of the occupational health and safety program on a regular basis.

8.1.6 Routine inspections are performed by workers, supervisors, senior staff and/or safety professionals to identify any potential safety issues.

8.1.7 Processes and procedures are established and maintained to investigate accidents and incidents, to identify root causes, to implement corrective actions and to verify that corrective actions have been completed and will effectively prevent recurrence.

8.1.8 Procedures have been implemented and maintained for reporting work-related injuries, illnesses, fatalities and conventional health and safety incidents including near misses.

8.1.9 The causes of injuries are investigated, corrective actions implemented, and the effectiveness of corrective actions verified.

8.1.10 A preventative and corrective action procedure has been established and maintained to address non-conformances and inadequately controlled risks.

Guidance

Guidance Publications

Source	Document Title	Document Number
CNSC	Conventional Health and Safety	REGDOC-2.8.1

9. ENVIRONMENTAL PROTECTION

Licence Condition 9.1

The licensee shall implement and maintain an environmental protection program, which includes a set of action levels. When the licensee becomes aware that an action level has been reached, the licensee shall notify the Commission within 24 hours.

Preamble

The "environmental protection" safety and control area covers programs that identify, control and monitor all releases of radioactive and hazardous substances and effects on the environment from facilities or as the result of licensed activities.

Compliance Verification Criteria

Licensing Basis Publications

Source	Document Title	Document Number
CNSC	Environmental Protection: Environmental Principles, Assessments and Protection Measures, version 1.2	REGDOC-2.9.1
CNSC	Controlling Releases to the Environment	REGDOC-2.9.2
CSA Group	Environmental Management of Nuclear Facilities: Common requirements of the CSA N288 series of Standards, 2022	N288.0:22
CSA Group	Environmental Monitoring Programs at Nuclear Facilities and Uranium Mines and Mills	N288.4:19
CSA Group	Effluent and Emissions Monitoring Programs at Nuclear Facilities	N288.5:22
CSA Group	Environmental Risk Assessments at Nuclear Facilities and Uranium Mines and Mills	N288.6:22
CSA Group	Groundwater Protection and Monitoring Programs for Nuclear Facilities and Uranium Mines and Mills	N288.7:23
CSA Group	Establishing and Implementing Action Levels for Releases to the Environment from Nuclear Facilities	N288.8:17

Licensee Documents that Require Notification of Change

Source	Document Title	Prior Notification Required
Denison	Facility Licensing Manual	Yes
Denison	Environmental Management Program	Yes
Denison	Effluent and Emissions Monitoring Plan	Yes
Denison	Environmental Monitoring Plan	Yes
Denison	Groundwater Protection and Monitoring Plan	Yes
Denison	Environmental Code of Practice	Yes
Denison	Waste Management Program	Yes
Denison	Environmental Risk Assessment	Yes

To ensure the applicable environmental protection measures have been established, implemented and maintained, the environmental protection program will also be assessed against:

9.1.1 Action levels specified in the environmental code of practice. When the licensee becomes aware that an action level has been triggered, the licensee shall notify the Commission within 24 hours and take specific action as defined in the *Uranium Mines and Mills Regulations* and the environmental code of practice.

9.1.2 The authorized release limits as specified below. When the licensee becomes aware that an authorized release limit has been reached or exceeded, the licensee shall immediately notify the Commission, investigate and take corrective action to ensure that the releases are maintained below the authorized release limits.

The authorized liquid effluent release limits are:

Deleterious Substance	Maximum Authorized Monthly Mean Concentration	Maximum Authorized Concentration in a Composite Sample	Maximum Authorized Concentration in a Grab Sample
Arsenic (mg/L)	0.10	0.15	0.20
Copper (mg/L)	0.10	0.15	0.20
Lead (mg/L)	0.08	0.12	0.16
Nickel (mg/L)	0.25	0.38	0.50
Zinc (mg/L)	0.40	0.60	0.80
Un-ionized ammonia (mg/L)	0.50	N/A	1.00
Total Suspended Solids (mg/L)	15.00	22.50	30.00

Radium-226 (Bq/L)	0.37	0.74	1.11

Acid balance (as H_3O^+) reported as pH	In a range of 6.0 to 9.5

Acutely Lethal Effluent	0%

Notes:

1) Authorized release limits have been harmonized, where available, with those required under the *Metal and Diamond Mining Effluent Regulations* (MDMER).
2) Definition of Units: mg/L = milligrams per litre
   Bq/L = becquerels per litre
3) All concentrations and activities are total values.
4) "Monthly mean concentration" means the average value of the concentrations measured in all composite or grab samples collected from the final discharge point during each month when liquid effluent is released.
5) "Composite sample" means:
   a) a quantity of effluent consisting of not less than three equal volumes or three volumes proportionate to flow that have been collected at approximately equal time intervals over a period of not less than seven hours and not more than 24 hours; or
   b) a quantity of effluent collected continuously at a constant rate or at a rate proportionate to the rate of flow of the effluent over a sampling period of not less than seven hours and not more than 24 hours.
6) "Grab sample" means a quantity of undiluted effluent collected at any given time.
7) ***"Acutely lethal"*** (Source MDMER), in respect of an effluent, means that the effluent at 100 percent concentration kills
   a) more than 50 percent of the rainbow trout subjected to it for a period of 96 hours, when tested in accordance with the acute lethality test set out in section 14.1;
   b) more than 50 percent of the Daphnia magna subjected to it for a period of 48 hours, when tested in accordance with the acute lethality test set out in section 14.3.

Guidance

Guidance Publications

Source	Document Title	Document Number
CSA Group	Environmental Management Systems – Requirements with Guidance for Use	ISO 14001:2015

10. EMERGENCY MANAGEMENT AND FIRE PROTECTION

Licence Condition 10.1

The licensee shall implement and maintain an emergency preparedness program.

Preamble

The "emergency management and fire protection" safety and control area covers emergency plans and emergency preparedness programs which exist for emergencies and for non-routine conditions. It also includes any results of exercise participation.

Licensees are required to continually maintain and enhance their emergency management programs.

Compliance Verification Criteria

Licensing Basis Publications

Source	Document Title	Document Number
CNSC	Nuclear Emergency Preparedness and Response, Version 2	REGDOC-2.10.1

Licensee Documents that Require Notification of Change

Source	Document Title	Prior Notification Required
Denison	Facility Licensing Manual	Yes
Denison	Emergency Preparedness and Response Program	Yes

Guidance

There is no guidance provided for this licence condition.

Licence Condition 10.2

The licensee shall implement and maintain a fire protection program.

Preamble

Licensees are required to implement and maintain a fire protection program (a set of planned, coordinated, controlled and documented activities) to ensure that the licensed activities do not result in an unreasonable risk to the health and safety of persons and to the environment due to fire and to ensure that the licensee is able to efficiently and effectively respond to emergency fire situations.

Compliance Verification Criteria

Licensing Basis Publications

Source	Document Title	Document Number
NRC	National Building Code of Canada	N/A
NRC	National Fire Code of Canada	N/A
CSA Group	Fire Protection for Facilities that Process, Handle, or Store Nuclear Substances	N393:13

*

Licensee Documents that Require Notification of Change

Source	Document Title	Prior Notification Required
Denison	Facility Licensing Manual	Yes
Denison	Fire Protection Program	Yes
Denison	Emergency Preparedness and Response Program	Yes

Guidance

Guidance Publications

There is no guidance provided for this licence condition.

11. WASTE MANAGEMENT

Licence Condition 11.1

The licensee shall implement and maintain a waste management program.

Preamble

The "waste management" safety and control area covers internal waste-related programs that form part of the facility's operations up to the point where the waste is removed from the facility to a separate waste management facility.

Waste management facilities at the Wheeler River Project include:

- storage areas for low-grade mineralized material and potentially acid-generating waste rock
- clean waste rock and overburden piles
- water treatment plant – mine water collection, contaminated surface drainage,
- hazardous substance or waste dangerous goods storage facilities
- site run-off containment systems and ponds
- contaminated industrial waste storage
- storage and recycling facilities for hazardous wastes

Compliance Verification Criteria

Licensing Basis Publications

Source	Document Title	Document Number
CNSC	Waste Management, Volume I: Management of Radioactive Waste	REGDOC-2.11.1
CNSC	Waste Management, Volume II: Management of Uranium Mine Waste Rock and Mill Tailings*	REGDOC-2.11.1

* Applicable to new uranium mine or mill projects and/or to new waste management facilities at existing uranium mines and mills.

Licensee Documents that Require Notification of Change

Source	Document Title	Prior Notification Required
Denison	Facility Licensing Manual	Yes
Denison	Waste Management Program	Yes

The waste management program will be assessed against the following principles:

11.1.1 A radioactive waste management program is implemented to control and minimize the volume of radioactive waste.

11.1.2 The volume of waste is minimized by applying the "reduce, reuse, recycle and recover" principle.

11.1.3 Work is carried out in a manner that minimizes waste and prevents pollution.

11.1.4 Waste is stored or disposed of in the appropriate manner.

11.1.5 Wastes are managed in a manner that does not compromise reclamation or decommissioning plans.

11.1.6 The effectiveness of waste management practices is monitored, measured and recorded on a regular basis.

11.1.7 Routine inspections are performed to identify any potential waste management issues and to verify the condition of containment structures and waste management facilities.

11.1.8 The safety of embankments/dams is inspected and evaluated.

11.1.9 Records are kept of the quantities and types of waste generated and the method of disposal or management.

11.1.10 Wastes are managed to control the present and future releases of contaminants to the environment.

11.1.11 Surface water is managed to prevent or minimize the volume that is contaminated.

Guidance

Guidance Publications

Source	Document Title	Document Number
CNSC	Waste Management, Volume III: Safety Case for the Disposal of Radioactive Waste, Version 2	REGDOC-2.11.1
Canadian Dam Association	Canadian Dam Association, Canadian Dam Safety Guidelines	N/A

WASTE MANAGEMENT

Licence Condition 11.2

The licensee shall maintain a decommissioning plan.

Preamble

This LC requires that the licensee maintain a preliminary decommissioning plan (PDP).

A PDP provides an overview of the proposed decommissioning approach that is sufficiently detailed to assure that the proposed approach is, in the light of existing knowledge, technically and financially feasible, and appropriate in the interests of health, safety, security and the protection of the environment. The PDP defines areas to be decommissioned and the general structure and sequence of the principle work packages. The PDP forms the basis for establishing and maintaining a financial arrangement (financial guarantee) that will assure adequate funding of the decommissioning plan.

Compliance Verification Criteria

Licensing Basis Publications

Source	Document Title	Document Number
CSA Group	Decommissioning of Facilities Containing Nuclear Substances	N294:19
CNSC	Decommissioning	REGDOC-2.11.2
CNSC	Financial Guarantees for Decommissioning of Nuclear Facilities and Termination of Licensed Activities	REGDOC-3.3.1

Licensee Documents that Require Notification of Change

Source	Document Title	Prior Notification Required
Denison	Facility Licensing Manual	Yes
Denison	Preliminary Decommissioning Plan and Preliminary Decommissioning Cost Estimate	Yes

The PDP is to be revised at a minimum of every five years or when required by the Commission; however, is to be kept current to reflect any changes in the site or nuclear facility. The current PDP and PDCE are dated December 2024.

Guidance

There is no guidance provided for this licence condition

12. SECURITY

Licence Condition 12.1

The licensee shall implement and maintain a security program.

Preamble

The "security" safety and control area covers the programs required to implement and support the security requirements stipulated in the regulations, the licence, orders, or expectations for the facility or activity.

Compliance Verification Criteria

Licensee Documents that Require Notification of Change

Source	Document Title	Prior Notification Required
Denison	Facility Licensing Manual	Yes
Denison	Security Management Program	Yes

The security program will be assessed against the following principles:

12.1.1 The security program addresses the risks identified in an industrial security threat and risk assessment.

12.1.2 Reasonable measures are implemented and maintained to prevent the loss of nuclear substances or prevent acts of sabotage at the facility.

12.1.3 Reasonable measures are taken to prevent unauthorized access to the mining facility and to areas within the facility where nuclear substances are stored.

12.1.4 Reasonable measures are implemented to prevent the unauthorized loss, alternation, or disclosure of prescribed information.

12.1.5 The industrial security threat and risk assessment is periodically reviewed and updated.

12.1.6 Security awareness training is implemented and maintained.

Guidance

Guidance Publications

Source	Document Title	Document Number
CNSC	Security of Nuclear Substances: Sealed Sources and Category I, II and III Nuclear Material, Version 2.1	REGDOC-2.12.3

13. SAFEGUARDS AND NON-PROLIFERATION

Licence Condition 13.1

The licensee shall implement and maintain a safeguards program.

Preamble

The "safeguards and non-proliferation" safety and control area covers the programs and activities required for the successful implementation of the obligations arising from the Canada/International Atomic Energy Agency (IAEA) safeguards agreements, as well as all other measures arising from the *Treaty on the Non-Proliferation of Nuclear Weapons*.

Compliance Verification Criteria

Source	Document Title	Document Number
CNSC	Safeguards and Nuclear Material Accountancy	REGDOC-2.13.1

Licensee Documents that Require Notification of Change

Source	Document Title	Prior Notification Required
Denison	Security Management Program	Yes
Denison	Facility Licencing Manual	Yes

The safeguards and non-proliferation program will be assessed against CNSC's REGDOC-2.13.1, *Safeguards and Nuclear Material Accountancy,* and the following principles:

13.1.1 Reasonable services and assistance are provided to the IAEA to enable the IAEA to carry out its duties and functions.

13.1.2 Prompt access to all locations at the facility is granted to the IAEA at all reasonable times where such access is required for the purposes of carrying on an activity pursuant to a safeguards agreement. Health and safety services and escorts are provided as required in order to facilitate activities.

13.1.3 Records that must be kept or any reports that are required to be made under a safeguards agreement are disclosed to the CNSC and the IAEA.

13.1.4 Reasonable assistance is provided to the IAEA to enable sampling and removal or shipment of samples.

13.1.5 Reasonable assistance is provided to the IAEA to enable measurements, tests and removal or shipment of equipment.

13.1.6 Measures are implemented to prevent damage to, or the theft, loss or sabotage of samples collected pursuant to a safeguards agreement or the illegal use, possession or removal of such samples.

13.1.7 Reports and information, that is required to facilitate Canada's compliance with any applicable safeguards agreement, is provided to the Commission.

Guidance

There is no guidance provided for this licence condition.

APPENDIX A CHANGE CONTROL PROCESS

A.1 Change Control Process

A change control process is applied to the LCH to ensure that:

- preparation and use of the LCH are properly controlled
- all referenced documents are correctly identified and maintained
- procedures for modifying the LCH are followed.

A request to change this LCH can be initiated by either CNSC staff or the licensee. The licensee will be consulted on any changes to the LCH that are proposed by CNSC staff.

CNSC staff will take the following steps to update the LCH:

1. the CNSC receives or initiates written notification of proposed change
2. initiate a change request using the Change Request Form
3. complete a technical review of the proposed change, if required
4. consult the licensee and in case of disagreement on the proposed change, the dispute resolution process outlined in section A.3 will apply
5. obtain consent and signature from a Delegated Officer
6. update the LCH in accordance with the Change Request Form and send the updated document to the parties identified on the distribution list (section A.5).

Change Request Form

1. GENERAL INFORMATION			
File Plan #		**e-Doc #(s) for Change Request Form**	
Licensee	**Licence Number**	**LCH #, Rev/Version**	**Request Date**
Licensing Officer			

2. CHANGE(S) TO THE LCH			
#	**Description and Purpose**	**Proposed Change**	**References**
1	<initiator, nature, reason for change, e.g. administrative, change to a licensee doc, etc.>	<identify modifications, such as by track changes, highlighting, etc.>	<LC, page, section #, etc.>
2			

3. ASSESSMENT (text and/or e-Doc #s)			
#	**Division/Org**	**Comment**	**Disposition**
1	<division>		
	<division>		
	<licensee>		
	<division>		
2	etc.		

4. CONSENT TO MODIFY		
#	**Agreed**	**Comment**
1		
2		

Name	**Title**	**Signature**	**Date**

5. LCH DOCUMENTATION AND DISTRIBUTION			
New LCH Number	**LCH Effective Date**	**e-Doc #** (include version number)	
CNSC Outgoing Notification		**e-Doc #**	**Date Sent**
		http://e-accessweb/cyberdocs	

APPENDIX A

	/cnsc-quickstart.asp?barcode=4212222&render=native	

APPENDIX A

A.2 Review Criteria for Proposed Changes to Licensing Basis Documents

The licensee must provide the CNSC with written notification of a proposed significant change to key licensee documents before the licensee implements the change. The notification must be accompanied by sufficient information to demonstrate that the change is within the intent of the licensing basis. Written notification of minor or administrative changes may be made in batches after the changes have been implemented.

The following criteria will be used by CNSC staff to determine if the proposed change is acceptable:

1. The submission includes the appropriate level and quality of information with regards to:
   a) The description of the proposed change including:
      - a summary of the change, including the purpose or need for the change
      - a preliminary finding of whether this proposal or notification is required under the NSCA, a regulation made under the Act or the licence, or has implications under the *Impact Assessment Act*, or whether a licence amendment or other licensing action would likely be required
      - where applicable, the alternatives evaluated and the reasons for selection of the chosen option
      - any changes to the inventories of nuclear substances on site related to the proposed change
      - the construction, commissioning and operating schedule for the proposed change including hold points or progress reports for regulatory review and approval (as appropriate)
      - expected impacts, if any, on the proposed decommissioning or closure plans
      - results of any risk analysis or hazard operability studies performed, and a summary of the identified hazards and the mitigation measures identified to control potential hazards
   b) The description of the design control, operating specifications and criteria including:
      - the design basis and criteria, and performance specifications
      - the design drawings such as the general arrangement, process and instrumentation diagrams, and process flow sheets
      - the quality management program for the various key stages of the change (e.g., design, construction, commissioning, etc.)

c) The assessment of both the short and long term impacts with the mitigation measures in place on:
   - worker's health and safety, including potential radiological and non-radiological exposures
   - the environment
   - security
   - Canada's international obligations

d) The planned administrative controls including:
   - changes to the organization, roles and responsibilities
   - changes to applicable programs and procedures
   - a description of the proposed monitoring, inspection and test plans, including locations and frequency proposed to evaluate both positive and negative results

e) Changes to contingency plans including "full-stop measures"

f) Evidence that the licensee's internal reviews and approvals have been completed, including meeting the requirements of the licensee's change management procedure and consultation with the onsite occupational health and environmental committees, where applicable

g) Identification of the documents and training programs that may require revision when the proposed change is implemented

2. The effects of the proposed change or action remain within the licensing basis.
3. Following the implementation of the change the licensee will remain in compliance with the requirements set out in the applicable acts, regulations, and LCs.

A.3 Dispute Resolution

In case of a dispute between the licensee and CNSC staff regarding changes to the LCH, both parties will meet to discuss the dispute and reach a decision on the path forward. The decision, including its rationale will be documented. If any party is not satisfied with the decision, the resolution process will proceed up to the Director, Director General or Executive Vice-President and Chief Regulatory Operations Officer level. If any party is still not satisfied with the decision, the issue will be brought to the attention of the Commission at a Commission meeting. The decision made by the Commission will be final.

A.4 Records Management

In order to track changes to the LCH, the document change request and accompanying documentation will be archived in records and referenced in the revision history of the LCH. Electronic communication related to the change, such as comments from reviewers will be stored in the CNSC information management system.

APPENDIX A

A.5 Distribution

A copy of the updated version of the LCH will be distributed to the following parties:

- Uranium Mines and Mills Division, CNSC
- Denison Mines Corp.

A.6 Reporting to the Commission

CNSC staff will report on the changes made to the LCH during the previous year in their annual report to the Commission.

APPENDIX A

APPENDIX B LICENSEE DOCUMENTS THAT REQUIRE NOTIFICATION OF CHANGE

Document Title

APPENDIX C LIST OF DOCUMENTS USED AS GUIDANCE OR COMPLIANCE VERIFICATION CRITERIA

Note: For CNSC documents, the most recent version of a referenced document shall be implemented following review and agreement between Cameco and the Canadian Nuclear Safety Commission.

Document	Document Title	Document Number
Canadian Dam Association	Canadian Dam Association, Canadian Dam Safety Guidelines	N/A
CNSC	Preparing Codes of Practice to Control Radiation Doses at Uranium Mines and Mills	G-218
CNSC	Management System	REGDOC-2.1.1
CNSC	Human Factors	REGDOC-2.2.1
CNSC	Safety Analysis for Class IB Nuclear Facilities	REGDOC-2.4.4
CNSC	General Design Considerations: Human Factors	REGDOC-2.5.1
CNSC	Aging Management	REGDOC-2.6.3
CNSC	Environmental Protection: Environmental Principles, Assessments and Protection Measures, Version 1.2	REGDOC-2.9.1
CNSC	Controlling Releases to the Environment	REGDOC-2.9.2
CNSC	Radiation Protection, Version 1.1	REGDOC-2.7.1
CNSC	Dosimetry, Volume I: Ascertaining Occupational Dose	REGDOC-2.7.2
CNSC	Personnel Training, Version 2	REGDOC-2.2.2
CNSC	Nuclear Emergency Preparedness and Response, Version 2	REGDOC-2.10.1
CNSC	Decommissioning	REGDOC-2.11.2

Document	Document Title	Document Number
CNSC	Safeguards and Nuclear Material Accountancy	REGDOC-2.13.1
CNSC	Public Information and Disclosure	REGDOC-3.2.1
CNSC	Licence Application Guide Nuclear Substances and Radiation Devices	REGDOC-1.6.1
CNSC	Safety Culture	REGDOC-2.1.2
CNSC	Design of Uranium Mines and Mills: Ventilation Systems	REGDOC-2.5.4
CNSC	Conventional Health and Safety	REGDOC-2.8.1
CNSC	Waste Management, Volume II: Management of Uranium Mine Waste Rock and Mill Tailings	REGDOC-2.11.1
CNSC	Security of Nuclear Substances: Sealed Sources and Category 1, II and II Nuclear Material, Version 2.1	REGDOC-2.12.3
CNSC	Reporting Requirements, Volume I: Non-Power Reactor Class I Nuclear Facilities and Uranium Mines and Mills	REGDOC-3.1.2
CNSC	Financial Guarantees for Decommissioning of Nuclear Facilities and Termination of Licensed Activities	REGDOC-3.3.1
CNSC	Regulatory Fundamentals	REGDOC-3.5.3
CNSC/SK	CNSC – Saskatchewan Harmonized Annual Reporting Requirements, August 2010	e-Doc 3678482
CSA Group	Management System Requirements for Nuclear Facilities	N286-12
CSA Group	Environmental Management of Nuclear Facilities: Common requirements of the CSA N288 series of Standards, 2022	N288.0:22

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Document	Document Title	Document Number
CSA Group	Environmental Monitoring Programs at Nuclear Facilities and Uranium Mines and Mills	N288.4:19
CSA Group	Effluent and Emissions Monitoring Programs at Class I Nuclear Facilities and Uranium Mines and Mills	N288.5:22
CSA Group	Environmental Risk Assessments at Nuclear Facilities and Uranium Mines and Mills	N288.6:22
CSA Group	Groundwater Protection Programs at Class I Nuclear Facilities and Uranium Mines and Mills	N288.7:15
CSA Group	Establishing and Implementing Action Levels for Releases to the Environment from Nuclear Facilities	N288.8:17
CSA Group	Decommissioning of Facilities Containing Nuclear Substances	N294:19
CSA Group	Selection, use and care of respirators	Z94.4:18
CSA Group	Environmental Management Systems – Requirements with Guidance for Use	ISO 14001:2015
NRC	National Building Code of Canada 2020	N/A
NRC	National Fire Code of Canada	N/A
CSA Group	Fire Protection for Facilities that Process, Handle, or Store Nuclear Substances	N393-13

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APPENDIX D REGULATORY COMMITMENTS

Appendix D.1: EA Conditions Prescribed by the Commission

Condition Number	EA Condition	Closure Criteria Requirements	Timeline Required By
EA1	The licensee shall conduct further characterization and assessment of geological and hydrogeological conditions and update the groundwater flow and contaminant transport models and the EA follow-up monitoring programs and mitigation measures as necessary.	Submission for review and acceptance by a person authorized by the Commission of an updated geological and hydrogeological assessment to the CNSC that: • Uses additional characterization data collected throughout the construction phase and updates the assessment of hydraulic conductivity, effective porosity, dispersivity, and geological structure within the desilicified zone. • Addresses IRs (IRs 89, 89-R1, 53, 78, 96 and 97) carried over from the EA review to licensing. • If the additional characterization data and assessment demonstrates variation from data used in the EIS, update the groundwater flow and contaminant transport models with additional available data. Submission for review and acceptance by a person authorized by the Commission an updated EA Follow-up Monitoring Program and mitigation measures if assessment and modelling results indicate additional monitoring and mitigation measures are required.	Licence to operate application.

EA2	1) The licensee shall collect additional baseline water and sediment quality data to supplement existing baseline characterization data. 2) The licensee shall update the ERA and near-field water quality modelling with the additional baseline data collected. 3) The licensee shall review the option of calculating site-specific Kd values for use in future licensing phase ERAs.	To address Part 1 of the condition: • Conduct sampling of additional pre-construction baseline water and sediment quality characterization data. • Review and acceptance by a person authorized by the Commission of finalized effluent concentrations derived from the BATEA, ensuring and that these concentrations are within the bounds of the EA, and the environmental risk assessment. • Review and acceptance by a person authorized by the Commission of the methodologies for power analyses and any additional supporting statistical analyses for water and sediment quality data. To address Part 2 of the condition: • Review and acceptance by a person authorized by the Commission of an updated ERA that: ○ Conducts a sensitivity analysis on regional sediment coefficients utilized in the IMPACT modelling and updates ERA conclusions as needed. ○ Incorporates the results of the power analysis and any additional supporting statistical analyses for the water and sediment quality data. ○ Incorporates the additional pre-construction baseline data collected into the IMPACT modelling. ○ Conducts a sensitivity analysis on low (7Q10 low flow, monthly low flow, and monthly average flow) and high receiving environment water flows.	Prior to in-water works.
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		○ Updates IMPACT modelling using the results of the sensitivity analysis to provide an assessment of impacts to water quality from changes in low and high flows and climate change. ○ Completes supplementary validation of model performance against additional collected monitoring data including validation of regional sediment coefficients against measured data where possible. ○ Addresses IRs (IR-101, 107, 113, 113-R1, 115, 115-R1, 124, 194, 198, and 199) carried over from the EA review to licensing and adequately addresses CNSC staff technical comments from the previous ERA review. ○ Addresses information requests in EA4. • Review and acceptance by a person authorized by the Commission of updated near-field water quality modelling incorporating the additional pre-construction baseline data collected.	
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		To address part 3 of the condition: • After collecting additional site-specific data and conducting the validation of regional sediment coefficients against measured data, where possible Denison shall calculate site-specific sediment coefficients for future ERA updates. • Review and acceptance by a person authorized by the Commission of the methodology for calculating site-specific sediment coefficients, which may incorporate both site-specific and regional data.	Licence to operate application unless changes to the timeline are accepted by a person authorized by the Commission.
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EA3	The licensee shall submit a woodland caribou mitigation and offset plan based on site-specific information to evaluate effects to woodland caribou and includes a plan for habitat offsetting. The plan must ensure that measures are taken to avoid or lessen any adverse effects to woodland caribou and monitor those effects. The plan shall be consistent with the Government of Canada's Amended Recovery Strategy for Woodland Caribou (*Rangifer tarandus caribou*), Boreal Population, in Canada.	Review and acceptance by a person authorized by the Commission of a draft woodland caribou mitigation and offsetting plan to the CNSC that: • Discusses overall consistency with the federal Amended Recovery Strategy for Woodland Caribou. • Describes the residual adverse effects on caribou including details on the loss of critical habitat and biophysical features. • Provides details of the mitigation hierarchy, including avoidance, minimization, on-site restoration, and offsetting measures. • Provides details on monitoring for the effectiveness of proposed mitigation measures. Regarding offsetting, the plan may include the proposed: • Offsetting ratio amounts (in hectares) • Methodologies and associated benefits, uncertainties, and risks • Locations including habitat types • Timing • Ownership • Justification of how the offsetting achieves no net loss of critical habitat • Contingency measures • Commitment on progress reporting including information to be provided and frequency • Statement on quality assurance and quality control	Prior to the commencement of site preparation activities.

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		Review and acceptance by a person authorized by the Commission of a finalized woodland caribou mitigation and offsetting plan to the CNSC that builds on the draft plan and: • Provides an offset description, offset ownership, offset assessment, and contingency measures for offsetting. • Progress made on the implementation of offsetting. • Summary of changes made to items proposed in the draft plan. • Adequately addresses CNSC technical comments that were deemed to be appropriate to be deferred to the finalized plan. • Includes a commitment for regular review and update through the life of the project.	Licence to operate application.
EA4	The licensee shall conduct additional bat baseline surveys to supplement existing baseline characterization data in order to obtain a basic understanding of within-year and between-year variation for bat species, and to inform the environmental risk assessment.	Review and acceptance by a person authorized by the Commission of a report to the CNSC that: • Outlines the methodology, timing, and locations for additional bat baseline surveys with appropriate justification. • Provides the results of the additional bat baseline surveys. • Discusses validity of the EA predictions and conclusions based on the new data. • Demonstrates that the baseline data is sufficient to obtain a basic understanding of within-year and between-year variation for bat species.	Prior to the commencement of site preparation activities.
		Review and acceptance by a person authorized by the Commission of the next ERA update as per EA2 requirements that incorporates the data from the	Submit as part of the next ERA update, related to condition EA2.

		additional bat baseline surveys and updates the ERA conclusions accordingly.	
EA5	The licensee shall submit plans for the monitoring of adverse effects of the project on listed wildlife species and their critical habitat over the lifecycle of the project.	Review and acceptance by a person authorized by the Commission of detailed plans for the monitoring for adverse effects of the Project on all listed wildlife species identified in the EIS and their critical habitat. The monitoring plan design must: • Demonstrate consistency with any applicable recovery strategy or action plan for each species, or other guidance with appropriate justification. • Enable detection of each predicted adverse effects of the project on each species. • Enable verification of the effectiveness of implemented mitigation measures for each adverse effect of the project on each species. • Enable collection of data that allows for a statistically robust comparison to assess potential impacts on listed species over the lifecycle of the project. • Contain at least the following information for each species: objective; target areas/sampling points; monitoring techniques; timing; frequency. • Identify the circumstances under which corrective measures may be needed to address any issue or problem identified through the monitoring. • Include a commitment for progress reporting and associated level of information and frequency.	Prior to the commencement of site preparation activities.
		Review and acceptance by a person authorized by the Commission of updated detailed monitoring plans to address subsequent project phases for all listed wildlife species and a report to the CNSC that includes:	Prior to the commencement of activities under subsequent licences (e.g., licence to
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		• Summary of monitoring results for each listed species. • Discussion of detected adverse effects. • Evaluation of detected versus predicted effects as well as the effectiveness of mitigation measures to address adverse effects. • Any corrective measures taken to address unanticipated or greater than predicted effects. • Review for consistency with any updated applicable recovery strategy or action plans. • Review of list of species for consistency with Schedule 1 of SARA. • Proposed changes to the monitoring plans.	operate, license to decommission).

Appendix D.2: Licensing Regulatory Commitments

Commitment Number	Description of Requirement	Closure Criteria for the Requirement	Timeline Required By
PD-01	The licensee shall provide the detailed design of the monitoring wells for the freeze wall.	Review and acceptance by a person authorized by the Commission of a detailed freeze wall monitoring well design that provides well locations including geographical coordinates and a map with locations.	Prior to freeze wall construction.
PD-02	The licensee shall provide the detailed design of the ISR wellfield, including surface infrastructure.	Review and acceptance by a person authorized by the Commission of a detailed ISR wellfield design that: • Provides detailed design specifications of surface infrastructure including pumphouses, pipes and controls.	Prior to wellfield construction.

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		• Provides well patterns, distance between wells and well orientations.	
PD-03	The licensee shall provide: 1) The detailed site surface water management plan incorporating an updated Probable Maximum Precipitation (PMP) assessment. 2) The climate change resiliency assessment of the Project.	Review and acceptance by a person authorized by the Commission of a detailed site surface water management plan that: • Provides a PMP assessment that uses a historical storm events database that includes the most recent extreme storm events and meteorological data. • Addresses IR-104 carried over from the EA review to licensing. • Incorporates results of the updated PMP assessment and the 100 year 24-hour rainfall event. • Provides the detailed design of site grading, ditches, culverts, and runoff ponds. • Provides a map as well as drawings of the final design and locations of the surface water management infrastructure. Review and acceptance by a person authorized by the Commission of a climate change resilience assessment that provides an assessment of climate vulnerabilities of project infrastructures and operations/activities and the proposed adaptation measures over the Project lifetime.	Prior to construction activities for site water management infrastructure.
PD-04	The licensee shall provide detailed design for the mill as further detailed information is available.	Review and acceptance by a person authorized by the Commission of a detailed design of the mill that incorporates: • Human performance considerations • Containment structures • Considerations to the potential impacts to the environment, as needed	Prior to commencing the mill construction.
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PD-05	The licensee shall provide the detailed requirements for the various cementitious-based materials to be used, with regards to their rheological properties, durability and resistance to aggressive environments, integration into the overall design, and QA/QC.	Review and acceptance by a person authorized by the Commission of the detailed requirements as outlined in a formal request for information submitted to Denison (email K. Gorzkowski to R. Nagel and B. England subject: Design Criteria Comments, sent May 13, 2025).	Prior to construction activities.
EP-01	The licensee shall: 1) Provide a detailed diffuser design and assessment to ensure environmental conclusions of risk to aquatic receptors will not change. 2) Incorporate the results of updated near-field modelling in the detailed diffuser design and assessment into the finalized BATEA and ERA updates as needed.	Review and acceptance by a person authorized by the Commission of a detailed diffuser design and assessment to CNSC staff that: • Provides the detailed diffuser design specifications and engineering drawings. • Provides the final location including geographical coordinates and a map of the final discharge location. • Provides updated near-field water quality modelling using detailed diffuser design specifications, finalized effluent concentrations derived from the BATEA, and additional measured pre-construction baseline data. Incorporate the detailed diffuser design and assessment results into the BATEA and ERA as needed. Addresses IR-110 carried over from the EA review to licensing.	Prior to in-water works.

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EP-02	The licensee shall provide the finalized Best Available Technology Economically Achievable (BATEA) assessment.	Review and acceptance by a person authorized by the Commission of a final version of the BATEA that: • Includes effluent conductivity and TDS values that are technically feasible, and addresses IR-18 carried over to licensing. • Incorporates results and conclusions of the ERA update for in-water works. • Incorporates the results of the finalized diffuser design and updated near-field modelling from EP-01.	Licence to operate application.
EMFP-01	The licensee shall provide updated fire protection design criteria.	Review and acceptance by a person authorized by the Commission of an update to the criteria with additions that may include: • Passive fire protection measures such as automatic sprinklers. • How the proposed structures will mitigate the effects of wildfires.	Prior to construction activities.

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