25-H12 - CNSC Staff Submission

NexGen Energy Ltd. Application for a Licence to Prepare Site and Construct the Rook I Uranium Mine and Mill

Classification	Unclassified
CMD Type	Original
CMD Number	25-H12
Reference CMD(s)	N/A
Type of Licensing CMD	A new licence
Hearing	Commission Public Hearing - Part 1
Date of Hearing	November 19, 2025
Word and PDF e-Doc #	7374580 – Word 7586921 – PDF
Summary	This CMD presents information about the following matters of regulatory interest with respect to NexGen Energy Ltd.'s application for a licence to prepare site and construct a Uranium Mine and Mill at their Rook I site: CNSC staff's review, assessment and recommendations regarding the request by NexGen Energy Ltd. for a licence to prepare site and construct a uranium mine and mill. CNSC staff recommend the Commission consider taking the following actions: ○ Determine that the Rook 1 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) and (b) of the *Nuclear Safety and Control Act* that NexGen Ltd.:

	○ Is qualified to carry on the activities authorized by the licence ○ 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 agreements to which Canada has agreed ○ Issue a licence to prepare site and construct the Rook I uranium mine and mill, including licence conditions and consideration of regulatory commitments with which NexGen must comply as articulated in appendix D. ○ Determine that the 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 as set out in section 5.5. of this CMD. The following items are attached: ▪ Proposed licence UML-MINEMILL-ROOK1-20XX ▪ Draft Licence Conditions Handbook ▪ Environmental Assessment Report: Rook I Project ▪ Indigenous Consultation Report: NexGen Rook I Environmental Assessment and Licence to Prepare Site and Construct Application

25-H12 – Mémoire du personnel de la CCSN

NexGen Energy Ltd. Demande de permis pour la préparation du site et la construction de la mine et l'usine de traitement d'uranium Rook I

Classification	NON CLASSIFIÉ
Type de CMD	Originale
Numéro de CMD	25-H12
CMD(s) de référence	S.O.
Type de CMD relatif à une décision de permis	Nouveau permis
Audience	Audience publique de la Commission -Partie 1 (personnel de la CCSN et promoteur)
Date de l'audience	19 novembre 2025
Word et PDF N° d'e-Doc	7374580 – Word 7586921 – PDF
Résumé	Le présent CMD fournit des renseignements sur les questions d'intérêt réglementaire suivantes en ce qui concerne la demande de permis présentée par NexGen Energy Ltd pour la préparation de l'emplacement et la construction d'une mine et d'une usine de concentration d'uranium à son site de Rook I : Examen, évaluation et recommandations du personnel de la CCSN concernant la demande de permis de NexGen Energy Ltd pour la préparation de l'emplacement et la construction d'une mine et d'une usine de concentration d'uranium. La Commission pourrait considérer prendre les mesures suivantes : o Déterminer que le projet Rook I 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, conformément aux alinéas 24(4)a) et b) de la Loi sur la sûreté et la réglementation nucléaires, que NexGen Ltd : ○ est compétente pour exercer les activités autorisées par le permis ○ 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; ○ délivrer un permis pour la préparation du site et la construction de la mine et de l'usine de traitement d'uranium Rook I, y compris les conditions du permis et la prise en compte des engagements réglementaires auxquels NexGen doit se conformer, tels qu'énoncés à l'annexe D. ○ 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 les pouvoirs tel qu'il est établi à la section 5.5 du présent CMD. Les pièces suivantes sont jointes : ▪ Permis proposé UML-MINEMILL-ROOK1-20XX ▪ Ébauche du Manuel des conditions de permis ▪ Rapport d'évaluation environnementale : projet Rook I ▪ Rapport de consultation des Autochtones : Évaluation environnementale et Demande de permis de préparation et de construction pour le projet Rook I de NexGen

CMD 25-H12

NexGen Energy Ltd. Application for a Licence to Prepare Site and Construct the Rook I Uranium Mine and Mill

2025-10-10

Signed by:

X Campbell, Kimberley A

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Kimberley Campbell
Acting Director General, Directorate of Nuclear Cycle and Facilities Regulation

Table of contents

Land Acknowledgement

Canadian Nuclear Safety Commission (CNSC) staff would like to acknowledge that the NexGen Rook I project is located in northern Saskatchewan on Treaty 8 territory (1906), and the Homeland of the Métis, and is within territories of the Denesųłiné, Cree, and Métis.

Plain Language Summary

Background

The NexGen Energy Ltd. (NexGen) Rook 1 project consists of a proposed uranium mine and mill. NexGen is seeking approval to prepare site and construct an underground uranium mine as well as a mill on the Patterson Lake peninsula in the southwestern Athabasca Basin in northern Saskatchewan [1]. The proposed Rook I project would include the construction of underground and surface facilities to support the eventual operation, and decommissioning. The project is located approximately 155 km north of the village of La Loche, 80 km south of the former Cluff Lake mine site, and 640 km northwest of Saskatoon.

Regulatory Requirements

The Rook I 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). On February 14, 2019, NexGen submitted their initial project description for the Rook I project, which was revised and resubmitted on April 19, 2019, to address CNSC staff's request for changes. CNSC staff determined that the revised project description was complete and contained sufficient information to make an Environmental Assessment determination. On June 30, 2023, in accordance with section 8.1 of the *Uranium Mines and Mills Regulations*, NexGen submitted its final application for a licence to prepare a site and construct the Rook I uranium mine and mill. In accordance with section 8.2 of the *Uranium Mines and Mills Regulations,* CNSC staff confirmed on September 1, 2023, that the documentation provided was sufficient to commence its review of the licence application [2].

The proposed Rook I project is included under the definition of a nuclear facility in the NSCA and therefore requires the Commission's authorization before site preparation and construction activities may commence. 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 35 of the *Constitution Act, 1982*, have the potential to be impacted by the proposed Rook I project.

Therefore, the Commission has 3 separate decisions to render with respect to NexGen's application for the proposed Rook I project:

- an EA decision under *Canadian Environmental Assessment Act* (CEAA) 2012
- a licensing decision under the NSCA
- a decision on whether the honour of the Crown has been met in fulfilling the CNSC's duty to consult obligations.

Indigenous Consultation and Engagement

As an agent of the Crown, the CNSC recognizes and understands the importance of building relationships 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 NexGen and the CNSC in a meaningful way. CNSC staff consider that the consultation and engagement process for the Rook I project was meaningful, reasonable, responsive, and followed best practices.

NexGen 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, NexGen 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 NexGen's engagement.

CNSC Staff Conclusions

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

CNSC staff have performed rigorous technical assessments of the Rook I project proposal, including NexGen's environmental impact statement, safety case and extensive supporting documentation. CNSC staff conclude that the proposed Rook I project is not likely to cause significant adverse environmental effects. This conclusion takes into account the implementation of all identified mitigation measures and follow-up program measures. CNSC staff's validation of these assessments and predictions will be a part of ongoing licensing and compliance verification activities throughout the lifecycle of the project, including the decommissioning and post-decommissioning monitoring phase.

CNSC staff have determined that NexGen 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. NexGen's compliance history related to both the NSCA and CEAA*, 2012*, is described in this CMD and is taken into account in this conclusion. CNSC staff are satisfied that the information presented addresses the regulatory requirements set out under 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 verification activities, reviews and monitoring.

CNSC Staff Recommendations

Based on CNSC staff's assessment, CNSC staff recommend that the Commission determine that the Rook I project is not likely to cause significant adverse environmental effects, taking into account the implementation of all identified mitigation measures and follow-up program measures. Further, CNSC staff recommend that the Commission issue NexGen a licence to prepare site and construct the Rook I project.

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

CMD Structure

This Commission Member Document (CMD) includes the following:

1. An overview of the matter being presented, including overall conclusion and recommendations
2. A summary of the Environmental Assessment
3. General discussion pertaining to the safety and control areas (SCAs) that are relevant to this submission
4. & 5 Discussion about other matters of regulatory interest

- Appendices material that complements items 1 through 5
- Proposed licence
- Draft licence conditions handbook

1 Overview

1.1 Background

The Rook I Uranium Mine and Mill Project (Rook I) is a proposed new uranium mining and milling operation that is 100% owned by NexGen Energy Ltd. (NexGen), a publicly traded Canadian uranium development company headquartered in Vancouver. The Rook I site is located in the southwest Athabasca Basin in northern Saskatchewan, approximately 155 km north of the village of La Loche, 80 km south of the former Cluff Lake mine site, and 640 km northwest of Saskatoon.

1.1.1 Past Performance

NexGen does not currently hold any CNSC licences; information on past performance is limited to CNSC/NexGen interactions since the Environmental Assessment (EA) and licensing processes were triggered. Although NexGen is not currently a licensee, some legislative requirements apply.

On December 12, 2024, the CNSC issued an administrative monetary penalty (AMP) (2024-AMP-06) to NexGen in the amount of $29,080. The AMP was issued to NexGen for performing site preparation and construction of a uranium mine and mill facility without a CNSC licence, as required by paragraph 26(e) of the *Nuclear Safety and Control Act* (NSCA). The activities performed without a licence included the production of two large circular arrays of cased drill holes at the Rook I project site, intended for the creation of freeze walls for the future development of mine shafts. The AMP was also issued to promote compliance per subsection 65.02(2) of the NSCA.

On January 9, 2025, NexGen made a request to the Commission to review both the amount of the penalty as well as the facts of the violation, further requesting that the AMP be dismissed entirely. A hearing was held on April 8, 2025, to review the facts stated in the Notice of Violation and the amount of the penalty. The Commission determined that [3]:

> "58. The activities being undertaken were part of the licence application and are part of the site preparation for or construction of the proposed nuclear facility. This activity required Commission authorization under the NSCA. As a result, NexGen committed the violation stated in the Notice of Violation associated with 2024-AMP-06."

The facts of the AMP were upheld; however, the Commission reduced the penalty amount to $11,920. In accordance with subsection 65.14(5) of the NSCA, this determination was final and binding, subject to judicial review under the Federal Courts Act. On June 13, 2025, NexGen filed a request for a judicial review of the Commission's decision; this legal process remains ongoing at the time of the finalization of this CMD.

1.1.2 NexGen Application

On February 14, 2019, NexGen submitted an initial application for a licence to prepare site and construct a uranium mine and mill facility, and on June 30, 2023, NexGen submitted the final tranche of licensing documents to support their application. The licence application covers site preparation and construction of an underground uranium mine and an associated mill, as well as associated support facilities required to support future operations [1]. In accordance with section 8.1 of the *Uranium Mines and Mills Regulations*, CNSC staff performed a sufficiency check of the licensing documents submitted and issued a letter to NexGen on September 1, 2023, confirming that the application was sufficiently detailed to commence the technical review [2].

1.1.3 Project Overview

The NexGen Rook I project is intended to allow for the safe mining of uranium from the Arrow deposit where the Rook I site is located. The mined uranium ore will be processed into uranium concentrate at the onsite mill before shipment offsite. The proposed use of an underground tailings management facility will limit the surface area associated with the facility. Rook I is located in an area where temporary ground freezing will be required in order to construct 2 mine shafts. The mine workings will be in competent basement rock and ground freezing will not be required once the shafts are constructed. NexGen will use conventional stope mining methods to exploit the Arrow deposit.

The total area of the Rook I property is approximately 351 square kilometers and consists of 32 mineral claims, not all of which are associated with the Rook I project. It is located roughly 9km east of Highway 955 and roughly 130km north of Clearwater River Dene Nation, along a dedicated access road which branches off Highway 955. The Rook I project is roughly 8 km east of the Patterson Lake South (PLS) project, another proposed uranium mine and mill which is also to be located on Patterson Lake.

Figure 1.1 provides a map of the location of the Rook 1 project.

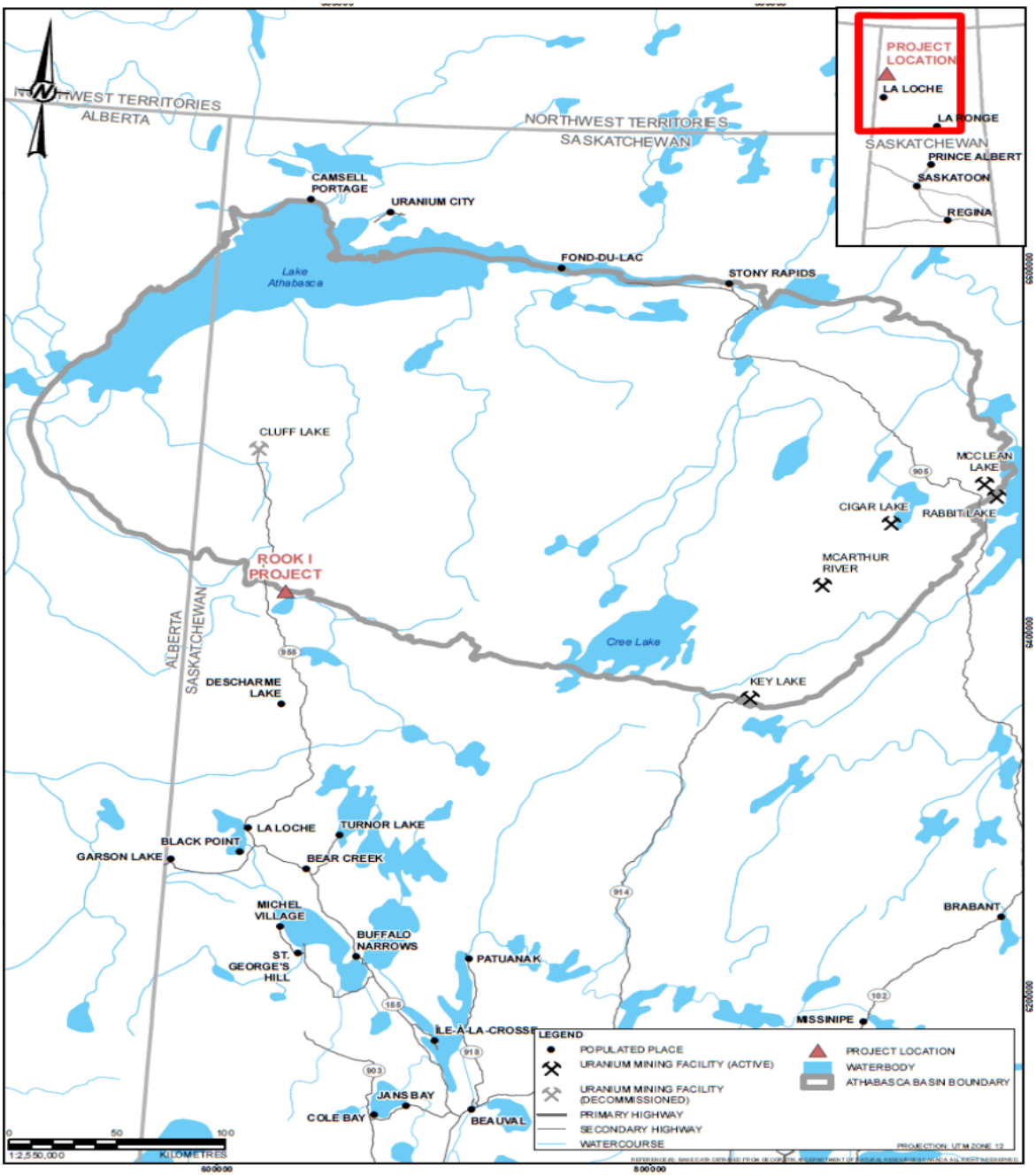

Figure 1.1. Location of Rook I site (source: Rook I Mining and Milling Facility Description Manual, 2023)

The Arrow deposit is considered a high-grade deposit with 116 million kilograms of uranium at an average grade of 3.10%. NexGen's proposed mill will use a sulphuric acid leach and a solvent extraction process to extract and purify a uranium oxide (U_3O_8) product from the ore. NexGen estimates a potential uranium production of up to 11.5 million kilograms U_3O_8 per year, with an average annual mill feed grade of 2.24% U_3O_8. The uranium oxide concentrate is also commonly referred to as yellowcake.

The *Uranium Mines and Mills Regulations* require that an application for a licence to prepare site and construct include the proposed commissioning plan for the components, systems and equipment to be installed at the mine site. Commissioning activities will begin with clean materials but may culminate in the mining and milling of some uranium ore. If the commissioning plan proposes any uranium mined and milled prior to the issuance of a CNSC licence to operate, this material cannot be considered as saleable product. Should NexGen propose to commission the facility using any amount of uranium bearing material (ex. exploration core), 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 NexGen from progressing beyond commissioning activities without a CNSC licence to operate.

NexGen has outlined their project activities for all phases of the Rook I project's life cycle in the EIS a summary of the activities is captured in Table 1 and includes some activities that are not in scope for the licence application under consideration [4].

Table 1: Rook I project activities and duration by phase

Project phase (Planned duration)	Project activities
Site preparation, initial construction and shaft sinking preparation (1 year – within scope of NexGen's current licence application)	▪ Site clearing and mass earthworks ▪ Temporary effluent treatment facilities ▪ Temporary power plant installation ▪ Concrete batch plant installation ▪ Initiate ground freezing ▪ Production shaft and bin house ▪ Hoist building construction ▪ Project offices and temporary mine dry facilities ▪ Site water management infrastructure

Project phase (Planned duration)	Project activities
Exhaust shaft sink, production shaft sink, Under Ground (UG) construction/lateral development, and process facility construction/commissioning (years 2-4 – within scope of NexGen's current licence application)	▪ Commission sinking plant ▪ Shaft sinking concrete shaft lining ▪ Installation of temporary ventilation and dewatering systems ▪ Installing steel structures in shaft ▪ Shaft station excavation ▪ Installing temporary waste handling system for underground development ▪ Underground construction ▪ Ore/waste handling system ▪ Ventilation system ▪ Underground maintenance facilities ▪ Waste rock storage areas preparation ▪ Main surface support facilities ▪ Operations effluent treatment facilities ▪ Process plant construction ▪ Main power plant ▪ Site accommodations complex ▪ Shaft changeover ▪ Tailings paste plant commissioning ▪ Mill commissioning
Operations (24 years – not in scope of NexGen's current licence application; a separate application to the Commission will be required)	▪ Underground mining including progressive development of mining areas ▪ Underground tailings management including progressive development of tailings management areas ▪ Batch plant operation (grout and cement); crusher at borrow area ▪ Expansion of pond and pads ▪ Operation of the processing plant (mill) and production of uranium concentrate ▪ Water withdrawal from groundwater or surface water body

Project phase (Planned duration)	Project activities
	▪ Management of site water (including seepage and site runoff) ▪ 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 mine waste rock, process precipitates and industrial wastewater treatment plant precipitates ▪ On-site and off-site operation of vehicles and transport of materials ▪ Power supply – 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

Project phase (Planned duration)	Project activities
Decommissioning (5 years – not in scope of NexGen's current licence application; a separate application to the Commission will be required)	▪ Site water management, treatment, and release ▪ Decommissioning of mine and mill site ▪ Process water treatment and release
Post-Decommissioning (10 years – not in scope of NexGen's current licence application; a separate application to the Commission will be required)	▪ 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

1.2 Highlights

The Commission has 3 separate decisions to render with respect to NexGen's application for the proposed Rook I project:

1. An EA decision under *Canadian Environmental Assessment Act* (CEAA) 2012,
2. A licensing decision under the NSCA
3. A decision on whether the honour of the Crown has been met in fulfilling the CNSC's duty to consult obligations.

For the EA decision, pursuant to section 7 of CEAA 2012, the Commission is prohibited from issuing a licence to the applicant unless the Commission is satisfied that the Rook I project is not likely to cause the significant adverse environmental effects outlined in section 5 of CEAA 2012, or that the significant adverse environmental effects that the project is likely to cause are justified under the circumstances.

For the licensing decision, pursuant to subsection 24(4) of the NSCA, the Commission must be satisfied that NexGen 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 NexGen 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, additional information on the EA and CNSC staff's Environmental Assessment Report (EA Report) are provided in Section 2 and Appendix B of this CMD.

Pursuant to the *Nuclear Safety and Control Act*, in February 2019, NexGen submitted an application [1] for a Licence to Prepare Site and Construct a Uranium Mine and Mill. In addition to the initial application, NexGen submitted a request for a 10-year licence term to prepare site and construct activities [5]. During this licence term, NexGen 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 Rook I project, NexGen's licence application and associated technical documents will become part of NexGen's licensing basis as outlined in the draft LCH in part 2 of this CMD. CNSC staff's assessment of the Rook I 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 Rook I project was meaningful, reasonable, responsive, and followed best practices.

1.2.1 CNSC Staff Assessment of NexGen's Application

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

The Rook I 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 assessed NexGen's submissions of technical documents and safety assessments against the regulatory requirements of the NSCA and its associated regulations, as well as Canadian Standards Association (CSA) standards and applicable International Atomic Energy Agency (IAEA) safety standards .

NexGen proposes to construct a conventional mine and mill using well-established methods and intends to manage tailings underground in both mined out chambers (i.e. former stopes) and in dedicated tailings management cavities (i.e. purpose-built chambers for initial tailings to be deposited). This would be the first time this type of tailings management is used for uranium mining in Canada, though it is a common approach used for other types of mines in Canada and in other countries. CNSC staff found that existing CNSC regulatory requirements for uranium mines and mills are adequate for the assessment of NexGen's application, and for the regulation of NexGen's project should the Commission issue a licence .

CNSC staff carried out their assessment of the Rook I project technical documents in an iterative manner, communicating questions to and holding focused technical meetings with NexGen to obtain clarification and to resolve outstanding issues. Correspondence between CNSC and NexGen continued until CNSC staff were satisfied that all regulatory requirements were met. CNSC staff visited the Rook I site on 4 occasions to discuss NexGen's licence application with NexGen staff and to view the proposed site and its major features.

While all requirements are currently assessed as being met for the site preparation and construction phase, some of the documents submitted as part of this application and the EIS will need to be updated or revised at different stages of the development of the facility (pre-operational, operational, and post operational periods). Updates that will be required to key documents and the submission of additional documents are described in Appendix D of this CMD. These conditions and commitments are bounded by the proposed licensing basis and will be monitored by CNSC staff and tracked via the draft Rook I LCH. CNSC staff's regulatory oversight of NexGen to ensure that activities at the Rook I site remain within the licensing basis established by the Commission will continue throughout the lifecycle of the project via compliance verification activities. CNSC staff will report to the Commission any significant deviation from the licensing basis.

1.2.2 Other Regulatory Approvals

To advance the Rook I project, NexGen is required to obtain other regulatory approvals from provincial agencies responsible for regulating mining activities. In November 2023, NexGen received the required Provincial Environmental Assessment approval from the province of Saskatchewan Ministry of Environment. NexGen is the sole entity responsible for meeting all provincial and federal regulatory requirements and is accountable and responsible to ensure the health, safety and security of persons and the environment are protected. As such, in addition to any regulatory approvals that NexGen is required to obtain, NexGen is also responsible to ensure that any contractor or third party engaged on the project also has obtained all requisite approvals and respects the licensing basis for the Rook I project.

Provincial permits that are required for the Rook I project include the following approvals/permits from the Saskatchewan Ministry of Environment:

- Approval to construct a pollutant control facility
- Approvals to construct facilities to handle hazardous substances and waste dangerous goods
- Permits for the construction of potable (drinking water) water and sewage works

The provincial approvals/permits that may be required for the project to proceed are not contingent on the Commission's decision nor do these provincial approvals/permits impede the Commission from issuing the requested licence to NexGen. CNSC staff will continue to monitor the receipt of other regulatory approvals as the project progresses and will also keep provincial counterparts apprised of the CNSC's work.

1.2.3 Rook I Prepare Site and Construct Licence and LCH

If the Commission issues a prepare site and construction licence for the Rook I project, CNSC staff will implement an LCH, and the licensing basis documents submitted as part of NexGen's application will be included as part of the licensing basis. Key licensing basis documents will in turn be listed in the LCH. The draft LCH included in Part 2 of this CMD describes the licensing basis for the facility and includes CNSC staff's expectations for compliance with the licence conditions and the licensing basis. The compliance verification criteria included in the draft LCH describes how CNSC staff will evaluate NexGen's compliance with the licence conditions.

Appendix D of the LCH includes a list of EA conditions and regulatory commitments that NexGen will be required to close prior to the commencement of specific activities. The regulatory commitments are required to be completed during the site preparation and construction phase of the Rook I project. CNSC staff will verify the completion of EA conditions and 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 verification activities.

1.2.4 Compliance Verification for a Licence to Prepare Sites and Construct at the NexGen Rook I Project

Should the Commission issue a licence to prepare site and construct for the Rook I project, CNSC staff will monitor site activities and adapt compliance oversight as needed. The 5-year compliance plan for the Rook I project is included in Appendix A.5 and is reflective of the scale and complexity of the project.

CNSC staff are confident in having the necessary regulatory tools for the effective regulatory oversight of the Rook I project. Compliance oversight, including inspection scope, can be adjusted whenever these measures are needed and in response to changing project schedules.

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

NexGen will be required to submit annual, quarterly and monthly reports, as well as event reports, as needed, that will be reviewed by CNSC staff to ensure project activities remain within the licensing basis.

1.2.5 Next Licensing Phase

Subsequent Rook I project licensing phases will also require authorization from the Commission. The Rook I project encompasses 3 phases:

- representing the full life cycle of the project
- site preparation and construction
- operation and decommissioning

While site preparation and construction activities for Rook I are expected to take 4 years, a longer licence period of 10 years is proposed to account for any unforeseen project delays or changes.

Operation*:* NexGen plans to apply for a licence to operate the Rook I project prior to the completion of site preparation and construction. In support of a future application for a licence to operate, NexGen will be required to submit to CNSC staff information pertaining to mining uranium ore in the underground mine, transferring of ore to the mill, processing uranium ore to produce uranium concentrate, transporting uranium concentrate offsite, and managing resulting wastes.

Decommissioning: following the operating phase, NexGen will be required to seek Commission authorization to proceed with the decommissioning of the facility and site infrastructure. NexGen will be required to submit a detailed decommissioning plan to support this request for authorization. During the decommissioning phase, NexGen will be required to carry out surveys to ensure the land meets the criteria and requirements established in the detailed decommissioning plan are 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 Rook I project. Based on the regulatory review and technical assessments of NexGen's EIS and supporting documentation, CNSC staff determined that the proposed Rook I 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 (please refer to section 5.5, part two of this CMD and the EA Report in Appendix B for further details).

Based on a regulatory review of the application, CNSC staff concluded that NexGen's licence application to prepare site and construct the Rook I 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

CNSC staff recommend that the Commission:

1. Determine that the Rook I 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 a licence to prepare site and construct the Rook I uranium mine and mill, including licence conditions and consideration of regulatory commitments with which NexGen 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

The CNSC, as Responsible Authority, conducted an EA of the proposed Rook I project in accordance with CEAA 2012, as this was the federal EA legislation at the time the application was received. CNSC staff further determined that the project met the description of physical activity set out under section 31 of the Schedule to the *Regulations Designating Physical Activities* and by virtue of section 2 of those regulations is a "designated project" under section 2(1) of *Canadian Environmental Assessment Act, 2012* (CEAA 2012).

The *Impact Assessment Act* (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. Section 182 of the IAA, 2019 provides:

"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 Rook I project continued under CEAA 2012. The CNSC 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 Rook I project. CNSC staff assessed the potential effects that the Rook I project is likely to have on the environment, based on information provided by NexGen 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.

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

3 General Assessment of SCAs

CNSC staff review and assess an applicant's proposed measures and controls, and if applicable, an applicant's past performance in each SCA. All SCAs are covered in this CMD with the exception of transport and packaging which is not applicable to the site preparation and construction phase .

The specific areas of SCAs applicable to this proposed uranium mine and mill are listed in Appendix C, section C.2, and the results of CNSC staff's detailed review for each specific area are outlined in the following subsections.

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, NexGen must implement and maintain a management system that will be in accordance with CSA standard 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.

NexGen has proposed a management system program for the Rook I project in accordance with CSA N286-12 and is committed to continual improvement and to oversee its Rook I project activities to assure the protection of the health and safety of workers, the public, and the environment. NexGen is also required to implement and maintain written operating procedures and carry out the licensed activities in accordance with the policies and programs for the purposes described in the licence application. This documentation must 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

NexGen has developed a management system for the proposed Rook I 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 Rook I project, CNSC staff evaluated the significant volume of documents submitted with the licence application and will evaluate NexGen's management system throughout the project's lifecycle by reviewing and assessing NexGen documents, verifying records, and conducting inspections. As activities on the Rook I site change over time, NexGen will be required to update existing documentation and to draft new documentation. 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 Rook I Integrated Management System Manual [7] is a higher tier document that explains the integrated management system and sets out the framework of policies and procedures through which Rook I will be governed and managed, from the setting of direction through to day-to-day operations. The framework applies to 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 NexGen'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 licensed activities performed by NexGen employees, contractors and sub-contactors at the Rook I project. CNSC staff are satisfied that NexGen's proposed management system program elements are acceptable and meet regulatory requirements for the proposed activities for the Rook I project.

Safety Culture

As part of the review of the application, CNSC staff note that NexGen's Rook I Integrated Management System Manual, 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, NexGen has provided additional information regarding safety culture processes in the Rook I Health and Safety Management Program [11]. These documents reflect the intent of 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 project, especially during the site preparation and construction phases. NexGen's Rook I Integrated Management System Manual provides the framework for external contractors performing site preparation, construction and installation activities. Construction work carried out at the Rook I 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. This information is detailed in NexGen's Rook I Construction Management Program [8].

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

3.1.2 Summary

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

3.1.2.1 Past Performance

There is no previous performance for the management system SCA at the Rook I project as this is a licence application for a new facility.

3.1.2.2 Regulatory Focus

CNSC staff will monitor NexGen's performance in the management system SCA through regulatory oversight activities including inspections and desktop reviews of relevant program documentation, scheduled reports, and event reports.

Should the Commission issue a licence for the site preparation and construction of the Rook I project, CNSC staff will implement an inspection plan for the site preparation and construction/commissioning phase. CNSC staff will observe, assess, and inspect targeted activities and milestones to verify that these activities are carried out in compliance with the accepted and validated site preparation, construction and commissioning processes, plans, procedures, and quality assurance and quality control measures. CNSC staff will also verify the implementation of the Rook I Construction Management Program, Rook I Commissioning Management Program as well as associated processes [9]. CNSC staff intend to carry out a minimum of 2 focused inspections on the management system SCA during the prepare site and construct phase.

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 Rook I project management system documentation, CNSC staff conclude that the program is adequate to support the proposed site preparation and construction activities of the Rook I project.

Should the Commission issue a licence for site preparation and construction of the Rook I project, CNSC staff will monitor activities through the conduct of regular compliance verification activities to ensure that NexGen 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 that 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 comprises this SCA for the Rook I 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.

Rook I Training Program [10] proposes a training system which 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 Rook I project. NexGen's application proposes the implementation of REGDOC-2.2.2 at the Rook I project. CNSC staff are satisfied that the proposed training system for the Rook I project will meet regulatory requirements.

3.2.2 Summary

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

3.2.2.1 Past Performance

There is no previous performance for the human performance management SCA for the Rook I project.

3.2.2.2 Regulatory Focus

To ensure the program is successfully implemented during the proposed licence period, CNSC staff will verify NexGen's compliance with regulatory requirements by assessing human performance management criteria and the implementation of the SAT at the Rook I project. 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

As part of on-going compliance verification activities, CNSC staff will monitor and review any proposed modifications to NexGen's training system and programs.

3.2.3 Conclusion

Based on review of the Rook I project human performance management and training documentation, CNSC staff conclude that the program is adequate to support the proposed site preparation and construction activities of the Rook I project.

Should the Commission issue a licence to prepare site and construct the Rook I project, CNSC staff will monitor activities through the conduct of regulatory compliance verification activities to ensure that NexGen continues to meet requirements of the human performance management SCA.

3.3 Operating Performance

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

Based on CNSC staff's assessment of NexGen'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, NexGen must implement and maintain operational programs at the Rook I 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*.

NexGen has proposed effective operational programs in order to ensure that the proposed licensed activities at the Rook I site are performed safely and in compliance with regulatory requirements.

CNSC staff's review focused on NexGen's proposed measures in order to assess NexGen's ability to adequately carry out operating performance elements with respect to the proposed Rook I construction and commissioning activities.

Procedures

NexGen's Management System consists of high-level program documentation that is supported by lower-level procedures and work instructions [7]. NexGen 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 NexGen's processes and procedures and conclude 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.

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

Should the Commission issue a licence for the site preparation and construction of the Rook I project, the facility will be subject to these operating performance program elements. In addition, CNSC staff will monitor the Rook I facility through the conduct of compliance verification activities to verify that NexGen continues to meet operating performance requirements.

Reporting and Trending

In accordance with the proposed licence condition and REGDOC-3.1.2, NexGen will be required to report information to the CNSC through annual, quarterly and monthly compliance monitoring and operational performance reports. NexGen will also be required to report any unplanned events such as injuries to persons, releases of nuclear substances to the environment, or security events. NexGen 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 NexGen's management system included provisions for reporting to the CNSC in accordance with regulatory requirements.

3.3.2 Summary

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

3.3.2.1 Past Performance

There is no previous performance for the operating performance SCA for the Rook I project.

3.3.2.2 Regulatory Focus

CNSC staff will use operating performance criteria, the implementation of procedures, and reporting and trending to verify compliance during inspections at the Rook I project and ensure the program is successfully implemented.

Should the Commission issue a licence to prepare site and construct the Rook I project, CNSC staff will focus compliance verification activities on the safe conduct of site preparation, construction and commissioning activities. CNSC staff intend to carry out a focused inspection on the operating performance SCA during the prepare site and construct phase.

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 assessment of NexGen's licence application and supporting documents for the site preparation and construction of the Rook I facility, CNSC staff conclude that NexGen has adequate operational programs to ensure that licensed activities will be performed safely and in accordance with regulatory requirements.

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

3.4 Safety Analysis

The safety analysis SCA covers 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 preventive measures and strategies in reducing the effects of such hazards.

3.4.1 Discussion

As a licensing requirement, NexGen will be required to implement and maintain a process to identify and assess hazards and risks on an ongoing basis at the Rook I 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 valuable guidance on safety analysis for uranium mine and mill licensees. Based on CNSC staff assessment, focused highlights are provided below for hazard analysis, a specific area within the safety analysis SCA that is relevant to this application.

Hazard Analysis

Hazard analysis provides an opportunity to identify and mitigate potential hazards to worker health and safety, and to the environment to an acceptable level or as low as reasonably achievable (ALARA). These analyses will be completed by workers and subject matter experts before the work begins, as described in NexGen's Health and Safety Program, Environmental Impact Statement, Rook I Hazard Analysis Report, and the Rook I Mine Waste Safety Case [11, 12, 13].

NexGen has proposed to use the following methodology for identifying and addressing risks and hazards at the Rook I project :

- Hazard identification
- Assessing hazards and risks
- Addressing identified hazards and risks

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

Assessment of Natural External Hazards

NexGen has identified site specific external natural hazards at Rook I site that include climate extremes such as drought, major precipitation events, severe snowstorms, high winds (tornadoes and severe thunderstorms) and extreme temperatures, wildfires and seismic events that have a potential to impact the project components. NexGen has further identified appropriate mitigation measures that will be implemented in the design, construction and operation phases of the project to ensure the protection of the project facilities, the people and the environment. NexGen will design the structures, systems, and components of the project to applicable standards and codes to withstand exposure to these hazards during its design life.

NexGen has also assessed hazards related to climatic extremes and seismic events in their hazard analysis [12] and concluded risks from these hazards to be low as there will be adequate design measures and appropriate standard operating procedures (SOPs). NexGen will design surface water management infrastructure (surface drainage, collection and storage systems) to safely manage even the most extreme runoff event such as the 24-hour Probable Maximum Precipitation event, despite its very low probability of occurrence during the life of the project.

Mine waste safety case

The Rook I project mine waste safety case presents safety assessment results with complementary arguments and evidence to demonstrate that people and the environment will be protected from the hazards posed by Rook I mine waste during both the pre-closure and post-closure periods for a reference assessment time frame of 10,000 years. The safety case covers mine waste from all project phases – site preparation and construction, operation, and decommissioning.

The mine waste generated during site preparation and construction would be waste rocks from shaft sinking and underground development (i.e. early mine development and excavation of 3 underground tailings management chambers), and mine water pumped out during shaft sinking and underground development. The primary hazard associated with the mine waste during the site preparation and construction is the acid rock drainage and metal leaching (ARD/ML) from the potentially acid generating (PAG)

mine waste rock. The PAG waste rock was evaluated as part of the environmental assessment and the mine waste safety case. The Rook I project proposes to employ a comprehensive framework combining static and kinetic testing, following industry best practices such as those from the Mine Environment Neutral Drainage (MEND) and the International Network for Acid Prevention (INAP), to assess potential ARD/ML [13].

To mitigate the potential risk of ARD/ML from the PAG waste rock, NexGen has proposed to implement adequate engineering design control. The PAG waste rock stockpile will be designed with a base high-density polyethylene (HDPE) liner, multiple engineered source control layers, contact water management during construction and operation phases, and ultimately a vegetated cover system. The engineered source control layers plus the vegetated cover system will limit oxygen ingress and water infiltration into the PAG waste rock stockpile and minimize the ARD/ML from the PAG waste rock so that their full safety functions could be maintained through the assessment timeframe as demonstrated in the safety case. NexGen has also committed to adaptive management so that plans and designs for mine waste management can be modified as new environmental, geological, hydrological, hydrogeological, and geotechnical data are collected to meet safety objectives [13].

CNSC staff will review future iterations of the safety case to ensure that people and the environment are protected from the hazards posed by the mine waste in the long term. The safety case will be updated to incorporate staff's comments and recommendations however, it was determined to be acceptable for the site preparation phase.

Geotechnical and hydrogeological assessment for mine shafts and underground tailings management facility

Rook-I site preparation, and construction includes the sinking of 2 shafts (production shaft and exhaust shaft) and early underground development including the excavation of 3 chambers of the underground tailings management facility (UGTMF). The primary hazards associated with the shaft sinking and the UGTMF chamber excavation are potential rock falls and ground collapses, and groundwater inflow. To construct such structures safely, geotechnical assessments are conducted to support their designs and construction based on the geotechnical data collected from geotechnical investigations for the Rook I project. The geotechnical assessment of the shaft sinking employs empirical methods (i.e., rock mass rating (RMR) and Q-system), kinematic wedge analyses, and stress analyses of numerical modeling (i.e., PLAXIS2D for shafts and FLAC3D for shaft bottoms) using shaft pilot hole data as the inputs while empirical methods and kinematic wedge analyses are conducted for the UGTMF chamber design and construction. The analysis results provide a basis for recommendations for both temporary and permanent ground support for shaft sinking and UGTMF chamber construction through NexGen's front-end engineering design (FEED).

The FEED is a design step taken before the detailed engineering design and procurement to support the refinement of the project execution strategy, with the main purpose for cost estimate and control[4].

NexGen developed a conceptual site model (CSM) for the Rook I project that integrates regional geology, hydrostratigraphy, and baseline geochemistry into a coherent 3-dimensional framework. During the review, CNSC staff determined that the applicant's approach and methodology for the geotechnical and hydrogeological assessment for the Rook I FEED is adequate and that the recommended mitigation measures including temporary ground freeze and permanent ground supports for the shaft sinking and the UGTMF chamber construction appear to be appropriate for the FEED of such structures.

The results of the stress modeling for the UGTMF were conducted and the results provided in the Rook I Mining Geotechnical Assessment [14]. CNSC staff have included a regulatory commitment for NexGen to submit a plan to measure in-situ stresses to support/verify the shafts and UGTMF detailed designs. Therefore, CNSC staff expect that further geotechnical assessments be conducted/verified with measurements of in situ stresses for detailed shaft engineering design and sinking, and for the detailed UGTMF design supported with stress modeling of the UGTMF construction. The kinematic wedge analyses should be verified/confirmed with geological structure conditions mapped during the shaft sinking and the underground development. Groundwater inflow analyses should be conducted with measured hydraulic conductivities of overburden soils and sedimentary rocks surrounding the shafts. Regulatory commitments related to geotechnical characterization work and detailed shaft design are included in Appendix D.

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 Rook I project.

3.4.2.2 Regulatory Focus

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

During the proposed licence period, CNSC staff will perform an inspection of the Rook I site using safety analysis criteria and will verify the implementation of the hazard analysis to ensure the program is successfully implemented.

CNSC staff will review updates to the mine waste safety case to ensure that requirements are met, and that the safety case remains within the licensing basis. during construction, operation, decommissioning and after decommissioning.

CNSC staff will also review the updated geotechnical and hydrogeological assessments to ensure that the assessments are conducted adequately to support the detailed engineering design of the shafts and the UGTMF.

3.4.2.3 Proposed Improvements

As noted above, there are areas related to geotechnical characterization where further work and the submission of further documentation will be required in order to demonstrate full compliance with relevant requirements. CNSC staff will ensure that this work is performed, and the resulting reports are acceptable.

3.4.3 Conclusion

Based on the above assessment, CNSC staff conclude that NexGen's application meets the regulatory requirements and CNSC staff's expectations to protect workers and the environment at the Rook I project as it relates to the development and maintenance of the safety analysis for the facility.

Should the Commission issue a licence for site preparation and construction of the Rook I project, CNSC staff will monitor activities through the conduct of regulatory compliance verification activities to ensure that NexGen 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 (SSC) 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 Rook I project include:

- Design governance
- Site characterization
- Facility design
- Structure, system and component design

3.5.1 Discussion

As a licence requirement, NexGen will be 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 the Rook I Integrated Management System Plan as well as the Rook I Construction Management Program [7,8]. These documents confirm 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 in support of an application for a licence to prepare site and construct; final detailed designs are not required. Some site preparation activities will in fact need to be carried out to gather the required information to include in the final detailed engineering designs based on site conditions. CNSC staff have included a list of regulatory commitments in Appendix D to ensure that it is clear to NexGen which detailed designs are required to be submitted prior to the commencement of specific construction activities.

NexGen provided CNSC staff the Rook I Project Mining and Milling Facility Description Manual [4] 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, NexGen will be required to submit final design documentation to CNSC staff for review, and then acceptance by the Commission or an individual designated by the Commission prior to construction. Please see Appendix D for further details related to this request as well as Regulatory Commitments for NexGen to meet.

Design Governance

NexGen submitted the following design documentation which govern the design of the facility:

- Civil design criteria
- Front end engineering design of production and exhaust shafts
- Structural design criteria
- Mechanical design criteria
- Mine heating ventilation and air conditioning design criteria
- Fire protection design criteria
- Electrical design criteria
- Surface process design criteria
- Mine design criteria
- Paste system design criteria
- Shafts and hoisting design criteria
- Ground support standard specification

These documents cover the criteria that NexGen has set in place for the detailed design of all aspects of the Rook I project facilities. CNSC staff reviewed these documents and raised various comments including interfaces with design decisions and the radiation protection program objectives.

NexGen's responses to CNSC staff comments were sufficient to address CNSC staff's initial concerns. The regulatory commitments listed in Appendix D of the proposed LCH contain a list of documents and updates that will be required for CNSC staff's review and acceptance prior to activities related to the requests.

CNSC staff have determined that NexGen meets regulatory requirements and in addition, CNSC staff are satisfied that the design criteria will govern the remaining design process through to final design.

Engineering Change Control Process

NexGen's engineering change control (ECC) process is documented by the Rook I Construction Management Program [8] which includes a Construction Change Procedure. CNSC staff have reviewed the program and the procedure for regulatory compliance and are satisfied that the NexGen ECC process meets regulatory requirements and that any design changes to the Rook I project will be sufficiently documented. Should the Commission issue a licence to prepare site and construct the Rook I project, CNSC staff will monitor NexGen's implementation of the ECC process.

Human Factors in Design

NexGen has provided a framework for considering human factors within the engineering design control plan, as governed by the *Rook I Human Factors and Engineering Program Plan* [15]. NexGen's Human Factors Engineering Procedure provides guidelines to establish a systematic process for integrating human factors into the design, operation, and maintenance of nuclear facilities in accordance with CNSC REGDOC-2.5.1, *General Design Considerations: Human Factors*. To ensure human factors are adequately incorporated, the procedure outlines criteria for considering human factors, steps to follow and the required qualifications for the Human Factors Experts. Human factors are considered in new plant designs and include:

- Maintenance and operations procedures
- Human-Machine interfaces (HMI)
- Training and staffing strategies

Radiation Protection in Design

NexGen proposes the Rook I facilities to be designed and constructed, incorporated with features to keep radiation exposures as low as reasonably achievable (ALARA). Radiological hazard controls are considered as outlined in the hierarchy of controls and the ALARA principle introduced in the Rook I Integrated Management System Manual and described in the radiation protection (RP) program. Ventilation is an example of an important engineered control for reducing occupational exposures to airborne radiation at the project site. Facility design optimization also includes addition of shielding intended to reduce gamma dose rates in higher dose rate areas.

Additional provisions for radiation protection are elaborated in section 3.7 for the radiation protection SCA.

Site Characterization

The Rook I project site was characterized during the mineral exploration, the environmental assessment, and the site geotechnical investigations for the mine design (see figure 1.1 of the site).

CNSC staff conducted a comprehensive review of the geological, hydrogeological, meteorological, hydrological, aquatic and terrestrial environment characterization of the site provided by NexGen. CNSC staff have accepted that the provided information is sufficient to support the preliminary design or front-end engineering design of the mine facility for the site preparation and construction phase. However, CNSC staff have requested that NexGen update the estimates of design precipitation or rainfall events and clarify the approach to factor climate change into the estimates prior to starting licensed activities for the design of surface water management infrastructures. The in-situ stresses and the hydraulic conductivities of the overburden soils and the sedimentary rocks in the area of shafts need to be measured to support/verify the detailed engineering design. (Please see Appendix D for further details related to this request as well as regulatory commitments NexGen will be required to meet).

Structures, Systems and Components Design

NexGen has completed the preliminary design or outline of several key structures, systems and components of the Rook I project which were identified by CNSC staff as critical components and are elaborated upon below.

Surface Drainage and Water Management Infrastructure Design

NexGen will manage both contact and non-contact surface water generated on the site through Rook I surface water management infrastructures.

The Rook I site surface water management infrastructures will be designed to maximize the diversion of non-contact surface runoff water away from site-developed features, and for collection, conveyance and storage of surface water within the contact and non-contact water areas of the site, which comprise of surface drainage system, collection areas and storage ponds as shown in figure 3.5.1.

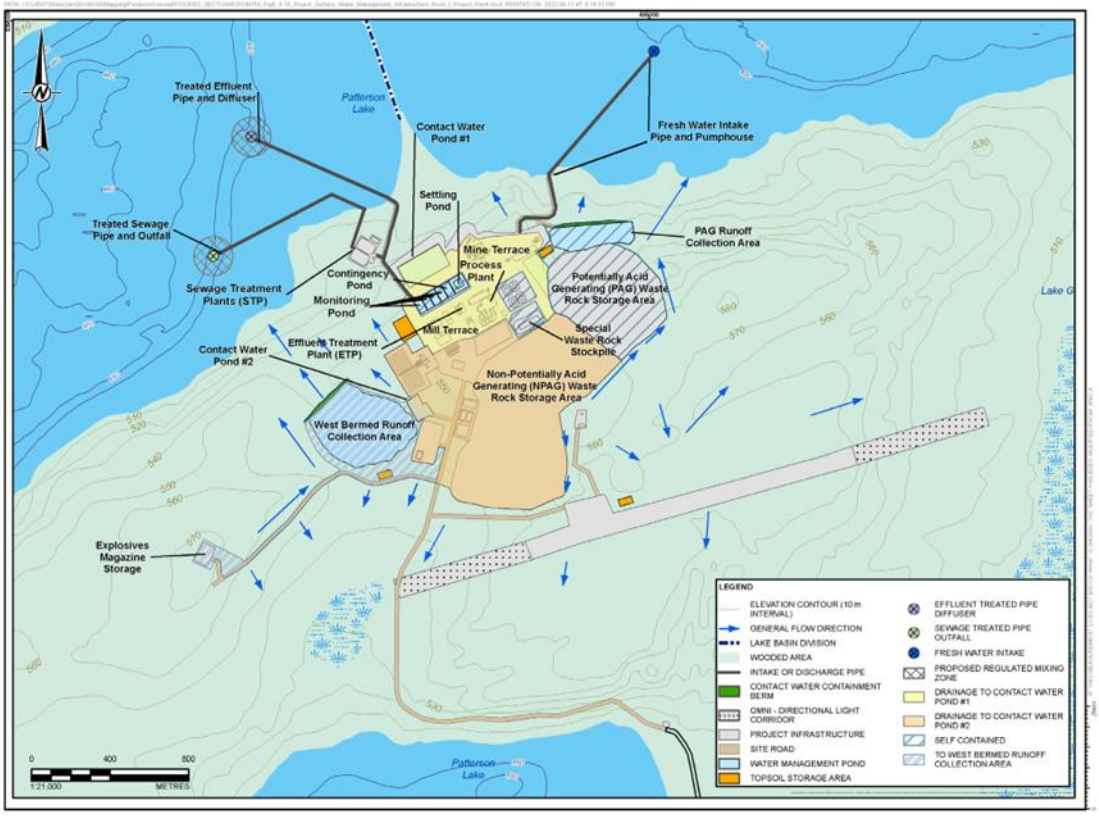

Figure 3.5.1: Rook I Project Site Water Management Structures (source: Section 5.4.5 of EIS, NexGen Energy Ltd. (2022))

As outlined in Section 5.4.5 of the EIS , Rook I Project Civil Design Criteria [16] the Mining and Milling Facility Description Manual [4] and the Rook I Site Water Management Plan [17], clean, non-contact runoff from undisturbed catchments will be diverted away from or around project components as much as possible. In most cases, contact water such as runoff from mineralized surfaces and non-mineralized surfaces, as well as undisturbed non-contact runoff that cannot be diverted around the industrial area, will be captured, collected, and directed to respective site runoff ponds or collection areas, and then directed to the Effluent Treatment Plant (ETP) for treatment prior to discharge into Patterson Lake, as detailed in NexGen's Rook I Effluent and Emissions Plan [18]. The site surface drainage ditches (collection, diversion and conveyance of surface runoff) will be sized to accommodate surface runoff from the 24-hour Probable Maximum Precipitation (PMP) event (489.2mm) and 24-hour 100-year event with climate change incorporated (100.13mm) for mineralized contact water and non-contact water or non-mineralized contact water respectively.

To maintain ditch integrity, both diversion collection ditches will be designed with erosion control measures such as armoring (e.g. rip-rap material). The culverts will generally be designed for the 24-hour 100-year event with consideration of climate change, but in locations where there is potential for overflow that could result in a reportable spill, these culverts shall be sized for larger capacity using the 24-hour PMP event. NexGen will conduct further analysis of the flooding impact near culverts for the 24-hour PMP event during the detailed design phase.

CNSC staff have reviewed the FEED of surface water management infrastructures (site grading, collection and diversion ditching, self-contained runoff collection areas and runoff and water storage ponds) and supporting documents and have found NexGen's design basis, design criteria and assessment of design inputs to be adequate to safely manage site water generated at the project Area. However, should a licence be issued, NexGen will be required to submit additional design and analyses documents for CNSC staff review and acceptance, as documented in Appendix D. These include the detailed engineering design drawings of the surface water management infrastructure prior to the initiation of licensed activities, such as:

- Surface drainage network
- Site runoff ponds (pond #1 and pond #2)
- Runoff collection areas (West bermed runoff collection area, Ore and Special Waste Rock Stockpile Containment Area and PAG Runoff Pond)
- Modelling (hydraulic and hydrologic) and analyses for design of the stormwater management system of the project area including analysis of flooding impact near culverts and buildings for the 24-hour PMP event

NexGen is also expected to address CNSC staff review comments of the updated PMP study prior to initiation of licensed activities.

Design of Mine Rock Storage Area

During shaft sinking and underground development, mine rock will be generated, which could be characterized as special waste rock (mine rock with >0.03% U_3O_8 but <0.26% U_3O_8), PAG waste rock (mine rock with <0.03% U_3O_8 and ≥0.1% sulphur), or Non-Potentially Acid Generating (NPAG) waste rock (i.e., clean waste rock) (mine rock with <0.03% U_3O_8 and <0.1% sulphur). It is predicted that during the construction phase, about 606,781 tonnes of PAG waste rock will be generated and about 529,672 tonnes of NPAG waste rock will be generated. Based on NexGen's waste management plan, all special waste rock will be temporarily stored in the special waste work stockpile area, all PAG waste rock will be stored in the PAG waste rock storage area (WRSA), and NPAG waste rock will be either stockpiled on site for use as construction material or stored in NPAG WRSA.

Mine rock management facilities and systems are designed for responsible closure in a manner that protects the environment through the project life cycle and minimizes the reliance on active institutional control following the decommissioning and reclamation phase. According to the MMFDM, NPAG storage areas and stockpiles will be developed for a maximum side slope of 2H:1V, the approximate angle of repose for placed material. The PAG WRSA will be developed with a side slope of 4H:1V, the approximate closure slope angle.

To mitigate the hazard of the potential ARD/ML, an HDPE liner will be placed over the prepared footprint of the PAG WRSA, and multiple engineered source control layers will be constructed in the PAG waste rock stockpile with contact water collection system (i.e., collection ditch and pond). However, the detailed design of waste rock stockpiles, in particular, the technical specification of the engineered source control layers, have not yet been submitted to CNSC staff. This item is included in the regulatory commitments list in Appendix D for closure prior to shaft sinking.

Shaft Design

A FEED is conducted for both production shaft and exhaust shaft based on the shaft geotechnical design basis and the shaft geotechnical assessment (presented in section 3.4.1). NexGen's document *Ground Freezing FEED Stage Design for NexGen Rook I Shaft Sinking* provides a ground freezing FEED stage design for the Rook I shaft sinking based on the shaft geotechnical design basis [19] and the ground freezing performance resulted from the FEED finite element thermal modeling.

The production shaft (PS) is designed to provide a consistent supply of fresh air and a means of ingress and egress to underground areas for personnel and materials while the exhaust shaft (ES) is designed and constructed for exhaust air return and provides a means of secondary egress in the event the PS conveyances are disabled. Figure 3.5.2 shows underground layout and infrastructure with relation to the 2 shafts. The PS will have a diameter of 8 m and a depth of 573.3 m with stations at 500 m and 530 m levels where lateral underground developments off the PS are located. The ES will have a diameter of 5.5m and a depth of 535.3 m with a station at 500 m level where lateral underground developments off the ES are located.

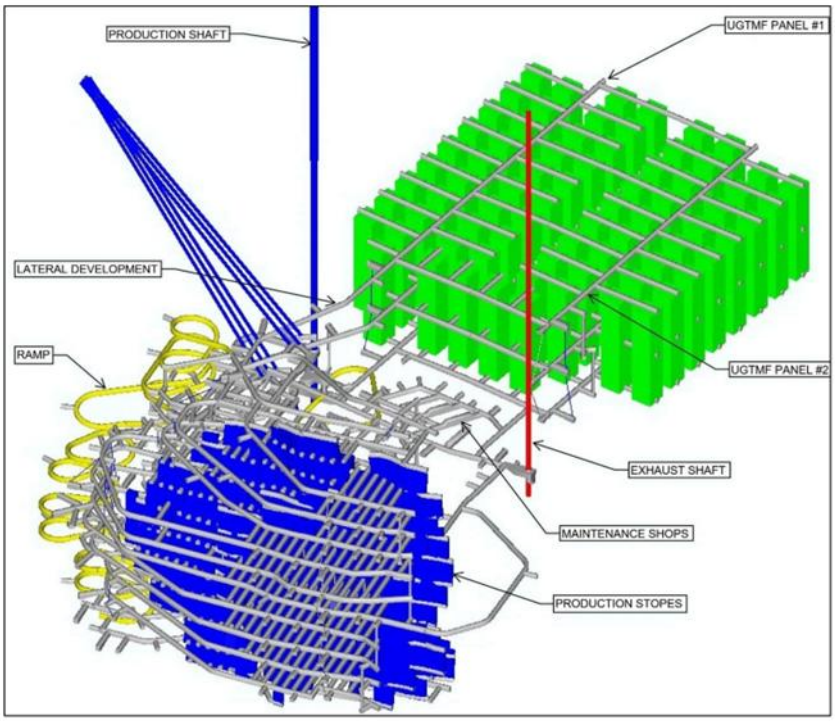

Figure 3.5.2 Overview of underground layout and infrastructure (source: NexGen Ground Freezing FEED Stage Design for NexGen Rook I Shaft Sinking)

NexGen has planned that both shafts will be excavated with the conventional drill and blast method. As both shafts will pass through unconsolidated water-saturated overburden, (Cretaceous shale, Devonian sandstone and Athabasca sandstone) to 96 m for the PS and 110m for the ES, the ground around the shaft excavation will be artificially frozen to provide a stable excavation in such units. NexGen's current design provides for freezing that will extend to the competent basement rock estimated at 175 m below ground surface for the PS, and 220 m below ground surface for the ES. A 600 mm thick hydrostatic liner will be installed through the depth of frozen ground and keyed into the competent basement rock with backwall grouting to fill the void between the permanent shaft liner and the surrounding thawed ground, and a 300 mm non-hydrostatic liner will be installed from the base of the hydrostatic liner to the shaft bottom. The ground control recommendations are provided for shaft constructions based on the geotechnical assessment in the FEED.

CNSC staff have determined upon assessment that this approach and methodology NexGen has used in developing the FEED meets regulatory requirements. However, CNSC staff have provided comments to NexGen to respond to in preparation for the detailed engineering design. These comments are related to drawings of the shafts' final design that have not been submitted for construction purpose; data/information that are currently unavailable (e.g., in-situ stresses and hydraulic conductivities in overburden and sedimentary rocks) but would be necessary to reduce uncertainties in

the detailed engineering design; a project coordination schedule or a critical path schedule that includes details such as freezing, drill and blast, temporary ground control, etc.; thermal, mechanical, and hydrogeological analyses to assess inflow and ground stability during construction and mining taking into account rock strength degradation and creep, influence of groundwater chemistry on the ground support, and influence of mining activities; temporary and final instrumentation and monitoring program to verify stability and groundwater inflow during construction and long-term operation with defined acceptance criteria for the monitored data, and remediation/contingency measures should the criteria not be met.

Should a licence to prepare site for and construct the Rook I project be issued, these elements will be required via the list of regulatory commitments included in Appendix D.

Underground Tailings Management Facility Design

The UGTMF is a purpose-built underground facility with chambers designed and constructed to store and eventually dispose of tailings and other waste streams generated through mining and ore processing. The UGTMF will be located on the north side of the Arrow Deposit and will consist of approximately 97 chambers excavated into clean rock. Three chambers will be built during the construction phase, which will provide sufficient volume ready for initial mining and milling operations.
Figure 3.5.3 shows a plan view and an isometric view of the UGTMF facility.

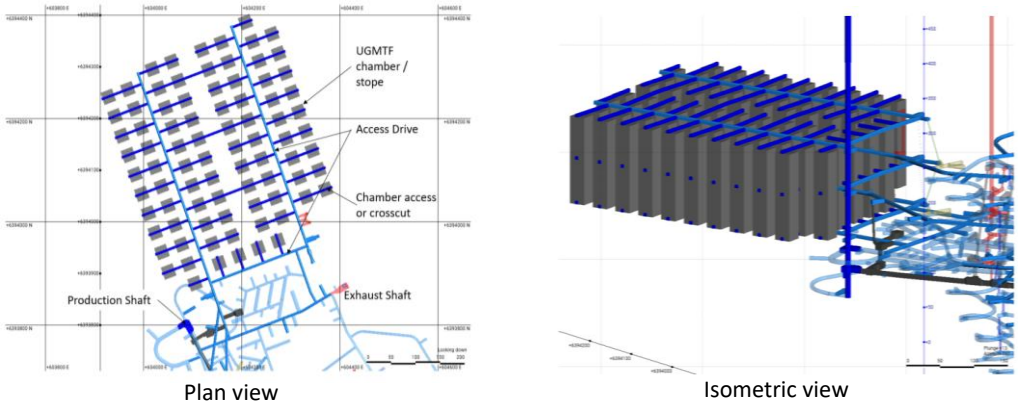

Figure 3.5.3 Plan view and isometric view of the UGTMF in relation to other underground mining infrastructures (source: NexGen -Rook I Project Geotechnical Assessment)

A FEED of the UGTMF was completed based on the site geotechnical conditions and the geotechnical assessment (presented in section 3.4.1). The UGTMF design infrastructure includes lateral development, 5 m wide by 5 m high access drives, and crosscuts. The chamber will have a nominal dimension of 25m wide by 25m long by 60m high, excavated bottom-up. The facility is planned on 3 mine levels: 380mL, 440mL, and 500mL.

There are several pillars including the 17.5m wide north-south rib pillars between chambers, 35m wide north south rib pillars adjacent to the west and east access drives, and 15m wide east-west rib pillars referred to as “parallel pillars”. Figure 3.5.4 shows a typical plan view of a representative portion of the UGTMF and the cross-sections are presented in figure 3.5.5.

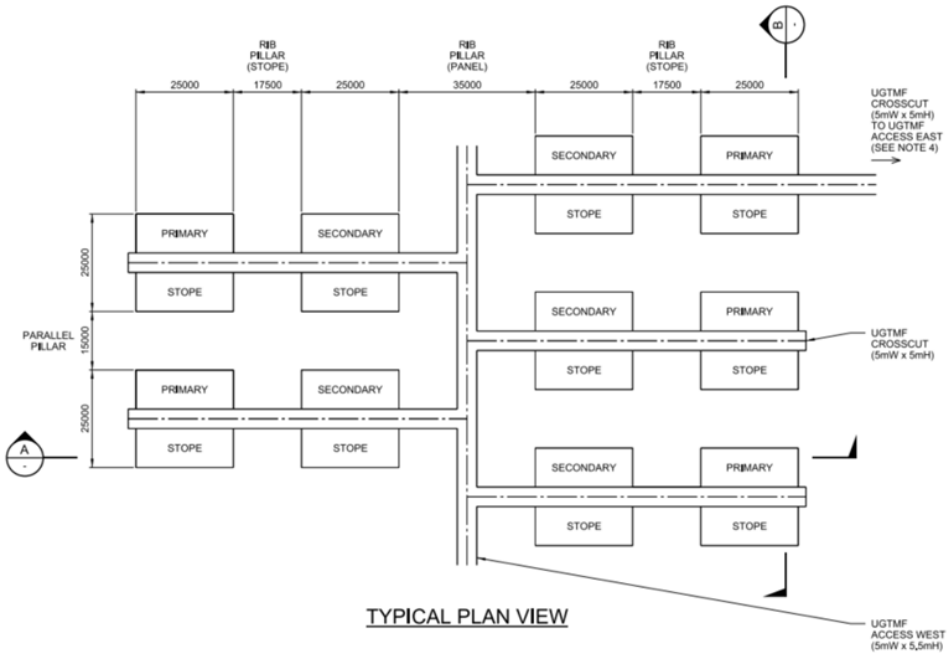

Figure 3.5.4 UGTMF chamber/Stope layout (source: NexGen -Rook 1 Project Mining Geotechnical Assessment)

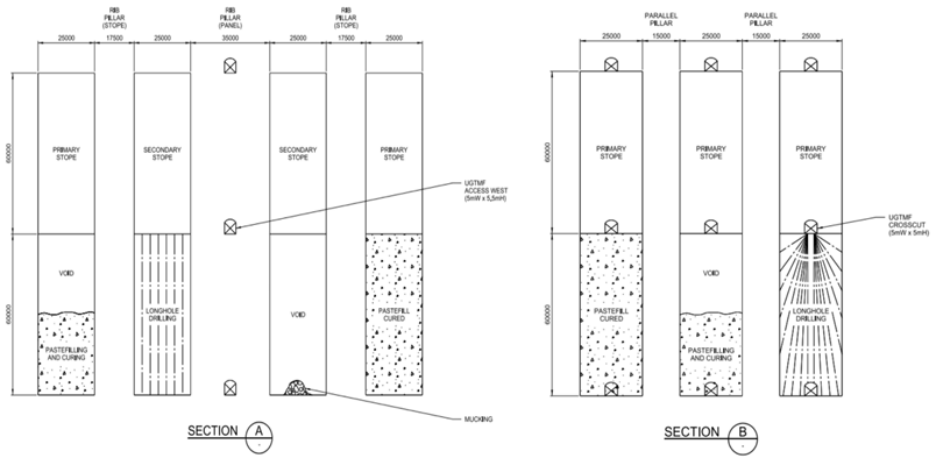

Figure 3.5.5 Cross-sections of the UGTMF (source: NexGen -Rook I Project Mining Geotechnical Assessment)

During the review, CNSC staff understood that the FEED of the UGTMF was completed based on the preliminary geotechnical assessment with empirical methods and kinematic wedge analyses. The results of the stress modeling of the UGTMF were provided in the Rook I Mining Geotechnical Assessment [14] for the UGTMF design. The kinematic wedge analyses were conducted with geological fracture data obtained from investigation boreholes. The in-situ stresses need to be measured to support/verify the detailed engineering designs. Regulatory commitments related to these areas are included in Appendix D.

Plant Design

Preliminary design for the water and processing plant has been included in NexGen's *Rook I Project Mining and Milling Facility Description Manual,* however, there is a regulatory commitment to provide the final design for the plant for CNSC staff's review prior to the commencement of construction activities. This commitment is included 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 performance for the physical design SCA for the Rook-I project.

3.5.2.2 Regulatory Focus

CNSC staff will monitor NexGen's performance in the physical design SCA through regulatory oversight activities including inspections and desktop reviews of compliance reports and relevant program documentation.

3.5.2.3 Proposed Improvements

NexGen has committed to submitting detailed designs of their facilities prior to construction. Regulatory commitments are found in Appendix D of this CMD

3.5.3 Conclusion

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

Should the Commission issue a licence to prepare site and construct the Rook I project, CNSC staff will track the completion of NexGen's regulatory commitments, including the submission of the detailed designs for the site water management infrastructure, the PAG Waste Rock Storage Area (WRSA) the shafts, the UGTMF and for the processing plant, which are supported with necessary analyses/assessments conducted with site specific data as described in Appendix D, prior to commencement of construction of any of these features. CNSC staff will also monitor performance through the conduct of regulatory compliance verification activities to ensure that NexGen 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 (SSCs) 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 NexGen's licence application and supporting documents for the construction of the Rook I project focused highlights are provided for the specific area of maintenance.

3.6.1 Discussion

NexGen will be required to manage the adding of SSCs at the Rook I 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 a licence for site preparation and construction be issued by the Commission, CNSC staff will verify NexGen'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 which will be measured against NexGen's Rook I Construction Management Program, Rook I Asset Management Program and Rook I Commissioning Management Program. [8,20,9]

Maintenance

CNSC staff verified that the Rook I project design description and design requirements documents addressed the maintainability of components and systems. CNSC staff reviewed provisions in the Rook I Asset Management Program [20] and determined that the licence application is adequate to support the maintenance activities that will be carried out during the site preparation and construction of the Rook I project.

Should the Commission issue a licence for site preparation and construction of the Rook I project, NexGen will establish schedules for preventative maintenance and work instructions for the overall maintenance of the facility to ensure that the relevant SSCs can meet design requirements.

3.6.2 Summary

CNSC staff conducted a detailed review of the Rook I Integrated Management System Manual, Rook I Construction Management Program, Rook I Mining and Milling Facility Description and the Rook I Commissioning Management Program [4,9] to verify that that the Rook I project design description and design requirements documents addressed the maintainability of components and systems. In addition, CNSC staff verified that NexGen's design criteria documents and maintenance governance would be adequate to support the Rook I maintenance activities that will be carried out during the site preparation and construction phase.

3.6.2.1 Past Performance

There is no past performance for the fitness for service SCA for the Rook I project.

3.6.2.2 Regulatory Focus

CNSC staff will monitor NexGen's performance in the fitness for service SCA through regulatory oversight activities including inspections, and desktop reviews of compliance reports and relevant program documentation. In the proposed 5-year compliance plan (Appendix A5), CNSC staff have included a fitness for service focused inspection which will verify that the activities on-site meet regulatory requirements and that there are measures in place to maintain the SSCs.

3.6.2.3 Proposed Improvements

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

3.6.3 Conclusion

Based on CNSC staff's assessment of NexGen's licence application and supporting documents, CNSC staff conclude that NexGen's provisions for the fitness for service SCA meet regulatory requirements and CNSC staff expectations.

Should the Commission issue a licence for prepare site and construct the Rook I project, CNSC staff will monitor activities through the conduct of regulatory compliance verification activities to ensure that NexGen 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* and other relevant CNSC 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 Rook I project include:

- Application of ALARA
- Worker dose control
- Radiation protection program performance
- Radiological hazard control

3.7.1 Discussion

If the Commission issues a licence for the Rook I project, NexGen will be 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. Radiation hazards during the prepare site and construct phase will be limited at the outset but will become progressively more as workers spend increasing time underground, and as commissioning work commences.

NexGen developed the Rook I Radiation Protection Program (RP program) [21] commensurate with the radiological hazards associated with Rook I project-related activities during the site preparation and construction phases including commissioning. The program describes the project principles, processes, and framework for effectively protecting workers, the public, and the environment from ionizing radiation hazards. The scope of the program includes planning, delivering, evaluating, and improving project processes for effectively managing and continually improving RP.

The RP program is supported by several implementing procedures and the *Radiation Protection Code of Practice*, which cover aspects that include but not limited to: ALARA, radiation exposure and monitoring, worker dosimetry, contamination control, and radiation safety training. The RP program is part of the Rook I Integrated Management System (IMS) and is subject to the IMS Policy which provides the foundation for NexGen's approach to RP. As a component of the IMS, the program follows the Plan-Do-Check-Act cycle to identify, control, monitor, and continually improve RP processes.

Based on CNSC staff's assessment of NexGen's licence application and supporting documentation for the Rook I project, focused highlights are provided for each specific area of the radiation protection SCA.

Application of ALARA

NexGen's RP program recognizes the importance of keeping radiological exposures to workers and the environment ALARA while maintaining the security of the project site and nuclear substances. The program adopts the ALARA principle, intended to keep occupational and public exposures to radiation minimized. The ALARA principle is a key driver of the project site's health and safety culture, and the basis for all decisions made within the program.

NexGen commits to a consistent approach to select the most appropriate option for minimizing radiation exposures including:

- identifying a potential radiation exposure situation
- identifying and evaluating the RP options
- assessing the feasibility of the possible options
- selecting and implementing the most appropriate options
- monitoring and evaluating the performance of the selected options and re-assessing if needed

The RP program's supporting procedure, ALARA, describes the strategy and methods for applying and integrating the ALARA principle within Rook I project-related activities. This includes defining roles and responsibilities, and defining the ALARA process through the following key components:

- documenting NexGen's commitment to ALARA
- allocating adequate resources and implementing appropriate controls to keep doses ALARA
- applying RP tools and processes to achieve the ALARA principle
- providing consistent and diligent oversight to evaluate whether control strategies are effective at maintaining the ALARA principle

The RP program also describes the planning and control of exposures through radiation work planning and engineered controls. Facilities are to be designed, constructed, operated, and maintained with consideration for keeping radiation exposures ALARA and worker health, safety, and well-being in compliance with legal requirements.

The *Radiation Code of Practice* (RCOP) [22], 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, 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

NexGen performed a screening-level assessment of occupational radiological exposures to inform RP measures during the site preparation and construction phase. The potential radiological hazards to nuclear energy workers (NEWs) performing work for each construction activity are primarily due to external gamma radiation, with potential for exposure from the inhalation of RnG and RnP. Exposure due to LLRD is expected to be low and considered negligible during this phase. The estimated annual radiation doses to NEWs performing construction activities are predicted to be below 5 mSv/year. The maximum total effective doses for NEWs during routine construction activities are predicted to be 0.52 mSv/year for surface development and 2.18 mSv/year for the shaft sinking (i.e., bounding scenario of encountering of uranium mineralization). For early mine (lateral) development, the maximum estimated effective dose for a NEW associated with encountering uranium mineralization is 3.7 mSv/year. Note that NexGen does not intend to encounter uranium mineralization in either shaft sinking or early mine development.

NEWs' effective doses will be calculated as the sum of the following components: gamma radiation, RnG, RnP, and LLRD (noting that LLRD exposures are expected to be negligible). The RP program provides for monitoring equipment that can 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 work areas by means of passive and real-time personal dosimeters. Internal radiation doses will be monitored through a combination of air grab samples, continuous air monitoring, personal dust pumps, and personal alpha dosimeters. 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. The uranium-in-urine program will be implemented prior to shaft sinking activities.

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 may be expected. Action levels and administrative levels for exposures and workplace monitoring 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. [23]

Radiation Protection Program Performance

The performance and effectiveness of the RP program and its associated processes are to be monitored and verified by NexGen, with regular conformance audits. Workplace inspections will also occur, to monitor the effective use of radiation exposure controls.

The RP program and supporting processes are to be subject to review and evaluation by NexGen management, in accordance with the management review process outlined in the Rook I Integrated Management System Manual (IMS Manual) [7]. The management review information includes topics such as proposed program-specific objectives and targets or their current status; significant changes in radiation risks; and workplace monitoring and dosimetry results. Continual improvement opportunities are to be identified, documented, evaluated, and implemented as outlined in the IMS Manual.

Should the Commission issue NexGen a licence to prepare site and construct the Rook I project, CNSC staff will monitor and review NexGen'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 procedures describe provisions for contamination monitoring and control. All areas of the Rook I 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 may be 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 Rook I project.

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 Rook I site, and will verify 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 NexGen's performance in the radiation protection SCA through regulatory oversight activities including inspections and 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 NexGen's licence application and supporting documents, CNSC staff conclude that NexGen's provisions for the radiation protection SCA meet regulatory requirements. CNSC staff are satisfied that NexGen will implement sufficient measures in accordance with the *Radiation Protection Regulations* for the protection of workers during the site preparation and construction phase of the project.

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 NexGen's licence application and supporting documents for the site preparation and construction of the Rook I project focused highlights are provided for the following specific areas:

- Performance
- Practices
- Awareness

3.8.1 Discussion

In addition to the NSCA and its associated regulations, NexGen's activities at the Rook I 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. The Saskatchewan Ministry of Labour Relations and Workplace Safety 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.

Performance

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 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 have maintained a memorandum of understanding (MOU) and will continue to collaborate in regulatory efforts pertaining to the Rook I project.

Practices

NexGen's Rook I Health and Safety Program will apply to all work performed by NexGen employees at the Rook I facility. NexGen will apply its occupational health and safety program through:

- Safety orientation and training
- Work permits for specialized work
- Occupational health committees
- Planned inspection program and preventative maintenance
- Management of change
- Contractor management
- Management reviews
- Work procedures and instruction

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

All contractors working at the Rook I project will be required to adhere to NexGen's Rook I Health and Safety Program [11] or an equivalent program that has been authorized by NexGen. 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 program, NexGen will require that all workers and visitors participate in site orientation covering general site rules and providing required information for working safely at the facility.

Awareness

Though their health and safety program, NexGen intends to promote conventional health and safety through several measures including the use of hazard identification processes and documented procedures for licensed activities. There are also 2 hazard identification processes which will be used by NexGen 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. NexGen's programs also require NexGen management review of the implementation of the health and safety program to identify areas for improvement.

NexGen's systematic approach to training is also used to deliver safety-related training at the Rook I project to employees and contractors. This training includes site-specific safety requirements, first aid , and Workplace Hazardous Materials Information System (WHMIS), the latter 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 Rook I project.

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 Rook I project, and will verify the implementation of the performance, practices and awareness specific areas to ensure the program is successfully implemented.

CNSC staff will monitor NexGen's performance in the conventional health and safety SCA through regulatory oversight activities including inspections and desktop reviews of compliance reports and relevant program documentation.

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 NexGen's Rook I project licence application and supporting documents for the site preparation and construction of the project facilities, CNSC staff conclude that the Rook I project's conventional health and safety program meets regulatory requirements. NexGen has demonstrated to CNSC staff's satisfaction that the Rook I project conventional health and safety program is in compliance with regulatory requirements.

Should the Commission issue a licence to prepare site and construct the Rook I project, CNSC staff will monitor that Rook I Project construction activities meet the conventional health and safety requirements through the conduct of regular compliance verification activities.

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 Rook I 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 site preparation and construction phase of the project.

During the site preparation and construction phase, Rook I project will produce negligible radiological releases to the environment 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) is a systematic process used by proponents and / or licensees to identify, quantify, and characterize the potential risks posed by radiological and hazardous substances, and physical stressors in the environment on human and other biological receptors, including the magnitude and extent of the potential effects associated with an existing and/or proposed 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), which are both components of an ERA. 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 environmental protection measures are effective. The results of these programs, in turn, inform further updates to refine the ERA. Upon inclusion in the licence conditions handbook, REGDOC-2.9.1, *Environmental Protection: Environmental Principles, Assessments and Protection Measures*, includes a requirement for an ERA in accordance with CSA N288.6, *Environmental Risk Assessments at Nuclear Facilities and Uranium Mines and Mills* [24], and outlines expectations that ERAs be updated every 5 years, 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, in November 2024, NexGen submitted a predictive ERA for CNSC staff's review [25] against regulatory requirements in REGDOC-2.9.1 and CSA N288.6 , which was not previously conducted as part of the EA process. CNSC staff have conducted a preliminary review of the predictive ERA for licensing and found it to be generally consistent with the methodology described in CSA N288.6-22. However, a thorough technical review is still underway. Should a licence to prepare site and construct be issued, CNSC staff have included regulatory commitments (see Appendix D of the LCH) where NexGen must provide documentation related to the ERA prior to commencing construction activities.

NexGen will be required to have an accepted ERA, that meets all regulatory commitments prior to commencing construction activities, related to the licence to prepare site and construct phase prior to undertaking licensed work that may affect the environment or human health (i.e., prior to excavation activities). Should any updates to the ERA identify any new or revised risks to the environment or receptors, to ensure the protection of the environment NexGen will be required to implement additional mitigation measures and/or adaptive management programs that will be reviewed by CNSC staff.

Effluent and Emissions Control (Releases)

As uranium mines are considered a metal mine 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 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.

Should a licence be issued by the Commission, NexGen will be required to maintain an effluent and emissions monitoring program in compliance with REGDOC-2.9.1 and CSA N288.5, *Effluent and emissions monitoring programs at nuclear facilities* [26]. NexGen submitted an effluent and emissions monitoring program for the site preparation and construction phase, (which includes commissioning), of the project (NexGen Rook I project Effluent and Emissions Plan) [18]. For a future application for a licence to operate the Rook I project, NexGen will be required to update the effluent and emissions monitoring program accordingly.

Atmospheric emissions associated with the site preparation and construction phases of the Rook I project will include point source emissions from mobile equipment and stationary equipment (e.g., incinerators, generators, heaters, vehicle and equipment movements), fugitive emissions from the temporary freeze plant and fugitive dust emissions from various sources, including drilling and blasting, crushing, material handling, wind erosion from mine rock storage areas and vehicle generated road dust. NexGen has proposed mitigation measures to minimize emissions and dust generation. For example, to reduce dust, NexGen is proposing to apply water to site roads, access roads, and the airstrip and to reduce speeds on unpaved roads. Furthermore, NexGen will be required to apply pollution control techniques and technologies, perform preventive maintenance and periodic stack testing to the incinerators with stacks.

During the proposed licence period, CNSC staff will verify that these mitigation measures are implemented and are effective.

Liquid effluent releases are anticipated for the construction phase of the Rook I project. NexGen submitted a Best Available Technology and Techniques Economically Achievable (BATEA) assessment for a temporary effluent treatment plant that will be operational during the construction phase, as required by REGDOC-2.9.2, *Controlling Releases to the Environment*. The temporary effluent treatment plant will treat contact water generated from dewatering during shaft and early mine development, runoff and seepage intercepted by the potentially acid generating waste rock storage area, runoff from collection ponds, and other sources.

The treated effluent will be pumped into a monitoring pond where a composite sample will be collected as the pond fills up. The sample will be analyzed at NexGen's on-site laboratory for parameters including arsenic, copper, nickel, lead, zinc, uranium, selenium, un-ionized ammonia, total suspended solids, and pH. Prior to the batch release to the environment, the analysis of the composite sample must demonstrate that the parameters meet applicable release limits.

In addition, while the treated effluent is discharged to the environment, there will be continuous monitoring of parameters in the effluent such as flow rate, pH, temperature, dissolved oxygen, conductivity, and turbidity. In addition, NexGen will be required to collect weekly composite samples and monthly grab samples and analyze them for metals, the uranium-238 series of radionuclides, nutrients, and major ions. NexGen will also be required to conduct monthly acute lethality tests to demonstrate that the effluent is not toxic to rainbow trout and *Daphnia magna*. The results of all these analyses will be provided to CNSC staff as per reporting requirements which can be found in Operating Performance SCA of the LCH.

The revised BATEA documentation submitted June 2025 (Rook I Project Best Available Technology and Techniques Economically Achievable Assessment for Construction Phase Effluent Treatment) [27] is currently under review by CNSC staff. CNSC staff have included regulatory commitments for NexGen to address any outstanding BATEA comments and to submit final design documents for the temporary effluent treatment plant prior to the commencement of licensed project activities, should a licence to prepare site and construct be issued. During the proposed licence period, CNSC staff will perform desktop reviews and inspections to verify that the temporary effluent treatment plant is constructed in accordance with the design documents and that the commissioning requirements in REGDOC-2.9.2 are followed. In addition, NexGen will be required to submit another BATEA assessment for the permanent effluent treatment plant in support of an application for a licence to operate.

NexGen will be required to conduct environmental effects monitoring (EEM) programs as prescribed by the MDMER once they commence effluent discharges to the environment, which is proposed to occur during the prepare site and construct phase. This includes quarterly effluent characterization and semi-annual sublethal toxicity testing.

Section 4 of the *Uranium Mines and Mills Regulations* requires NexGen 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 could indicate a loss of control of the environmental protection program. The ECOP also contains actions to take in the event that an action level is exceeded. NexGen is required to derive action levels in accordance with CSA N288.8, *Establishing and implementing action levels for releases to the environment from nuclear facilities* [28].

NexGen submitted the Rook I Project Environmental Code of Practice [29], which contained their proposed action levels. NexGen is also expected to incorporate administrative levels in their supporting procedures and work instructions. 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. NexGen is required to have action levels prior to commissioning their temporary water treatment plant. CNSC staff expect that NexGen will refine the administrative and action levels during the commissioning phase of the project prior to operation. This action will be tracked via regulatory commitments found in Appendix D of the LCH.

Assessment and Monitoring

Should the licence be issued by the Commission, NexGen will be required to maintain an environmental monitoring program in compliance with REGDOC-2.9.1 and CSA N288.4, *Environmental monitoring programs at nuclear facilities and uranium mines and mills* [30]. NexGen is also required to implement an EA Follow-up Monitoring Program. NexGen submitted an environmental monitoring program that applies to licensed activities during the site preparation and construction phases, which includes commissioning (NexGen Rook I Project Environmental Monitoring Plan which is the supporting document of the Rook I Environmental Protection Program) [31,32]. The environmental monitoring program includes details about monitoring locations, frequencies, and environmental parameters to be measured, and is informed by the environmental aspects, environmental effects monitoring, the ERA and follow-up monitoring. NexGen will be required to update the environmental monitoring program as more information becomes available and as other reports are finalized. The details of NexGen's environmental monitoring program for the site preparation and construction phases 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 staff are aware that NexGen 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, and ambient air samplers to monitor total suspended particulates and composite rainfall samples to monitor nitrogen dioxide, sulphur dioxide, volatile organic compounds and 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-time campaign during construction near the baseline locations at Patterson and Forrest Lakes, where the sensitive human receptor is 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. Should a licence be issued, NexGen will be required to monitor the flow and levels of the lakes in the vicinity of the Rook I project. NexGen will also be required to collect grab samples at quarterly or biannual frequencies during the site preparation and construction at 18 surface water locations including Patterson, Broach and Forrest Lakes as well as the Clearwater River. The frequency depends on the sampling location. The locations include the future project impacted areas (i.e., to establish a baseline prior to site preparation and construction activities) and reference areas that have similar characteristics but are not going to be impacted by the activities. The sampling locations were selected based on their location and potential for downstream effects from the Rook I project. The parameters to monitor include Contaminants of Potential Concern (COPCs) identified in the ERA, such as metals, the uranium-238 series of radionuclides, and major ions such as chloride and sulphate. Since there may be changes in the receiving environment as a result of the effluent discharges from the temporary effluent treatment plant, NexGen will be required to conduct EEM programs during the prepare site and construct phase. This will involve surface water quality monitoring at near-field, far-field, and reference waterbodies.

Fish monitoring

The fish monitoring program consists of monitoring fish habitat and fish health. The purpose of the program is to verify the accuracy of the predicted effects and the effectiveness of the proposed mitigation measures. During the prepare site and construction phase, NexGen will be required to implement 1 fish monitoring campaign that involves the collection of fish tissue data for analysis of hazardous and radiological parameters. There may also be additional fish monitoring required if the Rook-1 project triggers the MDMER requirements during the construction phase.

Sediment and benthic invertebrate monitoring

Sediment quality monitoring will be conducted every year to refine models used in the ERA and verify predictions made in the ERA. The parameters to be monitored in sediment include moisture content, particle size, total organic carbon, metals, radionuclides, nutrients, and total mercury. Benthic invertebrates monitoring will be implemented every 3 years as required by the MDMER (Section 7 Environmental Effects Monitoring) to verify the accuracy of the predicted effects and the effectiveness of the proposed mitigation measures. The samples will be collected at various locations to be determined in the vicinity of the Rook I project. The parameters to be monitored for benthic invertebrates include various community measures (e.g., mean Simpson's diversity, dominant taxa, Bray-Curtis index).

Soil monitoring

Soil monitoring will be implemented to verify that mitigation measures are appropriate and effective and to verify predictions in the ERA. The program consists of several sampling plots in the vicinity of the Rook I project every 3 years and once during earthworks.

Vegetation monitoring

Vegetation monitoring will be implemented to verify predictions and refine models used in the ERA. The program consists of sampling blueberries (leaves, stem and fruit) in the vicinity of the Rook I project every 3 years. The timing and sample locations of the vegetation monitoring program will coincide with the soil sampling program. Moreover, the presence of noxious and nuisance weeds and invasive species will be monitored annually.

Groundwater monitoring

Groundwater monitoring will be implemented through the groundwater protection and monitoring program for the Rook I project. If a licence is issued, NexGen will be required to comply with REGDOC-2.9.1 and CSA N288.7, *Groundwater protection and monitoring programs for nuclear facilities and uranium mines and mills* [33]. NexGen included groundwater monitoring in their Environmental Monitoring Plan [31].

A few of the objectives of groundwater monitoring are to verify the accuracy of the EA predictions and the effectiveness of the mitigation measures, detect potential excursions and identify unusual or unforeseen conditions that may require corrective measures or adaptive management.

Constituents to be considered as key performance indicators in groundwater include pH, temperature, specific conductivity and turbidity.

Terrestrial monitoring

Terrestrial wildlife monitoring will be implemented to verify that mitigation measures are appropriate and effective. Specifically, NexGen has developed a mitigation and offsetting plan for woodland caribou which was approved by Saskatchewan Ministry of Environment but is currently being reviewed by Environmental Canada and Climate Change.

NexGen will be required to implement mitigation measures to minimize the impact of site preparation 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*. Refer to Appendix D for the specific environmental assessment condition related to this topic.

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.

If issued a licence, NexGen will be 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 Rook I 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 NexGen, there will be no radiological releases to the environment during the site preparation and construction phase.

NexGen conducted a human health risk assessment (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 to identify any potentials risks. CNSC staff are currently reviewing the HHRA as part of the ERA as mentioned under section “Environmental Risk Assessment’.

For the radiological releases, NexGen predicted that the maximum incremental radiological dose during all project phases to be below the regulatory public dose limit of 1 mSv/yr, and the reasonable upper bound scenarios for the project lifespan. The maximum dose was predicted for the subsistence harvester (1-year-old) who would consume traditional foods gathered at Patterson Lake South Arm during operations (Application Case: 0.0745 mSv/yr; Upper-Bound: 0.119 mSv/yr). A reasonably foreseeable development scenario, taking into account the releases from the potential Paladin Patterson Lake South project, was also assessed. The incremental radiation dose for the subsistence harvester (1-year-old) was predicted to increase to 0.136 mSv/yr for the project lifespan. This would, however, still remain well below the regulatory public dose limit. As such, the HHRA concluded that no discernable health effects would be anticipated due to exposure by the human receptors to radioactive releases from either the project alone or cumulative with the potential Paladin Patterson Lake South project. In terms of a far-future projection scenario, a future permanent resident living at the decommissioned and reclaimed project site well beyond site closure could receive a dose of up to 0.1 mSv/yr, well below the regulatory public dose limit.

With respect to the non-radiological releases, NexGen's HHRA predicted that the risk estimates for all non-carcinogenic COPCs (cobalt, copper, molybdenum, and uranium) due to project only releases would remain below the acceptable risk level of 0.2 per exposure pathways for all human receptors assessed. It should be noted that for molybdenum, risk estimates for the base case (i.e., existing conditions) slightly exceeded the 0.2 benchmark for the terrestrial animal ingestion pathway for the reference subsistence harvester (1-year-old). The HHRA concluded, therefore, that the Project would have a minimal contribution to the existing risk from molybdenum in traditional foods. With respect to carcinogenic COPCs, an assessment of arsenic for the Project lifespan predicted an incremental lifetime cancer risk (of 4 in 100,000) for the subsistence harvester at Patterson Lake South Arm, which would exceed the negligible cancer risk level of 1 in 100,000. However, this finding was based on the conservative assumption of high consumption of traditional foods by the receptor in the project footprint and local study area. The greatest contributor to the predicted incremental lifetime cancer risk for the subsistence harvester at Patterson Lake South Arm during the project lifespan was determined to be consumption of moose meat and organs. The predicted carcinogenic risk from the project was also considered to be a small portion of the existing baseline cancer risk from arsenic exposure by the reference subsistence harvester, which was predicted to be 69 in 100,000. A reference dose (RfD) scenario was also assessed. The arsenic incremental lifetime cancer risk for the RfD scenario was predicted to exceed the negligible cancer risk level for the adult camp worker (3 in 100,000), the subsistence harvester (11 in 100,000), and the seasonal resident (2 in 100,000) harvesting traditional foods from Patterson Lake South Arm.

The interpretation of the predicted cancer risk for the reasonably foreseeable development scenario was similar to that provided for the project lifespan.

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. Should any updates to the HHRA identify any new or revised risks to receptors, NexGen will be required to implement additional mitigation measures and/or adaptive management programs to ensure the protection of people that will be reviewed by CNSC staff. As part of regulatory oversight, CNSC staff will review and evaluate NexGen's HHRA to ensure compliance with regulatory requirements

Environmental Management System

REGDOC-2.9.1 requires licensees to develop and maintain an environmental management system (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. NexGen submitted their Rook I Environmental Protection Program (EP program) as well as the Rook I Integrated Management System, which is the basis of their EMS. It was created in accordance with ISO 14001:2015, *Environmental Management Systems – Requirements with Guidance for Use* [34]. The EP program is organized according to the "Plan-Do-Check-Act" iterative process to ensure that continual improvement initiatives can be implemented. The EP program identifies and manages environmental risks and 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 NexGen'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 Rook I project.

3.9.2.2 Regulatory Focus

During the proposed licence period, CNSC staff will monitor NexGen's performance in the environmental protection SCA through regulatory oversight activities including inspections and desktop reviews of compliance reports, and relevant program documentation. CNSC staff will focus on regulatory oversight of NexGen's implementation of their EP 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 1.3.1 and 5.5 of the CMD and the regulatory commitments as described in Appendix D of the proposed LCH.

CNSC staff will also have regulatory oversight of NexGen'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 NexGen is addressing CNSC EA conditions made during the EA process. CNSC staff will conduct compliance verification activities to verify that NexGen has implemented the mitigation measures identified in the EA follow-up monitoring program throughout the site preparation and construction phase.

3.9.2.3 Proposed Improvements

CNSC staff will include a regulatory commitment for NexGen to submit an updated predictive ERA prior to specific licensed activities that could affect the environment or human health (i.e., excavation activities). NexGen will also submit an updated BATEA and updated environmental protection documents to address CNSC staff's comments and incorporate additional information should a licence to prepare site and construct be issued. Regulatory commitments are found in the proposed LCH Appendix D.

3.9.3 Conclusion

Based on CNSC staff's assessment of NexGen's licence application and supporting documents for site preparation and construction of the project facilities, CNSC staff conclude that the Rook I project meets regulatory requirements for the environmental protection SCA under paragraph 3(c) the UMMR, 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 NexGen will take all reasonable precautions to protect the environment and the health and safety of persons.

Should the Commission issue a licence to prepare site and construct the Rook I project, CNSC staff will track the completion of NexGen's regulatory commitments for the submission of the updated ERA as described in the proposed LCH Appendix D. CNSC staff will further monitor activities through the conduct of regulatory compliance verification activities to ensure that NexGen 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 NexGen's licence application and supporting documents for the construction of the Rook I 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 Rook I 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.

NexGen has provided the Rook I Emergency Preparedness and Response Program, Rook I Emergency Response Plan and the Rook I Ground Transportation Emergency Response Plan that detail how all activities on site during construction are monitored and the provisions in place to protect workers [35,36,37]. Furthermore, NexGen has provided their Rook I Fire Protection Program that describes how fire protection activities will be implemented, managed, and monitored during the construction phase to ensure that fire risks are minimized [38]. NexGen has also described how the 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

NexGen provided information that addressed non-radiological and non-routine conditions and emergencies commensurate with the emergency preparedness program. The licence application also included processes to address emergency situations that have the potential to endanger the safety of workers, the environment, and the public. Specifically, the application described the processes 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 organizations, personnel, and equipment to be used to respond to on-site emergencies.

NexGen is located approximately 155 km from the northern village of La Loche which is the nearest community and therefore cannot rely on them for timely support during emergencies. NexGen has communicated to CNSC staff that they will have adequate emergency response resources on site during the preparation and construction stages.

In addition, if a licence is issued, NexGen will be accountable for all contracting companies and will be required to ensure they have a site-specific safety plan designed to meet NexGen's management system and CNSC requirements. NexGen 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 detailed nuclear emergency preparedness program is not required during site preparation and construction; however, NexGen has pre-emptively developed an emergency response program document to comply with REGDOC-2.10.1 and has a detailed list of supporting plans that will be used including the emergency response plan.

Fire Emergency Preparedness and Response

Fire Response

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

Fire Protection

NexGen 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.

NexGen has demonstrated how the construction phase will address fire prevention, protection, control, mitigation, response, and recovery measures to protect both personnel and the environment.

NexGen's FPP document ensures that an adequate fire safety plan will be implemented during the prepare site and construct phase.

NexGen submitted a Fire Protection Design Criteria 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. In addition, CNSC staff noted that passive fire protection measures such as fire separations, rated enclosures, or locally applied fire barriers have been included in the Rook I Fire Hazard Assessment -ERT/Admin/Mill Dry Building [39], currently included in the fire protection design criteria document. The fire protection design criteria document also establishes that the fire mitigation design will conform to the latest editions of CSA N393 – *Fire protection for facilities that process, handle, or store nuclear substances* [40], 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 conventional health and safety SCA at the Rook I project.

3.10.2.2 Regulatory Focus

During the proposed licence period, CNSC staff will perform inspections at the Rook I site using emergency management and fire protection criteria and will verify the implementation of conventional emergency preparedness, 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

No improvements are proposed by CNSC staff with respect to the emergency management and fire protection SCA.

3.10.3 Conclusion

Based on CNSC staff's review of the Rook I project emergency management and fire protection documentation, CNSC staff concluded that NexGen 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 to prepare site and construct the Rook I project, CNSC staff will track the completion of NexGen's regulatory commitments 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 Rook I project, CNSC staff will monitor activities through the conduct of regulatory compliance verification activities to ensure NexGen 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 SCA also covers the planning for decommissioning of the facility.

The specific areas that comprise this SCA at the Rook I project include:

- Waste characterization
- Waste minimization
- Waste management practices
- Decommissioning plans

3.11.1 Discussion

NexGen'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*.

NexGen submitted their Rook I Waste Management Program and Rook I Preliminary Decommissioning and Reclamation Plan (PDP) [41,42], including the decommissioning of ancillary facilities, with their application to prepare site and construct the facility, as required by the aforementioned regulations.

Waste Characterization and Waste Minimization

Waste that is predicted to be generated during the prepare site and construct activities includes hazardous non-radiological waste, special waste rock (i.e. potentially acid generating waste rock) and clean waste rock. REGDOC-2.11.1, *Waste Management, Volume II: Management of Uranium Mine Waste Rock and Mill Tailings*, outlines expectations for the characterization and minimization of radioactive wastes. Characterization includes identification of the principal radionuclides relevant to safety, and assurance that the waste or waste package will meet the acceptance criteria for the appropriate management of radioactive wastes. Waste minimization pertains to the waste management practice of reducing the activity and volume of waste. The licensee should ensure that the generation of radioactive wastes is minimized to the extent practicable.

NexGen provided information that describes future waste management activities, which include the characterization of the wastes expected to be generated during the prepare site and construct phase. Based on CNSC staff's review of NexGen's Rook I project's Waste Management Program [41], CNSC staff are satisfied that NexGen's Waste Management Program will have measures in place to safely manage the wastes generated during the prepare site and construct phase of the Rook I project.

NexGen's waste minimization activities at the proposed Rook I project will be carried out in accordance with the Waste Management Program. NexGen has committed to sort and segregate likely contaminated or known contaminated low-level radioactive or hazardous waste from clearable/likely clean waste. If radioactive contamination is found, NexGen commits to perform cleanup or decontamination operations by following the appropriate Rook I project site procedures, to minimize the amount of contaminated radioactive waste requiring further management. Based on CNSC staff's review of NexGen's Waste Management Program, CNSC staff are satisfied with the measures proposed for waste minimization during the site preparation and construction stages of the Rook I project.

Waste Management Practices

Waste management practices include the control of the waste, handling of the waste, minimizing the accumulation of waste, conditioning of the waste (or waste processing), storage, and disposal of the waste. REGDOC-2.11.1 outlines the regulatory expectations for waste management practices.

CNSC staff's assessment of NexGen's Waste Management Program, processes and procedures concludes that NexGen effectively considers waste segregation, waste minimization, and in its waste management practices. NexGen has stated that they will continue to develop processes and equipment and enabling facilities to support waste management for the Rook I project in future licensing phases.

Decommissioning Plans

Subparagraph 3(a)(viii) of the *Uranium Mines and Mills Regulations* requires an application to contain the proposed plan for the decommissioning of the mine or mill and maintain a proposed plan for the decommissioning of the mine or mill throughout the life of the facility. The preliminary decommissioning plan is commensurate with the proposed licensed activities in each phase of the lifecycle of the facility. All licensees are required to implement and maintain a PDP that sets out how the facility will be decommissioned to an agreed-upon end-state—including, should the project be stopped—restoration of the site to the original condition. The PDP must also be kept current to reflect any changes in the site or facility and provide a credible basis for estimating the decommissioning cost.

In its application for a licence to prepare site and construct, NexGen submitted a PDP for CNSC staff review [42]. CNSC staff have assessed NexGen's PDP for the Rook I project and conclude that it meets the expectations outlined in CSA Group standard N294-19, *Decommissioning of facilities containing nuclear substances* [43] and CNSC REGDOC-2.11.2, *Decommissioning*.

Alongside the PDP, CNSC staff reviewed the Rook I Preliminary Decommissioning and Reclamation Cost Estimate (PDCE) submitted as part of the PDP [44]. 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 is 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 Rook I project.

3.11.2.2 Regulatory Focus

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

If a licence is issued, CNSC staff will monitor performance in this area through routine regulatory oversight activities including inspections and desktop reviews. In the draft 5-year inspection plan, CNSC staff have scheduled a focussed waste management plan during year 2 of the licence term.

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 NexGen application and supporting documents, CNSC staff conclude that NexGen will implement and maintain an effective waste management program and a PDP in compliance with regulatory requirements, and international and industry best practice associated with waste characterization, waste minimization and waste management practices.

Should the Commission approve the site preparation and construction of the Rook I project, NexGen will update the waste management plan and PDP as per the applicable regulatory requirements, to reflect further information on waste streams generated and projected future waste generation as they become available. Reviews of these plans will be undertaken by CNSC staff during the site preparation and construction phase to verify readiness to move to the operational phase.

3.12 Security

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.

The specific areas that comprise this SCA at the proposed Rook I project include:

- Facilities and equipment
- Security practices

3.12.1 Discussion

NexGen's programs are required to meet the requirements set out in the GNSCR and UMMR and will not be subject to the *Nuclear Security Regulations*. The applicant has indicated to CNSC staff that the licensed activities will not include Category 1, 2, or 3 sealed sources, and therefore REGDOC-2.12.3, *Security of Nuclear Substances: Sealed Sources and Category I, II and III Nuclear Material, Version 2.1* will provide guidance on how to meet the requirements of the GNSCR but will not be a regulatory requirement.

In their application, NexGen has provided their proposed Rook I Security program [45] and measures to meet the requirements of the GNSCR and UMMR. Details of the Security program and measures are considered prescribed information.

Facilities and Equipment

NexGen has outlined its proposed measures to control access to the site of the activity to be licensed in a Security program [45]. The description of the facilities and equipment are sufficient to meet the requirements under paragraphs 3 (1)(g), 3(1)(h), 12(1)(c), and 12(1)(g) of the GNSCR, and paragraph 3(e) of the UMMR for the current prepare site and construct phase of licensing.

Security Practices

NexGen's proposed security practices are outlined across the Security program [45] and the Nuclear Substances and Radiation Devices Management Procedure [46] under the RP Program. In its submissions, NexGen 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. The security program includes a procedure for performing threat and risk assessments to the CNSC.

It is anticipated that NexGen 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 NexGen has an adequate process to identify and protect the prescribed information that will be required in future licensing phases. NexGen's security program contains procedures and criteria for the identification and protection of prescribed information that will be generated during the licence and the associated application process. NexGen has indicated access to prescribed information will be restricted in accordance with the "need-to-know" principle, with technical safeguards to prevent unauthorized access.

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 Rook I project.

3.12.2.2 Regulatory Focus

During the proposed licence period, security compliance verification criteria will be included in inspections to be conducted by CNSC staff at the Rook I 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 that the security measures proposed by NexGen are sufficient to meet the GNSCR and UMMR requirements for security for the activities anticipated during site preparation and construction. CNSC staff's assessment of the regulatory requirements was guided by the nuclear substances, prescribed equipment, and prescribed information requested to be included in the licence. CNSC staff will monitor to ensure NexGen meets the security requirements for any activities which they are licensed to conduct.

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/International Atomic Energy Agency (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 Rook I 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 expectations 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.

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

NexGen submitted, as part of their licence application, a security program [45] which includes content that meets the requirements of REGDOC-2.13.1. NexGen'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 Rook I project.

3.13.2.2 Regulatory Focus

CNSC staff will monitor NexGen'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 NexGen's application and determined that, based on the information submitted in the application, NexGen 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 Rook I project, CNSC staff will monitor activities through the conduct of regulatory compliance verification activities to ensure that NexGen 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 Rook I project site and are not applicable to the site preparation and construction phase. Given NexGen's licence application is limited to the site preparation and construction of the Rook I 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 as having Indigenous and/or treaty rights in the Project area (referred to as "potentially impacted Indigenous Nations and communities"):

- Clearwater River Dene Nation
- Buffalo River Dene Nation
- Birch Narrows Dene Nation and
- Métis Nation-Saskatchewan (Northern Region 2)

Additionally, based on information received and reviewed to date, the following Indigenous Nations and communities have expressed interest in the Project (referred to as "interested Indigenous Nations and communities"):

- Ya'thi Nene 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
- Athabasca Chipewyan First Nation
- Willow Lake Métis Nation and
- Mikisew Cree First Nation

The potentially impacted Indigenous Nations and communities and the interested Indigenous Nations and communities are referred to collectively 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 NexGen, in relation to the NexGen Rook I 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 of this section, 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 NexGen Rook I 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 NexGen Rook I 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 review process under the NSCA.

In relation to Rook I, 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 process 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 Clearwater River Dene Nation (CRDN), Métis Nation – Saskatchewan (MN-S), Birch Narrows Dene Nation (BNDN), and Buffalo River Dene Nation (BRDN) 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 Project along with an assessment of proposed mitigation and accommodation measures, should the Project 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 NexGen EA and Licence to Prepare a Site and Construct Application, based on CNSC staff's assessment as described in the Consultation Report, CNSC staff recommended 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 NexGen Rook I Commission hearing. This supplemental submission will include an update on CNSC staff's consultation activities, RIAs, updated issues tracking tables, NexGen'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 NexGen Rook I project is located in Saskatchewan's southern Athabasca Basin with access to the project from Highway 955, located approximately 640 km northwest of Saskatoon. The project falls within the traditional territory of Treaty 8 and lies within "No Hoe Nene" the traditional lands of CRDN, the homeland of the Métis and the Nuhenéné, the traditional territory of the Athabasca Denesuliné.

This Treaty covers the northwestern quadrant of Saskatchewan, through northern Alberta and into northern British Columbia, extending to the Northwest Territories to the west and the north, with the southern and western border extending to central and eastern Saskatchewan.

Signatories of Treaty 8 in the regional area of the Project:

- Clearwater River Dene Nation (SK)
- Fond du Lac Denesuline First Nation (SK)
- Black Lake First Nation (SK)
- Athabasca Chipewyan First Nation (AB)

Signatories of Treaty 10 having overlapping territories with the Project area:

- Birch Narrows Dene Nation (SK)
- Buffalo River Dene Nation (SK)

The project falls within the homeland of the Métis and, as such, the CNSC has consulted Métis Nation-Saskatchewan (Northern Region 2) on the Project and engaged with Willow Lake Métis Nation, who are located in Alberta in proximity to the Saskatchewan border and who have expressed an interest in the Project to the CNSC in May 2025. CNSC staff are aware that Willow Lake Métis Nation has filed a judicial review in relation to Indigenous consultation related to the project.

No communities are located within the immediate vicinity of the Rook I project property. Travelling by existing roads, the closest community to the Project is La Loche, Saskatchewan which is approximately 155 km away. Calculated using a straight line, the closest communities are approximately 120 km from the site, with Saskatoon 640 km to the southeast. The federal lands within a 140 km radius of the Project area are First Nations' reserve lands belonging to Clearwater River Dene Nation and Birch Narrows Dene Nation and do contain permanent residences.

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 Rook I project, CNSC staff sent early notification of the expected Rook I 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 fostered numerous opportunities for dialogue through phone and video 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 for Consultation on the Project specifically with CRDN in November 2021, and MN-S in July 2022, which outlined a collaborative and mutually agreeable approach to the consultation, regulatory review and the assessment processes for the Project. This included opportunities for CRDN and MN-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 BNDN and BRDN but due to capacity constraints, BNDN and BRDN indicated that they would prefer to continue consulting and engaging on the Project with the CNSC during regular monthly meetings and did not require the development of a project-specific Terms of Reference.

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 more generally. The CNSC also has Terms of Reference (TOR) for long-term engagement in place with YNLR and ACFN. 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 project, that are located within an Indigenous Nations' traditional and/or treaty territories. CNSC staff offered to develop a TOR for long-term engagement with CRDN, MN-S, BNDN and BRDN; however, there has not been interest expressed by the Nations to date. CNSC staff remain open to and interested in developing TORs for long-term engagement with these Nations.

In addition, CNSC staff continue to participate in and coordinate meetings with the identified Indigenous Nations and communities on the Project including CRDN, BNDN, BRDN, ACFN, YNLR and MN-S. During these regular meetings and dialogue, CNSC staff provide updates specific to the Project, and have discussions regarding each Nations' interests, concerns, and potential impacts on Indigenous and/or Treaty Rights in relation to the Rook I 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 project with each identified Indigenous Nation and community. The CNSC is open to developing and establishing TORs for long-term engagement and engagement work plans with Indigenous Nations and communities where TORs are not yet in place, should there be interest.

Engagement Led by NexGen

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, is fulfilled, the Commission can consider the engagement activities undertaken by NexGen when determining whether the consultation process has been adequate. The engagement activities conducted by NexGen, including measures proposed by NexGen to avoid, mitigate, or offset potential adverse impacts from the project are used to support the CNSC in meeting its consultation obligations.

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

CNSC staff are aware that NexGen 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. NexGen has offered capacity funding agreements to assist Indigenous Nations and communities in their engagement with NexGen, where appropriate. NexGen has also supported multiple Indigenous Knowledge and Land Use Studies and integrated the results of the studies and knowledge and wisdom shared by the Nations into their Environmental Impact Statement (EIS) and technical documents submitted to the CNSC.

CNSC staff recognize that NexGen has long-standing relationships and agreements with many of the identified Indigenous Nations and communities including the Impact Benefit Agreements signed with CRDN, MN-S, and BRDN, and the Mutual Benefit Agreement with BNDN.

NexGen continues to work to support and maintain relationships with the identified Indigenous Nations and communities and is working to address items of concern and requests related to the Project. NexGen 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, and addressing comments, questions and concerns raised by Indigenous Nations and communities to date. CNSC staff encourage NexGen to continue engagement and collaboration activities with identified Indigenous Nations on the Project 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 NexGen's engagement related to the 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 consultation and regulatory process for the 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 project were offered opportunities to collaboratively develop sections of the Consultation Report and issues tracking tables.

CNSC staff will continue to monitor and assess NexGen's engagement activities throughout the regulatory review process as per REGDOC-3.2.2, and staff's conclusions and assessment on NexGen's engagement related to the 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 CRDN, MN-S, BNDN and BRDN on project-specific Rights Impact Assessments (RIAs). The assessments will include CNSC staffs' 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 Nation's position regarding 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 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 Project. CNSC staff will involve NexGen in these discussions and consultation activities as appropriate and continue to monitor NexGen's engagement activities and implementation of commitments to Indigenous Nations through the proposed licence condition on Indigenous engagement (LC G-6).

To date, the consultation and engagement activities and processes have been meaningful and in line with current best practices and legal requirements in relation to the duty to consult and accommodate. 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.

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

CNSC staff have held webinars, meetings and public information sessions including attending multiple in-person northern community tours alongside NexGen to provide updates on the project since 2019. CNSC staff attended the Northern Saskatchewan Environmental Quality Committee (NSEQC) meetings in 2022, 2023, 2024 and 2025 where CNSC presented on proposed projects, including the NexGen Rook I project, and provided updates regarding uranium mining and milling in northern Saskatchewan. The NSEQC is a provincial body intended to create avenues for dialogue between northern Saskatchewan residents, provincial and federal regulatory bodies, and the uranium industry.

CNSC staff also held the Regulatory Oversight Report (ROR) for Uranium Mines and Mills in-person engagement sessions in September 2022, 2023, and 2024 where the potentially impacted Indigenous Nations were invited and participated in regulatory reviews of the operating uranium mines and mills. At these sessions, NexGen Rook I project updates were provided, and questions regarding the regulatory review process were answered. CNSC staff also leveraged the CNSC social media channels (LinkedIn, Facebook, Twitter/X) and updated the NexGen Rook I webpage on the CNSC website to ensure information was easily accessible and available. This included sharing project updates and information through the Rook I project inbox to the project subscribers which consisted of Indigenous Nations and communities, members of the public and community representatives.

CNSC staff informed the public of the NexGen Rook I Federal Environmental Assessment (EA) and made all documents submitted by NexGen and Indigenous Nations and communities publicly available on the Canadian Impact Assessment Registry (CIAR) Rook I project website. The CIAR regarding the Rook I 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 NexGen and CNSC staff. In CNSC staff's view, 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 NexGen Rook I project.

4.3 Applicant Public Information and Engagement

A Public Information and Disclosure Program (PIDP) is a 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 an applicant'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

CNSC staff deemed sufficient NexGen's Rook I Indigenous and Public Engagement Program [47]. As NexGen is currently applying for a licence to prepare site and construct the Rook I project, there are no reporting requirements regarding their PIDP at this stage.

As per REGDOC-3.2.1 and stated by NexGen, a copy of the PIDP will be made available on NexGen Energy Ltd. - Rook I Project should the Commission issue a licence.

CNSC staff's review of their pre-licensing public communications indicates that NexGen maintains a comprehensive website dedicated to the project. This website features recent photos, a project description, updated maps, and the latest developments. NexGen provides regular updates to the nations and communities via announcements and updates broadcasted from radio stations located in proximity to the in the languages in their target audiences: English and Dene.

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

NexGen 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 issued by the Commission, NexGen will need to comply with applicable reporting requirements, and that NexGen continue adhering to their PIDP by regularly providing updates to their target audiences as the project progresses.

4.4 Participant Funding Program

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

1 enhance individual, not-for-profit organization and Indigenous Nations and Communities participation 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 individuals, not-for-profit organizations and Indigenous Nations and Communities 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 NexGen's Rook I project and providing value-added information to the Commission through informed and topic-specific interventions. In total, since providing early notification on the proposed project, the CNSC has allocated $1,053,361, to support participation.

The CNSC offered funding for the project in 2 phases. The first phase was to assist with reviewing NexGen'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 $588,381.00 for the first phase to the following recipients:

- Birch Narrows Dene Nation
- Buffalo River Dene Nation
- Métis Nation-Saskatchewan
- Clearwater River Dene Nation
- Athabasca Chipewyan First Nation
- Ya'thi Néné Land and Resource Office
- Saskatchewan First Nations Natural Resource Centre of Excellence

Based on recommendations from the Funding Review Committee, the CNSC awarded a total of $464,979.93 for the second phase to the following recipients:

- Birch Narrows Dene Nation
- Buffalo River Dene Nation
- Métis Nation-Saskatchewan
- Clearwater River Dene Nation
- Athabasca Chipewyan First Nation
- Ya'thi Néné Land and Resource Office
- Mikisew Cree First Nation
- Willow Lake Métis Nation

Within the first phase of funding, Athabasca Chipewyan First Nation received $145,150 to conduct an Indigenous Knowledge Study relating to the NexGen Rook I project and other potential uranium and nuclear projects in NW Saskatchewan, and Clearwater River Dene Nation received $76,712 for meetings with CNSC staff to discuss a consultation protocol and rights impact assessment relating to the project. Saskatchewan First Nations Natural Resource Centre of Excellence declined the funding to participate in the project. During the second phase of funding Williow Lake Métis Nation did not accept funding to participate in the regulatory review process for the project.

4.4.2 Conclusion

Through the PFP, the CNSC offered assistance to interested Indigenous Nations and communities, members of the public, and other interested parties to prepare for and participate in the Commission's public hearing. Should the Commission approve the NexGen Rook I 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 uranium mine and mill facility licence is subject to Part 2 of CRFR, which is based on Regulatory Activity Plan fees.

5.1.1 Discussion

Through the review of CNSC records, CNSC staff have determined that NexGen is in good standing with respect to CNSC CRFR requirements. NexGen'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. NexGen has paid their cost recovery fees in full.

NexGen has yet to pay an administrative monetary penalty (AMP) associated with 2024-AMP-06, first due to the Commission review of the AMP requested by NexGen, and now due to the judicial review application of the AMP decision filed by NexGen. NexGen requested both of these review processes within the legislated timelines allotted for them. If the application for judicial review is dismissed, CNSC staff will ensure that payment of the AMP is made.

5.1.2 Conclusion

After assessing CNSC records, CNSC staff conclude that NexGen is in good standing with respect to the CNSC CRFR requirements for the Rook I project. Based on NexGen'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, a licence may contain any term or condition that the Commission considers necessary for the purposes of the NSCA, including a condition that the applicant provide a financial guarantee in a form that is acceptable to the

Commission. *General Nuclear Safety and Control Regulations*, paragraph 3(1)(l) stipulates that, "an application for a licence shall contain a description of any proposed financial guarantee related to the activity to be licensed." The financial guarantee for decommissioning is established to fund the activities described in the Preliminary Decommissioning and Reclamation Plan (PDP). These requirements are found in REGDOC-3.3.1, *Financial Guarantees for Decommissioning of Nuclear Facilities and Termination of Licensed Activities*.

5.2.1 Discussion

CNSC staff have reviewed the preliminary decommissioning plan and cost estimate that NexGen submitted. CNSC staff have requested additional information and clarification from NexGen and are waiting on a response. Once an updated cost estimate is provided for CNSC staff review, NexGen will need to submit a revised description of their financial guarantee, which will require acceptance by both the Saskatchewan Ministry of Environment (MoE) and CNSC staff.

5.2.2 Conclusion

Currently CNSC staff's review of NexGen's financial guarantee is ongoing, however, NexGen has committed to providing an updated cost estimate to respond to both recommendations/comments from CNSC staff. Saskatchewan MoE accepted the cost estimate in June 2025. Once CNSC staff are able to review and accept the updated cost estimate, it is anticipated that NexGen will submit a draft financial guarantee instrument. CNSC staff anticipate providing final advice regarding NexGen's financial guarantee for decommissioning to the Commission prior to Part II of the Commission hearing, scheduled for February 2026.

5.3 Improvement Plan and Significant Future Activities

This section discusses the activities to be completed and information to be submitted by NexGen, to CNSC staff for review, in this phase of the Rook I project. NexGen's submissions of the information pertaining to the site preparation and construction phase is captured in the regulatory commitments in Appendix D of this CMD. 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 2 of the *Nuclear Liability and Compensation Act* (NLCA) which came into force on January 1, 2017, , 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 generic licence condition for licence, UML-MINE-ROOK1.00/20XX related to reporting:

- *Licence Condition 3.2 Reporting Requirements*

The licensee shall implement and maintain a program for reporting to the Commission or a person authorized by the Commission.

This licence condition currently exists in other licenses however, as this is a new application it would be the first request for delegation for reporting by the Commission.

In addition, the draft NexGen licence contains a proposed licence condition related to EA conditions and regulatory commitments:

- Licence Condition G5: *The licensee shall implement the Rook I Project EA conditions and regulatory commitments.*

As indicated in Appendix D, NexGen 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 Rook I project. Based on the regulatory review and technical assessments of NexGen's EIS and supporting documentation, CNSC staff determined that the proposed Rook I 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 (please refer to section 5.5, part two of this CMD and the EA Report in Appendix B for further details).

Based on the licensing regulatory review and technical assessments, CNSC staff have determined that NexGen's licence application to prepare site and construct the Rook I project complies with all applicable regulatory requirements and that the proposed Rook I 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. I

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.

6.1 Overall Recommendations

CNSC staff recommend that the Commission:

1. Determine that the Rook I 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 Control Act in that the applicant:
    a. Is qualified to carry on the activities that the licence with 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 a licence to prepare site and construct the Rook 1 uranium mine and mill, including licence conditions and considerations of regulatory commitments with which NexGen 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.

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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
ACFN	Athabasca Chipewyan First Nation
ALARA	As Low As Reasonably Achievable
AMP	Administrative Monetary Penalty
ARD/ML	Acid Rock Draining/Metal Leaching
BATEA	Best Available Technology & Techniques Economically Achievable
BNDN	Birch Narrows Dene Nation
BRDN	Buffalo River Dene Nation
CEAA	Canadian Environmental Assessment Act
CIAR	Canadian Impact Assessment Registry
CMD	Commission Member Document
CNSC	Canadian Nuclear Safety Commission
COPCs	Contaminants of Potential Concern
CRDN	Clearwater River Dene Nation
CRFR	Cost Recovery Fees Regulations
CSA	Canadian Standards Association, CSA Group
CSM	Conceptual Site Model
EA	Environmental Assessment

ECC	Engineering Change Control
ECOP	Environmental Code of Practice
EcoRA	Ecological Risk Assessment
EEM	Environmental Effects Monitoring
EIS	Environmental Impact Statement
EMP	Environmental Monitoring Program
EMS	Environmental Management System
ERA	Environmental Risk Assessment
ES	Exhaust Shaft
ETP	Effluent Treatment Plant
FEED	Front-End Engineering Design
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 Polyethylene
HHRA	Human Health Risk Assessment
HMI	Human-Machine Interface
IAA	Impact Assessment Act
IAEA	International Atomic Energy Agency
IMS	Integrated Management System
JHA	Job Hazard Analysis
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
MoE	Saskatchewan Ministry of Environment
MoU	Memorandum of Understanding
NEW	Nuclear Energy Worker
NFCC	National Fire Code of Canada
NLCA	Nuclear Liability and Compensation Act
NPAG	Non-Potentially Acid Generating
NPT	Treaty on Non-Proliferation of Nuclear Weapons
PAG	Potentially Acid-Generating
PDCR	Preliminary Decommissioning and Reclamation Plan
PDP	Preliminary Decommissioning Plan
PFP	Participant Funding Program
PIDP	Public Information and Disclosure Program
PMP	Probable Maximum Precipitation
PS	Production Shaft
RCOP	Radiation Code of Practice
RfD	Reference Dose
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
TOR	Terms of Reference
UGTMF	Underground Tailings Management Facility
WHMIS	Workplace Hazardous Materials Information System
YNLR	Ya'thi Nene Lands and Resources

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 paragraphs:
    - 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 subparagraph 3(b)(v) of the *Uranium Mines and Mills Regulations* 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:

- Pursuant to the below paragraphs of the *General Nuclear Safety and Control Regulations*, the licensee must:
    - 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 subparagraph 3(d)(v) of the *Uranium Mines and Mills Regulations* 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 subsection 24(5) of the NSCA subsection 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 below subparagraphs of the *Uranium Mines and Mills Regulations* that the application 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 subparagraph 3(1)(i) of the *General Nuclear Safety and Control Regulations* paragraph that an application contain a description and the results of any test, analysis or calculation performed to substantiate the information included in the application.
- Pursuant to paragraphs 5(1)(e) and 5(2)(e) of the *Uranium Mines and Mills Regulations* it is a requirement 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 paragraph 3(1)(d) of the *General Nuclear Safety and Control Regulations* that an application contain a description of any nuclear facility, prescribed equipment, or prescribed information to be encompassed by the licence.
- Pursuant to the below paragraphs of the *Uranium Mines and Mills Regulations* It is a requirement 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 paragraph 3(1)(d) of the *General Nuclear Safety and Control Regulations* paragraph 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 below paragraphs of 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 sections 4-6 of the *Radiation Protection Regulations* 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 below provisions 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 paragraphs 14(a) and (b) 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 subparagraphs 3(d)(i),(ii), and (iii) of the *Uranium Mines and Mills Regulations* 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 paragraphs 12(1)(c) and (f) of the *General Nuclear Safety and Control Regulations* 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.

- The *Radiation Protection Regulations* prescribes the dose limit for the general public, under subsection 1(3) which is 1mSv per calendar year.
- Under the following subparagraphs, it is a requirement of the *Uranium Mines and Mills Regulations* that an application 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)(iv) 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 below subparagraphs of the *General Nuclear Safety and Control Regulations* that a licensee :
    - 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.

- Pursuant to the below subparagraphs, it is a requirement of the *Uranium Mines and Mills Regulations* that an application contain:
    - 3(c)(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
    - (A) assist off-site authorities in planning and preparing to limit the adverse effects of an accidental release.
    - (B) notify off-site authorities of an accidental release or the imminence of an accidental release.
    - (C) report information to off-site authorities during and after an accidental release.
    - (D) assist off-site authorities in dealing with the adverse effects of an accidental release.
    - (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 below provisions of the *Uranium Mines and Mills Regulations* that an application 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 paragraph 3(e) of the *Uranium Mines and Mills Regulations* 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 NexGen's 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 NexGen	Complete?	Sufficient?	Adequate?
(1) An application for a licence shall contain the following information:				
(a) the applicant's name and business address;	Mining and Milling Facility Description Manual	Y	Y	Y
(b) the activity to be licensed and its purpose;	Mining and Milling Facility Description Manual	Y	Y	Y
(c) the name, maximum quantity, and form of any nuclear substance to be encompassed by the licence;	Mining and Milling Facility Description 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 NexGen	Complete?	Sufficient?	Adequate?
(d) a description of any nuclear facility, prescribed equipment, or prescribed information to be encompassed by the licence;	Mining and Milling 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;*	Mining and Milling Facility Description Manual Radiation Protection Program Security 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

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 NexGen	Complete?	Sufficient?	Adequate?
(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 Program Mining and Milling Facility Description Manual	Y	Y	Y
(h) the proposed measures to prevent loss or illegal use, possession, or removal of the nuclear substance, prescribed equipment, or prescribed information;	Security Program	Y	Y	Y
(i) a description and the results of any test, analysis or calculation performed to substantiate the information included in the application;	Mining and Milling Facility Description 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 NexGen	Complete?	Sufficient?	Adequate?
(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;	Mining and Milling Facility Description Manual Waste Management Program	Y	Y	Y
(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;	Integrated Management System Manual Mining and Milling Facility Description Manual Preliminary Decommissioning and Reclamation Cost Estimate	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 NexGen	Complete?	Sufficient?	Adequate?
(l) a description of any proposed financial guarantee relating to the activity to be licensed;	Mining and Milling Facility Description Manual Preliminary Decommissioning and Reclamation Plan	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.	N/A	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 NexGen	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,	Mining and Milling Facility Description Manual Environmental Impact Statement	Y	Y	Y
(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,	Mining and Milling Facility Description Manual	Y	Y	Y
(iii) a plan showing the existing and planned structures, excavations and underground development,	Mining and Milling 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,	Mining and Milling 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 NexGen	Complete?	Sufficient?	Adequate?
(v) a description of the site geology and mineralogy,	Mining and Milling 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,	Mining and Milling Facility Description Manual Environmental Impact Statement	Y	Y	Y
(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 and Reclamation Plan	Y	Y	Y
(ix) a description of the proposed emergency power systems and their capacities;	Mining and Milling 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,	Mining and Milling Facility Description Manual Construction 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 NexGen	Complete?	Sufficient?	Adequate?
(ii) a description of the proposed methods for carrying on the activity,	Mining and Milling 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,	Mining and Milling Facility Description Manual	Y	Y	Y
(iv) the anticipated duration of the activity	Mining and Milling Facility Description Manual	Y	Y	Y
(v) the proposed management system for the activity, including measures to promote and support safety culture;	Mining and Milling Facility Description Manual Integrated Management System Manual Human Factors Engineering Program Plan Health and Safety Program	Y	Y	Y
(c) in relation to the environment and waste management,		Y	Y	Y
(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

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 NexGen	Complete?	Sufficient?	Adequate?
(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
(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	Y	Y	Y
(vi) the proposed effluent and environmental monitoring programs,	Environmental Management Program Environmental Monitoring Plan Effluent and Emissions Plan	Y	Y	Y
(vii) the proposed location, the proposed maximum quantities and concentrations, and the	Environmental 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 NexGen	Complete?	Sufficient?	Adequate?
anticipated volume and flow rate of releases of nuclear substances and hazardous substances into the environment, including their physical, chemical and radiological characteristics,	Waste Management Program Effluent and Emissions Plan Environmental Monitoring Plan			
(viii) the proposed measures to control releases of nuclear substances and hazardous substances into the environment,	Mining and Milling Facility Description Manual Environmental Management Program Waste Management Program Environmental Monitoring Plan Effluent and Emissions 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,	Mining and Milling Facility Description Manual Environmental Management Program Waste 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 NexGen	Complete?	Sufficient?	Adequate?
	Effluent and Emissions Plan Environmental Monitoring Plan			
(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
(A) assist off-site authorities in planning and preparing to limit the adverse effects of an accidental release,	Environmental Management Program Emergency Preparedness and Response Program	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
(C) report information to off-site authorities during and after an accidental release,	Emergency Response Plan Spill 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 NexGen	Complete?	Sufficient?	Adequate?
	Reporting Procedures			
(D) assist off-site authorities in dealing with the adverse effects of an accidental release,	Environmental Management Program Emergency Preparedness and Response Program	Y	Y	Y
(E) test the implementation of the measures to control the adverse effects of an accidental release,	Mining and Milling Facility Description Manual	Y	Y	Y
(xi) the anticipated quantities, composition and characteristics of backfill,	Mining and Milling Facility Description Manual	Y	Y	Y
(xii) a description of the proposed waste management system;	Mining and Milling Facility Description Manual Waste Management Program	Y	Y	Y
(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 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 NexGen	Complete?	Sufficient?	Adequate?
(ii) the proposed program for selecting, using and maintaining personal protective equipment,	Health and Safety Program Mining and Milling Facility Description Manual Asset Management Program	Y	Y	Y
(iii) the proposed worker health and safety policies and programs,	Health and Safety Program	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	Y	Y	Y
(vi) the proposed measures to control the spread of any radioactive contamination,	Radiation Protection Program ALARA Plan	Y	Y	Y
(vii) the proposed ventilation and dust control methods and equipment for controlling air quality,	Mining and Milling Facility Description Manual Asset 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 NexGen	Complete?	Sufficient?	Adequate?
(viii) the proposed level of effectiveness of and inspection schedule for the ventilation and dust control systems;	Mining and Milling Facility Description Manual Asset Management Program Radiation Protection Program	Y	Y	Y
(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 Program	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
Safeguards and Non-Proliferation	REGDOC-2.13.1, *Safeguards and Nuclear Material Accountancy*	Y	Y

SCA	Document Title	Sufficient?	Adequate?
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
	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

SPECIFIC AREAS FOR THIS FACILITY TYPE		
Functional Area	**Safety and Control Area**	**Specific Areas**
Facility and Equipment	Safety Analysis	▪ Deterministic Safety Analysis ▪ Hazard Analysis ▪ Probabilistic Safety Analysis ▪ Criticality Safety ▪ Severe Accident Analysis ▪ Management of Safety Issues (including R&D Programs)
	Physical Design	▪ Design Governance ▪ Site Characterization ▪ Facility Design ▪ Structure Design ▪ System Design ▪ Components Design
	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

SPECIFIC AREAS FOR THIS FACILITY TYPE		
Functional Area	**Safety and Control Area**	**Specific Areas**
	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
	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 Rook I 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 NexGen'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	FY29/30	FY30/31
GENERAL INSPECTION	3	2	2	2	2
PHYSICAL DESIGN		1	1	1	1
ENVIRONMENTAL PROTECTION	1		1		
FITNESS FOR SERVICE					1
MANAGEMENT SYSTEM	1		1	1	1
HUMAN PERFORMANCE MANAGEMENT		1			1
WASTE MANAGEMENT		1			
OPERATING PERFORMANCE				1	1
TOTAL INSPECTIONS /YR	5	5	5	5	7

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.

Fitness for service inspections will verify the readiness of NexGen's physical plant for operations.

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

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

Waste management inspections will verify that they are managing waste rock as per the requirements.

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

Appendix B:
Environmental Assessment Report

Canada's Nuclear Regulator

Environmental Assessment Report:
Rook I Project

October 2025

e-Doc: 7563537 (Word English)
e-Doc: 7586821 (Word French)
e-Doc: 7586815 (PDF English)
e-Doc: 7586826 (PDF French)

Canadian Nuclear Safety Commission
Commission canadienne de sûreté nucléaire

Canada

October 2025 Environmental Assessment Report – Rook I Project

Signed/Signé le

10 October 2025 / 10 octobre 2025

Beaton, Dana

Digitally signed by Beaton, Dana
DN: C=CA, O=GC, OU=CNSC-CCSN, CN="Beaton, Dana"
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Dana Beaton

Director General

Directorate of Environmental and Radiation Protection and Assessment

Directrice générale

Bureau

Bureau de la directrice générale, Direction de l'évaluation et de la protection environnementales et radiologiques

Executive Summary

Background

NexGen Energy Ltd. (NexGen) proposes to construct and operate a new underground uranium mine and mill on the Patterson Lake peninsula in the southwestern Athabasca Basin in northern Saskatchewan, approximately 130 km north of the Northern Village of La Loche. The site is in northern Saskatchewan, on Treaty 8 Territory (1899), and the Homeland of the Métis, and is within the traditional territories of the Dene, Cree, and Métis peoples.

The proposed Rook I Project includes underground and surface facilities to support the mining and processing of uranium ore. The main components include an underground mine, an onsite mill to process an average of 1,300 tonnes of ore per day, surface facilities to support the short- and long-term storage of waste rock and ore, an underground tailings management facility, water-handling infrastructure and an effluent treatment circuit, and additional infrastructure to support mining activities.

Under the *Nuclear Safety and Control Act* (NSCA), a licence from the Canadian Nuclear Safety Commission (CNSC) is required to prepare a site for and construct a new uranium mine and mill (Rook I 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 Rook I 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 and to harmonize environmental assessment processes to the extent possible. Potentially impacted and 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 that the Rook I 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 NexGen 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, NexGen has worked bilaterally with several 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 believe the Project's potential impacts on Indigenous and/or Treaty rights have been adequately identified and will be mitigated to the extent possible. The supplemental submission that the CNSC will be providing to the Commission prior to Part 2 of the hearing that will include CNSC's conclusions and recommendations on potential impacts to Indigenous and Treaty 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, or that such effects are justified, CNSC staff recommend that NexGen be required pursuant to paragraph 53(4)(b) of CEAA 2012 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. Further to this determination by the Commission, other environmental monitoring will be required under permits, licences and authorizations that may be issued, as part of regulatory oversight for the Project.

Summary of Potential Effects of the Project

The Project has the potential to interact with environmental and human components in various ways. CNSC staff have reviewed NexGen's assessment, including identified mitigation and follow-up monitoring program measures, and considered expert advice from federal and provincial authorities, as well as comments from Indigenous Nations and communities. Taking all this into account, CNSC staff have found that there are sufficient grounds on which the Commission may conclude 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 NexGen to Indigenous Nations and communities, CNSC staff recommend that the Commission conclude that the Rook I Project is not likely to cause significant adverse environmental effects.

These findings are contingent on the recommended EA Conditions (table 12.1) and EA Commitments (table 12.2) proposed throughout this EA Report. Included in the proposed conditions is a recommendation from CNSC staff that NexGen's list of identified mitigation measures, follow-up monitoring program measures and agreed upon commitments with Indigenous Nations and communities, as documented in NexGen's Commitments Report, become an enforceable condition that is set out in the Commission's decision.

Table of Contents

LIST OF TABLES

LIST OF FIGURES

1.0 Introduction

NexGen Energy Ltd. (NexGen) is proposing to construct and operate a new underground uranium mine on the Patterson Lake peninsula in the southwestern Athabasca Basin in northern Saskatchewan, approximately 130 km (155 km by road) north of the Northern Village of La Loche. The site is in northern Saskatchewan, on Treaty 8 Territory (1899), and the Homeland of the Métis, and is within the traditional territories of the Dene, Cree, and Métis peoples.

The proposed Rook I Project includes underground and surface facilities to support the mining and processing of uranium ore. The main components include an underground mine, an onsite mill to process an average of 1,300 tonnes of ore per day, surface facilities to support the short- and long-term storage of ore and waste rock, an underground tailings management facility, water-handling infrastructure and an effluent treatment circuit, and additional infrastructure to support mining activities. For further information providing an overview of the Rook I Project, the project components and activities, please refer to section 3 of this report and to section 1.1.3 of staff's Commission Member Document (CMD 25-H12).

This Environmental Assessment (EA) report summarizes the assessment conducted by the Canadian Nuclear Safety Commission (CNSC) staff to inform the Commission's decision on whether the proposed Rook I Project is likely to cause significant adverse environmental effects, including any adverse effect to Indigenous peoples. Indigenous interests, as described within this EA report, refer to any change to the environment on 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 2, 2019, following NexGen's submission of the Project Description (PD), the CNSC issued the Notice of Commencement of a federal EA for the proposed Rook I 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 (RA) 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 are responsible authorities (RAs) 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 NexGen on August 29, 2019, that the EA process for the proposed Rook I 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 NexGen 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 Canada (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: human health
- TC: navigable waters, transportation activities
- NRCan: geology, seismicity

These FAs, along with CNSC subject matter experts and a representative from Clearwater River Dene Nation and Métis Nation - Saskatchewan 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* (EAA). 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).

NexGen submitted an application requesting a licence to prepare site and construct a uranium mine and mill at their Rook I site. As detailed in the CMD 25-H12, to which this EA report is appended, this application is subject to a regulatory decision under the *Nuclear Safety and Control Act* (NSCA). Subsection 24(4) of the NSCA requires that, prior to granting a licence, the Commission must be satisfied that the applicant is qualified to carry out the project and that they will in doing so, make adequate provision for the protection of the environment. Although the licensing decision is specific to the first licensing phase (licence to 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; rather, the Commission must determine that the project is not likely to result in significant adverse environmental effects before it may grant a licence under the NSCA. Pursuant to section 26 of the NSCA, a licence is required for site preparation and construction activities.

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 November 19, 2025 (Part 1) and February 9-13, 2026 (Part 2).

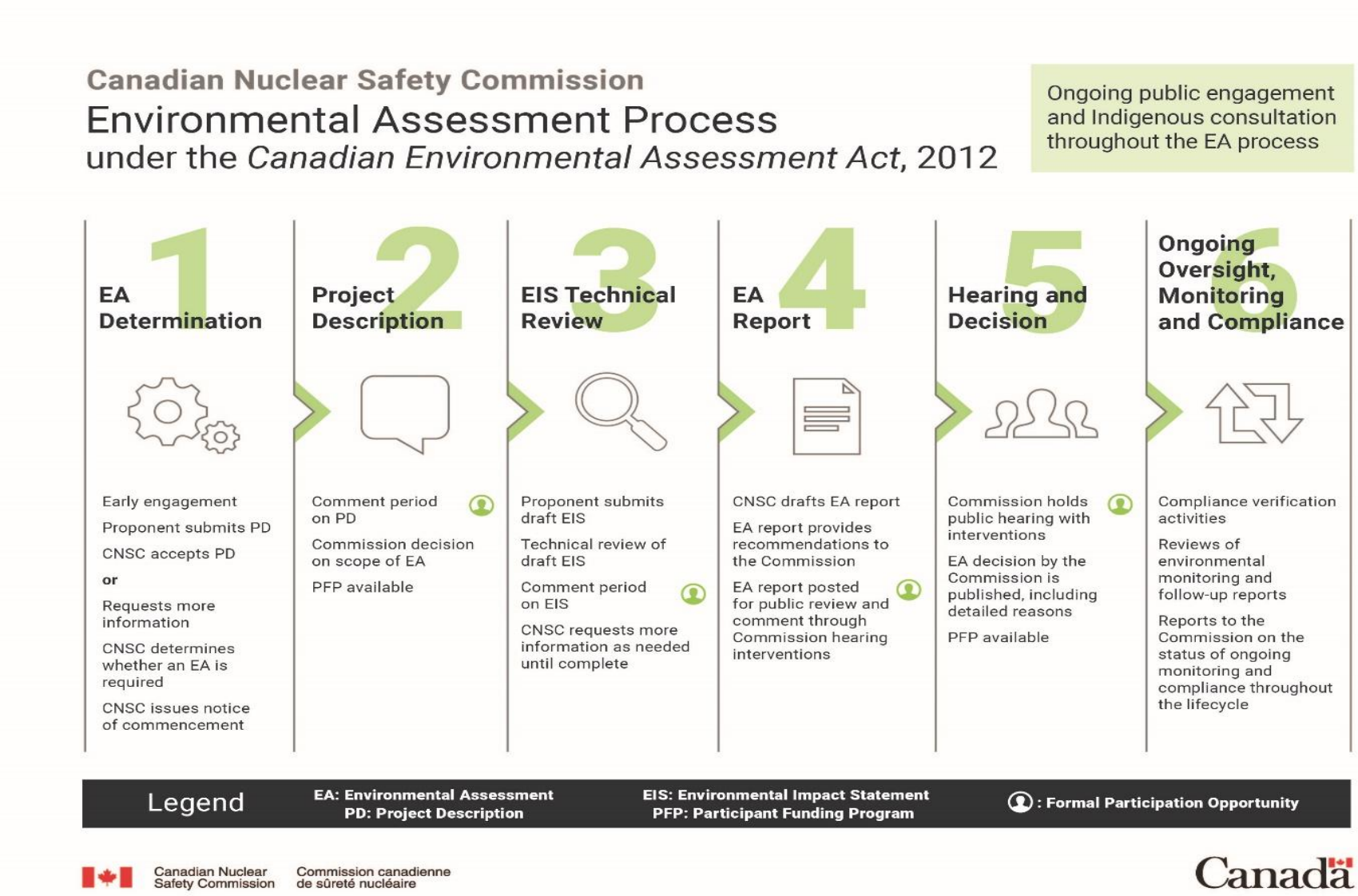
The full details and records related to consultation and engagement activities with Indigenous Nations and communities are contained in a separate report, titled *"CNSC Staff's Indigenous Consultation Report for the NexGen Rook I Environmental Assessment (EA) and Licence to Prepare a Site and Construct Application"* (herein referred to as "the "Consultation Report"). This can be found in appendix C of the CMD 25-H12 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 NexGen'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 activities 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 NexGen Rook I Part-2 hearing.

1.2. Environmental assessment process and timeline

The CNSC, as RA, conducted the various stages of the EA process under CEAA 2012 for the proposed Rook I Project. These stages are presented in figure 1.1. The timeline associated with the Rook I Project EA process with links 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 proposed Rook I Project. NexGen submitted a PD for the proposed Rook I Project. CNSC staff assessed the PD against CNSC's *Generic Guidelines for the Preparation of and Environmental Impact Statement – Pursuant to the Canadian Environmental Assessment Act, 2012* (herein referred to as the CNSC Generic Guidelines), as identified in CNSC REGDOC-2.9.1 *Environmental Protection: Environmental Principles, Assessments and Protection Measures*, (herein referred to as REGDOC-2.9.1). On May 2, 2019, the CNSC deemed the PD complete, and issued the notice of commencement of a federal EA process for the Rook I Project pursuant to CEAA 2012.

Stage 2: Project Description

Stage 2 consisted of 2 main steps: a public comment period on the PD, and a Commission decision on the scope of the EA. A public comment period held from May to June 2019, allowed Indigenous Nations and communities and the public to review the PD submitted by NexGen. In February 2020, 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.

Stage 3: EIS Technical Review

Stage 3 started in June 2022, with the submission of a draft Environmental Impact Statement (EIS) by NexGen and consisted of 2 main steps: a public comment period on the draft and a FIRT technical review. In advance of the public comment period, the CNSC granted $409,079 in funding through its Participant Funding Program (PFP). The purpose of this funding is to support Indigenous Nations and communities, members of the public and interested parties in the review of NexGen's draft EIS.

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 July 2022 to October 2022. Concurrently, CNSC staff and the FIRT 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 November 2022, CNSC staff completed the initial technical review and produced consolidated tables of FIRT comments, including information requests (IRs) and *Advice to the Proponent* comments, and provided these to NexGen for response. Multiple rounds of iterative review occurred between November 2022 and November 2024, whereby NexGen provided responses to IRs, which the FIRT assessed and provided follow-up requests for outstanding information for NexGen, as demonstrated in table 1.1.

Once NexGen provided complete and sufficient responses to all comments and information requests, they submitted a revised final EIS on November 29, 2024. CNSC staff have reviewed NexGen's final EIS and all supporting documents, including NexGen's responses to IRs to

ensure that all changes had been incorporated into the final EIS. CNSC staff deemed NexGen's final EIS complete on January 28, 2025.

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 NexGen's application for a licence to prepare a site for and construct its Rook I 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.

During Part 1 of the hearing, the Commission will consider oral and written submissions from NexGen and CNSC staff, related to NexGen's application. 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 $464,979.93 in funding through its PFP. The purpose of this funding is to support Indigenous Nations and communities, members of the public and interested parties to 1) review CNSC staffs' and NexGen's submissions to the Commission 2) participate in the hearing process, and 3) provide topic-specific interventions to the Commission

Pursuant to rule 19 of the *CNSC Rules of Procedure*, persons who have an interest or expertise in this matter or information that may be useful to the Commission in coming to a decision are invited to comment on NexGen's application.

Stage 6: Ongoing Oversight Monitoring and Compliance

Should the Commission issue a licence to prepare site and construct, and in future to operate, and decommission the Rook I Project, CNSC staff will verify compliance through desktop reviews and inspections, including the review of environmental monitoring and follow-up reports. 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.

Table 1.1: Timelines associated with the Rook I EA process

Activity or step in EA process	Date
NexGen submitted the **Rook I Project** description – **Notice of Commencement issued for Project**	May 2, 2019
Public comment period on Rook I Project description (30 days)	May 2- June 1, 2019
Commission hearing and decision on the scope of the proposed Rook I Project	February 20, 2020
CNSC Notice of participant funding for the public for reviewing and commenting on the draft EIS	May 2020
NexGen submitted a draft EIS for the Rook I Project	June 13, 2022
CNSC staff performed a conformity review of the draft EIS (30 days)	June 13 to July 12, 2022
CNSC webinar – CNSC regulatory review process	September 2022
Public comment period on the draft EIS (90 days)	July 14– Oct 12 2022
The FIRT completes initial technical review of the draft EIS and deems draft EIS incomplete (120 days), transmission of FIRT IRs to NexGen	Nov 16, 2022
CNSC completes review of public comments and transmission of public comments to NexGen	Dec 20, 2022
NexGen submits responses to IRs from FIRT and CNSC completeness review passes	Nov 14, 2023
The FIRT completes a technical review of NexGen's responses to IRs and deems incomplete	Feb 12, 2024
NexGen submits Revised Draft EIS	May 22, 2024
The FIRT completes review of revised Draft EIS and all IR responses deemed acceptable by CNSC staff	Nov 18, 2024
NexGen submits Final EIS	Nov 29, 2024
CNSC deem Final EIS complete	Jan 28, 2025
Notice of participant funding offering (2)	March 10, 2025
Notice of Public Hearing	March 11, 2025
Revised Notice of Public Hearing	August 20, 2025

These steps are documented on the Canadian Impact Assessment Registry (herein referred to as the Registry - formerly the Canadian Environmental Assessment Registry) for the project (Reference Number 80171).

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 VCs from changes to the environment (section 7)
- assessment of accidents and malfunctions, effects of the environment on the project, and assessment of cumulative environmental effects (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)

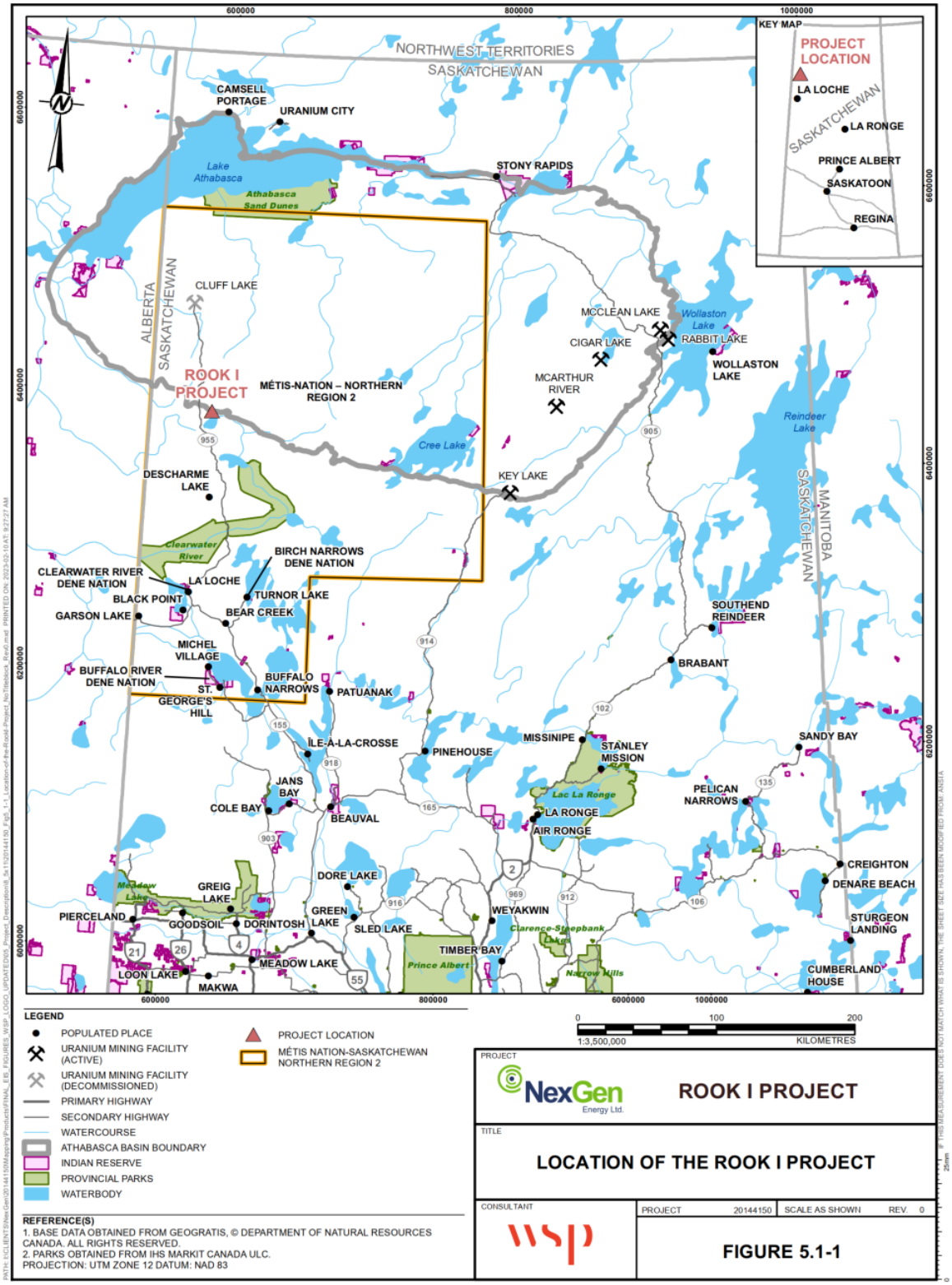
2. Project overview

NexGen is proposing to develop a new uranium mining and milling operation located in Northern Saskatchewan, approximately 130 km north of the Northern Village of La Loche. The Rook I Project would produce up to 13.6 million kilograms (Mkg) of U_3O_8 annually with a projected mine life of 24 years. The proposed project would include an underground mine and surface facilities to support the extraction of uranium ore and the production of uranium concentrate. The project would span a 43-year period, where construction phase is expected to take place over approximately 4 years, operations phase is anticipated to last approximately 24 years, followed by decommissioning and reclamation (closure) phase with an expected duration of 15 years. Section 4 of this EA report summarizes the alternative means considered by NexGen for the Project. Additional Project details can be found in section 1.1.2 of the CMD 25-H12 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 40 km east of the Saskatchewan-Alberta border, 130 km north of the Northern Village of La Loche, and 640 km northwest of the city of Saskatoon. The project falls within Treaty 8 Territory (1899), and the Homeland of the Métis, and is within the traditional territories of the Dene, Cree, and Métis peoples. Figure 2.1 depicts the Project location in Saskatchewan.

Figure 2.1: Project location



2.2. Project components

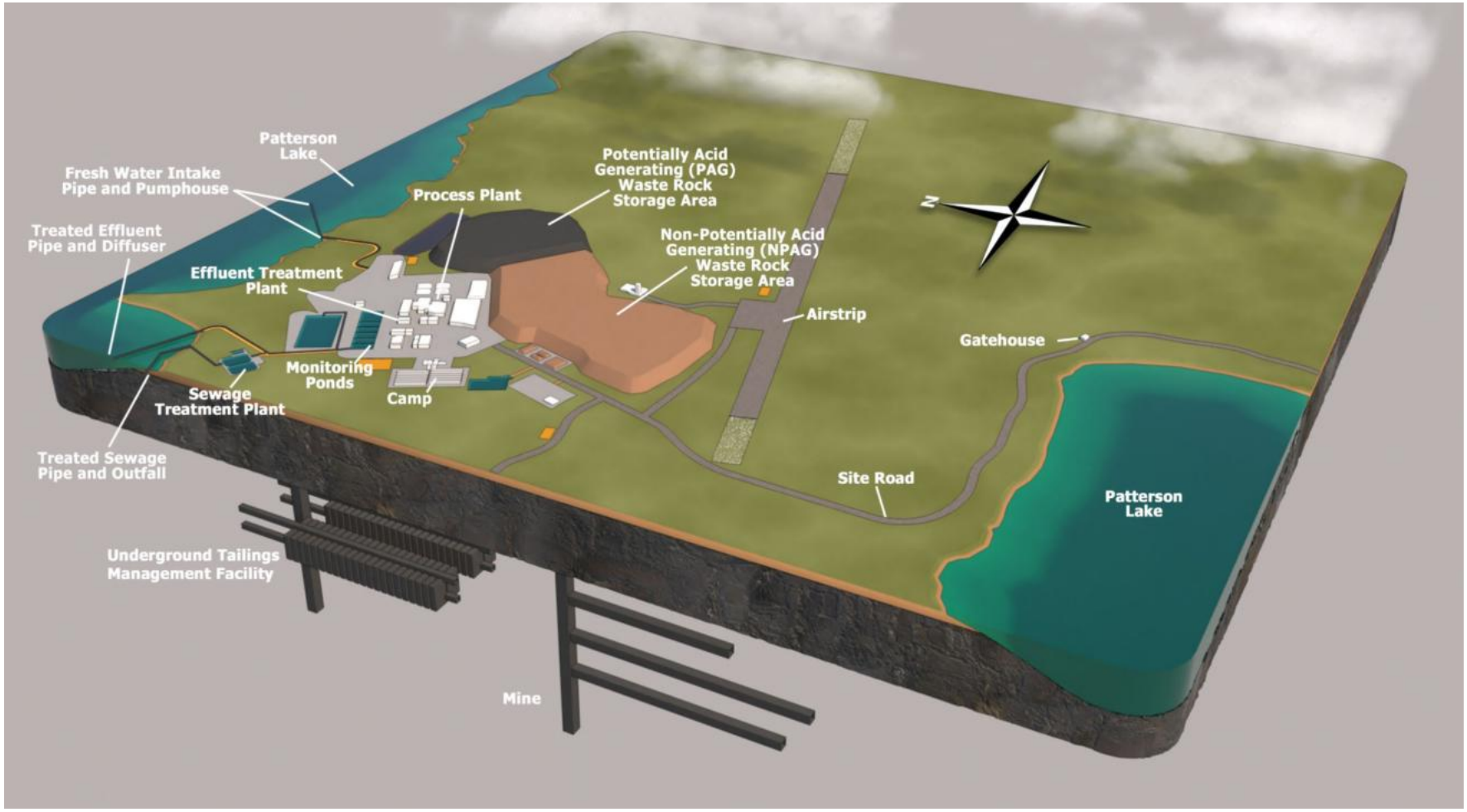
The main Rook I Project components and descriptions are listed in table 2.1. Figure 2.2 illustrates the proposed geographic locations of the proposed Rook I Project components.

Table 2.1: Descriptions of the main Rook I Project components

Project component	Description
Mining	The underground mine includes all the components required to access, extract and support mining and the underground tailings management facility (UGTMF) storage. Long hole stoping is the primary mining method for both the production and development of UGTMF chambers.
Processing	Uranium ore processing for the Project would include acid leaching, solvent extraction, uranium precipitation and calcining to extract the uranium concentrate product.
Tailings Management	The tailings management system would include the paste plant, paste delivery system, production stope backfilling, and UGTMF.
Mine Rock Management	The ore storage stockpile, special waste rock stockpile, potentially acid generating (PAG) waste rock storage area (WRSA) and non-potentially acid generating (NPAG) WRSA will be used to store the different classifications of mine rock at the surface.
Site Water Management	Site water management would include infrastructure related to water supply; surface water management; mine dewatering; effluent treatment, monitoring and release; and sanitary sewage collection, treatment and release.
Conventional Waste Management	Conventional waste management includes infrastructure and processes used for the collection, storage, handling, processing and disposal of conventional waste streams. This includes domestic waste, industrial waste, hazardous waste and low-level radioactive waste (LLRW).
Supporting Infrastructure	On-site surface infrastructure required to support mining and milling includes worker accommodations; maintenance shop and warehouse building; wash bays; airstrip* and associated infrastructure; power supply and distribution; fuel storage; information technology and communications; site roads and gatehouse.

*In July 2025, CNSC staff became aware that NexGen had started the construction of a temporary exploration airstrip. NexGen has advised CNSC staff that this temporary airstrip is separate and distinct from the work done in support of the Rook I project and have indicated that the temporary airstrip has clear and independent utility in supporting NexGen’s regional exploration programs.

Figure 2.2: Project components and site layout



2.3. Project activities

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

Table 2.2: Rook I Project activities and duration by phase

Project phase (planned duration)	Project activities
Construction (4 years)	• Establish the gatehouse. • Upgrade existing access road and develop selected site roads within the Project footprint. • Install the camp. • Construct the on-site airstrip and associated infrastructure. • Clear and grub the mine and mill terrace areas. • Strip topsoil layers, subsoil material, and organic materials and stockpile for future reclamation. • Use cut and fill excavation to create mine and mill terrace areas. • Establish waste and water management infrastructure. • Develop surface infrastructure to support underground activities. • Establish the exhaust shaft and production shaft and begin underground development. • Begin construction and commissioning of the process plant. • Develop and commission other infrastructure and services in preparation for Operations.
Operations phase (24 years)	• Mine development, production mining and UGTMF development. • Operation of processing plant. • Tailings management. • Mine rock management. • Site water management. • Waste management. • Operation of mobile fleet.
Decommissioning and Reclamation (i.e. Closure phase) (15 years)	• Active closure: Active decommissioning, water treatment and reclamation activities (5 years). • Transitional monitoring stage: Control of the site is transferred to the Province of Saskatchewan for management (10 years).

3. 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 NexGen, the following 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 (as related to environmental effects) (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 boundaries of 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 RAs to determine the scope of the factors to be taken into consideration in the EA of a proposed project. On February 20, 2020, 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 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 Rook I Project should consider Indigenous Knowledge (IK) and community knowledge. For the Rook I 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 and to monitor them. The measures must be taken in a way that is consistent with any applicable recovery strategy and action plans.

These subsections require that any authority who is required to ensure that an EA is conducted must ensure that the EA considers whether the project is likely to affect a listed wildlife species or its critical habitat, and if the project is carried out, must 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 assessment process, as well as species of interest identified by Indigenous Nations and communities and the public.

Transport Canada highlighted that NexGen 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, NexGen 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 the Rook I Project is in the Southwestern 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 NexGen's responsibility to identify and comply with all applicable regulatory requirements, both federal and provincial.

Other Views Expressed sub-sections are 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 also capture key issues and concerns heard in writing or verbally through technical meetings or engagement and consultation activities, as well as how NexGen will be mitigating or managing such concerns, because 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 NexGen, government agencies, Indigenous Nations and communities, and the public.

The VCs selected by the CNSC are presented in table 3.1. 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 IK yielded the list of equivalent species and ecosystems of interest presented in table 3.1. The equivalent NexGen-identified VCs are also presented in table 3.1.

Table 3.1: Rationale for CNSC-identified VCs and their equivalent NexGen-identified VCs

CNSC-identified VCs	Species and ecosystems of interest identified by Indigenous Nations and communities	Equivalent NexGen-identified VCs	Rationale
Effects identified pursuant to subsection 5(1) of the CEAA 2012			
Fish and fish habitat (5(1)(a))	• Arctic Grayling (*Thymallus arcticus)* • Bait fish/Minnows *(Phoxinus Phoxinus)* • Burbot *(Lota lota)* • Catfish *(Siluriformes)* • Herring *(Clupea harengus)*/Cisco *(Coregonus artedi)* • Jackfish *(Trachurus symmetricus*)/Northern Pike *(Esox lucius)* • Pickerel *(Esox)* /Walleye *(Sander vitreus)* • Lake Trout *(Salvelinus namaycush)* • Yellow Perch *(Perca flavescens)* • White Sucker *(Catostomus commersonii)* • Longnose Sucker *(Catostomus Catostomus)* • Lake Whitefish *(Coregonus clupeaformis)*	• Lake Trout • Lake Whitefish • Walleye • Northern Pike	Project-related predicted changes to water quality and quantity, and discharge of treated wastewater to Patterson Lake/other nearby lakes and rivers could adversely affect fish and fish habitat.
Transboundary environmental effects: GHG emissions (5(1)(2)	• Air Quality	• Greenhouse Gases	Project-related predicted changes to GHG emissions could contribute to global climate change.
Migratory birds (5(1)(a))	• Common Goldeneye (*Bucephala clangula*) • Mallard (*Anas platyrhynchos*) • Common Loon (*Gavia immer*)	• Olive-sided Flycatcher *(Contopus cooperi)* • Mallard	Project-related predicted changes to surrounding terrestrial environment could adversely affect migratory birds and their habitat.

CNSC-identified VCs	Species and ecosystems of interest identified by Indigenous Nations and communities	Equivalent NexGen-identified VCs	Rationale
	• Bank Swallow (*Riparia riparia)* • Barn Swallow (*Hirundo rustica*) • Red-throated Loon (*Gavia stellata*) • Horned Grebe (*Podiceps auritus*) • Red-necked phalarope (*Phalaropus lobatus*) • Yellow Rail (*Coturnicops noveboracensis*) • Whooping Crane (*Grus americana*) • Osprey (*Pandion haliaetus*) • Peregrine Falcon (*Falco peregrinus*) • Short-eared Owl (*Asio flammeus*) • Great grey Owl (*Strix nebulosa*)	• Common Goldeneye • Rusty Blackbird *(Euphagus carolinus)*	
Indigenous uses: Current use of lands and resources for traditional purposes (5(1)(c)	• Medicinal plants • Traditional use plant species (Traditional plant species used for food, medicinal, ceremonial or other purposes) • Fish (see fish and fish habitat)	• Indigenous 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.
Effects identified pursuant to subsection 5(2) of the CEAA 2012			
Human Health (5(2)(b)) (Includes Indigenous peoples Health*) (5(1)(c))	• Harvester • Resident • Worker	• Human health	Project-related predicted changes in water quality and air quality could adversely affect the health of Indigenous peoples, the public and workers.

CNSC-identified VCs	Species and ecosystems of interest identified by Indigenous Nations and communities	Equivalent NexGen-identified VCs	Rationale
*applies to both 5(1) and 5(2)			
Wetlands (5(2)(b))	• Canadian Toad (*Anaxyrus hemiophrys*) • Northern Leopard Frog (*Lithobates pipiens*)	• Canadian Toad • Wetland Ecosystems	Project-related predicted changes to water 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))	• Spruce Grouse (*Canachites canadensis*) • Rabbits/Snowshoe Hare (*Lepus americanus*) • Moose (*Alces alces*) • American Marten (*Martes americana*) • Beaver (*Castor*) • Red Fox (*Vulpes vulpes*) • Mink (Lutreola) • Canada Lynx (*Lynx canadensis*) • Coyote (*Canis latrans*) • Wolverine (*Gulo gulo*) • Fisher (*Pekania pennanti*) • Muskrat (*Ondatra zibethicus*) • Squirrel (*Sciuridae*) • Weasel (*Mustela*) • River Otter (*Lontra canadensis*) • Barren-ground Caribou (*Rangifer tarandus groenlandicus*)	• Moose • Grey Wolf • Black Bear • Beaver • Mallard • Common Goldeneye • Upland ecosystems • Riparian ecosystems • Traditional use 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*.

CNSC-identified VCs	Species and ecosystems of interest identified by Indigenous Nations and communities	Equivalent NexGen-identified VCs	Rationale
	• White-tailed Deer (*Odocoileus virginianus*) • Black Bear (*Ursus americanus*) • Grey Wolf (*Canis lupus*)		
Species at risk	• Woodland Caribou (*Rangifer tarandus caribou*) • Little Brown Myotis (*Myotis lucifugus*) • Olive-sided Flycatcher (*Contopus cooperi*) • Rusty Blackbird (*Euphagus carolinus*) • Beautiful Sedge (*Carex concinna*) • Northern Myotis (*Myotis septentrionalis*) • Common Nighthawk (*Chordeiles minor*) • Barn Swallow (*Hirundo rustica*) • Ashton Cuckoo bumble bee (*Bombus ashtoni*) • Yellow-banded Bumble Bee (*Bombus terricola*) • Transverse Lady Beetle (*Coccinella transversoguttata*) • Nine-spotted Lady Beetle (*Coccinella novemnotata*)	• Woodland Caribou • Little Brown Myotis • Olive-sided Flycatcher • Rusty Blackbird	Project-related predicted disturbances of terrestrial and aquatic environments could adversely affect species at risk 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.

3.3.1. Spatial Boundaries

The spatial boundaries for the proposed Rook I Project were determined by CNSC staff to be appropriate for each selected environmental compartment (atmospheric and acoustic environment, geology and groundwater environment, aquatic environment and terrestrial environment), and associated VCs (including human health and Indigenous land and resource use). Effects on the VCs are caused by changes to the environmental compartments, which may originate from project activities. Consistent with the CNSC Generic Guidelines, the following spatial boundaries identified by NexGen were considered for each environmental compartment:

- **Site study area (SSA)**: The SSA is the Rook I 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.

It is important to note that a maximum disturbance area was also a spatial boundary consideration for certain assessments (e.g., terrain and soils, vegetation, wildlife and wildlife habitat, indigenous land and resources use, and other land and resource use) to address uncertainty in the final design of the project.

Table 3.2 summarizes the spatial boundaries for the Rook I Project for each environmental compartment. Maps of the spatial boundaries for each environmental compartment are provided in figures 3.1 – 3.14, as illustrated in NexGen's final EIS.

3.3.2. 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 NexGen 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 proposed Rook I Project, identified by NexGen, were consistent with the CNSC Generic Guidelines and determined to be appropriate by CNSC staff to be appropriate. The following temporal boundaries were considered for the EA:

- **Site Preparation and Construction phase** (4 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** (24 years): Includes all activities associated with mining and processing ore, tailings, waste rock and domestic waste management, hazardous materials, water management, release of treated effluent, site maintenance, progressive reclamation, and transportation of staff and materials.
- **Decommissioning (active closure) phase** (5 years): active decommissioning and reclamation activities that occur post-operations, such as backfilling mine workings, removal of physical infrastructure, recontouring and revegetation disturbed areas, waste disposal and removal, and any other activities required to achieve decommissioning objectives and return the site to a safe and stable condition prior to the Transitional monitoring stage.
- **Post-closure (transitional monitoring) phase** (10 years) that includes monitoring and reporting activities that occur post-active closure that would continue until monitoring and reporting verifies that the performance criteria have been met.

Once performance criteria have been fully demonstrated, an application to be released from the CNSC licence would be submitted to the CNSC for approval, the land would be transferred back under provincial management though the Institutional Control Program.

In certain circumstances, the duration of effects may extend beyond specific phases of the Project, including Closure, depending on the physical, biological, social, and/or cultural properties and resilience of VCs and intermediate components. Under these circumstances, effects from the Project that may occur well beyond Closure, were also assessed using a far-future scenario, that encompasses the long-term period during extremely slow migration of COPCs from the UGTMF and waste rock storage areas to the environment (i.e., more than 5,000 years).

Table 3.2: Spatial boundaries for each environmental compartment considered in the EA

Environmental compartment	Spatial boundaries		
	SSA	LSA	RSA
Atmospheric environment (see figure 3.1 and 3.2)	Synonymous with the Project footprint	90,000 ha	640,000 ha
Geological and hydrogeological environment (see figure 3.3 and 3.4)	Synonymous with the Project footprint	Includes the SSA and is defined as the area where direct changes to the physical-chemical groundwater environment because of the proposed Project would be expected. Defined by the Clearwater River watershed boundary up to the Naomi Lake outlet.	Encompasses NexGen's Arrow deposit and defined by the Clearwater River watershed boundary upstream of the Mirror River confluence.
Surface water* environment (see figure 3.5)	Synonymous with the Project footprint	Includes the SSA and is defined by the Clearwater River watershed boundary to just downstream of the Naomi Lake outlet.	Defined by the Clearwater River watershed boundary upstream of the Mirror River confluence.
Aquatic environment* (see figure 3.6)	Synonymous with the Project footprint	Includes the SSA and is defined by the Clearwater River watershed boundary up to the Naomi Lake outlet.	Includes the LSA and is defined by the Clearwater River watershed boundary upstream of the Mirror River confluence.
Terrestrial environment* (see figures 3.7, 3.8, 3.9)	Includes the Project footprint which covers 228 ha and includes the access road and bridge, and all proposed mine site infrastructure and features.	Is defined by a 500 m buffer around the maximum disturbance area.	Includes the LSA plus Forrest Lake, Beet Lake, and Naomi Lake and the watershed east and north of the confluence of the Clearwater and Mirror rivers.
Human health* (see figure 3.10)	Equivalent to the Project footprint, which includes all proposed mine infrastructure and facilities, the access road, and accommodations where workers reside while at work.	Encompasses the LSA for the aquatic and terrestrial environments and defines the expected extent of the direct and indirect effects from the project on selected receptors. Includes the spatial extents of potential air quality effects and provides local context for assessing the residual effects.	Encompasses the RSA for the aquatic and terrestrial environments but also includes Lloyd Lake. Provides broader scale context for Project effects and assesses cumulative effects, if applicable.

Environmental compartment	Spatial boundaries		
	SSA	LSA	RSA
Land and resource use*, ** (see figures 3.11, 3.12)	Synonymous with the Project footprint and includes the access road and bridge, all proposed Project infrastructure.	Includes the LSAs for the terrestrial and aquatic environments and human health RSAs, for a total area of approximately 125,679 hectares	Encompasses the RSA for the aquatic and terrestrial environments as well as the traditional territories of the directly affected Indigenous nations and communities and covers an area of approximately 43,577 km2.
Socio-economic environment* (see figures 3.13, 3.14)	Synonymous with the Project footprint and includes the access road and bridge, all proposed Project infrastructure.	Includes the LPA communities that are either along Highway 155 or have close ties to Patterson Lake.	Includes the LSA and the Northern Saskatchewan Administrative district as defined in *The Northern Municipalities Act, 2019.*

*Spatial boundaries selected were influenced by Indigenous and/or Métis Knowledge

** CNSC staff's assessment is broader than provincial borders where applicable and includes any additional information shared by Indigenous Nations and communities

Figure 3.1: Site, local and regional study areas – Air Quality

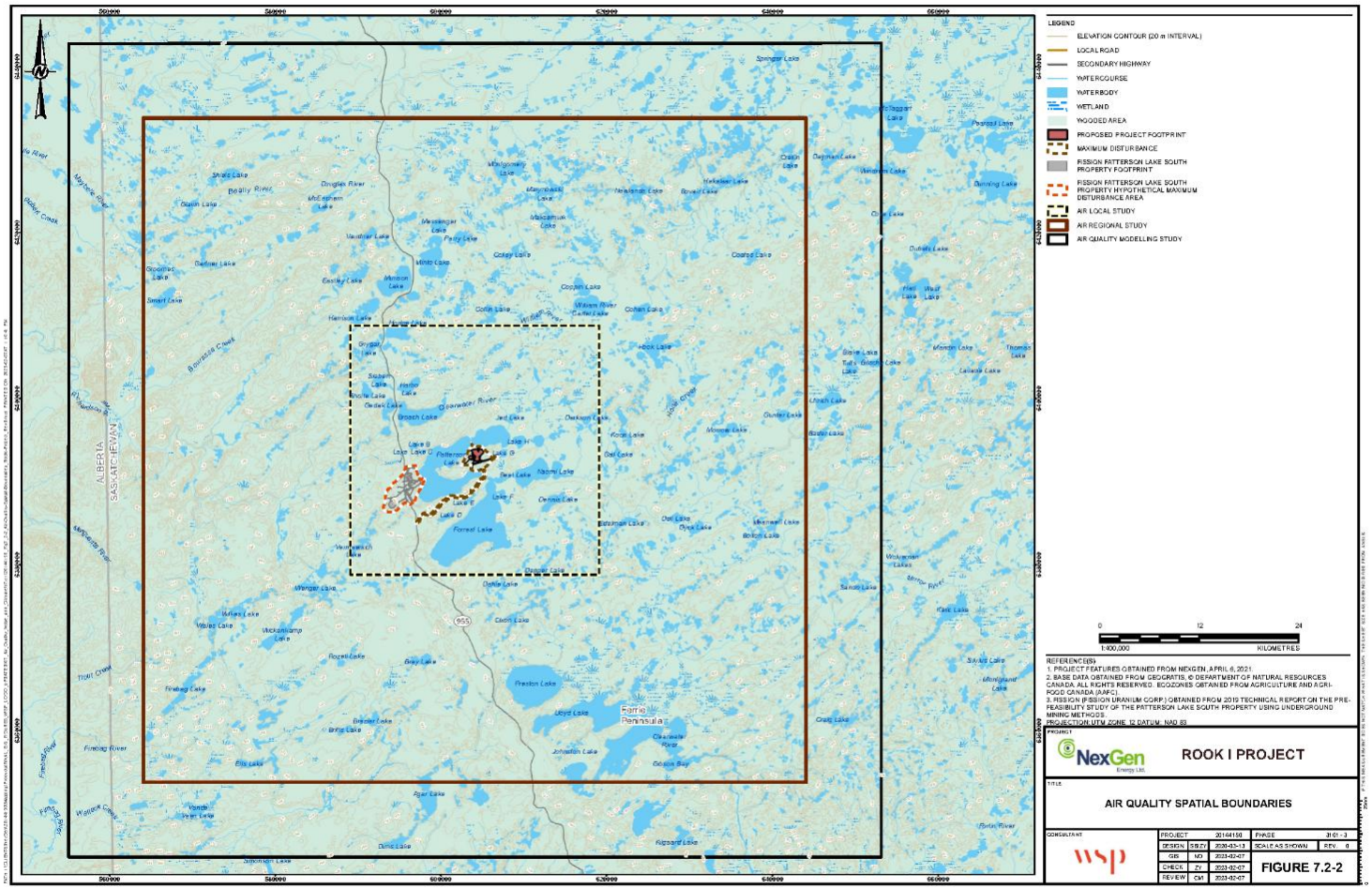


Figure 3.2: Site, local and regional study areas – Noise

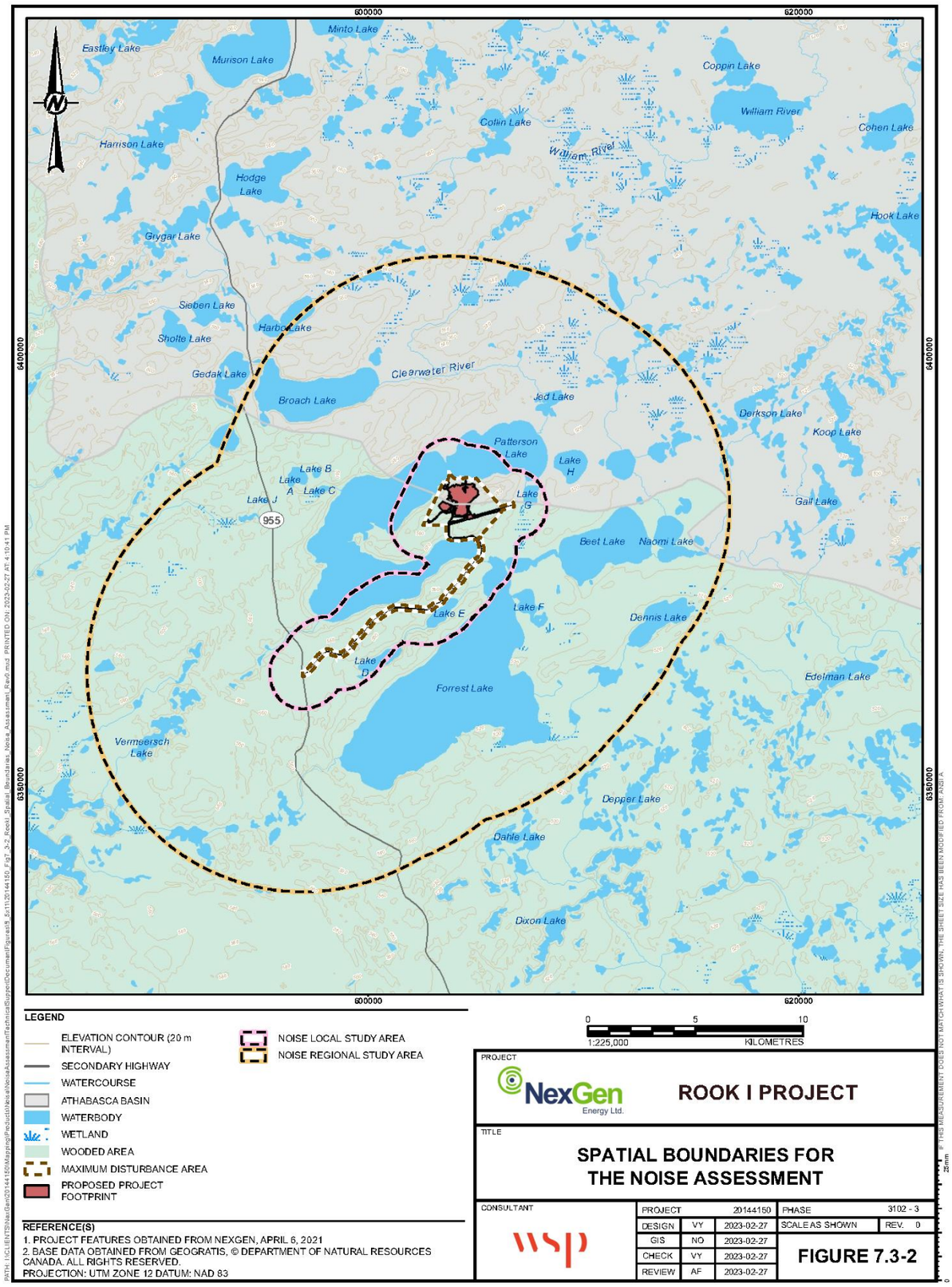


Figure 3.3: Site, local and regional study areas – Hydrology

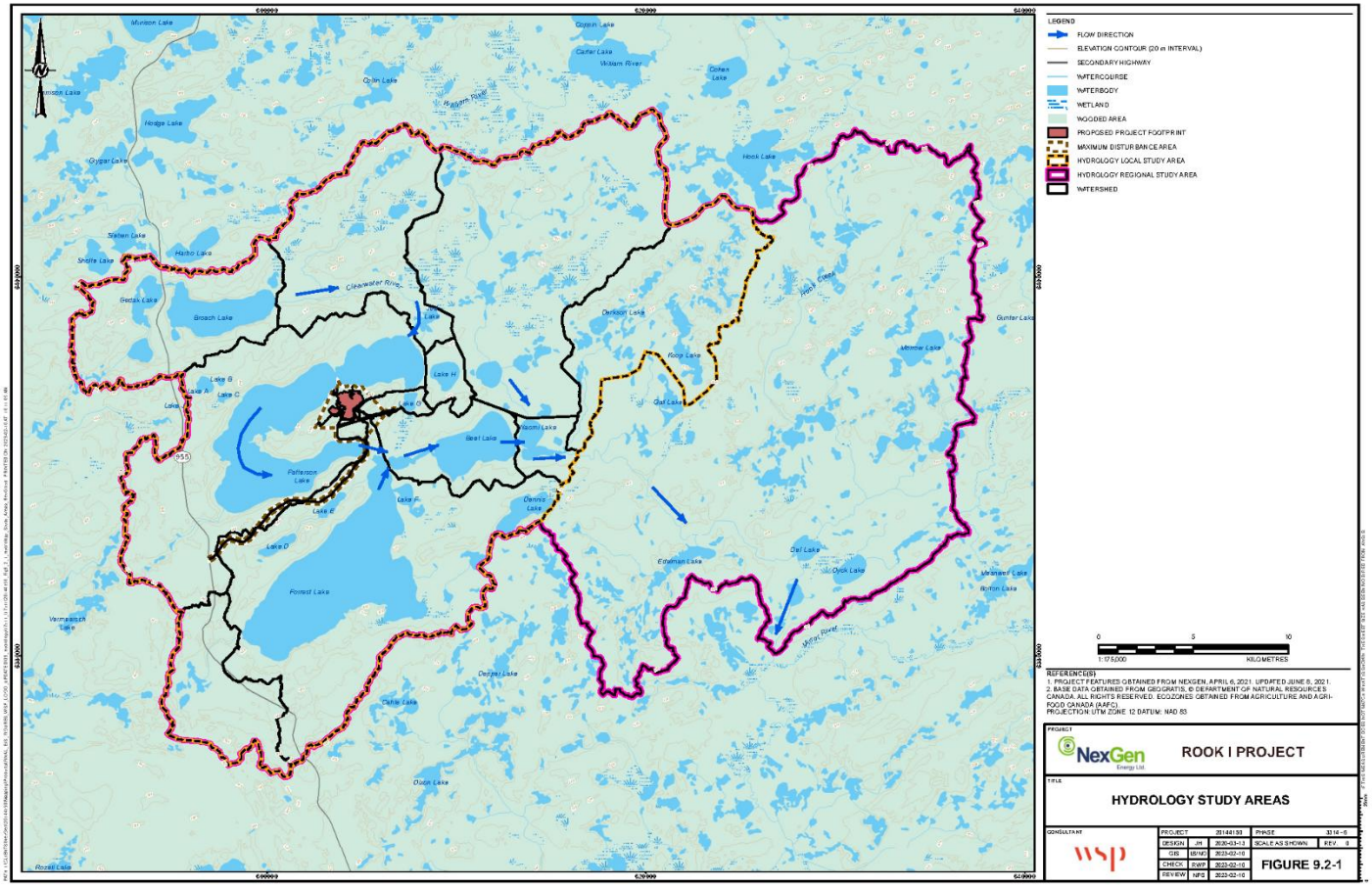


Figure 3.4: Site, local and regional study areas – Hydrogeological

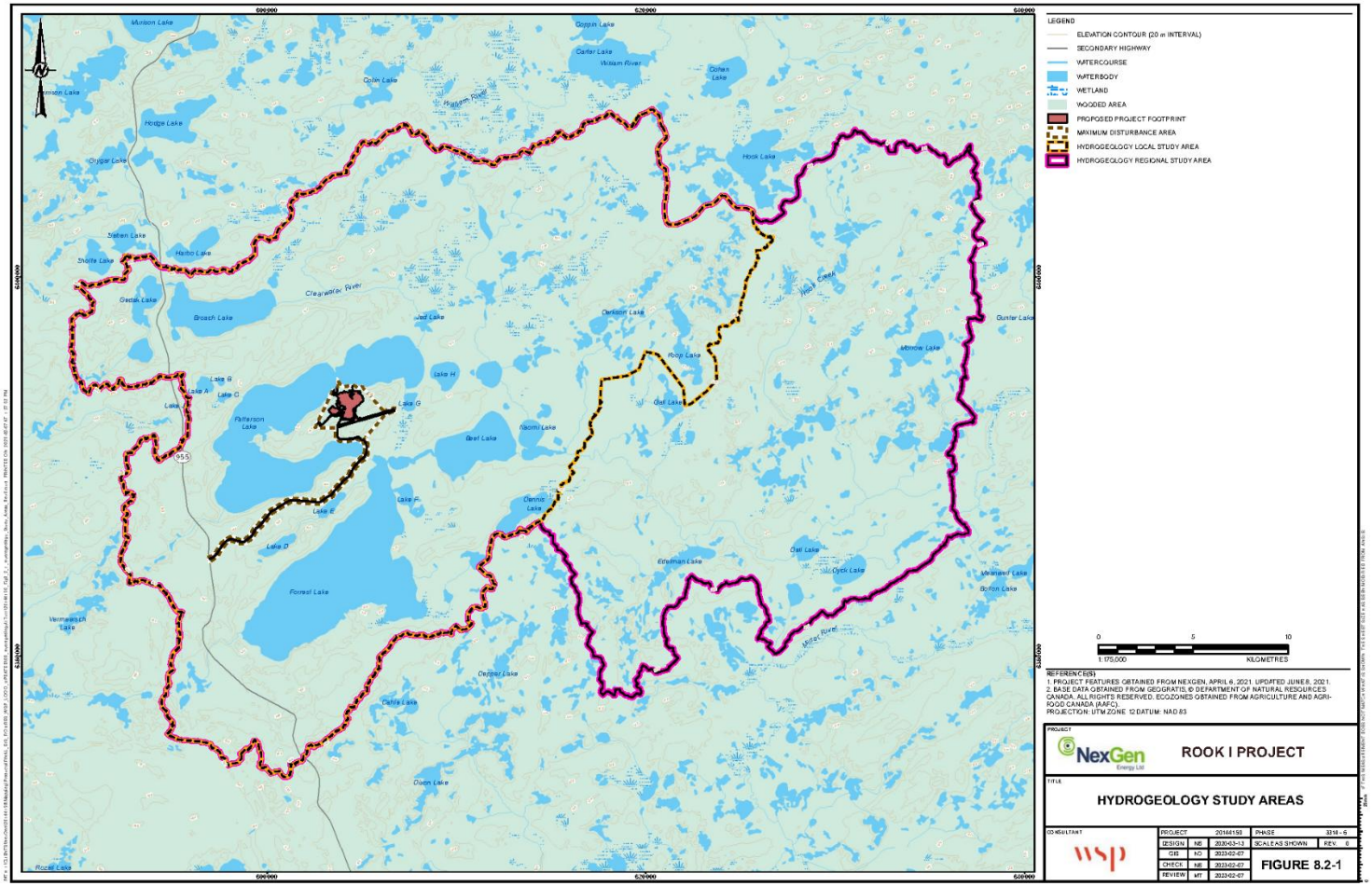


Figure 3.5: Site, local and regional study areas – Water and Sediment Quality

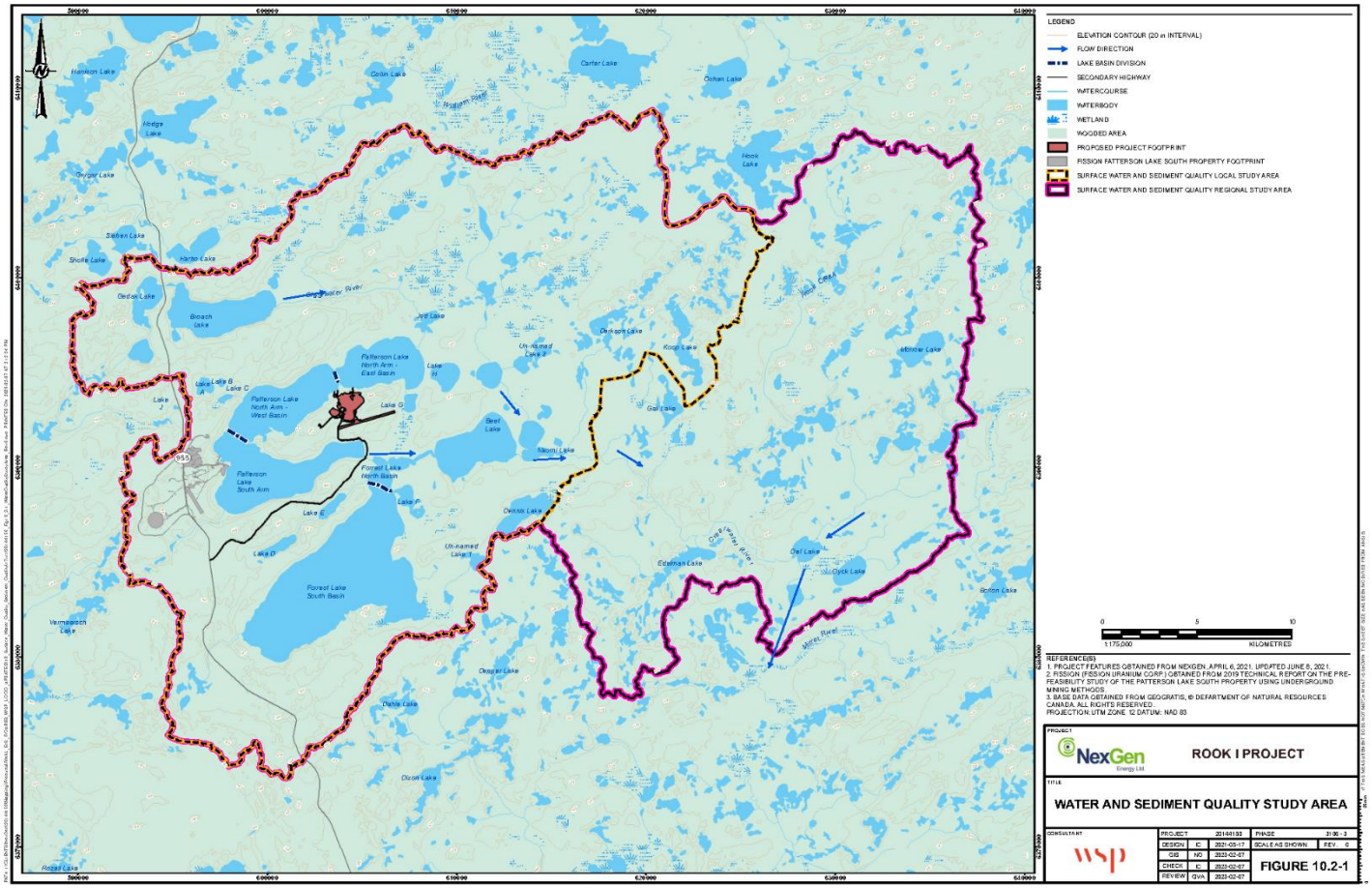


Figure 3.6: Site, local and regional study areas – Fish and fish habitat

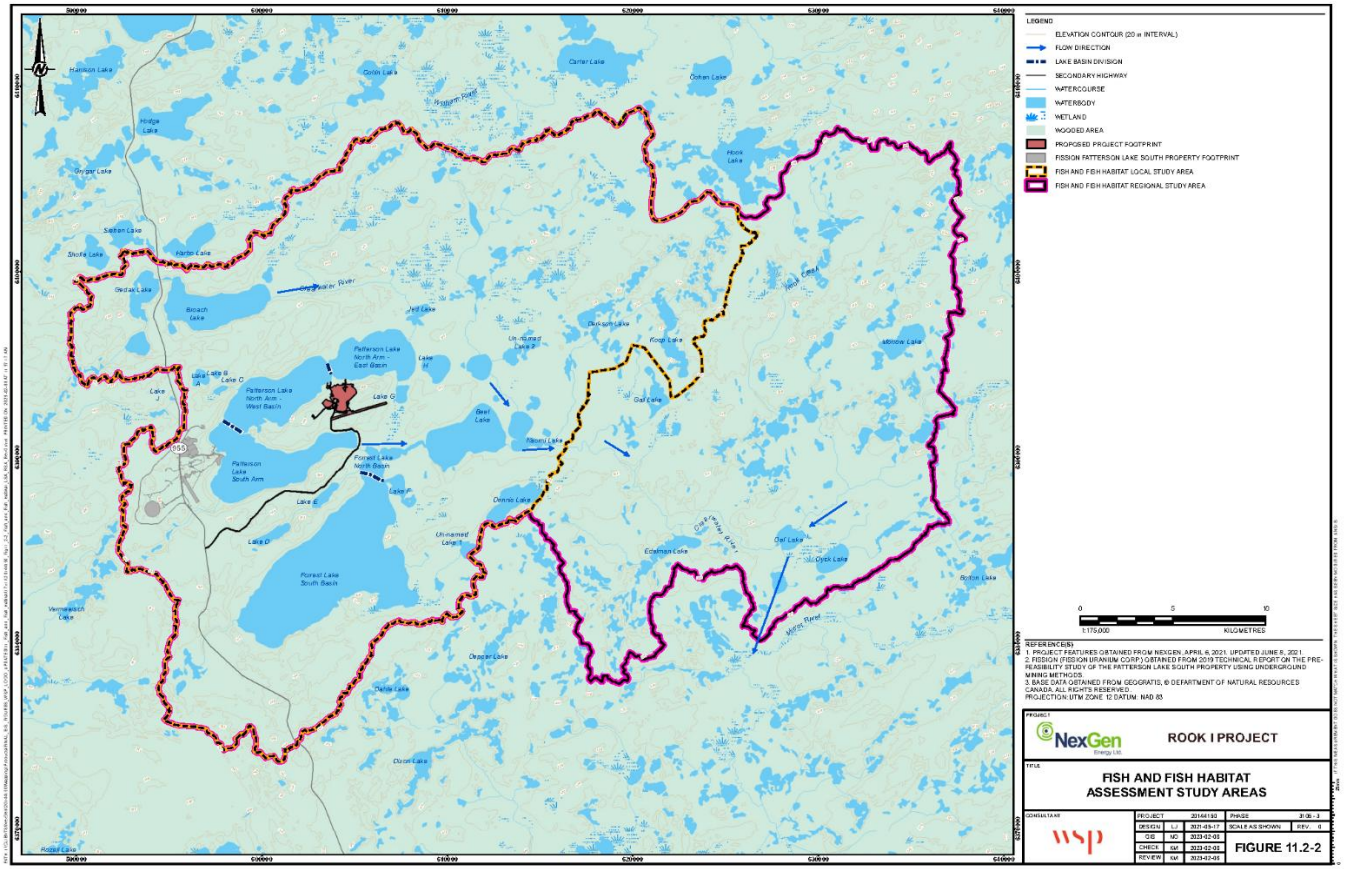


Figure 3.7: Site, local and regional study areas – Terrain and soils

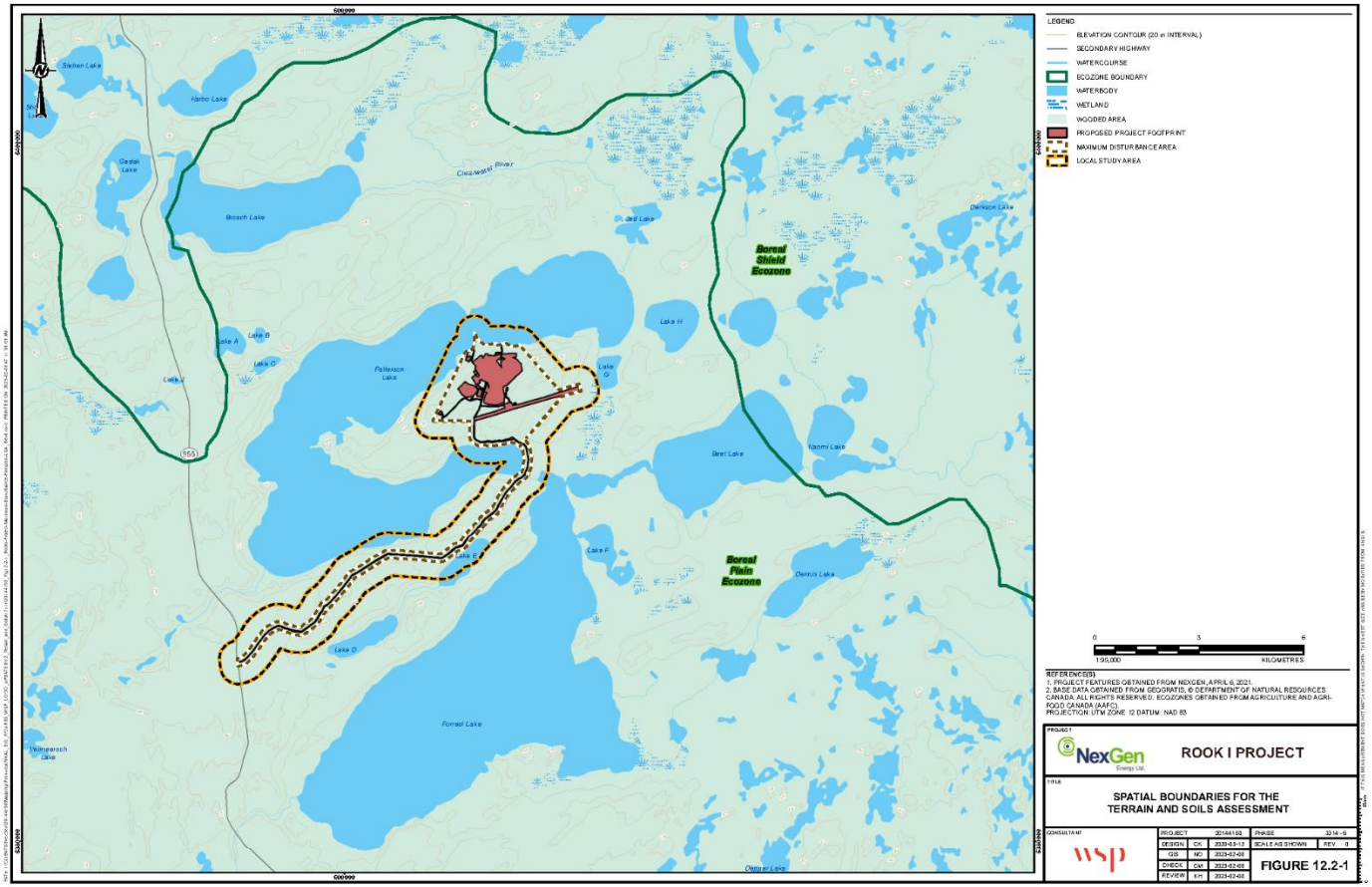


Figure 3.8: Site, local and regional study areas – Vegetation

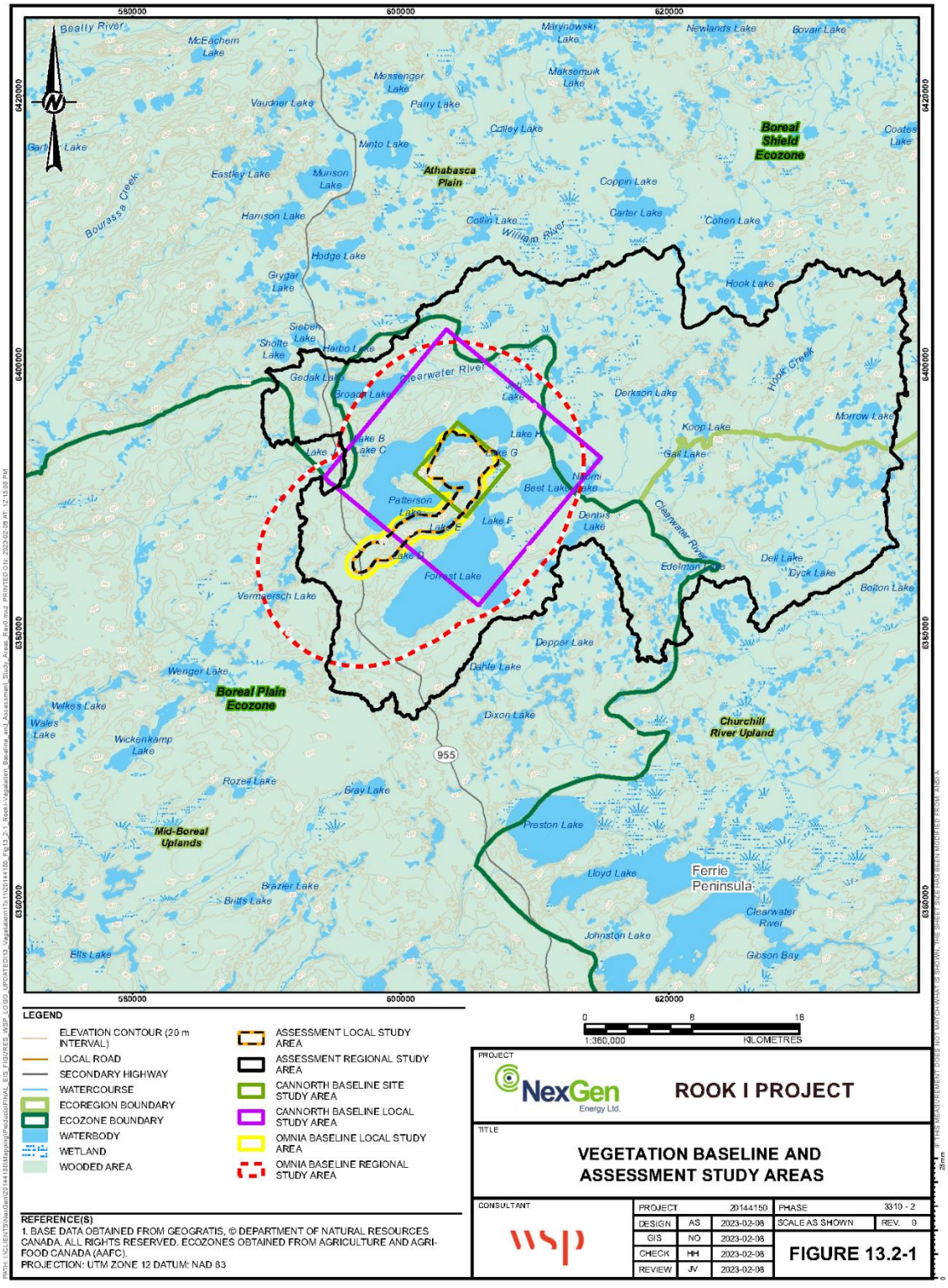


Figure 3.9: Site, local and regional study areas – Wildlife

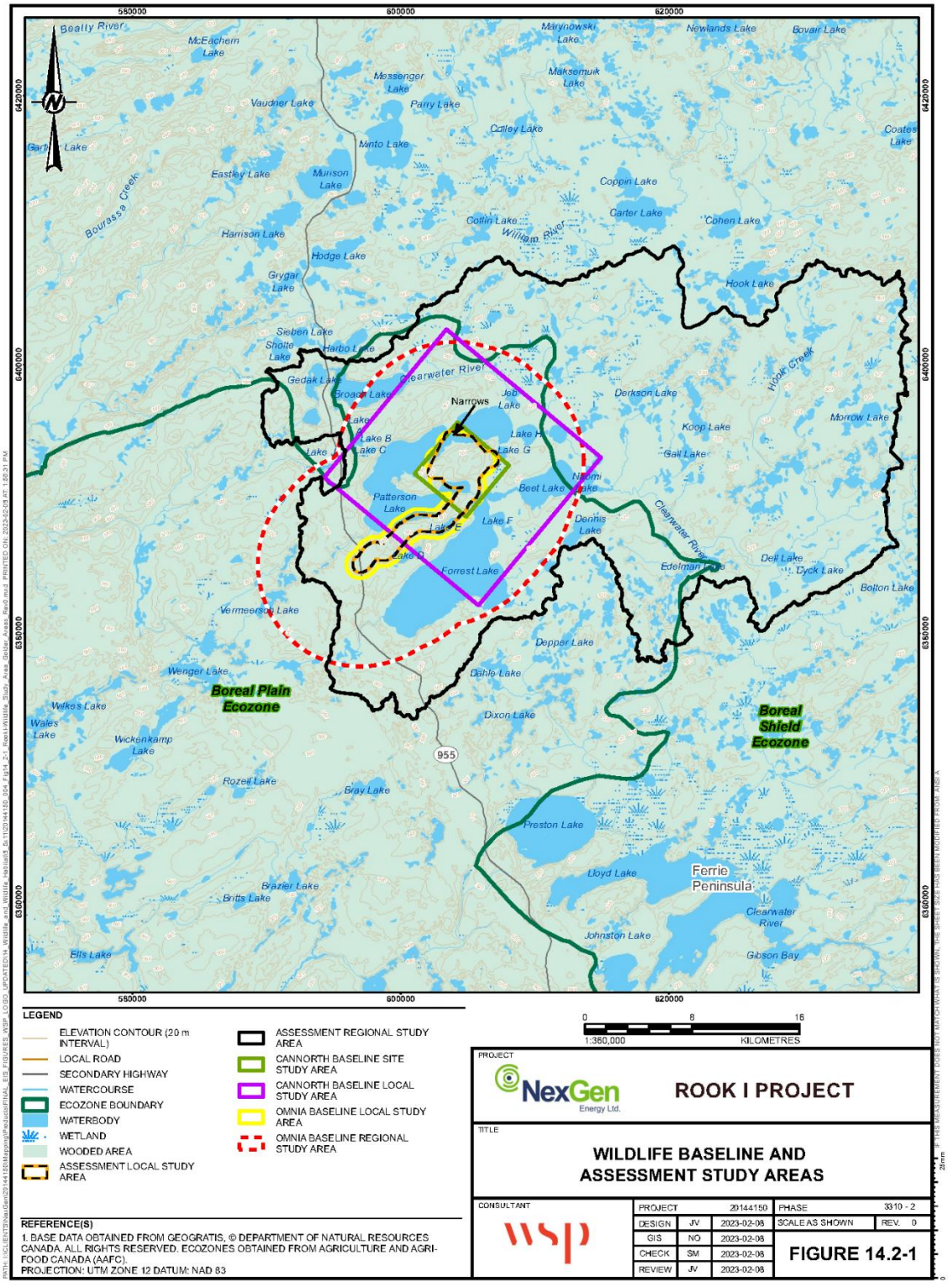


Figure 3.10: Site, local and regional study areas – Human health

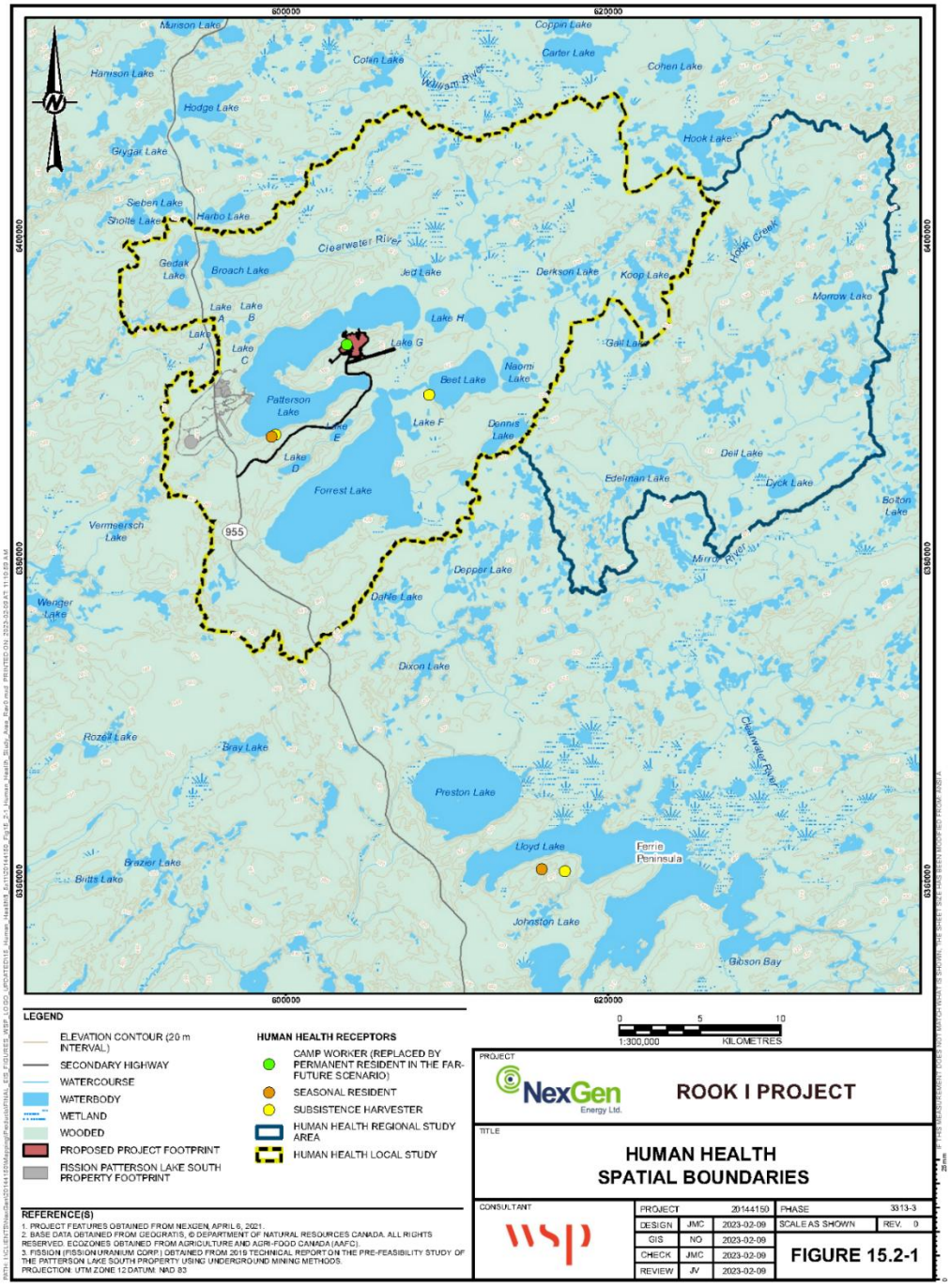


Figure 3.11: Site, local and regional study areas – Indigenous lands and resource use

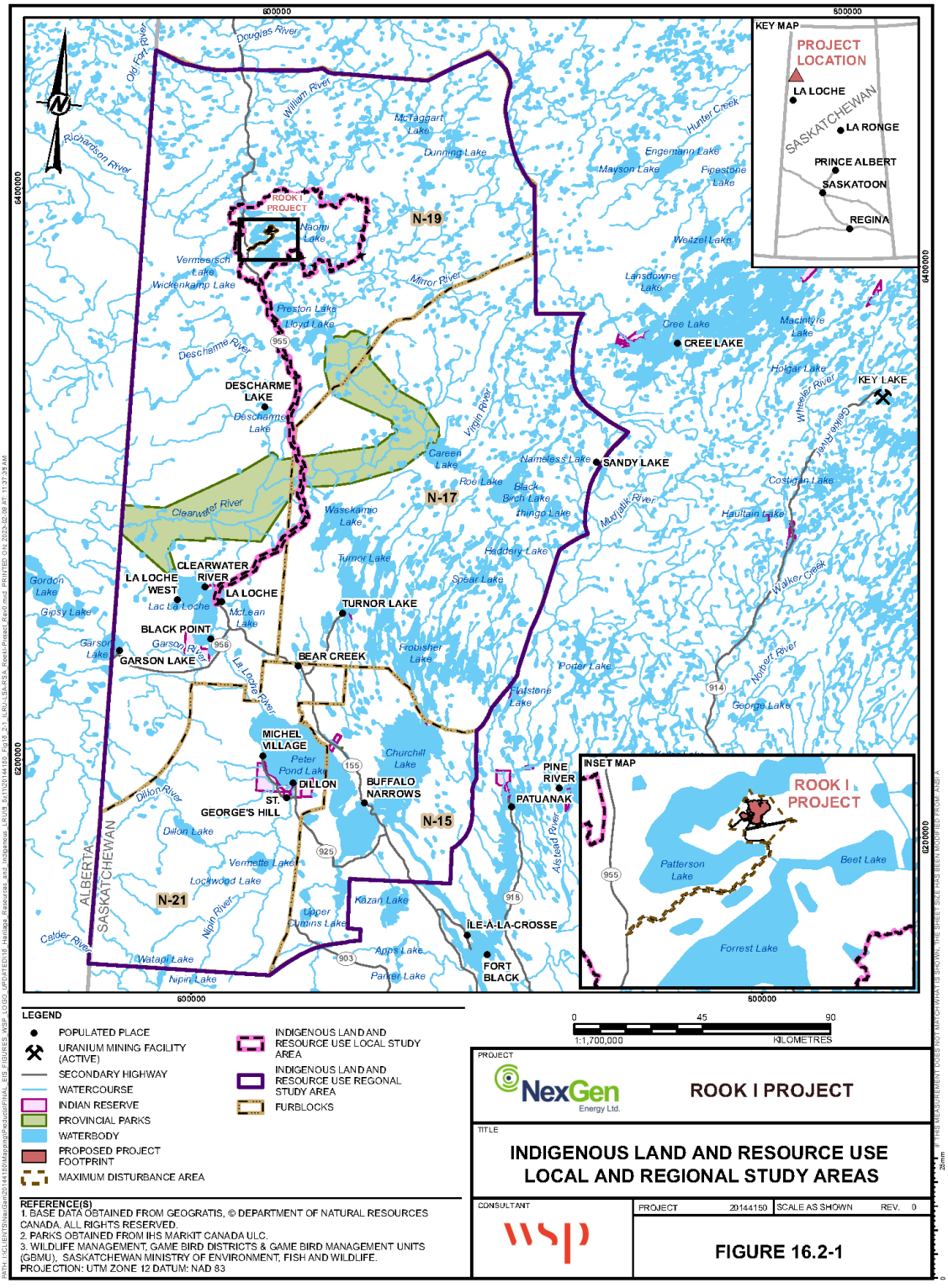


Figure 3.12: Site, local and regional study areas – other land and resource use

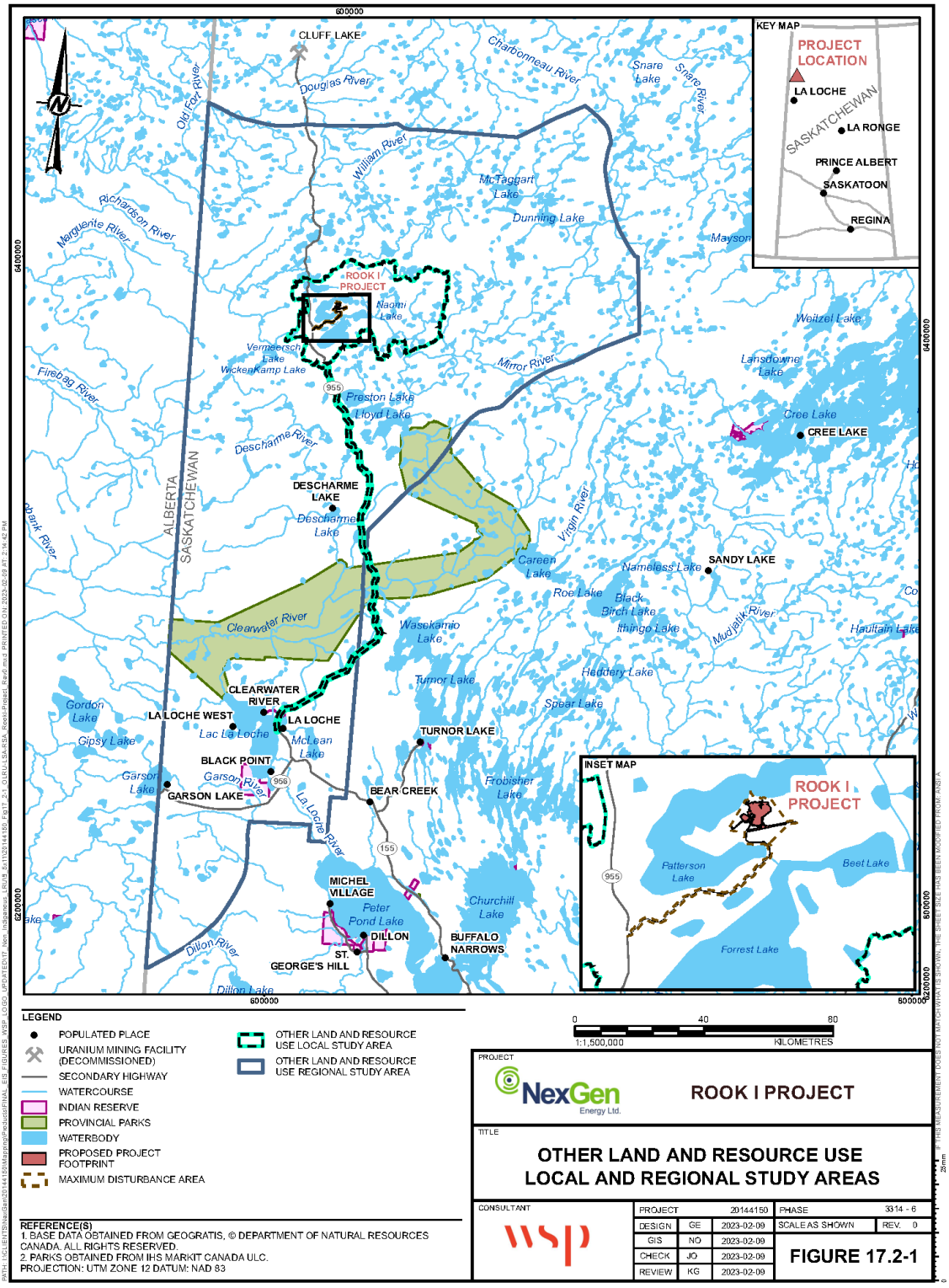


Figure 3.13: Site, local and regional study areas – Economic environment

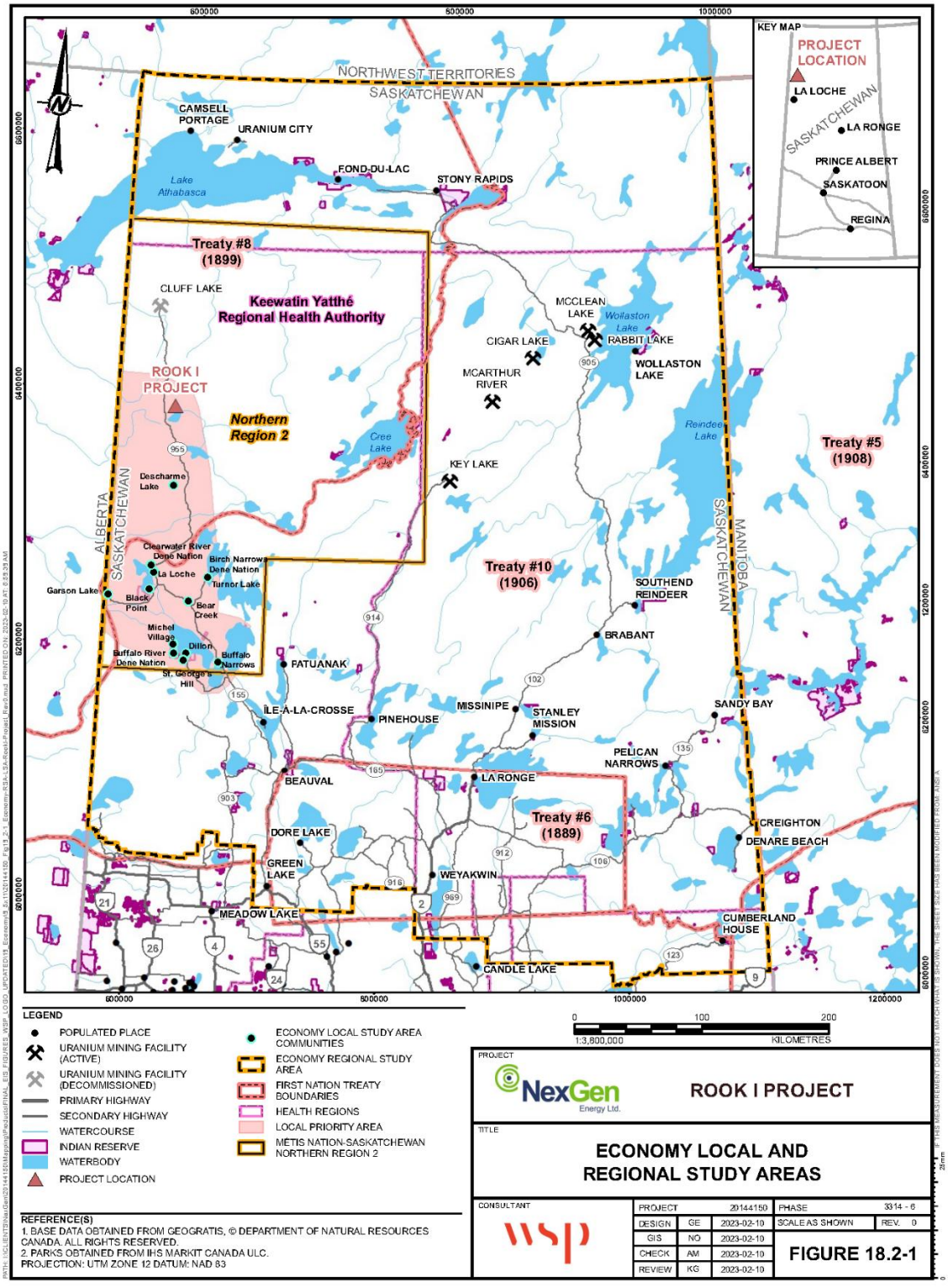
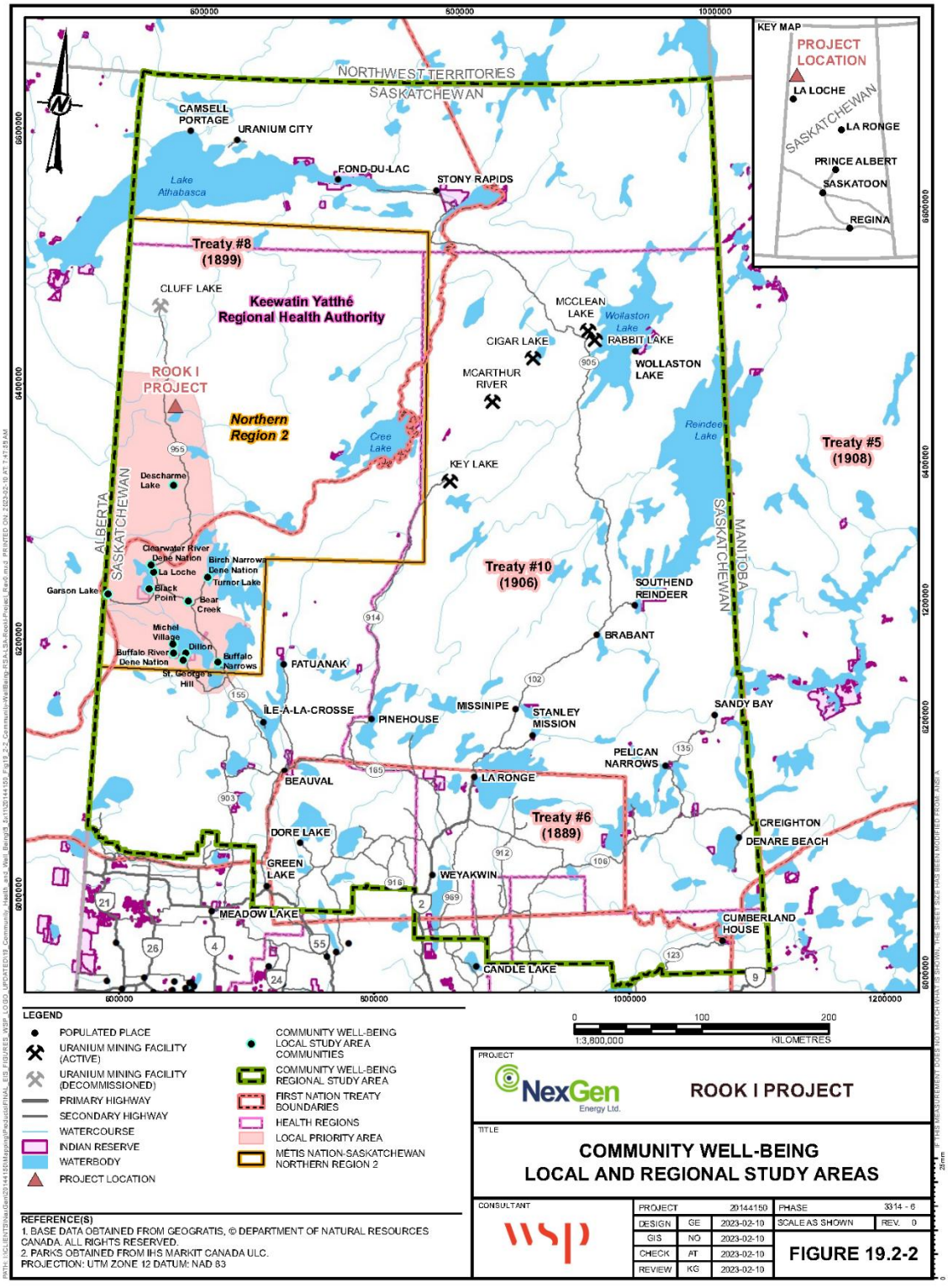


Figure 3.14: Site, local and regional study areas – Community well-being



3.4. Consideration of Indigenous Knowledge

NexGen completed their environment and effects assessment and selection of the VCs considering feedback provided during community information sessions, Joint Working Group (JWG) meetings and engagement with Indigenous Nations and communities including Indigenous Knowledge (IK), Métis Knowledge (MK), and Traditional Land Use Studies (TLUs).

IK and MK were 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. NexGen helped fund and support the completion of community-led TLUs for Indigenous Nations and communities. NexGen worked collaboratively with each Indigenous Nation and community on how their knowledge would be used, managed, and protected and their preferred approach and methods for incorporating IK/MK in the EA.

The IK and MK studies helped NexGen identify and refine their list of VCs for socio-economic and biophysical components during initial JWG meetings, improve understanding of existing conditions for species' habitat and diet preferences, calving areas, 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 Clearwater River Dene Nation (CRDN), Métis Nation of Saskatchewan (MN-S), Birch Narrows Dene Nation (BNDN), Buffalo River Dene Nation (BRDN) and Ya' thi Néné Land and Resource Office (YNLR). CNSC supported and provided funding to Athabasca Chipewyan First Nation (ACFN) to complete a regional IK and TLU study to provide more information about ACFN's land use and interest in the region, including in relation to the Project where appropriate.

NexGen 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 and fish; air and water quality; decreased access to the Project area; noise; potential for accidental release of pollution; specific locations where medicines and plants are gathered; the safety of drinking water downstream of the treated effluent; the UGTMF method and its safety for animals and human health, to name a few.

CNSC's evaluation of NexGen'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 are also included in section 6, section 7, and section 8 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 capture key issues and concerns heard in writing or verbally through technical meetings or engagement and consultation activities, as well as how NexGen will be mitigating or managing such concerns, because 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 RA, 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 NexGen 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 NexGen'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 have 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 NexGen in June 2022, revised draft EIS submitted in May 2024 and Final EIS submitted in November 2024
- NexGen's responses to IRs from the CNSC and the FIRT during the EIS technical review and related supplemental information
- NexGen responses to comments received from the public and Indigenous Nations and communities
- advice from expert federal departments and provincial ministries
- IK/MK and land use studies from CRDN, MN-S, BNDN, ACFN, and YNLR

CNSC staff also reviewed NexGen's Rook I Project Federal Commitments Report (the commitments report), a document that captures all mitigation measures, follow-up monitoring program measures and other commitments made by NexGen 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 NexGen resulted in NexGen incorporating additional mitigation and follow-up monitoring program measures into the revised and final EIS document. NexGen's Commitment Report, which is an evergreen document, will continue to be updated to capture any additional commitments made by NexGen during public hearings, and any actions directed by the Commission to NexGen.

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 using EA Conditions, proposed later in this report and summarized in table 12.1. Should the Commission issue a licence, the Commitments Report will be included in the Licence Control Handbook as part of the licensing basis for the project.

The conclusions from CNSC's review are captured in section 6, section 7 and section 8, for all 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 on NexGen's draft EIS were addressed as part of the EA process. Comments directed to NexGen were addressed and resulted in changes to NexGen'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 NexGen, respectively, are posted on the Canadian Impact Assessment Registry (CIAR) Internet site.

Of the 9 submissions received during the public comment period for the draft EIS, the primary tailingcommenters were Indigenous Nations and communities, except for two submissions (Saskatchewan Environmental Society and Canadian Environmental Law Association). Submissions were received from CRDN, BNDN, BRDN, MN-S, ACFN, YNLR, and the community of Ile-a-la Crosse. 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 the 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 requests made to NexGen 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 because of the analysis, IRs and comments submitted during the EA process.

4. Purpose of the project and alternative means

4.1. Purpose of the project

The purpose of the Project is to construct, operate and decommission a uranium mine and mill. NexGen has indicated that the proposed Rook I would provide uranium supplies for the increasing demands for electricity and help the Government of Canada and Saskatchewan's obligations and commitments regarding renewable energy and lower carbon emission electricity generation.

NexGen undertook an analysis of alternatives to the project to examine different ways to achieve the purpose of the project. NexGen evaluated various energy types (fossil fuels and renewable energy) as well as locations. The analysis served to validate that the preferred alternative is a reasonable approach to meeting the need and purpose of the project.

4.2. Alternative means to carry out the project

"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 NexGen'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 Rook I Project alternative means assessment and CNSC staff analysis and findings. 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 because of the analysis, IRs and comments submitted during the EA process.

4.2.1.1. Mining method

Primary mining method

Two different alternatives for the primary mining (i.e., extraction) method were considered:

1. Open pit
2. Underground

The following criteria were considered during the assessment process:

- Surface area disturbance, potential effect on plant, fish, and other wildlife populations and habitat
- Potential effect on Patterson Lake
- Potential effect on surface or groundwater
- Design and reliability

- Construction risk and complexity
- Operational risk and complexity
- Flexibility to develop new areas
- Operating cost
- Closure cost
- Change in land use
- Worker safety and human health

Alternative 1 (open pit) was eliminated due to the proximity to Patterson Lake limiting the maximum size, and limitations of the ore depth that could be exposed sterilizing a significant portion of the target ore body or requiring a combination with underground mining to recover the full extent of the target ore. Moreover, the stripping ratio would likely be uneconomic, and the design would be complicated by poor ground quality, seepage from Patterson Lake, and the presence of aquifers or high-water tables. Furthermore, underground mining reduces surface disturbance and waste rock volumes compared to the open pit.

Underground mining method

Three alternatives for underground mining method were considered:

1. Caving
2. Long hole stoping
3. Cut and fill

The following criteria were considered during the assessment process:

- Surface area disturbance
- Potential effect on surface water or groundwater
- Design and reliability
- Flexibility
- Capital cost
- Operating cost
- Employment opportunities
- Worker safety and human health

Alternative 2 (long hole stoping) was considered by NexGen to be the most favourable due to its suitability for the geometry of the target or body and flexibility to adapt to changes in the ore body targeting and mining new target areas. Furthermore, long hole stoping minimizes the effects on the surface and tends to be safer than cut and fill, which were aspects valued among Indigenous Nations and communities and local communities.

4.2.1.2. Processing

NexGen assessed the following project alternatives relating to processing:

- Process plant location

- Process stripping method
- Final product type

NexGen considered on-site and off-site process plant locations and selected on-site after evaluating several advantages and disadvantages, including the ability to control the design process and store tailings underground, and the removal of the requirement for high-volume, long-distance ore transport which would result in increased carbon emissions. NexGen selected strong acid stripping, followed by uranium peroxide precipitation as the favorable process stripping method, and U_3O_8 as the final product due to higher quality effluent, easier waste management, and simpler handling requirements for reagents, as well as community concerns regarding health impacts and potential spills of yellowcake.

4.2.1.3. Mine waste storage

NexGen assessed the following project alternatives relating to mine waste storage:

- Mine waste storage – tailings
- Mine waste storage – gypsum
- Mine waste storage – waste rock

Based on alternative assessment and sensitivity analysis, NexGen has decided on underground tailings storage with paste at location U-4 as it does not require a surface storage facility, which generally have a negative perception among Indigenous Groups and local communities, and underground storage complies with best practice for new tailings facilities to minimize the volume of tailings and water placed in external facilities. Underground storage with tailings in UGTMF was selected for gypsum due to lower operational complexity and the potential for gypsum to reduce the binder requirement in the cemented paste tailings (CPT). The storage of gypsum with the tailings stream is considered standard practice in Saskatchewan. For the storage of waste rock, segregated, NPAG unlined, PAG engineered source control and lined storage was selected as it is predicted to have a reduced potential to affect Patterson Lake water quality, and additionally it exceeds Saskatchewan Environment and Resource Management guidelines for waste rock management while achieving lower costs for lining, having the potential to be progressively closed during Operations, and would have reduced potential for requiring long-term water treatment.

4.2.1.4. Supporting infrastructure

NexGen assessed the following project alternatives relating to supporting infrastructure:

- Power supply type
- Fuel delivery method
- Camp location
- Airstrip location
- On-site road alignment

NexGen has selected an on-site liquified natural gas (LNG) power plant for power supply, fuel delivery by truck, the west location for the camp location, the central west-east alignment for the airstrip location, and a southwest alignment for the on-site road. The LNG power plant was chosen to allow NexGen a higher degree of control of the reliability of power supply, maintenance, and outages, as well as for a lower complexity and capital costs compared to connecting to the grid. Furthermore, LNG was selected over diesel as a fuel source based on better air quality and lower GHG emissions. This alternative is a conservative approach for determining effects in the EA while further evaluations are being completed on incorporating a hybrid power system with renewable energy, which if implemented, would result in fewer environmental effects. Fuel delivery by truck was selected based on lower costs, less surface area disturbances, and more feasible logistics compared to the alternatives of air or pipeline transport. The west camp location was selected to reduce the overall Project disturbance area, while the central west-east airstrip alignment was selected to minimize cut and fill construction requirements and limit effects on additional watersheds, and due to its proximity to other infrastructure without limiting potential future expansion. The southwest on-site road alignment was chosen primarily due to the higher percentage of existing roads and trails that could be utilized, and to avoid technical challenges associated with the northeast alignment requiring construction and maintenance over steeper grades and/or multiple switchbacks.

4.2.1.5. Water management

NexGen assessed the following project alternatives relating to water management:

- Effluent treatment technology
- Treated effluent discharge location
- Fresh water supply – source
- Fresh water supply – location
- Sewage treatment technology

NexGen has selected two-stage precipitation using lime as the effluent treatment technology due to its simple and reliable design, its robustness and adaptability to changing conditions while meeting environmental protection requirements in terms of water quality and discharges to Patterson Lake. The effluent discharge location of the North Arm – West Basin at optimal depth was selected as it best aligns with feedback from Indigenous Nations and communities on avoiding key fish habitats and installations around the shorelines of Patterson Lake. The simulated optimal depth of approximately 10 m is estimated to have favorable ambient currents to promote mixing, and the pipeline alignment would intersect a section of shoreline that is not suitable for fish spawning except for yellow perch, where the spawning habitat is only marginally suitable. Fresh water supply will be sourced from Patterson Lake surface water as this will reduce traffic, GHG emissions, and operating costs despite the higher complexity of construction compared to trucking and will be more reliable in the long-term than deep groundwater. The location for the source was selected as North Arm – East Basin, ~700 m from shore due to lower risk of potential influence from treated effluent discharge and higher anticipated operational reliability compared to alternatives. A sewage lagoon was selected as the

sewage treatment technology due to simple and reliable design during construction and operation, ease of expansion, and relatively low health and safety risks to workers.

4.2.1.6. Conventional waste

NexGen assessed the following project alternatives relating to conventional waste:

- Domestic waste
- Industrial waste
- Hazardous waste
- Low-level radioactive waste (LLRW)

NexGen selected on-site incineration as the primary waste disposal method for domestic waste, industrial waste, and LLRW, as the availability of off-site facilities to accept various waste types/volumes could not be confirmed at the time of the assessment. Based on information available, this method provides relatively greater certainty and flexibility for managing this waste stream and was deemed the most conservative for the purposes of NexGen's EA. Off-site repurposing/recycling was selected as the primary hazardous waste disposal method due to feedback from local communities encouraging NexGen to decrease the amount of material requiring disposal in a landfill. Disposal options for all types of waste will be reconsidered, as necessary, as the Project advances and additional information becomes available.

4.2.1.7. Decommissioning demolition waste

NexGen assessed the following project alternatives relating to decommissioning demolition waste:

- Clean waste
- LLRW
- Hazardous waste

NexGen selected underground disposal for both clean waste and LLRW, as Indigenous Nations and communities and community feedback value backfilling material underground to minimize effects on the surface. Furthermore, the future availability of off-site disposal and/or recycling could not be confirmed at the time of the EA. Off-site disposal was selected as the primary method for the decommissioning and disposal of hazardous waste. As the project advances, and additional information becomes available, options will be reconsidered as necessary. OBJ

4.2.2. Views Expressed

NexGen held technical meetings with concerned Indigenous Nations and communities which included specific discussions on potential Project alternatives. NexGen considered information provided by Indigenous Nations and communities in the alternatives assessment for the Project. Key themes NexGen considered in the alternatives assessment included environment, health and safety, traditional land and resource use, community well-being, and socioeconomics as discussed in Section 4 of the Rook I EIS.

4.2.3. CNSC Staff Findings

In collaboration with the FIRT, CNSC staff reviewed NexGen'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. Based on its review of NexGen's analysis, CNSC staff are satisfied that NexGen 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. Geographic setting

The area of the proposed Rook I Project is currently subject to activities supporting regional exploration programs, environmental baseline and monitoring programs for the proposed Project, and field investigation programs to support Project design. NexGen currently has an exploration camp with access to a maintenance shop, laundry facility, first aid tent, sewage treatment plant, and water treatment plant. Power is supplied by diesel generators. A trail from the existing exploration camp to the Arrow laydown allows all season access to the area of the Arrow deposit. There is a drum storage tent and a temporary storage tent at the laydown area. The area of the proposed Project also includes fuel storge, silt fencing, and a fire suppression sprinkler system established during the fire season.

5.1. Biophysical environment

The Rook I Project is proposed to be located within the southern Athabasca Basin adjacent to Patterson Lake, along the upper Clearwater River system which drains to the Mackenzie River watershed. The project area is characterized by a sub-arctic climate. Winters are long and cold, and mean ambient temperatures range from -18°C in February to a high of 17°C in July. The area surrounding the project is characterized by drumlins, lakes, wetlands, rivers, streams, and muskegs with ground surface elevations ranging from 583-480 metres above sea level (masl). The area of the proposed Project contains approximately 92 active mineral dispositions, issued to 12 companies. The Arrow deposit is estimated to contain a total of 209.6 million pounds triuranium oxide (U_3O_8) contained in 2,183 kilotonnes grading 4.35% U_3O_8. The cumulative thickness of the units overlying the basement rock at the Arrow deposit is between 90 m and 120 m, with approximately 60 m of glacial overburden overlying sedimentary rocks with some bedrock outcroppings.

The Project is located within the Boreal Plain Ecozone of the Mid-Boreal Uplands Ecoregion, while the broader region of the Project intersects the Boreal Shield and Boreal Plain ecozones. Commonly harvested species in the area include moose, black bear, and beaver. Fish species in the area are characteristic of northern temperate waterbodies and watercourses in Saskatchewan.

Groundwater flow directions in the glacial drift are predominantly toward local surface water and drainage features, with flow in the proposed underground mine being towards Patterson Lake. There is a divide south of the Project site where groundwater flows north to the north of the divide, and south to the south of the divide, with both ultimately discharging to Patterson Lake. Lateral flow in shallow bedrock is predominantly from west to east, with flow towards the south in the northern Project area. Generally local groundwater flow is similar between shallow

bedrock and glacial drift. Groundwater flow in deep bedrock is predominantly from west to east, and towards Paterson Lake local to the proposed underground infrastructure. The vertical groundwater flow direction is downwards in high topography of the Project site, transitioning upwards in the area of the proposed underground mine and UGTMF.

Air quality within the LSA and RSA was established through baseline field study and desktop study. Measured sulphur dioxide, nitrogen dioxide, and particulate matter (PM)2.5 concentrations generally remained below annual provincial standards. $PM_{2.5}$ only occasionally exceeds 24-hour provincial standards from wildfire smoke, and local activities may contribute to short-term ambient sulphur dioxide levels above the Saskatchewan Air Quality Model Guideline. Modelling background concentrations of PM2.5, PM10, total suspended particulates, carbon dioxide, nitrogen dioxide, and sulphur dioxide indicated concentrations characteristic of a rural setting and close to or lower than prescribed levels.

5.2. Human environment

Within Saskatchewan, the proposed Project is located 41 km north of Clearwater River Provincial Park, 141 km south of Athabasca Sand Dunes Provincial Park, and 29 km north of Preston Lake Wildlife Refuge. The Clearwater River has been designated as part of the Canadian Heritage River Systems. The Project is located 38 km east of Marguerite River Wildland Provincial Park and 51 km southeast of Richardson River Dunes Wildland Provincial Park in Alberta. The proposed Project site is north of the inactive commercial forestry zone and 80 km south of the Cluff Lake Mine, which closed in 2002. The Cluff Lake Mine is in a long-term monitoring and maintenance phase. Currently, only 0.5% of the area encompassing the Patterson Lake watershed surrounding the Project has been influenced by human developments. Paladin Energy Limited (formerly Fission Uranium Corp.) has proposed the Patterson Lake South Property, which is planned to also be located on Patterson Lake, approximately 5 km from the proposed Project. The proposed Project is located on Provincial Crown Land within Treaty 8 territory and the Métis Homeland, and adjacent to Treaty 10 territory. The closest federal lands to the Project are Clearwater River Dene Band 222 (120 km south), English River First Nation Cable Bay Cree Lake 192M and 192N (130 km southwest), Cree Lake 192G (130 km southwest), Turnor Lake 193B (135 km southeast), and Clearwater River Dene Band 221 (140 km south). The local priority area (LPA) consists of communities closest to the Project that would experience most of the Project effects and for which NexGen would prioritize employment opportunities. As of 2016, 96% of residents within the LPA were identified as being Indigenous.

The Project is located within the SK2 West administration for woodland caribou and adjacent to the boundary of the SK1 caribou conservation unit. Large-bodied fish in the area are commonly targeted by recreational and subsistence fishers. This includes Arctic grayling, burbot cisco, lake trout, lake whitefish, longnose sucker, northern pike, walleye, white sucker, and yellow perch.

6. Predicted changes to the environment

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, particulate matter (PM2.5 and PM10), NO_2, SO_2, CAAQs, due to project activities during construction and operations phases, and mobile and stationary combustion sources during closure phase.
- Increase in noise, including exceedances of federal guidelines (i.e., ECCC and HC).

CNSC staff assessed and concurred with NexGen'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 Greenhouse Gas Emissions (GHG)

NexGen estimated the direct and indirect Project GHG emissions as a transboundary effect utilizing the methodologies outlined in ECCC's 2021 Draft Technical Guide Related to the Strategic Assessment of Climate Change (SACC Technical Guidance) 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 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 (0.02%) and provincial (0.3%) emissions.

6.1.1. Description of the existing atmospheric and acoustic environments

The local study area (LSA) for the air quality assessment was defined as a 90,000 ha (900 km2) area centred on the Project. The LSA is the area within which air quality effects due to the Project may be highest and can be predicted or measured with reasonable certainty. The LSA encompasses the local lakes surrounding the Project (e.g., Patterson Lake, Broach Lake, Jed Lake, Forrest Lake, Beet Lake, Naomi Lake) that are important to the assessments of other disciplines.

6.1.1.1. Atmospheric environment

Project-related activities can alter air quality through the emissions from fossil fuel combustion and mining and milling activities. Changes in air quality could influence biophysical VCs and intermediate components (i.e., surface water and sediment quality, fish and fish habitat, terrain and soils, vegetation, and wildlife and wildlife habitat) and socio-economic VCs (i.e., human health, Indigenous land and resource use, and other land and resource use). The baseline monitoring program included particulate matter (i.e., TSP, PM10, PM2.5), NO_2, CO, and SO_2. Regional air quality monitoring data from other programs at four remote locations outside the air dispersion modelling domain were used to supplement data collected in the LSA and were used to additionally characterize baseline air quality conditions. Background concentrations of the

compounds being evaluated are indicative of a rural setting, relatively unaffected by outside influences on air quality.

Assessment criteria for potential air quality effects (table 7.2-1) and adopted background measurements (table 7.2-9) are presented in the EIS and will allow for a comparison once activities take place within the project area. Criteria air contaminants (CACs) that have applicable provincial or federal ambient air quality criteria and would be emitted directly from the project include nitrogen oxide (reported as NO_2), sulphur dioxide (SO_2), sulphuric acid, carbon monoxide (CO), particulate matter (PM)2.5, PM10, and total suspended particles (TSP).

6.1.1.2. Acoustic environment

An assessment of noise was conducted by delineating a maximum disturbance area around the Project footprint (site study area) consisting of 228 ha, with a maximum disturbance area of 981 ha, a local study area (LSA), consisting of 6,629 ha, and a regional study area (RSA), consisting of 61,544 ha. The LSA and RSA are composed of primarily forested landscape interspersed with water bodies and wetlands. Existing anthropogenic noise was characterized to be mainly from Highway 955, mineral exploration activities, recreational uses such as hunting and fishing, and Indigenous land and resource use.

A baseline noise survey was undertaken at three locations within the LSA and RSA to measure ambient noise levels: north shore of Forrest Lake, south shore of Patterson Lake, and general forested area. Baseline average noise levels (Health Canada, 2017) measured at these locations were 33 dBA, 46 dBA, and 30 dBA, respectively. These measurements consider daytime and nighttime noise levels, with a 10 dBA adjustment to the nighttime noise value to account for higher disruptiveness than daytime noise (Health Canada, 2017). Primary contributors to ambient noise levels were identified to be birds, wind in vegetation, power boat and fishermen, and wildlife activity such as footsteps, howling and vocalizing.

6.1.2. Proponent's assessment

NexGen's assessment considered air quality and the acoustic environment as intermediate components that were evaluated to facilitate the assessment of potential effects of the Project on receptor VCs. Air quality and acoustic environment assessments provided information that was used to support VC assessments, such as human health, surface water and sediment quality, wildlife and their habitat, Indigenous and other land and resource uses. Intermediate components are not assessed for significance.

NexGen 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 sections 7.2 and 7.3.

6.1.2.1. Air quality

Existing air quality conditions in the Project Area have been established by NexGen through field studies and predictions 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. Air quality from the Project and from the Patterson Lake South Property (RFD case) proposed by Paladin Energy Limited (formerly Fission Uranium Corp.) is predicted to result in detectable changes from existing conditions. However, most of the CACs (i.e., nitrogen dioxide, sulphur dioxide, sulphuric acid, carbon monoxide, and PM2.5) are predicted to remain compliant with the SAAQS throughout all phases of the Project within the RSA.

Short-term concentrations of 24-hour PM10 and 24-hour TSP are predicted to be above the SAAQS, but the exceedance frequencies remain low, and the exceedance areas are localized to the Project. For example, the maximum frequency of exceedance of 24-hour PM10 is 2.7% (10 days per year) and occurs during Construction. Maximum exceedances predicted in areas outside of the disturbance area, where PM10 concentrations are higher than the SAAQS, are 279.1 ha during Construction. The maximum distance from the exceedance area to the disturbance area is 1,185 m for Construction.

Residual effects were predicted to be in a negative direction, reversible, continuous (duration 4 years during construction, 24 years during operations, and 5 years during active closure), and with a high probability of occurrence. 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, NexGen anticipates that air quality will be managed throughout all Project phases. Therefore, NexGen determined that the Project residual effects to air quality would not result in a significant effect to any VC (table 6.1).

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

Constituents of Potential Concern	Averaging Period	Criteria	Construction		Operation	
			Max. Off-Property Conc.	% Of Criteria	Max. Off-Property Conc	% Of Criteria
Total suspended particulates (TSP)	24-hour	100 µg/m³ (SAAQS/ AAAQO)	170.9 µg/m³	265.3%	94.8 µg/m³	94.8%
Particulate matter (PM_{10})	24-hour	50 µg/m³ (SAAQS/ AAAQO)	132.6 µg/m³	256%	51.0 µg/m³	102%
Nitrogen dioxide (NO_2)	1-hour	79 µg/m³ (CAAQS 2025)	218.6 µg/m³	276%	141.9 µg/m³	179%

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)

6.1.2.2. Acoustic environment

The proponent's results suggest that noise levels during construction and operations at the nearest receptor location (R-48) which is closest to the mine site, are predicted to be slightly higher than the existing (baseline) values but comply with the ECCC (2009) and HC (2017) guidance levels. For the farthest receptor location (R-07), which is farthest from the mine site in a north-east direction, noise levels during construction and operations are predicted to be well below the measured baseline and lower than the ECCC (2009) and HC (2017) guidance levels. When cumulative noise levels from the potential Patterson Lake South Property, that is approximately 7 km away, are considered in combination with either Project construction or operations activities, noise levels are predicted to be compliant with HC and ECCC guidance for receptors in the RSA.

An analysis of the predicted noise levels at the nearest (high noise) and farthest (low noise) receptor locations and the noise thresholds published by ECCC (2009) and HC (2017) are provided in table 6.2 below. Cumulative noise levels from the project construction/operations have also been included for comparison purposes.

Table 6.2: Predicted noise levels at the nearest and farthest receptors compared with noise regulatory guidance/thresholds.

Projet phase	Nearest (high) noise receptor (R-48), dBA***	Farthest (low) noise receptor (R-07), dBA	ECCC Noise Threshold	Health Canada Sleep Disturbance Analysis
Existing (baseline)	39	26	45	40
Construction	41	14	45	40
Cumulative – construction	43	26	45	40
Operations	41	7	45	40
Cumulative – operations	43	26	45	40

*ECCC (2009). Environmental code of practice for metal mines. Daytime and nighttime noise levels averaged, with 10 dBA adjustment for nighttime noise levels.

**Health Canada (2017). Guidance for evaluating human health impacts in environmental assessment – Noise.

***There are no receptors at location R-48 who may sleep, so HC sleep disturbance threshold does not apply

6.1.2.3. Atmospheric Residual Effects and Monitoring

Residual effects for construction and operation phases are expected to be most apparent as compared to the closure phase. These residual effects are predicted to diminish following the active closure stage and are predicted to be similar to levels measured during existing (baseline) conditions. The proponent has proposed monitoring, follow-up, and adaptive management

measures to verify if environmental noise levels are consistent with or less than model predictions in the EIS and confirm if the air quality and noise emissions, propagation modelling, and other assumptions used in the EIS were reasonable. Monitoring will also be conducted to verify compliance with regulatory noise thresholds (ECCC 2009, HC 2017, etc.) and to confirm air quality EIS predictions and the absence of clear tonal components in noise emissions, or provide information to inform additional mitigation measures, if necessary (adaptive management). Follow-up monitoring will also be done to identify unanticipated negative effects on the environment.

NexGen proposed that noise levels would be measured at a minimum of three terrestrial receptors (locations) for a 24-hour period using integrating sound level meters. The current baseline monitoring program that monitors meteorological parameters, nitrogen dioxide, sulphur dioxide, TSP, and PM2.5 would be continued, likely with some modification through the licensing and provincial permitting processes, through all phases of the Project.

Finally, Environmental Committees (one per primary Indigenous group in the area) composed of NexGen and Indigenous group representatives would be established to provide oversight on the environmental performance of the project and to verify that regulatory and environmental performance commitments for the project are implemented.

6.1.2.4. Potential mitigation measures

NexGen 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 NexGen and have concluded that they are adequate to manage potential adverse effects to air quality and noise. Mitigation measures for air quality and noise proposed by the proponent for each of the project components / activities are summarized in table 6.3 and table 6.4.

Table 6.3: Proposed mitigation measures to address effects on air quality.

Construction and Operations Phases
▪ Primarily use LNG, which generates lower emissions per unit of energy produced than diesel, for on-site power generation
▪ Evaluate opportunities to reduce fuel combustion requirements of infrastructure and equipment, to the extent practical, during detailed design
▪ Optimize haul routes to reduce fuel consumption and emissions from equipment
▪ Recover heat from the LNG power plant exhaust and use to heat other process and ancillary buildings, to the extent practical
▪ Use pollution control technology on process plant exhaust stacks with preventative maintenance and stack testing, as well as adaptive management, if necessary
▪ Use Tier 4 diesel mobile equipment for underground operations, whenever practical, with applicable mine ventilation airflow rates specified by Canada Centre for Mineral and Energy Technology, when available
▪ Apply water and/or suppressants to site roads, access road, and airstrip, as necessary

▪ Use dust suppressants that minimize environmental risk and are government approved for use
▪ Limit idling of vehicles and equipment to the extent practical
▪ Limit vehicle speed on unpaved site roads to reduce fugitive dust during Construction and Operations
▪ Use and maintain emissions control devices on combustion-based equipment
▪ Maintain mobile mining equipment and vehicles and operate the equipment within parameters for engine exhaust system design
▪ Identify and implement procurement criteria to confirm stationary and mobile engines meet applicable performance standards
▪ Implement a Project-specific Environmental Protection Program (EPP)
▪ Implement a Project-specific Environmental Monitoring Program (EMP) that includes ambient air monitoring
Closure Phase
▪ Primarily use LNG, which generates lower emissions per unit of energy produced than diesel, for on-site power generation.
▪ Optimize haul routes to reduce fuel consumption and emissions from equipment
▪ Apply water and/or suppressants to site roads, access road, and airstrip, as necessary. Use dust suppressants that minimize environmental risk and are government approved for use
▪ Use and maintain emissions control devices on combustion-based equipment
▪ Maintain mobile mining equipment and vehicles and operate the equipment within parameters for engine exhaust system design
▪ Limit idling of vehicles and equipment to the extent practical
▪ Identify and implement procurement criteria to confirm stationary and mobile engines meet applicable performance standards
▪ Implement a Project-specific EPP
▪ Implement a Project-specific EMP that includes ambient air monitoring

Table 6.4: Potential mitigation measures for noise for each project component/activity.

Project component/activities	Mitigation measures/environmental design features
Noise during construction and operations	
Land clearing, site preparation, construction of facilities and infrastructure	Enclose and dampen equipment in process buildings where sound levels are expected to exceed approx. 80 dBA where feasible. Install internal combustion engines with muffler systems. Install noise dampening structures in power plant/generator facilities, install silencers in surface and underground venting equipment (fans). Road maintenance to minimize ruts and reduce noise emissions from vehicles. Project-related health and safety program.
Underground shaft and underground operations	
Power generation	
Underground operations	
Camp, maintenance shop, offices	
Site traffic, transportation of personnel and materials to and from the site	
On-site airstrip	
Explosive blasting	
Noise during closure	
Removal of infrastructure	Enclose or dampen equipment in in-process buildings where sound levels are expected to exceed approx. 80 dBA where feasible. Outfit internal combustion engines with muffler systems. Install noise dampening structures in power plant/generator facilities, install silencers in surface and underground venting equipment (fans). Maintain roads to minimize ruts and reduce noise emissions from vehicles. Implement project-specific health and safety program.
Site restoration and revegetation of facilities and infrastructure	
Removal of power generation plant	
Removal of additional infrastructure such as but not limited to worker camp, maintenance shop and offices	
Site traffic, transportation of personnel and materials to and from the site	
On-site airstrip	

6.1.3. Other Views Expressed

6.1.3.1. Indigenous Nations and Communities

During consultation and engagement activities with Indigenous Nations and communities, concerns regarding changes in air quality were raised by CRDN, MN-S, BNDN, YNLR, and ACFN.

CRDN, which affirms that it consents to the Project and that its concerns have now been appropriately accommodated, had previously requested clarification on whether contaminants of potential concern (COPCs) in interstitial air are tracked, as well as clarification on the calculation and definition of relative risk levels for greenhouse gas (GHG) emissions. NexGen has clarified that in general, terms such as “low”, “minor”, and “negligible” indicate that Project effects are not expected to be harmful to people or the environment, and further information on the rationale to determine Project effects for the atmospheric environment may be found in EIS Section 7 [Air Quality, Noise, and Climate Change].

MN-S, which affirms that it consents to the Project and that its concerns have now been appropriately accommodated, had previously recommended that all objectives for screening against Ambient Air Quality Objectives (AAQO) be entirely health-based. Further, MN-S had previously recommended that all COPCs acting within a non-threshold level of toxicity be included for further assessment, regardless of whether they exceed AAQOs. NexGen has maintained that the ambient air quality criteria selected for the air quality screening of COPCs are appropriate. NexGen used a precautionary approach for screening COPCs, following standard best practices for Human health risk assessments (HHRAs). The criteria used in the HHRA were in accordance with current science and regulatory requirements, and NexGen has stated no additional consideration of guidelines is required for the final EIS.

MN-S had previously emphasized that intermediate components, such as air, should be considered and discussed within the EIS when selecting boundaries for Indigenous land and resource use. Given that IK evidence demonstrates that air quality is extremely high in the Study Area, MN-S had previously asked if the ERA reflects these high-quality air conditions rather than those already impacted by activity. NexGen has confirmed that the information requested was considered when defining the spatial boundaries for assessment and is provided in Draft EIS Section 16. The definition of the local study area and regional study area for the Indigenous land and resource use valued component were defined to include predicted effect on supporting intermediate components. Additionally, the Nation questioned why short-term exposures to air quality pollutants were not included in the HHRA. NexGen has maintained that further quantitative assessments for nitrogen dioxide, particulate matter, and uranium are not required as the screening assessments showed that only minor, short-term, reversible effects to human health could potentially occur. NexGen has committed to implementing a monitoring program to measure ambient air concentrations to maintain human health.

BNDN was concerned that NexGen does not specify how it will monitor air contaminant concentrations during all phases of the Project. BNDN’s position is that continuous on-site ambient air monitoring for all contaminants of concern (including particulates, metals, dioxins

and furans (D&F) compounds, and radionuclides) is the only way to truly assess the Project's impact on air quality and compliance with government standards. BNDN believes without proper on-site monitoring Project-related air contaminant exceedances will be possible. BNDN critiqued the use of diesel power generators and recommended that NexGen replace them with the Best Available Technology Economically Achievable (BATEA) to mitigate GHG and air pollutant emissions. The Nation also requested that NexGen include GHG emissions related to fuel hauling and freight in its GHG emissions model. These issues have been discussed through a workshop conducted between NexGen and BNDN and follow up communication, where BNDN stated these comments have been addressed. NexGen has noted that local infrastructure requires the temporary use of diesel during construction and has committed to measures such as the use of emission control devices on combustion-based equipment and implementing procurement criteria to confirm stationary and mobile engines meet applicable performance standards, to mitigate effects associated with diesel power generators. NexGen has also committed to implementing a net-zero framework and periodically reassessing alternative technologies. NexGen has further noted that emissions related to Project support activities are not assessed, consistent with the federal GHG reporting program for individual projects, but Project-specific mitigation measures are expected to minimize GHG emissions to an acceptable degree.

BNDN emphasized that the results of modeling for the residual effects assessment for air quality should be analyzed with reference to relevant regulatory standards. For the assessment itself, the Nation noted that NexGen did not include radon or other radionuclides, metals, or Dioxins and Furans (D&F) compound emissions where it should have. Of particular concern to BNDN is the lichen-caribou-human food chain, which is vulnerable to the bioaccumulative effects of airborne radionuclides. NexGen has disagreed that D&F and radionuclides are required to be included in the residual effects assessment as no annual criterion is available, however NexGen has confirmed that radionuclide and D&F concentrations were modelled and assessed, and maximum concentrations expected do not raise health or environmental concerns. Furthermore, NexGen has committed to a Regional Traditional Foods Study with Indigenous Nations and communities in the region and further developing details of monitoring programs during permitting and licensing to address concerns of bioaccumulation.

BNDN also expressed concerns about NexGen's air dispersion modelling, which did not take variable conditions, such as wildfires, into consideration. BNDN was also concerned that NexGen's air dispersion model did not properly account for cumulative effects, specifically in relation to the Patterson Lake South Project. The Nation recommended the halting or modification of project construction and operations during wildfire events, given their ability to start wildfires or exacerbate particulate exceedances. NexGen has stated that a risk-based, graded approach would be taken to prioritize worker health and safety. NexGen will modify site activities or provide personal protective equipment in the event of wildfires, however shut down of site activities will not occur unless unacceptable risks to worker or public health exist.

BNDN also recommended that NexGen consider the impacts of sulphur dioxide emissions from Alberta oil sands operations in its cumulative effects assessment and requested that NexGen develop a GHG emissions offsetting plan. NexGen has noted that the development of such an

offsetting plan is outside of the scope of the CEAA 2012*,* but NexGen supports discussion within the Environmental Committee to identify opportunities for further GHG reductions.

Finally, BNDN requested clarification on what the total Project Hazard Quotient (HQ) was compared to for the risk assessment for each medium, including air, to which NexGen confirmed that the total HQ was compared to a benchmark of 1 for all pathways, while individual pathways used an HQ value of 0.2.

YNLR underscored that maintaining air quality over the long-term is very important to them and that they expect NexGen to design and implement monitoring programs with their active participation. YNLR is especially concerned about how the Project will impact air quality not just for humans, but also for wildlife and the broader ecosystem. YNLR expressed concerns about increased air traffic and dust from Highway 955 and recommended that strategies be implemented to mitigate air quality effects, given the lifespan of the project. YNLR also requested clarification on the methodology for air quality effects in Section 7. NexGen has confirmed that Project activities would result in changes to local air quality, and as such effects to people, wildlife, and the environment were evaluated within the EA. Results generally showed that effects due to changes in air quality and noise would be minor, with the exception of woodland caribou; NexGen has committed to working with provincial and federal regulatory agencies and local Indigenous Nations and communities to develop a Caribou Mitigation and Offsetting Plan (CMOP) to prevent significant adverse effects to woodland caribou. NexGen has acknowledged that maintenance of Highway 955 is outside of NexGen's control but has committed to discussions with the Saskatchewan Ministry of Highways to develop a road upgrade and maintenance agreement, which will be required to be in place prior to Construction. On the methodology for air quality effects, NexGen has clarified that concentrations of Project air emissions are predicted to reach background levels or 10% of the applicable air quality criteria at the RSA boundary. NexGen has acknowledged that Project engagement will continue with YNLR throughout the Project life.

Athabasca Chipewyan First Nation (ACFN) requested that NexGen include a summary of ACFN-identified issues relating to predicted concentrations of COPCs in air modeling. Specifically, ACFN offered suggestions for improving air dispersion modelling such as using a three-year period to enable comparison with federal air quality standards (CAAQS); reevaluating predictive modeling data for air to identify bioaccumulative and persistent substances; using complex mixtures in the screening process for COPCs and updating the HHRA and ERA accordingly; and employing World Health Organization (WHO) air quality guidelines (AQGs) to identify air-related COPCs. NexGen has noted that the ACFN has not presented any specific issues related to spatial and temporal boundaries and predicted concentrations of COPCs in the air, and completing individual assessments for each Nation is outside of the scope of the requirements of an EA under the *Canadian Environmental Assessment Act, 2012.* NexGen has confirmed that the five-year modelling assessment used was provincially mandated by the Province of Saskatchewan, but the data included multiple possible three-year periods that could be used to approximate the three-year monitoring data called for in the CAAQS, and the highest predictions have been compared to the CAAQS and summarized in table 7.2-12 of Draft EIS

Section 7.2.5.1.1.2 (Air Dispersion Modelling Predictions). NexGen maintains that no re-evaluation of predictive modeling data is required, as the environmental risk assessment used best and standard practices to screen COPCs, including applying maximum predicted or observed concentrations and utilizing the most conservative applicable guidelines. The screening guidelines used by NexGen focused on Canadian guidelines based on the protection of health.

ACFN also requested clarification on how the air dispersion modelling study is representative of long-term exposures and enquired as to whether NexGen will monitor snow quality to confirm non-negligible residual effects from air emissions. The Nation recommended that NexGen update the ERA to include soil screening values using the 2006 Canadian Council of Ministers of the Environment (CCME) guidance for metals associated with air deposition of total suspended particles. ACFN also asked NexGen to provide scientific evidence showing that mitigations for fugitive dust and constituent emissions will prevent dust and other emissions from impacting plant species. Beyond plant life, ACFN remains concerned about the ability of air emissions to acidify lakes and rivers. NexGen has stated that the use of conservative guidelines and worst-case data in the five-year simulation generated a scenario representative of possible maximum long-term air quality conditions, and NexGen has confirmed that the EMP includes sampling snow quality near the Project site. NexGen has confirmed that the latest CCME guidelines were used to screen predicted soil quality from air deposition (CCME 2024).

NexGen has indicated in Draft EIS Section 13.4.2 (Secondary Pathways) that dust deposition rates form the project are predicted to be much less than rates shown in the scientific literature, and any changes are expected to be negligeable. NexGen has committed to monitoring dust deposition and other constituents to determine the effectiveness of mitigation and adapt if necessary. On the acidification of lakes and rivers, NexGen has predicted low acidifying emissions, indicated by total H^+ equivalent of approximately 10% of the criterion of 0.175 t/d, and the pH values of the rainwater in the Project site indicate that potential for acid deposition issues is low. NexGen has committed to continuing to monitor and report pH values of rainwater, and Section 7A2.1 of Final EIS Appendix 7A will be updated to include H_2SO_4 emissions in the total H^+ equivalent calculations and the monitored pH value of rainwater.

6.1.3.2. Federal Authorities

HC raised questions about cumulative noise effects and community engagement, and the inclusion of airstrip noise as a source of “infrequent but impulsive noise” when evaluating noise effects. HC stated there were no outstanding issues related to noise provided that all management, monitoring, and mitigation measures were implemented. Specifically, they referred to NexGen’s commitments to: 1) implement an Indigenous and Public Engagement Program to effectively engage with communities on Project activities, effects, mitigation, and monitoring to keep people involved and provide opportunities for feedback, 2) install noise dampening structures in power plant generating facilities and install silencers in surface and underground large vent fans, 3) implement procedures to reduce noise, dust, and light levels, 4) maintain roads to minimize ruts and reduce noise emissions from vehicles, 5) establish a Project feedback and grievance mechanism to record and action issues identified by local priority area residents, and

6) monitor noise emissions from Project equipment and activities during Construction and Operation.

HC sought clarification on the potential risks to human receptors with respect to air quality. These included clarification on the modeling of background concentrations for air quality parameters, project-related dust associated with on-site material handling and transportation, impacts of short-term exceedances of air-quality for human health, predicted short-term exceedances of air quality parameters, and proposed management, mitigation, and monitoring plans. HC encourages the use of all available mitigation measures that are technically and economically feasible (e.g., use of Tier 4 engines) to ensure that air pollutants (i.e. PM and NO_2) and possible adverse effects for off-duty workers are minimized. HC also supports monitoring dust, total suspended particles (TSP), nitrogen dioxide (1 hour), particulate matter (24 hour), uranium in TSP, PM10 and PM2.5 for comparison to the CAAQS and applicable standards. HC recommends that NexGen interpret these monitoring results using current health-based air quality values (e.g., CAAQs, WHO Global Air Quality Guidelines) and assess the need for additional mitigation for the protection of human health. HC also recommends that monitoring results are fully integrated into the Project's Effluent and Emissions Plan and EMP, and to use adaptive management measures to address uncertainty with modelled predictions.

NexGen has made commitments to reduce the impact of air quality contaminants on human health, including implementing a Project-specific EPP and Project-specific Effluent and Emissions Plan, limit idling vehicles, evaluate opportunities to reduce fuel combustion requirements of infrastructure and equipment, use Tier 4 diesel mobile equipment for underground operations when feasible, use and maintain emission control devices on combustion-based equipment, use pollution control technology on process plant exhaust stacks with preventative maintenance and stack testing with adaptive management where necessary, identify and implement procurement criteria to ensure stationary and mobile engines meet performance standards, maintain mobile mining equipment and vehicles and operate within equipment parameters, optimize haul routes to reduce fuel consumption and emissions, apply water and/or suppressants to roads and airstrip as necessary, and conduct monitoring to verify ERA predictions, support ongoing management to protect human health, and refine risk assessment models to inform management and mitigation.

ECCC recommended that NexGen complete a carbon sinks assessment separate from the land-use change estimate, provide additional information on carbon sink removal, and use a more robust (Tier 2 or 3) approach for estimating emissions related to land-use change. ECCC also recommended that NexGen refrain from comparing the Project's GHG emissions to provincial and federal emissions and recommended that the Net-Zero Framework align with the SACC Technical Guide. ECCC stated that the main emissions source from the Project include land-use change, stationary combustion for heating and electricity generation, mobile equipment, and waste incineration. When reviewed annually, land-use change is expected to be the largest source of GHG from the Project, but ECCC noted that the draft EIS and IRs lack details related to estimated emissions from land-use change. Therefore, the emissions may be underestimated as NexGen used a Tier 1 approach instead of a Tier 2 or 3 approach which are more robust, detailed,

and appropriate for the size of the Project. ECCC noted that LNG generators will be used over diesel generators, and that there may be further mitigations of GHG emissions as a hybrid system (e.g., wind and solar) is under consideration for the future. NexGen has committed to implementing a Net-Zero Framework, including annual reporting on GHG emissions, and periodically re-assessing alternative technologies and practices to reduce GHG emissions.

CNSC staff are satisfied that other views expressed in this section have either been satisfactorily resolved through consultation activities with Indigenous Nations and communities, the EIS technical review, or will be addressed during the ongoing regulatory process.

6.1.4. CNSC Staff's Analysis

CNSC staff have reviewed NexGen's assessment and determined that while the identified changes to air quality (e.g., from vehicle/equipment use, operations) will be long lasting due to the nature of the project, they are expected to be of low to moderate magnitude and not cause significant changes to the atmospheric environment, taking into account the implementation of mitigation and follow-up monitoring program measures. Follow-up monitoring will also be used to confirm model predictions and ensure the environment remains protected. 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.

With respect to acoustic (noise) environment, CNSC staff have reviewed NexGen's assessment and determined that some minor increases in noise levels are expected during the construction and operations phase in comparison to baseline conditions, particularly for the nearest receptor. CNSC staff conclude that the mitigation measures proposed by NexGen are appropriate and will help attenuate the noise to some extent. CNSC staff also note that monitoring will be conducted to verify compliance with regulatory noise thresholds (ECCC 2009, HC 2017, etc.)

6.1.4.1. Greenhouse Gas Emissions (Transboundary effect)

CNSC staff assessed NexGen'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 (0.02%) and provincial (0.3%) total emissions. GHGs will be further evaluated under licensing through a BATEA for air emissions and treatment technologies and techniques assessment.

Considering the currently available information and NexGen's commitments, with respect to transboundary implications of GHG emissions and their potential to 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.

6.1.5. CNSC Staff's Findings and Recommendations

CNSC staff have reviewed NexGen's effect assessment of the atmospheric environment, related to the air quality, acoustic environment and greenhouse gas emissions and confirmed that

NexGen conducted a comprehensive analysis of these effects and that identified mitigation and follow-up monitoring program measures are adequate.

6.1.6. Issues requiring Follow-up

CNSC staff have requested that NexGen provide additional analysis in future licensing reviews. In future ERA updates and/or updated licensing document submissions, CNSC staff expect NexGen is to consider Tier 2 or Tier 3 approach for the assessment of carbon sinks and land-use change emissions. In addition, during the project lifespan CNSC staff expect NexGen to continue to evaluate monitoring and mitigation measures to track and minimize air pollution and, where practical, implement any newly identified mitigation measures that are technically and economically feasible. CNSC staff also expect NexGen to implement a Net-Zero Framework and to reassess alternative technologies and practices to manage GHG emissions, as well as to implement GHG management strategies to reduce emissions to the extent practical. CNSC staff expect NexGen to quantify and report project GHG emissions on an annual basis, following the Greenhouse Gas Reporting Program (GHGRP).

6.2. Geological and hydrogeological environment

6.2.1. Description of the environment: geology and hydrogeology

6.2.1.1. Studies conducted by the proponent to characterize baseline geology and hydrogeology

Characterization of existing conditions by the proponent was based on regional studies of the southern Athabasca Basin and extensive project-specific data. The project-specific data includes:

- drilling records and samples from exploration, geotechnical, and environmental boreholes
- geophysical data
- previously published geologic data sources (i.e., mapping and the literature)
- hydrostratigraphic, hydraulic, geochemical, groundwater chemistry and calibration with numerical models

6.2.1.2. Characterization of baseline geology

NexGen's Rook I Project centers on the Arrow deposit (figures 6.1 and 6.2), a high-grade uranium deposit that is located adjacent to Patterson Lake in the southern Athabasca Basin of northern Saskatchewan. This deposit is hosted by veins that formed in northeast-striking, near vertical southeast-dipping brittle-ductile high-strain zones in the Paleoproterozoic (2.5–1.6-billion-year-old) basement rocks that are composed of granite or gneiss (figure 6.2).

The lithologic units within the regional study area (RSA), which are broadly divided into the Paleoproterozoic to Cretaceous bedrock and Quaternary surficial deposits, are described as follows:

Bedrock (figures 6.1-6.4):

Paleoproterozoic basement rock of the Taltson Domain: this unit, which is encountered between -150 and 430 masl, is composed predominantly of granites or gneisses that are heavily deformed

with steeply dipping shear and fault zones. The main fabrics and contacts observed within the crystalline basement rocks in the vicinity of the Arrow deposit are all northeast-striking, southeast-dipping.

- Paleoweathered Paleoproterozoic basement rock (regolith): this 20 -200 m thick unit is composed of weathered material derived from the Paleoproterozoic basement rock beneath.
- Mesoproterozoic (1.85-1.54-billion-year-old) Athabasca Sandstone bedrock: this unit, which reaches up to 400 m in thickness, is composed of sandstones that are unconformably overlying the paleoweathered basement rock
- Devonian (419.2-358.9-million-year-old) bedrock: this unit, which reaches up to 60 m in thickness, is composed of carbonate-rich interbedded sandstone, siltstone, and mudstone, likely belonging to the Elk Point Group
- Cretaceous (145-66-million-year-old) bedrock: this unit, which reaches up to 100 m in thickness, consists of an upper unit of green to grey-black, fine- to medium-grained quartz sandstone interbedded with fissile mudstones, and a lower unit of brown, fine- to coarse- grained quartz sandstones crossbedded with minimal mudstones likely belonging to the McMurray Formation.

Surficial deposits (figure 6.5):

- Quaternary (2.58 million years-present) glacial drift and till deposits: This 10 - 200 m thick unit is composed of glacial deposits that are derived from both the crystalline basement rocks and the Athabasca Sandstones. These glacial deposits are divided into two sub-units, an “upper overburden” generally located above the water table with higher sand and boulder content, and a “lower overburden” generally located below the water table with higher fine sediment content.

Figure 6.1: Bedrock Geology

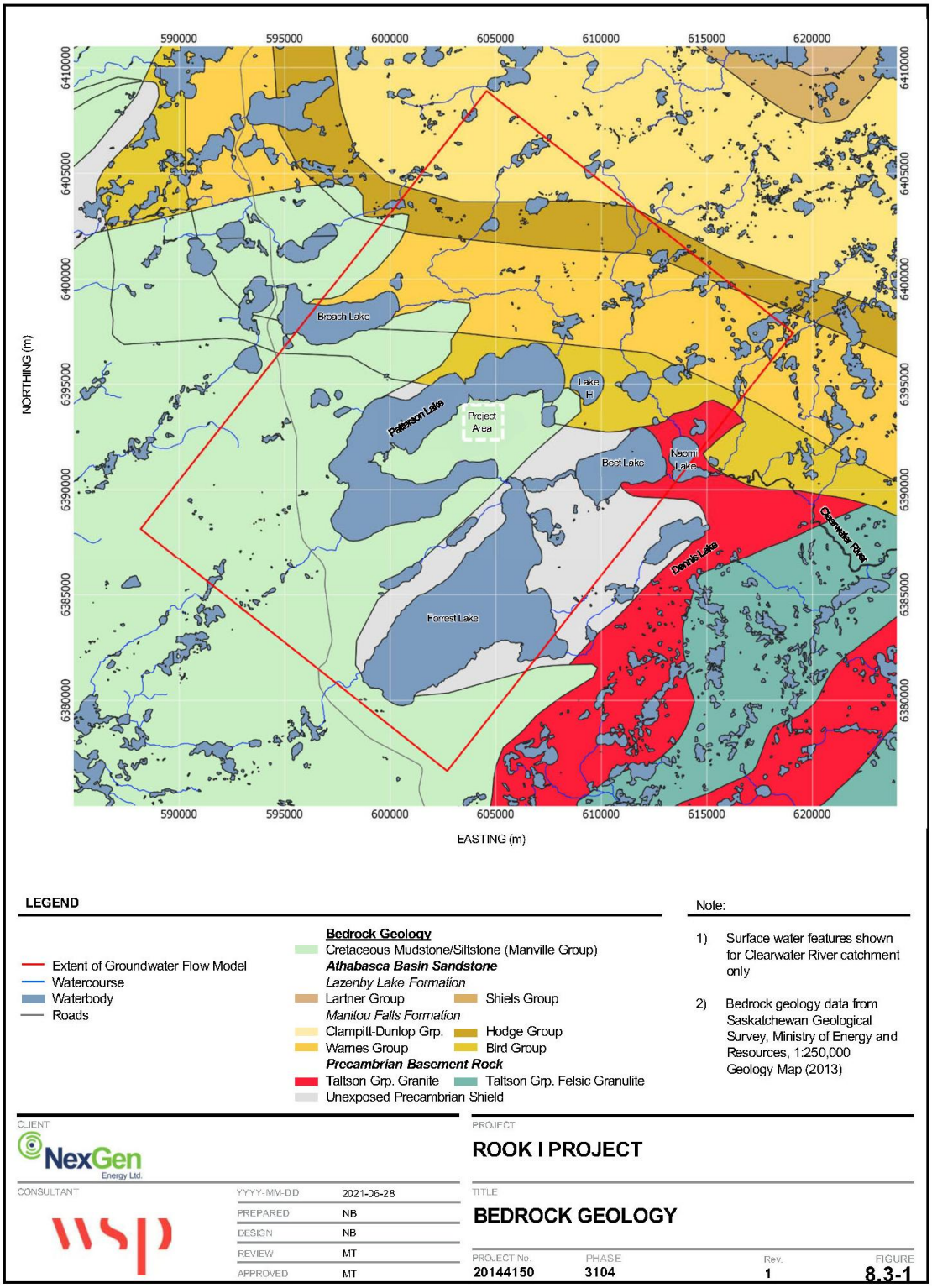
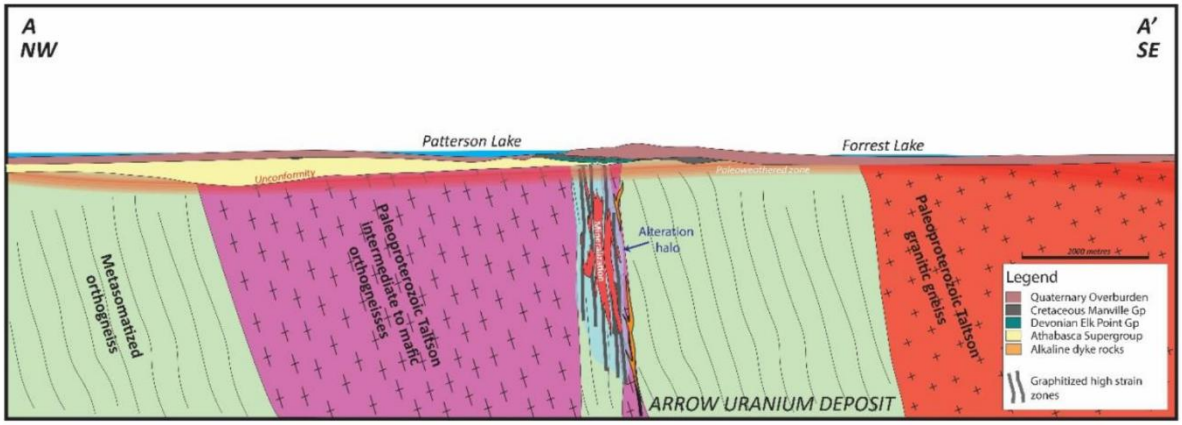
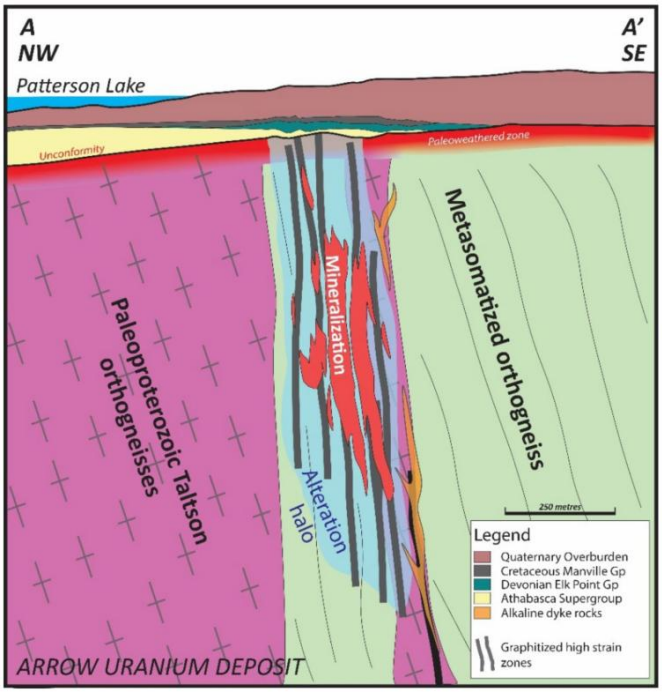


Figure 6.2: Arrow deposit. No indication of vertical exaggeration applied.



Schematic Southwest-Northeast Long-Section through the Arrow Deposit Showing Regional Study Area Sedimentary and Basement Geology, Structure, and Zones of Uranium Mineralization



Schematic Southwest-Northeast Long-Section through the Arrow Deposit Showing Regional Study Area Sedimentary and Basement Geology, Structure, and Zones of Uranium Mineralization

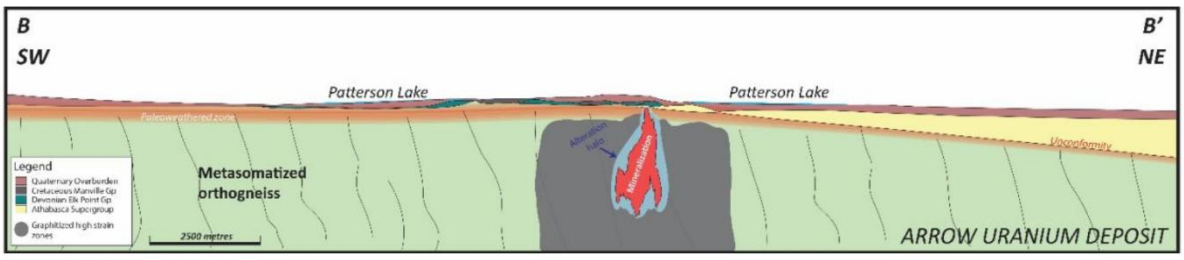


Figure 6.3: Geologic cross section A-A'. Faults and Shear zones are indicated by nearly vertical lines.

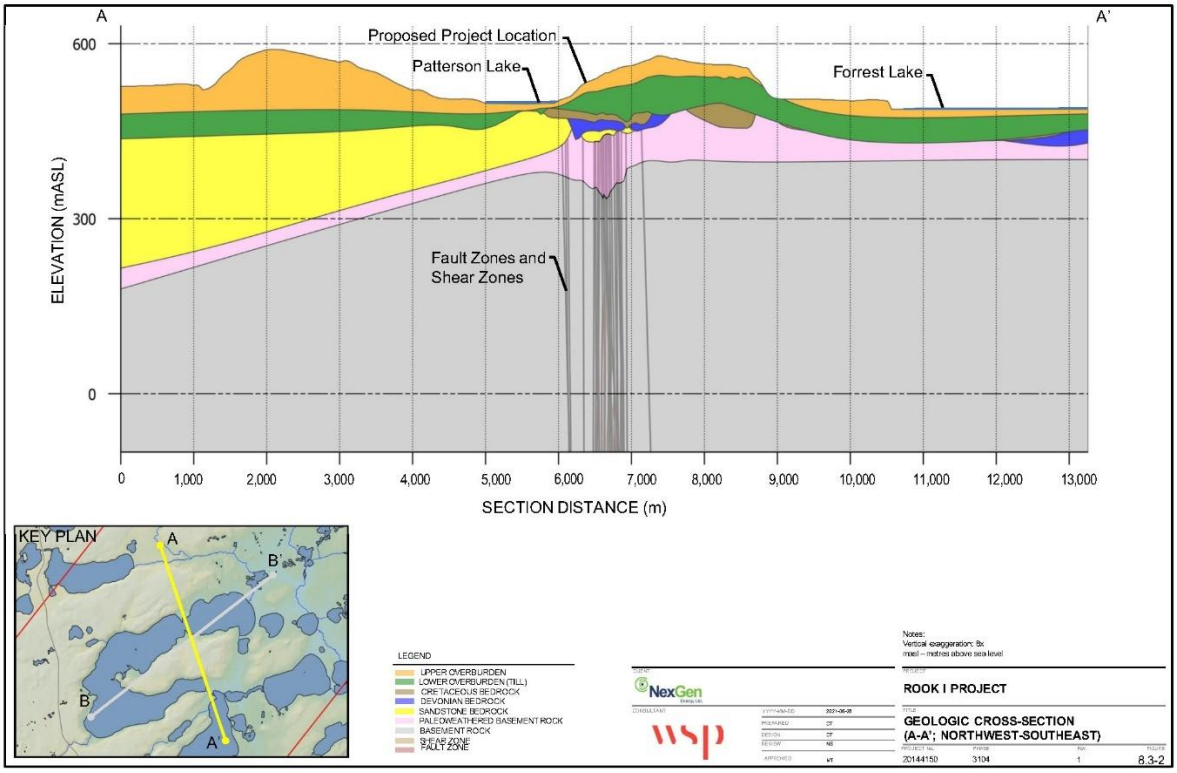


Figure 6.4: Geologic cross section B-B'.

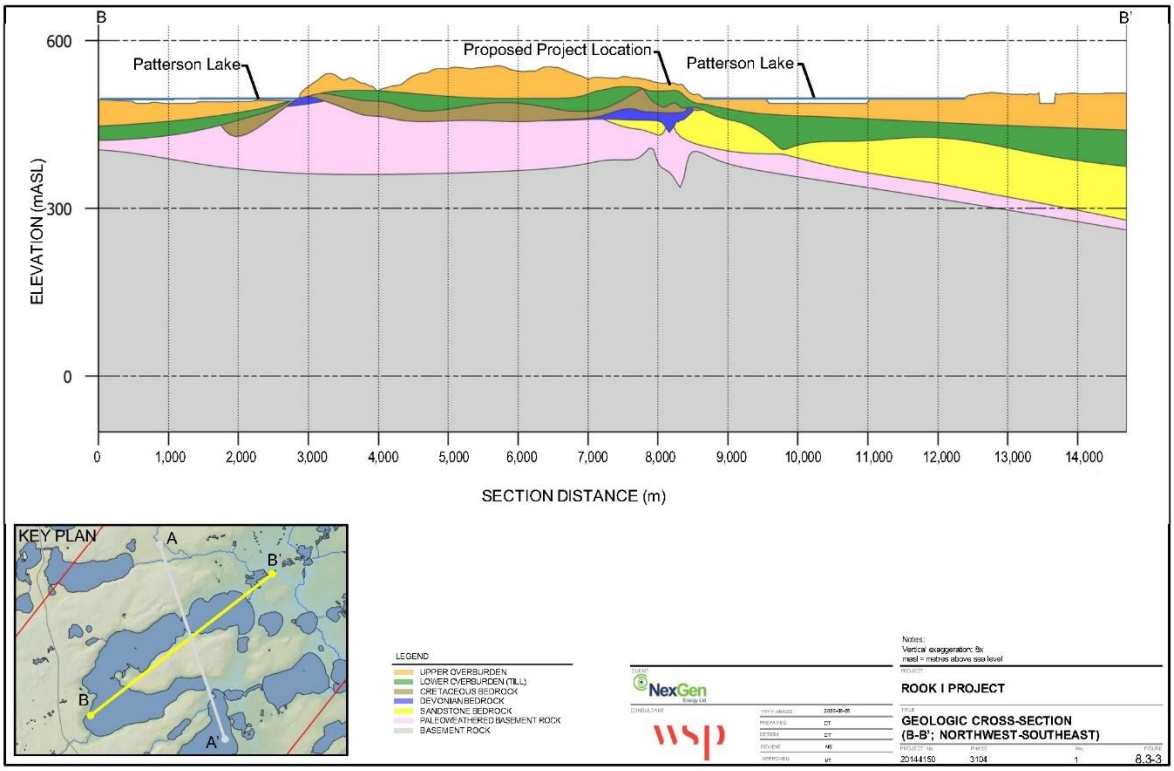
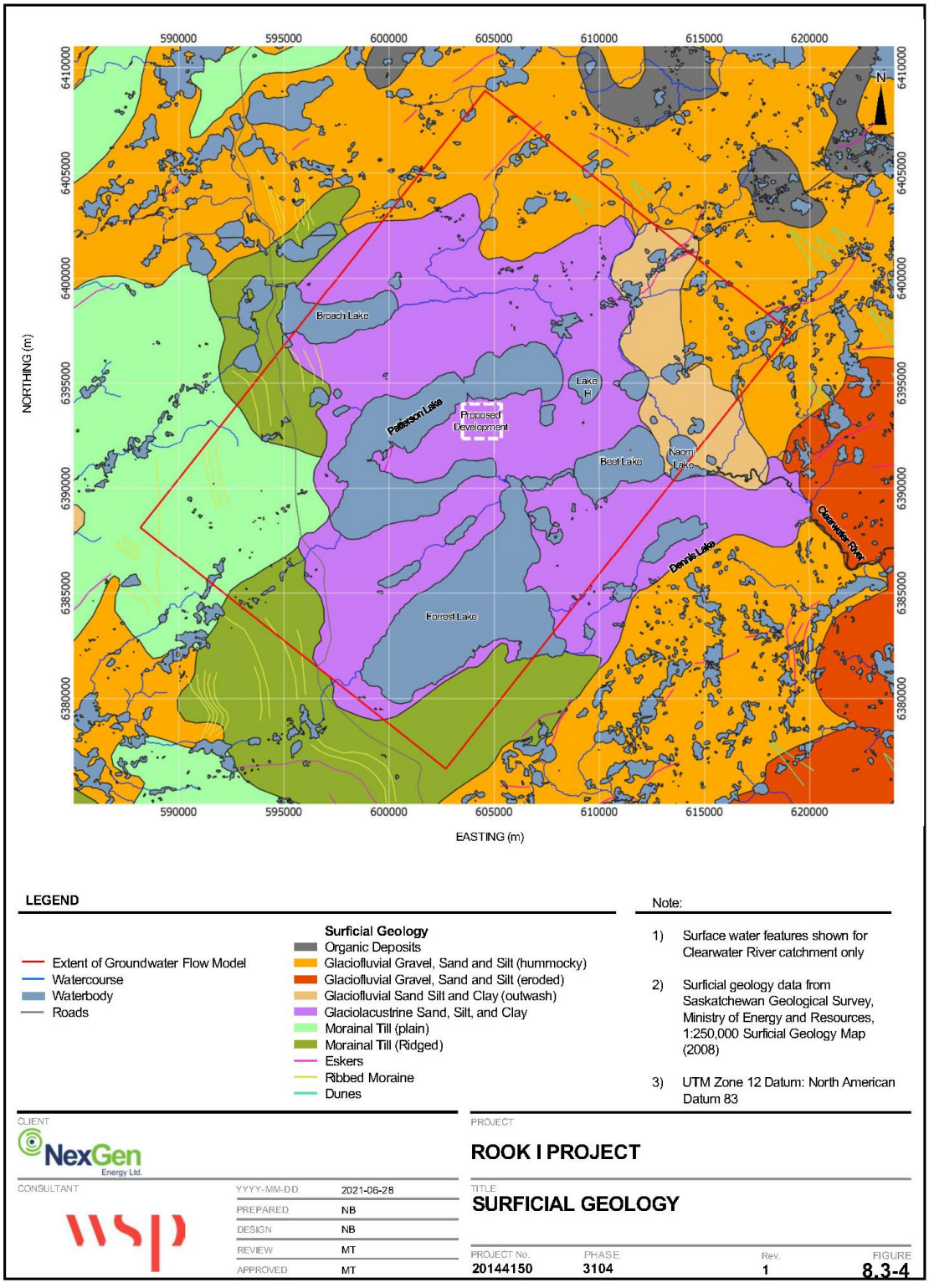


Figure 6.5: Surficial Geology.



6.2.1.3. Characterization of baseline hydrogeology

Hydrogeological stratigraphy of the site assimilates with the geologic units as described above. Figure 6.6 shows the conceptual site model of the site developed by the proponent. The baseline static groundwater head is shown as well.

Baseline groundwater flow conditions

Groundwater recharge in the study area primarily occurs through the infiltration of atmospheric precipitation into sandy glaciofluvial deposits, as well as seasonal leakage from surface water bodies—particularly near lakes and along riverbanks where fracture zones are present.

The regional groundwater flow system can be conceptualized in three types:

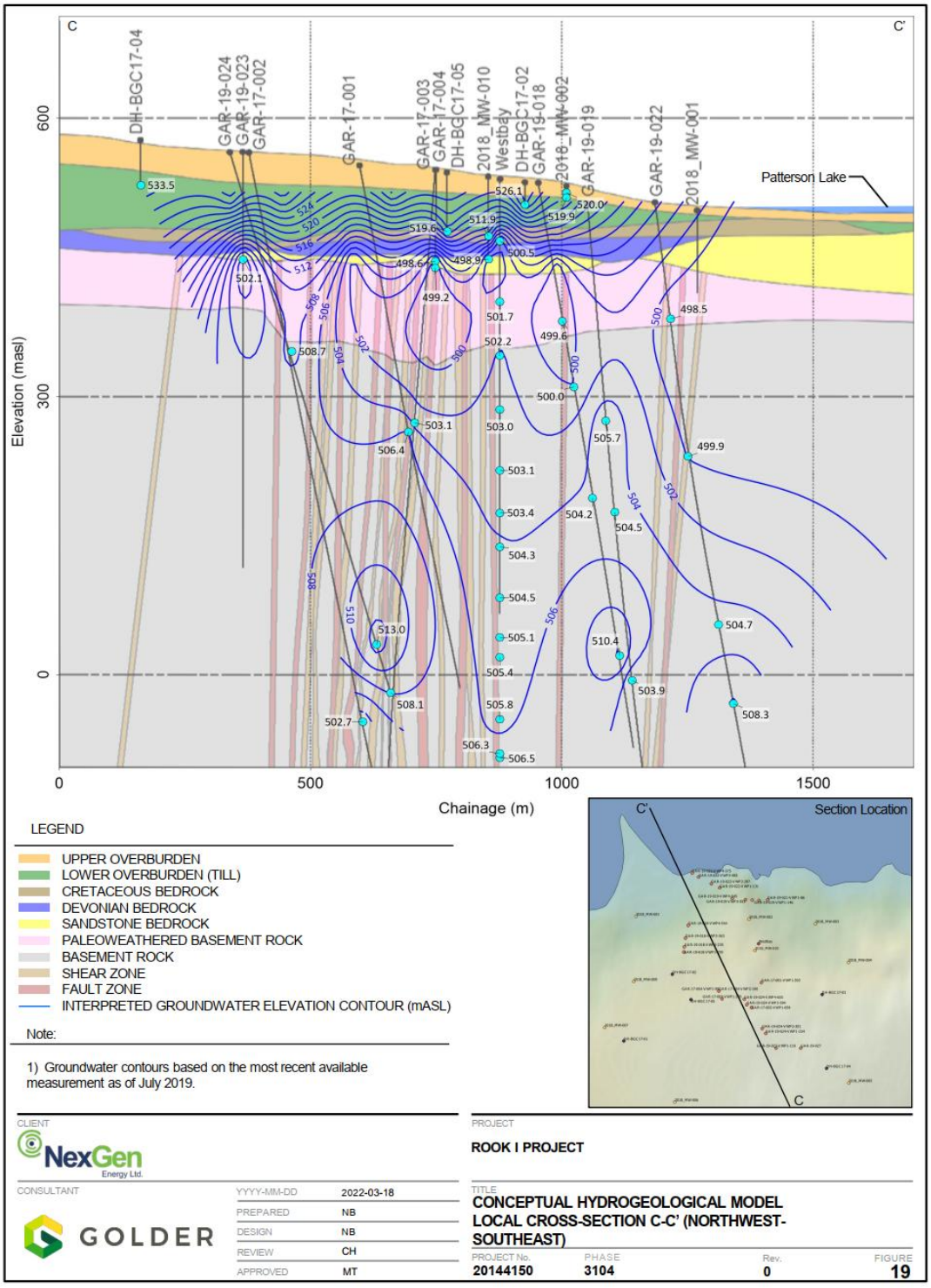
- Local flow within shallow aquifers, driven primarily by surface topography
- Intermediate flow within deeper confined aquifers, characterized by longer travel paths
- Regional flow, governed by the tectonic structure of the basin

Shallow groundwater generally flows toward the Clearwater River, while deeper groundwater migrates from the basin margins toward its central areas. Fault structures introduce complex hydraulic connections between aquifers, influencing both horizontal and vertical flow patterns.

Within the glacial drift deposits, groundwater moves toward nearby surface water bodies such as Patterson Lake. A prominent groundwater flow divide exists south of the proposed mine site, situated on a peninsula, which directs shallow groundwater both northward and southward into the lake. Similarly, in the shallow bedrock, groundwater exhibits an overall west-to-east flow direction, though it is locally redirected by topographic gradients to converge toward Patterson and Forrest Lakes. This flow pattern also features a divide south of the mine, mirroring that of the glacial drift, with groundwater split and directed northward and southward toward Patterson Lake.

In deep bedrock, the groundwater maintains a general west-to-east flow, with the steepest hydraulic gradients located west of Patterson Lake, driving groundwater toward the lake.

Figure 6.6: Hydrogeological stratification and static water head distribution



The vertical component of groundwater movement reveals additional complexity in the flow regime. In the region characterized by a topographic high located to the south of the proposed mine, the groundwater flows downward, driven by the elevation difference. This downward movement transitions to an upward flow in the area directly beneath the proposed underground mine and UGTMF. This shift reflects the influence of both the local topography and the subsurface geological features. Notably, the presence of structural elements such as fault zones and shear zones significantly affects the simulated groundwater elevations. These structures manifest as areas of reduced groundwater pressure in their vicinity, suggesting enhanced conductivity compared to the surrounding basement rock. As a result, they serve as preferential pathways for groundwater movement, channeling flow from the mine horizon—the depth at which mining activities would occur—toward discharge points in Patterson Lake. This interplay between structural geology and hydrology highlights the critical role that faults and shear zones play in shaping the groundwater flow regime in this region.

In summary, the baseline groundwater flow regime around the proposed mine site is a complex system influenced by topography, geological layering, and structural features. The glacial drift directs flow toward local surface waters like Patterson Lake, with a clear divide splitting the flow north and south. The shallow and deep bedrock layers exhibit a west-to-east trend, modified by local divides and water features, while vertical flow shifts from downward in high areas to upward near the mine, guided by conductive structures. These insights, derived from the simulation results of the CSM, provide a basis for understanding the predevelopment groundwater dynamics in the area.

Baseline chemistries for groundwater and waste rock

The Rook I Project area exhibits a distinct geochemical stratification across its hydrogeological units, shaped by depth, lithology, water–rock interactions, and the regional mineralization setting. Key units include the glacial drift aquifer, the basement rock aquifer, and several waste rock domains associated with mine development and tailings management.

The glacial drift aquifer hosts fresh, low-salinity groundwater dominated by calcium-bicarbonate ($Ca\text{-}HCO_3$) chemistry, indicative of modern recharge and limited geochemical evolution. Monitoring conducted between 2017 and 2020 across 34 piezometers showed median concentrations of bicarbonate at 39 mg/L, calcium at 7.0 mg/L, and chloride at just 0.18 mg/L, while sodium exhibited high variability (up to 45 mg/L). Iron (mean 0.25 mg/L) and manganese (mean 0.320 mg/L) levels reflect localized redox conditions. Overall, the aquifer has low trace metal and total dissolved solids concentrations, with minimal evidence of anthropogenic influence, making it a suitable baseline for future environmental monitoring.

In contrast, the basement rock aquifer contains more geochemically evolved, higher-salinity groundwater of Ca-Cl and Na/K-Cl types, suggesting prolonged residence time and extensive water–rock interaction. Median concentrations of calcium, sodium, and chloride are 65 mg/L, 76 mg/L, and 270 mg/L, respectively. These values, particularly the elevated sodium and chloride levels (with maxima of 2,200 mg/L and 17,000 mg/L respectively), highlight a shift toward

salinization consistent with deep, confined aquifers undergoing long-term geochemical interaction. Metal concentrations were significantly elevated compared to shallow groundwater. Elevated levels of iron (mean 4.3 mg/L) and strontium (mean 13 mg/L) and naturally occurring radionuclides such as radium-226 have been detected, consistent with the area's uranium-bearing geology. This deeper system serves as a key reference for assessing potential subsurface impacts from mining activities.

Geochemical characteristics vary significantly across mine-related waste rock units. The proposed UGTMF area is composed primarily of semi-pelitic gneiss (SPGN) and intermediate orthogneiss (INT), exhibits low to moderate acid generation potential. Total sulfur ranges from 0.01% to 2.7% (median 0.18%), with low carbonate content (<0.5 kg $CaCO_3$/t) and a neutralization potential (NP) of 4–8 kg $CaCO_3$/t. Humidity Cell Tests (HCTs) show that low-sulfur samples (<0.24%) maintain near-neutral pH, whereas high-sulfur samples acidify quickly and release sulfate and metals such as molybdenum. Although radiological and heavy metal risks are generally low, scattered or localized distribution of sulfur-rich zones may suggest the need for targeted management.

The Mine Development Area (MDA), encompassing the mineralized core, presents elevated risks for acid generation and metal leaching. Sulfide content ranges from 0.02% to 3.3%, with carbonate buffering capacity below 0.83 kg $CaCO_3$/t. Over 40% of samples are classified as potentially acid generating (PAG), and HCTs show pH values as low as 3.6 in high-sulfur samples. Significant leaching of uranium, molybdenum, selenium, and radium-226 (up to 100 Bq/g) was observed. Although silicate minerals dominate the rock matrix, their buffering capacity is limited and more dominant in low pH conditions. Elemental correlation analysis revealed a strong positive correlation between cobalt and total sulfur content. Both molybdenum and selenium exhibited associations with sulfide minerals in high-sulfur samples. No significant correlation was observed between uranium and sulfur content, suggesting that uranium may primarily exist in discrete mineral forms, such as crystalline uraninite (UO_2). The MDA represents the area of greatest concern within the project in terms of acid drainage, heavy metal enrichment, and radiological risk. The proponent indicated that waste classification and segregation strategy would be implemented, with PAG materials isolated and managed separately in lined waste rock storage facilities with oxidation control measures.

The special waste rock in the Mine Development Area (MDA), located in fault and shear zones with localized uranium enrichment (0.03%–0.26% U_3O_8), presents a unique risk profile. While most samples are non-PAG due to low sulfide levels (<0.1%), they contain elevated concentrations of uranium, molybdenum, and selenium. Data indicates that uranium, molybdenum, and selenium enrichment in special waste rock is more pronounced than in MDA samples. HCTs show pH values between 5.6 and 6.6, with radium-226 concentrations reaching up to 66 Bq/L in leachates. Neutralization is driven by silicate weathering, with NP values between 2.5 and 40 kg $CaCO_3$/t, but is insufficient for long-term stability. Accordingly, this material requires separate storage and robust containment to mitigate environmental risks.

By contrast, the Shaft and Portal Area, composed of basement rock and minor sedimentary lithologies, exhibits low environmental risk. Sulfur content is minimal (<0.02%), pH ranges from 5.5 to 9.6, and radionuclide and trace metal levels are negligible (e.g., Ra-226 <0.3 Bq/g). These properties make the material suitable as low risk backfill or for use in closure applications.

Overburden and cover materials, including glacial tills and shales, also demonstrate very low sulfur (<0.01%) and metal content, with pH values ranging from 6.5 to 8.2. Their low reactivity and slow weathering rates suggest minimal potential for acid generation, making them appropriate as reference materials for baseline conditions or use in site closure designs.

Across all units, results from HCTs confirm that rocks with low sulfur content (<0.18%) remain geochemically stable, with near-neutral pH maintained through silicate dissolution. In contrast, high-sulfur materials (0.19%–3.3%) undergo acidification within weeks to years, accompanied by the release of sulfate, metals, and radionuclides. The highest contaminant mobility was observed in samples from the MDA, necessitating strict classification and containment strategies. The Shaft/Portal and Overburden areas are relatively low in this respect. These findings inform waste management planning, material segregation, and long-term monitoring to ensure environmental protection and compliance throughout the project lifecycle.

6.2.2. Proponent's Assessment

6.2.2.1. Effect of the Project on Geology

There is no dedicated section in the EIS that dicusses the effects of the Project on the geology. However Appendix 8A of the EIS contains a geology supplement that provides a summary of the utilization of geological information for the assessment of potential Project effects to sediment transport, hydrogeology, and terrain and soils, and refers to the corresponding EIS section [10] where more details can be found. Table 6.5 describes the potential effect pathways, project components and environmental design and mitigation. Measures to mitigate the impacts on sediment transport, terrain and soils, and hydrogeology are discussed in EIS sections 10, 12, and 8, respectively.

6.2.2.2. Effect of the Project on Hydrogeology

The proponent developed and calibrated a three-dimensional numerical groundwater flow model to represent the conceptual hydrogeological model, using target groundwater levels and baseflow data (i.e., the portion of streamflow sustained between precipitation events) for calibration. The model was established to accurately represent current (i.e., pre-development) conditions.

The objective of the groundwater flow modeling was to develop and calibrate a model that reflects the existing conditions at the project site and extends to the Regional Study Area (RSA). The calibrated model was used to predict the impacts of the project at various stages (construction, operation, and closure) on groundwater inflows, drawdown levels, and flow paths, with a particular focus on groundwater pathways from the mine waste source areas to Patterson Lake.

To achieve these objectives, the proponent first developed a conceptual groundwater model to simplify and organize the site's hydrogeological features in a manner suitable for modeling. The conceptual model retained sufficient complexity to ensure that the resulting numerical model could adequately reproduce real groundwater behavior and meet project requirements. Based on this conceptual model, the proponent built and calibrated a three-dimensional numerical groundwater model to best represent groundwater flow under existing conditions. Subsequently, simulations using the calibrated model were conducted to generate groundwater flow results representative of project application cases. The development and calibration process for the model is documented in detail in the "TSD XIV Groundwater Flow and Solute Transport Modeling Report" [14].

Table 6.5: Potential effects pathways, project components, and environmental design and mitigation

Pathway ID	Project Components/Activities	Effects Pathway	Environmental Design Features and Mitigation	Pathway Assessment
HG-01	Project components/activities that may influence surface water elevations and flows during **Construction, Operations, and Closure**: ▪ underground shaft and mine development ▪ underground operations	**Groundwater inflow to underground mine:** ▪ Groundwater inflow may affect surface water elevations and flow rates	▪ **Isolate mine workings** from groundwater inflows that could occur through high permeability strata (i.e., Cretaceous sandstone) with a hydrostatic liner in the shaft ▪ Design, maintain, and monitor a mine dewatering system to manage the flow of **groundwater inflow**	Primary pathway
HG-02	Project components/activities that potentially change groundwater quality during **Construction, Operations, and Closure**: ▪ site preparation activities ▪ handling and storage of waste rock, special waste rock, and ore	**Seepage from the WRSAs during Construction, Operations, and Closure:** ▪ Seepage from the WRSAs may cause changes and alter groundwater, surface water and sediment quality in Patterson Lake	▪ **Segregate PAG material** from NPAG material and store separately ▪ **Contain and divert runoff and seepage from PAG** waste rock, special waste rock, and ore to the effluent treatment plant ▪ Implement a Project-specific **Mine Waste Management Plan** ▪ Implement a Project-specific **Environmental Protection Program** and a Project-specific **Environmental Monitoring Plan** that includes groundwater monitoring and adaptive management, if necessary ▪ Develop and implement a **Detailed Decommissioning and Reclamation Plan** to decommission and transfer the site to the province under the Institutional Control Program	Primary pathway
HG-03	Project components/activities that potentially change groundwater quality **following Closure**: ▪ storage of waste rock in the WRSAs	**Seepage from the WRSAs after Closure:** ▪ Seepage from the WRSAs to Patterson Lake may adversely affect groundwater, surface water, and sediment quality after Closure	▪ Use **engineered cemented paste backfill and tailings** to control source concentrations ▪ Include **engineered source control** layering in the PAG WRSA ▪ Install **engineered cover system** on PAG and NPAG material during reclamation ▪ Develop and implement a **Detailed Decommissioning and Reclamation Plan** to decommission and transfer the site to the province under the Institutional Control Program	Primary pathway
HG-04	Project components/activities that potentially change groundwater quality **following Closure**: ▪ storage of cemented paste tailings in the UGTMF and cemented paste backfill in the mined stopes	**Seepage from the UGTMF and backfilled production stopes after Closure:** ▪ Seepage from the UGTMF and backfilled production stopes to Patterson Lake may adversely affect groundwater, surface water, and sediment quality after Closure	▪ **Apply binder** to reduce permeability in cemented paste backfill and tailings ▪ **Engineer the tailings geochemistry** to control source concentrations	Primary pathway

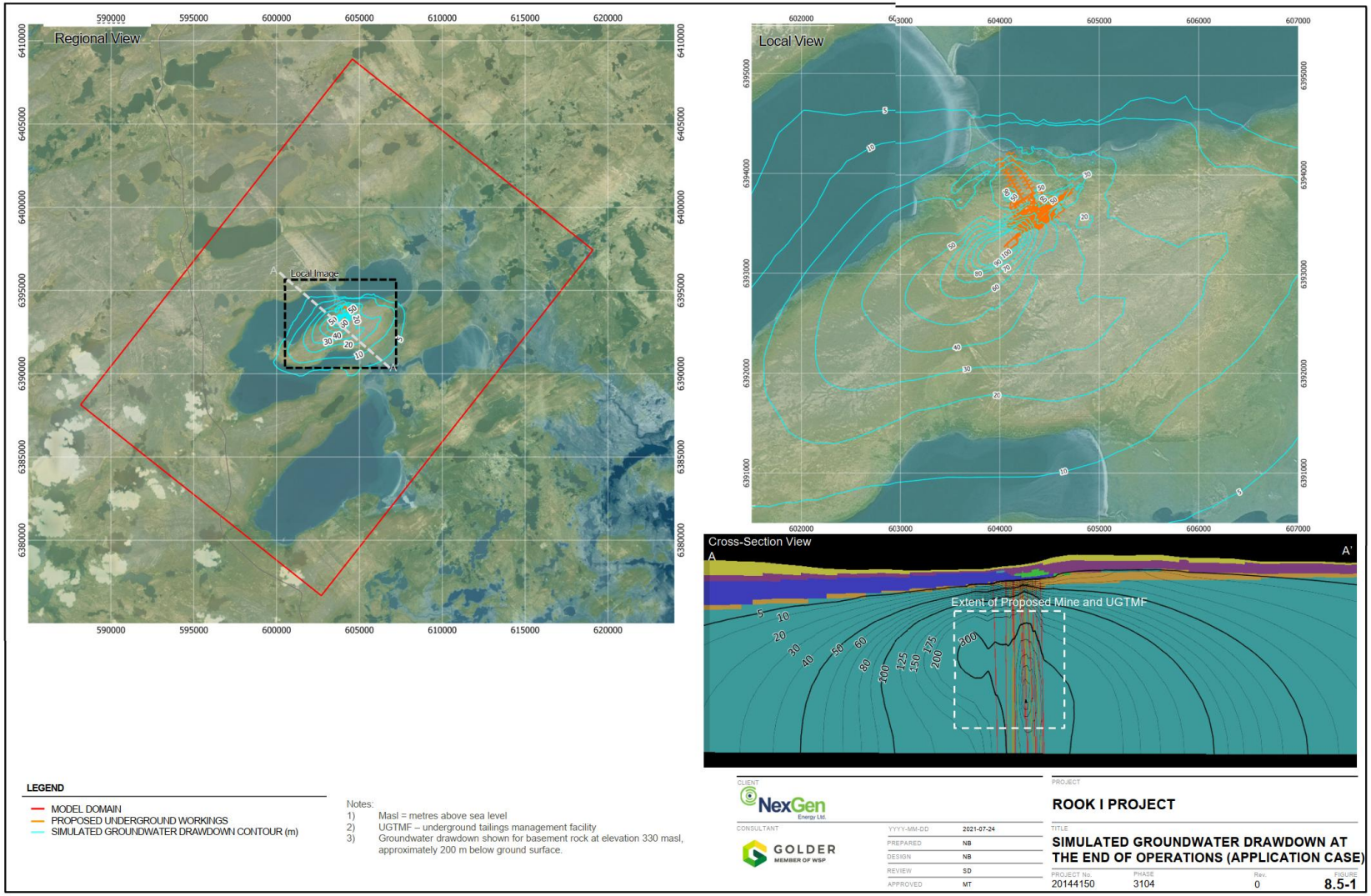
Effect on groundwater Flow

In the EIS for the Rook I project, the Residual Effects Analysis is a key component in evaluating the potential long-term impacts of mining activities on the groundwater system. Through the development of three-dimensional groundwater flow and solute transport models, NexGen assessed the impacts of project activities at different stages (construction, operation, closure, and long-term) on groundwater levels, flow directions, velocities, and water quality.

Groundwater Levels

During the operational phase, seepage from the mine will result in depressurization of the surrounding bedrock, manifested as declines in groundwater levels at monitoring points (i.e., groundwater drawdown shown in figure 6.7). Simulation results show that by the end of operations, the area of groundwater drawdown (represented by the 5-meter drawdown contour) in the bedrock near the upper part of the mine extends approximately 2 kilometers to the north, 4 kilometers to the south, and about 3.5 kilometers to both the east and west. Vertically, the depressurization is primarily confined to the bedrock layer, as the overlying sandstone aquifer has higher permeability. Around the mine site, the maximum simulated drawdown within the sandstone layer is less than 5 meters. Assessment results indicate that the lowering of groundwater levels is mainly restricted to the bedrock layer. During the closure and long-term periods, model predictions suggest that the groundwater system will gradually recover. Localized areas may continue to experience long-term changes, such as the bedrock layer needing a longer time to recover in groundwater level because of its comparatively lower permeability that delays this process. The shallow region near the ground surface will recover quickly due to the high permeability and recharge. Therefore this is not a concern for the shallow groundwater level.

Figure 6.7: Simulated groundwater drawdown at end of operation



Groundwater Flow Patterns and Rates

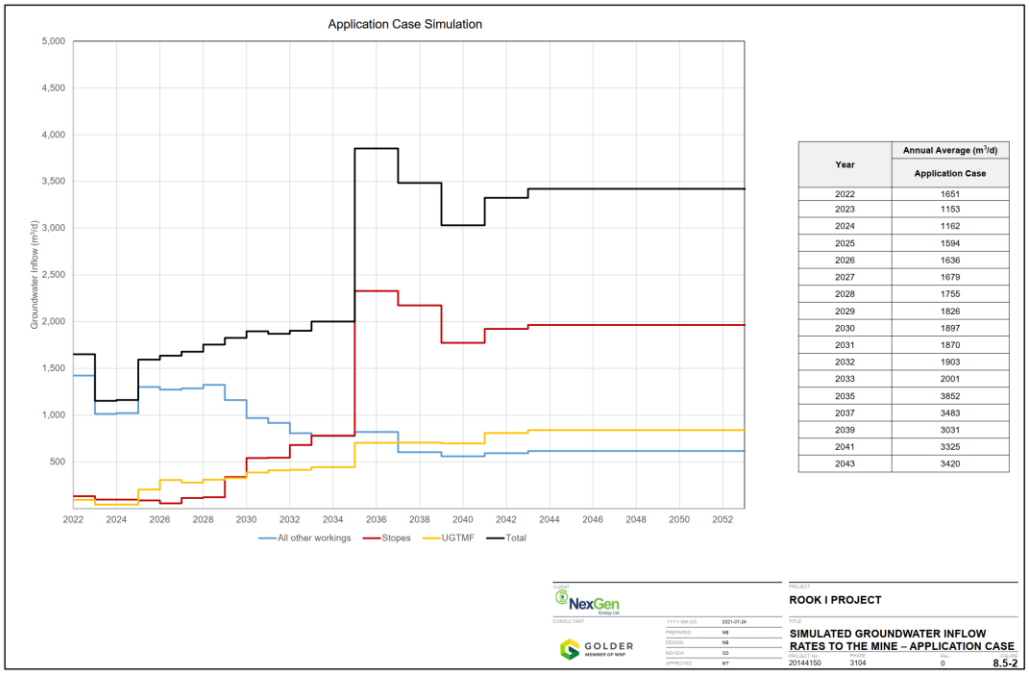
Groundwater Inflow to the Mine Site

Simulation results shown in figure 6.8 indicate that within the first 13 years of operation groundwater inflow rates range from approximately 1,200 to 2,000 m³/d, primarily entering other underground infrastructure areas (excluding the UGTMF and mining backfill areas). By the end of the 13th year of operation, as new mining stopes are opened, the inflow rate increases to approximately 3,900 m³/d. From 2041 onwards, groundwater inflow stabilizes at around 3,500 m³/d, with 60% of the inflow sourced from the mining stopes and 20% each from the UGTMF and other underground facilities. The proposed pumping capacity is 7080 m^3/d, providing a good safety margin against higher-than-expected inflow.

Baseflow from surface waste rock storage areas and ore/special rock stockpiles

During operations, groundwater seepage will be collected, treated, and discharged into Patterson Lake. Assuming that all seepage groundwater originally infiltrates from the surface within the Patterson Lake catchment area, this process results in a net-zero effect on the overall water balance of the surface water system. Model estimates suggest that the current groundwater discharge rate from the Patterson Lake watershed is approximately 68,300 m³/d, whereas the peak groundwater inflow rate into the mine site is about 3,900 m³/d, representing only around 6% of the total surface water discharge.

Figure 6.8: Simulated groundwater inflow rate at end of operation



Year	Annual Average (m³/d)
	Application Case
2022	1651
2023	1153
2024	1162
2025	1594
2026	1636
2027	1679
2028	1755
2029	1826
2030	1897
2031	1870
2032	1903
2033	2001
2035	3852
2037	3483
2039	3031
2041	3325
2043	3420

Groundwater Flow Paths and Transit Times

During the construction and operational phases, groundwater seepage from the PAG Waste Rock Storage Area (WRSA) will be collected, treated, and ultimately discharged. Therefore, impacts on surface water will primarily occur during the post-closure period. After closure, groundwater originating from underground sources (UGTMF) will migrate upward through faults and shear zones, then flow laterally within the sandstone layer, and ultimately discharge into Patterson Lake (figure 6.9). Leachate from above ground WRSAs will reach waterbody in a comparatively faster rate in postclosure stage (figure 6.10).

- The vertical length of the subsurface pathway is approximately 260 meters, while the horizontal extent within the sandstone layer is about 1,000 meters.
- The overall cross-sectional area of the fault conduit is approximately 34,400 m², and the sandstone conduit is about 350 meters wide and 20 meters high.
- The groundwater transit time from the upper mine area to Patterson Lake is estimated to be approximately 1,000 years.
- Seepage from the WRSA is expected to take about 43 years to flow northward into Patterson Lake, and approximately 77 years to flow southward (figure 6.10).

Figure 6.9: Simulated particle tracks released from underground sources that indicates groundwater flow pathways

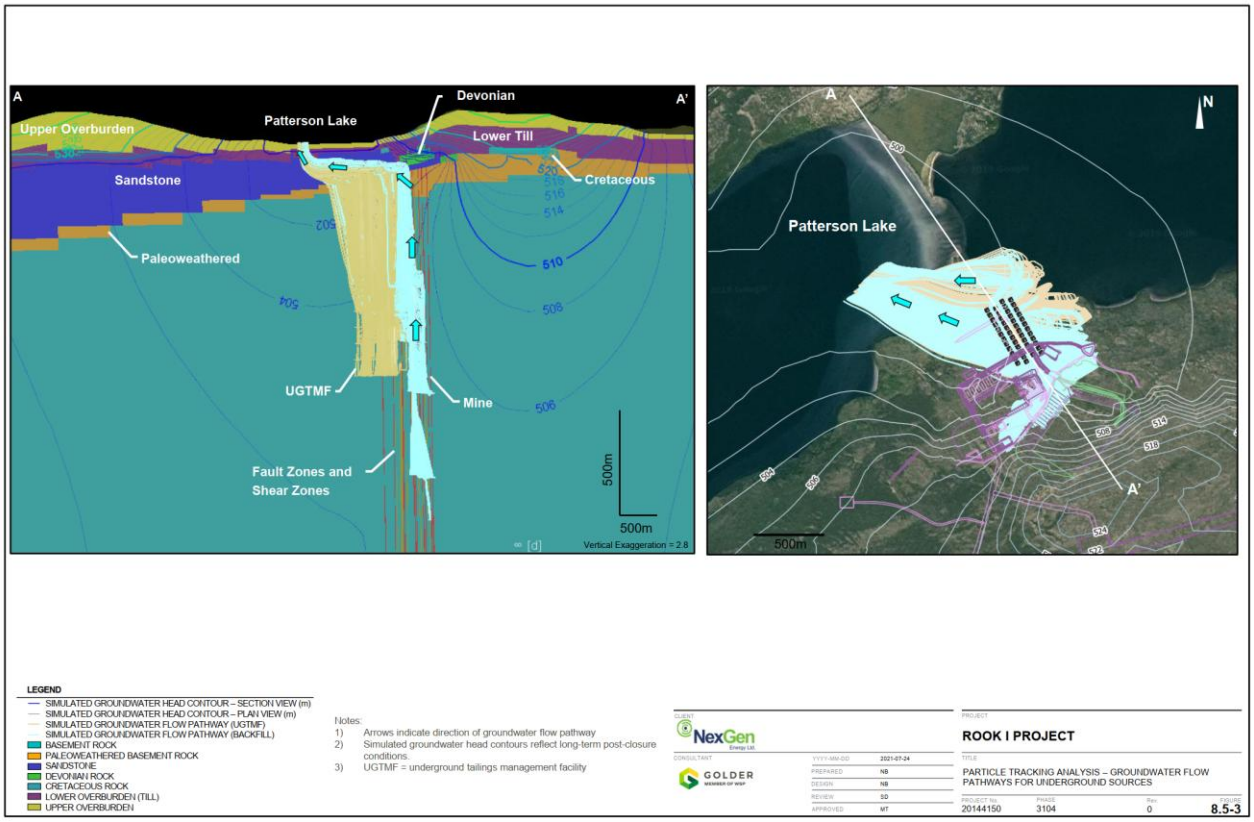
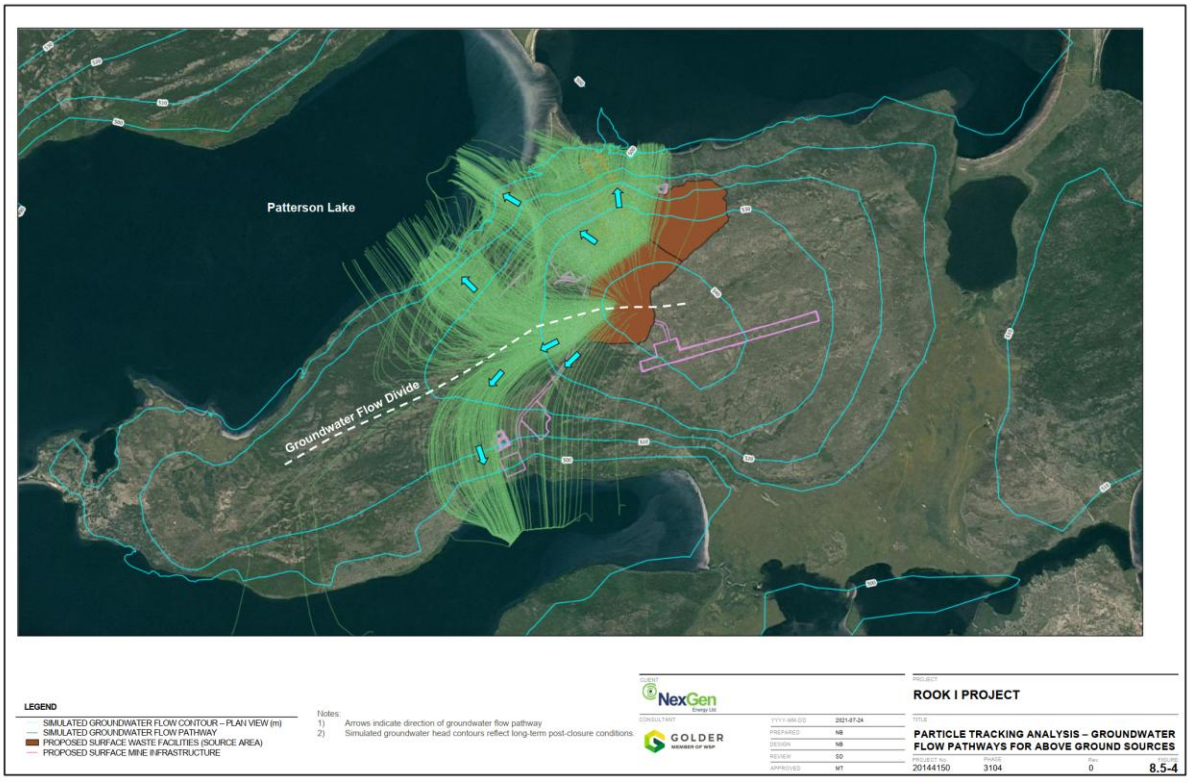


Figure 6.10: Simulated particle tracks released from above ground sources that indicates groundwater flow pathways



6.2.2.3. Effect on groundwater quality

For the Rook I Project, residual effects on groundwater quality primarily originate from the continued release of contaminants from source areas following mine operation and closure, including theUGTMF, reflooded mine workings, surface WRSAs, and underground wall rocks. Model simulations indicate that these source areas influence groundwater quality mainly through mechanisms of solute diffusion and hydraulically driven solute transport. Key chemical constituents include:

- Major ions: sodium (Na^+), magnesium (Mg), calcium (Ca), chloride (Cl^-), sulfate (SO_4^{2-}), bicarbonate (HC03-)
- Metals: iron (Fe), manganese (Mn), molybdenum (Mo), strontium (Sr), uranium (U), cobolt (co) and copper (Cu)
- Radionuclides: lead-210 (Pb-210), radium-226 (Ra-226), thorium-230 (Th-230)

Simulated transport pathway results show that contaminants will migrate slowly northward along groundwater flow paths and may eventually reach receptors such as Patterson Lake or other watershed outlets. Due to the low hydraulic conductivity of the bedrock at the project site, solute migration primarily occurs along fault zones and locally developed high-permeability sandstone units. These pathways are limited but represent a risk of channelized contaminant transport.

Peak solute load rates and sensitivity simulation results for groundwater pathways are provided in table 6.6. Figure 6.11 illustrates the variations in solute load rates from various source areas (such as the surface waste rock, UGTMF and reflooded mine workings) reaching Patterson Lake, particularly for copper, uranium, and radium. In the early stages of the simulation (around 100 model years), solute load rates reach the receptor (i.e., Patterson Lake) quickly and remain stable throughout the simulation period, assuming an infinite source condition.

For certain solutes, such as uranium, the arrival time of solute loads from underground mine site and UGTMF at the receptor is approximately 10,000 years. For other solutes, solute loads from underground backfill and waste rock sources are relatively balanced, such as sulfate, calcium, and strontium.

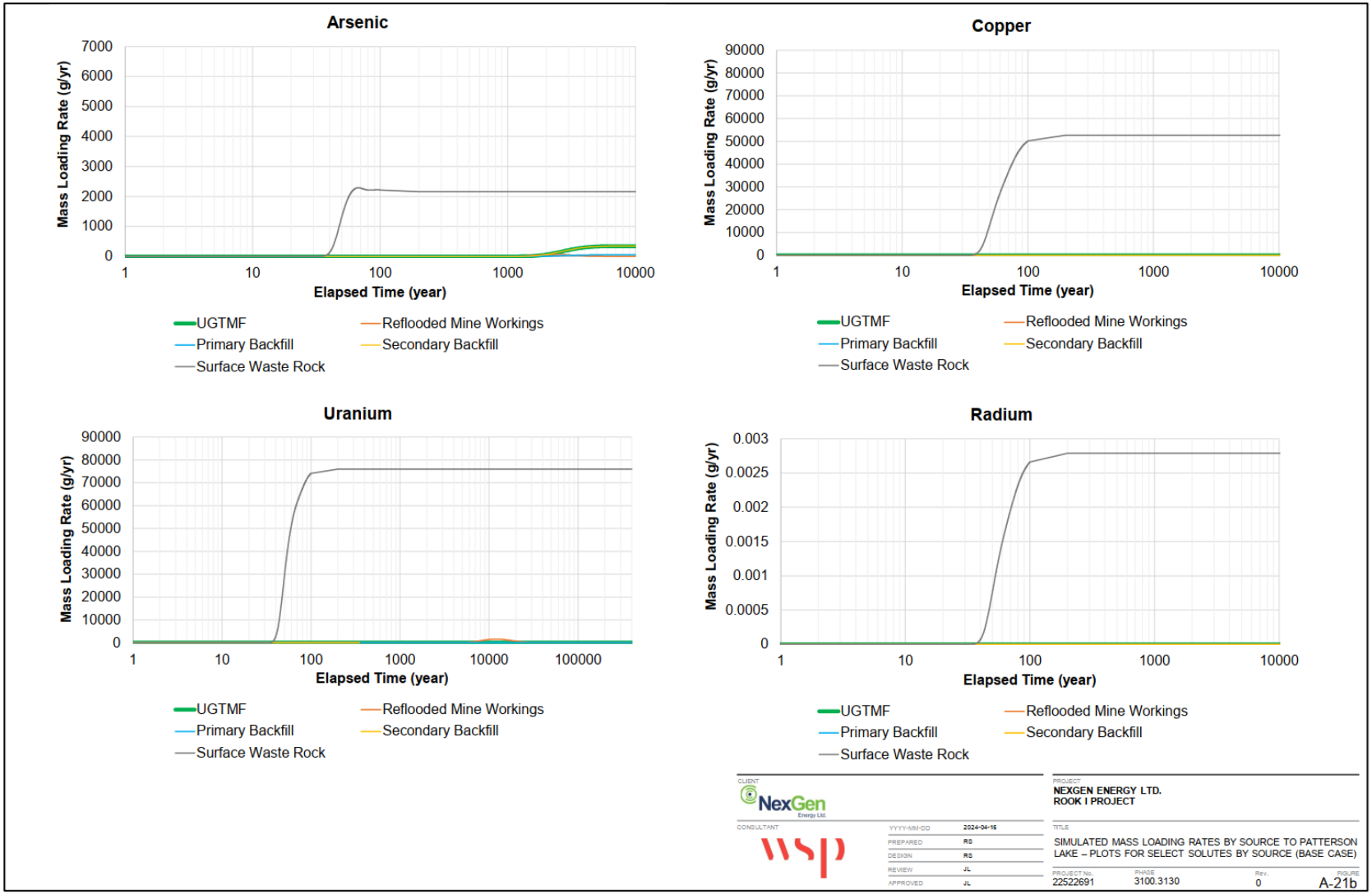
Table 6.6: Simulated peak solute mass loading rates for various application cases

		Solute																
		Silver	Aluminum	Arsenic	Boron	Calcium	Cadmium	Chlorine	Cobalt	Chromium	Copper	Fluorine	Iron	Mercury	Magnesium	Manganese	Molybdenum	Sodium	Ammonia
Application Case Peak Mass Loading Rate (g/yr)		210.6	812,669	2,918	20,756	5,376,000	89.78	13,030,000	32,209	472	52,879	163,880	604,519	38.93	2,362,000	48,220	175,901	2,463,000	115,559
Percent change relative to Base Case	SR1 – Bedrock K	0.90%	0.00%	3.00%	2.80%	1.10%	0.10%	-1.50%	0.00%	0.20%	0.00%	-1.50%	0.20%	0.00%	0.00%	0.00%	2.80%	2.60%	-1.50%
	SR2 – Fault zone K	2.20%	0.10%	6.20%	8.40%	7.10%	0.60%	-1.40%	0.00%	1.70%	0.10%	-1.80%	0.40%	0.00%	0.00%	0.00%	25.30%	23.90%	-1.90%
	SR3 – UGTMF tailings K	0.10%	0.00%	11.20%	0.30%	10.10%	0.30%	0.40%	0.00%	1.00%	0.10%	0.40%	0.00%	0.00%	0.00%	0.00%	14.60%	13.50%	0.40%
	SR4 – Backfill K	0.80%	0.10%	7.10%	0.50%	12.90%	1.00%	1.50%	0.00%	2.90%	0.10%	1.00%	0.00%	0.00%	0.00%	0.00%	42.60%	40.30%	0.80%
	SR5 – Fracture zone area	3.10%	0.00%	0.00%	11.30%	-2.90%	0.00%	-2.80%	0.00%	0.30%	0.00%	-2.90%	0.60%	0.00%	0.00%	0.00%	0.00%	0.00%	-3.00%
	SR6 – Upper bound UGTMF source	0.30%	0.10%	17.10%	0.10%	0.20%	0.80%	0.00%	0.00%	37.90%	0.10%	0.00%	0.00%	0.00%	0.00%	0.10%	15.30%	8.70%	0.00%
	SR7 – Upper bound backfill source	1.60%	1.70%	10.40%	0.10%	3.70%	1.30%	0.20%	0.00%	24.20%	0.10%	0.30%	0.10%	0.00%	0.00%	0.00%	130%	8.00%	0.10%
	SR8 – Upper bound waste rock source	47.00%	48.00%	40.40%	38.10%	27.20%	51.60%	46.40%	53.10%	46.60%	49.80%	46.90%	49.60%	48.90%	47.80%	51.00%	0.50%	2.90%	47.10%
	SR9 – All upper bound sources	52.30%	51.00%	107.10%	39.10%	57.40%	56.30%	48.70%	53.20%	160%	50.30%	48.70%	49.80%	48.90%	47.90%	51.30%	284%	85.20%	48.40%

		Solute																
		Nickel	Nitrite	Nitrate	Phosphorus	Lead	Lead-210	Polonium-210	Radium-226	Radium-228	Selenium	Sulphate	Strontium	Thorium-228	Thorium-230	Uranium-234	Uranium-238	Vanadium	Zinc
Application Case Peak Mass Loading Rate (g/yr)		28,441	1,066	1,023	1,171	638.8	3.081×10^{-05}	5.24×10^{-07}	0.002796	2.38×10^{-09}	2,779	34,200,000	28,880	1.18×10^{-09}	0.03176	4.191	77,582	3,082	22,544
Percent change relative to Base Case	SR1 – Bedrock K	0.00%	-1.50%	-1.50%	-1.50%	0.20%	0.00%	0.00%	0.00%	0.00%	0.60%	1.10%	3.80%	0.00%	0.00%	0.50%	0.50%	4.00%	0.00%
	SR2 – Fault zone K	0.00%	-2.10%	-2.10%	-2.00%	3.10%	0.10%	0.10%	0.00%	0.00%	7.20%	7.30%	6.50%	0.00%	0.00%	1.10%	1.10%	6.80%	0.00%
	SR3 – UGTMF tailings K	0.00%	0.40%	0.40%	0.30%	1.20%	0.00%	0.00%	0.00%	0.00%	3.50%	5.20%	0.10%	0.00%	0.00%	0.00%	0.00%	0.60%	0.10%
	SR4 – Backfill K	0.00%	0.60%	0.50%	0.60%	5.40%	0.00%	0.00%	0.00%	0.00%	12.50%	11.80%	0.20%	0.00%	0.00%	0.00%	0.00%	0.50%	0.10%
	SR5 – Fracture zone area	0.00%	-3.00%	-3.00%	-3.10%	0.00%	0.10%	0.10%	0.10%	0.00%	0.00%	0.00%	8.70%	0.00%	0.00%	1.90%	1.90%	8.80%	0.00%
	SR6 – Upper bound UGTMF source	0.20%	0.00%	0.00%	0.00%	185.40%	0.00%	0.10%	0.00%	0.00%	0.80%	0.20%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.40%
	SR7 – Upper bound backfill source	0.10%	0.00%	0.00%	0.00%	119.60%	0.20%	0.20%	0.10%	0.00%	12.00%	3.10%	0.00%	0.00%	0.00%	0.00%	0.00%	0.10%	0.20%
	SR8 – Upper bound waste rock source	53.50%	47.20%	47.30%	47.10%	10.90%	0.00%	0.00%	0.00%	0.00%	32.40%	36.00%	35.00%	0.00%	0.00%	0.00%	0.00%	0.00%	50.10%
	SR9 – All upper bound sources	54.10%	48.30%	48.30%	48.20%	556%	0.40%	0.50%	0.30%	0.00%	67.80%	58.00%	35.00%	0.00%	0.00%	0.10%	0.10%	1.30%	51.40%

Shading indicates range in values:
minimum (-3.1%) maximum (556%)
UGTMF = underground tailings management facility; K = hydraulic conductivity.

Figure 6.11: Simulated mass loading rates by source to Patterson Lake



6.2.3. Other Views Expressed

6.2.3.1. Indigenous Nations and Communities

CRDN had previously raised concerns of permafrost thaw and if COPCs would infiltrate groundwater due to the thawing of permafrost and increased hydraulic connectivity. NexGen has stated that the hydraulic conductivity of groundwater was not assumed to be impeded by permafrost, as the Project is in the sporadic scattered discontinuous permafrost zone and no permafrost was encountered in baseline soil surveys.

MN-S had previously noted a lack of clarity concerning cumulative impacts to groundwater from nearby future developments as groundwater drawdown from the Project activities is predicted to extend 2-4 kilometres from the Project site, but it is not evident if groundwater drawdown from a reasonably foreseeable future development case will overlap or cause additional impacts to NexGen's groundwater drawdown. NexGen has noted that the simulated drawdown in the upper horizon does not overlap with the Patterson Lake South Project area, and overall Patterson Lake represents a strong boundary for the groundwater flow system, minimizing changes in groundwater elevation and flow directions. The total groundwater flow to Patterson Lake may be affected by the concurrent development of the two projects, however NexGen does not expect cumulative effects due to the collection, treatment and discharge of Project groundwater inflows to Patterson Lake mitigating reduction in baseflow. Furthermore, NexGen has confirmed that seepage pathways for the Project and Patterson Lake South Project will not overlap, therefore, groundwater affected by the two projects is not expected to interact in the groundwater environment. MN-S had previously noted that the residual effects for groundwater indicated a negative change to groundwater elevation but a neutral change for groundwater flows and direction. MN-S had also indicated that groundwater elevation influences flow and direction and questioned the differing conclusions reached as part of the groundwater effects assessment. NexGen clarified that the assessment of changes to environment resulting from changes to the hydrogeological environment predicted no significant residual adverse effects to any VCs.

BNDN indicated their concerns that through continual loading of elevated concentrations of COPCs, that groundwater could be adversely impacted for thousands of years based on NexGen's Application and Reasonably Foreseeable Development Cases contained in the EIS. BNDN requested that the CNSC require NexGen to obtain BNDN's approval for their groundwater monitoring plan. Additionally, BNDN expressed concern that utilizing cemented paste backfill and cemented past tailings in the underground operations could adversely impact groundwater quality for centuries into the future. NexGen confirmed that they are committed to working with BNDN on additional mitigation measures to address the continual loading of elevated concentrations of COPCs. NexGen has stated that obtaining written consent prior to the implementation of groundwater measures is impractical, however the program is part of the EPP, which NexGen has committed to discussing with BNDN through the Environmental Committee.

NexGen has committed to pumping cemented paste tailings directly into chambers within competent basement rock and not backfilling cemented paste into underground working areas until the areas are no longer used, thereby not increasing risk to underground workers. Furthermore, NexGen has committed to working with the Implementation Committee to

organize community meetings to further discuss safety concerns should BNDN request it. BNDN also indicated that because of the UGTMF, that elevated levels of copper and cobalt predicted to occur in the EIS will be a result of groundwater migration from the UGTMF and are concerned of the potential impacts related to groundwater from the UGTMF. BNDN are also concerned that mine-affected groundwater is predicted to reach Patterson Lake in 43 years and questioned whether groundwater monitoring will be carried out to determine if impacted groundwater predictions remain accurate. NexGen is currently developing an adaptive management plan to manage copper loading from the potentially acid generating waste rock storage area to Patterson Lake and has committed to monitoring seepages and runoff quality at waste rock storage areas during operations. Following closure, transitional monitoring would verify that performance criteria have been met by NexGen, and long-term risks would be addressed. NexGen has confirmed that groundwater monitoring would be performed to ensure that impacted groundwater predictions remain accurate and aligned with EA predictions. BNDN noted they had general concerns regarding groundwater quality and potential impacts to groundwater. NexGen has committed to further presenting and discussing Project effects through workshops coordinated by the Environmental Committee to address continued concerns, and NexGen has supported engagement between the BNDN and the CNSC regarding potential effects to BNDN Aboriginal and treaty Rights.

Upon review of their issues and concerns identified in the EA Report, BNDN identified additional concerns including that there is no uranium mining precedent for underground tailings storage and as such long-term structural and containment performance is uncertain. BNDN requested NexGen provide engineering studies from similar facilities, use a phased approach with a test cell before full-scale deployment, and employ a verification timeline to evaluate system performance early. BNDN raised concerns that the placement of tailings may cause ground movement, triggering rock failures or instability. They have recommended that NexGen establish a geotechnical monitoring system, ensuring extensometers, stress meters, and micro seismic sensors are installed, tested and operational before tailings deposition. BNDN noted concerns about cracking, radon gas release, or tailings failure due to the degradation of binders over time because of chemical, microbial, or mechanical factors. They have requested that in-situ curing trials are conducted, and a performance verification plan is developed before additional tailings are placed to assess long-term chemical durability.

BNDN has requested long term tailing monitoring, containment, and treatments plans to mitigate leaching and the mobilization of heavy metals and radionuclides from paste degradation. They have also suggested that NexGen includes sulphate resistance and thermal effects in CPT due to risks of sulphates in tailings and temperature during curing degrading cementitious materials. BNDN also raised concerns that heat may cause thermal cracking in CPT, damage rock, or strain ventilation and recommended that NexGen conduct thermo-mechanical modeling, evaluate cooling systems and incorporate heat management into ventilation design.

BNDN has found that the response plan for tailings liquefaction, bulkhead failure, or roof collapse is insufficient and requested that NexGen conducts a Failure Modes and Effects Analysis (FMEA), install and test secondary egress, and establish drill schedules. They also

noted that current hydro models lack regional and transient calibration and groundwater may destabilize tailings and accelerate reactions; as such BNDN recommends NexGen conduct pump tests for aquifer characterization, improve solute transport modelling with numerical models, and more robustly address climate risks such as extreme rainfall. BNDN has requested that NexGen engineer cover systems for PAG and NPAG rock to prevent seepage from WRSA. BNDN identified concerns regarding water inflow during shaft sinking or outside frozen zones delaying work and increasing exposures, noting that risks exist despite the use of ground freezing. Finally, BNDN requested NexGen conducts advance probe drilling and permeability testing, ensures that water management systems are in place before mining advances, and follows best practices from Athabasca Basin shaft projects.

YNLR have indicated their concerns for potential contamination of groundwater because of the Project. YNLR also raised concerns about potentially contaminated groundwater from the proposed potential Patterson Lake South project local study area reaching the local study are of the NexGen Rook I Project and vice versa. YNLR indicated their concerns that potential impacts to groundwater seems to be significant over time and space and that discharge of potentially impacted groundwater is of high concern to YNLR members. YNLR noted their support for groundwater monitoring but also suggested a risk assessment be conducted and contingency plans developed should residual impacts be greater than predicted. Addressing concerns regarding groundwater contamination, NexGen has committed to minimizing potential Project effects to groundwater and surface water through an Environmental Management Program and supporting processes containing monitoring and mitigation plans in addition to environmental design features. NexGen has confirmed that groundwater from the Project is not predicted to overlap with groundwater influenced by the Patterson Lake South Property, and cumulative effects of seepage are considered in the surface water quality assessment. NexGen has acknowledged concerns regarding potential impacts across time and space but has disagreed that the effects would be significant; effects on groundwater are considered by NexGen to be local and would reverse over time following Operations. Finally, NexGen has committed to developing additional measures beyond future monitoring to address concerns regarding residual impacts.

ACFN recommended that the environmental risk assessment extend to 77 years when groundwater influences from the waste rock pile are predicted to discharge to the south end of Patterson Lake and would overlap the reasonably foreseeable future development case. NexGen has noted that far-future Project effects have been assessed, and the projection encompasses long-term effect on human health and ecosystems to model a precautionary representation of the maximum potential changes to surface water quality.

6.2.3.2. Federal Authorities

ECCC suggested that there is a risk of potential residual effects to aquatic life from the Project based on the information provided. The proposed mitigation measures of lined waste management areas and the use of an underground tailings facility still allows for seepage of contaminants to groundwater and transport to Patterson Lake. Therefore, NexGen has committed to providing a Monitoring Follow-up and Adaptive Management Plan that will include

groundwater quality and quantity monitoring, monitoring discharge and surface water quality in the receiving environment and monitor effects on fish and fish habitat to apply adaptive management when necessary.

6.2.4. CNSC Staff's Analysis

CNSC staff and FIRT members conducted a comprehensive review of the effect assessment of geology and groundwater, covering the following topics:

- Characterization of baseline geological and hydrogeological conditions.
- Evaluation of the potential impact of the Project on the geological and groundwater environment (quantity and quality) for each phase of the Project.
- Mitigation measures developed for each phase of the Project to eliminate, reduce, or control adverse impacts on geology and groundwater environment.
- Follow-up and monitoring tailored for each phase of the Project to verify the accuracy of predictions and effectiveness of mitigation measures.

CNSC staff raised an IR pertaining to the consideration of geology as an intermediate component. The proponent was requested to provide justification for its exclusion of geology as an intermediate component. The proponent explained that while geology per se was not fully assessed as an intermediate component, assessments of effects on key components related to geology have already been included in the EIS. The proponent also provided further discussion on the potential linkages of geology to certain valued components and intermediate components, and how geology has been considered within the Project design and the EIS (refer to Appendix 8A Geology Supplement in the EIS).

During the review process, CNSC staff put forward IRs requesting additional information, clarifications, and further analysis specific to the effect assessment for groundwater and geochemistry source terms. In response, NexGen addressed these comments satisfactorily and revised their Environmental Impact Statement (EIS) documents accordingly.

CNSC staff and other FIRT members raised concerns over design and implementation of the groundwater monitoring program to ensure that groundwater quality remains unaffected during operations and post-closure phases. Key areas of concern included the placement of monitoring wells along groundwater flow paths to effectively capture potential contaminant migration, the selection of monitoring parameters and sampling frequency, and the use of monitoring data to support adaptive management. In response, NexGen acknowledged the importance of groundwater monitoring, and committed to submit the detailed designs as part of future licensing applications. The response outlined that the monitoring well network would be installed along the groundwater flow direction in downstream zones from WRSA and UGTMF towards Patterson Lake. NexGen confirmed that specific monitoring parameters, frequencies, and well locations would be submitted as part of future licensing applications (licence to prepare site and construct).

In terms of model construction and validation, CNSC requested the proponent to provide detailed technical justifications for the groundwater flow model, e.g. assumption of boundary condition

settings and discretization methods. The proponent replied that its model adopted a rectangular grid system based on site-specific hydrogeological characteristics, and that the boundary conditions were rigorously validated.

Regarding groundwater inflow under extreme scenarios, CNSC staff requested NexGen to further clarify the prediction of maximum inflow rates under unconventional conditions such as increased fault conductivity or ground subsidence. Through sensitivity analyses, the proponent demonstrated that when fault conductivity increases by five times, the groundwater inflow could reach 6,246 m^3/d by the 13^{th} - 15^{th} year of operation. To further assess the risk, the proponent also simulated an extreme scenario where exploration boreholes unintentionally intersect underground tailings facilities, predicting that the daily inflow under such circumstances would increase by 2,000 m^3/d. The proponent emphasized that the current drainage system design capacity (7,080 m^3/d) has fully considered such extreme scenarios and is equipped with multiple safeguard measures, including backup pump sets.

Regarding the solute transport model and its source term derivation, CNSC staff requested the proponent to provide more robust technical justifications. For the influence of subsurface temperature, the proponent predicted, based on regional geothermal gradient data (25–35°C/km), that the underground operational environment temperature would remain in the range of 20–30°C, which is generally consistent with the laboratory testing conditions (20–22°C), and thus considered that no temperature correction was necessary. Regarding the influence of redox potential, the proponent's simulation analysis showed that under pH 10–12 conditions, uranium migration is mainly controlled by the solubility of calcium uranyl oxide ($CaU_2O_7 \cdot 3H_2O$), and that the omission of this control mechanism in the current model in fact results in a conservative overestimation of the source term. As for the release mechanism of uranium from waste rock, the proponent confirmed through mineralogical analysis and an 18-month humidity cell test that uranium mainly exists in the form of crystalline uraninite (UO_2), and its release process is primarily controlled by oxidative dissolution mechanisms.

CNSC staff noted that the proponent's waste rock source term prediction model lacked supporting derivations for key parameters and original experimental data. In response, the proponent submitted a supplemental report providing complete humidity cell test data, geochemical characterization of waste rock, and detailed explanations of the calculation methods. The proponent explained that the model input values were conservatively extrapolated based on HCT test results, with parameter adjustments informed by mineralogical analysis.

CNSC staff noted the proponent relied on an engineered layered design to mitigate potential acid rock drainage generation from the PAG waste rock storage area. The design aimed to emplace PAG waste rock in 5m lift with interval layers of compacted fine grain material to restrict oxygen ingression. Regarding oxygen transport in the waste rock pile (IR 243), CNSC requested the proponent to provide the complete report from Okane (2020). In response, the proponent submitted the Okane (2020b) technical report (Appendix A), which provides a detailed description of the 1D model construction and scenario analysis for oxygen transport in the waste rock pile. Model comparisons indicated that the engineered barrier design (layered cover with fine-grained materials) can reduce the post-closure infiltration rate to 65–85 mm/year, and by

limiting the gas conductivity (3×10^{-14} m/s), oxygen transport would be dominated by diffusion, with oxidation occurring only within the top 3 meters of the waste rock. Climate sensitivity analyses showed that variations in infiltration rates remain within a controllable range, and that the liner has no significant impact on overall site hydrology.

CNSC staff have found that NexGen's effect assessment related to geology and groundwater [10, 11] 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 (as outlined in table 6.8) has been appropriately assessed; the mitigation measures (as outline in table 6.8) proposed for each phase of the Project are suitable. Given the uncertainties inherent in geological model development and hydrogeological analysis, CNSC staff consider the EA follow-up monitoring which the proponent committed to, is necessary. CNSC staff also noted that future developments in the site will be able to provide more data for verification of the hydrogeological flow and transport models provided in the current EIS. The updating of hydrogeological conceptual site model and the overall safety case will be necessary in future licensing stages (licence to prepare site and construct).

6.2.5. CNSC Staff's Findings and Recommendations

CNSC staff have reviewed NexGen's effect assessment of the geological and hydrogeological environment and conclude that NexGen conducted a comprehensive analysis of these effects and that identified mitigation and follow-up monitoring program measures are adequate.

6.2.6. Issues requiring Follow-up

6.2.6.1. Groundwater protection and monitoring program

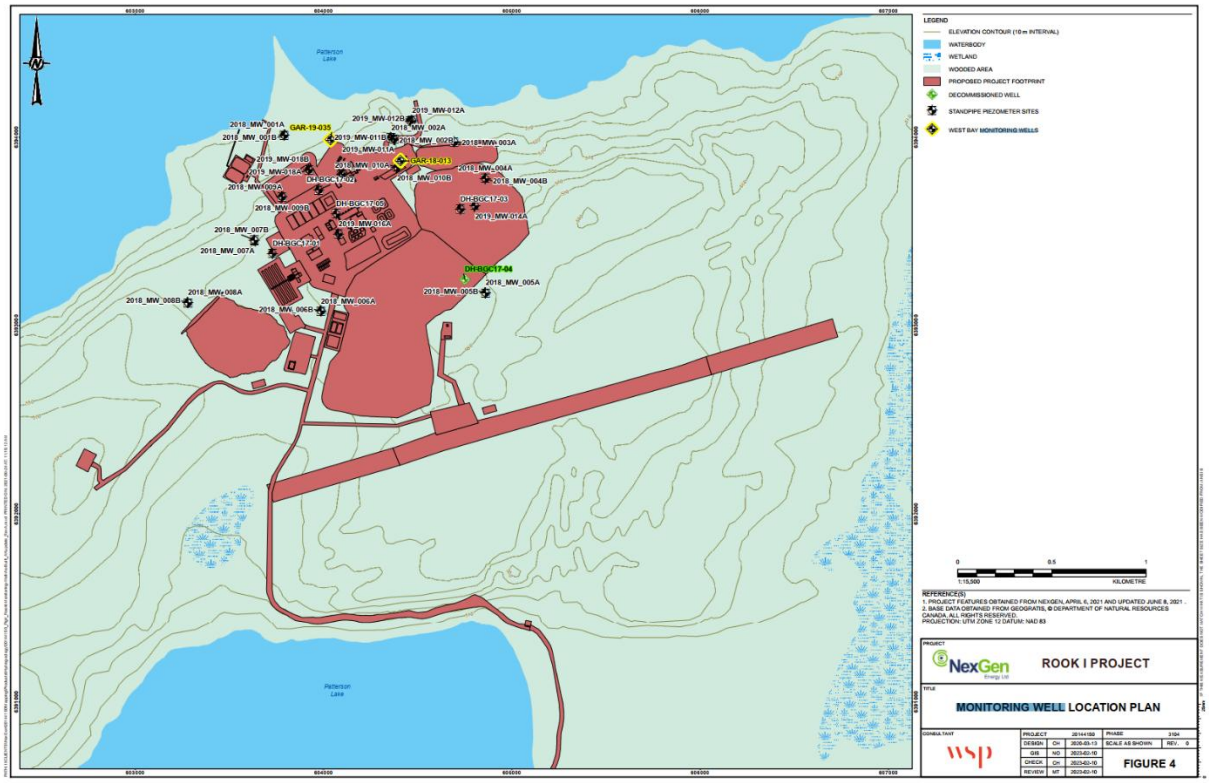
The proponent indicated that the plan for monitoring groundwater quantity and quality as a part of the Project would be detailed in the EMP and has committed that the EMP will be ready for CNSC review and approval in following licensing stages (licence to prepare site and construct). The groundwater focus of this plan is establishment of monitoring systems to evaluate the effectiveness of groundwater protection controls. Groundwater monitoring targets were selected under the plan to achieve the monitoring objectives detailed above. These targets include monitoring of groundwater elevations and quality in the bedrock and overburden to monitor the effects of the following:

- dewatering during construction and development of the shaft, underground mine, and UGTMF
- seepage from the WRSAs
- seepage from the process and mine terrace areas, including the fuel and reagent storage areas and equipment such as diesel fuel generators (i.e., in the event of a spill and non-routine events)
- seepage from the area of the effluent treatment ponds (in the event of leakage)

CNSC staff noted NexGen has monitoring wells as shown in figure 6.12 for sampling of groundwater in the hydrogeological baseline investigation. It is also noted that these monitoring

wells need further refinement and optimization in consideration of CSA standard 288.7-23. Most importantly, monitoring well locations should cover the predicted COPC plume extents.

Figure 6.12: Monitoring well locations in hydrogeological baseline investigations (Annex III: Hydrogeological Baseline Report)



6.3. Aquatic Environment

Hydrology, surface water quality and sediment quality represent intermediate components in the EA. They were selected based on how changes could influence the health of fish, plants, wildlife, and the people that use natural resources. Information from these assessments were used to support valued component assessment such as fish and fish habitat, vegetation, and wildlife and wildlife habitat.

6.3.1. Description of the existing surface water hydrology of the aquatic environment

The assessment of the aquatic environment was conducted within two defined study areas: the LSA and the RSA. The LSA represents the spatial boundaries of the Clearwater River watershed most likely to experience direct environmental effects from the proposed Project and extends from the river's headwaters to the outlet of Naomi Lake covering approximately 685 km² (to the orange dotted boundary in the below figure). There are five larger lakes in the LSA including Broach, Patterson, Forrest, Beet, and Naomi lakes, as well as several smaller waterbodies including Lake G, Lake H, and wetlands. The proponent selected the extent of the LSA since it includes the waterbodies (i.e., lakes, ponds or wetlands) and watercourses (i.e., streams, creeks or rivers) where direct Project-related changes would be expected and likely to be measurable

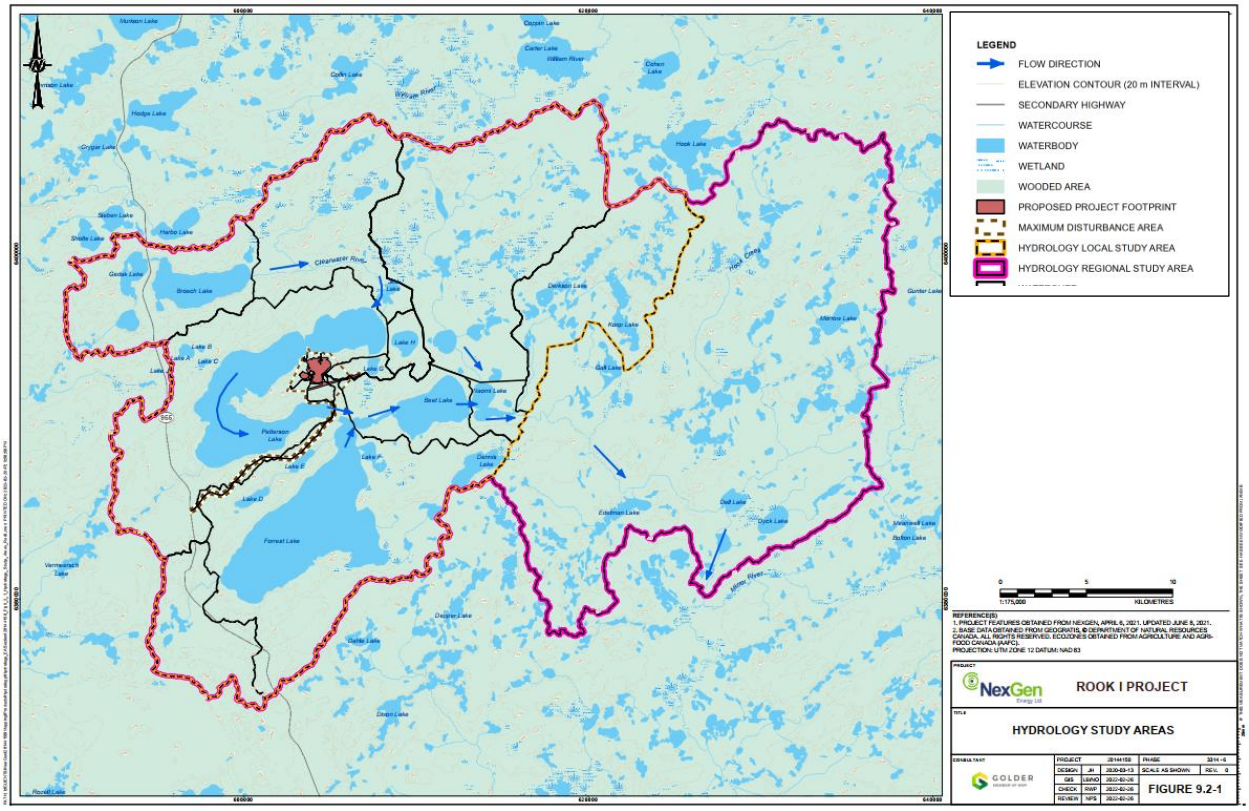
(i.e., the receiving environment). The RSA encompasses the LSA and is defined by the Clearwater River watershed boundary upstream of the Mirror River confluence, covering a total area of 1,076 km² (purple dotted area in

Figure 6.13 below added to the LSA).

6.3.1.1. Description of the existing surface water hydrology

The hydrology LSA and RSA spatial boundaries used in this assessment were consistent with those applied to other components of the aquatic environment, such as fish and fish habitat, surface water and sediment quality, and followed CEAA guidance. See figure below, taken from EIS figure 9.2-1.

Figure 6.13: Local and Regional Hydrology Study Areas (adopted from section 9 of EIS)



Extensive baseline monitoring programs were completed over the period from August 2018 to September 2020 to characterize the hydrology, geomorphology, stream channel parameters, stream hydraulics and fluvial sediment transport of Clearwater River and its tributaries in the RSA. A summary of waterbodies, watercourses, baseline hydrological monitoring stations (evaluation nodes) and measured parameters, can be found in table 6.7 below which are considered in hydrology assessment. Detailed characteristics of the waterbodies and water courses considered in hydrology assessment can be found in table 9.3-2 and table 9.3-3 of EIS. In addition, NexGen completed bathymetric mapping of lake depth contours for Patterson Lake, Broach Lake, Lake G, Lake H, and Beet Lake, and Naomi Lake to generate baseline bathymetric

maps and establish water surface elevation (WSE)-volume relationships for Broach Lake, Patterson Lake, Forrest Lake, Beet Lake, and Naomi Lake as well as Lake G and Lake H. Historical and current climate data for the period January 1979 to August 2019 and August 2018 to October 2020 was obtained from European Reanalysis (ERA) databases and Rook I meteorological stations. The baseline characterization conducted by NexGen provides key insight into the environmental conditions that are relevant to understanding the potential effects of the Project on aquatic ecosystems. For more detailed information, please refer to the Aquatic Environment Baseline Report (annex V.1) of the EIS.

The proponent developed a regional hydrological model for RSA and fluvial sediment transport model for the Clearwater River below (i.e., downstream of) Patterson Lake to characterize existing conditions and predict Project effects on surface water hydrology which were developed and calibrated based on measured data collected during baseline studies. The models were used to broaden the range of conditions compared to what could be measured over the baseline monitoring period to include a longer period and greater range of conditions, including extreme conditions such as drought and floods.

Table 6.7: Water bodies, watercourses, drainage areas and baseline hydrology monitoring locations (adopted from section 9 table 9.2-2 of the EIS)

Hydrometric Station ID	Hydrometric Station Name	Watershed Area (km2)
HL-WB-MS-01	Hodge Lake	52.6
CR-WB-MS-01	Broach Lake	56.4
CR-WB-TI-01	Lake H	7.36
CR-WB-TI-02	Lake G	3.75
CR-WB-MS-02	Patterson Lake	264
CR-WB-MS-03	Forrest Lake	445
CR-WB-MS-04	Beet Lake	473
CR-WB-MS-05	Naomi Lake	685
HL-WC-MS-01	Hodge Lake outflow	52.6
CR-WC-MS-01	Clearwater River below Broach Lake	56.4
CR-WC-MS-02	Clearwater River above Patterson Lake	121
CR-WC-MS-03	Clearwater River below Patterson Lake	264
CR-WC-MS-04	Clearwater River below Beet Lake	473
CR-WC-MS-05	Clearwater River below Naomi Lake	685
CR-WC-MS-06	Clearwater River above Mirror River confluence	1,076
CR-WC-MS-07	Clearwater River below Mirror River confluence	3,300

Hydrometric Station ID	Hydrometric Station Name	Watershed Area (km2)
CR-WC-MS-08	Clearwater River at the Lloyd Lake Outlet	4,370
CR-WC-MS-09	Clearwater River at Warner Rapids	9,590
CR-WC-TI-01	Tributary Inflow above Forrest Lake	34.8
CR-WC-TI-02	Tributary Inflow to Naomi Lake	134
CR-WC-TI-03	Tributary Inflow downstream of Naomi Lake	67.5

NexGen developed site-specific future climate projections for the Project based on results from a multi-model ensemble representing different levels of greenhouse gas emissions. The 2050s (i.e., this includes the years 2041 to 2070) was selected as a reasonable upper bound in terms of climate change during the Project lifespan. The mean projected monthly changes in air temperature and precipitation for the 2050s relative to a historical climate period of 1981 to 2020 were incorporated into the hydrological model. In the mean climate change scenario, temperature, precipitation, lake evaporation, and evapotranspiration are all projected to increase, while sublimation would decrease due to a shorter snow-covered period.

6.3.1.2. Description of the existing surface water and sediment quality

The LSA and RSA boundaries used in this analysis were consistent with those applied to other components of the aquatic environment, such as hydrology, fish, and fish habitat, and followed CEAA guidance

The conditions for surface waterbodies in the LSA were determined from baseline studies conducted between 2015 and 2020. These baseline water quality conditions provide important context for evaluating the potential impacts of the Project. Understanding the natural state of the waterbodies helps identify any changes caused by Project activities, ensuring that any impacts can be detected and appropriately managed. The water quality of the lakes and streams within the LSA reflects characteristics typical of Canadian Shield waterbodies. These include:

- High water clarity
- Near-neutral pH levels
- Seasonal variability in surface water temperatures

Surface waters in the LSA were characterized by low concentrations of dissolved solids, with calcium and bicarbonate being the primary ions present. Most waterbodies are oligotrophic, with low nutrient levels, except for Lake G, classified as mesotrophic due to higher phosphorus concentrations. Indigenous Nations and communities described historically clear, clean waters in Patterson Lake and surrounding lakes. However, some community members reported deteriorated water quality and fish health since exploratory drilling activities began, discouraging traditional fishing practices. Overall, concentrations of ions and metals, including those identified as COPCs, were generally below established water quality guidelines. However, some

naturally elevated levels of certain COPCs were observed in the waterbodies and streams within the LSA. Natural exceedances of iron, manganese, lead, nickel, and arsenic were noted in certain waterbodies, including Patterson Lake, Naomi Lake, and Beet Lake. These exceedances align with regional natural ranges, except for iron in Naomi Lake, which exceeded regional maximums.

Baseline studies conducted from 2018 to 2019 provided insight into sediment quality within the LSA's surface waterbodies. The upper sediment layer (0–2 cm) typically consisted of varying mixtures of coarse sand, fine sand, and silt, with the proportions differing across waterbodies. Sediment composition varies by location, particularly within Patterson Lake. Patterson Lake North Arm – East Basin had primarily fine sand and silt while the North Arm – West Basin had fine sand and silt dominate in deeper areas, with coarse sand near the shoreline. South Arm had primarily coarse sand near the lake outlet. The total organic carbon (TOC) content, which measures the amount of organic matter in the sediment, ranged widely from as low as 0.24% in Beet Lake to as high as 25.8% in Naomi Lake. Generally, lakes with coarser sediments (such as sand) had lower organic content, while lakes with finer sediments (such as silt) had higher organic content. In sediment, metal and radionuclide concentrations were generally low and below thresholds in most areas, however elevated levels were noted in specific locations. Arsenic in Patterson Lake North Arm – West Basin and Naomi Lake exceeded multiple sediment quality guidelines in the baseline samples, polonium-210 exceeded thresholds in Patterson Lake North Arm – West Basin, and vanadium exceeded thresholds in Naomi Lake. Local Indigenous groups highlighted concerns about potential contamination, noting diseased bottom-feeding whitefish in Patterson Lake, possibly linked to sediment quality issues.

The baseline characterization conducted by NexGen provides key insight into the environmental conditions that are relevant to understanding the potential effects of the Project on aquatic ecosystems. For more detailed information, please refer to the Aquatic Environment Baseline Report (Annex V.1) of the EIS.

6.3.2. Proponent's Assessment: Aquatic Environment and Surface Water Resources

6.3.2.1. Hydrology

The pathway analysis performed by NexGen assessed the potential adverse effects of the Project on surface water hydrology, identified mitigation measures, and evaluated whether these measures could effectively reduce or eliminate residual adverse impacts. Potential Primary (i.e., effects are greater than negligible and require further detailed assessment) effects pathways are detailed in table 6.8. No potential Secondary (i.e., mitigation reduces effects to negligible levels) effects were identified. Potential effects with no pathway (i.e., mitigation results in no effect on hydrology) such as Construction, Operation, and Closure of culverts and changes in flows during Closure are not considered further in this EA but are described in section 9 table 9.5-2 of the EIS.

Table 6.8: Potential adverse effects pathways for surface water hydrology (adapted from section 9 of the EIS).

Pathway	Project Phase	Effects Pathway	
Primary	Construction, Operations	Diversion of natural watercourses and drainage areas	Project activities and footprint may divert site runoff from its natural course and change drainage areas
Primary	Construction, Operations and Closure	Changes in water balance and hydrological processes	Activities may affect basin yields (i.e., and in turn affect waterbody WSEs and watercourse flows) through changes in water balance and hydrological processes in the upstream contributing area
Primary	Construction and Operations	Changes in flows	Changes in watercourse flows during Construction and Operations may cause erosion downstream, alter stream channel sediment transport and stream channel parameters and affect shoreline integrity.

Residual Effects Analysis

The predicted changes to receiving environment surface water hydrology was assessed based on four measurement indicators (waterbody water surface elevations (WSE), watercourse flow rates, stream channel parameters (e.g., wetted area) and fluvial sediment transport), identified for hydrology assessment, for the primary pathways identified in table 6.8 under four assessment cases, i.e., application case and three reasonably foreseeable development (RFD) cases that include effects of climate change. The effects of primary pathways on hydrology were calculated numerically by integrating these pathways into a hydrological model developed for each phase of the Project. The approach used quantitative analysis and logical reasoning to describe anticipated changes to each measurement indicator caused by the Project and RFDs as the net result of changes in the contributing watershed associated with the identified primary pathways. The changes in measurement indicators for surface water hydrology were estimated relative to the Base Case conditions to the Application Case and RFD Case conditions including climate change scenarios (2041-2070) to describe the residual effects and are discussed below. The changes to measurement indicators are summarized for the key evaluation nodes, that coincide with existing or planned hydrometric monitoring stations, on waterbodies and watercourses downstream of the Project. The receiving environment waterbodies carried forward for the residual effects analysis included Patterson Lake, Forrest Lake, Beet Lake, Naomi Lake and Clearwater River.

Water Surface Elevations

The effect of the Project on water surface elevations of waterbodies in Application Case and RFD Cases including climate change was assessed for Patterson, Forrest, Beet and Naomi Lakes (Table 6.9). The predicted WSE in the lakes is expected to increase, however, the magnitude of

the change both in mean monthly and annual estimates are predicted to be small (<0.05m) with the maximum predicted change of 3.5% (0.03m) for RFD case including climate change and unlikely to be measurable. The changes to predicted range of WSE (i.e., the variability) are also not likely be differentiated from existing conditions for all assessment cases.

Table 6.9: Changes in mean annual WSE relative to the Base Case (adopted from table 9.7-1 of EIS)

Application Case	RFD Case Scenarios		
	RFD Case	Climate Change	Total (i.e., RFD Case including climate change)
Ranges from 0.2% (0.002 m) annual increase at Beet and Naomi lakes to 1.0% (0.008 m) at Patterson Lake (low magnitude)	Ranges from 0.4% (0.004 m) at Beet and Naomi lakes to 2.2% (0.017 m) at Patterson Lake (low magnitude)	Ranges from -0.01% (0.000 m) annual decrease for Beet Lake, and 0.33% (0.004 m) annual increase for Naomi Lake to 1.6% (0.013 m) at Patterson Lake (low magnitude)	Ranges from 0.4% (0.004 m) annual increase for Beet Lake to 3.5% (0.028 m) at Patterson Lake (low magnitude)

Base Case: *hydrology represents existing conditions*; Application Case: *hydrology represents the Base Case plus the potential effects from the proposed Project*; RFD Case: *Application Case plus the Patterson Lake South Property (under historical climate)*; RFD Climate Change Scenario: *represent effect of climate change (2041-2070) without the inclusion of Project or Patterson Lake South Property effects*; RFD Case (including climate change): *combined effects of the RFD Case and climate change scenarios.*

Watercourse Flow Rates

The effect of the Project on watercourse flow characteristics (mean maximum and minimum daily flows and mean annual flows) was assessed at Clearwater River below Patterson Lake, Beet Lake, Naomi Lake and above Mirror River confluence in Application Case and RFD Case Scenarios including climate change. The predicted flows in Clearwater River below are expected to increase during both Application Case and RFD cases in response to a net discharge of water to Patterson Lake from Project activities. However, the percent increases in predicted flows are too small to be detectable at any of the hydrometric stations and would be difficult to distinguish from existing conditions. Under climate change scenario, predicted mean annual flows and mean annual maximum daily flows are expected to increase at evaluation nodes with mean annual minimum daily flows depicting a predicted decrease. The mean monthly flows are also predicted to increase except fall and early winter months. In RFD Case including climate change, flows in the Clearwater River are also expected to increase in response to climate change and, to a lesser degree, developments. The quantitative estimates of the percent changes are shown in table

Table 6.10.10. The predicted changes are low in magnitude.

Table 6.10: Changes in flow characteristics relative to the Base Case (adopted from table 9.7-1 of EIS)

Measurement Indicator	Application Case	RFD Case Scenarios		
		RFD Case	Climate Change	Total (i.e., RFD Case including climate change)
Watercourse mean annual maximum daily flow	Ranges from 0.7% at Clearwater River above Mirror River confluence to 1.4% at Clearwater River below Patterson Lake (low magnitude)	Ranges from 0.1% at Clearwater River above Mirror River to 2.6% at Clearwater River below Patterson Lake (low magnitude)	Ranges from 3.2% at Clearwater River above Mirror River confluence to 8.0% at Clearwater River below Patterson Lake (low magnitude)	Ranges from 3.9% at Clearwater River above Mirror River confluence to 9.7% at Clearwater River below Forrest Lake (low magnitude)
Watercourse mean annual flow	Ranges from 0.7% at Clearwater River above Mirror River confluence to 1.6% at Clearwater River below Patterson Lake (low magnitude)	Ranges from 0.7% at Clearwater River above Mirror River confluence to 3.1% at Clearwater River below Patterson Lake (low magnitude)	Ranges from 3.4% at Clearwater River below Beet Lake to 6.2% at Clearwater River above Mirror River confluence (low magnitude)	Ranges from 4.9% Clearwater River below Naomi Lake to 7.5% Clearwater River below Patterson Lake (low magnitude)
Watercourse mean annual minimum daily flow	Ranges from 1.0% at Clearwater River above Mirror River confluence to 1.6% at Clearwater River below Patterson Lake (low magnitude)	Ranges from 1.6% at Clearwater River above Mirror River confluence to 3.4% at Clearwater River below Patterson Lake (low magnitude)	Ranges from -3.1% at Clearwater River above Mirror River confluence to -0.3% at Clearwater River below Patterson Lake	Ranges from -2.0% at Clearwater River above Mirror River confluence to 3.0% at Clearwater River below Patterson Lake (low magnitude)

Measurement Indicator	Application Case	RFD Case Scenarios		
		RFD Case	Climate Change	Total (i.e., RFD Case including climate change)
			(low magnitude)	

Stream Channel Parameters

The effect of the Project was assessed at Clearwater River below Patterson Lake, Beet Lake, Naomi Lake and above Mirror River confluence in Application Case and RFD Case including climate change. The predicted increase in flows downstream of the Project may result in small changes in Clearwater River channel parameters. The predicted changes in river channel parameters using wetted areas were found to be a maximum of 5.7% which is for RFD Case including climate change (see tableTable 6.11.11) and are not expected to be large enough to be detectable or large enough in magnitude to change how the watercourses are used by humans for navigation, may in fact slightly improve navigation, and are well within the range of natural variation. Therefore, changes in Clearwater River channel parameters are not expected to affect navigation for Indigenous land users, resource users and recreationists.

Table 6.11: Changes in Wetted Area at the Mean Annual Flow for relative to the Base Case (adopted from table 9.7-1 of EIS)

Application Case	RFD Case Scenarios		
	RFD Case	Climate Change	Total (i.e., RFD Case including climate change)
Ranges from 0.3% at the Clearwater River below Beet and Naomi lakes to 1.2% at the Clearwater River below Patterson Lake (low magnitude)	Ranges from 0.4% at the Clearwater River below Naomi Lake to 2.3% at the Clearwater River below Patterson Lake (low magnitude)	Ranges from 1.1% at the Clearwater River below Naomi Lake to 3.5% at the Clearwater River below Patterson Lake (low magnitude)	Ranges from 1.5% at the Clearwater River below Naomi Lake to 5.7% at the Clearwater River below Patterson Lake (low magnitude)

Fluvial Sediment Transport

NexGen assessed the effect of the Project on fluvial sediment transport for the Clearwater River below Patterson Lake along the reach from Patterson Lake to the north end of Forrest Lake. Changes in sediment transport relative to the Base Case were assessed at one location in the Upper Reach and in both North Channel and South Channel of the Lower Reach (see table 1.12).

Erosional losses are expected in the Upper Reach with increased flows; however, these losses are offset by sediment deposition in the lower reaches. The net balance for the entire reach was negative, which represents a net loss of sediment from the reach to downstream areas, but this negative net balance is predicted to be of a similar magnitude as the Base Case for both Application Case and RFD cases. All assessment cases resulted in negligible changes in net transport of sediment for the Clearwater River reach between Patterson Lake and Forrest Lake compared to the Base Case, which would not be detectable.

Table 62.12: Fluvial Sediment Load in the Clearwater River below Patterson Lake relative to the Base Case (adopted from EIS)

Assessment Case	Median Annual Maximum Daily Flow (m3/s)	Longitudinal Cumulative Mass Change (ton/year)					
		Upper Reach	% Change	Lower Reach			Net Balance
				North Channel	South Channel	% Change	
Base Case	1.89	-86	-	27	36	-	-23
Application Case	1.92	-88	2%	28	37	3%	-23
RFD Case	1.95	-90	5%	29	38	6%	-23
Climate change scenario	2	-93	8%	31	40	13%	-23
RFD Case including climate change	2.05	-97	13%	33	41	17%	-23

Mitigation Measures

NexGen has proposed measures to mitigate adverse effects on surface water hydrology (tableTable 6.13.13). CNSC staff agree with the mitigation measures proposed by NexGen.

Table 6.13: Proposed mitigation measures to address effects on surface water hydrology

Residual Effect #1: Diversion of natural watercourses and drainage areas
Construction and Operations Phase
• Limit the Project footprint to the extent practical using practices such as: o designing an efficient infrastructure footprint o optimizing the use of cleared areas for Project activity o using existing road infrastructure, including existing access road and bridge crossing o storing tailings underground

○ divert water away from site facilities through design and the establishment of berms and grading
• Break drainage areas into smaller catchment areas to limit large areas of runoff and reduce the potential erosive energy
• Base ditch geometry and erosion protection on analysis of predicted peak flows and incorporate climate change effects so that the channels have sufficient capacity
• Use engineered containment and conveyance of PAG waste rock runoff and seepage to the PAG Runoff Collection Area
• As part of reclamation activities, complete contouring of disturbed areas to minimize erosion, re-establish drainage, and encourage the growth of vegetation.
• Implement sedimentation and erosion control best practices and standard mitigation (e.g., temporary sediment ponds, silt curtains, sediment traps) during all Project phases.
• Implement progressive reclamation and revegetation of disturbed areas no longer required
• Implement a Project-specific EPP and a Project specific EMP
• Implement a Project-specific Mine Waste Management Plan.
Closure Phase
• As part of reclamation activities, complete contouring of disturbed areas to minimize erosion, re-establish drainage, and encourage the growth of vegetation
• Implement sedimentation and erosion control best practices and standard mitigation (e.g., temporary sediment ponds, silt curtains, sediment traps) during all Project phases
• Reclaim and revegetate areas where non-permanent Project facilities have been decommissioned
• Develop and implement a Detailed Decommissioning and Reclamation Plan to decommission and transfer the site to the province under the Institutional Control Program.
Residual Effect #2: Changes to hydrological processes and water balance
Construction and Operation Phase
• Recycle and reuse of process water to reduce freshwater intake and release to Patterson Lake, to the extent practical
• Adhere to guidance from regulators such as DFO as to the allowable rate and timing of water withdrawals from the point of supply.
• Confirm discharge meets water quality discharge criteria prior to release to the environment
• Implement progressive reclamation and revegetation of disturbed areas no longer required
• Reclaim and revegetate areas where non-permanent Project facilities have been decommissioned.
• Monitor flows before and after Construction to quantify the change of flow and its effects to the aquatic environment

• Implement a Project-specific EPP and a Project specific EMP.
• Implement a Project-specific Mine Waste Management Plan.
Closure Phase
• As part of reclamation activities, complete contouring of disturbed areas to minimize erosion, re-establish drainage, and encourage the growth of vegetation
• Implement sedimentation and erosion control best practices and standard mitigation (e.g., temporary sediment ponds, silt curtains, sediment traps) during all Project phases
• Reclaim and revegetate areas
• Develop and implement a Detailed Decommissioning and Reclamation Plan to decommission and transfer the site to the province under the Institutional Control Program.
Residual Effect #3: Changes in flows
Construction and Operation Phase
• Avoid placing soil stockpiles near waterbodies and near natural drainage features
• Minimize areas of vegetation clearing and soil disturbance
• Minimize steepness and length of slopes of disturbed areas and stockpiled soil
• Discharge water to the watershed of origin, to the extent practical
• Adhere to guidance from regulators such as DFO as to the allowable rate and timing of water withdrawals from the point of supply
• Provide adequate contact water storage capacity to allow controlled rate of release during both routine and non-routine operation scenarios.
• Use erosion control measures as required
• Implement progressive reclamation and revegetation of disturbed areas no longer required
• Reclaim and revegetate areas where non-permanent Project facilities have been decommissioned
• Monitor flows before and after construction to quantify the change of flow and its effects to the aquatic environment.
• Perform routine inspection and maintenance of water containment and conveyance structures to limit the risk of road wash-out or sediment release to the environment
• Implement a Project-specific EPP and a Project-specific EMP.
• Implement a Project-specific Mine Waste Management Plan.

Monitoring and Follow-up

The EPP, EMP, and related monitoring activities will be implemented to verify the accuracy of predicted effects, assess the effectiveness of mitigation measures in protecting aquatic environments, identify any unexpected impacts, and apply adaptive management strategies as needed.

Monitoring and follow-up programs are proposed by NexGen for surface water hydrology to the accuracy of effects predictions, reduce or address uncertainties, determine the effectiveness of mitigation, or provide appropriate feedback to operations for modifying or adopting new mitigation designs, policies, and practices (e.g., implementation of adaptive management). Monitoring follow up programs proposed to address residual effects related to surface water hydrology is in tableTable 6.14.14. In addition, NexGen will maintain continued hydrometric monitoring and data collection initiated for baseline studies to extend the baseline monitoring period and available data. Selected hydrometric stations would be monitored during the Project phases using remotely operated telemetry stations, which could be used to verify the receiving environment predictions of minimal changes in flows and water levels during the proposed Project duration in the future. Proposed remotely operated stations being considered include the following:

- Clearwater River below Patterson Lake
- Clearwater River below Beet Lake
- Clearwater River below Naomi Lake
- Clearwater River above the confluence with the Mirror River
- Clearwater River below Broach Lake

CNSC staff agree with the monitoring follow up measures proposed by NexGen.

Table 6.14: Follow-up program measures for effects on surface water hydrology.

Residual Effect #1: Diversion of natural watercourses and drainage areas Residual Effect #2: Changes to hydrological processes and water balance Residual Effect #3: Changes in flows
• Confirm effects predictions and address uncertainty in predictions that are associated with baseline data collection and modelling. • Evaluate the effectiveness of mitigation actions and reclamation and modify or enhance them as necessary through monitoring and developing updated mitigation measures, if needed. • Identify unanticipated negative effects, including possible accidents and malfunctions; and • Contribute to the overall continual improvement of the Project and assure the local communities the potential Project effects have been minimized.

6.3.2.2. Surface Water and Sediment Quality

The pathway analysis performed by NexGen assessed the potential adverse effects of the Project on surface water and sediment quality, identified mitigation measures, and evaluated whether these measures could effectively reduce or eliminate residual adverse impacts. Potential effects were categorized as follows:

- **No pathway**: Mitigation eliminates effects on surface water or sediment quality.
- **Secondary pathway**: Mitigation reduces effects to negligible levels.
- **Primary pathway**: Effects could be greater than negligible and require further detailed assessment.

Mitigation measures and environmental design features, outlined in table 10.4-1 of the EIS, informed the pathway analysis. NexGen is also required to implement an EPP, and this program would periodically assess mitigation performance and identify any additional mitigation needed, as well as trigger potential adaptive management measures. After considering mitigation measures, the screening analysis concluded that some potential environmental pathways, particularly those related to sediment quality, could be excluded. However, the outcome of the analysis identified several primary pathways that could negatively affect surface water quality and were therefore further assessed in the EIS, including:

- Deposition of fugitive dust and criteria air contaminants (e.g., particulate matter, metals, radionuclides, sulfur, nitrogen oxides) on local waterbodies.
- Direct discharge of treated effluent and sewage into Patterson Lake during construction, operations, and closure.
- Seepage from Waste Rock Storage Areas (WRSAs) into groundwater, potentially flowing into Patterson Lake during construction and operations.
- Runoff and seepage from WRSAs and groundwater from underground workings (including the UGTMF) into Patterson Lake after closure.

Residual Effects Analysis

The residual effects analysis examined changes to water quality from the Project (Application Case) and cumulative effects from the Project and Patterson Lake South Property (RFD Case), compared to baseline conditions (Base Case) and established Project-specific thresholds. The methods used by NexGen to determine the COPCs and to develop the Project-specific thresholds are summarized in section 10.2.8.2 and section 10.2.8.3 of the EIS. Sensitivity scenarios were also evaluated (i.e., a reasonable upper bound scenario for the application case, and a climate change scenario of the RFD case). The temporal scope of the assessment focuses on the 43-year period from initial Construction to the end of Decommissioning and Reclamation (i.e., Closure), however the assessment of surface water quality effects for the far future was based on surface water quality modelling that spanned 400 years, including the 43-year project timeline and 357 years after Closure.

Surface water quality

Surface water quality effects were numerically modeled for each phase, integrating primary pathways. Project and cumulative effects were assessed based on changes to COPCs within the Local Study Area (LSA), which represents the predicted area where direct and indirect impacts on surface water quality are expected to be detectable. Further downstream, beyond the confluence of the Clearwater and Mirror Rivers, changes to surface water quality are expected to be negligible (the regional study area). For the Application Case, residual effects were assessed using both the Near-Field Water Quality Model (NFWQM) and the Regional Surface Water Quality Model (RSWQM). For the RFD Case, only the RSWQM was used, as no cumulative effects were identified within the near-field zone (i.e., Patterson Lake South Project's planned effluent discharge is located further downstream).

Predicted trends in COPCs, including nutrients, major ions, trace metals, and radionuclides, were used to classify residual effects for the three surface water quality indicators (water quality, drinking water quality, and productivity status) at key waterbodies within the LSA. Figures summarizing COPC trends over time are provided in Appendix 10A of the EIS. For each measurement indicator, the various surface water constituent concentrations measured were compared to the respective thresholds. Thresholds were generally chosen by NexGen to represent the lowest chronic water quality guidelines available.

During the lifespan of the Project (from construction to closure), in both the Application Case and RFD Case, contaminant of potential concern (COPC) concentrations are expected to increase locally. However, these predicted increases would remain below established thresholds for all measurement indicators. However, for the NFWQM sensitivity analysis, which included variations of effluent flow rates and TDS concentrations, the chloride concentration is predicted to be marginally above the threshold of aquatic life (i.e., 120 mg/L) for the last 14 years of Operations (maximum annual average of 134.9 mg/L) and for the Active Closure Stage (maximum annual average of 158.2 mg/L). This conservative upper bound scenario is considered to be unlikely, however, if granted a licence, NexGen will be required to perform monitoring to guide adaptive management of effluent treatment if concentrations trend in this direction over the course of Operations.

In the far-future projections, for both the Application Case and RFD Case (which represents a cumulative effect scenario), seepage from the potentially acid-generating (PAG) Waste Rock Storage Area (WRSA) could result in a very slow release of COPC metals and radionuclides into the surrounding environment via shallow groundwater. Under this scenario, cobalt and copper concentrations are predicted to marginally surpass surface water quality thresholds. The far-future projections for cobalt and copper show that the elevated concentrations are likely limited to Patterson Lake (see table 6.15 below). In the RFD Case, there is a small incremental change to COPC concentrations in the far future, including cobalt and copper, which would be sourced from runoff from the Patterson Lake South Property above-ground tailings management facility into the South Arm, and the flow through loading of runoff from the Patterson Lake South Property covered waste rock storage facility, which drains to the North Arm – West Basin. Groundwater inputs from the Rook I project are expected to be the main source of increased

COPC metals, such as cobalt and copper, in Patterson Lake. To address this, NexGen has stated in the EIS that source control measures for the PAG WRSA would include reducing oxygen exposure to the waste rock and installing a cover system to minimize water infiltration. These measures are expected to reduce the mass of contaminants entering Patterson Lake through groundwater and result in long-term metal concentrations lower than currently predicted.

To further assess potential risks from cobalt and copper, hazard quotients were calculated for effects on aquatic life. NexGen calculated that cobalt values would remain below conservative chronic aquatic benchmarks values. Copper would also remain below conservative chronic aquatic benchmark values when a site-specific assessment was performed (see appendix 11a of the EIS). This site-specific risk assessment relied on biotic ligand models and multiple linear regression models and provided results for the application case, the application case upper bound scenario (sensitivity analysis), and the RFD case (cumulative impacts from the Patterson Lake South project). The Biotic Ligand Model and Multiple Linear Regression Model estimate copper's bioavailability—and therefore its toxicity—for specific species by accounting for factors that influence toxicity, such as the hardness of the surrounding water. As a result, unlike the fixed TRVs in the EcoRA, the no-effect and low-effect thresholds change over time depending on variations in ambient water conditions. It was determined that adverse effects on fish, invertebrates, and plants are unlikely because predicted copper concentrations in all scenarios, including the upper bound scenario (sensitivity case), were below the lowest low effect concentration for the most sensitive species. The only exception to this was during periods of dry climate conditions in the unlikely upper bound scenario where concentrations are predicted to occasionally fluctuate marginally above the low effect threshold. It is important to acknowledge the inherent uncertainty in far-future projections due to the long timeframe modeled (tens of thousands of years) and the conservative assumptions used in the groundwater solute transport model. This uncertainty would be managed by NexGen adaptively throughout the Project's lifespan. More on effects to aquatic biota can be found under section 7.1 of the EA report.

Key information from the surface water quality assessment was carried forward to other disciplines for consideration in the assessment of VCs. The water quality results, particularly for projected cobalt and copper concentrations in the far-future scenario, were carried forward in the ERA. The results of the ERA were subsequently considered in the fish and fish habitat VCs (section 11), vegetation VCs (section 13), wildlife VCs (section 14), human health VC (Section 15), Indigenous land and resource use VC (section 16) and other land and resource use VC (section 17).

Table 6.15: Application Case Summary Statistics for Selected Constituents in the Far Future for Patterson Lake (From EIS: table 10A-12)

Constituent	Unit	Project Threshold	Minimum - North Arm – East Basin	Minimum - North Arm – West Basin	Minimum - South Arm	Average - North Arm – East Basin	Average - North Arm – West Basin	Average - South Arm	Maximum - North Arm – East Basin	Maximum - North Arm – West Basin	Maximum - South Arm
Total ammonia (as nitrogen)	mg/L	n/a[(a)]	0.026	0.028	0.026	0.029	0.031	0.031	0.042	0.082	0.13
Un-ionized ammonia (as nitrogen)[(b,c)]	mg/L	0.016	0.000073	0.000077	0.000072	0.000025	0.000027	0.000027	0.000072	0.00014	0.00023
Nitrate (as nitrogen)	mg/L	2.9	0.018	0.016	0.017	0.019	0.018	0.021	0.031	0.064	0.11
Phosphorus (total)	mg/L	0.020	0.0051	0.0051	0.0054	0.0053	0.0052	0.0058	0.0057	0.0059	0.0072
Chloride	mg/L	120	0.39	0.72	0.77	0.44	0.83	0.86	0.60	1.3	2.0
Hardness	mg/L	n/a	12	13	15	13	14	16	17	28	45
Sulphate	mg/L	128-218	1.5	2.3	2.4	1.8	3.1	4.0	6.9	23	48
Cobalt	mg/L	0.00078[(d)]	0.000065	0.000091	0.00012	0.00020	**0.0010**	**0.00083**	0.00032	**0.0015**	**0.0011**
Copper	mg/L	0.0020	0.00012	0.00015	0.00019	0.00035	0.0017	0.0014	0.00054	**0.0024**	0.0019
Uranium	mg/L	0.015	0.00014	0.00041	0.00052	0.00040	0.0024	0.0020	0.00067	0.0034	0.0026
Radium-226	Bq/L	0.11	0.0051	0.0040	0.0055	0.0070	0.0044	0.0071	0.0085	0.0052	0.011

a) Project threshold for ammonia considers the proportion of total ammonia that is un-ionized ammonia.
b) Function of total ammonia, pH, and temperature.
c) The average seasonal pH and average monthly temperature of samples were used to calculate the fraction factor.
d) Federal environmental water quality guideline (FEQG), variable based on hardness concentration in the surface waterbody; guideline value shown based on a hardness value of 52 mg/L as $CaCO_3$, which is the lowest hardness applicable to the guideline (Environment Canada 2017; Government of Canada 2021).
Bold values represent concentrations that exceed the Project threshold.
Bq/L = becquerels per litre.

Productivity status

The productivity status of waterbodies is projected to remain oligotrophic (low in nutrients and productivity) throughout the Project lifespan and in far-future scenarios, consistent with existing conditions. However, it was predicted for the reasonable upper bound sensitivity scenario that the project may cause a temporary increase in nutrient levels in the North Arm – West Basin and South Arm of Patterson Lake, shifting them from a low productivity (oligotrophic) state to a moderate productivity (mesotrophic) state for a period of time. This change is expected to last for 25 to 27 years, depending on the area. However, other water bodies downstream are not expected to be affected and will stay at their current low productivity levels. Eventually, all water bodies should return to their original state. It's important to note that the modeling used may overestimate nutrient levels because it didn't account for how algae might absorb some nutrients, so these changes are likely to be smaller than predicted.

Sediment Quality

As mentioned above, after considering mitigation measures the screening analysis concluded that the potential sediment quality environmental pathway could be excluded in the EIS as a primary pathway. However, details on the sediment quality screening and assessment can be found in the ERA (TSD XXI). As described in the ERA, the preferred benchmarks for sediment quality are from Burnett-Seidel and Liber (2013), with NE2 and REF values specific to Saskatchewan waterbodies. REF values refer to areas upstream of mining or milling activities or within nearby drainages. Exceedances of REF values indicate elevated metal concentrations in sediments downstream compared to natural background conditions. NE2 values represent areas with elevated concentrations but are not expected to significantly affect benthic invertebrate abundance, richness, or evenness. Concentrations below NE2 values indicate benthic invertebrate community metrics downstream are not expected to differ significantly (less than 20% difference) from natural background conditions. Thompson et al. (2005) and CCME also provide sediment quality guidelines with two tiers. The lower of each are defined by with Lower Effect Levels (LELs) and Interim Sediment Quality Guidelines (ISQGs), respectively, where concentrations below these levels indicate no adverse effects are likely. Exceedances of these benchmarks suggest further investigation is warranted but do not necessarily indicate adverse effects. Exceedances of Severe Effect Levels (SELs) (Thompson et al.) and Probably Effect Levels (PELs) (CCME) are more likely to cause ecological harm, with SELs representing concentrations that most benthic organisms cannot tolerate, and PELs representing concentrations that adverse effects are expected to occur frequently (more than approximately 50%).

As presented in the ERA, based on comparison of maximum predicted sediment quality in Patterson Lake North Arm – West Basin in the Application Case and Upper Bound sensitivity scenario against the REF values from Burnett-Seidel and Liber (2013), only arsenic and molybdenum would exceed the REF values. However, they do not exceed the NE2 values, indicating low risk. Arsenic would exceed the REF value in Operations, while molybdenum would exceed the REF value in the far-future projection for the reasonable upper-bound sensitivity scenario. Arsenic and molybdenum were considered sediment COPCs for further

quantitative assessment in the ERA and were included in HQ calculations. There were no HQ exceedances of these parameters in the ERA for all receptors in all project phases.

The maximum predicted upper bound concentrations of lead-210 and polonium-210 in sediment in Patterson Lake North Arm – West Basin exceeded the LEL values from Thompson et al. (2005); however, they did not exceed the SEL values. While exceeding the LEL does not necessarily indicate that adverse effects would occur, it indicates that further assessment is warranted. Radionuclides in the uranium-238 decay series (uranium-238, uranium-234, thorium-230, radium-226, lead-210, polonium-210) were considered sediment COPCs for further quantitative assessment in the ERA. There were no HQ exceedances of these parameters in the ERA for all receptors in all project phases.

Mitigation Measures

NexGen has proposed measures to mitigate adverse effects on surface water and sediment quality. CNSC staff agree with the mitigation measures proposed by NexGen, however CNSC staff has also proposed additional measures. See table 6.16 below.

Table 6.16: Proposed mitigation measures to address effects on the surface water and sediment quality

Residual effect #1 **Water quality of the receiving environment (water quality, drinking water quality, productivity status)**
Reduce discharge/drainage to surface water pathways: • Maximization of the recycle and reuse of process water to reduce both freshwater intake and Project discharges to Patterson Lake • Site-specific ETP and STP to reduce COPCs in contact water and domestic sewage and greywater so that treated water can be discharged to Patterson Lake • Design and construction of diffuser/outfall in the receiving environment for the ETP and STP discharges away from sensitive or unique habitats, to the extent practical, and to provide effective mixing of the treated effluent and limit the area of the receiving water expected to have elevated concentrations of COPCs, and ensure flow does not interact with sediment • Robust site-wide water management procedures to identify contact water on site, its collection, and a process to determine whether treatment is required prior to release to the environment • Treatment of any mine-affected discharge water to below the effluent release targets prior to being discharged to the receiving environment • Limit project footprint/area of clearing and disturbance to extent practical, and ensure water storage capacity to manage runoff and seepage from disturbed areas • Appropriately manage stockpiles and ensure proper erosion control measures • Implementation of Project-specific management plans (e.g., Mine Waste Management Plan), monitoring programs (e.g., Effluent and Emissions , EMP), and a Preliminary Decommissioning and Reclamation Plan to reduce the potential for the receiving environment to be affected by Project activities during the lifespan of the Project and after Closure (e.g., aerial emissions and their deposition, surface runoff, direct discharge).

Residual effect #1 **Water quality of the receiving environment (water quality, drinking water quality, productivity status)**
Reduce air to surface water pathways: • Optimize haul routes to reduce fuel consumption and emissions from equipment • Apply water and/or suppressants to site roads, access road, and airstrip, as necessary. • Use dust suppressants that minimize environmental risk and are government approved for use § • Limit vehicle speed on unpaved site roads to reduce fugitive dust during Construction and Operations • Establish and enforce speed limits on site and access roads to reduce dust production • Evaluate opportunities to reduce fuel combustion requirements of infrastructure and equipment, to the extent practical, during detailed design • Primarily use liquified natural gas for power generation • Optimize haul routes to reduce fuel consumption and emissions from equipment • Use and maintain emissions control devices on combustion-based equipment • Limit idling of vehicles and equipment to the extent practical • Identify and implement procurement criteria to confirm stationary and mobile engines meet applicable performance standards • Maintain mobile mining equipment and vehicles and operate the equipment within parameters for engine exhaust system design • Implementation of Project-specific management plans (e.g., Mine Waste Management Plan), monitoring programs (e.g., Effluent and Emissions , EMP), and a Preliminary Decommissioning and Reclamation Plan to reduce the potential for the receiving environment to be affected by Project activities during the lifespan of the Project and after Closure (e.g., aerial emissions and their deposition, surface runoff, direct discharge).
Reduce groundwater to surface water pathway • Segregate PAG material from NPAG material and store separately • Contain and divert runoff and seepage from PAG waste rock, special waste rock, and ore to the effluent treatment plant • Use engineered cemented paste backfill and tailings to control source concentrations • Apply binder to reduce permeability in backfill and tailings • Install engineered cover system on PAG and NPAG material • Implementation of Project-specific management plans (e.g., Mine Waste Management Plan), monitoring programs (e.g., Effluent and Emissions , EMP), and a Preliminary Decommissioning and Reclamation Plan to reduce the potential for the receiving environment to be affected by Project activities during the lifespan of the Project and after Closure (e.g., aerial emissions and their deposition, surface runoff, direct discharge).
CNSC staff recommendations for additional mitigation measures
• CNSC recommends NexGen explore mitigation and adaptive management plans for acid rain/lake acidification from both project sources and cumulative effects sources, if future data collection indicates a risk. See follow up monitoring commitment below for more details.
• CNSC recommends NexGen explore mitigation and adaptive management plans for COPCs in LSA lakes from both project sources and cumulative effects sources if future data collection or

Residual effect #1 Water quality of the receiving environment (water quality, drinking water quality, productivity status)
modelling indicates a risk (e.g., combined risks to aquatic environment from Rook I and Patterson Lake South Projects during far future). See follow up commitment below for more details.

Monitoring and follow-up

Monitoring and follow-up are proposed by NexGen for the surface water and sediment quality to verify the accuracy of the predicted effects and effectiveness of proposed mitigation measures.

The EPP, EMP, Effluent and Emissions Plan, and related monitoring activities will be implemented to verify the accuracy of predicted effects, assess the effectiveness of mitigation measures in protecting aquatic environments, identify any unexpected impacts, and apply adaptive management strategies as needed. The Project's EMP will include surface water and sediment monitoring in Patterson Lake and other waterbodies within the LSA. The EMP builds on the baseline water quality monitoring program and will evolve to address Project changes or new data, ensuring compliance with regulatory requirements such as the Metal and Diamond Mining Effluent Regulations. Monitoring stations will cover key locations, including Patterson Lake, downstream waterbodies, and reference lakes. Additional monitoring will focus on air emission deposition in small lakes and groundwater influences on Patterson Lake. Data will measure general parameters, COPCs, and constituents required by regulations, supporting adaptive management and mitigation strategies, particularly for groundwater-related risks to Patterson Lake. The surface water quality monitoring program will align with the Metal and Diamond Mining Effluent Regulations, the federal Fisheries Act, and conditions outlined in authorizations from the CNSC and Saskatchewan Ministry of Environment.

CNSC staff agree with the follow up measures proposed by NexGen, however CNSC staff has also proposed additional measures. See table 6.17 below.

Table 6.17: Follow-up program measures for effects on the aquatic environment and surface water resources

Residual effect #1 **Water quality of the receiving environment (water quality, drinking water quality, productivity status)**

• monitor for water and sediment quality changes in the receiving environment as a result of Project activities
• verify that the site contact water management infrastructure is operating as designed and evaluate the effectiveness of the surface water protection controls in place
• verify the predictions of the EIS and confirm that the aquatic ecosystem in the receiving environment is protected
• confirm the adequacy of the study areas (i.e., confirm that effects do not extend beyond boundaries)
• track the trajectories of constituents that were identified in sensitivity analyses, such as chloride, so that these constituents can be proactively and adaptively managed
• evaluate the effectiveness of reclamation and other mitigation actions, and modify or enhance as necessary through monitoring and developing updated mitigation, if needed
• identify unanticipated negative effects, including possible accidents and malfunctions
• contribute to the overall continual improvement of the Project.
 	
Water quality monitoring for the Project may be divided into two parts:
  • site contact water monitoring, which includes the Project processes as well as the area directly affected by the Project footprint, and monitoring of treated effluent to verify discharge criteria is met prior to batch discharge and release to Patterson Lake (i.e., upstream of the final point of control)
  • the surface water receiving environment monitoring (i.e., Patterson Lake and downstream).

CNSC recommended follow up monitoring
• As a follow up action and commitment, NexGen has been requested by CNSC staff to collect water quality data for wetlands in the vicinity of the project activities (see EA commitments report). Although there were no predicted effects on wetlands modelled in the EIS, and thus NexGen had not collected wetland data for the purposes of the EIS, additional baseline data was requested in order to help assess any unexpected impacts from the project in the future (as the baseline levels will help assess any changes). NexGen has committed to this follow up monitoring and will include the results of the data collection in future reports.
• CNSC has recommended a follow up commitment for NexGen to include follow-up monitoring for all relevant pathways (e.g., air, effluent, surface water, runoff, rain and snow precipitation, groundwater) and contaminants of potential concern (COPCs) (e.g., SO_2, NO_x, sulfates, nitrates, pH) that may contribute to lake acidification, as this was flagged as a potential cumulative effect from Alberta Oil sands emissions, and of concern to Indigenous communities. This environmental monitoring data is to be incorporated into the future ERAs to model and assess potential cumulative effects related to this risk. Based on future results, mitigation or adaptive management may be required.
• CNSC has recommended a follow up commitment that NexGen incorporate the Patterson Lake South project's most up to date model outputs (for all project phases and pathways) into the Rook I

Residual effect #1 Water quality of the receiving environment (water quality, drinking water quality, productivity status)
model for the RFD case in the next iteration of the ERA after the Patterson Lake South project data is publicly available. This is to demonstrate that the cumulative effects analysis was performed conservatively. Any increased risks found through this analysis, if any, would require NexGen to assess mitigation or adaptative management plans.

6.3.3. Other Views Expressed

6.3.3.1. Potential Impacts to Surface Water Quality

Indigenous Nations and Communities

CRDN had previously indicated that they had overarching concerns regarding exploration and mining activities taking place at Goráchághı tu [Patterson/Forrest Lake] and they were concerned about the potential contamination of the entire Des Nëtthę̆ [Clearwater River]. CRDN had previously indicated that harvesters had noted changes to water quality since exploratory drilling on Goráchághı tu have taken place. In addition, CRDN harvesters had previously expressed doubt that radioactive and drilling contaminants will not impact Goráchághı tu and downstream environments. NexGen noted that changes to the availability and quality of fish for harvesting were assessed in the EA pathway analyses and has committed mitigation measures including Project-specific Groundwater, Effluent, and EMPs, installing effluent and sewage treatment plants, and avoiding critical or sensitive habitat to the extent practical during construction. NexGen will establish an Environmental Committee to monitor environmental performance of the Project and will provide funding for full-time independent Indigenous Monitors to address concerns and minimize adverse impacts to surface water quality.

MN-S had previously identified concerns with how NexGen was selecting COPCs for their environmental risk assessment. MN-S had indicated that it was unclear if COPCs that exceeded water quality objectives at end-of-pipe treatment, but met water quality objectives in the mixing zone were excluded from further assessment. MN-S had previously made it clear that using dilution in surface water as part of their ecological risk assessment was not best practice. MN-S had also previously expressed concern that NexGen was relying on design criteria and road access management controls to mitigate any release of uranium or other COPCs from an accident near surface water bodies such as the Clearwater River. NexGen confirmed that end-of-pipe concentrations of COPCs are predicted to be higher than chronic Project threshold, but below acute toxicity levels for fish and has committed to developing a comprehensive monitoring plan including surface water quality. As acutely toxic COPCs would not be released to the environment, NexGen has maintained that their assessment, including the use of dilution, is appropriate. NexGen noted that to address increased road use and mitigate the release of COPCs from an accident, upgrades to existing access roads are planned.

BNDN found that NexGen's modeling and conclusions concerning surface water quality were inadequate and significantly understated the potential impacts of the Project on surface water

quality. BNDN noted that the EIS understates the acid generating capability of the waste rock produced from the Project and raised concerns that water quality will be irreversibly impaired in Patterson Lake. BNDN noted that Patterson Lake is oligotrophic with extremely limited buffering capacity, making it particularly susceptible to acidification and dramatic changes in water quality from the mine effluent. BNDN also noted that many lakes in the region suffer from algae blooms, and that the addition of nutrients to the lake from project effluent could cause similar impacts in Patterson Lake. NexGen has maintained that impacts of the Project on the environment have been adequately assessed and noted that the methodology used was deemed acceptable by provincial and federal regulatory agencies. NexGen has committed to mitigation measures for potentially acid generating materials including and storing them separately from other material, implementing source control and installing a liner for the storage area, installing an engineered cover system during reclamation, and containing and diverting runoff and seepage to the effluent treatment plant. In addition, BNDN members are concerned that utilizing cemented paste backfill and cemented paste tailings in the underground tailings management facility (UTMF) will have the potential for long-term impacts to surface water. BNDN members are concerned that any impacts to surface water quality are highly likely to have adverse impacts to human health and traditional practices. NexGen has committed to pumping cemented paste tailings directly into chambers within competent basement rock and not backfilling cemented paste into underground working areas until the areas are no longer used, thereby not increasing risk to underground workers. NexGen has noted support for continued engagement between the BNDN and Crown regarding potential effects to BNDN Aboriginal and treaty Rights. Furthermore, NexGen is open to further discussions regarding surface water effects, including the potential for follow-up presentations.

YNLR noted their members are very concerned about the potential for impacts to surface water quality that may arise from the Project. This includes concerns that surface water quality may be impaired and raised concerns about the long-term ecological health of Patterson Lake. NexGen has acknowledged the importance of surface water quality to YNLR and has committed to developing an EPP containing several mitigation and monitoring plans and utilizing adaptive management to provide a structured and flexible approach to maintaining water quality.

ACFN requested that NexGen include an assessment for the potential acidification of lakes and rivers to capture results from emissions from the Project that may deposit contaminants of potential concern to surface waters. NexGen has predicted low acidifying emissions, indicated by total H^+ equivalent of approximately 10% of the criterion of 0.175 t/d, and the pH values of the rainwater in the Project site indicate that potential for acid deposition issues is low. NexGen has committed to continuing to monitor and report pH values of rainwater, and section 7A2.1 of Final EIS Appendix 7A will be updated to include H_2SO_4 emissions in the total H^+ equivalent calculations and the monitored pH value of rainwater.

In addition, ACFN requested clarification if climate change induced effects on surface water temperature were assessed for the residual and cumulative impacts for the Project, to which NexGen noted that they were not included in the scenarios assessed, however they were not expected to influence the findings of the EA should they be found. Lastly, ACFN recommended

that NexGen adjust the Project life to align with outputs included in their predictive modeling related to waste rock seepage which may impact the surface water quality at Patterson Lake and constitute a risk to human health. NexGen has assessed long-term effects on human health using a far-future projection, which encompasses effects beyond Project closure. ACFN requested that surface water quality data compilations and related analyses be revised so that updated data points and more robust approaches are used in the surface water quality data study. NexGen has maintained that the methodology used is appropriate and that setting half of the detection limit substitutes for non-detect data represents an overestimate and a conservative approach.

Federal Authorities

TC noted that project activities are subject to the *Canadian Navigable Waters Act* (CNWA) but determined there are no significant residual effects to navigation in Patterson Lake from water intake and effluent discharge. If the water intake and effluent discharge pipeline and diffuser are constructed as minor works, no mitigations, other than adherence to the requirements of the CNWA Minor Works Order, will be required. The Minister of Transport is of the opinion that minor works are likely to slightly interfere with navigation. Should CNWA approval be required for any of the in-water works (water intake and effluent discharge pipeline and diffuser), mitigation measures will be developed during the regulatory phase and included as terms and conditions in the CNWA approval(s).

ECCC noted that some rating curve formulae did not match the plotted lines, which was corrected. ECCC pointed out that potential residual effects to surface water quantity would be mitigated by a robust hydrometric monitoring program, which would reduce uncertainty of the discharge estimates, allow for updates to be made to the water balance models, if necessary, and determine if further actions are required to mitigate any adverse effects. The Proponent has committed to a robust hydrometric monitoring program which includes stations measuring lake water levels, visiting field sites (5 per year) to monitor rating curve applicability and backwater, under-ice flow measurements.

ECCC also noted that thallium has the potential to be a parameter of concern, and therefore recommended it also be included as a parameter for follow-up and monitoring of effects. For Radium-226, measures to reduce predicted concentrations to meet the project environmental release target of 0.37 Bq/L should be identified and implemented. ECCC recommended the implementation of a robust surface water quality monitoring program that includes all COPCs. ECCC also recommends that the EPP explicitly include details related to water management and monitoring of COPCs associated with the airstrip, west bermed runoff collection area, and explosives storage area. NexGen has committed to an EMP which includes surface water quality sampling in the receiving environment where there is exposure to effluent and would take place four times a year. NexGen has also committed to an Effluent and Emissions Plan which would include sampling effluent in ponds to confirm they meet release targets, and monitoring components to meet Metal and Diamond Mine Effluent Regulations (MDMER) requirements at the final point of discharge at the licensing stage (licence to prepare site and construct).

ECCC noted potential residual effects to surface water were possible if a pump failure were to occur during an extreme storm. The Proponent has committed to an Emergency Preparedness and Response Program and a Ground Transportation Emergency Response Plan as mitigation measures for this event.

6.3.3.2. Potential Impacts to the Aquatic Environment

Indigenous Nations and Communities

BNDN raised concerns regarding the potential accumulation of phosphorus in Patterson Lake and the associated effects on oxygenation in Paterson Lake. Areas of high oxygen are necessary for overwintering species of cultural importance, such as lake trout and reductions in oxygen levels could reduce overall habitat availability for these species. NexGen has noted that the inclusion of a small-bodied fish is unwarranted, as they are represented in the assessment of lake whitefish, but their inclusion will be considered as a sentinel species for environmental monitoring should an Environmental Effects Monitoring fish population study be triggered.

BRDN, which affirms that it consents to the Project and that its concerns have now been appropriately accommodated, had previously indicated their members were concerned about potential Project impacts on water quality and how this may adversely impact fish and fish habitat. NexGen has noted that the predicted effects would be within the resilience and adaptability limit of VCs and therefore the Project is not predicted to have significant adverse effects.

6.3.3.3. Potential Impacts to Sediment Quality

Indigenous Nations and Communities

MN-S had previously indicated that Lake whitefish is an inadequate fish to use to predict COPCs concentrations in sediments as they do not behave in the same manner as other fish species, such as Burbot, that may be potentially impacted due to COPC concentrations in sediment given they are more sedentary and move smaller distances. NexGen noted that northern pike was selected to represent burbot as a primarily piscivorous benthic-dwelling fish in addition to lake whitefish. Additionally, NexGen completed an aquatic health assessment to evaluate the potential magnitude of effects on sensitive aquatic species, which showed that potential health effects on burbot would be minimal and within the range of variability observed in unexposed populations.

BNDN requested that a baseline survey for sediment quality and characteristics be completed on a section of the Clearwater River between Broach Lake and Forrest Lake to determine the health of an upstream area from Patterson Lake that is likely used for spawning runs for important fish species. NexGen maintained that sufficient baseline has already been collected focused on downstream waterbodies and other areas potentially affected by the Project. However, NexGen has committed to conducting a baseline environmental effects monitoring program and will be open to discussion with the BNDN regarding potential sampling activities. BNDN indicated concerns that runoff from the Project footprint may cause adverse impacts to sediment quality, which in turn may affect human health. NexGen confirmed that site runoff was identified as a potential primary pathway to be assessed and has committed to mitigation measures including

monitoring and treating site runoff, eliminating significant adverse effects to ecological or human health. BNDN observed that sediment pathways did not appear to be calculated in the HHRA and indicated that exposures and associated health risks should be quantified for all complete human health exposure pathways, including sediment. In response to this concern, NexGen quantitatively assessed incidental ingestion and dermal contact with sediment exposure pathway, as included in the Final EIS. Lastly, BNDN noted that concentrations in sediment were based off concentrations in water in the EIS and that not collecting baseline sediment data adds a level of uncertainty to the environmental risk assessment. NexGen clarified that baseline sediment quality was collected and used to verify modelled concentrations.

YNLR are concerned changes to groundwater and surface water quality predicted for the receiving environment based on the sediment quality assessment raised concerns regarding the long-term ecological health of Patterson Lake. NexGen has noted that changes to groundwater quality are not expected to significantly affect VCs, but NexGen committed to developing an adaptive management plan to manage copper loading to Patterson Lake in the far future.

ACFN requested an explanation of why project thresholds for sediment quality were not selected for COPCs with existing guidance thresholds readily available. NexGen noted that the selection of COPCs was driven by the environmental risk assessment screening, and thresholds were not included for sediment quality constituents which did not screen in as COPCs. NexGen has maintained that each non-COPC sediment constituent poses a negligible risk to aquatic biota or other users. ACFN requested that sediment quality data compilations and related analyses be revised so that updated data points and more robust approaches are used in the sediment quality data study. NexGen has maintained that the methodology used is appropriate and that setting half of the detection limit substitutes for non-detect data represents an overestimate and a conservative approach. ACFN asked for clarification if sediment concentration data was standardized to particle size for the sediment quality data analyses. NexGen confirmed that sediment quality data were not standardized to particle size, but particle size distribution was reported for each sample taken in 2019 and 2020. ACFN questioned why sediment quality was not considered as a Project effect for the life of the Project. NexGen noted that Project-related changes to sediment quality were not assessed past Closure as the discharge of treated effluent to Patterson Lake would end during the Closure Phase. Lastly, ACFN recommended that the screening process to identify COPCs associated with sediment be re-evaluated to consider complex mixtures as per HC guidance and identify individual COPCs and mixture-based COPC classes that reflect similar target organs and effects and that the new COPCs are contained in an updated HHRA and environmental risk assessment (ERA). NexGen has maintained that the ERA used best and standard practices to screen COPCs and focus the assessment on constituents with the potential to affect VCs and receptors, and therefore no re-revaluation is needed.

6.3.4. CNSC Staff's Analysis

6.3.4.1. Hydrology

CNSC staff have reviewed NexGen's effect assessment of surface water hydrology and the aquatic environment, related to changes in flow characteristics, water levels or surface water elevations, stream channel parameters (e.g. water depth and wetted area) and rate and nature of

fluvial sediment transport in receiving surface water environment due to project activities as well as climate change. CNSC staff confirmed that NexGen conducted a comprehensive analysis of surface water hydrology effects and identified mitigation and follow-up monitoring program measures that are acceptable. CNSC staff concurs with the proponent's conclusion that any residual effects resulting from changes to hydrology are not predicted to result in significant effects to VCs, taking into account identified environmental protection design, mitigation and follow-up monitoring program measures.

However, NexGen has been requested to provide additional information for CNSC staff review and approval during the CNSC licensing stage (licence to prepare site and construct). NexGen is expected to provide an updated PMP estimate or confirm whether the current PMP is valid, or conservative based on analyses of up-to-date storm database.

6.3.4.2. Surface water and sediment quality

The assessment predicted residual effects on surface water quality due to change in water and drinking water quality constituent concentrations. However, with the implementation of appropriate mitigation measures and the effects being characterized as low magnitude, localized, and can be further reduced through adaptive management, the residual effects on surface water and sediment quality are predicted to not cause adverse effects to VCs. CNSC staff have reviewed NexGen's models and predictions for effects to surface water and sediment quality and confirmed that NexGen conducted a comprehensive analysis of these effects. CNSC staff also concluded, taking into account input from other federal departments, provincial ministries, Indigenous Nations and communities and the public, that the identified changes to surface water and sediment quality are expected to be negligible due to the implementation of mitigation measures and will not cause significant changes to the surface water and sediment quality measurement indicators. However, during CNSC staff's assessment of the EIS several topics were discussed that warranted further discussion and further information from NexGen. Some of these topics were the appropriateness and completeness of baseline data (especially for wetlands); the exclusion of the sediment pathway as a primary pathway; clarification on dose benchmarks, molybdenum thresholds, sulphate thresholds, and sediment thresholds; cobalt and copper levels in surface water in the far-future and the TRVs used; impacts on trophic status; and the conservatism of cumulative impact assessment on water quality.

Sediment pathway in the EIS

CNSC staff requested additional details on why sediment pathways were excluded in the EIS as a primary pathway. NexGen clarified that this was due to mitigation measures reducing effects to negligible levels for this pathway. NexGen clarified that the model used for the environmental risk assessment (ERA) submitted as a technical supporting document in the EIS (TSD XXI) considered multiple pathways to potential effects on receptors and environmental media (e.g., water, sediment). The ERA evaluated the potential for significant adverse effects on aquatic and terrestrial populations and communities resulting from any changes to sediment quality and concluded that there would be limited risk of adverse effects to aquatic life, wildlife, and humans. Therefore, although not listed as a primary pathway, the risks from sediment were still assessed and are presented in the ERA. CNSC staff accepted this response and concluded that the

sediment pathway was adequately characterized and assessed in the EIS and supporting documentation (EIS TSD XXI).

Surface water and sediment baseline data for wetlands

Related to sufficiency of water and sediment quality baseline data, as a follow up action and commitment NexGen has been requested to collect water quality baseline data for wetlands in the vicinity of the project activities. Although there were no predicted effects on wetlands modelled in the EIS, and thus NexGen had not collected wetland data for the purposes of the EIS, additional baseline data was requested to help assess any unexpected impacts from the project in the future (as the baseline levels will help assess any changes). NexGen has committed to this follow up monitoring and will include the results of the data collection in future reports.

Copper and cobalt levels in surface water in the far future

CNSC staff have reviewed the proposed project and have found that the EIS and supporting documentation demonstrate minimal impacts from copper and cobalt on the aquatic environment through the water and sediment quality pathway. While projections for the far future indicate minor exceedances of guidelines for cobalt in Patterson Lake North Arm – West Basin and Patterson Lake South Arm, and for copper in Patterson Lake North Arm – West Basin, these exceedances have been thoroughly evaluated.

For cobalt, the ERA submitted as a technical supporting document in the EIS (EIS TSD XXI) concluded that there would be no adverse effects on aquatic life as all estimated hazard quotients (HQs) for cobalt were less than 1 for all aquatic receptors. For copper, slight exceedances of the HQ value of 1 were observed in the model in the far future. NexGen conducted a more detailed aquatic health assessment using site-specific models (see Appendix 11A in the EIS). The results indicated that under the upper-bound scenario, predicted water quality values remained below the benchmarks for the most sensitive fish and invertebrate species (i.e., all HQs < 1). The only exception to this was during periods of dry climate conditions in the upper bound scenario where concentrations are predicted to occasionally fluctuate above the low effect threshold, however this scenario is considered unlikely and is very conservative. These results indicate minimal risks to aquatic receptors from the planned project activities.

Regarding copper loading from the potentially acid-generating waste rock storage area to Patterson Lake in the far future, NexGen is developing an adaptive management plan. This plan aims to reduce uncertainty and manage risks associated with this pathway.

Furthermore, under licensing (licence to prepare site and construct) requirements, an ERA will be updated every five years, or sooner (e.g., if a significant change occurs in either the facility or activity that could alter the nature of the interaction with the environment within the ERA predictions), to confirm predictions. If future monitoring indicates that the modeling did not capture risks or if there are unforeseen impacts, mitigation measures or adaptive management actions would be required to address these issues. This ongoing monitoring process ensures that the health of the environment will be maintained throughout the life of the Project and beyond.

Trophic status of surface water

CNSC staff requested additional information regarding lake eutrophication during the operation of the project. The EIS reported that a potential change in trophic status in Patterson Lake, from oligotrophic to mesotrophic conditions, could occur under the Application Case based on total phosphorus (TP) projections, however this change is limited to the upper bound scenario only. No trophic level change is predicted for the Reasonably Foreseeable Development Case. CNSC staff relayed their expectations to NexGen that eutrophication will be monitored and prevented to the extent possible during the operation of the project.

NexGen has confirmed that the application of best available technology and techniques economically achievable (BATEA) for wastewater treatment during the life of the Project will be used. This ensures that concentrations of contaminants of potential concern (COPCs), including phosphorus, are kept as low as reasonably achievable (ALARA). CNSC staff will be reviewing NexGen's BATEA documentation during the licensing phase (licence to prepare site and construct). Further, surface water quality modeling results are based on conservative assumptions to ensure a robust and precautionary approach to environmental protection. Preliminary documentation submitted from NexGen indicates plans to use the chronic threshold for phosphorus in the BATEA assessment (0.01 mg/L), which aligns with the upper boundary of oligotrophic trophic status. NexGen will aim to meet this concentration at the edge of the mixing zone, minimizing potential impacts to Patterson Lake.

In addition, ongoing environmental and effluent monitoring will be conducted throughout the life of the Project. The ERA will also be updated every five years to incorporate new data, evaluate the effectiveness of mitigation measures, and ensure adaptive management practices are in place. Should the ERA indicate a potential effect related to phosphorus loading, the proponent will be required to conduct additional analysis and potentially enact mitigation measures to mitigate these effects.

Molybdenum guideline used in the EIS

CNSC staff requested more information on the less stringent water quality threshold that was selected for molybdenum in the EIS. NexGen explained that they used the Saskatchewan provincial molybdenum guideline (31 mg/L) preferentially over the more conservative CCME federal guideline (i.e., 0.073 mg/L) because the CCME guideline remains interim and because the provincial guideline has been derived from recent data following the CCME protocol. The CCME molybdenum guideline is based on limited data and is intended as an interim measure pending further research and for this reason NexGen initially selected the Saskatchewan provincial guideline as a project threshold. However, based on feedback from Environment and Climate Change Canada (ECCC) and CNSC, NexGen changed the Project threshold from the Saskatchewan province-specific guideline for molybdenum to the BC MOE guideline of 7.6 mg/L (BC MOE 2021) in the revised EIS. The regulatory rationale for this change is because the BC MOE guideline is more conservative than the Saskatchewan Water Security Agency (SWSA) guideline and is derived from recent data following the CCME (2007) protocol using broader species, ensuring more conservatism at the EIS stage of the project. Nevertheless, the expected concentrations of molybdenum in the receiving environment are all well below both the provincial guidelines and the CCME guideline indicating very low risks from molybdenum.

Methylmercury assessment in the EIS

Another topic of concern heard from Indigenous Nations and communities was surrounding methylmercury. CNSC staff determined that NexGen has appropriately considered mercury in the ERA based on the current understanding of mercury methylation and its associated risks. Although mercury concentrations in Patterson Lake are marginally below the screening value, the projected sulphate levels from the Project are not expected to significantly contribute to mercury methylation. This is because mercury methylation occurs under anaerobic conditions, which are unlikely to prevail in Patterson Lake, particularly in the oxygenated portions of the water column. As long as both mercury and sulphate guidelines are met, the risk of significant methylmercury production remains low, ensuring protection for both human health and the aquatic ecosystem.

Furthermore, NexGen has committed to comprehensive monitoring throughout the life of the Project, which will include water and sediment quality testing, as well as assessments of aquatic biota such as benthic invertebrates and fish. This monitoring will provide valuable data on the potential for mercury accumulation and enable adaptive management in response to any observed changes. Additionally, should the applicable Metal and Diamond Mining Effluent Regulations triggers be met, a study investigating mercury levels in fish tissue will be conducted. NexGen's commitment to ongoing monitoring and adaptive management ensures that any potential risks are identified and addressed promptly, with appropriate actions taken based on monitoring data.

Surface water cumulative effects

CNSC requested further details on the conservatism of NexGen's RFD case (which covers cumulative impacts with the potential Patterson Lake South project) assessment and to provide information on how using the assumptions in the EIS are conservative to determine cumulative effects on water quality, and how it respects the precautionary approach. Since detailed plans for the Patterson Lake South project were not yet available at the time of submission of the Rook I EIS, NexGen made informed assumptions about its potential environmental effects. These assumptions were based on data from other uranium mines in the region, as well as predictions from NexGen's own Project models. NexGen also stated that they used assumptions based on modern best practices, including geochemical similarities to the Project, use of BATEA principles, and adherence to ALARA standards. For example, it was assumed that similar practices as those used in NexGen's Project, such as treating water to very high standards before releasing it into the environment, would also be applied by other projects. Therefore, to estimate how runoff from the Patterson Lake South project's facilities might affect water quality, NexGen assumed it would be similar to the high-quality treated water released by its own Project. This approach provides a practical and realistic way to evaluate potential impacts, even without detailed information about the Patterson Lake South project. NexGen deems this approach robust and defensible, while acknowledging that future cumulative effects assessments and project-specific details will be required as the Patterson Lake South Property advances through regulatory phases. CNSC accepted NexGen's response, as at the time of receiving the EIS report, Patterson Lake South project data was not publicly available, therefore NexGen's

approach to assess cumulative effects on surface water and sediment quality was sufficient and met the requirements of CEAA. As described above, cumulative effects for the RFD Case are similar to the application case indicating a low chance of impacts from cumulative effects as most COPCs will remain below conservative chronic benchmarks under all scenarios modelled. However, given the interest in cumulative effects from the Indigenous Nations and communities, and the expectation that the Patterson Lake South Project data is expected to be publicly released, CNSC has recommended a follow up commitment that NexGen incorporate the Patterson Lake South Project's most up to date model outputs for all project phases and include all predicted pathways (for instance the Patterson Lake South project's far future groundwater pathways) into the Rook I model for the RFD case in the next iteration of the ERA once this data is publicly available, in order to demonstrate that the cumulative effects analysis was performed conservatively and the conclusions remain valid. Any increased risks found through this analysis, if any, would require NexGen to develop mitigation or adaptative management plans.

Another potential cumulative effect of concern to Indigenous Nations and communities was the potential for emissions from Alberta's oil sands operations to cause acidic deposition from sulfur dioxide through rainfall and snowfall, which could contribute to increased lake acidification. NexGen's activities, such as air emissions, effluent discharge, and seepage from the PAG WRSA, could combine with the impacts of oil sands emissions and further increase lake acidification risks. CNSC staff analyzed this issue and concluded that the potential cumulative effect is unlikely to result in significant adverse environmental effects. The rationale for this conclusion is described below.

The Saskatchewan air quality guideline outlines two criteria for determining if a facility's emissions warrant regional acid deposition modeling:

1. Combined emissions of SO_2, NO_x, and ammonia (NH_3) must exceed 0.175 tonnes per day (t/d) of hydrogen ion (H^+) equivalent, calculated using specific formulas.
2. Facility emissions must account for more than 5% of the baseline emissions in the region.

Preliminary screening for NexGen's project found that the total H^+ equivalent from all acidifying emissions was about one-tenth of the Provincial 0.175 t/d threshold. Following consultations between NexGen and the Saskatchewan Ministry of Environment, it was determined that due to the low emissions of SO_2, NO_x, and sulfuric acid, acid deposition modeling was unnecessary for the project. To further support predictions of low risk from acid deposition cumulative effects, NexGen conducted rainwater pH monitoring at the site from September 2018 to October 2020. The results showed an average pH of 6.36, which is less acidic than typical unpolluted rain (pH ~5.6). Given the relatively low acidity of rainwater at the project site, the potential for acid emissions to cause acid deposition issues is considered low.

However, CNSC staff acknowledge concerns from Indigenous Nations and communities on this topic and have provided recommendations for more EA follow-up monitoring requirements and commitments to NexGen to ensure there are no unexpected risks as the project progresses. CNSC staff expect NexGen to include follow-up monitoring for all relevant pathways (e.g., air, effluent, surface water, runoff, rain and snow precipitation, groundwater) and contaminants of potential concern (COPCs) (e.g., SO_2, NO_x, sulfates, nitrates, pH) that may contribute to lake

acidification. This environmental monitoring data should be incorporated into the next ERA to model and assess potential cumulative effects related to this risk. NexGen is also expected to explore mitigation options and adaptive management strategies to address potential environmental impacts based on increasing acidification levels in lakes if future monitoring data indicates risk. Additionally, CNSC staff note that if a license is granted, other environmental monitoring programs such as those required under the EEM program, will assess aquatic health indicators that could be affected by acidification, potentially triggering further mitigation or adaptive management actions. These monitoring actions will help refine the risk assessment to ensure lakes in the project area are protected from acid deposition and acidification.

CNSC staff have also reviewed NexGen's updated Geochemical Characterization of Waste Rock report as part of the EIS and are satisfied with the updated dataset on baseline geochemical information for waste rock stored on the surface. CNSC staff also noted NexGen's proposed engineering measures to mitigate potential acid generation during surface storage, including the segregation of PAG and NPAG waste rock and the use of low-permeability horizontal layering to limit oxygen ingress and precipitation infiltration into the waste rock pile. These measures will further help protect the environment from potential lake acidification risks associated with the project.

In summary, the assessment predicted residual effects on surface water quality due to change in water and drinking water quality constituent concentrations. However, with the implementation of appropriate mitigation measures and the effects being characterized as low magnitude, localized, and can be further reduced through adaptive management, the residual effects on surface water and sediment quality are not predicted to be cause adverse effects to VCs. CNSC staff have reviewed NexGen's models and predictions for effects to surface water and sediment quality and confirmed that NexGen conducted a comprehensive analysis of these effects.

6.3.5. CNSC Staff's Findings and Recommendations

CNSC staff have reviewed NexGen's effect assessment of the aquatic environment, related to hydrology, surface water and sediment quality and confirmed that NexGen conducted a comprehensive analysis of these effects and that identified mitigation and follow-up monitoring program measures are adequate.

6.3.6. Issues requiring Follow-up

As part of licensing reviews, NexGen is expected to submit some additional information for CNSC staff review and acceptance. During the licensing phase (licence to prepare site and construct), as part of BATEA documentation package, NexGen is expected to optimize the design of their water treatment plant, as well as refine environmental release targets, as per the requirements of REGDOC-2.9.2. NexGen is also expected to provide an updated PMP estimate or confirm whether the current PMP is valid, or conservative based on analyses of up-to-date storm database.

6.4. Terrestrial environment

6.4.1. Description of the terrestrial environment

The proposed Project is located within the southern Athabasca Basin, in the Firebag Hills Landscape Area in the Mid-Boreal Upland Ecoregion of the Boreal Plain Ecozone of Saskatchewan. The dominant terrain in the local study area is glaciofluvial (78.8%), followed by water (13.7%), fen peat (3.9%), and anthropogenic disturbance (3.7%). Upland soils in the area are dominantly Brunisolic soils that have developed on sandy glacial till and glaciofluvial deposits. While the area is primarily an undulating to hummocky upland landscape, the lower areas and depressions are typically poorly drained and contain organic and Gleysolic soils developed on sandy till deposits. No permafrost was observed during baseline studies.

A baseline soil sampling program in 2018 and 2019 investigated soil chemistry and reclamation suitability. Soils showed acidic pH levels although these were deemed natural to the area and thus not a limiting factor for reclamation success. Electrical conductivity (EC) and sodium adsorption ratios (SARs) were rated as good for reclamation suitability. In contrast, the cation exchange capacity (CEC) was low, indicating that soils have a naturally low supply of, and ability to retain nutrients for plants, and a low buffering capacity against soil acidification. Among the analyzed metals, boron, sulphur and uranium concentrations exceeded soil quality guidelines for the protection of environmental and human health by the Canadian Council of Ministers of the Environment (CCME). Analyzed radionuclides in soils were either below detectable levels or measured at levels below guideline limits for the management of naturally occurring radioactive materials (NORM). Taking into account the soil texture, course fragment content, ease of salvage, and depth of soil horizons, both the mineral topsoil and subsoil are considered to have poor reclamation suitability despite being capable of supporting local ecosystems.

The boreal forest landscape is heterogeneous, having been influenced by a variety of natural disturbances including wildfires that result in a mosaic of burned and unburned areas that can fragment the habitat. Ecosystems in the region are mainly upland deciduous, mixed, and coniferous forests dominated by jack pine. On the local scale, uplands represent 76.7% of the area whereas wetlands account for 19.5% including swamps, bogs, fens, and water. Riparian ecosystems, which are a subset of both uplands and wetlands, cover 7.3% of the local area. Small areas of anthropogenic disturbance (3.7%) are also present. The area supports a number of traditional use plant species, including jack pine, mosses, blueberry, and bog cranberry. A complete list is available in the EIS table 13.3-5.

No federally listed plant species were observed during 2018 baseline plant community surveys, however, a total of six provincially tracked plant species were observed: Beautiful Sedge (*Carex concinna*), English Sundew (*Drosera anglica*), Hudson Bay Sedge (*Carex heleonastes*), Northern Lady-fern (*Athyrium filix-femina* var. *angustum*), Scheuchzer Cotton-grass (*Eriophorum scheuchzeri*), and Water Lobelia (*Lobelia dortmanna*). Moreover, a review of the provincial HABISask database identified an additional species, Heart-leaved Twayblade (*Listera cordata* var. *cordata*) within approximately 1 km of the local study area.

6.4.2. Proponent's Assessment

6.4.2.1. Terrain and soils

To assess the residual effect of alteration of soil and terrain conditions, the proponent employed the following measurement indicators:

- Quantity and distribution of terrain units: measures the quantitative change in area of terrain units within the maximum disturbance area[1].
- Quantity and distribution of soil map units: measures the quantitative change in area of soil map units within the maximum disturbance area.
- Soil quality: provides a qualitative assessment of the change in soil quality (i.e., productivity) in the maximum disturbance area with respect to alterations in soil chemistry, reclamation suitability, erosion susceptibility, acidification, permafrost, and compaction.

In terms of quantity and distribution of terrain and soils, the proponent assessed the residual effects using the conservative assumption that terrain and soils in the entire maximum disturbance area would be altered. Following this approach, the disturbance size is predicted to be a total of 980.0 ha, entailing 897.8 ha of new disturbance and 82.2 ha of existing disturbance. Among the newly disturbed area, glaciofluvial terrain is the primarily affected unit with 874.2 ha lost, followed by fen peat with 23.6 ha lost. The newly disturbed area contains different mineral and organic soil units which will be lost.

Various mitigation measures are proposed to address the residual effect, which are outlined in table 6.18. Notably, it is proposed to minimize Project overlap with wetlands and fen peat terrain. The actual anticipated footprint, estimated as approximately 25% of the maximum disturbance area, is predicted to disturb only 5.5 ha of fen peat terrain, reflecting 5.5 ha organic soil area. Moreover, the proponent plans to limit the footprint by using existing cleared areas and roads and by storing tailings underground.

Progressive reclamation during operations and reclamation during closure are predicted to reverse effects on disturbed terrain and soil map units and provide productive soils to support the establishment and succession of vegetation communities with similar function to natural ecosystems. However, the establishment of some reclaimed vegetation ecosystems such as mature forest types are predicted to require more than 60 years beyond closure. As well, effects associated with permanent features such as the waste rock storage areas (WRSAs) are irreversible and would result in a permanent change to natural terrain and soil units. Nevertheless, over time, these areas are expected to provide functional substrates for soils and the establishment of early seral vegetation communities.

For soil quality, the proponent noted that the only relevant aspect was the suitability of disturbed soils for reclamation. The reclamation suitability of mineral soils is largely limited by texture and

[1] The maximum disturbance area (981 ha) is four times larger than the anticipated Project footprint in order to address uncertainty in the final design of the Project so that adverse effects are not underestimated.

given the course texture of upland soils in the Local Study Area (LSA), reclamation success would depend on measures taken to mitigate effects on soil quality. Proposed mitigation measures include soil handling that minimizes loss and degradation (e.g., direct placement) and stockpiling for long-term storage. The proponent noted that seed banks in salvaged topsoil are valuable for natural revegetation during reclamation. Based on this, reclaimed soils are expected to provide similar ecological function to natural soils and result in the establishment of early seral vegetation communities within 5-10 years. Monitoring programs would be implemented to evaluate the effectiveness of mitigation measures.

In summary, the proponent concluded that residual effects are predicted to be negative, long-term, certain to occur, and reversible; except for the WRSAs which will be permanent features with irreversible effects on terrain and soils. More detailed information can be found in the EIS section 12.5.

Table 6.18: Proposed mitigation measures to eliminate, reduce, or control potential adverse effects on terrain and soils (prior to residual effects characterization)

Alteration of soil and terrain conditions
• Implement an EPP including site water management procedures that include monitoring seepage from waste rock storage area
• Develop and implement a Preliminary Decommissioning and Reclamation Plan
• Limit the Project footprint to the extent practical, using practices such as designing an efficient infrastructure footprint, optimizing the use of cleared areas, and storing tailings underground
• Minimize areas of vegetation clearing and soil disturbance
• Implement progressive reclamation and revegetation of disturbed areas where non-permanent facilities have been decommissioned
• Use of erosion control measures as required
• Avoid placing soil stockpiles near waterbodies and near natural drainage features
• Design slopes for long-term stability and minimize steepness and length of slopes of disturbed areas and stockpiled soils
• To the extent practical, work in sensitive areas (e.g., erosive soils) scheduled to avoid periods that may result in high flow volumes and/or increase erosion and sedimentation
• Site access road realigned during Project design to avoid a wetland
• Use clearing equipment that minimizes surface disturbance, soil compaction, and topsoil loss
• Where soils are prone to wind erosion, tackify, cover, seed, and/or apply water during periods of high erosion potential

Alteration of soil and terrain conditions
• Implement an EMP that includes monitoring for soil quality to determine if Project activities influence soil chemistry
• Implement a Mine Waste Management Plan
• Use and maintain emissions control devices, reduce fuel combustion, and limit idling of vehicles and equipment
• Reduce fugitive dust generation through limits to vehicle speed on unpaved site roads
• Apply water and/or dust suppressants to site roads, access road, and airstrip as necessary
• Conduct regular equipment maintenance
• Contain and divert runoff and seepage from potentially acid generating (PAG) waste rock, special waste rock, and ore to the effluent treatment plant

Table 6.19: Follow-up program measures for effects on terrain and soils

Alteration of soil and terrain conditions
• Slope monitoring to assess terrain stability completed during land clearing, site preparation works, and construction of facilities
• Perform routine inspection and maintenance of containment and conveyance structures (i.e., roadside ditches and culverts) to limit the risk of washout or sediment release
• Soil quantity and quality monitoring during site clearing, contouring, and excavation activities for signs of admixing, compaction, and erosion
• Monitoring of soil transport and stockpiling activities for signs of erosion
• Monitoring of dust deposition
• Monitoring of soil chemistry

6.4.2.2. Vegetation

To assess the residual effects of direct loss and terrain alteration on vegetation, the proponent employed the following measurement indicators:

- Ecosystem availability: changes were estimated quantitatively by calculating the change in Ecological Land Classification (ELC) units associated with each ecosystem.
- Ecosystem distribution: changes were estimated qualitatively by examining changes to the size and distribution of ecosystem patches.

- Ecosystem condition: changes were estimated qualitatively using scientific literature with respect to dust deposition, moisture and sunlight, and competition with invasive species.
- Traditional use plants habitat availability and distribution: changes were estimated quantitatively for habitat availability by calculating differences in the occupancy of each traditional use plant species, and changes were estimated qualitatively for distribution by examining changes to the size and distribution of habitat patches.

In terms of ecosystem availability, the proponent assessed the residual effects using the conservative assumption that vegetation in the entire maximum disturbance area would be altered. Following this approach, the Project is predicted to contribute to a loss of 868.4 ha of upland ecosystems (1.2% of Regional Study Area, RSA), 27.8 ha of wetland ecosystems (<0.1% of RSA), and 39.6 ha of riparian ecosystems (0.4% of RSA).

Changes to upland ecosystems are predicted to be limited to five ELC units. The largest absolute change is for "burned Jack pine/lichen" (720.4 ha lost), but this is also the most common ecosystem in the area and several analogous habitats remain available, such as the "unburned Jack pine/lichen" or "Jack pine/blueberry/lichen". The largest relative change is for "Black spruce/Labrador tea/feathermoss" with a predicted loss of 11.5 ha representing 8.9% change in the RSA. This ELC unit is relatively uncommon, yet 118.3 ha will remain available in the RSA.

Changes to wetland ecosystems are predicted to be limited to four ELC units. The largest absolute and relative change is for the "Labrador tea shrubby bog" with a loss of 16.6 ha representing 1.3% change in the RSA. Yet, more than 1,000 ha of this wetland type remain available in the RSA. Moreover, disturbance associated with permanent facilities (e.g., WRSAs) is not anticipated to occur within wetlands.

Changes to riparian ecosystems are predicted to be limited to five ELC units. The largest absolute change is for the "Labrador tea shrubby bog" with a loss of 10.4 ha, although close to 1,000 ha remain available in the RSA. The largest relative change is for "Black spruce/Labrador tea/feathermoss" with a predicted loss of 9.8 ha, and only 86.8 ha remaining on the RSA scale. Disturbance associated with permanent facilities (e.g., WRSAs) is not anticipated to occur within riparian ecosystems.

With respect to ecosystem distribution, the proponent stated that decreased connectivity would occur at the local scale around the maximum disturbance area, noting that the Project is in an area of aggregated existing linear and non-linear disturbance. Also, the majority of the maximum disturbance area (77%) was disturbed by fire in 1990 which has led to a relatively homogenous vegetation community. Most upland ecosystems remain abundant and well-connected across the RSA. The least common upland ELC unit disturbed by the Project is "Black spruce/Labrador tea/feathermoss" which is distributed along shorelines of Patterson Lake and other lakes in the area. Disturbance of this ELC unit would slightly increase the inter-patch distance on a local scale but is not expected to affect regional connectivity. Similarly, existing wetlands are mostly distributed along shorelines, notably an extensive organic wetland to the east of the existing bridge crossing the existing access road. Project components were redesigned to minimize effects on wetland distribution, but the access road would be widened to 10 m while maintaining alignment. The access road widening would also result in minor changes to riparian habitat. Yet,

since these wetland and riparian areas are in close proximity to existing disturbance, additional fragmentation would be limited and localized. Lastly, the Project would not change the density of linear features in the RSA.

For ecosystem condition, the proponent noted that forest near development can be affected by edge effects such as ingress of invasive species or changes in moisture or sunlight. These can result in structural changes in forest stands that extend to about 50 m from disturbance. Likewise, edge effects can alter wetland species abundance and richness. One provincially tracked plant species (Beautiful Sedge) was observed in upland within the maximum disturbance area, however, four additional occurrences of the same species were observed elsewhere with no direct effects anticipated. Moreover, six rare plant species occurrences were recorded in wetlands and riparian habitats but not in the maximum disturbance area: English Sundew, Hudson Bay Sedge, Northern Lady-fern, Scheuchzer Cotton-grass, Water Lobelia, and Heart-leaved Twayblade. The proponent specified that known rare plants would be clearly marked and avoided where feasible, with appropriate setback distances. Where disturbance is unavoidable, the Saskatchewan Ministry of Environment (ENV) would be consulted to determine the best course of action. Furthermore, one species of noxious weed (Narrow-leaved Hawk's Beard, *Crepis tectorum*) and one species of nuisance weed (Dandelion) designated under *The Weed Control Act* were identified in disturbed areas during baseline surveys. Introduction and spread will be mitigated through an EPP and monitoring of designated weed species. In summary, effects on ecosystem condition are possible, but predicted to be within resilience and adaptability limits.

Various mitigation measures are proposed to address the residual effects, which are outlined in table 6.20. Progressive reclamation would occur in areas no longer required, as well as decommissioning and reclamation of non-permanent facilities and infrastructure during active closure. Reclamation is predicted to reverse effects on disturbed upland ELC units and to support the establishment and succession of vegetation communities reflecting boreal forest upland. Young seral forest communities are anticipated to be established within 6-20 years, and mature forest within 60-80 years. Additional reclamation activities would be implemented to focus on restoration of existing linear anthropogenic disturbances (e.g., seismic lines). However, while permanent facilities of the Project (e.g., WRSAs) would be reclaimed, vegetation communities anticipated to establish on these features would likely not be representative of natural upland; thus, effects on 73.1 ha of upland are considered permanent and irreversible. In addition, while wetlands would be reclaimed to the extent possible in an attempt to achieve no net loss of wetland functions, the loss of wetlands – including those with riparian potential – is conservatively assumed to be permanent because fens and bogs cannot be restored with confidence. Nevertheless, any disturbed wetland types remain well-distributed outside the Project footprint.

With regard to traditional use plants, availability of their habitat is expected to be decreased by 298.1 ha (1.0%) in the RSA while remaining abundant on a regional scale. The largest predicted changes are associated with common boreal forest plants such as blueberry, jack pine, and bog cranberry. Within the LSA, the occupancy of 24 traditional use plants would be reduced based on the removal of the maximum disturbance area which is a conservative overestimation. Most are

anticipated to re-establish quickly following removal of disturbance, except for those species that occupy wetlands (e.g., Pitcherplant, *Sarracenia purpurea* ssp. *gibbosa*) as it is uncertain if wetland plant composition will be similar following restoration. The Project would also result in localized changes in plant habitat connectivity, although the habitat is predicted to continue to be self-sustaining and ecologically effective.

In summary, the proponent's analysis found that no unique upland, wetland, or riparian ecosystems would be lost due to the Project, and no unique traditional use plant species would be lost either. Changes to the availability and distribution of upland, wetland, or riparian ecosystems, including those that support traditional use plants, are predicted to be localized. The proponent concluded that residual effects are predicted to be negative, long-term, certain to occur, and reversible; except for the WRSAs which will be permanent features with irreversible effects on vegetation, as well as wetlands which are assumed to be irreversibly disturbed. The overall residual effects are predicted to be not significant for the vegetation VCs. More detailed information can be found in the EIS section 13.5.

Table 6.20: Proposed mitigation measures to eliminate, reduce, or control potential adverse effects on vegetation (prior to residual effects characterization)

Direct loss of vegetation
• Implement an EPP including site water management procedures that include monitoring seepage from waste rock storage area
• Implement an EPP including actions to prevent, detect, and control areas with prohibited, noxious, and nuisance weeds and invasive species
• Implement an EMP that includes monitoring for soil quality to determine if Project activities influence soil chemistry
• Implement an Effluent and Emissions Plan
• Implement a Mine Waste Management Plan
• Develop and implement a Preliminary Decommissioning and Reclamation Plan
• Mark clearly with an applicable setback distance and avoid known rare plants; where disturbance to rare plants is unavoidable, compensation would be considered following discussion with and guidance from regulators
• Limit the Project footprint to the extent practical, using practices such as designing an efficient infrastructure footprint, optimizing the use of cleared areas, and storing tailings underground
• Minimize areas of vegetation clearing and soil disturbance
• Implement progressive reclamation and revegetation of disturbed areas where non-permanent facilities have been decommissioned

• Use of sedimentation and erosion control measures as required
• Site access road realigned during Project design to avoid a wetland
• Use clearing equipment that minimizes surface disturbance, soil compaction, and topsoil loss
• Design and maintain a mine dewatering system to manage the flow of groundwater inflow
• Use and maintain emissions control devices, reduce fuel combustion, and limit idling of vehicles and equipment
• Reduce fugitive dust generation through limits to vehicle speed on unpaved site roads
• Apply water and/or dust suppressants to site roads, access road, and airstrip as necessary
• Conduct regular equipment maintenance
• Implement best management practices and mitigation such as spill prevention
• Contain and divert runoff and seepage from PAG waste rock, special waste rock, and ore to the effluent treatment plant
• Install and operate an effluent treatment plant and sewage treatment plant to reduce release of constituents of potential concern (COPC) to the environment
• Confirm discharge meets quality criteria prior to release and locate treated effluent diffuser away from sensitive or unique habitats
• Install engineered cover system on PAG and Non-PAG material during reclamation
• Use native species or non-aggressive, non-native species for revegetation
• Procure clean construction materials and procure seed mixes that work to avoid the introduction of noxious weeks
• Promote natural propagation and regeneration to enhance reclamation along the access road and other Project rights-of-way
• Adhere to the Federal Policy on Wetland Conservation to have no net loss of wetland functions
Terrain alteration for vegetation
• Minimize steepness and length of slopes of disturbed areas and stockpiled soils
• Work in sensitive areas (e.g., erosive soils, wetlands) scheduled to avoid periods that may result in high flow volumes and/or increase erosion and sedimentation
• Reclamation to include contouring of disturbed areas to encourage vegetation growth and blend with the natural surrounding topography

Table 6.21: Follow-up program measures for effects on vegetation

Direct loss of vegetation
• Surveillance to identify and manage new occurrences of species designated by *The Weed Control Act* as prohibited, noxious, and nuisance weeds
• Monitoring and follow-up during construction to delineate potential activity restriction guideline setbacks for rare and provincially tracked plants
• General environmental monitoring to evaluate changes to vegetation including traditional use plant species
• Reclamation monitoring such as for treatments to be used during revegetation
• Wetland function monitoring surveys including water level, water quality, and sediment quality sampling

6.4.3. Other Views Expressed

6.4.3.1. Potential Impacts to Terrain, Soils and Vegetation

Indigenous Nations and Communities

CRDN members were previously concerned that impacts from the Project may result in vegetation being contaminated, thus raising concerns related to human health. NexGen confirmed that emissions, deposition of contaminants, and discharge of treated effluent were assessed as potentially affecting human health through ingestion, and mitigation measures will be implemented to ensure emissions and effluent discharge will be in accordance with provincial standards and license conditions.

MN-S had noted that there is a disconnect between field studies and assessments, given that the number of traditional plant species listed is less than the number observed during baseline surveys. NexGen noted that baseline and assessment study areas do not align, however this is common practice due to differences in methodologies for grouping plant species. MN-S had previously noted that it was unknown if soils investigations were completed to describe soil characteristics in the Project study areas. NexGen has confirmed that soil investigations were completed at a total of 118 sites. MN-S had noted concerns of Project-related dust and its potential impacts to vegetation as a pathway of effects to humans and wildlife. MN-S had also previously indicated a number of additional pathways, including secondary pathways, that should be considered concerning potential impacts to vegetation. NexGen updated the Final EIS Appendix 2B to provide key mitigation efforts for this pathway. NexGen has noted that secondary pathways, including fugitive dust and vegetation changes from particulates, are not expected to contribute to cumulative effects and cause minor changes relative to existing conditions or guideline values. Therefore, residual effects for secondary pathways have not been

considered. MN-S had also previously requested NexGen include results from supplemental vegetation inventory and rare plant surveys in the EIS. NexGen has clarified that additional rare plant studies conducted in 2021 found no additional rare plant species, and therefore no update was required to the Draft EIS. MN-S had also previously questioned the omission of Lesser Duckweed (*Lemna minor*), despite it being a provincially listed species observable within ecosite BP25. NexGen has clarified that due to taxonomic changes, all *Lemna minor* observations in the project area have been changed to *Lemna turionifera* (Common Duckweed), a species that is not provincially tracked. MN-S had previously noted a concern that the EMP for vegetation was not identified. MN-S had identified that reclamation activities should be completed such that vegetation communities present at the time of disturbance would be reestablished and also indicated it was not clear which vegetation species would be used for reclamation and asked NexGen to confirm the completion of surveys for non-vascular plants or lichen Species of Conservation Concern. NexGen confirmed that the development of environmental monitoring details for the Project would occur outside of the environmental assessment process, and involve engagement with primary Indigenous Nations and communities, including MN-S. NexGen has stated that while all reasonable efforts will be made to reestablish vegetation communities representative of existing conditions, the terrain would have changed as a result of the Project and the effectiveness of such a reclamation is uncertain. NexGen has confirmed that surveys for non-vascular plants were not conducted as no plant species at risk or critical habitat, including lichen, were listed in the regional study area.

BNDN indicated that the Project will result in habitat loss and alterations, including alterations to vegetation communities. The alterations will have impacts on wildlife. BNDN also noted that Project-related particulate matter may result in increased particulate deposition on vegetation, which in turn will have adverse impacts to human health and wildlife. Further, BNDN is concerned that Project-related dust will also deposit on traditionally important vegetation communities. BNDN requested that NexGen develop a follow-up monitoring program for sensitive vegetation communities. NexGen has committed to two monitoring objectives including evaluating the effectiveness of the environmental protection measures and to identify unanticipated effects, however, NexGen has noted that challenges exist in defining suitable monitoring methods for monitoring impacts of habitat alterations on wildlife densities. NexGen has committed to minimizing fugitive dust and thereby particulate deposition on vegetation through environmental design features and measures provided in table 7.2-10 of EIS section 7.2.4 and will explore further mitigation efforts should localized exceedances of guidelines occur. NexGen has confirmed that details of monitoring programs will be developed during permitting and licensing, and follow-up monitoring can be discussed with BNDN during this process.

YNLR noted that the 43-year anticipated lifespan of the Project will mean restoration of vegetation communities will take decades to reestablish. As such, YNLR recommends that NexGen undertake offsetting of impacted vegetation. YNLR indicated that NexGen's use of only three vegetation ecosystems is too coarse and may miss important vegetation communities. YNLR noted that they believe that predicted effects, and effectiveness of mitigation on vegetation is critical to understand if such measures are working as intended and as a means to

identifying adaptive management that may be required to maintain the ecological health of Project-area forests. NexGen has confirmed that a key Project goal is to mitigate effects to the environment including minimizing impacted vegetation. Additionally, NexGen's preliminary objective for Closure is to design the landscape to allow for unrestricted traditional use as soon as practical. NexGen has maintained that the selected VCs have resulted in a comprehensive assessment of vegetation, by applying a fine-filter approach, which assessed effects on species identified as important by Indigenous Nations and communities, in addition to a coarse-filter approach, which assessed effects on ecosystems more broadly.

ACFN requested that NexGen re-evaluate the predictive modelling data for soils in the ERA to identify bio accumulative and persistent substances with respect to the Canadian Environmental Protection Agency (CEPA) Persistence and Bioaccumulation Regulations. NexGen has maintained that no re-evaluation is required, as best practices were used to screen for COPCs. Concerning invasive species, ACFN asked NexGen to provide scientific evidence that plant species that predominate pre-disturbance plant communities (e.g., lichens and feathermosses) can be reestablished within boreal forest reclamation sites. NexGen has noted that mosses can be effectively reclaimed using the spreading of moss clippings on reclaimed areas, and approaches are detailed in the *Peatland Restoration Guide* (Quinty and Rochfort 2003). Scientific literature on lichen propagation is limited; some successful techniques are detailed in research trials completed by Ronalds and Grand (2018) and Rapai et al (2023), and additional site-specific research would be conducted.

ACFN noted that NexGen plans to use non-native plant species in reclamation and asked that NexGen explain how it will prevent each of those plants from becoming established within the reclaimed plant community. NexGen has clarified that the intent is to use native plant species, however flexibility is necessary should the use of native species be impractical for ensuring successful reclamation. Potential non-native plants would be non-aggressive and non-invasive species and would be early successional plants that establish quickly and decrease soil erosion. ACFN asked whether NexGen would carry forward the invasive species pathway in its assessment of project effects. Additionally, ACFN requested justification for the prediction that impacts on availability of upland and riparian ecosystems are reversible, given that many predominant species, including traditional plant species, are difficult to reestablish in reclamation. NexGen has found the occurrence of invasive plant species to be limited to existing disturbed upland ecosystems and committed to mitigation measures to minimize the introduction of noxious and nuisance weeds near the Project footprint. Therefore, invasive species are predicted to result in negligible effects and NexGen maintains a detailed assessment of this pathway is not required. And finally, NexGen has noted that the continued re-establishment of plant communities in the boral forest after intense disturbances such as forest fires have exemplified a high capacity for resilience and adaptation of plants in upland and riparian ecosystems.

6.4.4. CNSC Staff's Analysis

6.4.4.1. Terrain and soils

CNSC staff have reviewed the proponent's residual effect assessment for the alteration of soil and terrain conditions and deemed the measurement indicators as appropriate for the assessment of residual effects. CNSC staff's analysis confirmed that the proponent conducted a comprehensive analysis of these effects and that identified mitigation and follow-up monitoring program measures are adequate.

6.4.4.2. Vegetation

CNSC staff have reviewed the proponent's residual effect assessment for the direct loss and terrain alteration for vegetation, and the valued components of upland, wetland, and riparian ecosystems, and traditional use plant species. CNSC staff deemed the measurement indicators as appropriate for the assessment of residual effects. However, CNSC staff had several information requests that are discussed below.

As for the assessment boundaries, CNSC staff noted that the RSA was selected to provide a watershed-based context for interpreting local effects of the Project. Given that the RSA is used to evaluate the availability and distribution of vegetation in upland, wetland, and riparian ecosystems, CNSC staff requested further rationale for the appropriateness of the watershed-based RSA for all vegetation valued components. The proponent responded that the spatial boundaries of the RSA were selected to be complementary to the assessments for air and water that potentially affect vegetation. The RSA was also used to assess cumulative effects from the Patterson Lake South Property and fire factors which are more appropriately assessed at the regional scale. CNSC staff deemed this response as acceptable.

With respect to upland ecosystems, the statement that effects are permanent and irreversible for upland ELC units covered by permanent facilities (e.g., WRSAs) stood out to CNSC staff. Certain upland ELC units are uncommon in the LSA, and it was unclear whether these would be affected. Thus, CNSC staff requested information on which ELCs are located in areas that are planned to be covered by permanent facilities. The proponent confirmed that permanent WRSAs would be located on the common Jack pine/lichen (burned) ELC unit which comprises 58% of the LSA. The proponent further noted that an alternative assessment was conducted to evaluate options for permanent facilities (e.g., WRSA) that included environmental considerations. CNSC staff were satisfied that the permanent facilities would not irreversibly disturb unique or uncommon ecosites.

For wetland ecosystems, CNSC staff commented that the discussion of the effects pathway of "surface water flow changes" does not acknowledge that seemingly isolated wetlands can also be connected hydrologically through groundwater. Therefore, CNSC staff requested an evaluation of predicted effects on wetland hydrological connectivity in the context of vegetation. The proponent responded that the Project is predicted to have no measurable effect on wetland hydrological connectivity. This is because the glacial drift material at surface in the LSA is highly permeable, and as such, the water surface elevation of riparian wetlands adjacent to waterbodies is expected to be primarily controlled by the water surface elevation of the adjacent

waterbody. During operation, there is a predicted 5% reduction in groundwater discharge to riparian wetlands distributed between Patterson Lake, Forrest Lake, and Lake G. However, the reduction in baseflow would be mitigated by increased surface water level in Patterson Lake and the Clearwater River below Patterson Lake, as well as in Forrest Lake. Moreover, one isolated wetland, a black spruce treed bog, is located perched on a hill slope adjacent to the existing access road approximately 30 m above Patterson Lake. This wetland is the only wetland located in the LSA that is not a riparian wetland. Due to the elevation, this wetland is not expected to interact with the Project under current conditions or during the Project lifespan. CNSC staff found this answer to be acceptable and agreed that given the limited effects on wetland hydrological regimes, effects on vegetation in this respect are negligible.

With respect to rare plants, CNSC staff's analysis found that the spatial boundaries for the 2018 vegetation baseline assessment differ from the actual EA boundaries, and therefore it was unclear whether rare species were adequately captured in baseline surveys. Furthermore, the baseline surveys were only completed in one year which may underestimate the presence of certain rare plant species, such as annuals depending on a seed bank. CNSC staff also pointed out that the limited amount of rare plant observations was used as a rationale to use an ecosystem-based approach to their assessment. Thus, CNSC staff requested further rationale for the selection of an ecosystem-based approach for rare plants including a discussion of uncertainties related to this approach and baseline data. The proponent responded that the assessment applied both a coarse- and fine-filter approach to the selection of vegetation valued components. The coarse-filter approach ensures that biodiversity is assessed and managed at the vegetation and wetland ecosystem level, while the fine-filter approach assessed effects on 28 traditional use plant species as well as rare plants. Conducting extensive regional surveys on rare plants would require extensive resources and would not change the mitigations required to minimize indirect effects. The proponent further clarified that a precautionary approach was used to address uncertainty by identifying the greatest magnitude, duration, and geographic extent of potential adverse effects when a range of outcomes were possible. Baseline survey methods for rare vascular plants followed provincial survey standards focusing the intensity of surveys on the anticipated Project footprint where there would be the potential for direct losses. Therefore, there is low uncertainty in the potential for direct loss of rare plants. The proponent also explained that additional rare plant studies were conducted in the anticipated Project footprint in 2021, but no additional rare plant species were found. CNSC staff found this response to be acceptable, also taking into account the mitigation measure that known rare plants as well as previously unidentified species (e.g., chance find during construction) would be clearly marked and avoided where feasible, and the ENV would be consulted to determine the most appropriate course of action.

In terms of COPC in vegetation, CNSC staff remarked that the spatial extent for the deposition of fugitive dust emissions is assumed to be concentrated within 500 m of the Project footprint.

However, a cited study[2] concluded that dust generated from a haul road was found to decrease lichen cover up to 1 km, indicating that lichen is a sensitive species to dust deposition. Moreover, the Environmental Risk Assessment (ERA) concluded that COPC relevant to dust and particulates exceeded screening values. CNSC staff requested an evaluation of predicted effects of total suspended particulates (TSP) and particulate matter PM_{10} and $PM_{2.5}$ on lichen to verify assumptions. The proponent responded that the cited study was completed in unforested, subarctic tundra, whereas the Project is located in the boreal forest where dust would not disperse as far due to the presence of trees. Average annual dust deposition rates from the Project at the boundary of the maximum disturbance area are predicted to be below any rates reported to have effects on vegetation and lichen. Furthermore, air quality modelling indicated the criteria exceedances for PM_{10} would occur mostly over the Patterson Lake North Arm, with minimal changes expected for terrestrial vegetation. Baseline air quality monitoring, including particulates, would continue into construction, operations, and decommissioning to verify predictions. CNSC found this explanation to be acceptable.

Related to this topic, CNSC staff noted in the ERA that aquatic macrophyte shoots and roots were sampled at Lloyd Lake along with sediment, however, the COPC data was not discussed beyond a comparison of modelled and measured concentrations. CNSC staff requested that the proponent present information on the macrophyte sampling campaign including measured COPC concentrations in shoots and roots, along with an explanation on how this information was considered in the EIS. The proponent clarified that *Carex* sp. (sedge) were collected in multiple waterbodies in addition to Lloyd Lake and that baseline data is available in Appendix C of EIS Annex V.1 (Aquatic Environment Baseline Report). Further, the measured baseline data for aquatic macrophytes were used to validate the bioaccumulation factors (BAFs) used in the modelling. The measured baseline data were compared against the predicted macrophyte concentrations using the BAFs from publicly available regional data from other uranium mines in northern Saskatchewan. There was generally good agreement between modelled and measured macrophyte data. CNSC staff found this response to be acceptable, but to ensure accuracy and completeness, staff recommended to update the ERA to indicate that macrophyte sampling was conducted in Lloyd Lake, as well as Broach Lake, Jed Creek, Patterson Creek, Beet Creek, and Clearwater River. NexGen included his update in the Final EIS submission.

Taking into account all of the above information, CNSC staff's analysis confirmed that the proponent conducted a comprehensive analysis of these effects and that identified mitigation and follow-up monitoring program measures are adequate. CNSC staff conclude that residual effects on vegetation VCs are not significant.

6.4.5. CNSC Staff's Findings and Recommendations

CNSC staff have reviewed NexGen's effect assessment of the terrestrial environment, related to the terrain and soils, and vegetation, and confirmed that NexGen conducted a comprehensive

[2] Chen, W., et al. (2017). Does Dust from Arctic Mines Affect Caribou Forage. *Journal of Environmental Protection*, 8, 258-276. DOI: 10.4236/jep.2017.83020.

analysis of these effects and that identified mitigation and follow-up monitoring program measures are adequate.

Taking into account the implementation of mitigation measures (table 6.20) and recommended follow-up program measures (table 6.21), CNSC staff conclude that the Project is not likely to cause significant adverse effects on vegetation, including upland, wetland, and riparian ecosystems, and traditional use plants.

7. Predicted effects on valued components

7.1. Fish and Fish Habitat

7.1.1. Description of the existing fish and fish habitat in the aquatic environment

Fish and fish habitat conditions in the LSA and RSA were evaluated for several waterbodies, including Broach Lake, Patterson Lake, Forrest Lake, Beet Lake, and Naomi Lake, and sections of the Clearwater River mainstem. In total, seventeen fish species were documented within these waterbodies. The most abundant large-bodied species captured included white sucker, lake whitefish, yellow perch, longnose sucker, northern pike, walleye, burbot, and lake trout. Commonly captured small-bodied species included trout perch, spottail shiner, and lake chub. This species list is characteristic of northern temperate waterbodies and watercourses in Saskatchewan (Langhorne 2001). Of the seventeen species identified, none were classified as species with a designated conservation status by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC 2021), aquatic species listed under the *Species at Risk Act or* would be considered rare or unique to the area based on a review of Saskatchewan's Conservation Data Centre taxa lists (SKCDC 2021a).

Four fish species (i.e., lake trout, lake whitefish, walleye, and northern pike) represented valued components (VCs) in the Environmental Assessment (EA). The selection of these four VCs was based on the respective roles and linkages of each species in the ecosystem and food web, the high traditional and cultural importance of these species to local communities, and the species' presence within nearby waterbodies and watercourses. Additionally, these VCs were selected because they are strong indicators of broader species assemblages and ecosystems and therefore are suitable for assessing both potential population-level effects and determining potential Project effects on overall biodiversity.

Lower trophic level communities such as plankton and benthic invertebrates were also characterized. Phytoplankton and zooplankton biomass and abundance was typically low in the sampled lakes, which is characteristic of northern oligotrophic lakes. Phytoplankton and zooplankton richness (i.e., the number of taxa present) and diversity were both moderate to high. The average density and richness of benthic invertebrates was also low and within the range typically observed for northern oligotrophic lakes, whereas diversity was moderate to high.

Fish tissue samples from northern pike and lake whitefish in flesh and bone were collected in 2018 and 2019 to be analyzed for radionuclides and trace metals for baseline characterization. Sample locations included Broach Lake, Patterson Lake, Forrest Lake, Beet Lake, Naomi Lake,

Clearwater River Nearfield, and Lloyd Lake. Currently, few guidelines exist for parameter concentrations in fish. Selenium levels measured in the flesh samples were compared to the U.S. EPA selenium criterion for fish muscle (flesh) of 11.3 ug/g dry weight (U.S. EPA 2016), which ensures protection of fish embryos. Other parameters were considered as baseline data and not compared to guidelines as none currently exist.

For northern pike, all flesh samples collected during the surveys had selenium concentrations below the 11.3 ug/g guideline (U.S. EPA 2016). For mercury, mean concentrations in flesh and bone samples from Naomi Lake, Clearwater River Nearfield, Llyod Lake Inlet and Hodge Lake were higher than other water bodies in the area and above the 0.5 ug/g recommended level by HC for safe consumption by humans. Although mean mercury concentrations in northern pike flesh from Patterson Lake was below 0.5 ug/g, two samples were above the HC recommendation.

For lake whitefish, all flesh samples collected during the surveys had selenium concentrations below the 11.3 ug/g guideline (U.S. EPA 2016). Mercury concentrations in fish flesh samples from all sampling areas were also below the 0.5 ugh/g HC recommended safe consumption level by humans (GS 2015).

The baseline characterization conducted by NexGen provides key insight into the environmental conditions that are relevant to understanding the potential effects of the Project on aquatic ecosystems. For more detailed information, please refer to the Aquatic Environment Baseline Report (Annex V.1) of the EIS.

Fish and fish habitat are protected under the federal Fisheries Act. In the Fisheries Act, “fish” is defined as fish species that occur in the area surrounding the Project and includes eggs and juvenile stages of fish. The definition of “fish habitat” in the Fisheries Act is “water frequented by fish and any other areas on which fish depend directly or indirectly to carry out their life processes, including spawning grounds and nursery, rearing, food supply and migration areas.”

The Project has the potential to cause adverse effects on fish VCs primarily through changes in surface water quality resulting from operational discharges and long-term solute transport from the underground tailings management facility (UGTMF) and waste rock storage areas (WRSAs). In addition, the Project could affect fish and fish habitat due to direct habitat loss and disturbance associated with the development of a freshwater intake, treated effluent diffuser, treated sewage outfall, and associated pipelines in Patterson Lake. Changes to water flows and water levels resulting from site water management activities and altered surface runoff conditions also have the potential to affect fish VCs. CNSC staff concurred with the proponent’s assessment of Project activities that may interact with fish and fish habitat that could cause residual effects.

The assessment endpoint for fish and fish habitat VCs is a self-sustaining and ecologically effective fish population. Measurement indicators identified and used to evaluate changes on this endpoint for the fish VCs are habitat availability (i.e., habitat quantity and quality), habitat distribution (i.e., habitat arrangement and connectivity, habitat fragmentation), and survival and reproduction.

Mitigation measures that can be applied to the project activities to minimize potential changes and residual adverse effects are described below.

7.1.2. Proponent's Assessment

The pathway analysis performed by NexGen assessed the potential adverse effects of the Project on fish and fish habitat, identified mitigation measures, and evaluated whether these measures could effectively reduce or eliminate residual adverse impacts. Potential Primary (i.e., effects are greater than negligible and require further detailed assessment) and Secondary (i.e., mitigation reduces effects to negligible levels) effects pathways are detailed in table 7.1. An evaluation of Project-related effects on surface water quantity is presented in the EIS hydrology assessment (see EIS section 9). Potential effects with no pathway are not considered further but are described in EIS table 11.4-1.

Table 7.1. Potential effects pathways for fish and fish habitat (adapted from EIS).

Pathway		Effects Pathway	
Primary	After closure and in the far future	Changes in surface water quality from WRSAs and UGTMF after Closure	Runoff and seepage from the WRSAs and groundwater flow from the UGTMF may alter surface water quality in Patterson Lake after Closure and adversely affect fish habitat availability, survival, and reproduction
Secondary	Construction, Operations and Closure	Disturbance at river crossings	Movement of heavy equipment and infrastructure across the Clearwater River at the existing access road crossing location may adversely affect fish habitat availability, survival, and reproduction
		Altered site drainage affecting water levels and flow	Altered site drainage, runoff, and discharge may cause changes to water levels and flows and channel/bank stability in downstream waterbodies and water courses and affect fish habitat availability and distribution
		Water use affecting water levels and flows	Water supply requirements (potable and process) for the Project may cause changes to water levels and flows and channel/bank stability, which can affect fish habitat availability and distribution
		Changes to sediment transport	Changes to water flows may alter channel sediment transport conditions in the Clearwater River downstream of Patterson Lake, which can affect fish habitat availability and distribution
		Sediment release	Sediment release during in-water construction and from ground disturbance may alter fish habitat availability, survival, and reproduction in downstream waterbodies and watercourses
		Air and dust emissions affecting water quality	Air and dust emissions, including emissions of criteria air contaminants and fugitive dust, and subsequent deposition (e.g., particulate matter, metals, and radionuclides) may cause changes to surface water quality, which may adversely affect fish habitat availability, survival, and reproduction in local waterbodies and watercourses

Pathway		Effects Pathway	
		Loss or alteration of fish habitat	Physical loss or alteration of fish habitat in Patterson Lake from the Project footprint, including the freshwater intake, treated effluent diffuser, treated sewage outfall, may affect fish habitat availability
		Disturbance during in-water construction	In-water construction and related activities for the freshwater intake, treated effluent diffuser, and treated sewage outfall can cause injury or mortality to fish, including fish eggs, and disturb fish habitats in Patterson Lake, which may adversely affect fish habitat availability, survival, and reproduction
		Impingement and entrainment of fish in the freshwater intake	Impingement and entrainment of fish in the freshwater intake may cause injury or mortality to fish and affect the survival of fish
		Habitat disturbance from treated effluent diffuser	The area of water turbulence around the treated effluent diffuser may affect local fish habitat availability in Patterson Lake
		Public access affecting survival	Changes in public access to recreational fishing areas on the Clearwater River and in Patterson Lake, and increased density of people (e.g., Project staff and contractors) in the area, may affect the survival of fish
		Project activities affecting water and sediment quality and aquatic health	Project activities and discharge (e.g., treated effluent and treated sewage discharge, runoff from the Project footprint, air and dust emissions, and runoff and seepage from the WRSAs) may cause changes to water and sediment quality and adversely affect fish habitat availability, survival, and reproduction
		Nutrient changes from Project activities	Project activities and discharge (e.g., treated effluent and treated sewage discharge, runoff from the Project footprint, and air and dust emissions) may change nutrient concentrations in the aquatic receiving environment, and affect fish habitat availability, survival, and reproduction

7.1.2.1. Residual Effects Analysis

Predicted effects on fish VCs from changes to surface water quality are described for the far-future projection that considers the long-term, slow migration of hydrogeological mass load inputs from certain areas of the Project site following Closure. The approach used to characterize potential effects on fish VCs and associated measurement indicators was quantitative where possible; however, the approach was primarily qualitative. Changes in measurement indicators for fish VCs were estimated relative to the Base Case to describe the following residual effects.

Habitat availability

The residual effects assessment for fish VCs indicated limited potential for changes in habitat availability due to exposure to predicted copper concentrations in Patterson Lake North Arm – West Basin after Closure and in the far future. Changes to health of lower trophic level communities (e.g., plankton, benthic invertebrates) and forage fish (e.g., lake whitefish) due to exposure to copper could alter the available food supply for fish, and consequently the quality of available habitat for fish VCs in Patterson Lake. Zooplankton are an important food source for pelagic fish; therefore, direct toxicological effects on zooplankton could alter habitat quality for pelagic fish (e.g., lake trout and walleye). Similarly, benthic invertebrates exposed directly to potential toxicants in water or sediment are a key food supply for fish feeding on the lake bottom; therefore, direct toxicological effects on benthic invertebrates could alter habitat quality for bottom-feeding fish (e.g., lake whitefish). Forage fish, including lake whitefish, are an important food source for piscivorous fish; therefore, direct toxicological effects on forage fish could adversely affect habitat quality for upper trophic level consumers such as lake trout, walleye, and northern pike.

Potential residual effects on fish VC habitat availability are expected to be reduced in magnitude and duration following implementation of mitigation measures. In consideration of all assessment factors, the predicted effects to habitat availability are considered to be possible, meaning that the changes may occur but are not likely.

Habitat distribution

No adverse effects on habitat distribution in the LSA and RSA are predicted to occur as a result of predicted changes to surface water quality in the aquatic receiving environment after Closure and in the far future. While there is some potential that exposure to copper could result in negligible to low magnitude effects on the available food supply for fish, no change in the viability of habitats for use by fish in Patterson Lake is expected at the predicted magnitude of effect. Therefore, fish would be able to continue using the habitats present, and move between habitats, to carry out their life processes (e.g., spawning, rearing, overwintering), and no effects on habitat arrangement or the spatial distribution and movement of fish in Patterson Lake are expected to occur.

Survival and reproduction

Effects on the survival and reproduction of fish VCs could directly occur as a result of exposure to copper in the water column or indirectly due to changes in habitat availability resulting from

potential effects on the lower trophic food base for fish, as described in EIS section 11.5.2.4.1. The effects associated with both mechanisms (i.e., direct exposure and changes in habitat availability) were then considered when describing the resulting residual effects on the survival and reproduction of fish VCs.

Potential residual effects on fish VC habitat availability are expected to be reduced in magnitude and duration following implementation of mitigation measures (table 7.2). In consideration of all assessment factors, the predicted effects to survival and reproduction are considered to be possible, meaning that changes in habitat availability, habitat distribution, survival and reproduction may occur but would be unlikely to be measurable. The overall incremental effects from the Project would not have a significant effect on the maintenance of self-sustaining and ecologically effective fish populations.

7.1.2.2. Mitigation Measures

NexGen has proposed measures to mitigate adverse effects on fish and fish habitat (table 7.2). CNSC staff agree with the mitigation measures proposed by NexGen.

Table 7.2: Proposed mitigation measures to address effects on fish and fish habitat

Residual Effect #1: Changes in surface water and sediment quality
• See mitigation measures in section 6.3.2.2 (Surface water and sediment)
Residual Effect #2: Disturbance to fish habitat
• Employ a crane to move heavy equipment and infrastructure across the Clearwater River only in instances where loads exceed the legal rating or capacity of the bridge and options for reducing load size/weight are not feasible or practical (e.g., dismantling equipment, breaking down a load into smaller units)
• Minimize the footprint of work areas adjacent to the Clearwater River, and associated ingress/ egress, to limit the area of disturbance. Fording of the Clearwater River, or activities that could result in a direct disturbance to the bed or banks of the river, would not occur
• To the extent practical, construct work areas to avoid critical or sensitive habitat (e.g., riparian zones) following best practices and regulatory requirements
• Design in-water components of site water management infrastructure (i.e., proposed freshwater intake, treated effluent diffuser, and treated sewage outfall) to minimize the potential for adverse effects on the aquatic environment and such that discharged flow does not interact with sediment, to the extent practical
• Where possible, schedule in-water activities to avoid work during DFO's Saskatchewan Restricted Activity Timing Windows for the Protection of Fish and Fish Habitat (DFO 2013a). Restricted activity periods for fish are as follows: o fall/winter spawning fish in northern Saskatchewan with lake trout present (1 September to 15 July) o spring spawning fish in northern Saskatchewan without lake sturgeon (1 May to 15 July)

• Employ construction methods that avoid or minimize the potential to cause injury or mortality to fish or disturb nearby habitats, to the extent practical. Assemble in-water structures on shore, where practical, and float into position in Patterson Lake, and then submerged and anchored on the lake bottom
• Construct in-water developments in adherence with the conditions of any permits or authorizations that may be issued for the Project from the appropriate regulatory agencies
• Implement DFO's Measures to Avoid Causing Harm to Fish and Fish Habitat (DFO 2019b) to minimize potential adverse effects on aquatic resources
• Install appropriate erosion and sediment control measures, as required. Regularly inspect erosion and sediment control measures to confirm they are functioning as planned, and perform any required maintenance, as needed
• Confirm heavy equipment (e.g., crane) used on site is properly maintained and is free of leaks o Inspect loads to be moved across the Clearwater River for leaks
• If an upgrade to the existing Clearwater River bridge is required, avoid any permanent disturbance below the high-water mark of the Clearwater River
• Implement a Project-specific EPP
• Develop and implement a Preliminary Decommissioning and Reclamation Plan to decommission and transfer the site to the province under the Institutional Control Program
• Locate proposed treated effluent diffuser away from sensitive or unique habitats, to the extent practical
• Locate the diffuser discharge ports above the lake bed to avoid or minimize erosion
• Discharge pumped contact water through an engineered diffuser to minimize effects from changes in velocity
• Develop appropriate discharge flow rates and monitor treated effluent flow to address erosion concerns
Residual Effect #3: Changes to hydrological processes and water balance
• See mitigation measures in section 6.2.2.2. (Hydrology)
Residual Effect #4: Sediment release from terrestrial environment
• See mitigation measures in section 6.4.2.1. (Terrestrial Environment)
Residual Effect #5: Air and dust emission affecting water quality
• See mitigation measures in section 6.1.2.1. (Atmospheric Environment)

Residual Effect #6: Risk of fish injury or mortality
• Locate the freshwater intake in an area and depth of water that avoids sensitive or unique fish habitats, to the extent practical
• Locate the intake screen above the bottom of the waterbody to prevent entrainment of sediment and aquatic organisms associated with the bottom area
• Design and install a fish screen on the freshwater intake in Patterson Lake to avoid or reduce entrainment or impingement of fish. Pump intake screens would be designed in accordance with DFO's Freshwater Intake End-of-Pipe Fish Screen Guideline (DFO 1995)
• Develop and implement a Preliminary Decommissioning and Reclamation Plan to decommission and transfer the site to the province under the Institutional Control Program
Residual Effect #7: Change in access for Indigenous and other land users
• See mitigation measures in section 7.4 (Indigenous uses)

7.1.2.3. Monitoring and Follow-up

The EPP, EMP, Effluent and Emissions Plan, and related monitoring activities will be implemented to verify the accuracy of predicted effects, assess the effectiveness of mitigation measures in protecting aquatic environments, identify any unexpected impacts, and apply adaptive management strategies as needed.

Monitoring and follow-up programs are proposed by NexGen for the fish and fish habitat to verify the accuracy of the predicted effects and effectiveness of proposed mitigation measures. Monitoring program measures proposed to specifically address residual effects related to fish and fish habitat are in table 7.3. CNSC staff agree with the follow up measures proposed by NexGen.

Table 7.3: Follow-up program measures for effects on fish and fish habitat.

Residual Effect #2: Disturbance to fish habitat Residual Effect #6: Risk of fish injury or mortality
• Monitor for changes to fish and fish habitat, including lower trophic level community conditions (e.g., benthic invertebrates), in the receiving environment as a result of Project activities • Verify the predictions of the EIS and confirm that the aquatic ecosystem in the receiving environment is protected. • Evaluate the effectiveness of mitigation measures and modify or enhance as necessary through monitoring and developing updated mitigation, if needed. • Identify unanticipated negative effects, estimate spatial extent of effects, and support the implementation of adaptive management measures to address previously unanticipated adverse environmental effects. • If applicable, monitor and evaluate the success of any fish habitat offsetting measures constructed for the Project.

- Contribute to the overall continual improvement of the Project

7.1.3. Other Views Expressed

7.1.3.1. Indigenous Nations and Communities

Fish and Fish Habitat

CRDN had previously indicated they had overarching concerns regarding exploration and mining activities taking place at Goráchághı tu [Patterson/Forrest Lake] and they were concerned about the potential contamination of the entire Des Nëtthé [Clearwater River]. CRDN previously indicated that harvesters had noted changes to water quality since exploratory drilling on Goráchághı tu have taken place. In addition, CRDN harvesters had expressed doubt that radioactive and drilling contaminants will not impact Goráchághı tu and downstream environments. NexGen noted that changes to the availability and quality of fish for harvesting were assessed in the EA pathway analyses and has committed mitigation measures including Project-specific Effluent and Emissions Plan and EMP, installing effluent and sewage treatment plants, and avoiding critical or sensitive habitat to the extent practical during construction. NexGen has established an Environmental Committee to monitor environmental performance of the Project and will provide funding for full-time independent Indigenous monitors to address concerns and minimize adverse impacts to surface water quality.

CRDN had also noted their concerns that operations from the Project may adversely impact fish and fish habitat which may impact the quantity and quality of fish available for harvesting. NexGen noted that such impacts were assessed using access to the area available for land and resource use and availability of fish and wildlife for harvesting as measurement indicators. NexGen committed to mitigation measures including Project-specific Effluent and Emissions Plan and EMP, installing effluent and sewage treatment plants, and avoiding critical or sensitive habitat to the extent practical during construction.

MN-S had previously identified concerns with how NexGen was selecting COPCs for their environmental risk assessment. MN-S had indicated that it was unclear if COPCs that exceeded water quality objectives at end-of-pipe treatment, but met water quality objectives in the mixing zone were excluded from further assessment. MN-S had made it clear that using dilution in surface water as part of their ecological risk assessment was not best practice. MN-S had also previously expressed concern that NexGen was relying on design criteria and road access management controls to mitigate any release of uranium or other COPCs from an accident near surface water bodies such as the Clearwater River. Noting that NexGen makes no mention of aquatic invasive species, MN-S had asked how NexGen will monitor aquatic environments until decommissioning and asked NexGen to detail its EMP for aquatic species. NexGen confirmed that end-of-pipe concentrations of COPCs are predicted to be higher than the chronic Project threshold, but below acute toxicity levels for fish and has committed to developing a comprehensive monitoring plan including surface water quality. As acutely toxic COPCs would not be released to the environment, NexGen has maintained that their assessment, including the use of dilution, is appropriate. NexGen noted that to address increased road use and mitigate the

release of COPCs from an accident, upgrades to existing access roads are planned. Finally, NexGen has clarified that the invasive species management plan will be developed during licensing (licence to prepare site and construct). ECCC also recommended that the Environmental Protection Program explicitly include details related to water management and monitoring of COPCs associated with the airstrip, the west bermed runoff collection area, and explosives storage area.

MN-S had also previously noted that given Burbot's unique physiology, use of habitat and feeding habits that they should have been selected as a fish species VC to more fully assess baseline information and knowledge gaps for the EIS. MN-S identified that using one forage fish species may be inadequate to assume how other forage species may retain COPCs. NexGen has maintained that the selective VCs are representative of burbot physiology, habitat, and feeding habits, however NexGen is open to discussions regarding future monitoring activities. NexGen completed an aquatic health assessment to evaluate the potential magnitude of effects on sensitive aquatic species, which showed that potential health effects on other forage fish species (namely, burbot) would be minimal and within the range of variability observed in unexposed populations. MN-S also requested more information regarding effluent release and how mixing zones and temperature changes in water may attract fish and affect refuge type habitat and use. NexGen committed to capturing and storing treated effluent at ambient temperatures prior to release to Patterson Lake such that it is not expected to result in changes to water temperatures or volumes that would affect fish. MN-S also noted concerns that the ERA identified benthic invertebrates as the most sensitive endpoints for copper exposure in Patterson lake's north arm. NexGen has noted that the predicted effects would be within the resilience and adaptability limit of VCs and therefore the Project is not predicted to have significant adverse effects.

BNDN recommended that that small-bodied fish be included in the assessment of fish and fish habitat as small-bodied fish account for unique ecological niches and roles in aquatic ecosystems. In addition, BNDN noted concerns regarding potential adverse impacts to fish and fish habitat from various Project operations. NexGen has noted that the inclusion of a small-bodied fish is unwarranted, as they are represented in the assessment of lake whitefish, but their inclusion will be considered as a sentinel species for environmental monitoring should an Environmental Effects Monitoring fish population study be triggered. NexGen has committed to multiple environmental protection and monitoring measures to minimize impacts to fish and fish habitat.

BRDN, had previously indicated that their members were concerned about potential Project impacts on water quality and how this may adversely impact fish and fish habitat. NexGen confirmed that Fish habitat availability, habitat distribution, and survival and reproduction were all measurement indicators in the EA and effects on fish and fish habitat as a result of changes to water quality were assessed.

YNLR noted their members are very concerned about the potential for impacts to surface water quality that may arise from the Project. This includes concerns that surface water quality may be impaired and raised concerns about the long-term ecological health of Patterson Lake. YNLR requested that NexGen add oligotrophic species (longnose and white suckers) to the list of VCs,

given their historical, cultural, and ecological significance. NexGen has acknowledged the importance of surface water quality to YNLR and has committed to developing an EPP containing several mitigation and monitoring plans and utilizing adaptive management to provide a structured and flexible approach to maintaining water quality. NexGen noted that detailed scoping and development of an EMP, including the decision to add oligotrophic species, would occur during licensing (licence to prepare site and construct) and monitoring mechanisms would be established through the Environmental Committee with primary Indigenous Nations and communities.

YNLR indicated their concerns that development of the Project would lead to increased harvesting pressures to area fish populations and that harvesting pressures to fish were not assessed as a result of increased access and use to reach a significance determination with respect to the fish and fish habitat valued component (VC). In addition, YNLR noted that species of cultural significance were not identified as a VC. NexGen noted that the effects of the increased density of people near the project were considered across various assessments, and that the selected VCs represent important ecosystem processes that occupy similar niches, ecological spaces, and functional roles as the omitted culturally significant species. Furthermore, NexGen completed an aquatic health assessment to evaluate the potential magnitude of effects on sensitive aquatic species, which showed that potential health effects burbot would be minimal and within the range of variability observed in unexposed populations.

ACFN requested clarification if climate change induced effects on surface water temperature were assessed for the residual and cumulative impacts for the project.

7.1.3.2. Federal Authorities

ECCC requested additional information on how climate change was considered, particularly how projected changes in extreme precipitation were considered, the range of climate change projections used to assess risk levels, and how climate change was considered in the design of water management infrastructure. ECCC noted that the proponent must design infrastructure above a 100-year storm or there is a potential risk that their water management infrastructure will be overwhelmed in an extreme storm event and release mine contact water. NexGen has committed to design cross-drainage structures to provide a conveyance for the maximum instantaneous flow resulting from a 1:100-year 24-hour storm event. NexGen also committed to developing a Climate Action Framework focused on climate resilience, to monitoring and considering climate risk on surface water management structures, monitoring greenhouse gas emissions during all project phases, and implementing a net-zero framework.

ECCC requested additional information on contingency planning concerning tailings storage and management before underground spaces were ready to receive backfill as they posed a potential risk to aquatic biota. In response, NexGen provided information on where tailings will be directly pumped to the paste plant for processing before being directly pumped to the mined-out underground, and clarified how tailings will be managed to prevent the movement of contaminants. NexGen also provided clarification regarding how tailings will be managed or stored if there are any issues with the UGTMF, paste delivery system, or paste plant and confirmed that processing may need to be halted if tailings cannot be deposited into the UGTMF.

NexGen also confirmed that an additional storage contingency system or management plan will be devised in the event there are any issues with depositing tailings into the UGTMF.

ECCC recommended that NexGen provide more details on their selenium bioaccumulation modelling methodology in the updated ERA during licensing (licence to prepare site and construct). NexGen provided more details on their selenium bioaccumulation modelling methodology in the updated Final EIS.

ECCC also raised concerns regarding potential risk for residual effects to aquatic life due to the proponent using the outdated Federal Environmental Quality Guideline (FEQG) formula for iron**.** ECCC recommended that NexGen re-calculate iron FEQG based on the latest guidance to determine if baseline exceedances are present. If baseline exceedances occur, then iron should be included in the exposure assessment of the ERA and sediment quality modelling for the sediment quality assessment. After re-calculation, NexGen should also update mitigation and monitoring plans accordingly. In response to this concern, NexGen updated the iron FEQG calculations and submitted as part of their revised final EIS. No further work was required based on the updated guideline.

ECCC recommended NexGen provide an updated monitoring well location plan, as without adequate placement there is the potential for residual effects to fish and fish habitat via contaminant seepage/migration into Patterson Lake. ECCC noted that there is a very limited number of monitoring wells located between the potentially acid generating (PAG) area and Patterson Lake and suggested planning for additional monitoring wells between the PAG area and Patterson Lake (regardless of the use of a liner for the PAG Area). ECCC also recommended the ongoing testing of waste rock to inform potential mitigations to water quality from PAG material. For the non-PAG area, ECCC recommends including monitoring wells for the south side of the operations. ECCC recommended that the development of a detailed commitment to address the issues prior to commencing any work/activities at the project site will be key mitigation and follow-up measures. NexGen has committed to monitoring groundwater quantity and quality, including background wells located upgradient from the project. The EMP will include sampling groundwater quality to detect potential COPCs and groundwater monitoring targets would be established under the plan to monitor the effects of dewatering during construction and development, seepage from WRSAs, process and mine terrace areas, and area of effluent treatment ponds. NexGen has noted that the current monitoring and follow-up plan is conceptual and shows the minimum level of monitoring anticipated for water quality and groundwater monitoring locations, and details will be finalized in the Effluent and Emissions Plan and EMP.

DFO also noted that predicted impacts to fish and fish habitat include habitat loss due to the development of the freshwater intake, treated effluent diffuser, sewage outfall and associated pipelines in Patterson Lake. DFO noted that the proponent should review DFO's Projects Near Water website to ensure they comply with the *Fisheries Act* and that a request for review to DFO should be submitted for the impacts described, or any other impacts on fish and fish habitat that cannot be avoided or mitigated. NexGen has made commitments to adhere to guidance from regulators, such as DFO, as to the allowable rate and timing of water withdrawals from the point

of supply, and to locate the treated effluent diffuser away from sensitive or unique habitats to the extent practical.

DFO requested that the proponent update their blasting assessment to reflect a 50kPa maximum overpressure threshold for impacts to fish. NexGen predicted that the peak pressure levels will be below the 50kPa threshold and therefore will not result in a residual impact to fish.

DFO requested NexGen clarify if there were wetlands within the study area that could be fish habitat. NexGen responded that riparian wetlands were considered in the assessment of impacts, and they predicted no impacts. However, ECCC has identified potential risk to wetlands from the Project. This is due to inadequate wetland baseline data, a lack of information on wetlands in the hydrological assessment, and lack of water quality and sediment quality baseline data. ECCC recommends that the Proponent commits to multi-year, multi-season baseline data collection for wetlands to assess potential effects to hydrology (i.e., flow rates, water levels), wetland habitat availability, and terrestrial and aquatic receptors. ECCC also recommends conducting a comparative analysis between relevant wetlands in the study area and Patterson Lake to confirm water quality data to confirm Patterson Lake samples are an appropriate substitute. ECCC recommends that prior to commencing any work or activities at the Project site, NexGen provides additional analysis based on conclusions derived from this additional data. NexGen has committed to a follow-up program that includes sampling water levels, water quality, sediment quality, and monitoring wetlands within and next to the Project footprint and representative wetlands within the LSA.

7.1.4. CNSC Staff's Analysis

The predicted effects on fish habitat availability and survival and reproduction are expected to be negligible to low in magnitude and likely not distinguishable from natural background variability. Exposure of aquatic biota to maximum copper concentrations would be limited spatially to the North Arm – West Basin of Patterson Lake and temporally limited to dry climate years when there is a lower natural runoff to the lake. The predicted effects are considered possible, meaning that the changes may occur but are not likely permanent in duration and are irreversible. The effects of the Patterson Lake South Property on surface water quality during the far future are not expected to result in any changes to these effects predictions for fish VCs.

7.1.5. CNSC Staff's 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 the Project is not likely to cause significant adverse effects on the fish and fish habitat valued components.

7.2. Terrestrial Biota

7.2.1. Description of the environment for terrestrial biota and species at risk

The assessment of wildlife and wildlife habitat used the same spatial boundaries as vegetation, which consists of a local study area (LSA) of 2,832 ha and a regional study area (RSA) of 107,491 ha, except for woodland caribou which included an additional spatial boundary based on caribou home range of 43,521 ha, and SK2 West Caribou Administration Unit (SK2 West) of 48,287 km^2. Temporal boundaries considered in this assessment were based on a 43-year period from initial construction to the end of decommissioning and reclamation (closure) and included the following project phases: construction (4 years), operations (24 years), and decommissioning and reclamation (closure) (15 years). The assessment of potential effects on wildlife and their habitat was also informed by other assessments such as those for vegetation, terrain, soils, hydrogeology, hydrology, surface water quality, sediment quality, air quality, and noise. These topics have been covered elsewhere.

Eleven wildlife species and their habitat were selected as valued components (VCs) in this Environmental Assessment (EA): woodland caribou, moose, grey wolf, black bear, beaver, little brown myotis, olive-sided flycatcher, rusty blackbird, common goldeneye, mallard, and Canadian toad. The selection of VCs was based on factors such as but not limited to their potential interaction with the project, sensitivity of the VCs, conservation status, and feedback from Indigenous Nations and communities. Certain species listed under SARA species that were not selected as VCs were assessed using surrogate species using similar habitat or niche in the project area.

Some of the wildlife VCs selected for assessment represented conservation values that extend beyond the species itself, functioning as an indicator, umbrella, or keystone species, which are highly interactive and have a large influence on the ecosystem. Woodland caribou, for example, may act as an umbrella species and improve conservation prospects for other wildlife inhabiting the boreal forest, such as but not limited to insects, birds, and small mammals. Also, this species has a large home range and specific habitat requirements that can serve as surrogates for the conservation of co-occurring species. Similarly, conservation of predators such as grey wolf can have substantial benefits to other biodiversity elements where predators act as keystone species. Keystone species are species whose addition to or loss from an ecosystem leads to major changes in at least one other species. Highly interactive species such as moose represent key food resources for humans, predators, and scavengers in the boreal ecosystem, and can have strong influences on the dynamics and persistence of caribou populations. The EIS has adequately considered these aspects in the assessment.

Identification of wildlife VCs included federally and provincially listed species at risk (SARA) that have a potential to interact with the project. Four federally listed species at risk were selected as VCs for the assessment: woodland caribou, little brown myotis, olive-sided flycatcher, and rusty blackbird. Seven other federally listed species under the SARA with a potential to occur in the LSA were not selected as VCs because they are represented by other species or ecosystems: northern myotis, common nighthawk, barn swallow, Ashton cuckoo bumble bee, yellow-banded bumble bee, transverse lady beetle, and nine-spotted lady beetle. A

screening level assessment was completed for conformance with the *Species at Risk Act*. Not all provincially listed species were represented as VCs because they were deemed to be affected by the project to the same degree or were represented by other species.

Baseline surveys conducted in 2018 and 2019 showed that woodland caribou were observed at four locations, most frequently in open bog and black spruce/Labrador tea/feathermoss habitat. A herd of approximately 150 to 200 caribou was reported in March 2020 by the Clearwater River Dene Nation (CRDN) between Lloyd Lake and Preston Lake in the project area.

Similarly, moose baseline surveys showed that this species was present in a variety of habitat types during winter and summer, including along roads and other anthropogenic features.

Baseline studies confirmed that the grey wolves and black bears were detected using roads and trails in the RSA. Surveys also detected beaver and beaver sign along shorelines of waterbodies in the LSA and RSA, including runs and feeding marks, active, and inactive lodges as well as beaver dams at two waterbodies near the project site.

Little brown myotis is an endangered bat species VC under Schedule 1 of the federal SARA due to large population declines caused by white nose syndrome (fungal infection). Critical habitat for this species has been partially identified for hibernacula in some parts of Canada and it was assumed that the likelihood of hibernacula near the project area was low. Nevertheless, suitable potential roosting habitat was identified and mapped through baseline surveys completed between late May and early October 2018, and again between early May and late September 2020. Several other bat species such as the Eastern red bat and Northern myotis were also detected.

Breeding bird surveys of bird species VCs such as the olive-sided flycatcher, rusty blackbird, common goldeneye, and mallard, were detected throughout the LSA and surrounding area around Patterson Lake. The population of these species are assumed to be stable based on the availability of suitable nesting habitat in the project area (LSA and RSA).

Canadian toads were detected in several different ecosite / vegetation cover types in the LSA, including open water, late-stage regenerated upland and wetland, shrubby bogs and fens.

7.2.2. Proponent's Assessment

With respect to the impacts on these wildlife VCs, several project-related activities would interact and potentially impact them in a variety of ways discussed below. The key measurement indicators used were habitat availability (quantity and quality), habitat distribution (arrangement and connectivity), and wildlife survival and reproduction.

Residual Effects Analysis

A summary of potential effects pathways and proposed mitigation measures for wildlife and wildlife habitat are summarized in table 7.4.

Table 7.4: Summary of potential effects pathways and proposed mitigation measures for wildlife and wildlife habitat

Project component/activity	Effects pathway	Environmental design features and mitigation measures
All project phases (composite)		
Land clearing, site preparation, and construction of facilities and infrastructure. Process plant. Operations, mining and ore processing. Roads, airstrip, camp, maintenance shop and offices. Handling and storage of waste rock, special waste rock, and ore. Sewage treatment plant and water storage and effluent monitoring ponds. Transportation of personnel to and from the site. Removal of infrastructure. Reclamation and revegetation of facilities and infrastructure.	Habitat loss: direct removal or alteration of soil and vegetation could impact wildlife abundance and distribution.	Avoiding wetlands when constructing site access road through realignment. Limit project footprint to the extent possible through optimization of site layout/design. Minimize areas of vegetation clearing and soil disturbance. Optimize use of clearing equipment to minimize surface disturbance, soil compaction, and loss of topsoil. To the extent possible, work in sensitive areas (i.e. erosive soils, wetland features, and fish habitats) would be scheduled to avoid periods that may result in high flow volumes and/or increase erosion and sedimentation (e.g., spring freshet). Implement progressive reclamation and revegetation of disturbed areas. Develop a Caribou Mitigation and Offsetting Plan (CMOP) in collaboration with indigenous communities and government agencies. Develop and implement a project-specific EPP, including restricted activity periods to limit impacts on denning animals and migratory bird nesting sites. If bats or birds are observed nesting, roosting, or hibernating, then do not disturb them to the extent possible, and contact authorities for guidance on safe removal or relocation.
	Habitat alteration: alteration of final terrain and soil conditions, and/or composition of plant species (including invasive species) which could alter the ecosystem and adversely affect wildlife habitat availability, distribution, survival and reproduction.	Minimize areas of vegetation clearing and soil disturbance. Minimize steepness and length of slopes of disturbed areas and stockpiled soils. Contouring of disturbed areas to minimize erosion, re-establish drainage, encourage vegetation growth, and blend with the surrounding natural topography. In sensitive areas, avoid work during periods of high flow volumes which can cause erosion/sedimentation (e.g. spring freshet). Implement progressive reclamation and revegetation of disturbed areas.

		Develop a caribou mitigation and offsetting plan in collaboration with indigenous communities and government agencies. Use native species or non-aggressive / non-invasive species for revegetation. Adhere to the Federal Policy on Wetland Conservation (i.e. no net loss of wetland functions). Implement an EPP and actions to avoid and limit invasive plant species.
	Sensory disturbance: Sensory disturbance such as bit not limited to the presence of people, air traffic, lighting, dust, smells, and noise can alter wildlife movement and behaviour, and adversely affect wildlife habitat availability, abundance and distribution.	Enclose and dampen equipment in process buildings, where feasible. Use and maintain noise suppression (e.g. mufflers) on vehicles. Maintain overflight altitudes of >300 m above ground level to the extent practicable. Limit idling of vehicles and equipment. Limit light pollution, using downward orientation or shielded fixtures and use of amber light (spectrum >500 nm), and limit blue spectral light, and avoid white lighting, to the extent feasible Apply activity restriction guidelines for sensitive species.
	Injury and mortality from clearing: Vegetation removal and grubbing during site preparation and construction may result in injury or mortality to individual wildlife with low mobility (e.g. denning black bears or marten), and destruction of nests, eggs or individuals of migratory birds (incidental take).	Avoiding wetlands when constructing site access road through realignment. Limit project footprint to the extent possible through optimization of site layout/design. Apply activity restriction guidelines for sensitive species. If vegetation removal is required during the black bear denning/hibernation periods, conduct bear den presence/absence surveys and wildlife tree surveys prior to clearing activities. Implement restricted activity periods to limit effects on denning animals and nesting migratory birds during sensitive time periods. Minimize habitat creation and human-wildlife interactions through design e.g. screening vents and preventing potential entry into rafters/attics.
	Increased predator access: Increased access for predators (wolf and black bear) and prey may increase predator risk and decrease survival and reproduction for caribou and moose.	Use existing road infrastructure, including existing road and bridge. Progressive reclamation and revegetation of disturbed areas.

	Air emissions: Fugitive dust emissions and associated constituents such as metals and radionuclides may cause changes in air, soil, and water quality, and result in inhalation and/or ingestion (food sources) exposure, which can adversely affect wildlife health, survival and reproduction.	Apply water and/or suppressants to site roads, access road, and airstrip, as necessary. Limit vehicle speed on unpaved site roads. Implement progressive reclamation and revegetation of disturbed areas. Implement a project-specific effluent and emissions plan.
	Soil contamination from emissions: Deposition of suspended solids in criteria air contaminant emissions (i.e. acid inputs) may change soil quality and vegetation and impact wildlife habitat availability and distribution.	Use and maintain emissions control devices on combustion-based equipment. Conduct regular equipment maintenance. Limit idling of vehicles and equipment to the extent practical. Use liquified natural gas for power generation. Implement project-specific EMP that includes ambient air, water quality, and aquatic organisms, and applying adaptive management, if necessary.
	Treated effluent discharge: Release of treated effluent into Patterson Lake may cause changes to surface water and sediment quality and adversely affect wildlife health, survival, and reproduction through contact and ingestion of water, and aquatic food sources.	Install and operate an effluent treatment plant (ETP) to reduce release of COPCs (major ions, metals and radionuclides) to the environment and discharge treated effluent to Patterson Lake. Locate the effluent diffuser away from sensitive and unique habitats to the extent practical. Design the effluent diffuser to provide effective mixing and dilution of the effluent in order to limit the area of the receiving environment affected by mine discharge. Design the effluent diffuser/outfall such that the discharged flow does not interact with the sediment. Treat ore processing water, and monitor/treat site contact water, if necessary. Monitor treated effluent flow and quality.
	Surface water quality from runoff: Changes in surface water quality from contact with surface facilities and infrastructure could adversely affect wildlife health, survival, and	Implement progressive reclamation and revegetation of disturbed areas. Implement mine waste management plan. Implement EMP.

	reproduction through ingestion of water and food sources.	
	Water quality from waste rock storage areas (WRSAs) and underground tailings management facility (UGTMF): Runoff and seepage from WRSAs and groundwater flow from UGTMF may alter surface water quality in Patterson Lake and adversely affect wildlife health, survival and reproduction.	Use engineered cemented paste backfill and tailings to control source concentrations. Apply binder to reduce permeability in backfill and tailings. Implement source control through engineered layers, and installation of a liner for the PAG WRSA. Install engineered cover system on potentially acid-generating (PAG) and non-potentially acid-generating (NPAG) waste rock piles during reclamation.
	Surface flow changes: Changes in surface water levels, flows, and drainage areas could affect soils and vegetation, and wildlife habitat availability and distribution.	Limit project footprint to the extent practical using practices such as but not limited to optimizing use of cleared areas, using existing road infrastructure and designing efficient infrastructure footprint (e.g. building clustered together). Avoid placing soil stockpiles near waterbodies (maintain 150 m buffer) unless required for temporary storage. Minimize areas of vegetation clearing and soil disturbance. Minimize steepness and length of slopes of disturbed areas and stockpiled soils and use erosion control measures where needed. Routine inspection and maintenance of water containment and conveyance structures.
	Physical barriers: Surface pipelines and snowbanks on site roads and the access road could decrease habitat connectivity and adversely affect animal distribution.	Design above-ground infrastructure so that the need for wildlife crossing structures is minimized, such as small to moderate diameter pipeline conveyance systems directly along the ground and/or small ditches. Snow clearing along access road to incorporate road pull-outs at regular intervals to provide refuge for wildlife. Progressive reclamation and revegetation.
	Power line injury/mortality: Electrocution by or collisions with power lines may cause injury or death to birds.	Design power lines to meet avian-safe standards in compliance with applicable laws, regulations and permits to prevent electrocutions such as but not limited to cover jumper wires, conductors, and equipment, discourage perching and prevent collisions through use of markers to enhance visibility of lines in movement corridors and staging areas.

	Vehicle collisions: Collisions with vehicles, buildings, equipment, and aircraft on site, and vehicles travelling to and from site may cause injury or mortality to wildlife.	Implement project-specific EPP, including: Providing wildlife with right of way, Advising staff, contractors, and visitors to take all reasonable precautions to avoid wildlife collisions, Identifying wildlife use areas and movement corridors/crossings along access road, and using signage in high wildlife areas, Maintaining gaps in road berms and snowbanks to facilitate wildlife crossing and escape routes, Stopping and reporting when wildlife is observed on or adjacent to the road, Reporting any wildlife collisions, Adjusting speed limit in accordance with road conditions, including wildlife use of road.
	Wildlife attractants: Wildlife could be attracted to the project site due to potential attractants such as but not limited to food waste, sewage, dust suppressants, explosive powder, runoff ponds which may increase human-wildlife interactions and change in predator-prey relationships, which can affect wildlife survival and reproduction.	Implement project-specific EPP, including: Prohibition against feeding wildlife, On-site ponds would be fenced or fit with animal egress matting or ramps, Measures to deter wildlife such as the use of noise cannons or bangers, Collect domestic and industrial wastes and store in wildlife-proof containers, incinerate on site, or transport off-site for recycling or disposal at licensed disposal facility, Minimize habitat creation and human-wildlife interactions.
	Exposure to contaminated water: Direct contact or ingestion of water from water storage and/or treated effluent monitoring ponds can cause adverse effects on wildlife health, survival and reproduction.	Conduct wildlife patrols during water bird nesting periods (late April to mid-August), and the northern and southern migration periods to monitor effectiveness of deterrents and apply adaptive management as necessary. Implement progressive reclamation and revegetation of disturbed areas. Implement project-specific effluent and emissions plan and project-specific EMP.
	Atmospheric emissions affecting habitat: Radiological and non-radiological emissions may change soil quality and vegetation	Implement project-specific EMP that includes ambient air monitoring and adaptive management based on ambient air quality standards.

	ecosystems and affect wildlife habitat availability and distribution.	
	Changes to groundwater quality from seepage: Runoff and seepage from the WRSAs may cause changes in groundwater quality and transfer up the food chain, adversely affecting wildlife health, survival and reproduction.	Segregate PAG material from NPAG material and store them separately. Implement source control (i.e. construction using engineered layers) and installation of liner for PAG WRSA. Install engineered cover system on PAG and NPAG material. Engineered containment and conveyance of PAG waste rock runoff and seepage to PAG runoff collection area. Implement project-specific mine waste management plan. Implement site water management procedures under an EPP.
	Changes to soil quality from seepage: Runoff and seepage from the WRSAs can change soil quality and affect vegetation, which can affect wildlife habitat availability and distribution.	
	Harm from use of dust suppressants: Ingestion of chemical dust suppressants may adversely affect the health, survival, and reproduction of wildlife.	Use water as dust suppressant to the extent practical. Apply water and/or chemical suppressants to site roads, access road, and airstrip, as necessary. Use chemical suppressants that minimize risk to the environment. Implement project-specific EPP with processes for dust suppression.
	Harm from altered ice conditions: Treated water discharged through the diffuser may change the timing and thickness of ice formation and timing of ice thaw, which can increase risk of some wildlife breaking through the ice and affect survival and reproduction.	Develop the final effluent treatment plant diffuser design such that it would avoid effects on ice cover.

It is noted that most, but not all, environmental design features and mitigation measures discussed in table 7.4 would likely minimize impacts on wildlife and wildlife habitat. Some impacts, however, such as those on caribou, wetlands and birds are expected to remain and have been carried forward as residual effects summarized in table 7.5.

Table 7.5: Summary of residual effects of the project on wildlife and wildlife habitat

Residual effect # 1	*Woodland caribou habitat loss*: The habitat area lost as a result of the project is in a habitat range that already does not meet threshold of a minimum 65% undisturbed habitat necessary to support a self-sustaining population of this species.
	Woodland caribou habitat alteration: Alteration of terrain and soil conditions, and/or plant species composition, could change the types of ecosystems that can be reclaimed on the landscape, and adversely affect woodland caribou habitat availability and distribution, and survival and reproduction.
	Woodland caribou sensory disturbance: Sensory disturbance resulting from the presence of people, lights, dust, smells, and noise can alter woodland caribou movement and behaviour, and adversely affect caribou habitat availability and caribou abundance and distribution.
Residual effect # 2	*Loss of wetlands*: Removal of wetlands in the project study area and reduction in function of wetlands in the local study area could impact wildlife, their survival, and reproduction.
Residual effect # 3	*Sensory disturbance for migratory birds*: Noise, light and human disturbance is predicted to have little effect on migratory birds or unique migratory bird habitats.

Effects on biodiversity was evaluated based on the assessment completed for the wildlife VCs, several of which were selected because they are ecological indicators of broader species assemblages and ecosystems. The effects on little brown myotis, for example, are representative of effects on late successional stage forests that support many wildlife species and high levels of biodiversity. Wildlife biodiversity is strongly linked to the extent, connectivity, and fragmentation of ecosystems in the landscape. This includes vegetation biodiversity at all levels of organization, from genes to landscapes, and ecological processes through which these levels are connected in the RSA. It is anticipated that the project and the foreseeable Patterson Lake South project will remove 2,318 ha (3.1 %) of upland vegetation in the RSA and many of these changes are predicted to occur within burned ecological areas with structural diversity and relatively high species richness for both vegetation and wildlife species.

Loss of wetland ecosystems, excluding open water, is predicted to be 55.7 ha (0.4 % of RSA), which may disproportionately affect biodiversity even though this loss is smaller as compared to the change in upland ecosystems. Therefore, this anticipated loss of wetland, however small, is considered as an adverse effect on wildlife.

NexGen 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 20, and 24.

Mitigation Measures

The mitigation measures proposed by NexGen for terrestrial biota are summarized in Table 7.4 of this report and identify key measures to reduce impacts on wildlife and wildlife habitat. For instance, NexGen has committed to siting infrastructure within previously disturbed or low-value areas to the extent possible, minimizing vegetation clearing and soil disturbance, and implementing progressive reclamation and revegetation of disturbed areas. To avoid disturbing wildlife during sensitive periods, pre-clearing surveys and activity restrictions will be applied, supported by species-specific measures for woodland caribou, bats, amphibians, and migratory birds. Other commitments include minimizing project-related noise and light through equipment design, maintenance, and light pollution controls; reducing wildlife-vehicle collisions through signage, speed limits, and road design; and adjusting air traffic operations to avoid sensitive caribou habitats where possible. Wetlands will be avoided wherever feasible, with buffer distances applied where disturbance is unavoidable. NexGen has also committed to a CMOP, no net loss of wetland function, if necessary, and species-specific measures for birds and bats, including avian-safe tower designs and protection of Common Nighthawk and Barn Swallow habitat. At decommissioning, NexGen will remove project components and implement reclamation activities to restore wildlife habitat.

CNSC staff have reviewed these measures and identified additional mitigation and follow-up requirements which are outlined in Table 7.6. For instance, a CMOP satisfying the requirements of the federal Woodland Caribou Recovery Strategy as well as the Province of Saskatchewan's offsetting framework must be approved by CNSC staff. In addition, an acceptable light pollution mitigation plan, including lighting design, must be submitted as part of CNSC licensing (licence to prepare site and construct).

Monitoring and Follow-up

To ensure mitigation is effective and adapted where necessary, NexGen has committed to an extensive monitoring and follow-up program. Monitoring will be used to verify that mitigation measures are effective, to identify any unexpected effects, and to guide adaptive management over the life of the Project. Programs will focus on both broad wildlife recovery and species-specific concerns. For example, caribou offsetting and habitat measures will be tracked to ensure they are meeting the objectives of the federal Recovery Strategy and provincial offsetting framework. Similarly, monitoring for birds, bats, and amphibians will address risks from lighting, towers, and construction activities, with results feeding into updates to mitigation plans where needed. Monitoring will also be carried through to decommissioning, with a focus on ensuring that reclaimed areas return to self-sustaining conditions that support vegetation and wildlife habitat.

Data from monitoring programs will be reviewed and reported regularly, including in the Environmental Performance Report, and will be used to adjust practices if outcomes are not being achieved.

Indigenous Knowledge and perspectives will be integrated into monitoring through Environmental and Implementation Committees, and collaborative planning. This will support Indigenous-led oversight, co-development of monitoring programs, and transparency in reporting.

Table 7.6: Proposed additional mitigation and follow-up measures to address residual effects on terrestrial biota and species at risk

Residual effect #1
• Mitigation #1: NexGen shall submit a revised Caribou Mitigation and Offsetting Plan (CMOP) that meets the federal recovery strategy for Woodland Caribou. The plan must be approved by CNSC staff.
Residual effect #2
• Mitigation #2: *If* the detailed design shows a greater potential disturbance to wetland ecosystems (regardless of the size), *then* NexGen will prepare and provide CNSC (and ECCC) a wetland mitigation and offset plan prior to any wetland disturbance, that includes a discussion on these impacts, what mitigations are to be used, how they would be implemented to reduce Project effects on species at risk and migratory birds, and how these effects would be monitored.
Residual effect #3
• Mitigation #3: NexGen shall develop an acceptable light pollution mitigation and monitoring plan, including lighting design, as part of CNSC licensing. Design of lighting should be developed taking into consideration potential impacts on migratory birds, and health and safety of workers, and security requirements, as applicable. Mitigations should be implemented year-round to accommodate winter resident migratory birds.

7.2.3. Other Views Expressed

7.2.3.1. Potential Impacts to Terrestrial Biota and Species at Risk

Indigenous Nations and Communities

CRDN had previously requested that NexGen share its invasive species management plan. The Nation had also asked how NexGen would minimize the impacts of light and noise pollution on the migration patterns of wildlife. NexGen has clarified that the invasive species management plan will be developed during licensing (licence to prepare site and construct), and detailed information on proposed mitigation methods for noise pollution can be found in Draft EIS section 7 [Air Quality, Noise, and Climate Change].

MN-S had previously questioned the data collection methods and survey results, particularly the number of nighthawks reported and methods for gauging the size of bat populations. Noting that the study area for birds is different from that of waterfowl and raptors, MN-S had underscored that this could impact the findings for different wildlife groups. NexGen clarified that the Automatic Recording Unity (ARU) data represents species occurrences for nighthawks, and high calling rates in a given area indicate the area is consistently used but cannot estimate the number of individuals. NexGen noted that the Alberta protocol for recording bat population could not be followed exactly due to logistics of the area but is confident detection methods met the requirements for baseline data collection. The Nation had expressed concerns about impacts to wildlife and connectivity and asked how NexGen will mitigate those impacts. On habitat availability and use, MN-S had previously asked whether the classification of caribou habitat is consistent with the Omnia (2018) report and, therefore, the EA and suggested that NexGen determine habitat use and availability based on seasonal or year-round use.

NexGen noted that mitigations and monitoring regarding connectivity will be developed in detail during licensing (licence to prepare site and construct) as part of the Environmental Management Plan. NexGen has confirmed that the woodland caribou classification is consistent and based on Government of Saskatchewan habitat mapping and confirmed that wildlife sampling including considerations of habitat use occurred across different habitat sites and seasons to support the development of habitat sustainability models. MN-S had also asked NexGen to explain the correlation drawn between the rusty blackbird habitat and that of the olive-sided flycatcher and its relevance to the EA, to which NexGen clarified that the implied correlation was an error and will be corrected in the final EIS. With respect to the methodology, MN-S had requested clarification on methods for the residual effects analysis and asked why the lack of available information for certain species was not addressed within baseline studies, and why more up-to-date provincial wildlife regulations were not used. MN-S had noted that there are no measurement indicators for resilience and adaptability, despite the analysis for determining residual effects being based on species' resilience and adaptability limits. MN-S emphasized that the assessment should consider both real and perceived impacts, to reflect that knowledge of the land and resource use is just as valuable as scientific data collection. NexGen clarified that Project pathways with the potential to have a greater-than-negligible impacts were carried forward to the residual effect analysis. NexGen maintained sufficient information for species were available for use in the Draft EIS and confirmed that up-to-date provincial guidelines were used and the Final EIS will be updated to include references to the more recent regulations. NexGen noted that ecological context was considered with residual effects criteria to determine significance, and changes in measurement indicators were examined in the context of trends, existing conditions, and resilience to assess cumulative effects. NexGen has maintained that perceived impacts have been considered and valued equally to scientific data collection.

BNDN underscored that it expects NexGen to exercise reasonable caution to protect highly sensitive and culturally important species to the Nation. Specifically, BNDN asked NexGen to develop a wild foods monitoring program to monitor radionuclides in culturally significant species (e.g., woodland caribou, moose, and blueberries) and other species which BNDN and other Nations identify. NexGen has initiated a Regional Traditional Foods Study with primary

Indigenous Nations and communities and has committed to discussing the inclusion of Traditional Food tissue samples with the BNDN.

Habitat loss for woodland caribou is of particular concern. BNDN emphasized that they are concerned the EIS underestimates the amount of woodland caribou habitat effectively lost due to project-related sensory disturbance and associated indirect effects, given both scientific research and BNDN knowledge. Additionally, BNDN is concerned that the Project will increase predator presence and access, public access and hunting pressure, and road mortality risk for caribou and other wildlife. BNDN asked NexGen to commit to monitoring ungulate and predator densities within the RSA, and to monitor wildlife mortality resulting from project infrastructure and operations. The Nation wants to be meaningfully involved in mitigation and offsetting plans, including but not limited to culverts for aquatic connectivity, wildlife crossings, and fencing to prevent road mortalities of the Canadian toad, as well as the installation of compensation habitat structures from tree removals, such as bat maternity roost boxes. NexGen has confirmed that a CMOP is required and has been submitted and since approved by the Saskatchewan Ministry of Environment. The Plan, which is subject to requirements under both provincial and federal approval, is predicted to make residual adverse effects to woodland caribou not significant and engagement with Indigenous Groups and regulators will continue to occur through its development. Details of monitoring plans will be developed during permitting and licensing (licence to prepare site and construct) and discussed with BNDN.

YNLR expressed concerns about the cumulative effects on woodland caribou and emphasized that it wants to be involved in any future decisions regarding woodland caribou conservation and, specifically, the development of an offset plan. YNLR emphasized that this plan must be finalized and agreed to before construction begins. YNLR noted an inaccuracy that indicates the assessment is not reflective of IK of caribou habitat and range. NexGen has confirmed that the EIS included comprehensive assessments of cumulative effects, and the CMOP will be open to Indigenous engagement and submitted prior to construction. Furthermore, NexGen has acknowledged the accuracy and has revised the Final EIS document to better align with IK. YNLR offered detailed feedback on the methodology for VC selection, noting that the method of choosing a handful of species to represent an entire ecosystem could lead to erroneous results, because each species has its own ecological niche.

YNLR supports the selection of the grey wolf, moose, common goldeneye, beaver, and Canadian toad as VCs and expressed concerns about increased pressures on these species due to road mortality, hunting, and other human-wildlife interactions. NexGen has noted that avoiding redundancy was just one of several factors for selecting appropriate VCs, and that avoiding redundancy aligns with widely accepted approach supported by regulatory guidance. NexGen has maintained that the selected VCs are appropriate. NexGen has further clarified that changes in public access to hunting areas and increased population density in the area affecting wildlife reproduction and survival was evaluated in the EA, and upgrades to road access are not expected to result in measurable change to existing hunting access, while mitigation measures (e.g. not allowing employees to hunt within the mine lease boundary) are also expected to minimize

potential effects to wildlife. For YNLR, the woodland caribou is a culturally significant species and therefore should be given special consideration for the assessment, to which NexGen agrees.

YNLR questioned the selections of little brown myotis, olive-sided flycatcher, and rusty blackbird, as well as the exclusion of leopard frogs and other amphibians. NexGen noted that little brown myotis were included as VCs due to their representation of effects on late successional stage forests and northern myotis. Olive-sided flycatchers were included due to their representation of songbirds, habitat-related effects on spruce grouse, and insectivores with potential to be impacted by environmental contaminants through their ingestion of insects. And rusty blackbirds were selected due to their representation of effects on horned grebe and yellow rail, birds occupying wetlands and wet forests, and insectivores. All of which have been recorded in the RSA and are federal species at risk. Leopard frogs and other amphibians were excluded in favor of the Canadian Toad due it its confirmed presence in the RSA. YNLR is especially concerned about the introduction of invasive plant species into forest ecosystems and believes that invasive species monitoring is critical to maintaining ecological integrity. NexGen has committed to a Project-specific EPP including actions to prevent, detect, control and monitor invasive species.

YNLR noted that effects on the resident moose population would be significant, and that habitat loss in general would impact species at risk, calling into question NexGen's methodology for determining statistical significance. As such, YNLR highlighted that any wildlife habitat that is destroyed should be offset, just as fish habitat must be under federal law. NexGen noted that rationale to support the significance of Project effects can be found in Draft EIS sections 7 to 19 and maintains that information within those sections supports the determination of significance. NexGen has confirmed the goal of the project is to minimize effects to the environment such as habitat loss and mitigation plans are being developed, such as the CMOP. Ultimately, YNLR found the analyses overly optimistic and underscored the need for open, transparent, and statistically robust monitoring programs and follow-up to ensure accountability, including meaningful dialogue with Indigenous Nations. NexGen has emphasized that the company has conducted engagement with local Indigenous Nations and communities, regulatory agencies, and stakeholders, and has disagreed that conclusions are overly optimistic, citing the conservative and comprehensive approach taken to the environmental assessment.

ACFN requested that NexGen clarify which species were included in the ERA and that NexGen describe which species will be monitored and how predictions will be verified. NexGen noted that caribou, moose, grey wolf, black bear, snowshoe hare, beaver, muskrat, little brown myotis, spruce grouse, rusty blackbird, common loon, red-throated loon, and mallard were included in the ERA and that the EPP and supporting documentation will outline wildlife monitoring where required to evaluate the effectiveness of environmental protection measures and verify assessment endpoints are maintained. Impacts to fisher and marten are of interest to ACFN, as well as the mortality risk for smaller wildlife in the VC risk assessment. Project effects on fisher are represented by grey wolf and black bear, which use similar habitats, and effects on marten are represented by woodland caribou and little brown myotis. NexGen has noted that overall, no significant adverse effects were predicted for smaller wildlife VCs, and mortality risk is

described in detail in various Draft EIS sections titled “Survival and Reproduction.” ACFN also had suggestions for improving the Habitat Suitability Indices (HSI) for moose and questioned how NexGen will monitor habitat availability for woodland caribou. ACFN requested the NexGen quantitatively assess changes in wildlife habitat quality and quantity, identify movement corridors due to loss of habitat between Patterson and Forrest Lakes, and explain how it will assess wildlife use of reclaimed habitat in follow-up programs. In terms of mitigating impacts, the Nation requested that NexGen provide scientific evidence that strategies for mitigating fugitive dust and constituent emissions coating plant leaves will be effective, particularly for sensitive species.

Further, ACFN asked NexGen to clarify how it will assess mitigation effectiveness for smaller species which are underreported or unknown. NexGen has confirmed no modifications to the Habitat Suitability Index (HSI) are required as ACFN’s suggestions were already incorporated, and the aforementioned CMOP will include monitoring. NexGen noted that changes in wildlife habitat quality and quantity assessed compared to predevelopment conditions are outside of the scope of the EA requirements, but the Base Case conditions largely reflect factors prior to development. The movement route at the narrows of Patterson Lake was the only route identified by NexGen, and the use of reclaimed habitat and effects to underreported species will be assessed in the EPP and supporting documentation. NexGen has clarified that dust deposition rates from the Project are predicted to be much less than rates shown to cause effects on plants in scientific literature and any changes would be negligible but has committed to monitoring dust deposition and other constituents to apply adaptive management if necessary.

Federal Authorities

ECCC stated that residual adverse effects of moderate magnitude, geographic extent, and duration may occur due to the use of intrusive search methods (i.e. nest searches) and the clearing of vegetation during the migratory birds breeding window. The ability to detect nests in most habitats is very low while the risk of disturbing or damaging a nest is high. If nest searches are required, ECCC recommends they are carried out by skilled and experienced observers, using appropriate methodology for activities that would take place in simple habitats, or conducted when surveying for conspicuous structures (e.g., Great Blue Heron or Bank Swallow nests, or cavity nesters) to minimize disturbance. NexGen has committed to pre-clearing wildlife sweeps being conducted by qualified professionals.

ECCC noted that residual effects of low geographic extent, moderate magnitude, and high duration (permanent) to wetlands from the project activities can occur if avoidance and mitigations do not result in No Net Loss which can result in residual effects on migratory birds. ECCC highlights the importance of key mitigation measures NexGen has committed to, particularly adhering to the *Federal Policy on Wetland Conservation* to have a No Net Loss of wetland functions tracked in the EPP and a follow-up monitoring program. ECCC also recommended that a Wetland Mitigation and Offset Plan be developed if the project is predicted to result in impacts to wetlands. ECCC emphasized the importance of the development of the five monitoring and management plans (EMP, EPP, Biodiversity Action Plan, Effluent and Emissions Plan, Decommissioning and Reclamation Plan) to mitigate effects on migratory birds

and SAR. With respect to the mitigation, ECCC noted the importance of integrating the measures in table 14.4-1 in the final EIS into these monitoring and management plans.

ECCC also raised concerns that soil and bank erosion, noise or sensory disturbance, and potential surface water and sediment quality effects from the project can have residual effects on migratory birds or SAR. NexGen has committed to mitigating potential effects from soil and bank erosion by avoiding periods with high flow volumes in sensitive areas to the extent practical, design stream crossing structures to limit bank disturbance, install effective erosion and sediment control measures and keeping them in place until all disturbed ground as been stabilized, minimize duration of exposure to disturbed soils through interim re-vegetation, avoid placing soil stockpiles near waterbodies and maintaining a 150 m buffer around waterbodies/courses, and regularly inspect erosion and sediment control measures, soil stockpiles, and monitor high sedimentation areas. NexGen has committed to adaptive management as a key mitigation measure to reduce residual effects on migratory birds and SAR from noise and sensory disturbance. NexGen has also committed to a series of mitigation measures to reduce effects of water and sediment quality on migratory birds and SAR, including adding fences or animal egress matting/ramps to lined contact water ponds, conducting wildlife patrols during migratory bird nesting and migration period, applying wildlife deterrents (e.g., cannons or bangers) where needed, and regular monitoring to evaluate effectiveness of deterrents and water quality.

The project is expected to increase the mortality risk for migratory birds and species at risk (SAR) through collisions with infrastructure, buildings, vehicles, and aircraft on site. ECCC noted that if setback distances are not applied for some migratory birds and SAR, and if measures are not put in place to avoid nests, roosts, and residences, there is the potential for residual effects. NexGen has committed to key mitigation measures to reduce these residual effects. With respect to the communication tower, NexGen has committed to locating the tower away from wetlands or other high suitability habitats, minimizing guy wires and installing markers for visibility, limiting tower lighting, and following avian-safe standards to prevent electrocution. NexGen has also committed to apply activity restriction guidelines for sensitive species (e.g., timing/setback distances) established by the Government of Saskatchewan, to the extent practical, awareness training for staff, giving wildlife the right of way, identifying wildlife use areas, reporting observations, adjusting speed limits, minimizing habitat creation and wildlife interactions, training workers to prevent the spread of disease (e.g., white-nose syndrome), and not disturbing observed species (e.g., bird or bat nests, roosts, hibernation) to the extent possible. ECCC raised concerns that Common Nighthawk may nest on roadways or other disturbed areas in the project area where there is high traffic, and NexGen has only committed to avoiding nests “to the extent possible” which may result in moderate residual effects. ECCC noted that the above stated mitigation measures to avoid collisions are important for Common Nighthawk. Additionally, ECCC noted that NexGen may be required to apply for an airport permit under the *Migratory Bird Regulations, 2022* to scare migratory birds with a firearm or aircraft, or to kill and take them, if those birds are within the perimeter of the airport and considered a danger to aircraft operations.

ECCC raised concerns about the effect that light pollution has on migratory birds and SAR, including resident species that are present year-round within the project area. ECCC noted the importance of implementing mitigation measures year-round. NexGen has committed to mitigating light pollution by limiting the use of decorative lighting and solid burning or slow pulsing warning lights, orienting lights downwards or using shielded fixtures and limiting their use, using amber light instead of white light and limiting blue spectral light, and turning off lights when not in use (e.g., motion sensors), to the extent possible/feasible.

ECCC notes that residual adverse effects of moderate magnitude, moderate geographic extent, and high duration, frequency, and timing are anticipated for boreal caribou from project activities if mitigation measures, including offsetting, are insufficient or not aligned with the attainment of the objectives set by the federal amended Recovery Strategy. Given the ecological context of the project location including the critical habitat status, the habitat function and quality and the population status, the project residual adverse effects are at the lower end of high risk with respect to the survival and recovery of boreal caribou. ECCC acknowledges that NexGen has developed an offset methodology for the project to manage effects to caribou in the draft interim CMOP which outlines a goal of No Net Loss, or Net Increase, in caribou habitat with a proposed offset ratio of 9:5:1. However, ECCC indicates that the method used to calculate the effects of the project on critical habitat, which is used in the total offset calculation, underestimated the amount of destruction of critical habitat and does not align with the amended federal Recovery Strategy. Moreover, the Proponent's conversion methodology (from hectares to kilometers) likely underestimated the kilometers of restoration required to achieve the total amount of offsetting in hectares of critical habitat. Based on risk factors of the project and its specific context, ECCC advised that the ratio could be as high as 20:1 to be consistent with the federal amended Recovery Strategy. ECCC acknowledged that the CNSC will require NexGen to finalize the CMOP before commencing activity at the project site and ECCC is available to work with the Proponent on the CMOP. ECCC recommended that the CMOP includes a revised total amount of habitat to be offset to reflect the amount of critical habitat affected by the project, an analysis of which biophysical characteristics for caribou will be directly and indirectly impacted by the project, provide offsetting objectives in hectares, articulate percentage of total offset commitment dedicated to on-the-ground restoration activities, and implement a robust follow-up and monitoring program with key indicators/thresholds. Finally, the Proponent's allocated offset should be implemented through direct restoration with any research and monitoring completed as supplemental to the main restoration activities.

7.2.4. CNSC Staff's Analysis

7.2.4.1. Woodland Caribou

Alteration and/or Loss of Habitat

CNSC staff have reviewed NexGen's assessment of habitat loss and alteration for woodland caribou and concur that the Project will result in residual effects. The Project is located within the SK2 West Caribou Administration Unit, where cumulative anthropogenic disturbance already exceeds the 35% threshold for maintaining a self-sustaining population, as outlined in the federal recovery strategy. NexGen's assessment acknowledges that the Project will contribute to further

habitat loss and alteration, including changes to terrain, vegetation composition, and ecosystem connectivity.

NexGen has committed to developing and implementing an updated CMOP, that is aligned with the Government of Canada's Amended Recovery Strategy for Woodland Caribou, Boreal Population, in Canada and developed in collaboration with Indigenous communities and Saskatchewan Ministry of Environment. The plan will include offsetting measures, progressive reclamation, and monitoring to ensure effectiveness. CNSC staff support this commitment and recommend it be formalized as an EA condition.

Additional mitigation measures include minimizing the Project footprint, avoiding wetlands through road realignment, and implementing progressive reclamation. These measures are considered appropriate to reduce the extent of habitat loss and alteration.

Sensory Disturbance

CNSC staff agree with NexGen's conclusion that sensory disturbances (e.g., noise, light, human presence) could affect caribou movement and behaviour. NexGen has proposed mitigation measures such as activity restrictions during sensitive periods, noise suppression, and light pollution controls. CNSC staff considers that the measures are sufficient to mitigate the identified effects. A light pollution mitigation and monitoring plan is recommended as an EA commitment.

7.2.4.2. Wetlands

CNSC staff have reviewed the predicted loss of wetlands and concur with NexGen's conclusion that while the area of wetland loss is relatively small (0.4% of the RSA), the ecological function of these habitats may be disproportionately affected. NexGen has committed to adhering to the Federal Policy on Wetland Conservation, implementing progressive reclamation, and avoiding wetlands through design.

CNSC staff recommend that if detailed design reveals greater wetland disturbance than currently predicted, NexGen should prepare a Wetland Mitigation and Offset Plan. This plan should be submitted to CNSC and ECCC for review and approval by the CNSC prior to any wetland disturbance occurring and is recommended as an EA commitment.

7.2.4.3. Migratory Birds

CNSC staff have reviewed the assessment of sensory disturbance and mortality risks to migratory birds and species at risk and found NexGen's mitigation measures to be appropriate. These include:

- Implementing restricted activity periods and pre-clearing surveys.
- Designing lighting to minimize light pollution and bird disorientation.
- Designing power lines and communication towers to be avian-safe.
- Conducting wildlife patrols during nesting periods and migratory periods.
- Avoiding and mitigating disturbance to nesting birds.

CNSC recommend that NexGen develop a light pollution mitigation and monitoring plan as part of licensing (licence to prepare site and construct) and recommend it be included in NexGen's EA commitments.

7.2.5. CNSC Staff's 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, as well as input received from Indigenous Nations and communities, CNSC staff conclude that the Project is not likely to cause significant adverse effects.

These findings are inclusive of terrestrial species at risk listed under Schedule 1 of SARA. CNSC staff will work with ECCC to ensure that measures taken by NexGen will be consistent with applicable recovery strategies for the identified species at risk.

In order to ensure that the aforementioned assessment conclusions remain valid, CNSC staff recommend that the Commission include EA Conditions, should it issue a licence. If accepted, NexGen will be required to address the EA Conditions EA2, and EA3 in table 12.1 related to IRs carried over from the EA Review into licensing (licence to prepare site and construct). CNSC staff's assessment conclusions are contingent on the establishment of the EA Conditions EA2 and EA3 for all listed species at risk, and particularly for Woodland Caribou.

7.3. Human Environment

7.3.1. Description of the human environment

The human health environment is well described in section 5.2. The human health assessment focused on a local study area (LSA) of 685 km2, which represents the area of the proposed Project where direct environmental effects would be most likely to occur, and a regional study area (RSA) of 1,076 km2, where cumulative effects may occur. The RSA includes the LSA and extends from headwaters of Clearwater River to the confluence of the Clearwater River and Mirror River and includes major waterbodies along its course including Broach Lake, Patterson Lake, Forrest Lake, Beet Lake, Naomi Lake, and Lloyd Lake, as well as their contributing watersheds.

The evaluation of residual effects for both radiological and non-radiological exposures involved an environmental risk assessment (ERA) which included a human health risk assessment (HHRA) and an ecological risk assessment (EcoRA). The ERA was prepared to be compliant with the Canadian Standards Association Group (CSA) N288.6-22 *Environmental Risk Assessments at Nuclear Facilities and Uranium Mines and Mills* along with the requirements for an ERA as outlined in section 4.1 of Regulatory Document-2.9.1: *Environmental Principles, Assessments and Protection Measures*

7.3.2. Proponent's Assessment

An environmental transport and pathways model (IMPACT) was used to evaluate the effects of COPCs on the local environment including human and ecological receptors.

The human receptors selected for the HHRA included:

- camp worker (adult) at Patterson Lake camp residence
- subsistence harvesters (adult and one-year old) at Patterson Lake, Beet Lake and Lloyd Lake
- seasonal residents/lodge operators (adult and one-year-old) at Patterson Lake
- future permanent resident (adult and one-year-old) at Patterson Lake

7.3.2.1. Human Health (Public): Radiological and Non-Radiological COPCs

Radiological:

The 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 by NexGen as COPCs. Due to public and regulatory interest, NexGen decided to include these radionuclides for modeling without conducting a formal screening.

For human receptors mentioned above, the incremental radiation dose during all project phases was predicted to be below 1 mSv/year for the application case, the reasonable upper bound sensitivity and the reasonably foreseeable development (RFD) case.

The maximum radiation dose for the critical receptor (subsistence harvester) (1 year old) eating traditional food gathered at Paterson Lake South was predicted to be 0.1 mSv/year for both the application case and the reasonable upper bound sensitivity scenarios. The main contributor to the total dose would be from Polonium 210 in the traditional food diet.

For the far projection, the maximum dose was also estimated to be 0.1 mSv/year for a future permanent resident living at the decommissioning and reclaimed project site following closure.

If dose constraint of 0.3 mSv/year is applied, the dose to subsistence harvester (1 year old) would be less than dose constraint for the application case, the reasonable upper bound sensitivity, and the RFD case and well below the dose limit and the dose constraint.

With respect to the far-future projection (e.g., a future permanent resident living at the decommissioning, reclaimed project site following closure), would receive a dose up to 0.07 mSv/year which is well below both the dose limit and dose constraint.

For an on-site receptor, the proponent included a camp worker as part of the Human Health Risk Assessment. The incremental radiological dose to the camp worker from all radionuclides in the uranium-238 chain, including radon, is predicted to be 0.58 mSv/year for the application case, and 0.59 mSv/year for the upper bound sensitivity scenario; both of which are below the dose limit for a person who is not a nuclear energy worker (NEW) of 1 mSv/year. The primary

contribution to effective dose is radon exposure. The assessment is conservative in that it assumes that the camp worker spends 100% of the time indoors.

Non-radiological

The non-radiological HHRA focused on COPCs that exceeded screening values in air and water based on predicted atmospheric and aqueous releases (i.e. treated effluent, treated sewage, site runoff, and solute releases to groundwater) from the project as well as COPCs predicted to exceed screening values in soil and sediment. Receptors, including camp worker, were assumed to consume traditional foods such as fish, game and harvested foods from within the LSA. The measurement indicators used to assess potential effects on human health included hazard quotient (HQ), which is a ratio of the predicted exposure (daily dose) to a non-carcinogenic COPC relative to the toxicity reference value (TRV), and, for carcinogenic COPC, incremental lifetime cancer risk (ILCR), which is the predicted increase in lifetime cancer risk from exposure to a carcinogenic COPC related to project activities, and represents risk above the background cancer risk.

Non-carcinogenic (toxicological) risks were evaluated using HQs for cobalt, copper, molybdenum, and uranium as measurement indicators. Project HQs were compared to an acceptable HQ value of 0.2, which was exclusive of background and consistent with HC guidance on human health preliminary quantitative risk assessment (PQRA) (Health Canada, 2021). The non-radiological HHRA, using conservative upper-bound sensitivity scenarios, concluded that releases from the project would not result in significant adverse effects on any human receptors during the lifespan of the project. All non-carcinogenic COPCs remained below the acceptable risk level (HQ) of 0.2 per exposure pathway for all receptors for the one-year-old and adult age groups.

Cancer risk, measured as ILCR, for arsenic was estimated and compared against the negligible cancer incidence level of 1 in 100,000 recommended by HC (2021). Incremental cancer risk was predicted to exceed the negligible cancer risk level of 1 in 100,000 for the relevant human receptors in the LSA just outside the project footprint, but did not exceed the negligible cancer risk within the RSA of the project. Based on a conservative assumption of high consumption of traditional foods including fish and game harvested from the project footprint and the LSA, the predicted arsenic ILCR was calculated to be 4 in 100,000. This estimate was compared to a baseline cancer risk of 69 in 100,000 for a reference subsistence harvester based on the selected regional background conditions. As such, the arsenic ILCR for this receptor from the Project was considered to be a small portion of the existing baseline cancer risks.

7.3.2.2. Human Health (Workers): Non-Radiological and Radiological COPCs

The potential radiological and non-radiological impacts of the project on the health and safety of all other workers, in particular, Nuclear Energy Workers (NEWs), during normal operations and during accidents and malfunctions, were initially excluded from the EIS. The rationale provided by the proponent was in reference to CSA N288.6-12, as NEWs are not considered in the Standard. CNSC staff noted that the CSA standard addresses environmental risk assessments for

Class I nuclear facilities and uranium mines and mills. It is agreed that the CSA standard does state the following in section 1.6 (Receptors):

> *NEWs are covered under the radiation protection program and health and safety program in place at the facility and therefore not considered in the Standard.*

However, there is currently no radiation protection program or health and safety program in place, since the Rook I Project is currently undergoing the EIS review process.

Therefore, an IR was raised, requesting the proponent assess the potential radiological and non-radiological impacts of the project on the health and safety of all persons on-site, during normal operations and during accidents and malfunctions (persons on-site in this context are NEWs and persons who are not NEWs who may incur occupational exposures).

In response to the IR, the proponent developed Appendix 15A of the EIS, which summarizes the assessment of the following for the Project:

For radiological hazards:

- radiological exposure assessment for underground workers;
- radiological exposure assessment for the process plant and paste tailings preparation workplace;
- radiological exposure assessment for the low-level radioactive waste incinerator; and
- radiological exposure assessment for accidents and malfunctions.

For non-radiological hazards:

- workplace exposure to diesel and crystalline silica dust;
- hazard analysis reports; and
- human factors engineering documentation.

Radiological hazards

Regarding NEWs, predicted doses across all phases of the Project are below CNSC's effective and equivalent dose limits.

Radiological exposure to NEWs are expected to occur in three (3) work environments: the underground workplace, the process plant and paste tailings workplace, and the low-level radioactive waste (LLRW) incinerator workplace. The radiological exposure assessments included the expected exposure pathways of inhalation of dust and radon, as well as external exposure to gamma radiation from the Uranium-238 decay chain.

Potential radiation doses of NEWs that could work in a variety of work activities associated with underground mining tasks (i.e., proposed underground development and associated mining activities) were assessed, and annual effective doses to NEWs are approximately 2 mSv to 12 mSv. Raisebore operators may receive a maximum annual effective dose of 12 mSv under steady state operations, which is below the CNSC's regulatory effective dose limit of 50 mSv in a one-year dosimetry period.

The assessment of potential radiation doses of NEWs in the process plant and paste tailings workplace determined annual effective doses to NEWs ranging from approximately 6 mSv to 13 mSv. Process operators may receive a maximum annual effective dose of 12.07 mSv (residue/paste area) and 13.18 mSv (grinding area) under steady state operations, which is below the CNSC's regulatory effective dose limit of 50 mSv in a one-year dosimetry period.

Finally, the assessment of potential radiation doses of NEWs in the LLRW incinerator workplace includes incinerator operators and maintenance staff. However, it is expected that operation of the incinerator would not occur 24 hours per day; therefore, these workers could have other duties not exclusive to the LLRW incinerator. Therefore, the proponent assessed the radiation exposure risks to an operator following an analysis of waste incinerator activities and determined that annual incremental effective doses would be very low (i.e., approximately 0.11 mSv (base case) and 0.3 mSv (sensitivity scenario)). These dose estimates are also well below the CNSC's regulatory effective dose limit of 50 mSv in a one-year dosimetry period.

Non-radiological hazards

The potential non-radiological impacts of the project on the health and safety of all workers during normal operations and during accidents and malfunctions, is included in Appendix 15A of the EIS. It is expected that worker health and safety will be required to be covered under the licensee's Occupational Health and Safety program/policy under legislation of the Province of Saskatchewan, if a licence is granted. CNSC staff will assess the proponent's proposed programs for conventional health and safety as part of the licencing process.

7.3.3. Other Views Expressed

7.3.3.1. Indigenous Nations and Communities

CRDN had previously noted that levels of stress and perceptions of stress affect health and can worsen physical and mental health outcomes. As such, CRDN had recommended that NexGen work with the Nation to establish risk thresholds for a Health Impact Assessment that will enable the identification and mitigation of perceived risks amongst community members. Additionally, CRDN had requested the inclusion of several key missing indicators for wellbeing, including mental health, functional health, and public health. The Nation also previously requested clarification on the methodology for calculating and communicating levels of risk to human health. NexGen has noted that the perception of Project effects was considered within the assessment of Indigenous land and resource use (Draft EIS section 17). NexGen has committed to engaging directly with Indigenous Nations and communities throughout the Project lifespan regarding ways to minimize perceived effects. NexGen has clarified that the indicators for wellbeing were based on likely community interactions with the Project and include both mental and physical health; therefore, NexGen is not proposing any changes to indicators used. Finally, NexGen has clarified that terms such as "low," "minor," and "negligible" levels of risk indicate that Project effects are not calculated to be harmful to human health.

MN-S had previously expressed concerns with the HHRA, including which COPCs were included, the methodology for evaluating toxicity interactions, inconsistencies with the HC policy on incremental cancer risk, and a lack of specifics on residual effects from arsenic. The

Nation had noted that the HHRA should form an integral part of any robust and holistic assessment of community wellbeing and requested that the analysis of community wellbeing be updated to that effect. NexGen has maintained that the methodology for completing the HHRA was appropriate, applying a precautionary approach, appropriate guidelines, and health-based screening for COPCs. NexGen has noted that the HHRA and effects to human health were considered in the assessment of community wellbeing. Further details on the rationale to determine Project effects can be found in Draft EIS sections 7-19.

MN-S had also sought clarification on how NexGen is defining “acceptable” levels of risk to human health and recommended that NexGen clarify the effects of radiological exposure on human health. NexGen emphasized the promotion of health, safety and well-being of people and the environment to achieve acceptable levels of risk and exposure. MN-S had also previously requested the inclusion of a detailed comparative review of health guidelines from multiple jurisdictions to guarantee the consistent application of those guidelines. NexGen has stated that no additional consideration of guidelines is required, as the guidelines used were in accordance with current science and regulatory requirements, the most restrictive of federal or provincial guidelines were used, and health-based guidelines from other jurisdictions were used when no federal or provincial guidelines were published.

BNDN identified issues with the Human Health Conceptual Model, recommending that the model include dermal contact with surface water and groundwater and account for variable conditions, such as wildfire season. NexGen clarified that dermal contact was explored as a potential exposure pathway in the HHRA. The Nation also requested further discussion of several topics, including the potential impacts of Dioxins and Furans compound (D&F) emissions, radon, and other radionuclides on human health, as well health hazards associated with molybdenum and uranium and cancers associated with airborne radionuclides and bioaccumulation. NexGen has stated that no health concerns regarding D&F were identified as no exceedances of the 24-hour Ontario Ambient Air Quality Criteria were modelled. NexGen has stated that radon and radionuclides are not required to be included in the residual effects assessment as no annual criterion are available but confirmed that they were modelled and assessed in the environmental risk assessment.

NexGen noted that the molybdenum HQ slightly exceeds 0.2 for terrestrial animal ingestion, but the total molybdenum HQ is less than 1 indicating no risk to subsistence harvesters from exposure. Regarding cancers associated with airborne radionuclides and bioaccumulation, NexGen has initiated a Regional Traditional Foods Study and committed to discussing further details of the monitoring programs to be developed during permitting and licensing (licence to prepare site and construct). For all human health exposure pathways, including sediment, BNDN also requested the quantification of exposures and associated health risks, which NexGen has completed and included with the Final EIS submission in TSD XXI. Stating that runoff can adversely affect human health, the Nation recommended that chemical concentrations exceeding guidelines in runoff be classified as COPCs as part of the environmental risk assessment. NexGen has stated that mitigation measures to minimize effects from site runoff essentially

eliminated site runoff as a pathway for release of COPCs to the environment and has committed to verifying this prediction during Operations.

BNDN underscored that indicators used to assess Community Wellbeing do not adequately consider Indigenous indicators of wellbeing. NexGen has clarified that current indicators used are consistent with requirements under CEAA, 2012 and that results were presented to BNDN for feedback in December 2022 where no concerns were raised. Highlighting the differences between provincial and federal risk benchmarks, BNDN underscored that the Project presents potentially unacceptable risks when interpreted using more conservative (i.e., provincial) benchmarks, particularly when it comes to arsenic. NexGen selected the less conservative federal guideline to represent a negligible risk rather than a benchmark, and risks of cancer range from negligible to low.

BNDN has raised concerns about the concentrations of copper and cobalt in fish during the post-closure period. Predictive modelling suggests that these contaminants will be elevated in Patterson Lake during post-closure and remain elevated for hundreds or thousands of years (due to groundwater migration from the UGTMF). Despite this risk, there is no plans for monitoring concentrations of metals in fish tissues at this time. BNDN also noted that approximately 67% of tailings placed in production stopes may expose workers to radioactive and toxic material and has requested that potential health and safety impacts on workers are properly assessed, risks and mitigation strategies are documented clearly, and backfilling effects are incorporated into overall mine ventilation and safety planning. BNDN has concerns regarding the radioactivity of tailings and the release of radon gas due to cracks in CPT and long-term buildup underground, therefore they have requested modelling for radon transport and underground ventilation to mitigate risk. BNDN raised concerns that airborne contaminants are not well monitored and noted that NexGen should implement real-time air quality monitoring systems, dynamically adjust ventilation based on exposure data, and share monitoring data with safety teams. Furthermore, BNDN noted the lack of specialized training and suggested a structured training and competency assessment program tied to UGTMF milestones is implemented. Finally, BNDN is concerned that the reliance on temporary surface storage may increase exposure to dust and radionuclides, and as such contingency plans should be implemented.

NexGen confirmed that a multiple account analysis determined that the UGTMF as the lowest risk option for contaminant migration from tailings. NexGen has committed to the development of an adaptive management plan, to be provided during licensing (licence to prepare site and construct), to further mitigate effects associated with tailings storage. NexGen supports further discussion with BNDN regarding mitigation measures. Finally, NexGen has confirmed that ongoing monitoring will be addressed within the Decommissioning and Reclamation plans and noted that a surface water monitoring is part of the EPP, while independent Indigenous monitoring programs have the opportunity address further BNDN monitoring requests.

YNLR sought clarification on whether qualitative and quantitative data on human health effects from other uranium mining projects have been factored into the assessment. NexGen has confirmed that the HHRA considers data and experience from other Canadian nuclear projects.

ACFN recommended that NexGen adjust the Project lifecycle to align with outputs from predictive modeling, which indicate project-related contaminants may present risks to human health by contaminating Traditional Foods. NexGen has assessed long-term effects on human health using a far-future projection, which encompasses effects beyond Project closure. ACFN requested that NexGen demonstrate the methodology is representative of predicted risks to human health by providing a comparative analysis of the predicted risks of exposure from the project-only scenario versus the scenario which accounts for exposure to baseline conditions and project-related effects. NexGen has noted that all hazard quotients (HQs) can be compared to a benchmark value of 1 if all exposure pathways are considered. Consistent with HC guidance, a benchmark HQ value of 0.2 per medium was applied, and the total project HQ can be calculated by adding together the "Base Case" and "Incremental Project Risk" rows for each COPC in table 5-18 of section 5.4.1 of Daft EIS. The total HQs are all below 1, indicating no predicted significant adverse health impacts. Additionally, with reference to the HHRA, ACFN requested an explanation of how the air dispersion modeling study is representative of long-term exposures. ACFN also requested the inclusion of available federal human health assessment guidance documents and confirmation that these were used to conduct the HHRA. NexGen has clarified that the air dispersion modelling study, which considers a simulation from a five-year meteorological modelling period, was added to a mandated background concentration and summarized to include 1-hour, 24-hour, and annual maximum predicted values. The model employs conservative guidelines and maximum possible emission rates to capture worst-case health impacts. ACFN also requested the inclusion of available federal human health assessment guidance documents and confirmation that these were used to conduct the HHRA. NexGen has confirmed that the methods used are based on guidance provided by the CNSC (2021), the CSA Group (2010, 2020) and HC (2010, 2021)

7.3.4. CNSC Staff's Analysis

The following provides a review analysis of section 15– Human Health of the Project's EIS and the associated technical support documents (Environmental Risk Assessment – TSD XXI and Worker Dose Assessment.

A summary of some key IRs related to the review for Human Health, including HHRA for non-radiological, radiological and effects to workers are provided below.

Analysis of each potential effect on the environmental compartment or VC

CNSC staff have reviewed the proponent's assessment of potential non-radiological and radiological effects from the Project on the Human Health VC and raised a number of IRs for further clarification and justification.

Radiological

CNSC staff requested the proponent to clarify why the radiological exposures due to ingestion were modelled for certain receptor groups, namely seasonal residents and lodge operators, assuming average food consumption rates, while for the other groups (camp workers, subsistence harvester, and permanent resident) their exposure was based on the assumption of a high food consumption rate. The proponent clarified the rationale for the dietary intakes stating that the

intent was to select diets that reflect different ways people may obtain Traditional Foods from the local study area (LSA) and regional study area (RSA); therefore, it was desired to have an average diet to reflect a person who would be ingesting a typical portion of Traditional Foods diet and a high diet to reflect a person who would be ingesting a higher proportion of Traditional Foods. It further explained that the establishment of the food consumption rates within the Traditional Foods diet was informed by engagement held during development of the Draft EIS with primary Indigenous Nations and communities and communities (e.g., Joint Working Groups) in 2019 and 2020, and with the CNSC, ENV, and Saskatchewan Health Authority in 2021.

In the draft HHRA, the proponent had initially compared the predicted radon exposure to a camp worker against an air concentration limit of 60 Bq/m^3, stating this was a CNSC limit. Therefore, an IR was raised, as there is no such CNSC limit. In addition, the proponent's assessment of exposure to radon progeny was not included in a total annual dose, which should be compared to the CNSC regulatory effective dose limits. The proponent 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 for a person who is not a NEW of 1 mSv/year [12].

As discussed in section 7.3.2.2, the potential radiological and non-radiological impacts of the project on the health and safety of all other workers (in particular, NEWs) during normal operations and during accidents and malfunctions, were excluded from the draft EIS. Therefore, an IR was raised to address this deficiency. In response to the IR, the proponent included a new Appendix 15A of the EIS, which summarizes radiological and non-radiological effects on the health of NEWs and persons who are not NEWs (i.e., non-NEWs) during normal operations and through the potential occurrences of accidents and malfunctions. The proponent's responses to the IRs were accepted by CNSC staff and incorporated in the final EIS, along with revised supporting worker dose assessments.

CNSC staff also reviewed the proponent's assessment of Human health (public) in the draft EIS and TSD XXI ERA and sought clarification through a few IRs.

The raised IRs on the radiological COPCs did not identify any associated potential effects, except clarification on the monitoring follow-up.

This was to clarify in both section 15.8 of the EIS as well as in section 8.3 of the TSD XXI status of the targeted traditional food study, and how it will be used to help validate the consumption of traditional foods used in the HHRA.

For the Draft EIS section 15.8 (Monitoring, Follow-Up), NexGen provided adequate information updates on the engagement with Indigenous Nations and communities on the Regional Traditional Foods Study design. This includes the goals of beginning of the project in 2022, follow-up engagement continuing in 2023, and completion in 2024.

With respect to the information in Draft EIS TSD XXI (Environmental Risk Assessment), NexGen explained that the existing Traditional Foods diet used was based on the First Nations Food, Nutrition and Environment Study (FNFNES) (Chan et al. 2018, 2019).

Furthermore, NexGen noted that engagement completed in support of the progression of the Regional Traditional Foods Study being proactively undertaken in collaboration with Indigenous Groups will be documented in revised EIS section 2 (Indigenous, Regulatory, and Public Engagement) and revised EIS TSD I (Indigenous Engagement Report). NexGen's disposition of this IR was found to be acceptable by CNSC staff.

Non-Radiological

With respect to the non-radiological IRs and their associated potential effects several IRs were raised by CNSC staff and dispositioned by NexGen.

CNSC staff requested NexGen to clarify the selection of "infants" and "toddler" receptors which were grouped together with one-year-old receptors. NexGen confirmed that they have appropriately considered the infant and toddler age groups of human receptors in accordance with the federal guidance. There are also differences in how infants, as an age class, are classified in the CSA N288.1-20 (CSA 2020) and HC (2021), and this HHRA used a harmonized age class to assess the same receptors for both radiological and non-radiological HHRAs. The CSA N288.1-20 definition of infant is based on the ICRP Publication 71 (ICRP 1996), whereas the HC 2021 PQRA guidance document, which is referenced in CSA N288.6-22 (CSA 2022) defines "infant" as zero to less than 6-months and "toddler" as six months to less than five years old. NexGen's disposition of this IR was found to be acceptable by CNSC staff.

CNSC staff had concerns regarding the lack of a bounding scenario of a failure of a stack scrubber in the mill, potentially resulting in an uncontrolled release of uranium and other particulate matter to the environment. NexGen provided information on the hazard identification analysis, specifically related to process containment and gas cleaning/filtration system failure, and calciner wet scrubber failures, which would be bounding, and included information on how these hazards would be managed by regular, preventative inspections, testing, and maintenance, and ambient air monitoring. This disposition was found to be acceptable.

CNSC staff requested that NexGen provide information regarding the potential risk to human health from a bounding scenario of spill of uranium concentrate in the mill. NexGen provided information on several scenarios that included uranium-bearing materials in the process plant which were considered in the hazard identification screening process, such as but not limited to: an ore spill; process vessel and piping system failure; a facility fire; process containment and gas cleaning and filtration system failure; and calciner wet scrubber failure. The likelihood of these scenarios to occur will be controlled through management controls such as, but not limited to, ambient monitoring, secondary containment, process sumps, redundant temperature/reagent controls, building ventilation, and spill and emergency response planning. These scenarios are also adequately bounding and, therefore, acceptable to CNSC staff.

Mitigation measures

Risk assessments performed by the proponent specific to worker health and safety are to be used to confirm the design basis for the Project; including confirmation or modification of design assumptions such as design of ventilation or other engineered controls, time management and radiation work planning, intended to keep worker exposures ALARA. The assessments included radiological exposure assessments for the underground mine, process plant, and paste processing and delivery systems. Controls identified by the proponent in the risk assessments are to be used to eliminate, prevent or reduce the potential risk of elevated radiation exposures to workers, and would be implemented with consideration of the hierarchy of controls. Examples of controls include facility, equipment and process design; safe work practices and training; and personal protective equipment. In addition, risks to worker health and safety will be managed through processes outlined in the Integrated Management System Manual and its supporting programs; specifically, the Health and Safety Program and the Radiation Protection Program.

For members of the public via radiological COPCs, there is no potential for a residual effect from the Project to human health via the considered pathways (e.g., radiation, inhalation and ingestion). Therefore, no specific mitigations measures were proposed. However, additional monitoring is noted in the follow-up program below.

With respect to non-radiological COPCs, there are no potential residual effects anticipated on members of the public via the oral, dermal, and inhalation pathways of exposure. Therefore, there were no specific mitigation measures proposed. It is noted that a monitoring and follow-up program has been proposed by the proponent, which would be implemented to identify unanticipated effects to inform adaptive management, as appropriate.

7.3.4.1. Follow-up program

The proponent highlighted that the monitoring of radiation exposures to NEWs throughout all phases of the Project will be done using personal dosimetry equipment. Doses will be routinely tracked and compared to CNSC regulatory dose limits. The processes for classifying NEWs and managing worker dosimetry will be included in the Radiation Protection Program.

For radiological aspects of the HHRA, NexGen will also focus on collecting data to verify ERA model, and data to improve predictions when the project starts, as well as working with local Indigenous Nations and communities to complete a traditional food study to help validate/modify dietary assumptions made in the HHRA.

With respect to non-radiological exposures, the proponent has proposed a monitoring and follow-up program which includes an EPP, EMP, Effluent and Emissions Plan, and a Regional Traditional Foods Study, which would be implemented to verify the effects' predictions and effectiveness of mitigation measures on human health, and also to identify unanticipated effects to inform adaptive management. Key components of the human health monitoring will include air and noise, surface water, sediment, and soil sampling program, and a sampling program for fish tissue, benthic invertebrate tissue, as well as country foods such as blueberries. It is anticipated that the EMP would be developed in accordance with the applicable federal and provincial requirements.

7.3.5. CNSC Staff's Findings and Recommendations

CNSC staff find the proponent's assessment to demonstrate that the predicted annual effective and equivalent doses to workers during construction, operation and decommissioning of the proposed Project will not exceed the applicable dose limits prescribed in the *Radiation Protection Regulations.*

For radiological residual effects to the Human Health, based on the residual effects characterization and determination of significance, the results of HHRA suggest that radiological residual effects to members of the public are negligible.

With respect to non-radiological residual effects to Human Health, a characterization of residual effects and determination other their significance, it can be concluded from the results of the HHRA that non-radiological residual effects to members of the public are negligible. 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 the Project is not likely to cause significant adverse effects on human health.

7.4. Indigenous Uses: Current use of lands and resources for traditional purposes

This section describes the potential effects of changes to the environment caused by the Rook I Project on the current use of Indigenous Land and Resource Use (ILRU) for traditional purposes by Indigenous peoples, including effects to fishing, hunting, gathering, trapping and the use of lands and resources for cultural and ceremonial purposes (referred to as heritage resources herein). The proposed Project could cause residual adverse effects on Indigenous lands and resource uses 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, archaeological, paleontological or architectural significance as a result of the Project

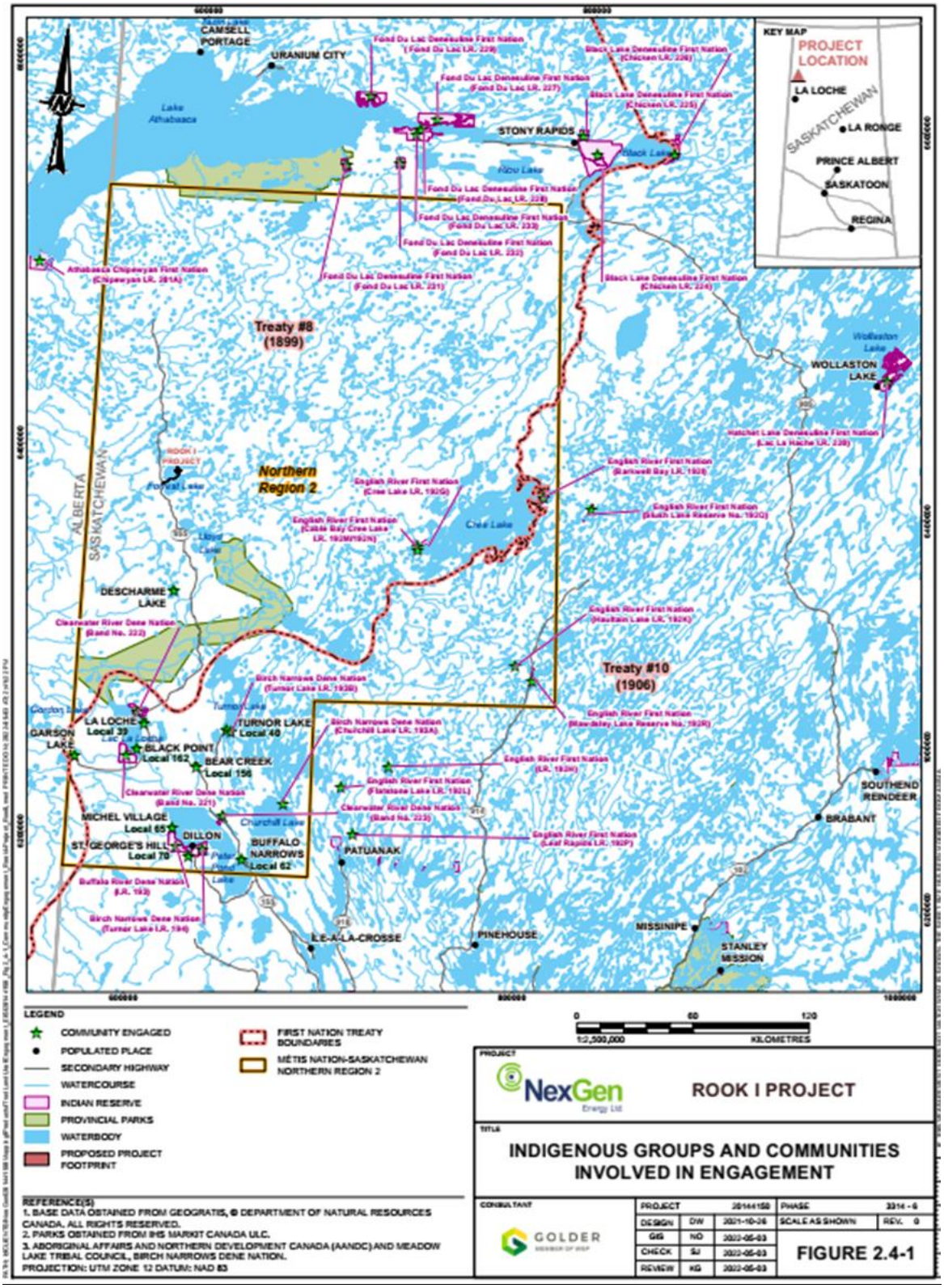
7.4.1. Description of the existing environment

Understanding the current use of land and resources for traditional purposes by Indigenous peoples requires the knowledge of traditional and contemporary activities of local 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 Site Study Area (SSA), as well as the Local Study Area (LSA) and Regional Study Area (RSA).

The Project is located along the southern Athabasca Basin adjacent to Patterson Lake, along the upper Clearwater River system. The Project falls within the boundaries of Treaty 8 Territory and lies within "No Hoe Neneh" the traditional lands of CRDN, Treaty 8, the Homeland of the Métis, and is within Nuhenéné, the traditional territory of the Athabasca Denesuline First Nations. The

closest federal lands to the Project site consist of Indigenous reserves, including Clearwater River Dene Band 222 (approximately 120 km south), English River First Nation Cable Bay Cree Lake 192M and 192N (approximately 130 km southwest), Cree Lake 192G (130 km southwest), Turnor Lake 193B (approximately 135 km southeast), and Clearwater River Dene Band 221 (140 km south). Figure 7.1 provides an overview of Indigenous Nations and communities location in relation to the Rook I project.

Figure 7.1: Indigenous Nations and Communities location in relation to the Rook I Project



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 La Loche, which is located approximately 130 km (155 km via road) south of the Project. Provincial Highway 955 starts from the community of La Loche and runs north to the decommissioned Cluff Lake mine (located 80 km north of the Project site) that was operated by AREVA Resources Canada (now Orano) from 1979 until 2002. Year-round vehicle and heavy equipment access to the proposed Project would involve upgrading the existing all-season access road from Highway 955 to the Project site.

The study areas for ILRU were based on the combined extent of the related atmospheric environment component (air quality, acoustic environment), human health, vegetation and wildlife, geology, groundwater and hydrology, surface water quality, and fish and fish habitat VCs. The broader regional area surrounding the Project is largely undisturbed by human activities and infrastructure, and approximately 0.5% of the regional area (i.e., 1,000 km^2) encompassing the Patterson Lake watershed has been influenced by human development. Most human-related disturbances in the regional area include linear features such as Highway 955, cutlines, seismic lines, trails, and cleared areas for exploration activities. The Project Site Study Area's for ILRU direct physical disturbance covers an area approximately 2.3 km^2 while the Local Study Area (LSA) is approximately 1247 km^2, and the Regional Study Area (RSA) covers approximately 43,577 km^2.

The LSA and broader RSA are accessed and used by several Indigenous Nations and communities for traditional, cultural and/or ceremonial activities. The primary Indigenous land use activities carried out within the LSA and RSA by Indigenous land users include hunting, trapping, fishing, and sustenance, medicinal and ceremonial plant gathering. 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. Several of the Indigenous Nations and communities that CNSC staff have engaged and consulted with throughout the EA and regulatory review process have identified the importance of protecting the existing environment as well as historic cultural sites 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. Clearwater River Dene Nation (CRDN)

CRDN (Treaty 8) is located in northwestern Saskatchewan. The main settlement, Clearwater Village situated on I.R. 22 is adjacent to the Northern Village of La Loche and their reserve lands are the closest in proximity to the Project, at approximately 120 km in a straight line to the south and 155 km by road. The Project is located within "No Hoe Nenuh" which is the traditional territory of CRDN that encompasses the upper reaches of Churchill River in the south, west into Alberta, and north to the southeastern shoreline of Lake Athabasca. CRDN has a long-established presence in northwestern Saskatchewan and northeastern Alberta and CRDN maintains that it is the most directly impacted First Nation in relation to the proposed Project. The Indigenous Knowledge (IK) that is contained within NexGen's EIS from CRDN was also shared with CNSC staff by CRDN for the purposes of the EA process. The information provided in CRDN's Indigenous Rights and Knowledge Survey (IRKS) for the Goráchághı tu/Pelican

Lake (Patterson/Forrest Lake area) indicates that the LSA and RSA are essential core hunting areas for large game such as moose, fishing areas, and gathering areas for berries and medicinal plants. CRDN ancestral connections to the Nation's traditional lands near the Project site run deep and Patterson Lake is a main waterbody within CRDN traditional lands which is integrally connected to the Clearwater River (Des Nëtthë) as it flows south and west and ultimately joins the Athabasca River in Alberta and flows north into the McKenzie River. The core part of CRDN's traditional lands that are most intensively utilized and occupied by CRDN families are situated within the Des Nëtthé (Clearwater River) watershed that has been continuously utilized and occupied by CRDN ancestors and descendants for at least several centuries. Given the centuries of Denesųłiné births and burials which have occurred within No Hoe Neneh these lands are understood to be sacred to CRDN members. Given the Nation's longstanding presence on traditional lands, there are numerous ancestral burial places within No Hoe Neneh, many of which have still not been recorded.

CRDN has indicated that there are a number of members' cabins in the LSA and RSA, which include "past, current and future planned structures north of the Clearwater River". Cabins mapped in the LSA, and maximum disturbance area are at Broach Lake, Patterson Lake, Forrest Lake, Beet Lake, Dahle Lake, and along the Clearwater River. CRDN members have been living, travelling, hunting, trapping, fishing, gathering and carrying out other cultural and/or commercial activities in their traditional lands, including the Goráchághı tu/Pelican Lake for thousands of years. These activities, and the resources that support them, are key to maintaining CRDN's strong connection to their No Hoe Neneh today and for future generations. CRDN members highlighted the importance of species including moose, fish, birds and wildlife in their diet and culture. Moose hunting locations and harvesting camps have been mapped near and around Patterson Lake and in the LSA and RSA while other noted mammals harvested and trapped in the immediate vicinity of Goráchághı tu/Pelican Lake included woodland caribou, rabbit, black bear, muskrat, beaver, porcupine, and marten among others.

One of the heaviest concentrations of contemporary harvesting by CRDN members is in the RSA in the region between the Clearwater River north to the Douglas River, approximately 70 km north of the proposed Project, where members use lakes and rivers on both sides of the highway for traditional activities. Closer to the Project site, CRDN participants identified fishing locations near the SSA and in the LSA at Patterson Lake and in the smaller lakes and creeks close to the Project site including Forest, Beet, Preston and Lloyd lakes all withing the same watershed in the LSA and RSA. Noted fish species harvested included from Patterson Lake and within the surrounding lakes in the RSA includes arctic grayling, northern pike, lake whitefish, cisco, lake trout, burbot, walleye, and suckers. It is believed that all waters within CRDN traditional lands are also understood to be connected to the underground hydrology which include muskegs and the importance of clear, clean water and its value is essential to Denesuline culture. Clean water is described as inextricably connected to CRDN livelihoods, practices, customs and spirituality and many CRDN members are concerned about the impacts and contamination resulting from the Project.

Plant and berry harvesting areas were also mapped in the LSA around Patterson Lake to the proposed Project site by CRDN. Several CRDN members have increasing concerns about being displaced by government and/or industry to leave cabins located within exploration lease areas which surround Goráchághı tu/Pelican Lake. A location such as Goráchághı tu/Pelican Lake where plant medicines, berries, or moose have been intensively and continuously harvested for

generations beyond memory, is inextricably linked to innumerable stories and teachings which are integral to CRDN's history, heritage and identity. CRDN had concerns that the loss of such a place may contribute to the erosion of Denesųłiné ecosystem knowledge, stories, lore, teachings, and customary practices.

7.4.1.2. Métis Nation Saskatchewan (MN-S) – Northern Region 2 (NR-2)

The Project site is located within Métis Northern Region 2 (MN-S NR-2) in northwest Saskatchewan which extends geographically from Cree Lake in the east to the Saskatchewan-Alberta border in the west, and from Buffalo Narrows in the south to Lake Athabasca in the north. Métis citizens from NR-2 have strong ties and interest in the Project area and several key Métis communities with whom NexGen and CNSC have been engaging with throughout the regulatory process within MN-S NR-2 includes the Métis Locals of La Loche, Buffalo Narrows, Turner Lake, Bear Creek, Michel Village, St. Georges Hill, and Black Point who access the Project area via road traveling north on highway 955 from their communities.

The MN-S NR-2 Traditional Land Use and Diet Study that was supported by NexGen and was shared with CNSC staff 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-2 and in proximity to the proposed Project. The study provided by MN-S NR-2 identified hunting, fishing, trapping and medicinal plant and berry harvesting sites throughout both the LSA and RSA and near Patterson Lake and several other lakes along the highway 955 corridor. In addition, the MN-S NR-2 also shared that there are culturally important current use and historical sites located within the LSA and RSA, including transportation travel routes, seasonal campsites, and gathering sites that are used for knowledge transfer and Métis teachings. These cultural activities related directly to the Métis peoples' traditional dietary habits, dependence on traditional foods and harvesting for medicinal purposes and essential to Métis identity.

MN-S members had concerns that the Project could impact their ability to hunt, trap, gather and fish and traditional country foods diet including moose, rabbit, grouse, ducks, fish, berries and plants is critical to MN-S NR2 members. In addition, the LSA provides harvesting locations which are also important for the collection of natural medicines. Rat root and birch bark are collected and used for medicine, as is birch syrup, the harvesting of which continues to be passed down in the area. MN-S also shared that the Patterson Lake area remains a cultural important area for the Métis where culture is passed down to youth through their knowledge of the land and their shared language that provides a sense of community and permanence. Informed by its experience with the Cluff Lake mine, several MN-S members were concerned with respect to the perceived contamination and decommissioning that took place for Cluff Lake and were worried that Patterson Lake will end the same way causing fear and avoidance behavior for its members from harvesting within the Project area.

7.4.1.3. Birch Narrows Dene Nation (BNDN)

BNDN is a Denesųłiné First Nation band located in Treaty 10 and the community of Turner Lake is located approximately 135 km in a straight line to the southeast and 230 km by road from the Project. BNDN members have occupied the lands of "Dene Nene" or "Land of the People" in northwestern Saskatchewan since time immemorial in accordance with their own laws and

system of government. BNDN has 3 reserves, one at Turnor Lake (IR 193B) which adjoins the village of Turnor Lake, Saskatchewan and is the main reserve for BNDN. Churchill Lake (IR 193A) is at the junction of Churchill Lake and Frobisher Lake, and Turnor Lake (IR 194) is on Peter Pond Lake east of Dillon, Saskatchewan. BNDN members continue to hunt, fish, gather and trap on the lands throughout our Ancestral Lands across northwestern Saskatchewan. The lands, waters and resources throughout their Ancestral Lands are essential to the well-being and survival of BNDN's way of life including associated knowledge, land use, occupancy and culture.

Important fishing locations were identified in the LSA and RSA including Patterson Lake, Forest Lake, Preston Lake, and Lloyd Lake. Other lakes that are located further afield which are of importance to BNDN residents to harvest fish from include Descharme Lake, Careen Lake, Proudfoot Lake, and Turnor Lake. BNDN identified values related to fishing including trails and a cabin site used while recreational fishing areas within the LSA and RSA. BNDN members fish several lakes in their traditional territory but outside the LSA which includes commercial fishing, winter fishing, and subsistence fishing.

BNDN also shared that harvesting plants for food and medicine are important activities for many BNDN members within the LSA and RSA, and important aspects of BNDN cultural life. Water is also considered medicinal and is often an ingredient in traditional medicines. BNDN identified two blueberry gathering sites, a portage location, water monitoring sites and drinking water locations within the LSA. Hunting and trapping still play and important role in BNDN culture and identity. BNDN members hunt large and small game throughout their traditional territory, including moose, deer, and birds. Moose are considered a current staple, and BNDN members previously relied in the past on caribou, but they have become increasingly rare in the region. BNDN members use the LSA and RSA for hunting and continue to trap in the RSA as it is an important source of food and furs for community members including fisher, beaver, muskrat, mink, lynx and marten. BNDN also shared concerns around Indigenous land use practices influencing the community and sense of place, spirituality, ceremonies, knowledge transmission, place names, travel routes and habitation sites.

7.4.1.4. Buffalo River Dene Nation (BRDN)

BRDN is a Denesųłiné First Nation located in Treaty 10, and their Dene ancestors traditionally occupied territory in northern Saskatchewan that extended from Lake Athabasca to the north, Ta Touie Lake to the east, Cold Lake to the south, and the Athabasca River to the west. The BRDN's current reserve land is Buffalo River Dene Nation 193 situated approximately 84 kilometres northwest of Île-à-la-Crosse, on the western shore of Peter Pond Lake near Dillon, Saskatchewan. The Project is located approximately 190 km to from the main BRDN reserve in a straight-line distance and 330 km by road and is within BRDN's traditional territory. There is limited documented land use by BRDN in the LSA, with most of the usage occurring in the RSA. BRDN members have hunted or currently hunt in the LSA and RSA and site-specific hunting and trapping values were 25 km from the Project site.

7.4.1.5. Athabasca Denesųłiné (AD)

Black Lake (Treaty 8), Fond du Lac (Treaty 8), and Hatchet Lake Denesųłiné First Nations (Treaty 10) are collectively termed the Athabasca Denesųłiné (AD) and are represented by the Ya'Thi Néné Lands and Resources Office (YNLR). Fond du Lac First Nation is the closest AD

First Nation to the Project and is located approximately 180 km in a straight-line distance to the northeast or approximately 1,335 km by road. Black Lake is located approximately 260 km in a straight-line distance to the northeast or approximately 1,230 km by road. YNLR asserts that treaty rights are practiced within the RSA and that the project area overlaps the southwestern extent of the AD's traditional territory, in Nuhenéné and that the AD generally access their traditional territory in the vicinity of the Project by means other than road.

The land use information shared with NexGen and CNSC by YNLR indicates that some AD members access and use the RSA for hunting, fishing, trapping and gathering activities, and that there are important cultural overnight travel routes and sites located in the RSA. Barren-ground caribou remains the most important resource for the Athabasca Dene people and members continue to harvest barren-ground caribou for subsistence and cultural purposes. Although the barren-ground caribou herds currently do not travel far enough south into the Project area, YNLR also indicated that other large game species are harvested in the RSA including moose. The protection of woodland caribou is also of the upmost importance to the AD and they have expressed concerns that the increased levels of traffic and human disturbance will have on the decline of the species. Other traditional land use activities practiced by YNLR members in the RSA included harvesting of small game, fish, and berries as well as overnight sites and historical travel routes. Current sites, such as cabins and culture camps were not documented in the LSA or RSA by the YNLR.

7.4.1.6. Athabasca Chipewyan First Nation (ACFN)

ACFN is a Denesųłiné First Nation with a primary community in Fort Chipewyan in northeastern Alberta, approximately 223 km north of eɬídlı̨kǫ́ę́ (Fort McMurray); reserve lands on the south shore of Lake Athabasca, on the Athabasca Delta, and on the des nedhé (Athabasca River) in Alberta. ACFN is a Treaty 8 First Nation descended from the K'ai Tailé Dené, or the "people of the land of the willow," who hold deep ties to their lands and resources across present-day northern Alberta, northern Saskatchewan, and the Northwest Territories. ACFN has constitutionally protected Aboriginal and treaty rights that extend throughout their ancestral homelands. Fort Chipewyan is closest ACFN community to the Project and is located approximately 160 km to the northwest in a straight-line distance or approximately 620 km by road including a portion of a winter road.

ACFN's Ancestral Lands encompass a large section of the boreal forest in present-day northern Alberta and northwestern Saskatchewan, with traditional activity focused throughout the northwest corner of the Athabasca basin. ACFN members have used and continue to use areas within the Athabasca basin with concentrated land use around łuezą́n tué chogh (Carswell Lake), łuezą́n túaze (Cluff Lake), thai tué (Sandy Lake) and Lake Athabasca within the RSA for a variety of subsistence, cultural, and traditional purposes. ACFN reported that community members rely on territory in Saskatchewan for subsistence including moose hunting and berry gathering as well as fishing in areas in the RSA. ACFN members noted hunting for moose and caribou on the Saskatchewan side of the traditional territory is particularly important to ACFN as it is relatively undisturbed in comparison to the Alberta side. Notable transportation routes included Highway 955 and a route paralleling Highway 955, and routes through and around Lake Athabasca in the RSA. ACFN also identified N22 and N23 traplines, that are in the RSA on the south and north side of Lake Athabasca respectively, that have been held by multiple generations of ACFN members. Cultural/Spiritual values noted by ACFN are concentrated within the RSA

along the south shore of Lake Athabasca, and surrounding Beaverlodge Lake including the decommissioned Beaverlodge (neé Eldorado) mine.

7.4.1.7. Other Indigenous Nations and Communities

Willow Lake Métis Nation (Alberta) and the Mikisew Cree First Nation (MCFN, Treaty 8) have recently expressed interest in the Project. WLMN have shared that the Project may have the potential to impact land users in the region as the Nation has asserted Métis rights in the Project area. However, CNSC staff have not been provided any information to ILRU that is carried out near the Project area or within SSA, LSA, or the RSA by WLMN. Both Nations have indicated that they do have concerns and utilize the region downstream of the project in Alberta to hunt, trap, fish, gather and carry out ceremonial purposes. MCFN has indicated that Nation members do not practice in the Project area, however, areas in Saskatchewan, including the Project area, are increasingly important to Nation members given the development pressures on MCFN's traditional territory in Alberta. The CNSC is open to receiving additional information and details regarding each Nation's ILRU in the region should each Nations be willing to share additional land use information and data specific to the Project area.

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 25-H12.

7.4.2. Proponent's assessment

NexGen'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, 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 (SSA, 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, 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. NexGen's ILRU VC focused on land and resource use by the CRDN, MN-S, BNDN, and BRDN. In addition, Fond du Lac Denesųłiné First Nation and the Black Lake Denesųłiné First Nation of the Athabasca Denesųłiné, showed interest in the Project, and are represented by Ya'thi Néné Lands and Resources (YNLR). ACFN, as well as Willow Lake Métis Nation also have indicated that they have rights and interests in the area that may be potentially impacted by the Project.

The LSA and RSA for the Indigenous land and resource use VC were defined to include predicted effects on supporting intermediate components (e.g., noise, air quality) and VCs (e.g., fish and fish habitat, traditional use of plants, wildlife and wildlife habitat). The Indigenous land and resource use LSA includes the areas surrounding Patterson, Forrest, Beet, and Naomi lakes, plus the Highway 955 corridor between the Project site and the community of La Loche. The Indigenous land and resource use RSA included the four fur blocks closest to the local communities (N-15, N-17, N-19, and N-21) and captures the broad traditional use activities and patterns of Indigenous Nations and communities in the region. More specifically, the LSA and

RSA for Indigenous land and resource use were developed to reflect the spatial extent of anticipated direct and indirect Project effects on supporting intermediate components and VCs, along with known and documented land use patterns by several Indigenous Nations and communities' traditional territories across the region (NexGen, 2025).

In relation to access to and/or the quality and quantity of hunting, fishing, trapping and gathering activities, NexGen did not predict any residual effects from the project due to changes in the biophysical environment on ILRU, after the implementation of proposed mitigation and follow-up monitoring program measures. Within the SSA, 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. NexGen determined that the Project will likely result in localized and temporal disturbances to ILRU and access to lands and resources used by Indigenous Nations for traditional purposes would be reduced within the maximum disturbance area by 981 ha or 0.7% of the broader LSA. The effect is expected to be minor due to the currently limited amount of ILRU activity occurring within the maximum disturbance area combined with other commercial trapping areas available in close proximity to the site.

Throughout all phases of the Project, monitoring and communication would be key to creating positive working relationships that would facilitate open communication with local Indigenous Nations and communities and local land users such as the N-19 Trappers Association among others. Additionally, the Project is not predicted to restrict access to and between the lakes in the Indigenous land and resource use in the LSA. To minimize the quantity of land that is disturbed by the Project, NexGen has reduced the proposed Project footprint to be developed within previously disturbed areas, to the extent possible, including roads currently used for exploration activities.

In relation to the potential effects on the availability of fish, traditional use plants and wildlife for harvesting and availability was also assessed by NexGen for ILRU. The results of these assessments were then considered within the context of Indigenous land and resource use to determine how changes in the availability of resources harvested may affect hunting, trapping, fishing, and gathering activities.

The Project may result in changes to the availability of fish, plants, and wildlife for harvesting because of increased competition for resources important to Indigenous land and resource use through changes in access and the presence of the Project workforce during construction and operations. NexGen determined that the Project could change the availability of fish, plants, and wildlife for harvesting through the potential for increased access, which could result in increased competition for resources due potential improvements to Highway 955 and increased traffic and familiarity to the region. Workforce members will be transported to/from site via a fly-in/fly-out in 2-week rotation and will, therefore will help to reduce fishing pressure on local lakes. The main Project site entrance would also be gated to control public access to the Project site, which would also limit public road access to local plant harvesting and hunting opportunities and road access to Patterson Lake for fishing. Project-induced changes to fish quantity in Patterson Lake are expected to be negligible and the abundance and distribution of fish species were not expected to be detectable due the project.

Effects on current resource availability to terrestrial resources including plants, and large game were determined to be low in magnitude, local, and reversible, as most large game hunting and

gathering within the Project area is sparse to infrequent and most of the large game hunting take place outside the LSA. Effects on resource availability of the aquatic and terrestrial species were, therefore, not expected to affect subsistence hunting, trapping, and gathering because the effects were anticipated to be of low magnitude and reversible.

Overall, the Project is expected to have a small, local effect on Indigenous land and resource use although irreversible for traditional plants in small areas of potentially affected wetland ecosystems where effects are assumed to be permanent. Indigenous land and resource users are concerned about the potential exposure to contamination of hazardous waste to surface water and groundwater due to underground tailings, plants and soils due to air emissions, and overall, impacts to traditional foods including fish, moose and berries and plants. These concerns may thus impact perceptions around the overall quality of the resource use for land users in the region. 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 perceived risks 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 toxicological risks to humans, including Indigenous resource harvesters who consume high proportion of traditional foods close to the Project site and included exposure to ILRU and high consumption of traditional foods.

The HHRA predicted no significant adverse effects associated with exposure to non-radiological and radiological COPCs. Local Indigenous communities have also expressed concerns related to increased bioaccumulation of contaminants in fish tissues due to project-related effects, therefore NexGen has committed to supporting additional Indigenous led monitoring in the aquatic environment relevant to the list of identified COPC's over the life of the project to monitor changes in 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. NexGen has committed to monitoring the health risks from fish consumption by comparing fish tissue data collected during operations from their EMP against applicable human health risk-based maximum permissible concentrations and working with local Indigenous Nations and communities to complete a traditional foods study before construction begins to help validate/modify dietary assumptions made in the HHRA that can used to compare to baseline moving forward.

NexGen 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. Potential Project-related effects for Heritage Resources were limited to the areas where ground disturbance will occur and primarily, in the immediate SSA where the main Project infrastructure will be located (130 ha): a large level upland where the airstrip will be located (17 ha); shoreline area along Patterson Lake along the access road to site (33 ha). Based on defined criteria for a Heritage Resource Impact Assessment (HRIA), an HRIA was completed that assessed areas with heritage resource potential within the Project footprint and three general study areas during the baseline studies based on defined criteria for an HRIA by Saskatchewan's Heritage Conservation Branch (HCB).

In total, 180 ha were assessed, and no heritage resources were identified in the survey area. Following a review of the HRIA, the HCB confirmed that the HRIA met the requirements of section 63 of The Heritage Property Act, and no further assessment was required. NexGen determined that given the low number of Heritage Resources within the Project site, 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 proposed) that might affect heritage resources will be required to be submitted to the HCB for their review, and additional HRIAs may be required. Completion of the impact assessment and implementation of the chance find procedure is expected to protect archaeological and heritage resources.

Indigenous land users may also experience indirect effects through disturbances from traffic, noise, light, air quality changes, changes related to the relationship to the land, and increased competition for resources to increased traffic and safety concerns in the area as was included in NexGen's assessment. These indirect impacts in the decrease in quality of resources and land user experience may be considered to represent important losses of land and resource use and cultural connections for some individuals. NexGen deemed changes to the perceived experience of land users would be limited and that proven mitigation measures from the mining sector in northern Saskatchewan 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. NexGen'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. NexGen determined the residual adverse effects for the perceived suitability of lands and resources are expected to be moderate in magnitude, limited in geographic extent, and reversible, and the conclusion relative to changes to ILRU is not significant. NexGen 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 mining. NexGen acknowledges that continued land and resource use activities are critical to local Indigenous Nations and communities, and necessary to maintain a social licence to operate. NexGen has committed to mitigations to improve perceptions on the quality of resources and cultural landscape and would include environmental committees with Indigenous Nations, an independent Indigenous monitoring program, Indigenous and Public Engagement Program to communicate results from the Project and independent environmental monitoring, and commitments contained within the benefit agreements such as monetary and human resources to support community-related initiatives in areas such as cultural and traditional values for ILRU.

7.4.3. Views expressed

Several Indigenous Nations and communities raised concerns with the Project's ability to affect their ILRU throughout the regulatory review process. Several Indigenous Nations and communities shared, and their views expressed that relate to ILRU are presented in the section below.

7.4.3.1. Indigenous Land Use

CRDN has previously shared that a location such as Goráchághı tu/Pelican Lake (Patterson Lake Area), where plant medicines, berries, or moose have been intensively and continuously harvested for generations is inextricably linked to the stories and teachings which are integral to CRDN's history, heritage and identity. Since CRDN harvesting activities are discontinued when an area is deemed to be unclean, the appearance of the drilling barges resulted in an immediate cessation of fishing activities on the lake as was reported by a number of CRDN harvesters in 2014 and again in 2016. More harvesting cessations at Goráchághı tu/Pelican Lake were reported in the 2020 IRKS interviews. CRDN members also noted experiencing loss of access to longstanding harvesting areas, loss of access to longstanding trails and travel routes, and loss of access to cabins and harvesting camps. NexGen has committed to establishing a closure landscape that would be accessible for unrestricted traditional use by Indigenous Nations and communities as a decommissioning and reclamation objective. Continued ability to participate in Indigenous land and resource use activities, which considered the importance of intergenerational knowledge transfer, was included as an assessment endpoint. NexGen noted that changes to the availability and quality of fish for harvesting were assessed in the EA pathway analyses and has committed mitigation measures including Project-specific Groundwater, Effluent, and EMPs, installing effluent and sewage treatment plants, and avoiding critical or sensitive habitat to the extent practical during construction.

MN-S Northern Region 2 (NR-2) members had previously shared concerns about accessing existing traplines in proximity to the potential mine site. MN-S NR-2 members expressed the need for locals to control the land, not industry, as industry leasing the land from the province it restricts access to their traplines and cabins. MN-S had previously requested that NexGen work with MN-S to develop fishing policies that consider both fisheries protection and traditional use activities for the project. NexGen has committed to accommodation measures including limiting the project footprint to the extent practical and controlling public access to the site.

BNDN members emphasised that fishing is important for subsistence, survival, livelihood and is an important part of community and cultural life. These values are connected to the traditional territory and rely on BNDN members having unimpeded and undisturbed access to the territory. BNDN also highlighted the importance that place names have in connecting contemporary members with the history of their people and in knowledge transmission. This knowledge transmission often requires access to the land and uncontaminated resources. Additional values related to cultural continuity included a cabin site, teaching areas, a gathering site, and Dene place names. BNDN members identified an important site known as the dancing ground where the Dene people would gather to celebrate, hunt and fish. NexGen noted that the importance of intergenerational transmission of knowledge was considered in the assessment of changes to access to Indigenous land, and changes to availability of fish, plants, and wildlife for were measurement indicators for the assessment of Indigenous land and resource use.

BRDN has previously shared concerns about project access limitations to lands and resources, and implications this would cause to transmitting IK to younger generations. BRDN has also shared concerns about the ability to harvest country foods and implications surrounding food security and community well-being for those using the land for food harvesting. BRDN also raised concerns with respect to noise due to truck traffic and how that may impact animals in the

region. NexGen confirmed that the importance of intergenerational transmission of knowledge was considered in the assessment of changes to access to Indigenous land, and changes to availability of fish, plants, and wildlife for harvesting as well as changes to sensory disturbance were measurement indicators for the assessment of Indigenous land and resource use. NexGen has committed to accommodation measures including limiting the project footprint to the extent practical and controlling public access to the site. Furthermore, results generally showed that effects due to changes in air quality and noise would be minor, and while maintenance of Highway 955 is outside of NexGen's control they have committed to discussions with the Saskatchewan Ministry of Highways to develop a road upgrade and maintenance agreement to minimize noise.

YNLR raised concerns that NexGen did not fully include and consider their IK and land use studies in the area and would have liked NexGen to support a more detailed land use study so that they could both contribute to a baseline of ecological knowledge and cultural use in the Project area. YNLR noted concerns that the Athabasca Denesųłiné traditional territory and documented traditional use, while recognized by the proponent to a degree, does not appear to be considered fully within the environmental assessment (EA) process. YNLR noted that the availability of wildlife, fish and traditional land use plants will not be sustainable as the result of the Project and conclusions regarding local resource users should be reconsidered. NexGen committed to continued engagement with YNLR throughout the Project lifespan including formalized agreements to support the inclusion of IK in Project materials. NexGen has acknowledged the potential overlap with the Athabasca Denesųłiné traditional territory within the RSA was omitted and has since included the information in the final EIS. NexGen maintained that the methodology used to conduct the EA resulted in an accurate characterization of potential effects on people and the environment but has supported robust-follow up monitoring to ensure impacts on local resources are minimized.

ACFN indicated that further uranium mining exploration or development in the study area is anticipated to have potential adverse effects on their treaty rights and add to the ongoing cumulative effects in the region. NexGen confirmed cumulative effects of the Project; previous, existing and approved projects, and RFDs were assessed for the Projects with similar effects on the same VCs and intermediate components. ACFN traplines north of Cluff Lake are ancient to ACFN members and have a network for harvesting and spiritual values. Respondents spoke of the unwelcoming atmosphere and feeling that Alberta-Saskatchewan has created with people being territorial over traplines and individuals requiring hunting licenses for the Territories and Saskatchewan. One respondent who has used the N22 trapline for 30 years indicated that once they pass away, they have been told they will not be able to pass along the trapline to a family member as the trapline will revert to provincial ownership and be open to Saskatchewan residents only. This will end the transfer of knowledge of this trapline for ACFN members and may impact the livelihood of younger generations. NexGen has committed to establishing a closure landscape that would be accessible for unrestricted traditional use by Indigenous Nations and communities as a decommissioning and reclamation objective. Continued ability to participate in Indigenous land and resource use activities, which considered the importance of intergenerational knowledge transfer, was included as an assessment endpoint.

ACFN also shared concerns that NexGen did not provide enough capacity funding to support meaningful engagement on the Rook I Project to complete a land use study. ACFN was unable to determine potential impacts to treaty rights early in the EA process through independent and objective review of the project impacts on ACFN's land use in the region. ACFN has also expressed concerns that Indigenous Knowledge and land use from ACFN had not yet been included or considered in NexGen's EIS and that a fulsome consideration of ACFN's Indigenous Knowledge and land use was needed to assess the impacts the Project may have on ACFN's rights. NexGen noted that in their opinion that capacity funding for a full land use study agreement with ACFN is not warranted as the Project location is located outside of the ACFN Homeland (ACFN 2010) and traditional territory (ACFN 2012), and therefore NexGen maintains the Project is not anticipated to directly affect ACFN land. However, NexGen has committed to developing an engagement agreement with the intent to allow discussions of the Project and NexGen activities where ACFN may be directly or indirectly affected. NexGen further noted that available information, including information provided by ACFN, did not demonstrate that the ACFN have documented traditional land use activities within any of the Project local study areas. CNSC provided funding to ACFN to conduct a regional IK/TLU study, including the project area. The results of the study did not demonstrate any direct use in the project area, however CNSC staff continues to work with ACFN to better understand and address any concerns in relation to the Project.

7.4.3.2. Landscape Fragmentation and Changes to Terrestrial Environment

CRDN had previously expressed concerns regarding habitat degradation and species decline resulting from the Project. CRDN members highlighted the importance of species including moose, fish, birds and wildlife in their diet and culture. The observed decrease in animal populations within CRDN traditional lands up north, reported by CRDN members since 2014, is a matter of particular concern reported by the Nation's hunters who find that they are having to travel further and further away to maximize the success of their efforts to procure moose meat for household. Some CRDN community members felt that habitat destruction and degradation and resultant species declines had already occurred at Goráchághı tu/Pelican Lake due to exploration activities and that they were anticipated to be exacerbated by the more than two decades of active uranium extraction and milling operations that are being proposed.

CRDN had also previously shared concerns that the provincial government and proponents of industrial and extractive projects are inclined to characterize exploratory endeavors as low impact activities which do not warrant consultation with potentially affected Indigenous communities. Yet the range and extent of reported mineral exploration disturbances have physically affected CRDN traditional land use, and the customary activities of members include no hunting/access signage, harassment, access roads, drilling pads, camps, cutlines, clear-cutting, waste and garbage, noise/lights, traffic, and wildfires. NexGen has committed to mitigation measures to minimize Project effects to the environment, Indigenous land and resources, and ecological and human health. This includes continued engagement with CRDN, environmental protection and monitoring plans, and minimizing the project footprint to the extent practical. Project-specific and independent Indigenous monitoring programs will support reaching

environmental objectives during the Projects lifespan. NexGen maintains that cumulative and residual effects were comprehensively assessed.

MN-S had previously shared concerns that moose have moved further away because there is too much activity in the area, and one member noted that not only are there are fewer fish in the lakes, but coyotes are also venturing into the community now because there is less food for them to hunt. NexGen has committed to developing details for an EMP during licensing (licence to prepare site and construct) with mechanisms for wildlife surveillance and independent Indigenous monitoring to observe and address changes in movement routes.

BNDN emphasizes the importance of hunting and trapping to the culture and subsistence ways of life for members of BNDN. Their study highlighted that there are key hunting and trapping locations throughout their territory and many members travel north to hunt and beyond. BNDN notes that moose and caribou are important resources for BNDN hunters. NexGen has committed to establishing a closure landscape that would be accessible for unrestricted traditional use, including hunting and trapping, by Indigenous Nations and communities as a decommissioning and reclamation objective. NexGen noted that changes in public access to hunting areas was evaluated in the EA, and upgrades to road access are not expected to result in measurable change to existing hunting access, while mitigation measures (e.g. not allowing employees to hunt within the mine lease boundary) are also expected to minimize potential effects to wildlife. Furthermore, NexGen has committed to developing a CMOP which is predicted to make residual adverse effects to woodland caribou not significant and includes engagement with Indigenous Nations and communities through its development.

7.4.3.3. Surface water and groundwater Contamination

CRDN had previously expressed apprehension 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 No Hoe Neneh. The proposed Rook I uranium mine and mill is situated in the upper reaches of the Des Nëtthé [Clearwater River] Watershed. Goráchághı tu/Pelican Lake is a main lake which is an integral part of Des Nëtthé [Clearwater River] system – the big/wide river which flows through the greater part of CRDN's traditional lands. All the waters within CRDN traditional lands are also understood to be connected to underground rivers which include muskegs. NexGen noted that changes to the availability and quality of fish for harvesting were assessed in the EA pathway analyses and has committed mitigation measures including Project-specific environmental monitoring plans, installing effluent and sewage treatment plants, and avoiding critical or sensitive habitat to the extent practical during construction. NexGen will establish an Environmental Committee to monitor environmental performance of the Project, will provide funding for full-time independent Indigenous Monitors, and will continue to address concerns and minimize adverse impacts to surface water quality.

For CRDN members, it was previously stated that an operating uranium mine and mill would increase the risk of above and below ground waters being contaminated with radioactive materials, heavy metals, and other toxic elements through industrial process water use and release, accidents, malfunctions, and other unplanned events. CRDN Denesuline standards for

clean water, air, and ground differ from western scientific and government-approved standards. CRDN had emphasized that they cannot be invalidated and dismissed in the regulatory assessment process as 'perceived misconceptions. CRDN Denesuline 'perceptions' of contamination (i.e. unclean conditions) are actual impacts (observed and experienced) although in regulatory processes such perceptions are typically dismissed as unfounded (perceived) by western scientific definition. NexGen has committed to engaging directly with CRDN throughout the Project lifespan regarding ways to minimize perceived effects of the project.

A massive fish decline is reported to have occurred at Goráchághı tu/Pelican Lake following exploratory drilling which took place on the lake, sometime during the late 1970s and 1980s (while Cluff Lake Mine was in operation). Deformities in fish that were caught at the time were also noted. NexGen noted that perception of Project effects was considered within the assessment of Indigenous land and resource use, and that perceived/observed impacts have been considered and valued equally to scientific data collection. NexGen has committed to engaging directly with CRDN throughout the Project lifespan regarding ways to minimize perceived effects of the project.

BNDN members have shared that they have experienced negative changes related to fishing in recent decades, including an increase in diseased or unhealthy fish being caught and that fish in Patterson Lake are diseased and that this could be attributed to the contamination caused by the drilling and mining activities. BNDN has also raised concerns about contaminants spreading through the water system and spreading via interconnected lakes and rivers, notably downstream through the Clearwater River system. NexGen confirmed that Project effects on local and regional waterbodies and watercourses were assessed. Primary effects pathways assessed included deposition of fugitive dust emissions on waterbodies, deposition of criteria air contaminant emissions on waterbodies, discharge of treated effluent, discharge of treated sewage, seepage from the waste rock storage areas during construction and Operations, and runoff and seepage from the waste rock storage areas and underground tailings management facility following Closure. Furthermore, NexGen has committed to mitigation measures including Project-specific environmental monitoring plans, installing effluent and sewage treatment plants, and avoiding critical or sensitive habitat to the extent practical during construction. NexGen will establish an Environmental Committee to monitor environmental performance of the Project, and will provide funding for full-time independent Indigenous Monitors, to address concerns and minimize adverse impacts to surface water quality.

7.4.3.4. Increased Access & Changes to Access

CRDN members had previously shared concerns about being displaced from Goráchághı tu/Pelican Lake as a result of NexGen's exploration activities. CRDN members had also noted experiencing loss of access to longstanding harvesting areas, loss of access to longstanding trails and travel routes, and loss of access to cabins and harvesting camps. The presence of so many outsiders within No Hoe Neneh has resulted in an unknown number of CRDN members constraining their customary activities or removing themselves from the Patterson Lake area for reasons of emotional, spiritual, and physical safety. CRDN had also previously noted that with all the mineral exploration activities taking place up north, traffic on Cluff Lake road (955) is

reported to have steadily increased, and the heavy traffic and activities are chasing the animals away making it necessary for hunters to travel further and further out or north. CRDN members also noted that travel up north is not as quiet and relaxing as it once was. NexGen has committed to establishing a closure landscape that would be accessible for unrestricted traditional use by Indigenous Nations and communities as a decommissioning and reclamation objective. Continued ability to participate in Indigenous land and resource use activities, which considered the importance of intergenerational knowledge transfer, was included as an assessment endpoint.

MN-S requested additional information related to the ongoing management and maintenance of Highway 955 given this is an important travel route to access traditional use areas. MN-S also shared that the Métis had strong kinship and familial ties to the area and that knowledge shared through oral history may be potentially impacted. Both CRDN and MN-S expressed concern that the Clearwater River is a culturally important river and waterway and must be protected. NexGen noted that development of the Project Ground Transportation Emergency Response Plan would occur during licensing (licence to prepare site and construct) and involve engagement with MN-S. NexGen has also acknowledged that maintenance of Highway 955 is outside of NexGen's control but has continued discussions with the Saskatchewan Ministry of Highways and has developed a road upgrade and maintenance agreement.

BNDN members' have concerns with respect to the disruption of the sense of place due to increase in traffic, human activity, and garbage, as well as changes to valued landscape features, as a result of the potential Project. Increases in traffic in the region and beyond due to Project activities and non-Indigenous recreational users impeding the ability of BNDN members to access preferred hunting, fishing and trapping areas is a real concern. BNDN also raised concerns on the potential to the loss of access to cabins, campsites, and travel routes due to avoidance and the installation of Project gating and other security measures and therefore the ability and opportunity of BNDN members to transmit cultural knowledge to future generations. NexGen noted that according to emails exchanged with BNDN, concerns regarding the disruption of sense of place were addressed in a workshop conducted with BNDN in December of 2022. NexGen has committed to mitigation measures including limiting the Project footprint to the extent practical by optimizing area cleared and using existing infrastructure, and implementing progressive reclamation to minimize effects associated with cultural continuity.

BRDN shared concerns about safety of truck transportation, including the number of trucks on the road, and spill response and who will be responsible for cleanup if spills do occur. BRDN has also raised concerns about increased development and industrial activity leading to increased competition with non-Indigenous recreational land-users for hunting and fishing in the region. BRDN is also concerned about cumulative access restrictions within BRDN traditional territory. NexGen confirmed the potential for accidental spills due to traffic accidents were assessed in the EIS and noted mitigating factors including future upgrades to existing access roads, speed limits for the access road and Clearwater River Bridge crossing, clear signage and the issuance of no-travel orders in unsafe conditions. Furthermore, NexGen has committed to developing a Ground Transportation Emergency Response Plan. Finally, NexGen has noted that continued ability to participate in Indigenous land and resource use activities, which considered the importance of

intergenerational knowledge transfer, was considered in the assessment of land use and NexGen has committed to mitigation measures to limit the Project footprint and minimize access restrictions within BRDN territory. These mitigation measures are intended to address concerns regarding competition with non-Indigenous land users.

YNLR indicated that hunting and trapping pressures may increase on several species due to the presence of work camps and increased access to the Project area. NexGen noted that predation by wolves is the dominating limiting factor to woodland caribou populations and increased hunting pressure is not expected. The project is not expected to increase access for humans and predators as an access road to the Project area already exists, and mitigation measures such as the installation of a gatehouse and not allowing employees to hunt within the mine lease boundary are expected to minimize potential effects to wildlife, including moose and grey wolves.

7.4.3.5. Legacy Impacts and Fear and Avoidance

CRDN members had noted that the perception of uranium contamination/radioactivity at Cluff Lake Mine in the present day is widespread within CRDN and the La Loche community and other Indigenous communities in the north. CRDN and other Indigenous Nations have noted that even if it looks nice and green on the surface, members are very aware of what's underneath the ground and caution avoidance of the area. Although the Cluff Lake Mine area was declared 'safe' according to current regulatory standards (some twenty years earlier), for many CRDN harvesters it still does not meet Denesuline standards of what is safe or clean. NexGen noted that perception of Project effects was considered within the assessment of Indigenous land and resource use. NexGen acknowledged that continued land and resource use is critical to local Indigenous Nations and communities and has committed to engaging directly CRDN throughout the Project lifespan regarding ways to minimize perceived effects of the project.

MN-S NR2 members had previously indicated that they do not believe that the Cluff lake mine was properly decommissioned and therefore do not trust the government's requirements as they pertain to the proposed NexGen Project. They questioned the manner with which the Cluff lake tailings pond was decommissioned, and they do not trust the method used and want to know if there is radioactive contamination on the surface of waste rock. Informed by its experience with Cluff lake the community has many concerns, the biggest of which is its distrust for the industry, an industry which in their opinion refuses to explicitly state the dangers involved with uranium extraction. In general, members believe that the deaths of those who worked at the mine were a result of exposure, and that the high cancer rates throughout the community are also a result of exposure to uranium in dust, water, animals and plants. MN-S NR-2 community members have also noticed a change in the quality of meat and pelts. Members have noted increased contamination in the food, especially from further north while others expressed a fear of eating fish, rabbits and moose from the north due to the legacy issues of Cluff lake. NexGen noted that a detailed Project Decommissioning and Reclamation Plan would occur during licensing (licence to prepare site and construct) and involve engagement with MN-S through the Environmental Committee. Independent Indigenous monitoring and discussions with MN-S throughout the Projects life through the Environmental Committee will result in an accurate understanding of Project effects and can inform progressive reclamation and adaptive management. NexGen

assessed multiple pathways that may adversely affect human health through food ingestion including emission and deposition of fugitive dust, radon, criteria air contaminants, and suspended solids as well as discharge of treated effluent and site runoff and committed to implementing a series of mitigation measures to minimize impacts on human health and the surrounding environment.

7.4.3.6. Community Health and Socio-Economic

CRDN members had previously reported concerns that there was a noticeable rise in cancer cases within the La Loche community-at-large which was attributed to mine-related employment and the transport of milled uranium (yellowcake) through the Northern Village of La Loche during Cluff lake operations and people are concerned the same may happen again. Of the many stories which circulate within the community about Cluff lake mine, the story most often told is that the benefits of the project for CRDN were negligible. There was no compensation for loss of use and short- and long-term damage to the land and, in the end, only a handful of people were employed, most in menial jobs. NexGen noted that key findings for incremental lifetime cancer risk are negligible to very low, and cumulative effects on human health are predicted to be not significant. Furthermore, NexGen has committed to implementing a Radiation Protection Program to keep worker radiological exposures as low as reasonably achievable, as well as an EPP to monitor and characterize Project emissions and environment quality to continually improve environmental protection performance. NexGen has stated that training, employment, and business opportunities for local communities closest to the project were made a priority to maximize value in a way that makes a positive impact environmentally, socially, and economically. This includes commitments to implement a recruitment strategy to confirm that the Local Priority Area (LPA) residents understand access to Project employment activities, working with local communities to address recruitment and retention barriers, working to deliver certified and accredited training and recruitment programs and providing qualified local residents with first preference for employment and training opportunities. NexGen's long-term target is 75% of the Project's workforce being composed of LPA residents.

BNDN members expressed concern that existing mines and exploration activities in the region are contaminating waters in the territory. For instance, BNDN members described how they avoid drinking from the area around Patterson Lake due to mineral exploration activity. BNDN expressed concerns that harmful uranium dust could be released into the air, and that uranium waste could lead to cancer and other illnesses and impact the mental health of BNDN members. NexGen has acknowledged the importance of surface water quality and committed to developing an EPP containing several mitigation and monitoring plans and utilizing adaptive management to provide a structured and flexible approach to maintaining water quality.

Several Indigenous Nations and communities have shared concerns about potential exposure to contamination of surface and groundwater, soils, waste sources, and fish species. Such perceived risk to the environment may lead to avoidance of areas adjacent to the Project and potentially limit access to treaty-protected activities. Several Indigenous Nations and communities have all raised concerns for potential contamination to the water and lands from accidents, malfunctions, land disturbance and traffic that may impact traditional land users' perception of health and

safety of harvesting plants and animals. NexGen has committed to engaging directly with primary Indigenous Nations and communities throughout the Project lifespan regarding ways to minimize perceived effects.

7.4.3.7. Environmental Monitoring

Several Indigenous Nations and communities have expressed that they wish to be more involved in NexGen's follow-up and EMPs to better understand potential effects and input into the management of the monitoring and follow-up activities in relation to the Project site. NexGen has committed to collaborating with several interested Indigenous Nations and communities on mitigation, monitoring and follow-up measures for certain aspects related to their concerns around ILRU including providing support to include IK/MK into their monitoring plans on the biophysical environment in relation to the Project.

NexGen has also committed to working with a number of the Indigenous Nations and communities to address concerns related to safety and willingness to harvest within the proximity of the Project, including developing an independent EMP that is conducted by Indigenous monitors that would sample the aquatic and terrestrial environment in the Project area and LSA and possibly the RSA to ensure the protection of water, lands and traditional foods with the Indigenous Nations and communities whose traditional territories are located closest to the Project.

7.4.3.8. Noise and traffic

Several Indigenous Nations and communities have identified concerns regarding sensory disturbances while practicing land use activities. Sensory disturbances may include visual and auditory disturbances due to increased access, mining and exploration activities, increased road activity and visual changes to the environment. These sensory disturbances may also result in a decrease in ILRU due to the perceived risks and impacts to the environment on traditional food sources and therefore decreased connections between families, communities and the traditional land and resource use activities. NexGen confirmed that changes to sensory disturbance were measurement indicators for the assessment of Indigenous land and resource use. NexGen has committed to accommodation measures including limiting the project footprint to the extent practical and controlling public access to the site. Furthermore, results generally showed that effects due to changes in air quality and noise would be minor, and while maintenance of Highway 955 is outside of NexGen's control they have committed to discussions with the Saskatchewan Ministry of Highways to develop a road upgrade and maintenance agreement to minimize noise.

7.4.4. CNSC staff Analysis

CNSC staff have reviewed NexGen'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 Traditional and Indigenous Knowledge (IK/MK) and local knowledge that was provided in NexGen's EIS, as well as IK/MK documents and maps that have been shared directly with CNSC staff that were requested to remain confidential.

CNSC staff have travelled to the Project site and region on several occasions, visited multiple communities, met and engaged directly with a number Indigenous land users, Elders, and leadership from several Indigenous Nations and communities potentially impacted and/or interested in the Project to hear and work towards addressing their concerns. In addition, CNSC staff have also reviewed the mitigation measures that were proposed and applied by NexGen in atmospheric and acoustic environment, geology and groundwater, aquatic environment, terrestrial environment, and human health sections as well as the follow-up commitments made by NexGen for the Project.

The Project's effects to ILRU are predicted to be primarily indirect effects to the quality of the perceived experience and may affect the sense of solitude due to perceived effects and hazards related to road safety, waste and 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 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 of the traditional land user, CNSC staff have determined that these residual effects are negligible and are is not likely to cause significant adverse effects to human health as the magnitude of effects are expected to be low.

If granted a licence by the CNSC, NexGen is required to implement an EMP that is compliant with Canadian Standards Association for nuclear facilities and mines (CSA N288.4). The EMP 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 (section 10). The EMP will include collection of surface water, sediment, plants, and soil samples as well as fish tissue, benthic invertebrates, and other traditional foods in collaboration with potentially affected Indigenous Nations and communities. NexGen has also established Environmental Committees for CRDN, BNDN, CRDN and MN-S and has committed to hiring full-time independent Indigenous monitors for each of these Indigenous Nations and communities to stay actively involved in monitoring the environmental performance of the Project and to verify the parties are implementing the regulatory and environmental commitments made in respect of the Project. NexGen has also committed to working with local Indigenous Nations and communities in efforts to complete a targeted baseline traditional food study to help validate or modify the dietary assumptions made in the human health risk assessment during operations. Additional monitoring programs will also be established to confirm the effectiveness of mitigation for VCs in relation to land and resources Indigenous peoples rely upon.

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 cultural/spiritual sites. When considering the studies completed and 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 conclude that the proponent's mitigation measures listed and their commitments table 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. NexGen has completed the required archaeology assessments in accordance with provincial regulations and has also committed to a chance find procedure that would mitigate potential effects of the Project on any unknown cultural and heritage resources. Any changes to the Project (i.e., expansion of the Project Area or the addition of new infrastructure) that might affect Heritage Resources must be submitted to the HCB for their review, and additional HRIAs may be required. NexGen has also committed to notifying interested Indigenous Nations and communities should any additional artifacts be discovered of undocumented archaeological resources, through established environmental committees with primary Indigenous Nations and communities.

7.4.5. CNSC Staff's 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. Other effects considered

8.1. Effects of Accidents and Malfunctions

8.1.1. Proponent's Assessment

The proponent carried out an assessment of effects of potential accidents and malfunctions on site, and of potential traffic accidents along the mine-related transportation route, on health and safety of public and/or the environment through hazard identification and screening, environmental design feature and mitigation evaluation, risk measurement, and risk evaluation. Among 93 identified potential accidents and malfunctions on site, six bounding scenarios were identified and carried forward for detailed analysis including risk evaluation. Table 8.1 below outlines six on site bounding accident and malfunction scenarios, whereas table 8.2 outlines five main traffic accident scenarios, and NexGen's proposed mitigation measures, including their risk characterization.

Table 8.1 On site bounding accidents and malfunctions, proposed mitigation measures, and risk characterization

Type of Accident and Malfunction	Description	Mitigation Measures	Risk Characterization
Traffic accident and aquatic release of uranium concentrate and radioactivity	Identified as a bounding potential accident during operation, where a truck transporting packed uranium concentrate is involved in an accident including: a rollover, collision, or run off road at or near the access road bridge crossing of Clearwater River could result in a release of uranium concentrate into the surface water at this location and subsequent downstream transport of radioactive material resulting in potential impacts on surface water, sediments, aquatic species, wildlife, and human health.	Mitigation measures proposed by the proponent include: • upgrades to the existing access road to address increased use • 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
Traffic accident and aquatic release of fuel and hazardous chemicals	Identified as a bounding potential accident during construction, operation, and decommissioning, where an accident involving a vehicle transporting fuel and hazardous chemicals, including a rollover, collision, or run off road at the site access bridge crossing of Clearwater River could result in aquatic release of fuel or hazardous chemicals into surface water resulting in potential impacts on surface water, sediments, aquatic species, wildlife, and human health.	Mitigation measures proposed by the proponent include: • upgrades to the existing access road to address increased use • 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
Solvent extraction fire or explosion	Identified as a bounding potential accident during operation whereby damage to equipment or vessels containing uranium-bearing solutions in the solvent extraction building result in fire or explosion and release	Mitigation measures proposed by the proponent include: • adequate engineering design control • fire suppression system in solvent extraction building and on site fire protection system	Probability: unlikely

	uranium to the environment and expose members of the public to airborne uranium.	• no potential sources of ignition or static electricity in the solvent extraction building • regular and preventive inspection, testing, and maintenance programs • emergency preparedness and response program • air quality monitoring program	Severity of consequence: minor to moderate Overall risk: low
Tailings transfer pipe or pump failure	Identified as a bounding potential accident during operation whereby the failure of tailings transfer pipe, or pump could result in the release of tailings and radioactivity to the environment, and then result in potential impacts on groundwater, soils, vegetation, and wildlife	Mitigation measures proposed by the proponent include: • adequate engineering design control • secondary containment at locations where a pipe rupture could release tailings to surface • emergency power system • comprehensive pipeline monitoring, inspection, and maintenance programs • effective environmental protection, and emergency preparedness and response programs	Probability: likely Severity of consequence: minor Overall risk: low
Untreated effluent transfer pipe failure	Identified as a bounding potential accident during operation and decommissioning, which could result in the release of untreated effluent from the piping system to the environment affecting surface water, soils, vegetation, and wildlife.	Mitigation measures proposed by the proponent include: • adequate engineering design control • comprehensive pipeline monitoring and leak detection system • emergency power system • adequate inspection and maintenance programs • effective environmental protection, and emergency preparedness and response programs	Probability: likely Severity of consequence: minor Overall risk: low
Acid plant tail gas scrubber failure	Identified as a bounding potential accident during operation, whereby the failure of acid plant tail gas scrubber could result in the release of acid gas to atmosphere resulting in potential impacts on air quality and human health.	Mitigation measures proposed by the proponent include: • effective sulphur dioxide gas detection system in the acid plant • implementation of regular and preventive inspection and maintenance program • ambient air quality monitoring • emergency preparedness and response program	Probability: likely Severity of consequence: minor to moderate Overall risk: low to moderate

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Table 8.2: Traffic accident scenarios, proposed mitigation measures, and risk characterization

Type of Traffic Accident	Description	Mitigation Measures	Risk Characterization
Traffic accident and aquatic release of uranium concentrate or other hazardous materials	Traffic accidents during construction, operation, and decommissioning where a vehicle transporting packed uranium concentrate or other hazardous materials, is involved in a rollover, collision, or run off road at the junctions between the Clearwater River and Highway 955, the Canoe River and Highway 155, the Beaver River and Highway 155, and at a small bay in the south part of Churchill Lake next to Buffalo Narrows. Such an accident could result in a release of uranium concentrate or other hazardous materials into the surface water at these locations and subsequent downstream transport of radioactive or hazardous materials resulting in potential impacts on surface water, sediments, aquatic species, wildlife, and human health.	Mitigation measures proposed by the proponent include: • traffic control measures such as speed limits • travel management plans • environmental protection and emergency preparedness and response programs • driver training	Probability: highly unlikely Severity of consequence: moderate Overall risk: low
Traffic accident and terrestrial release of uranium concentrate or other hazardous materials	Traffic accidents during construction, operation, and decommissioning where a vehicle transporting packed uranium concentrate or other hazardous materials, including a rollover, collision, run off road could result in a release of uranium concentrate or other hazardous materials on land (during summer and winter seasons) causing potential impacts on groundwater, soils, vegetation, and wildlife.	Mitigation measures proposed by the proponent include: • traffic control measures such as speed limits • travel management plans • environmental protection and emergency preparedness and response programs • driver training	Probability: likely Severity of consequence: minor Overall risk: low
Traffic accident and atmospheric release of uranium concentrate or	Traffic accidents during construction, operation, and decommissioning where an accident (with and without fire) involving a vehicle transporting packed uranium concentrate or other hazardous materials, including a rollover, collision, run off road could result in airborne	Mitigation measures proposed by the proponent include: • traffic control measures such as speed limits • travel management plans	Probability: unlikely (typical weather condition) to highly unlikely (worse-case

Type of Traffic Accident	Description	Mitigation Measures	Risk Characterization
other hazardous materials	release of uranium concentrate or other hazardous materials causing potential impacts on air quality and human health.	• environmental protection and emergency preparedness and response programs • driver training	weather condition) Severity of consequence: minor Overall risk: low
Vehicle-human collision	Collisions between a project-related vehicle and a member of the public within the communities along the transportation route could result in injury or death of the person	Mitigation measures proposed by the proponent include: • traffic control measures such as speed limit and adjustment • travel management plans • the right of way for the public • emergency service program • driver training	Probability: highly unlikely Severity of consequence: Major-Catastrophic Overall risk: moderate
Vehicle-wildlife collision	Collisions between a project-related vehicle and wildlife along the transportation route could result in wildlife mortality.	Mitigation measures proposed by the proponent include: • traffic control measures such as speed limit and adjustment • travel management plans • the right of way for wildlife • identification of wildlife areas or movement corridors and crossings • driver training	Probability: very likely Severity of consequence: minor Overall risk: low

Of the six on site bounding scenarios, five were determined to be low risk taking into account proposed mitigation measures. The potential failure of the acid plant tail gas scrubber was deemed to be low to moderate risk. However, given that the risk would be managed with gas sensors, regular inspections and maintenance, and on-site emergency response, and minimal off-site exposure, no additional mitigation was deemed necessary. For the five main traffic accident scenarios, four were determined to be low risk taking into account proposed mitigation measures while the vehicle-human collision was found to be moderate risk. Given the proposed safeguards and mitigation measures, this risk was deemed to be tolerable and as low as reasonably practicable.

In the draft EIS, the proponent did not assess the potential radiological effects of accidents and malfunctions on the health and safety of workers. As per CNSC staff's request, the proponent assessed the effects of potential accidents and malfunctions on workers' safety including estimates of radiological dose through hazard identification, screening, risk measurement, and risk evaluation. Of twenty-two potential radiological hazards, five hazard scenarios were identified as bounding scenarios for more detailed risk analysis including dose calculation as is shown in table 8.3 below. The dose acceptance criteria for all scenarios listed in the table are the dose limits for Nuclear Energy Workers stipulated in the *Radiation Protection Regulations*. For all scenarios listed in the table, the predicted worker doses are below these dose acceptance criteria.

Table 8.3: Bounding accidents and malfunctions for workers safety assessment, proposed mitigation measures, and risk characterization

Type of Accident and Malfunction	Location	Likelihood	Predicted Worker Dose	Estimated Effects Consequence	Overall Risk Rating
Vehicle accident including rollover, collision, resulting in fire and dusting	Access Road	Likely	0.70 mSv	Moderate	Moderate
Process vessel including leach tanks and piping system failure	Mill processing facility	Highly unlikely	0.048 mSv	Negligible	Low
Solvent extraction fire or explosion	Solvent extraction building	Unlikely	2.17 mSv	Minor	Low
Failure of tailings/ paste pipes and pumps	Paste plant and paste delivery/ Underground tailings management facility	Likely	0.017 mSv	Negligible	Low

Type of Accident and Malfunction	Location	Likelihood	Predicted Worker Dose	Estimated Effects Consequence	Overall Risk Rating
Ventilation disruption and radon accumulation in the mine	Underground mine	Unlikely	4.92 mSv*	Negligible	Low

* Conservative value provided. Values range from 0.000034 mSv to 4.92 mSv

Of these bounding scenarios, all doses are less than the regulatory limit for Nuclear Energy Workers (20 mSv), and only the vehicle accident including rollover, collision, resulting in fire and dusting scenario was deemed to be a moderate risk. Given that the risk would be managed to be as low as reasonably practicable by implementation of proper emergency response plans and radiation protection plans, this risk was deemed to be tolerable, and no further mitigation was deemed necessary by the proponent.

Overall, based on the assessment of accidents and malfunctions, the Proponent anticipated that potential effects could be addressed through engineering design and compliance with regulatory requirements and industry best practices that reduce risks associated with the hazard scenarios to as low as reasonably practicable. Based on this assessment, the risks of accidents and malfunctions were characterized as tolerable.

8.1.2. Other Views Expressed

Indigenous Nations and Communities

CRDN had previously noted concerns that an accident or malfunction would be devastating for the Nations members and traditional lands. In addition, CRDN had previously indicated that an operating uranium mine and mill could increase the risk of surface and groundwater containing COPCs and being released as a result of an accident, malfunction or unplanned event. NexGen found that of 6 most hazardous scenarios out of 93 accident and malfunction hazard scenarios, five were determined to be low risk overall. The acid plant tail gas scrubber failure was deemed to be low to moderate risk but would be managed to be as low as reasonably practicable and deemed as tolerable with no further mitigation measures necessary.

MN-S requested NexGen complete a hazard scenario related to vehicles be included in the EIS. NexGen indicated that vehicle malfunctions and three types of accidents leading to vehicle fires were assessed, which showed that risks would be low to moderate, with mitigation resulting in the risk to be as low as reasonably practicable. MN-S noted concerns of materials being hauled from Highway 955 and Highway 155 at Green Lake to the Project site and that there were no mitigations provided for reducing the potential for accidents on this stretch of road. NexGen confirmed that the spatial extent of transportation risk was appropriately assessed, as accident rates on larger highway systems are lower than on smaller roads and very few incidents have been reported despite hazardous chemicals being transported through freeways on a national scale, and effects in the area are similar to those assessed for Highway 955 and Highway 155

while being more accessible to response transportation. MN-S indicated that in the event of a traffic accident resulting in a release of uranium concentrates, fuel or hazardous chemicals pose a risk to the environment, as well as a risk to initiating a fire or explosion, beyond the aquatic environment, which poses additional risks to the environment and human health. NexGen confirmed that these potential hazards including the consideration of fires have been considered and either possess low risk or would be managed to present as low as reasonably practicable risks. MN-S noted concerns that the proposed mitigations contained in the Ground Transportation Emergency Response Plan did not specifically mention Indigenous land and resource users in order to maintain the safety of Indigenous land and resource users utilizing Project area roads. NexGen noted that Indigenous land and resource users and Indigenous trappers are mentioned in the plan, and detailed development of the plan will occur during licensing (licence to prepare site and construct) and involve engagement with primary Indigenous Nations and communities.

BRDN indicated concerns regarding the safety and truck transportation, including the number of trucks on the road that would increase the risk of an accident, and any subsequent spills that may result. NexGen confirmed the potential for accidental spills due to traffic accidents were assessed in the EIS and noted mitigating factors including future upgrades to existing access roads, speed limits for the access road and Clearwater River Bridge crossing, clear signage and the issuance of no-travel orders in unsafe conditions.

BNDN indicated concerns that pipeline leaks could cause localized flooding and radiation exposure, and recommended that NexGen use pressure sensors, automated shutoff valves, and fiber-optic leak detection, and additionally verify infrastructure functionality before operation begins.

YNLR supported NexGen's consultation with Indigenous peoples regarding accidents and malfunctions. YNLR noted concerns about the increased traffic between La Loche and the Project site and the increased risk for vehicle accidents as well as accidents with wildlife. YNLR also noted concerns on how the increase in traffic may impact moose in the Project area. YNLR inquired if the associated increase in traffic as a result of the Project will be considered to impact air quality and noise in the EIS. YNLR also inquired if dust along Highway 955 from the increase in Project-related traffic would be mitigated/controlled in the same manner as the Project-area roads. NexGen has committed to implementing mitigation measures to minimize potential effects of accidents, including the development of a Ground Transportation Emergency Response Plan, providing pedestrians, cyclists, and wildlife right of way, advising staff and contractors to reduce speed when wildlife is observed on the road, and providing training on how to drive safely along the transportation route in order to avoid collisions with wildlife such as moose. NexGen has committed to having discussions with the Saskatchewan Ministry of Highways to develop a road upgrade and maintenance agreement to mitigate dust.

8.1.3. CNSC Staff's Analysis

In reviewing the proponent's assessment of accidents and malfunction in the draft EIS, CNSC staff advanced 20 information requests (IRs) [9] among which eight IRs are related to on site

accident and malfunction assessment and twelve IRs are related to the transportation accident assessment. The proponent provided satisfactory responses to the IRs [9] [10].

As described in section 8.1.1, the proponent initially did not include an assessment of potential radiological and non-radiological impacts of the project on the health and safety of all persons on-site, during normal operations and during accidents and malfunctions (persons on-site in this context are NEWs and persons who are not NEWs may incur occupational exposures). The proponent was requested to identify all associated hazards and screen them as to potential risks for bounding scenarios [9] for workers' safety. In response, the proponent revised the EIS with Appendix 15A, providing a summary of radiological and non-radiological effects on the health and safety of workers, including potential effects of accidents and malfunctions (Appendix 15A2.4).

CNSC staff found the proponent's revision to the EIS [11] and assessment of Accidents and Malfunctions to be appropriate. Potential accidents and malfunctions during construction, operation, and decommissioning of the project and their potential impacts on human health and safety, and the environment were identified, characterized, and evaluated by the proponent through a systematic approach. The dose acceptance criteria, the methodology for the assessment of radiological consequences, and the calculated dose rate to both on-site and off-site workers are adequate. CNSC staff concur with the proponent'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 NexGen'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 NexGen to ensure NexGen 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 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, including extreme and periodic weather events. These factors may damage project components and increase the potential for accidents and malfunctions (section 8.2).

8.2.1. Proponent's Assessment

The proponent carried out an assessment of potential adverse effects of the environment on the Project [9]. 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.

8.2.1.1. Assessment of Effects of Natural Hazards

The assessment of potential effects of natural hazards on the Project included risk assessment of how natural hazard may affect project infrastructure and activities during different phases of the project and included the following steps:

- Natural Hazard Scenario Identification that involves identification of pertinent natural hazards and hazard scenarios that may affect the Project infrastructure and activities.
- Environmental design Features Evaluation that involves identifying environmental design features, planning (management practices) and other mitigation to avoid or minimize the risk of hazards.
- Risk Measurement that involves the classification of each hazard scenario according to the likelihood (e.g. almost certain to highly unlikely) and consequence (severity) (e.g. negligible to catastrophic) to arrive at an overall residual risk level associated with each hazard scenario. The criteria for this qualitative risk measurement can be found in table 22.4-1 and table 22.4-2 of the EIS.
- Risk evaluation that involves assigning overall residual risk levels (e.g. Low to High) to each hazard scenario to determine the required additional mitigation measures to lower the severity of the potential effects of the hazard on the Project. The criteria for this qualitative risk evaluation can be found in table 22.4-3 and table 22.4-4 of the EIS.

Through the process, the proponent identified the following major natural hazards (identified in table 8.4), potentially impacted project components, and the corresponding environmental design features of the Project to mitigate any effects on the Project. Where applicable, proposed mitigation measures, residual risk levels after implementation of environmental design features and mitigation measures, also identified as in table **Error! Reference source not found.**8.4 below. The impact of current climate and predicted future climate in the region on the evaluation of project design parameters related to weather related hazards was also considered and is discussed in the next section.

Table 8.4: Potential effects of the environment on the Project

Natural Hazard	Hazard Scenario	Project Component/ Activity	Environmental Design Features and Mitigations
Seismic events	• Damage to or failure of structural stability of Project infrastructure on surface • Damage to or failure of structural stability of underground mine workings • Damage to or failure of structural stability of the WRSAs	Mine and mill buildings, infrastructures, and equipment	• NexGen's Rook I Project in Northern Saskatchewan is located in the region of Canada with the lowest seismic activity. There is a low probability that a major seismic event would occur in the area of the Project. • NexGen will appropriately design all buildings and other mine and mill infrastructures to meet the standards of the latest edition of the National Building Code of Canada (NBCC 2020), which are expected to mitigate any risk from seismic events.
Wildfire	• Danger to worker safety, discomfort, and unhealthy working conditions due to smoke inhalation • Loss of access to the site • Fire reaching primary fuel	Mine and mill buildings, infrastructure, equipment	Forest fires are likely in the project location. NexGen will appropriately design facilities and operate the site in accordance with Fire Protection Program to be developed specific to the project. NexGen will consider the projected increase of forest fire frequency and severity due to climate change. NexGen 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

Natural Hazard	Hazard Scenario	Project Component/ Activity	Environmental Design Features and Mitigations
	and liquified natural gas storage tanks and the surface explosives magazine • Damage or loss of Project infrastructure • Loss of reclaimed areas		reviewed during future phases of CNSC's regulatory processes, prior to licensing to operate. NexGen's Emergency Preparedness and Response Program for the Project will provide detail and clarity regarding fire response plans for all fire related hazards.
Major precipitation events	• Impeded movement • Flooding in building areas • Water Management Infrastructure overflow • Mine Inflow Event • Slope Stability failure (Ore and Waste Rock Storge) • Erosion of the engineered cover (WRSAs)	Mine buildings and site infrastructures (e.g. site water infrastructure, Ore and Waste Rock Storage Areas, Mine Shaft and Underground workings)	• NexGen will manage risks associated with major precipitation events through design criteria and management practices. • Project related buildings and structures will be designed in accordance with NBCC 2020 to prevent flood damages to infrastructure. • NexGen will consider major precipitation events in the design of water management infrastructure so that contact water and non-contact water are appropriately managed to prevent uncontrolled releases to the environment. • NexGen will design the site water infrastructure to maximize the diversion of non-contact surface runoff away from developed features. • NexGen will ensure runoff in contact with potentially contaminated areas will be captured, collected, and directed to site runoff ponds and collection areas, followed by monitoring and treatment, prior to planned releases. • NexGen will design all ponds, collection areas and collection systems for mineralized contact water to accommodate a PMP of 24-hour precipitation event. • NexGen will design diversion ditches for non-contact water to accommodate a minimum of 1:100 year 24-hour precipitation event. • NexGen will design WRSAs and special waste rock and ore storage stockpiles with a stable slope angle (4:1) and appropriate water

Natural Hazard	Hazard Scenario	Project Component/ Activity	Environmental Design Features and Mitigations

			drainage, collection and storage features to mitigate risk of slope stability failures due to extreme precipitation.
			• The risk of erosion of the cover system for WRSAs is reduced by design slope, progressive reclamation and establishment of vegetation on cover system.
			• NexGen will implement mitigation measures during all phases of the project to avoid and limit the effects of major precipitation events on site water infrastructure and underground min workings, including but not limited to the following:
			  • Maintain channel integrity of diversion and collection ditches
			  • Routine inspection and maintenance of containment and conveyance structures, and local erosions of cover systems
			  • NexGen will have an Emergency Preparedness and Response Program for the Project that will include processes for responding to and mitigating the effects of major precipitation events, etc.

Drought	• Inadequate water supply • Drought condition affecting revegetation	Mining, processing and waste management water demands and site reclamation activities (e.g. revegetation)	• NexGen will manage drought through design criteria and water management processes. • NexGen will implement design features that will limit the Project footprint to the extent possible to minimize areas of reclamation. • NexGen intends to recycle process water, thereby reducing the demand for a fresh water supply • NexGen will undertake water management planning periodically to optimize water usage. • NexGen will collect and treat groundwater recovered from underground mine workings that will ensure more water released to Patterson Lake than withdrawn. (construction & operation phase) • NexGen will develop Preliminary and Detailed Decommissioning and Reclamation Plan that reflects mitigations necessary to avoid and limit the effects of drought on revegetation efforts that include progressive reclamation and revegetation using native and drought resistant species.

Natural Hazard	Hazard Scenario	Project Component/ Activity	Environmental Design Features and Mitigations
			• NexGen will apply adaptive management to verify reclamation objectives are met.
Severe Snowstorms	• Impeded Movement • Pond Overflow • Building Collapse	Mine and mill buildings, mining activities and site water infrastructure	• NexGen will manage risks associated with Severe Snowstorms through design criteria and management practices. • NexGen design of surface water management systems will include consideration of snow accumulation and site drainage would be designed to divert or collect runoff under 100-year flood or PMP events as appropriate to the facility. • NexGen will design buildings according to appropriate codes such as NBCC 2020 (Part 4) to withstand design snow load. • NexGen will control movement of vehicle traffic as well as aircraft during severe snowstorms as Canadian Aviation Regulations and Standards • NexGen will have an Emergency Preparedness and Response Program that include an emergency prevention and response process for heavy snowfall events.
Extreme temperatures	• Extreme Cold • Extreme Heat • Heat Fluctuations (Freeze-thaw Cycle)	Mine and mill buildings, site infrastructures, pipes and equipment and machinery	• NexGen will select suitable equipment and design systems for the Project to enable operation under extreme temperatures. • NexGen will design the ventilation system for their underground mine considering maximum working temperature as per NexGen's ventilation design criteria documentation. • NexGen will design HVAC and power systems in accordance with building codes and standards that are used to design and construct infrastructures appropriate for local climate to mitigate risk of overwhelming capacity of HVAC and power systems. • NexGen will design, construct and operate project infrastructures including pipes and equipment to be resilient to extreme cold as per standards designed for regional weather. • NexGen will design WRSAs cover systems to withstand cold climate and increasing temperatures as per design and construction guidance

Natural Hazard	Hazard Scenario	Project Component/ Activity	Environmental Design Features and Mitigations
			manuals such as '*MEND Report 2.21.4A Design, Construction, and Performance Monitoring of Cover Systems for Waste Rock and Tailings'* and '*MEND Report 1.16.5c Cold Regions Cover System design'*. • NexGen will implement mitigation measures during all phases of the project to avoid and limit the effects from freeze-thaw cycles such as winterization of mechanical equipment, routine inspection and maintenance of site infrastructures (e.g. roads, airstrips and WRSA).
Tornadoes/ Severe Thunderstorms	• Tornado Damage • Lighting Damage • Soil Erosion	Mine and mill buildings, site infrastructures, waste management	• NexGen's Rook I Project is located withing the F0 to F1 zone where the occurrence of tornadoes of magnitude greater than F1 is very rare. Tornados classified as F01 or F1 are not expected to cause any significant damage to Project infrastructures. • NexGen will appropriately design all buildings and other mine and mill infrastructures to meet the standards of the latest edition of the National Building Code of Canada (NBCC 2020), which are expected to mitigate any risk from tornados. • NexGen will manage risks associated with Severe thunderstorms or tornadoes through design criteria and management practices. • NexGen will design facilities according to appropriate codes such as NBCC 2020 to mitigate any risk from tornado, lightening damage. • NexGen would vegetate the cover system of WRSAs (NPAG and PAG) to reduce the potential for soil erosion from wind and water. • NexGen will have an Emergency Preparedness and Response Program that includes emergency prevention and response procedures for tornados and severe thunderstorms • NexGen will develop Preliminary and Detailed Decommissioning and Reclamation Plans that reflect mitigations necessary to avoid and limit the effects of major precipitation events or high winds on cover systems of WRSAs.

The proponent assessed the estimated risk level associated with natural hazards (table **Error! Reference source not found.**8.4) on the Project, after considering the potential effects of future climate change, and implementation of environmental design features and mitigation practices. The result of the assessment indicates (shown in Table 8.5 below) that the overall risk associated with most natural hazards are low, except for wildfires and extreme temperatures, where the overall risk level is moderate.

Table 8.5: Summary of estimated risk level associated with natural hazards on the Project (adopted from table 22.7-1 of the EIS, p.22-42)

Natural Hazard	Project Phase	Likelihood	Consequence	Risk Level
Wildfires	All phases	Unlikely to Likely	Minor to Major	Low to Moderate
Drought	All phases	Highly Unlikely to Unlikely	Negligible to Moderate	Low
Major precipitation events	All phases	Highly Unlikely to Very Likely	Minor to Moderate	Low
Severe snowstorms	All phases	Unlikely to Very Likely	Minor to Moderate	Low
Tornados / severe thunderstorms	All phases	Highly Unlikely to Likely	Minor	Low
Extreme temperatures	All phases	Unlikely to Likely	Negligible to Moderate	Low to Moderate
Seismic events	All phases	Highly Unlikely	Minor to Moderate	Low

In summary, the proponent's environmental design features and mitigation measures related to extreme weather events: major precipitation events, drought, extreme temperatures, severe snowstorms, tornados and severe thunderstorms include using engineering best practices and meeting current regulations and building codes. The proponent will design site water management infrastructures (e.g. ponds, ditches, collection areas) for contact water (runoff that comes in contact with potentially contaminated areas of the Project Area) to safely collect, convey and store 24-hour PMP extreme precipitation event with sufficient design freeboard. The design of site surface water infrastructure for diversion or collection and conveyance of non-contact runoff will be based on the 100-year 24-hour rainfall event design criteria. The special waste rock, ore storage stockpiles and Potentially Acid Generating (PAG) Waste Rock Storage

Areas (WRSAs) runoff collection areas will be designed to be self-contained by perimeter berms to retain contact runoff from a PMP event besides additional continency ponds to provide flexibility for site surface water management during extreme weather events.

The Proponent expects that potential effects of the environment on the project during all phases (construction, operation, decommissioning and closure), particularly for seismic events and extreme weather events, could be addressed through engineering design and compliance with industry best practices. Based on this assessment, adverse effects of these events on the project's components and activities during all phases of the project is unlikely and residual risks to the Project are assessed to be low as presented in table Table 8.5.

8.2.1.2. Assessment of Effects of Climate Change

The proponent carried out an assessment of potential adverse effects of climate change on the Project. Note that effects of climate change were also considered as part of the effects assessment for each valued component (e.g. fish and fish habitat, etc.) or intermediate component (e.g. water quantity and quality, etc.) and are discussed in section 6 and section 7 and more details can be found in the EIS. The assessment in this section focuses on the effects of climate sensitive natural hazards on the Project with consideration of climate change during all phases of the project. The climate change assessment by the Proponent was conducted in the following steps:

- Development of climate change dataset (current and projected future climate)
- Evaluation of climate-infrastructure interactions of the Project
- Assessment of Climate Vulnerability of Project Activities

Climate Change Data and Trends

The proponent developed local and regional climate change datasets to evaluate Project design parameters considering current and projected future climate trends. The site-specific climate projection data is based on percentiles of multi-model ensemble of 24 different Global Climate Models (GCMs) and three emission scenarios, represented by representative concentration pathways (RCPs): RCP 2.5 (low emission), RCP 4.5 (moderate emission) and RCP8.5 (high emission) of the Coupled Model Intercomparison Project Phase 5 (CMIP5) of each climate variables obtained from ClimateData.ca prepared by Canadian Center for Climate Services. The climate model projections data comprises statistically downscaled modelled baseline (1981-2019) and future time horizons of 2050s (2041-2070) and 2080s (2071-2100) in line with the estimated project lifespan (43 years). The estimated timeline for construction is 4 years (2023 to mid-2026), 24 years (mid-2026 to mid-2049) for operation followed by Closure, which will take approximately 15 years.

To understand how climate is projected to change in the area of the Project, the proponent derived future changes in climate statistics of probable maximum precipitation (PMP), rainfall statistics (across durations and return periods), evapotranspiration, and extreme rainfall and snowmelt events whose details can be found in Appendix 22A5 of the EIS. For example, table 22A-22 and table 22A-23 present probable maximum precipitation and projected changes in IDF curves, respectively. The proponent assessment of climate data at the project site shows that the

projected future climate extremes indicate a future that is likely to be warmer and wetter on an annual basis. The annual temperatures and annual precipitation are projected to increase by 2.4°C and 3.2°C and by 7% and 8%, in 2050s and 2080s, respectively. The one-day PMP values are projected to increase by 12% and 16% in the 2050s and in 2080s respectively. The 100-year, one-day rainfall events are projected to increase by 2% and 14% by 2050s and 2080s respectively. The annual potential evapotranspiration is expected to increase by 11.1% and 13.6% by the 2050s and 2080s respectively. The 100-year, one-day extreme rainfall and snowmelt events are projected to decrease by 0.4% by 2050s and increase by 4% by 2080s. The overall effect of climate change on wildfires is difficult to predict, but it can be conservatively assumed that fire intensity may increase due to warmer temperatures, in addition to frequency increasing due to additional lightning storms and longer fire seasons each year.

Climate-Infrastructure Interactions

The proponent assessed the interaction of potential climate events (e.g. extreme precipitation, extreme temperature, high winds, lightning, storms, changes in snowfall) with different surface and underground infrastructure components of the Project. The proponent identified all Project infrastructure components (e.g. surface drainage infrastructure, buildings, ore and waste storage areas, etc.) and all potential weather related or climate sensitive natural hazards that include temperatures (extreme heat, extended cold spell, freeze-thaw cycle), precipitation (major precipitation events and severe snowstorms) and extreme events (droughts, high winds and wildfire). The proponent then identified whether climate-infrastructure interactions exist for each infrastructure components by assessing whether the weather-related natural hazard will have any impact on the project component without considering any mitigation measures. The proponent finally presented the mechanism of the interaction and the associated climate impacts for each component where climate-infrastructure interactions are identified. The presented climate-infrastructure interactions by the proponent are based on the detailed climate dataset that describes the current and projected changes in mean temperature and precipitation, along with background information on changes in the extreme weather events. Further details on climate-infrastructure interactions for Surface and Underground Infrastructure of the Project are included in table 22B-1 and table 22B-2 of the EIS respectively.

Climate Vulnerability of Project

The proponent assessed climate vulnerabilities by project activity based on findings of climate - infrastructure interactions. The assessment of climate vulnerability of Project activities identified the climate vulnerabilities of the physical works and activities during all phases (Construction, Operations, Decommissioning and Reclamation or Closure) of the project by considering how the Project activities associated with any infrastructure or component identified in the climate - infrastructure interactions (table 22B-1 and table 22B-2 of the EIS may be vulnerable to climate. The vulnerabilities have been identified for climate events such as major precipitation events, drought, wildfire, etc. relevant to each phase of the project based on current and projected climate conditions. The vulnerability assessment also provided description of the identified vulnerabilities as well as the mitigation measures to withstand projected climate conditions. The outcome of climate vulnerability assessment is reported in table 22B-3 of the EIS which provides

an overview of the identified vulnerabilities by physical work or activity associated with the Project. In the assessment, the proponent noted that the impact of climate change on Project activities varied with the project phases. The short time frame for the construction phase means the potential for meaningful interactions with the climate trends outside of the normal seasonal variation experienced in the region is expected to be small and so is the vulnerability. However, the proponent determined that there is a greater potential for meaningful interactions with the projected climate trends in both the climate mean and extreme weather events during Operation and Closure, and in the longer-term after Closure.

Overall, based on the assessment of effects of climate change related hazards that will affect the project, the Proponent expect that potential effects will be addressed through consideration of the predicted changes in climate conditions that could occur during its lifecycle into the environmental design features and mitigation measures identified in table **Error! Reference source not found.**8.4 and through engineering design and compliance with codes and standards that provide sufficient margins of safety to prevent damage to Project infrastructure from climate sensitive hazards. The design of site water management infrastructure for contact water using 24-hour PMP event as design criteria is expected to consider uncertainty related to climate change and expected to provide adequate provisions to manage any potential increase in extreme precipitation events. The proponent will also incorporate additional climate change provisions into the 1:100-year 24-hour design storm event in the design of non-contact water collection and conveyance system. The design of Project Infrastructure and operation of the site will take the projected increase of wildfire frequency and severity due to climate change into consideration. In addition, although the mitigation measures have the potential to reduce climate risks, the proponent will monitor their performance through an ongoing monitoring and surveillance process. As a part of incorporating climate change into the continual improvement process for the Project, the proponent has developed Climate Adaptation Framework based on guidance from Mining Association of Canada. The framework will be used by the proponent to develop climate adaptation strategy for the Project that will include conducting detailed quantitative climate change risk assessment, identification of adaption pathways and timing of their implementation and developing monitoring and surveillance plan to improve climate resilience of the Project.

The proponent also will apply and iteratively update their adaptive management plan over the project lifetime and will integrate results of monitoring programs to verify effectiveness of resilience and mitigation actions and manage the unexpected outcomes so that they can proactively mitigate or prevent adverse climate effects on the Project. Moreover, NexGen's Climate Adaptation Framework would be used to support future climate risk assessments for the Project and the proponent has committed to identify and manage the projected climate risks as a part of their continual improvement process for Operation and Closure through the Climate Adaptation Framework and development of climate adaptation strategy. Based on this assessment, adverse effect of climate change on the project's components and activities is unlikely and the associated residual risks is assessed to be low.

8.2.2. Other Views Expressed

8.2.2.1. Potential Impacts as a result of climate change

Indigenous Nations and Communities

MN-S had previously noted that the climate change analysis contained in the EIS was qualitative and high-level and that some of the assumptions made regarding climate change effects may be too simplistic. MN-S also noted that monitoring programs do not consider climate change. MN-S had previously raised questions of whether the warmer effluent being released, interacting with the potential for climate change to also raise water temperatures, to affect lake trout habitat sooner than predicted. MN-S had previously indicated it was not clear if the risk measurement and evaluation for tornado damage considered climate change. NexGen noted that a quantitative climate change assessment was conducted with estimated prediction incorporated into the hydrology assessment. NexGen committed to conducting detailed scoping and development of EMP details during licensing (licence to prepare site and construct) including Indigenous engagement. NexGen committed to capturing and storing treated effluent at ambient temperatures prior to release to Patterson Lake such that it is not expected to result in changes to water temperatures or volumes that would affect trout. Finally, NexGen confirmed that the effects of climate change were considered in the assessment of all weather or climate-related hazards.

BNDN noted concerns that NexGen's EIS acknowledged the Project's contribution to climate change through GHG emissions however, the Project has not committed to a climate change offset plan such as other mining projects in Canada have. NexGen noted that the development of such an offsetting plan is outside the scope of the *Canadian Environmental Assessment Act, 2012*, however the Project will be subject to provincial and federal GHG reporting requirements and limits. NexGen is supportive of discussion with the BNDN for further GHG reduction mitigation.

YNLR indicated they believe that the Project increases impacts to woodland caribou and that impacts from the project will combine with predicted impacts from climate change to further adversely impact caribou habitat. NexGen has committed to developing a CMOP through engagement with the Saskatchewan Ministry of Environment, federal regulatory agencies, and primary Indigenous Nations and communities to meet legislated requirements and align with the goals of potentially impacted Indigenous Nations and communities.

ACFN identified data and assessment gaps, and methodological deficiencies in climate change data components that render the assessment of the effects of climate change unreliable. ACFN requested that the future climate predictions include the full extent of climate change expected during the Project lifespan. ACFN also requested clarification if climate change-induced effects on surface water temperatures included climate change scenario. NexGen has maintained that assessment of the effects of climate change is accurate; in addition to the independent assessment of climate change effects relative to the Base Case, four sensitivity scenarios were modelled to account for uncertainty in projections and quantify sensitivity of the model to the range of potential climate change effects. NexGen confirmed that projected climate change predictions

include the anticipate Project lifespan and the monthly climate change factors developed for the 2050s include data from 2041 through 2070. NexGen noted that climate change induced effects on surface water temperature were not included in the scenarios assessed, however they were not expected to influence the findings of the EA should they be found.

8.2.3. CNSC Staff's Analysis

CNSC staff have reviewed the information provided in the EIS on effects of the environment on the project. CNSC staff confirm that the proponent has identified all relevant natural hazards at the project site that include seismic events, wildfires, major precipitation events, severe snowstorms, high winds (tornado/severe thunderstorms) and extreme temperatures, and that their potential impacts on the project performance (project activities and infrastructure) are described, and appropriate environmental design features and mitigation measures identified to address the potential adverse effects. The proponent's assessment also considered climate change 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 the proponent's assessment, CNSC staff put forward one information request (IR-202) with regards to the effects of seismic events on the Project. The proponent provided clarification on the inconsistent information on probability and return period for the seismic event considered for the Project. The proponent satisfactorily responded to the IR. CNSC staff found that the proponent's proposed design features and mitigation measures for all phases of the Project are acceptable and expected to sufficiently mitigate the risk from seismic events in the area of the project.

8.2.3.2. Wildfires

CNSC staff have reviewed NexGen's assessment of effects of wildfires on the project that included consideration of climate change. CNSC staff have confirmed that NexGen conducted a sufficient assessment of wildfires 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 have reviewed NexGen's preliminary fire protection program and fire protection assessments. Once available, CNSC staff will review the updated fire protection assessments to verify that NexGen 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 NexGen's assessment of wildfires.

8.2.3.3. Drought

CNSC staff have reviewed NexGen's assessment of effects of drought on the project during all phases of the project and confirmed that NexGen conducted a sufficient assessment of drought at the project site and that identified design features and mitigation measures are adequate.

8.2.3.4. Major Precipitation Events

CNSC staff have reviewed NexGen's assessment of effects of major precipitation events such as severe rainstorms, snowmelts or flooding on the project during all phases of the project and confirmed that NexGen conducted a sufficient assessment of hazard scenarios related to major precipitation events at the project site and that identified design features and mitigation measures are adequate. NexGen plans to design surface water management infrastructure based on the 100-year return period, 24-hour precipitation event (non-contact runoff) and 24-hour PMP extreme rainfall event (for mineralized contact runoff) that consider uncertainty related to climate change. These design criteria are acceptable to CNSC staff to ensure adequate capacity for diversion, collection, conveyance and storage of contact and non-contact runoff generated at project site during major precipitation events expected during the lifetime of the project. In the review of the proponent's assessment, CNSC staff and other Federal Indigenous Review Team (FIRT) participants reviewed the NexGen's estimates of 24-hour PMP as well as proponent's approach to factoring climate change into the 24-hour PMP and 100-year precipitation in the design of water management infrastructure and reiterated the estimates to be updated or revisited during the licensing phase (licence to prepare site and construct), i.e., prior to the initiation of licensed activities (construction) as the final estimates are required at detailed design stage of the project (IR -47 and IR-76). NexGen has been requested by CNSC staff to commit to address this concern through additional analyses, as applicable.

8.2.3.5. Severe Snowstorms

CNSC staff have reviewed NexGen's assessment of effects of severe snowstorms on the project during all phases of the project and confirmed that NexGen conducted a sufficient assessment of severe snowstorms at the project site and that identified design features and mitigation measures are adequate.

8.2.3.6. Tornado and Severe Thunderstorms

CNSC staff have reviewed NexGen's assessment of effects of tornado and severe thunderstorm on the project during all phases of the project and confirmed that NexGen conducted a sufficient assessment of tornado and severe thunderstorm including lightning at the project site and that identified design features and mitigation measures are adequate.

8.2.3.7. Extreme Temperatures

CNSC staff have reviewed NexGen's assessment of effects of extreme temperatures on the project during all phases of the project and confirmed that NexGen conducted a sufficient

assessment of extreme cold, extreme heat and heat fluctuations at the project site and that identified design features and mitigation measures are adequate.

8.2.3.8. Climate Change

The proponent's climate change assessment identified the relevant climate variables, climate sensitive natural hazards and used appropriate emission scenarios and assessment time scales that takes in to account the different phases and lifespan of the project. The assessment is also based on site specific downscaled climate projection data derived from multi-model ensemble GCMs that capture uncertainties in climate projections. CNSC staff have reviewed the Proponent's identified climate-infrastructure interactions and the subsequent assessment of climate vulnerabilities of Project activities as well as the proposed environmental design features, mitigation measures and ongoing monitoring and surveillance process and found these to be acceptable to mitigate the potential adverse effect of weather events and climate change. CNSC staff will also review NexGen's proposed climate adaptation strategy, once developed, for adequacy and ensure its implementation to further improve climate change resiliency of the Project as part of the CNSC's licensing process.

In summary, CNSC staff have found the proponent's assessment of Effects of the Environment on the Project to be appropriate and in line with REGDOC-2.9.1 Environmental Protection: Environmental Principles, Assessments and Protection Measures (Section A.3.9) and best practice guidance such as Mining Association of Canada's *"Guide on Climate Change Adaptation for the Mining Sector"*. CNSC staff concurs with the proponent's conclusion that the project components or activities are not likely to be adversely impacted by seismic events, major precipitation events, severe snowstorms, tornado or severe thunderstorms, extreme temperatures and climate change taking into account the environmental design features, proposed mitigation measures and emergency preparedness and response program and ongoing monitoring and surveillance process.

8.2.4. CNSC Staff analysis and findings

CNSC staff are satisfied with the proponent's assessment of Effects of the Environment on the Project related to natural hazards and climate change pertinent to the project. The proposed environmental design features, mitigation measures and emergency preparedness and response program and ongoing monitoring and surveillance process are appropriate to account for the potential effects of the environment on the Project. CNSC staff conclude that 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, and emergency preparedness and response program and ongoing monitoring and surveillance process, 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 intermediate components and 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 / Aquatic environment
- Terrestrial environment

NexGen'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). 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.

NexGen's cumulative effects assessment considered all primary pathways that were likely to result in detectable changes in measurement indicators and subsequent residual effects on VCs after the implementation of environmental design features and mitigation.

8.3.1. Air Quality and Noise

8.3.1.1. Proponent's assessment of environmental effects and mitigation

NexGen's RFD case consisted of modelling assessment of the Project emissions during operations combined with the operations emissions from the Patterson Lake South property. Air quality from the Project and from the Patterson Lake South Property is predicted to reflect detectable changes from existing conditions. However, most of the CACs (i.e., nitrogen dioxide, sulphur dioxide, sulphuric acid, carbon monoxide, and PM2.5) are predicted to remain compliant with the SAAQS throughout all phases of the Project within the RSA. Noise-emitting activities during construction and operations of the Patterson Lake South Property are expected to be similar to noise-emitting activities during the Project Construction and Operations. The duration of cumulative noise effects for the RFD Case would be a maximum of 15 years.

Mitigation measures proposed by NexGen are detailed in tables 6.3 and 6.4, and EA Follow up program measures in section 6.16.

8.3.1.2. CNSC staff analysis and findings

CNSC staff have reviewed NexGen's cumulative effects assessment for air quality and noise, and CNSC staff have confirmed that NexGen conducted a comprehensive analysis of these effects and that identified mitigation and follow-up monitoring program measures are adequate. CNSC staff have verified that NexGen 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 noise associated with the operations emissions from the Patterson Lake South Property. 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 HC and ECCC guidelines.

CNSC staff agree with NexGen's conclusions that the risk is low with no cumulative effects anticipated. In addition, CNSC is satisfied with NexGen's cumulative effects assessment as it relates to how NexGen considered and addressed concerns regarding cumulative effects raised by Indigenous Nations.

CNSC staff conclude that there are no anticipated cumulative effects to the atmospheric environment. The Project's follow-up monitoring will verify these conclusions.

8.3.2. Surface Water / Aquatic Environment

8.3.2.1. 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 surface water and sediment quality exposure pathways during the operation and decommissioning phases. Therefore, cumulative effects were primarily assessed through effects to the intermediate components, surface water quantity, quality and sediment quality.

Cumulative effects including those from the Project, the Patterson Lake South Property, and climate change, are anticipated to be similar during the Project lifespan and in far-future projections and the only threshold exceedances are for copper and cobalt in the far future in Patterson Lake (as can be seen in table 10A-24 of the EIS). While uncertainties are inherent in climate change predictions, the analysis suggests that its impact on surface water quality would be minimal.

Another potential cumulative effect of concern to Indigenous Nations and communities was the potential for emissions from Alberta's oil sands operations to cause acidic deposition from sulfur dioxide through rainfall and snowfall, which could contribute to increased lake acidification. NexGen's activities, such as air emissions, effluent discharge, and seepage from the PAG WRSA, could combine with the impacts of oil sands emissions and further increase lake acidification risks. However, preliminary screening for NexGen's project found that the total H^+ equivalent from all acidifying emissions was about one-tenth of the Provincial 0.175 t/d threshold. Following consultations between NexGen and the Saskatchewan Ministry of Environment, it was determined that due to the low emissions of SO_2, NO_x, and sulfuric acid, acid deposition modeling was unnecessary for the project. To further support predictions of low risk from acid deposition cumulative effects, NexGen conducted rainwater pH monitoring at the site from September 2018 to October 2020. The results showed an average pH of 6.36, which is less acidic than typical unpolluted rain (pH ~5.6). Given the relatively low acidity of rainwater at the project site, the potential for acid emissions to cause acid deposition issues is considered low and was not considered for further quantitative assessment in the EIS. More on CNSC's analysis on this topic can be found below.

Table 8.6: Reasonably Foreseeable Development Case Summary Statistics for Selected Constituents in the Far Future for Patterson Lake (From EIS: Table 10A-24)

Constituent	Unit	Project Threshold	Minimum - North Arm – East Basin	Minimum - North Arm – West Basin	Minimum - South Arm	Average - North Arm – East Basin	Average - North Arm – West Basin	Average - South Arm		Maximum - North Arm – East Basin	Maximum - North Arm – West Basin	Maximum - South Arm
Total ammonia (as nitrogen)	mg/L	n/a[(a)]	0.027	0.036	0.057	0.030	0.040	0.066	0.044	0.090	0.16
Un-ionized ammonia (as nitrogen)[(b,c)]	mg/L	0.016	0.000075	0.000099	0.000016	0.000026	0.000035	0.000057	0.000075	0.00016	0.00029
Nitrate (as nitrogen)	mg/L	2.9	0.019	0.026	0.053	0.021	0.029	0.062	0.033	0.073	0.15
Phosphorus (total)	mg/L	0.020	0.0051	0.0051	0.0057	0.0054	0.0053	0.0060	0.0057	0.0060	0.0074
Chloride	mg/L	120	0.40	0.84	1.2	0.46	0.94	1.3	0.62	1.4	2.4
Hardness	mg/L	n/a	13	16	25	13	17	28	17	31	56
Sulphate	mg/L	128-218	2.1	8.2	25	2.8	9.8	30	8.1	28	72
Cobalt	mg/L	0.00078-0.0008[(d)]	0.000067	0.000098	0.00015	0.00020	**0.0010**	**0.00086**	0.00031	**0.0015**	**0.0011**
Copper	mg/L	0.0020	0.00013	0.00016	0.00022	0.00035	0.0017	0.0014	0.00053	**0.0024**	0.0019
Uranium	mg/L	0.015	0.00015	0.00047	0.00065	0.00041	0.0024	0.0021	0.00066	0.0035	0.0027
Radium-226	Bq/L	0.11	0.0057	0.0041	0.0068	0.0074	0.0045	0.0082	0.0089	0.0058	0.014

a) Project threshold for ammonia considers the proportion of total ammonia that is un-ionized ammonia.
b) Function of total ammonia, pH, and temperature.
c) The average seasonal pH and average monthly temperature of samples were used to calculate the fraction factor.
d) Federal environmental water quality guideline (FEQG), variable based on hardness concentration in the surface waterbody; guideline value shown based on a hardness value of 52 mg/L as $CaCO_3$, which is the lowest hardness applicable to the guideline (Environment Canada 2017; Government of Canada 2021).
Bold values represent concentrations that exceed the Project threshold.
Bq/L = becquerels per litre.

8.3.2.2. CNSC staff analysis and findings

CNSC requested further details on the conservatism of NexGen's RFD case (which covers cumulative impacts with the potential Patterson Lake South project) assessment and to provide information on how using the assumptions in the EIS are conservative to determine cumulative effects on water quality, and how it respects the precautionary approach. Since detailed plans for the Patterson Lake South project were not yet available at the time of submission of the Rook I EIS, NexGen made informed assumptions about its potential environmental effects. These assumptions were based on data from other uranium mines in the region, as well as predictions from NexGen's own Project models. NexGen also stated that they used assumptions based on modern best practices, including geochemical similarities to the Project, use of BATEA principles, and adherence to ALARA standards. For example, it was assumed that similar practices as those used in NexGen's Project, such as treating water to very high standards, established through the BATEA process, before releasing it into the environment, would also be applied by other projects. Therefore, to estimate how runoff from the Patterson Lake South project's facilities might affect water quality, NexGen assumed it would be similar to the high-quality treated water released by its own Project. This approach provides a practical and realistic way to evaluate potential impacts, even without detailed information about the Patterson Lake South project. NexGen deems this approach robust and defensible, while acknowledging that future cumulative effects assessments and project-specific details will be required as the Patterson Lake South Property advances through regulatory phases. CNSC accepted NexGen's response, as at the time of receiving the EIS report, the Patterson Lake South project data was not publicly available, therefore NexGen's approach to assess cumulative effects on surface water and sediment quality was sufficient and met the requirements of CEAA.

As described above, cumulative effects for the RFD case are similar to the application case indicating a low chance of impacts from cumulative effects as most COPCs will remain below conservative chronic benchmarks under all scenarios modelled. However, given the interest in cumulative effects from Indigenous Nations and communities, and the fact that the Patterson Lake South Project data is expected to be publicly released at a later date, CNSC has recommended a follow up commitment that NexGen incorporate Patterson Lake South Project's most up to date model outputs for all project phases and include all predicted pathways (for instance Patterson Lake South project's far future groundwater pathways) into the Rook I model for the RFD case in the next iteration of the ERA once this data is publicly available, in order to demonstrate that the cumulative effects analysis was performed conservatively and the conclusions remain valid. Any increased risks found through this analysis, if any, would require NexGen to develop mitigation or adaptative management plans.

Another potential cumulative effect of concern to Indigenous Nations and communities was the potential for emissions from Alberta's oil sands operations to cause acidic deposition from sulfur dioxide through rainfall and snowfall, which could contribute to increased lake acidification. NexGen's activities, such as air emissions, effluent discharge, and seepage from the PAG WRSA, could combine with the impacts of oil sands emissions and further increase lake acidification risks. CNSC staff analyzed this issue and concluded that the potential cumulative effect is unlikely to result in significant adverse environmental effects. The rationale for this conclusion is

described below.
The Saskatchewan air quality guideline outlines two criteria for determining if a facility's emissions warrant regional acid deposition modeling:

1. Combined emissions of SO_2, NO_x, and ammonia (NH_3) must exceed 0.175 tonnes per day (t/d) of hydrogen ion (H^+) equivalent, calculated using specific formulas.
2. Facility emissions must account for more than 5% of the baseline emissions in the region.

Preliminary screening for NexGen's project found that the total H^+ equivalent from all acidifying emissions was about one-tenth of the Provincial 0.175 t/d threshold. Following consultations between NexGen and the Saskatchewan Ministry of Environment, it was determined that due to the low emissions of SO_2, NO_x, and sulfuric acid, acid deposition modeling was unnecessary for the project. To further support predictions of low risk from acid deposition cumulative effects, NexGen conducted rainwater pH monitoring at the site from September 2018 to October 2020. The results showed an average pH of 6.36, which is less acidic than typical unpolluted rain (pH ~5.6). Given the relatively low acidity of rainwater at the project site, the potential for acid emissions to cause acid deposition issues is considered low.

However, CNSC staff acknowledge concerns from Indigenous Nations and communities on this topic and have provided recommendations for more EA follow-up monitoring requirements and commitments to NexGen to ensure there are no unexpected risks as the project progresses. CNSC staff expect NexGen to include follow-up monitoring for all relevant pathways (e.g., air, effluent, surface water, runoff, rain and snow precipitation, groundwater) and contaminants of potential concern (COPCs) (e.g., SO_2, NO_x, sulfates, nitrates, pH) that may contribute to lake acidification. This environmental monitoring data should be incorporated into the next ERA to model and assess potential cumulative effects related to this risk. NexGen is also expected to explore mitigation options and adaptive management strategies to address potential environmental impacts based on increasing acidification levels in lakes if future monitoring data indicates risk. Additionally, CNSC staff note that if a license is granted, other EMPs, such as those required under the EEM program, will assess aquatic health indicators that could be affected by acidification, potentially triggering further mitigation or adaptive management actions. These monitoring actions will help refine the risk assessment to ensure lakes in the project area are protected from acid deposition and acidification.

CNSC staff have also reviewed NexGen's updated Geochemical Characterization of Waste Rock report as part of the EIS and are satisfied with the updated dataset on baseline geochemical information for waste rock stored on the surface (see EERR on geological environment for more information). CNSC staff also noted NexGen's proposed engineering measures to mitigate potential acid generation during surface storage, including the segregation of PAG and NPAG waste rock and the use of low-permeability horizontal layering to limit oxygen ingress and precipitation infiltration into the waste rock pile. These measures will further help protect the environment from potential lake acidification risks associated with the project.

In summary, the assessment predicted residual effects on surface water quality due to change in water and drinking water quality constituent concentrations. However, with the implementation

of appropriate mitigation measures and the effects being characterized as low magnitude, localized, and can be further reduced through adaptive management, the residual effects on surface water and sediment quality are predicted to be not significant. CNSC staff have reviewed NexGen's models and predictions for effects to surface water and sediment quality and confirmed that NexGen conducted a comprehensive analysis of these effects.

CNSC staff conclude that there are no cumulative effects to the aquatic environment, including surface water quantity and quality and benthic invertebrates, fish, fish habitat or fish health. The Project's follow-up monitoring will verify these conclusions.

8.3.3. Terrestrial Environment

8.3.3.1. Proponent's assessment of environmental effects and mitigation

Terrain and Soils

For terrain and soils, there was no RFD case assessed due to negligible potential for cumulative effects. The proponent provided the rationale that the residual effects on terrain and soils are predicted to be confined to the maximum disturbance area, or within the LSA in the case of soil quality which can be affected by deposition of dust or particulate matter. The only notable RFD project is the Patterson Lake South Property, whose hypothetical maximum disturbance area is located approximately 4.8 km away. When considering 500 m buffers (e.g., LSA boundaries) from both projects' maximum disturbance areas, then the effects would not spatially overlap. Moreover, it was expected that the Patterson Lake South project would likewise implement appropriate mitigation measures and adaptive management to minimize contributions to cumulative effects.

In terms of climate and natural disturbance factors, the proponent stated that an increase in temperature and precipitation could shift the soil thermal regime. Longer growing seasons can alter ecological succession by increasing carbon and nutrient exports to the soil, resulting in higher soil productivity. This could have a positive effect on the ability to sustain vegetation communities. Alternatively, increased precipitation can also raise groundwater levels, leading to the removal of solutes from soil and thus decreasing nutrient availability for plants. In addition, forest fires can remove vegetation and increase erosion potential. Fire can alter the distribution of soil nutrients, and their loss can negatively affect the natural regeneration of vegetation.

Vegetation

For vegetation, the proponent assessed the RFD case taking into account the Patterson Lake South Property and associated additional trails, roads, and facilities. The combined assessment of both projects found cumulative effects of low magnitude at the regional scale. The RFD case predicted a total loss of 2,318.2 ha of upland, 55.6 ha of wetland, and 102.6 ha of riparian ecosystems in the RSA. In other words, around 96.9% of uplands, 99.9 % of wetlands, and 98.9% of riparian areas remain intact in the RSA in the RFD case. Incremental effects were predicted to occur from construction through the end of active closure and the time required to establish mature upland ecosystems, for a duration of maximum of 95 years assuming complete temporal overlap of ecosystem loss. Despite minor reduction in ecosystem connectivity

regionally, most upland, wetland, and riparian ecosystems are predicted to remain abundant and well connected across the RSA.

Traditional use plant habitat is predicted to be reduced by 744.0 ha in the RFD case, affecting mostly common species such as blueberry, jack pine, and bog cranberry. The RFD case also predicted a decrease for five traditional use plant species that would not have been disturbed in the Application case (Rook I Project only); these are Nagoon berry, dewberry, dwarf birch, hard-stemmed bulrush, and swamp red currant. However, the change in availability of these species is predicted to be less than 0.1 ha and habitat remains available. Overall, around 97.5% of traditional use plant habitat remains intact in the RSA in the RFD case.

In terms of climate and natural disturbance factors, the proponent stated that a longer, warmer growing season can overall increase forest productivity but can also affect ELC units with specific nutrient and moisture regimes that may be less resilient to climate changes. Moreover, heat waves, droughts, and weather patterns can increase the risk and frequency of forest fires. Large, stand-replacing fires are a driver of forest composition, structure, and function. However, the proponent noted that forests within the RSA may be resilient and likely to return to the same state post-fire. Yet, as the fire-return interval decreases, forest resilience is reduced which can affect overall distribution. Furthermore, wetlands are sensitive to changes in precipitation and temperature, but it is anticipated that increased annual precipitation would offset potential water deficits from higher temperatures and evapotranspiration, overall being within natural variability. Lastly, whether traditional use plant species are affected by climate changes depends on the niches they occupy; for example, fire-adapted species (e.g., jack pine, blueberry) could benefit from regenerating habitat whereas species with very specific requirements (e.g., pitcherplant) could be less resilient.

In summary, the proponent concluded that the overall residual effects from the RFD case for vegetation are predicted to be not significant. More detailed information can be found in the EIS section 13.5.

8.3.3.2. CNSC staff analysis and findings

CNSC staff have reviewed the proponent's cumulative effect assessment for the alteration of soil and terrain conditions, and the direct loss and terrain alteration for vegetation. CNSC staff's analysis confirmed that the proponent had identified applicable projects and activities that could cumulatively interact with the Project effects. It was noted that most upland, wetland, and riparian ecosystems are predicted to remain abundant and well connected across the RSA.

CNSC staff raised one information request for traditional use plant species. CNSC staff noted that Indigenous Nations and communities have expressed concerns related to Project activities and potential cumulative effects. CNSC staff noted the statement that effects of previous and existing developments and activities have negatively altered habitat availability and habitat distribution of traditional use plant species. Given the existing disturbances, it was unclear to CNSC staff what the magnitude of effects was compared to a "baseline natural state" of the habitat (i.e., before any disturbance). Thus, CNSC staff requested information on the cumulative

magnitude of existing and proposed disturbances, as well as on indicators of when species are considered not self-sustaining and ecologically effective anymore.

The proponent responded that the magnitude or state of the environment prior to any disturbance is beyond the EA scope, but that the Base case assesses the existing conditions that represent cumulative effects of historical and current environmental pressures. The proponent further explained that quantitative critical thresholds, such as the amount or distribution of habitat required for self-sustaining and ecologically effective traditional use plant populations, are rarely known with certainty. Rather, applying resilience, adaptability, and existing conditions provide important ecological context. Using a weight-of-evidence approach, it was determined that habitat for traditional use plants remains abundant, well connected, and distributed in the Application and RFD cases, and it is predicted that traditional use plants would continue to be self-sustaining and ecologically effective. Examples of changes that might be considered significant include permanent effects over a large geographic extent, exposure to COPC that causes permanent changes to survival and reproduction of a population, and habitat loss and fragmentation that disrupts population connectivity. However, the assessment of traditional use plants indicates that none of these conditions would occur from incremental and cumulative changes to habitat from the Project. CNSC staff found this answer to be acceptable, also taking into account that overall, around 97.5% of traditional use plant habitat remains intact in the RSA in the RFD case.

CNSC staff deemed the proposed mitigation, monitoring, and follow-up measures as appropriate to address potential cumulative effects on terrain, soils, and vegetation. CNSC staff conclude that cumulative effects on vegetation are not significant.

8.3.4. Terrestrial Biota

8.3.4.1. Proponent's assessment of environmental effects and mitigation

NexGen's analysis of the RFD Case considered combined effects from the Patterson South Property, and for woodland caribou the RFD evaluation included qualitative analysis of predicted effects from forestry in the southern unit of the SK2 West. In the RFD Case, a precautionary approach was taken by assuming a maximum disturbance of an area approximately four times larger than the currently anticipated footprint for the Rook I Project, and approximately six times larger than the currently anticipated footprint for the Patterson Lake South Property. The assumed period of residual effects from the Patterson Lake South Property completely overlaps with similar effects from the Project, a maximum duration of 95 years.

NexGen noted that activities from both the Rook I Project and Patterson Lake South Property that would have potential to affect terrestrial biota include land clearing, site preparation, construction of facilities and infrastructure, handing of ore and waste rock, changes to water and air quality, and other activities supporting mine construction, operation and closure.

Under existing conditions, woodland caribou is not considered to be self-sustaining in the SK2 West range in Saskatchewan. The provincial management threshold limiting the disturbance to 35% has been exceeded and therefore, any amount of incremental habitat loss from any development is considered significant to woodland caribou. NexGen has committed to offsetting

residual effects through the development of a CMOP. In the RFD Case, a loss of 1.3% of suitable caribou habitat is expected in the caribou home range, with less than 1% expected to occur in SK2 West. NexGen was unable to quantify the loss of suitable caribou habitat from forest harvest as the projected amount and layout of future forest harvest is not publicly available. With the implementation of the CMOP, NexGen has concluded that the contribution of Project-specific adverse residual effects are predicted to be not significant.

Cumulative habitat loss for all other wildlife VCs in the RFD Case is expected by NexGen to be less than 3.5% of suitable habitat in the RSA. NexGen has committed to progressive reclamation of habitats during Operations and Closure. Habitat distribution for all VCs in the RFD Case is expected to remain well connected through the RSA, and despite variability on effects for individual animals, overall, all VC populations are expected by NexGen to remain ecologically effective and self-sustaining.

Climate change is projected by NexGen to decrease the availability of wetlands and moister ecosystems and could exacerbate losses in wildlife habitats. Upland ecosystems could become drier and more prone to forest fires, exacerbating effects on wildlife VCs. NexGen's predictions of climate change induced effects are uncertain, but they anticipate that all VCs except for woodland caribou would remain self-sustaining and ecologically effective.

The RFD Case is expected to increase landscape fragmentation, but biodiversity in the RSA is predicted by NexGen to be maintained similar to existing conditions. Effects on biodiversity are anticipated to be low in magnitude and the geographic extent of effects would be within the maximum disturbance area for the RFD Case. Residual effects are predicted by NexGen to be mostly reversible over long term for all ecosystems that would regenerate after reclamation; however, loss of wetlands is conservatively assumed to be permanent and irreversible, but wetlands are expected to remain well connected in the RFD Case.

NexGen concluded that residual, incremental and cumulative effects resulting from the Project, previous and existing developments, and the Patterson Lake South Property on wildlife and wildlife habitat would be not significant for all VCs.

Table 8.7: Summary of Suitable Habitat Loss by Valued Component (From EIS: table 14.8-1)

VC	Life Requisite (seasonal requirement)	Habitat Suitability Rating	Base Case Area in RSA (ha)	Application Case Change in Area (ha)	Application Case % Change	RFD Case Change in Area (ha)	RFD Case % Change
Woodland caribou	All seasons	High	2,821.0	-7.5	-0.3	-13.2	-0.5
		Moderate	2,540.9	-24.6	-1.0	53.7	2.1
		Low	72.5	-0.3	-0.4	-1.4	-1.9
Moose	All seasons	High	12,556.8	-56.7	-0.5	-308.9	-2.5
		Moderate	58,996.2	-732.0	-1.2	-2,085.2	-3.5
		Low	12,655.0	-26.5	-0.2	-57.7	-0.4
Grey wolf	Snow-Free period	High	36,245.2	-146.8	-0.4	-389.1	-1.1
		Moderate	4,716.3	-68.1	-1.4	-217.5	-4.6
		Low	47,515.9	-731.9	-1.5	-1,847.4	-3.9
	Winter	High	11,555.4	-82.0	-0.7	-231.4	-2.0
		Moderate	3,408.7	-32.3	-0.9	-61.0	-1.8
		Low	54,638.4	-731.9	-1.3	-1,847.4	-3.4
Black bear	Spring	High	1,464.8	-63.2	-4.3	-195.2	-13.3
		Moderate	10,252.0	-42.1	-0.4	-77.7	-0.8
		Low	76,679.6	-841.5	-1.1	-2,181.1	-2.8
	Fall	High	54,795.6	-759.3	-1.4	-1,886.1	-3.4
		Moderate	161.5	-23.3	-14.4	-41.6	-25.8
		Low	32,212.7	-128.4	-0.4	-369.8	-1.1
Beaver	Beaver lodge	High	1,529.3	-7.4	-0.5	-21.6	-1.4
		Moderate	1,583.8	0.0	0.0	0.0	0.0
		Low	30,285.8	-28.8	-0.1	-179.1	-0.6
Little brown myotis	Roosting	High	127.8	0.0	0.0	-27.1	-21.2
		Moderate	989.5	< 0.1	0.0	< 0.1	0.0
		Low	21,080.7	-114.7	-0.5	-313.2	-1.5

VC	Life Requisite (seasonal requirement)	Habitat Suitability Rating	Base Case Area in RSA (ha)	Application Case Change in Area (ha)	Application Case % Change	RFD Case Change in Area (ha)	RFD Case % Change
Olive-sided flycatcher	Nesting	High	3,750.6	-4.1	-0.1	-19.5	-0.5
		Moderate	20,896.1	-90.3	-0.4	-235.1	-1.1
		Low	45,035.8	-450.8	-1.0	-1,436.3	-3.2
Rusty blackbird	Nesting	High	403.0	-0.2	-0.1	-0.2	-0.1
		Moderate	516.5	-0.1	0.0	0.0	0.0
		Low	13,528.2	-31.0	-0.2	-49.1	-0.4
Common goldeneye	Nesting	Suitable	13,103.9	-3.5	-0.0	-114.6	-0.9
Mallard	Nesting	High	29,103.9	-142.1	-0.5	-520.6	-1.8
		Moderate	96.8	0.0	0.0	0.0	0.0
		Low	44,236.6	-45.1	-0.1	-99.6	-0.4
Canadian toad	Breeding	Suitable	15,325.8	-27.0	-0.2	-47.1	-0.3

Note: Base Case area for woodland caribou is for the caribou home range rather than the wildlife RSA. Habitat suitability modelling for common goldeneye and Canadian toad rated habitat as suitable or unsuitable.

RFD = reasonably foreseeable development; RSA = regional study area; VC = valued component; <= less than.

8.3.4.2. CNSC staff analysis and findings

CNSC staff have reviewed NexGen's assessment of habitat loss and alteration for woodland caribou and concur that the Project will result in residual effects. The Project is located within the SK2 West Caribou Administration Unit, where cumulative anthropogenic disturbance already exceeds the provincial management threshold of 35% for maintaining a self-sustaining population, as outlined in the federal recovery strategy. NexGen's assessment acknowledges that the Project will contribute to further habitat loss and alteration, including changes to terrain, vegetation composition, and ecosystem connectivity.

NexGen has committed to developing and implementing an updated CMOP, which will be aligned with the Government of Canada's Amended Recovery Strategy for Woodland Caribou (Rangifer tarandus caribou), Boreal Population, in Canada and developed in collaboration with Indigenous communities and Saskatchewan Ministry of Environment. The plan will include offsetting measures, progressive reclamation, and monitoring to ensure effectiveness. CNSC staff support this commitment and recommend it be formalized as an EA condition.

CNSC staff agree with NexGen's conclusion that sensory disturbances (e.g., noise, light, human presence) could affect caribou movement and behaviour. NexGen has proposed mitigation measures such as activity restrictions during sensitive periods, noise suppression, and light pollution controls. CNSC staff considers that these measures are consistent with best practices will be sufficient to mitigate the identified effects. A light pollution mitigation plan is recommended as an EA commitment.

Taking into account the CMOP, NexGen's ongoing commitments to collaborate with Indigenous Nations and communities, mitigation measures and the ongoing compliance oversight through the CNSC's regulatory framework, CNSC expect the contribution of Project-specific adverse residual effects to be not significant.

8.3.5. Views Expressed

Indigenous Nations and Communities

CRDN members previously shared their concern 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 around and north of Patterson Lake. CRDN had also previously noted that the provincial government and proponents of industrial/extractive projects are inclined to characterize exploratory endeavors as low impact activities which do not warrant consultation with potentially affected Indigenous communities. However, without advance information from the Indigenous Nations and communities who are affected and whose members are intimately familiar with the traditional lands involved, there is no basis for assuming that the planned industrial activities will have little or no impact on their rights. NexGen confirmed cumulative effects of the Project; previous, existing and approved projects, and RFDs were assessed for the Projects with similar effects on the same VCs and intermediate components throughout the EIS. The Patterson Lake South Project was deemed an RFD based on NexGen's selection criteria. NexGen has committed to a variety of engagement methods with Indigenous Nations and communities and has noted that engagement with communities within the Local Priority Area (LPA) as foundational to the development of the Project. Engagement activities include the implementation of an Indigenous Public and Engagement Program to communicate regularly and reach early resolution to concerns raised.

MN-S members shared their concern that cumulative impacts of substantial and growing projects and mineral exploration activity will severely limit their ability to practice continued use of the region around and north of Patterson Lake. NexGen confirmed that exploration activities in the area of the project, including those conducted by NexGen, were assessed within the EA in addition to previous, existing and approved projects, and RFDs. NexGen has committed to establishing an Environmental Committee to monitor environmental performance of the Project, continued engagement with MN-S, and further mitigation measures to minimize adverse effects on access to Indigenous land and resources.

BNDN members have concerns that cumulative impacts of substantial and growing projects and mineral exploration activity may limit their ability to practice continued use of the region around and north of Patterson Lake. BNDN members are concerned that the Rook I Project could

contribute to cumulative effects in the region and study participants voiced frustration at historical and ongoing alienation from the territory caused by numerous sources, including the development of mines and mining activity within their territory. (e.g. Cluff Lake Mine). BNDN is concerned that NexGen's cumulative effects assessment did not include enough detail to capture the potential cumulative effects in a scenario where the Rook I Project and Patterson Lake South Project are both approved. BNDN noted concerns regarding potential adverse impacts to fish and fish habitat from various Project operations. NexGen noted that several effects pathways related to cumulative effects and Project effects on local and regional waterbodies and watercourses were assessed. NexGen has committed to Environmental Monitoring, Groundwater Protection and Monitoring, and Mine Waste Management plans and has further noted that the aforementioned concerns regarding cumulative effects from multiple industrial projects and changes to water quality in Patterson Lake and connected waterways were discussed and resolved through the Environmental Committee. NexGen has committed to further work with the BNDN through the Environmental Committee to address future concerns.

BNDN noted that the EIS entirely excluded the impacts of sulphur dioxide emissions from the Alberta oil sands that has already led to lakes in the region already exceeding critical acidity loads. The significant underestimation of the potential for acid rock drainage from mine waste rock on site compounds the risks of severe changes to the lake through acidification. concerns regarding potential adverse impacts to fish and fish habitat from various Project operations. BNDN is concerned that NexGen's cumulative effects assessment did not include enough detail to capture the potential cumulative effects in a scenario where the Rook I Project and Patterson Lake South Project are both approved.

BRDN raised concerned about cumulative effects from other industry in the region (e.g., the Project, Fort McMurray oil sands developments) such as impacts to air quality and its effects on human health and the environment, as well the Patterson Lake South project which is also located on Patterson Lake. NexGen confirmed cumulative effects of the Project; previous, existing and approved projects, and RFDs (including the Patterson Lake South Project) were assessed for the Projects with similar effects on the same VCs and intermediate components throughout the EIS, and exploration activities in the area of the project were assessed within the EA. NexGen has committed to establishing an Environmental Committee to monitor environmental performance of the Project, continued engagement with Indigenous Nations and communities, and further mitigation measures to minimize adverse effects on the environment and human health.

YNLR has conducted their own cumulative effects analysis, in accordance with accepted federal parameters, of the area around NexGen's project. While both the YNLR and NexGen analyses concluded that there would not be significant residual and cumulative effects in its EIS, YNLR believes that the spatial scope of NexGen's analysis is too limited to adequately address the cumulative environmental effects that are likely to result from other reasonably foreseeable future activities in the area. YNLR raised concerns about potentially contaminated groundwater from the proposed Patterson Lake South project local study area reaching the local study are of the NexGen Rook I Project and vice versa.

ACFN indicates that further uranium mining exploration or development in the study area is anticipated to have potential to direct and adverse effects on their treaty rights and add to the ongoing cumulative effects in the region.

8.3.6. Issues requiring Follow-up

CNSC staff expect NexGen to include follow-up monitoring for all relevant pathways (e.g., air, effluent, surface water, runoff, rain and snow precipitation, groundwater) and contaminants of potential concern (COPCs) (e.g., SO_2, NO_x, sulfates, nitrates, pH) that may contribute to lake acidification. This environmental monitoring data should be incorporated into the next ERA to model and assess potential cumulative effects related to this risk. NexGen is also expected to explore mitigation options and adaptive management strategies to address potential environmental impacts based on increasing acidification levels in lakes if future monitoring data indicates risk.

CNSC has recommended a follow up commitment that NexGen incorporate the Patterson Lake South Project's most up to date model outputs for all project phases and include all predicted pathways (for instance the Patterson Lake South project's far future groundwater pathways) into the Rook I model for the RFD case in the next iteration of the ERA once this data is publicly available, in order to demonstrate that the cumulative effects analysis was performed conservatively and the conclusions remain valid. Any increased risks found through this analysis, if any, would require NexGen to develop mitigation or adaptative management plans.

9. 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 upholds Indigenous peoples' potential or established Indigenous and/or treaty rights pursuant to section 35 of the Constitution Act, 1982 when it makes licensing decisions under the NSCA. The contents of the EA report address the requirements for the licence to prepare site and consultation on the EA report is required to fulfil the Crown's constitutional obligations.

This section of the EA report summarizes the Indigenous consultation and engagement activities conducted by CNSC staff and NexGen to date. 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 25-H12 as appendix C.

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

The NexGen Rook I Project is is situated within Treaty 8 Territory and the homeland of the Métis, and within the traditional territories of the Dene, Cree and Métis peoples. Treaty 8 covers the northwestern quadrant of Saskatchewan, through northern Alberta and into northern British

Columbia, extending to the Northwest Territories to the west and the north, with the southern and western border extending to central and eastern Saskatchewan. The Project is located in Saskatchewan's southern Athabasca Basin approximately 640 km northwest of Saskatoon and is accessed from Highway 955.

The following Treaty 8 signatory First Nations have been consulted and engaged on the Project:

- Clearwater River Dene Nation (SK)
- Black Lake First Nation, Fond du Lac Denesuline First Nation and Hatchet Lake First Nation, which Ya'thi Nene Lands and Resource Office (YNLR) represents
- Athabasca Chipewyan First Nation (AB)
- Mikisew Cree First Nation (AB)

Given the Project location's proximity to Treat 10 territory and the overlapping of traditional territories, the following Treaty 10 First Nations have been consulted and engaged on the Project:

- Birch Narrows Dene Nation (SK)
- Buffalo River Dene Nation (SK)

Given that the Project overlaps the homeland of the Métis, Métis Nation-Saskatchewan Northern Region II (MN-S NRII) has also been consulted on the Project. In addition, in May 2025, Willow Lake Métis Nation (WLMN), expressed an interest in the project to the CNSC. In response, CNSC staff responded and offered to consult and engage WLMN on the Project.

No communities are located within the immediate proximity of the Rook I property. Travelling by existing roads, the closest community to the Project is the Northern Village of La Loche, which is approximately 155 km away. Calculated using a straight line, the closest communities are approximately 120 km from the site, with Saskatoon 640 km to the southeast. The federal lands within a 140 km radius of the Project area are First Nations' reserve lands and do contain permanent residences.

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

In order to fulfill the CNSC's consultation obligations for a decision rendered under the NSCA and CEAA 2012 on the Rook I Project, CNSC staff sent early notification letters regarding the expected Rook I application to all identified Indigenous Nations and communities and have continued to provide multiple opportunities for consultation, engagement and collaboration with Indigenous Nations and communities regarding their concerns and interests related to the Project. CNSC staff provided multiple opportunities for dialogue through phone calls, correspondence, community workshops, tours, as well as virtual and in-person 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.

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 NexGen'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 of consultation protocols and Terms of Reference to outline agreed upon steps and activities for collaboration and consultation on the EA and regulatory review process

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 NexGen Rook I 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 Rook I Project were offered opportunities to collaboratively develop sections of the EA report and Consultation 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 work towards addressing and responding to any outstanding concerns with regards to the Project. CNSC staff will involve NexGen in these discussions and consultation activities as appropriate.

CNSC staff's findings 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. Public engagement

This section of the report is focused on CNSC staff's EA-specific public engagement activities. Details on all public engagement activities conducted by NexGen and CNSC staff with respect to the Rook I Project are provided in section 4 and appendix C of staff's CMD 25-H12.

Pursuant to section 24 of CEAA 2012, as RA, 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, when and for which steps in the EA process, 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 NexGen Rook I Project. Notices of these opportunities to participate were posted on the Registry, as well on the CNSC's website and they were sent out directly to the distribution list for the Project, which included interested Indigenous Nations and communities. During these opportunities, comments were solicited on:

- the Rook I Project Description (May 2 to June 1, 2019)
- the Rook I Draft EIS (July 14 to October 12, 2022)
- the Rook I EA report (this report, November 29 to January 28, 2026)

In addition to the formal opportunities for participation, CNSC staff responded to Rook I related 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. NexGen -led public participation activities

NexGen held a number of public information sessions and site tours across northern Saskatchewan starting in 2015 through to 2025. NexGen also organized other forms of Rook I Project-specific engagement and outreach activities, including but not limited to:

- posting and publishing information including key milestone events and engagement activities on NexGen's website. Posting of project-related information through its social media accounts on X, Facebook, LinkedIn, and Instagram. Joint Working Group (JWG) meetings/information sessions with Indigenous Nations and communities residing in the local priority area. JWG breakout sessions on specific topics of concern requiring more

detailed quarterly newsletters on project updates sent to Indigenous Nations and communities in the region numerous site visits to the Rook I Project site participating in regional open house events in northwestern Saskatchewan with federal and provincial regulators from 2022-2025 virtual meetings (TEAMS, Zoom) in 2020-2021 due to COVID-19 pandemic in-person leadership meetings with elected officials including mayors and councillors regular update meetings with local Indigenous leadership

- emails to and letters to communities and interested parties including notifications of the draft EIS submissions and responses to questions submitted

NexGen also developed Project materials and Executive Summaries of both the Project Description and Draft EIS in Cree, and Dene. In addition, a number of interviews and meetings were conducted with regional businesses, municipalities and other interested parties. NexGen also completed public outreach and communications out using local radio stations, digital and social media, local print media, quarterly community newsletters, and by mail to reach a variety of audiences.

10.2. CNSC-led/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 the case of Rook I Project, in-person engagement for the Project was often conducted in collaboration with NexGen and the province, specifically Saskatchewan Ministry of Environment, and Saskatchewan Environmental Assessment Branch (SKEAB) as they each have key oversight roles and provide interested parties with information relevant to their roles in regulatory approvals in Saskatchewan in uranium mining and milling.

10.2.1. Open house and outreach events

CNSC staff participated in a total of 5 public outreach and open house events across northern Saskatchewan with NexGen and the province of Saskatchewan on the Rook I Project throughout the regulatory review process. 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 June 20-24 of 2022, June 12-16, 2023, May 27-30, 2024, November 19-22, 2024, and September 23-24, 2025. CNSC staff also participated in several other in-person relationships building events with Indigenous Nations and communities and the public across northern Saskatchewan including sites visits, multiple in-person leadership meetings, and virtual meetings from 2022 to 2025.

The main concerns raised by attendees at the 3 open house events to CNSC staff are listed below:

- positive economic opportunities associated with the Project for the broader region
- concerns that certain communities may have more opportunity that others in the region for jobs and economic opportunities
- questions on job and training opportunities for youth in the north

- safety concerns with respect to increased traffic on the roads and opportunities for improvements to roads across the northern Saskatchewan due to the Project
- questions around transportation routes and concerns around potential spills and accidents and malfunctions
- concerns with land users maintaining their traditional way of life and culture
- health concerns around radiation and cancer rates and general community health
- concerns the protection of the environment including water, fish, and wildlife for future generations
- request for additional independent Indigenous environmental monitoring in the local area by communities
- concerns around cumulative effects of potentially having two mines on the same lake
- concerns emergency services and lack thereof as communities in the region are already lacking proper infrastructure at health centers and staffing
- questions regarding whether public/community concerns will be taken into consideration when the Commission is making a final decision on this project

10.2.2. Updates to the NSEQC

In addition, the Northern Saskatchewan Environmental Quality Committee (NSEQC) was also identified as potentially having an interest in the Project. The NSEQC has representatives from the majority of the northern municipal and First Nation communities located in the Northern Saskatchewan Administration District. CNSC staff participated in 5 Northern Saskatchewan Environmental Quality Committee (NSEQC) meetings that took place from 2022-2025 to provide updates to the NSEQC on the proposed mining projects undergoing EAs across northern Saskatchewan.

The main concerns discussed and raised by NSEQC members at the events to CNSC staff included the following:

- specific questions on underground tailings storage and challenges 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, fish, wildlife, and communities
- questions on other mines in the region and cumulative effects due to two new mines and mills and exploration activities taking place in the northwest.
- general questions on timelines of proposed mine and mining activities in the region

CNSC staff also hosted 1 webinar for the Project on September 13, 2023. This webinar provided an overview of the CNSC's regulatory review process for licensing and EA, provided an update on the NexGen Rook I Project, information on how to get involved in the process and allowed time for questions from attendees. In total 49 people participated in the webinar and the webinar was also recorded, for those unable to attend.

Questions and concerns discussed and raised by members at public at this webinar included the following:

- discussion on general timelines of upcoming public review periods including the draft EIS and final EIS documents and Commission hearings
- CNSC licensing and EA regulatory integrated approach
- questions on what determines if a nuclear project environmental assessments are conducted under CEAA 2012 vs IAAC legislation
- questions on harmonization of the provincial and federal EAs

A second webinar is planned for the fall of 2025 and will discuss CNSC's EA assessment and conclusions, provide an update on the upcoming Commission hearings, along with information on how to get involved and intervene in the hearing.

10.2.3. ***Email Updates***

CNSC staff provided regular updates to all those who have participated and/or expressed interest in the regulatory review process for the proposed Project, in the form of project bulletins that are distributed to all those signed up through the Project distribution list. These bulletins were also handed out in-person and open house events. Project bulletins were developed and sent to interested parties in the summers of 2022, 2023 and 2024 and planned fall of 2025. The bulletins included Project updates, major milestones, next steps of the process, as well as-information on how to stay informed and contact information for CNSC staff.

10.2.4. 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.

In 2020, the CNSC announced it was awarding $49,500 to Clearwater River Dene Nation (CRDN) to support its participation in a Terms of Reference for the Project and its continued participation in the EA process.

On May of 2020, the CNSC announced it was offering up to $150,000 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 the NexGen's draft EIS. A total of $409,079 was awarded for this phase of funding to the following 7 recipients:

- Clearwater River Dene Nation
- Birch Narrows Dene Nation
- Buffalo River Dene Nation
- Métis Nation-Saskatchewan
- Ya'thi Néné Land and Resource Office

- Athabasca Chipewyan First Nation
- Saskatchewan First Nations Center of Excellence
- Saskatchewan Environmental Society
- Canadian Environmental Law Association

In March 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 $464,979 for the second phase to the following recipients:

- Clearwater River Dene Nation
- Birch Narrows Dene Nation
- Métis Nation-Saskatchewan
- Ya'thi Néné Land and Resource Office
- Athabasca Chipewyan First Nation
- Buffalo River Dene Nation
- Mikisew Cree First Nation

11. 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.

NexGen's environmental assessment follow-up monitoring will include regulatory compliance monitoring (monitoring to confirm implementation of approved design standards, mitigation, approval conditions and NexGen commitments) and/or follow-up monitoring (testing the accuracy of effects predictions, reduce or address uncertainty, determine effectiveness of mitigation, provide feedback to operations for modifying or adopting new mitigation designs, policies, or practices).

NexGen is committed to providing public information related to activities throughout all phases of the project. NexGen's Indigenous and Public Engagement Program will provide the platform for disclosing information and maintaining relationships with Indigenous Nations and communities and other people and groups interested in the project. The Indigenous and Public Engagement Program will contain a grievance mechanism to monitor and respond to complaints and concerns, which will inform the development of follow-up monitoring measures. NexGen has also committed to using adaptive management to improve knowledge through an iterative process and seeking engagement and feedback within this process. The adaptive management approach is described in the Integrated Management System (IMS) manual.

Within the IMS, NexGen is developing monitoring and management plans related to environmental protection. If the project is approved, monitoring and follow-up programs and management plans will be developed as the project moves through the permitting and licensing processes. NexGen has stated they will consider input from Indigenous Nations and communities, regulatory agencies, and the public in developing these monitoring and follow-up programs.

NexGen's monitoring and follow-up programs will be managed under the IMS and carried out during the Construction, Operations, and Closure phases. Conceptual monitoring and follow-up programs have been developed for the following areas:

1. Air Quality (EIS section 7.2)
2. Noise (EIS section 7.3)
3. Climate Change (EIS section 7.4)
4. Hydrogeology (EIS section 8)
5. Hydrology (EIS section 9)
6. Surface Water Quality and Sediment Quality (EIS section 10)
7. Fish and Fish Habitat (EIS section 11)
8. Terrain and Soils (EIS section 12)
9. Vegetation (EIS section 13)
10. Wildlife and Wildlife Habitat (EIS section 14)
11. Human Health (EIS section 15)
12. Cultural and Heritage Resources and Indigenous Land and Resource Use (EIS section 16)
13. Other Land and Resources Use (EIS section 17)
14. Economy (EIS section 18)
15. Community Well-Being (EIS section 19)

Details of the preliminary monitoring and follow-up program for each area is in EIS Appendix 23B.

NexGen is also working with several Indigenous Nations and communities to implement independent environmental monitoring to verify project performance and determine if mitigations and controls are effective in protecting the environment. NexGen has committed to providing funding for the life of the project for a full-time independent Indigenous monitor from CRDN, MN-S, BNDN and BRDN to provide unrestricted environmental monitoring opportunities, including independent environmental sampling, subject to the Indigenous Monitors complying with appropriate health, safety, and other site-specific policies. The Indigenous monitor would report openly and without restrictions to community members of identified Indigenous Nations on the performance of the project.

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. CNSC Staff Findings and Recommendations

In preparing this report, CNSC staff took into account NexGen'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 Rook I 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 Indigenous Knowledge 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 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*. CNSC staff's recommendations related to 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.
    - 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.
    - the 3 EA Conditions listed in table 12.1 below and described in sections 6 and 7, along with NexGen's commitments as identified and included in the document titled "NexGen Rook I Project Federal Commitments Report" become enforceable conditions that are set out in the Commission's decision.

Table 12.1: List of proposed EA Conditions

EA Condition Numbers	EA Report chapter	EA Condition
EA1 LCH section G.5 and related appendix D.1	Environmental Protection, Aquatic Environment (See section 6.3)	The licensee shall collect and submit additional baseline wetlands water level and water quality data. The licensee shall also submit the plans for wetland monitoring over the lifecycle of the project to assess potential effects due to the Project and to verify conclusions of EIS.
EA2	Environmental Protection, SARA	The licensee shall submit a revised woodland caribou mitigation and offset plan that utilizes site-specific information to evaluate effects to woodland caribou and includes a plan for habitat offsetting. The plan must ensure

EA Condition Numbers	EA Report chapter	EA Condition
LCH Section G.5 and related Appendix D.1	(See section 7.2 of the EA report)	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.
EA3 LCH Section G.5 and related Appendix D.1	Environmental Protection, SARA (See section 7.2 of the EA report)	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.

Facility-specific conditions can be found in section 1.2.3 of the CMD 25-H12 and section G (General) of the licence and the associated LCH.

For commitments specific to Indigenous Nations and communities, additional information can be found in the Consultation Report.

In addition, CNSC staff are proposing a Licence Condition for Indigenous engagement which includes requirements for NexGen 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 recognized and protected under section 35 of the *Constitution Act,* 1982.

Table 12.2 outlines the list of EA commitments that NexGen will be required to include in their updated document "NexGen Rook I Project Federal Commitments Report" submission.

Table 12.2: List of Additional EA commitments

EA Report chapter	EA Commitment
Aquatic Environment (section 6.3)	At the licensing phase (licence to prepare site and construct), NexGen to incorporate the following into the EPP or EPP supporting documents: a. Manage all potential airstrip contaminants and substances, including, but not limited to, glycol and fuel, appropriately to avoid any adverse effects to fish and fish habitat. Confirm that any airstrip runoff containing glycol, fuel, or any other contaminants will be collected and managed appropriately. b. Monitor the explosives storage area for seepage and spills and to confirm effective containment of explosives c. Identify and implement best practices for use, storage, and management of nitrogen-based explosives to avoid the introduction of explosives and the residues into the aquatic environment.

EA Report chapter	EA Commitment
Aquatic Environment (section 6.3)	During the licensing phase (licence to prepare site and construct), as part of physical design/BATEA documentation package NexGen to provide to CNSC staff for review and approval an updated PMP estimate or confirm whether the current PMP is valid, or conservative based on analyses of up-to-date storm database.
Aquatic Environment (section 6.3)	During the licensing phase (licence to prepare site and construct), as part of BATEA documentation package, NexGen to optimize the design of their effluent treatment plant, as well as refine environmental release targets, as per the requirements of REGDOC-2.9.2.
Atmospheric Environment (section 6.1)	During the project lifespan, NexGen will continue to evaluate monitoring and mitigation measures to track and minimize air pollution and, where practical, implement any newly identified mitigation measures that are technically and economically feasible.
Atmospheric Environment (section 6.1)	During the licensing phase (licence to prepare site and construct), NexGen to provide a summary of carbon sinks and land use change emissions using either a Tier 2 or Tier 3 approach assessment.
Terrestrial Biota (section 7.2)	IF the detailed design shows a potential greater disturbance to wetland ecosystems than what was assessed in the EIS (regardless of the size), THEN NexGen will prepare and provide CNSC a wetland mitigation and offset plan, as a reference document in the EPP or EPP supporting documents, that includes a discussion on these impacts, what mitigations are to be used, how they would be implemented to reduce Project effects on species at risk and migratory birds, and how these effects would be monitored.
Terrestrial Biota (section 7.2)	NexGen to develop an EPP supporting document that would detail light pollution mitigation measures (including adaptive management) that would form part of the Project electrical design criteria. Design of lighting should be developed taking into consideration potential impacts on migratory birds, and health and safety of workers, and security requirements, as applicable.
Cumulative Environmental Effects (section 8.3)	NexGen to monitor or estimate airborne emissions of the acid precursors NO2 and SO2 from Project sources as per the Effluent and Emissions Plan as well as ambient air quality measurements of NO2 and SO2 as per the Environmental Monitoring Plan. NexGen to also monitor pH and alkalinity in treated effluent as per the Effluent and Emissions Plan as well as pH and alkalinity in snow, groundwater, wetlands and waterbodies listed in the Environmental Monitoring Plan. As part of annual reporting, NexGen to review the results of the Acid-Sensitive Lakes component of the Canada-Alberta Oil Sands Environmental Monitoring Program to determine if there is a potential for cumulative effects from

EA Report chapter	EA Commitment
	the Project and oil sands emissions. Based on future results, mitigation or adaptive management may be required.
Cumulative Environmental Effects (section 8.3)	Prior to the licensing phase (licence to operate), NexGen to review the Fission Uranium Corporation - Patterson Lake South Project EIS and compare the model outputs from that project to the assumed outputs in the Rook I Project EIS Reasonably Foreseeable Development Case. If any model outputs are greater than what was assumed in the Rook I EIS Reasonably Foreseeable Development Case, NexGen to incorporate those outputs into the next iteration of the Environmental Risk Assessment. Should any increased risks be discovered through this analysis, NexGen will assess whether additional mitigation measures or adaptative management will be required to keep Project effects levels protective of people and the environment.

Appendix A. Environmental effects rating criteria

Table A.1: - General Assessment criteria for significance determination

Assessment criterion	Effects rating definitions		
Residual adverse effect	**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.

Appendix B. Significance Determination Tables

Table B-1: Summary of significance determination for predicted residual adverse effects from Rook I Project

Residual Effect	Magnitude	Geographical Extent	Duration	Frequency	Reversibility	Timing	Significance of Residual Effect
Fish and Fish Habitat							
Habitat availability	Negligible to low: due to the potential for limited changes to the food base for fish resulting from exposure to elevated copper concentrations in the far future projection	Local: restricted to Patterson Lake North Arm – West Basin where peak copper concentrations are predicted to occur	Permanent	Periodic: fluctuating with climate	Irreversible: not reversible before end of modeling timeframe	N/A	**Not Significant** Effects on fish VC habitat availability was determined to be local in geographic extent and the predicted effects would be within the resilience and adaptability limits for the four fish VCs.
Survival and reproduction	Negligible to low: due the potential for direct toxicological effects (lake whitefish) and/or due to predicted changes in habitat availability (i.e., food base; all VCs)	Local: exposure of fish VCs to peak copper concentrations and changes in habitat availability would be restricted to Patterson Lake North Arm – West Basin. However, as fish VCs can move around, the geographic extent of effects on survival and	Permanent	Periodic: fluctuating with climate	Irreversible: not reversible before end of modelling timeframe	N/A	**Not Significant** Effects on fish VC survival and reproduction was determined to be local in geographic extent and the predicted effects would be within the resilience and adaptability

Residual Effect	Magnitude	Geographical Extent	Duration	Frequency	Reversibility	Timing	Significance of Residual Effect
		reproduction was assessed as local					limits for the four fish VCs..
Terrestrial Biota							
Woodland caribou habitat alteration and/or habitat loss	Moderate The habitat area lost to the project does not meet the minimum 65% undisturbed habitat threshold necessary to support a self-sustaining population of this species. Alteration of terrain and soil conditions, and/or plant species composition, could change the types of ecosystems that can be reclaimed on the landscape and adversely affect woodland caribou habitat availability and distribution, and survival and reproduction.	Moderate Local to regional study areas, and beyond regional study area, including SK2 West Administration Unit	Long term Effect predicted to occur during construction, operation, and the closure/decommissioning phases.	Continual Effect predicted to occur continuously during all phases of the Project.	Reversible Effect predicted to be reversible (reclaimed habitat) once project activities cease.	N/A	**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 the Government of Canada's Amended Recovery Strategy for Woodland Caribou (Rangifer tarandus caribou), Boreal

Residual Effect	Magnitude	Geographical Extent	Duration	Frequency	Reversibility	Timing	Significance of Residual Effect
							Population, in Canada. An EA Condition (see table 12.1 EA2) to meet the federal recovery strategy is proposed accordingly.
Woodland caribou sensory disturbance	Moderate Sensory disturbance resulting from the presence of people, lights, dust, smells, and noise can alter woodland caribou movement and behaviour, and adversely affect caribou habitat availability and caribou abundance and distribution.	Moderate Local to regional study areas, and beyond regional study area, including SK2 West Administration Unit	Long term Effect predicted to occur during construction, operation, and the closure/decommissioning phases.	Continual Effect predicted to occur continuously during all phases of the Project.	Reversible Effect predicted to be reversible (reclaimed habitat) once project activities cease.	N/A	**Not significant** Woodland Caribou are a federal and provincial species at risk that is present and uses habitat within the RSA. Potential sensory disturbance is expected to be appropriately addressed through mitigation, offsetting, and/or other measures necessary to meet the Government of Canada's Amended Recovery Strategy for

Residual Effect	Magnitude	Geographical Extent	Duration	Frequency	Reversibility	Timing	Significance of Residual Effect
							Woodland Caribou (Rangifer tarandus caribou), Boreal Population, in Canada. An EA Condition (see table 12.1 EA2) to meet the federal recovery strategy is proposed accordingly.
Sensory disturbance for migratory birds	Low Noise, light and human disturbance is predicted to have little effect on migratory birds or unique migratory bird habitats.	Moderate Effect predicted to extend into the local study area.	Moderate Effect predicted to occur during construction, and operation phases and the early part of decommissioning phase.	Intermittent Effect predicted to occur at intermittent intervals during, construction, operation phases, and the early part of the decommissioning phase.	Reversible Effect predicted to be fully reversible once project activities cease.	Moderate Timing of sensory disturbance may affect breeding activities of migratory birds, despite proposed timing of activities to avoid sensitive breeding seasons.	**Not significant** Migratory birds predicted to inhabit or frequent parts of the local and regional study areas, where sensory disturbance would be similar to the baseline.
Loss of wetlands	Low Removal of wetlands in the project study area and reduction in	Moderate Effect predicted to occur within the local study area.	Long – term Effect predicted to extend into	Continuous Effect predicted to occur continuously	Partially Reversible Effect predicted to be partially reversible as	N/A	**Not significant** Wetland habitats are available within the local

Residual Effect	Magnitude	Geographical Extent	Duration	Frequency	Reversibility	Timing	Significance of Residual Effect
	function of wetlands in the local study area.		closure/decommissioning phases.	during all phases of the Project.	pre-project conditions would not be fully achieved.		and regional study areas. Site rehabilitation in accordance with the decommissioning plan would partially restore wetlands in the project and local study areas in the long term.
Indigenous Land and Resource Use for Traditional Purposes							
Changes to access of and/or quality and quantity of hunting, fishing, trapping, and ceremonial gathering activities in the Site Study Area (SSA) as a result of the project.	Moderate A loss of access to the Project SSA 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 locations or means to practice the activity and use by an Indigenous group may be modified or limited. However, Indigenous Nations and communities are	Moderate Local Effect predicted to be in the Project SSA but may extend into the LSA as construction takes place in the short term due to increase in traffic etc. so some land users may choose to stay away from LSA.	High Medium-term Access to the SSA is expected to be restricted at the NexGen gate to the project site and is expected to last between 4 to 43 years (i.e., effect expected during construction through to the end of post-decommissioning) when the lands are expected to return to province through Institutional Control Program (ICP)	High Continuous Effect predicted to occur to start during construction (1-4 years) and continuously during operations, and decommissioning.	Moderate Partially Reversible Effect predicted to be reversible as the access to the SSA would be permitted for hunting, fishing and trapping post-decommissioning for traditional activities once it enters provincial Institutional Control Program (ICP)	Moderate Timing of project activities may affect some traditional activities in the SSA including moose harvesting, fishing and berry picking but mitigation measures will reduce these activities during the cultural harvesting seasons where possible.	**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 will be restricted access. However, there is limited ILRU in the Site Study Area and the changes in the availability of resources are not

Residual Effect	Magnitude	Geographical Extent	Duration	Frequency	Reversibility	Timing	Significance of Residual Effect
	able to continue to utilize both the LSA and RSA for traditional activities.						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 Local Study Area and 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 955 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 4 to 43 years (i.e., effect expected during construction through to the end of post-decommissioning when the lands are expected so may potentially impact use of LSA due to mine.	High Continuous Effect predicted to occur to start during construction (1-4 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
Changes in access to cultural and heritage resources including any of those of historical,	Low The effect results in a change to locations or experience, or use of locations or for	Low Site-Specific The change could be direct but will only	High Long-term Any change to a historical,	Moderate Intermittent While the possibility for a change exists	High Irreversible Any destruction or heritage resources that	Low Inconsequential The timing of predicted project	**Not significant** The Project may change the availability of a historical,

Residual Effect	Magnitude	Geographical Extent	Duration	Frequency	Reversibility	Timing	Significance of Residual Effect
archaeological, paleontological or architectural significance	traditional purposes, but the activity and use by an Indigenous group could be practiced in the same or similar manner as before**.**	likely take place in the SSA as no other areas outside the lease areas should be disturbed during construction, operations and decommissioning activities.	archaeological, paleontological or architectural significance likely be permanent.	throughout all Project phases, the actual change events are expected to occur sporadically and primarily take place during the construction phase of the project (1-4 years) during ground disturbance activities and are therefore deemed intermittent.	take place would likely be permanent and therefore deemed not reversible.	activities is not expected to affect sensitive activities to changes to a historical, archaeological, paleontological or architectural significance.	archaeological, paleontological or architectural significance sites in the Project Area**.** However, there are limited Heritage resources known to exist in the SSA and the identified Heritage mitigation and follow-up monitoring program measures were deemed adequate.
Fear and Avoidance and/or Perceived contamination of animals, water and plants (traditional foods) near Patteron 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	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	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	Low Inconsequential NexGen has committed to engaging with Indigenous Nations and communities on Project Follow-up Monitoring Programs in order to help address	**Not significant** NexGen has committed to engaging with Indigenous in their Project Follow-up Monitoring Programs in order to help address concerns raised regarding fear and

Residual Effect	Magnitude	Geographical Extent	Duration	Frequency	Reversibility	Timing	Significance of Residual Effect
	to perceived risks of contamination.		comfortable continuing to hunt, fish and trapping in the LSA while the project in ongoing.		area and find new areas to hunt, fish, trap etc.	concerns raised regarding fear and avoidance behaviours.	avoidance behaviours and has also committed to supporting independent Indigenous environmental monitors
(Sensory) Noise, traffic, and dust from construction and operation activities degrades the sensory experience of being on the land, causing avoidance of the area for traditional land use and ceremonial activities	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 sensory disturbance	Low to Moderate Local The primary sensory disturbances are expected to take place at the SSA although may extend into the LSA due to increased boundary traffic and access to site primarily during construction activity.	Moderate Medium-term Sensory disturbances are expected to be primarily during the construction phase (years 1-4) yet may extend into the operations phase due to increased traffic to and from the site.	High Continuous Effect predicted to occur continuously during all phases of the Project although initial construction will likely have a greater impact due to increase in human activity to the site	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 SSA including moose harvesting and berry picking but mitigation measures will help to reduce these sensory experiences during the cultural harvesting seasons where possible.	**Not significant** NexGen 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 with Indigenous Nations and communities to understand when cultural important periods relative to harvest times culture camps are

Residual Effect	Magnitude	Geographical Extent	Duration	Frequency	Reversibility	Timing	Significance of Residual Effect
							taking place to reduce potential sensory impacts.
Human Environment							
Cancer risk for Arsenic: consumption of traditional foods including fish and game harvested	Low Predicted ILCR was calculated to be 4 in in 100, 000, as compared to a background level of approximately 50, 000 in 100,000.	Moderate Effects are mostly local and limited to the project footprint.	Long-term Effect predicted to occur during the lifespan of the project.	Continual Effects predicted to occur continuously during the lifespan of the project.	Reversible Effects predicted to be fully reversible once the project activities cease.	N/A	**Not significant** Effects were determined to be local in geographic extent and categorized as negligeable to low.
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.

Appendix E. List of acronyms

AAQO	Ambient Air Quality Objectives
ACFN	Athabasca Chipewyan First Nation
ALARA	As low as reasonably achievable
BATEA	Best available technology economically achievable
BC MOE	British Columbia Ministry of Environment
BNDN	Birch Narrows Dene Nation
BRDN	Buffalo River Dene Nation
Ca	Calcium
CAAQS	Canadian Ambient Air Quality Standards
$CaCO_3$	Calcium carbonate
CCME	Canadian Council of Ministers of the Environment
CEAA 2012	*Canadian Environmental Assessment Act, 2012*
CEC	Cation Exchange Capacity
CEPA	Canadian Environmental Protection Agency
CIAR	Canadian Impact Assessment Registry
Cl-	Chloride
CMD	Commission member document
CMOP	Caribou Mitigation and Offsetting Plan
CNSC	Canadian Nuclear Safety Commission
CNWA	*Canadian Navigable Waters Act*
Co	Cobolt
CO_{2e}	Carbon Dioxide equivalent
COPC	Contaminant of potential concern
CPT	Cemented paste tailings
CRDN	Clearwater River Dene Nation
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
CSA	Canadian Standards Association

CSM	Conceptual Site Model
Cu	Copper
dBA	A-weighted decibels
DFO	Fisheries and Oceans Canada
EA	Environmental Assessment
EAA	Environmental Assessment Act
EC	Electrical Conductivity
ECCC	Environment and Climate Change Canada
EEM	Environmental Effects Monitoring
EIS	Environmental impact statement
ELC	Ecological land classification
EMP	Environmental Monitoring Program
EPP	Environmental Protection Program
ERA	Environmental Risk Assessment
FA	Federal Authorities
Fe	Iron
FIRT	Federal Indigenous Review Team
GCM	Global climate models
GHG	Greenhouse gas
GHGRP	Greenhouse gas reporting program
HC	Health Canada
HCB	Heritage Conservation Brance
HCO3-	Bicarbonate
HCT	Humidity cell test
HHRA	Human health risk assessment
HQ	Hazard quotient
HRIA	Heritage Resource Impact Assessment
HIS	Habitat Suitability Index

IAA	*Impact Assessment Act*
ICP	Institutional control program
IDF	Intensity duration frequency
IK	Indigenous Knowledge
ILCR	Incremental lifetime cancer risk
ILRU	Indigenous land and resource use
IMS	Integrated Management System
INT	Intermediate orthogneiss
IR	Information request
IRKS	Indigenous Rights and Knowledge Survey
ISQG	Interim Sediment Quality Guideline
LCH	License condition handbook
LEL	Lower Effect Level
LLRW	Low level radioactive waste
LNG	Liquefied natural gas
LSA	Local study area
JWG	Joint working group
masl	Metres above sea level
MCFN	Mikisew Cree First Nation
MDA	Mine development area
MDMER	Metal and Diamond Mine Effluent Regulations
Mg	Magnesium
MK	Métis Knowledge
Mkg	Million kilograms
Mn	Manganese
MN-S	Métis Nation of Saskatchewan
Mo	Molybdenum
mSv	Millisievert

Na+	Sodium
NEW	Nuclear energy worker
NexGen	NexGen Energy Ltd.
NFWQM	Near-Field Water Quality Model
NO_2	Nitrogen Dioxide
NORM	Naturally occurring radioactive materials
NP	Neutralization potential
NPAG	Non-potentially acid generating
NRCan	Natural Resources Canada
NSCA	*Nuclear Safety and Control Act*
NSEQC	Northern Saskatchewan Environmental Quality Committee
PAG	Potentially acid generating
Pb-210	Lead-210
PC	Parks Canada
PD	Project description
PEL	Probably Effect Level
PFP	Participant Funding Program
PM	Particulate matter
PMP	Probable maximum precipitation
RA	Responsible authority Ra-226 Radium-226
RCP	Representative concentration pathways
Registry	The Canadian Impact Assessment Registry
RFD	Reasonably foreseeable development
RIA	Rights Impact Assessment
RSA	Regional study area
RSWQM	Regional Surface Water Quality Model
SACC	Strategic Assessment of Climate Change
SAR	Sodium adsorption ratio

SARA	Species at Risk Act
SEL	Severe Effect Level
SKEAB	Saskatchewan Environmental Assessment Brance
SO_2	Sulfur Dioxide
SPGN	Semi-pelitic gneiss
Sr	Strontium
SSA	Site study area
SWSA	Saskatchewan Water Security Agency
TC	Transport Canada
TDS	Total dissolved solids
Th-230	Thorium-230
TLU	Traditional land use
TOR	Terms of reference
TRV	Toxicity reference value
TSP	Total suspended particals
U	Uranium
U_3O_8	Triuranium Oxide
UGTMF	Underground tailings management facility
VC	Valued component
WHO	World Health Organization
WLMN	Willow Lake Métis Nation
WRSA	Waste rock storage area
WSE	Water surface elevations
YNLR	Ya’ thi Néné Land and Resource Office

Appendix C: Consultation Report

Canada's Nuclear Regulator

Indigenous Consultation Report:

NexGen Rook I Environmental Assessment and Licence to Prepare a Site and Construct Application

October 2025

Edoc: (word) 7324611

Edoc: (PDF) 7586635

Canadian Nuclear Safety Commission
Commission canadienne de sûreté nucléaire

Canada

Signed/Signé le
October 10 2025 / 10 octobre 2025

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Strategic Planning Directorate

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TABLE OF CONTENTS

TABLES

FIGURES

EXECUTIVE SUMMARY

The Canadian Nuclear Safety Commission (CNSC) Staff would like to acknowledge that the NexGen Rook I project (the Project) is situated within Treaty 8 Territory and the homeland of the Métis, and within the traditional territories of the Dene, Cree and Métis peoples. Treaty 8 (1899) covers the northwest quadrant of Saskatchewan, through northern Alberta and into northern British Columbia, then extending to the Northwest Territories to the west and north, with the southern and western borders extending to central and eastern Saskatchewan. Treaty 8 (1899) includes the signatories of thirty-nine First Nations and contains a provision that establishes treaty rights to hunt, fish and trap throughout the treaty territory. The signatories of Treaty 8 include 3 Saskatchewan-based First Nations, 23 Alberta-based First Nations, 6 Northwest Territories-based First Nations and 8 British Columbia-based First Nations whose traditional territories span areas across Treaty 8. The following Treaty 8 signatory First Nations have been consulted and engaged on the Project:

- Clearwater River Dene Nation (CRDN)
- Black Lake First Nation, Fond du Lac Denesuline First Nation and Hatchet Lake First Nation, which Ya'thi Néné Lands and Resource Office (YNLR) represent
- Athabasca Chipewyan First Nation (ACFN) and
- Mikisew Cree First Nation (MCFN).

In addition, given the Project location's proximity to Treat 10 territory and the overlapping of traditional territories, the following Treaty 10 First Nations have been consulted and engaged on the Project:

- Birch Narrows Dene Nation (BNDN) and
- Buffalo River Dene Nation (BRDN).

Given that the Project overlaps the homeland of the Métis, Métis Nation-Saskatchewan Northern Region II (MN-S NRII) has also been consulted on the Project. In addition, in May 2025, Willow Lake Métis Nation (WLMN), expressed an interest in the project to the CNSC. In response, CNSC staff responded and offered to engage WLMN on the Project.

In support of *Commission Member Document NexGen Energy Ltd. Application for a Licence to Prepare Site and Construct the Rook I Uranium Mine and Mill* (CMD) and *Environmental Assessment Report: Rook I Project* (EA), CNSC staff have developed this *Indigenous Consultation Report: NexGen Rook I Environmental Assessment and Licence to Prepare a Site and Construct Application* (Consultation Report) to detail consultation and engagement activities for the Project [1], [2], [3]. This report details consultation and engagement activities for the NexGen Rook I Environmental Assessment (EA), Licence to Prepare a Site application (LTPS), and License to Construct (LTC) application. It provides key information and recommendations, as well as next steps for CNSC-staff-led Indigenous consultation and engagement activities. The Consultation Report also provides information on NexGen's engagement activities to date, as per the requirements and guidance set out in REGDOC-3.2.2, Indigenous Engagement, (REGDOC-3.2.2) and will inform CNSC staff's submissions and recommendations to the Commission [4].

In 2019, CNSC staff provided early notification to Indigenous Nations and communities that NexGen had submitted a project description with the intent to develop an underground uranium mine and mill in the southern Athabasca Basin, adjacent to Patterson Lake and located in northern Saskatchewan. Access to the Project would be from Highway 955 and would be located

approximately 640 km northwest of Saskatoon. Since that time, CNSC staff have aimed to conduct a thorough, transparent, flexible and collaborative consultation and regulatory process for NexGen's Rook I EA and LTPS and LTC application.

CNSC staff worked to draft key sections of this report with Indigenous Nations and communities collaboratively, including issues tracking tables, summaries of consultation and engagement activities, Rights Impact Assessments (RIAs) and conclusions. The consultation activity sections specific to each Indigenous Nation and community (sections 4.1 to 4.7) identifies which aspects of the report were shared with Nations based on their rights, interests and level of consultation and engagement.

CNSC staff are committed to working with each Indigenous Nation and community, as well as with NexGen, to achieve consensus and resolution on any outstanding issues or concerns relating to the Project in advance of the Part-2 Commission hearing scheduled for February 9th to 13th, 2026.

An update on consultation efforts with all identified Indigenous Nations and communities, including issues tracking tables and RIAs, will be submitted to the Commission as part of CNSC staff's supplemental submission prior to the Part-2 Commission hearing. This submission will include CNSC staff's conclusions and recommendations regarding 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 to supplement and support the CMD and EA report for the NexGen Rook I Project. CNSC staff's Consultation Report provides key information and recommendations on Indigenous consultation and engagement activities conducted by CNSC staff for the Project, including next steps. It also provides information on NexGen's engagement activities to date, as per the requirements of REGDOC-3.2.2, *Indigenous Engagement* [4].

Together, the Duty to Consult and Accommodate, as required by subsection 35(1) of the *Constitution Act, 1982*, the *United Nations Declaration on the Rights of Indigenous Peoples Act* (UNDA) and the CNSC's commitment to reconciliation guide the CNSC's approach to consultation and engagement with Indigenous Nations and communities [5], [6]. This approach is outlined in section 1.3, below.

At the time of publishing this Consultation Report, CNSC staff acknowledge that some Indigenous Nations and communities have outstanding concerns about the Project (see section 4 and Appendix A for details). CNSC staff remain committed to working with engaged Indigenous Nations and communities on the Project application to identify potential additional commitments and mitigations to address the concerns related to the Project, as appropriate. CNSC staff aim to secure consensus and resolution for any outstanding issues or concerns related to the Project.

CNSC staff note that there will be a two-part Commission hearing for the Project and that Part 2 of the hearing will focus on the interventions received. To provide additional time for

collaboration and consultation with Indigenous Nations and communities, CNSC staff will submit a supplemental report to the Commission in advance of the Part-2 hearing.

This supplemental submission will include an update on CNSC staff's consultation activities, RIAs with CRDN, MN-S, BRDN, BNDN, updated issues tracking tables, an updated consultation log, NexGen's engagement activities and conclusions and recommendations regarding the duty to consult and, where appropriate, accommodate. The submission will also include details on the outcomes of CNSC staff's efforts to achieve consensus and secure the FPIC of potentially impacted Indigenous Nations and communities on the proposed Project.

CNSC staff note that requirements and conditions relating to specific commitments made throughout the NexGen regulatory process may be included in an updated proposed Licence and Licence Conditions Handbook (LCH). Any updates to the Licence and LCH will be based on the outcomes of NexGen's and CNSC staff's consultation and engagement activities.

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 and/or established Indigenous and/or treaty rights. The Commission, as an agent of the Crown, must ensure that all licencing decisions under the *Nuclear Safety and Control Act* (NSCA) and other applicable legislation uphold the honour of the Crown and consider Indigenous peoples' potential and/or established Indigenous and/or treaty rights, pursuant to section 35 of the *Constitution Act, 1982* [7], [5]. CNSC staff work in collaboration and consultation with potentially impacted Indigenous Nations and communities to assess potential impacts to rights and propose mitigation and/or accommodation measures to address those 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 a duty to consult is triggered, then CNSC staff assess the depth of the duty to consult and, where appropriate, accommodate.

The CNSC's approach to assessing, preliminarily, the 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* [8]. 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), information regarding Indigenous and Treaty rights shared by Indigenous Nations and communities, information shared through interventions or submissions, as well as information that proponents or licensees gather and submit, as outlined in REGDOC-3.2.2 [9], [4]. As the CNSC is not a rights-determining body, staff do not conduct a formal 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 a proposed project's potential impacts on potential or established rights to determine the depth of consultation required to adequately discharge the duty to consult and, where appropriate, accommodate.

CNSC staff evaluate and update their assessment of the depth of the duty to consult and, where appropriate, accommodate continuously, as information becomes available. This information

may include details that Indigenous Nations and communities provide regarding the nature and extent of impacted rights, as well as information stemming from CNSC staff's technical assessment of a 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 that is flexible based on the needs of each Indigenous Nation and community.

The CNSC sets out requirements and guidance for licensees and applicants whose proposed projects may trigger the Crown's duty to consult in REGDOC-3.2.2 [4]. While the CNSC cannot delegate its duty to consult, proponents can carry out procedural aspects of the consultation process to support the CNSC in meeting its consultation obligations, where appropriate. For this matter, CNSC staff will provide conclusions and recommendations to the Commission which will consider NexGen's engagement with Indigenous Nations and communities and its proposed mitigations or accommodations, to assess 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) is an international human rights instrument that recognizes the human rights of Indigenous peoples around the world. In response to the UN Declaration, Canada passed legislation known as the *United Nations Declaration Act* (UNDA) and the bill received Royal Assent on June 21, 2021 [10], [11]. The Act provides a framework for the Government of Canada to work with Indigenous peoples to implement the UN Declaration at the federal level. Together with subsection 35(1) of the *Constitution Act, 1982* and the CNSC's commitment to reconciliation, the UNDA guides the CNSC's approach to engagement and consultation with Indigenous peoples [5].

The CNSC is committed to supporting the Government of Canada's whole-of-government implementation of UNDA through the *2023-2028 UNDA Action Plan* [12] (UNDA Action Plan), where it intersects with the CNSC's mandate [12]. The FPIC principle is integral to UNDA and is reflected in the UNDA Action Plan.

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" [12]. Natural Resources Canada (NRCan) is leading this work with the support of other federal departments and agencies and is in the planning phase.

The CNSC relies on the following sources for guidance on FPIC currently:

- *Principles Respecting the Government of Canada's Relationship with Indigenous Peoples*, 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." [13]

- *Backgrounder: United Nations Declaration on the Rights of Indigenous Peoples Act* [6], 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." [6]

The CNSC's approach to consultation and engagement with Indigenous peoples is mindful of and incorporates the principles articulated in UNDA. The CNSC aims to achieve consensus and secure the FPIC of potentially impacted Indigenous Nations and communities on proposed projects through collaborative consultation approaches that allow for open dialogue and provide 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. Concerns that Indigenous Nations and communities raise, including those relating to consent for a project, are considered part of the consultation process, including public hearings 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 the meaningful participation of Indigenous Nations and communities in Commission proceedings, as well as ongoing regulatory work. The CNSC also seeks to understand, support and follow an impacted Nations' approaches to achieve consensus and FPIC for proposed projects and looks to adapt its processes and procedures based on the Nations' processes, laws, customs and requests, whenever possible. The CNSC's goal is to ensure a robust consultation process that is clear, transparent and collaborative, enabling the FPIC of potentially impacted Nations and supporting them in communicating their processes and positions, regarding consent, to the Commission to inform its decision-making.

The CNSC remains committed to evolving its approaches, in alignment with Indigenous Nations and communities' FPIC processes, best practices and guidance emerging from court decisions and the whole-of-government implementation of UNDA [14], and the UNDA Action Plan [11]. For 2024-2025, this means initiating formal consultations on proposed updates and amendments to the CNSC's REGDOC-3.2.2 [15] to provide nuclear proponents and licensees with guidance on engaging and partnering with Indigenous Nations under UNDA [15].

As part of the CNSC staff's supplemental submission to the Commission for the Part-2 hearing, CNSC staff will outline the process and position of each potentially impacted Nation on their FPIC, with the permission of those Nations. Additionally, potentially impacted Indigenous Nations or communities wishing to express themselves to the Commission directly on their FPIC are encouraged to submit their FPIC position as part of written and/or oral interventions to the

Commission. Those interventions will assist and inform the Commission's decision-making on the Project.

1.2.1 Role of the Proponent

The CNSC encourages all nuclear proponents and licensees to work with all potentially impacted Indigenous Nations and communities proactively, to establish mutually agreeable processes to securing potentially impacted Nations' FPIC for proposed projects. This includes communicating details and outcomes of FPIC processes to the CNSC to inform CNSC staff's recommendations to the Commission.

CNSC staff acknowledge that, in the case of this Project, some Indigenous Nations and communities have raised concerns about FPIC and have requested that NexGen aim to secure their consent. CNSC staff have discussed those concerns with NexGen and have encouraged NexGen to work collaboratively with potentially impacted Indigenous Nations and communities to address FPIC-related concerns.

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. CNSC's approach aims to build capacity and seeks 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 for projects located in their territories.

The CNSC is committed to active listening, establishing regular dialogue and understanding the perspectives and values of Indigenous Nations and communities. Indigenous Nations and communities' feedback and priorities will continue to guide the CNSC in identifying key focus areas for taking action and implementing change.

Some of the CNSC's key focus areas include:

- Formalizing Terms of Reference (TOR) for long-term engagement with Indigenous Nations and communities.
- Incorporating Indigenous Knowledge (IK) and ceremony into the CNSC's regulatory processes and assessments.
- Reducing financial and capacity barriers to participation in the full lifecycle of CNSC regulatory activities.
- Updating regulatory documents and expectations to better reflect Indigenous Nations and communities' perspectives and UNDA principles.
- Increasing CNSC staff's Indigenous cultural competency and awareness.
- Collaborating with Indigenous Nations on monitoring, oversight and follow-up activities relating to nuclear facilities and activities in their territories to ensure that their communities are safe and that their territories, rights and interests are protected.

For more information on the CNSC's reconciliation initiatives, please visit the CNSC website at: Reconciliation (cnsc-ccsn.gc.ca).

1.4 Identification of Indigenous Nations and communities

CNSC staff have identified Indigenous Nations and communities with potential or established Indigenous and/or treaty rights that may be adversely affected by the Rook I licensing and EA decision. CNSC staff have identified these Indigenous Nations and communities by conducting analyses using Crown Indigenous Relations and Northern Affairs Canada's (CIRNAC) ATRIS [4] and other mapping and database tools, traditional land use studies (TLUS), as well as CNSC records and publicly available records, such as Indigenous Nations and communities' previous interventions and submissions for projects in the proposed Project's vicinity.

CNSC staff have identified the following Indigenous Nations and communities as having Indigenous and/or treaty rights in the Project area (referred to as "potentially impacted Indigenous Nations and communities"):

- Clearwater River Dene Nation
- Buffalo River Dene Nation
- Birch Narrows Dene Nation and
- Métis Nation-Saskatchewan (Northern Region II)

Additionally, based on information received and reviewed to date, the following Indigenous Nations and communities have expressed interest in the Project (referred to as "interested Indigenous Nations and communities"):

- Ya'thi Néné 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
- Athabasca Chipewyan First Nation
- Willow Lake Métis Nation and
- Mikisew Cree First Nation.

The potentially impacted Indigenous Nations and communities and the interested Indigenous Nations and communities are referred to collectively as the "identified Indigenous Nations and communities" throughout the Consultation Report.

The contents of section 1.4 represent staff's preliminary assessment which will be adjusted based on information received from Indigenous Nations and communities throughout the Project lifecycle, should the Project proceed.

1.5 CNSC staff's consultation approach for the Project

CNSC staff have consulted and engaged with potentially impacted or interested Indigenous Nations and communities on this Project since 2019, as part of the federal EA under the

Canadian Environmental Assessment Act 2012 (CEAA 2012) and the Licence to Prepare a Site and Construct application (LTPS and C) under the *NSCA* review processes [16]. During the EA and licensing assessment processes, consultation efforts included but were 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 reports and assessments. These efforts are elaborated upon below, as well as in section 4 and Appendix B of this Consultation Report. At key intervals, CNSC staff invited Indigenous Nations and communities to review and comment on the process and encouraged them to apply for funding through the CNSC's PFP and ISCF.

CNSC staff have ensured that recent changes, including the evolution of best practices and Court decisions, are reflected in the consultation and engagement process for the Project. This includes UNDA, the CNSC's commitment to reconciliation and the introduction of the *Principles Respecting the Government of Canada's Relationship with Indigenous Peoples* [13]. CNSC staff also acknowledge that if the Project proceeds through the licensing stages with an approved EA, the CNSC retains an obligation to hear and understand perspectives and concerns of Indigenous Nations and communities and therefore will continue to consult and engage with Indigenous Nations and communities over the Project lifecycle. Specifically, for the EA and the LTPS and C Application, based on CNSC staff's assessment as described in section 1.1 above, CNSC staff determined that the application for both raised the CNSC's duty to consult and, where appropriate, accommodate, potentially impacted 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*, including how they might be impacted by the Project and potential measures, commitments and/or conditions to meaningfully address potential impacts and concerns that Nations identify [5]. As part of this process, CNSC staff considered information that Indigenous Nations and communities and NexGen provided about the Project's potential impacts. This was done in view of understanding the FPIC processes and positions of potentially impacted Nations, the nature, scope and extent of any adverse impacts on Nations' rights and interests, as well as identifying potential measures to address those impacts and concerns.

To ensure potentially impacted Indigenous Nations and communities are able to present their views on the Project's potential impacts on their rights and interests in a collaborative and meaningful way, CNSC staff have followed best practices and current approaches to consultation in seeking the input of potentially impacted Nations on Nation-specific RIAs. This was done to ensure that the Project's potential impacts are thoroughly considered, assessed and addressed in the consultation process and resulting recommendations to the Commission. CNSC staff are drafting RIAs specific to the Project in collaboration with potentially impacted Indigenous Nations and communities, including CRDN, MN-S, BRDN and BNDN. Three of these Nations have sent letters of support and consent for the Project to the CNSC (CRDN, MN-S and BRDN). BNDN had initially provided CNSC staff with a letter of support and consent for the Project, however, have since communicated to the CNSC that they continue to have outstanding concerns regarding the potential impacts of the Project as well as concerns regarding the consultation and engagement process to date.

Given the Government of Canada's and the CNSC's commitments to reconciliation and the principles of UNDA, CNSC staff have conducted consultation with the goal of achieving

consensus and securing the FPIC of potentially impacted Indigenous Nations and communities. As such, CNSC staff undertook the following approach:

- Providing early notification about the Project, in April 2019, via notification letters. These letters included information on the proposed Project, as well as next steps in the regulatory process. They also outlined opportunities for early consultation and engagement with identified Indigenous Nations and communities.
- Offering to discuss preferred consultation approaches with each Indigenous Nation and community in order to develop a meaningful and mutually agreeable approach.
- Responding to and working with potentially impacted Indigenous Nations and communities and NexGen to address issues and concerns, while striving to achieve consensus on all issues and concerns raised in relation to the Project.
- Monitoring and providing feedback on NexGen's engagement activities, including support for and inclusion of Indigenous Knowledge, Land Use data and Indigenous perspectives in the Environmental Impact Statements (EISs), Indigenous Engagement Report (IERs) and other submissions and studies, based on *CEAA, 2012* and *REGDOC 3.2.2* requirements.
- Ensuring that NexGen responded to and addressed all comments and concerns that Indigenous Nations and communities raised about the EIS and other submissions.
- Collaborating on the issues tracking tables, which can be found in Appendix A. CNSC staff created an issues tracking table for each identified Indigenous Nation or community that raised concerns about the Project. These tables provide a summary of issues and concerns raised as well as CNSC's responses and their resolution status. CNSC staff sought input from NexGen on issues tracking tables to ensure their responses and commitments were captured and communicated to Indigenous Nations and communities accurately.
- Providing opportunities to comment on and review the EIS and technical documents.
- Providing funding and capacity support through the CNSC's PFP and ISCF funding programs, throughout the consultation and engagement process.
- Providing information and consulting on CNSC staff's technical review and assessment of NexGen'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 Project's federal EA process.
- Seeking to understand and confirm each impacted Nation's position with regards to its FPIC for the Project and their community-specific FPIC process, where appropriate.
- Collaborating on the drafting CNSC staff's Consultation Report with each identified Indigenous Nation and community that has raised concerns about the 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 NexGen to address the issues and concerns raised to date.

- Completing RIAs in response to concerns about impacts to rights and interests. This includes discussions on mitigations, commitments and potential accommodations to address potential impacts to rights, with input from potentially impacted Indigenous Nations and communities.
- Supporting and encouraging Indigenous participation in the regulatory review process, including all phases of the EA and licensing review, as well as Commission hearings, through interventions.

CNSC staff and NexGen have committed to providing Indigenous Nations and communities with opportunities to participate in the regulatory process throughout the Project lifecycle, should the Project proceed. This includes committing to working with identified Indigenous Nations and communities throughout the Project lifecycle to address issues and concerns as they arise. NexGen has offered and provided Indigenous Nations and communities with funding opportunities to conduct Indigenous Knowledge (IK) and baseline studies. CNSC staff have incorporated findings from these studies into the regulatory process and staff's assessments, with the permission of Indigenous Nations and communities who shared the information and knowledge. The CNSC remains open to offering additional funding for studies and initiatives that could inform future stages of the Project including monitoring and oversight activities, should it proceed.

CNSC staff will continue consulting and collaborating with identified Indigenous Nations and communities on both the CNSC and NexGen's commitments. Based on the outcomes of CNSC staff's consultation activities and NexGen's engagement activities, CNSC staff note that:

- CNSC staff are proposing a Licence Condition on Indigenous engagement which includes requirements for NexGen 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 for the Commission in advance of the Part-2 hearing.

For more information on CNSC staff's consultation activities, please see section 4.

CNSC staff acknowledge that, at the time of this Report's publication, some Indigenous Nations and communities have outstanding concerns about the Project (see Appendix A). CNSC staff are committed to working with each Indigenous Nation and NexGen to achieve consensus and secure FPIC on the Project, particularly for outstanding issues and concerns, in advance of the Part-2 hearing, where possible.

CNSC staff will provide a supplemental submission to the Commission in advance of the Part-2 hearing. This supplemental submission will include an update on the status of CNSC's staff's consultation efforts, NexGen's engagement activities, the outcomes of efforts to secure consensus on the Project, outstanding concerns, and any key measures and commitments to address any potential impacts.

2 ASSERTED OR ESTABLISHED INDIGENOUS AND/OR TREATY RIGHTS IN THE PROJECT AREA

The Project under review is a proposal to develop an underground uranium mine and mill in northern Saskatchewan, Canada. It is in Saskatchewan's Athabasca Basin, adjacent to Patterson Lake. Access to the proposed Project would be located approximately 640 km northwest of Saskatoon, from Highway 955. The Project falls within the boundaries of Treaty 8 territory and lies within "No Hoe Nene" the traditional lands of CRDN, the homeland of the Métis, and is within Nuhenéné, the traditional territory of the Athabasca Denesuline and Birch Narrows Dene Nation.

The proposed Project falls within the boundaries of Treaty 8 of 1899 and within the homeland of the Métis. This Treaty covers the northwestern quadrant of Saskatchewan, through northern Alberta and into northern British Columbia, extending to the Northwest Territories to the west and the north, with the southern and western border extending to central and eastern Saskatchewan. Treaty 8 includes thirty-nine First Nation signatories and covers approximately 841,000 square kilometres. It contains a provision that establishes treaty rights to hunt, fish and trap throughout treaty territory. The signatories of Treaty 8 include 3 First Nations in Saskatchewan, 23 First Nations in Alberta, 6 First Nations in the Northwest Territories and 8 First Nations in British Columbia. The Treaty 8 signatories listed below have traditional territories bordering the Project area.

Signatories of Treaty 8 near the Project:

1. Clearwater River Dene Nation (SK)
2. Fond du Lac Denesuline First Nation (SK)
3. Black Lake First Nation (SK)
4. Athabasca Chipewyan First Nation (AB)

Treaty 8 contains the following provision that establish treaty rights to hunt, trap, and fish:

> "…Her Majesty the Queen HEREBY AGREES with the said Indians that they shall have right to pursue their usual vocations of hunting, trapping and fishing throughout the tract 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 Her Majesty, and saving and excepting such tracts as may be required or taken up from time to time for settlement, mining, lumbering, trading or other purposes."

Signatories of Treaty 10 having overlapping territories with the Project area:

1. Birch Narrows Dene Nation (SK)
2. Buffalo River Dene Nation (SK)

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."

The Project falls within the homeland of the Métis and, as such, the CNSC has consulted Métis Nation-Saskatchewan Northern Region II (MN-S NRII) on the Project. In addition, in May 2025 Willow Lake Métis Nation informed the CNSC and NexGen of their interest in the Project. Since that time the CNSC held an introductory meeting with Willow Lake Métis Nation and has continued to offer opportunities to meet and discuss their concerns and interests in relation to the Project.

No communities are located within the immediate vicinity of the Rook I property. Travelling by existing roads, the closest community to the Project is La Loche, which is approximately 155 km away. Calculated using a straight line, the closest communities are approximately 120 km from the site, with Saskatoon 640km to the southeast. The federal lands within a 140 km radius of the Project area are First Nations' reserve lands and do contain permanent residences.

Table 1: Federal lands in proximity to the Project

Federal Land Type	Name of First Nation	Reserve Name and Number	Distance from Project (km)
First Nation	Clearwater River Dene Nation	Clearwater River Dene Band 222	120
First Nation	Birch Narrow Dene Nation	Turnor Lake 193B	130
First Nation	Clearwater River Dene Nation	Clearwater River Dene Band 221	140

Figure 1: Saskatchewan treaty territories

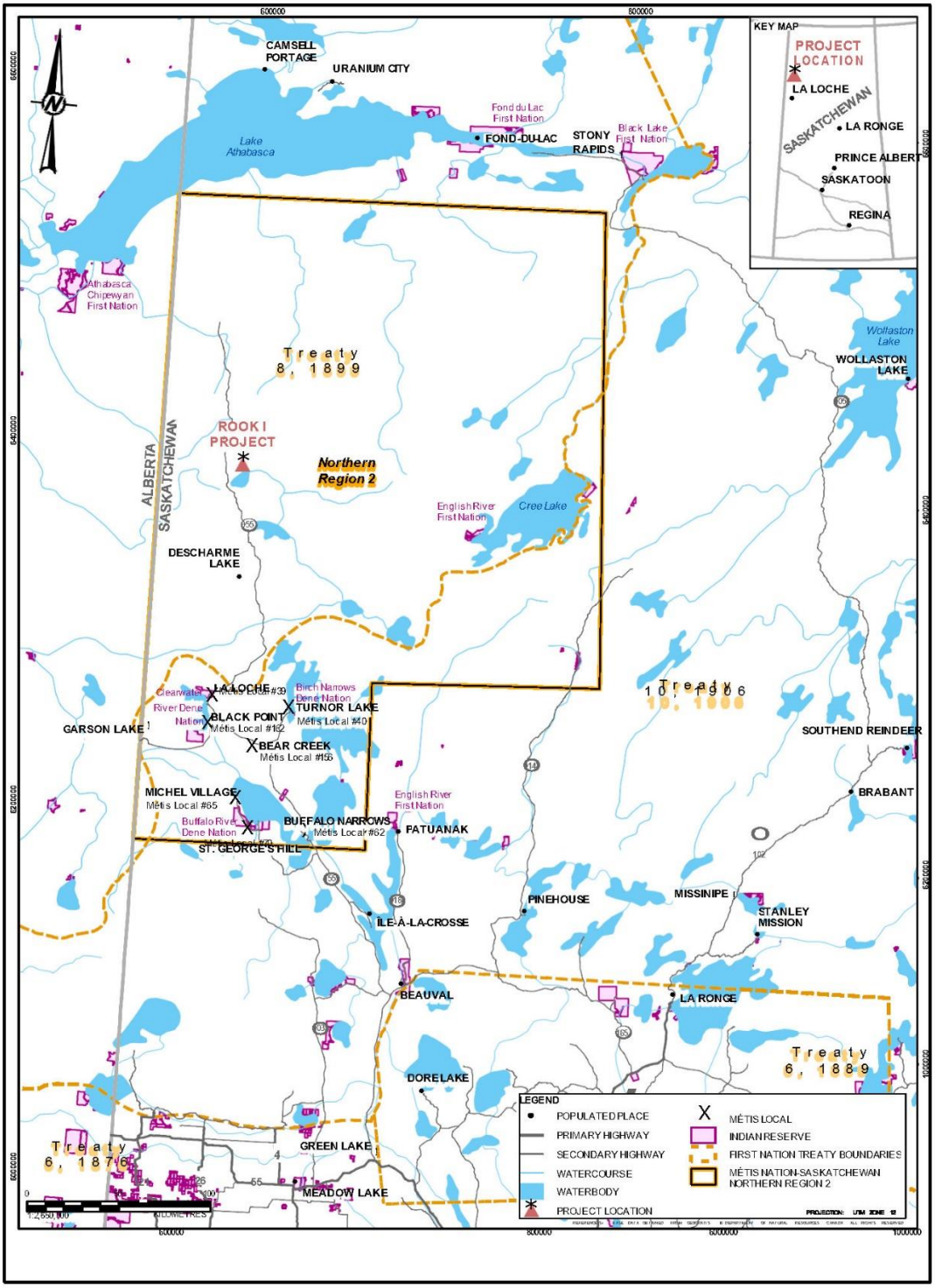

Figure 2: Rook I Project in relation to traditional territories

3 PARTICIPANT FUNDING PROGRAM

To support the participation of interested Indigenous Nations and communities in all phases of the regulatory review process, CNSC staff made funding available through the CNSC PFP to all identified Indigenous Nations and communities on multiple occasions. In total, since providing early notification on the proposed Project, the CNSC has allocated $1,053,361, as shown in Table 1, to support participation. The CNSC also provided additional funding to members of the public and key interested parties, as outlined in the CMD.

The CNSC has made two stages of funding available:

- Stage 1 - Participant funding to support an initial review of NexGen's draft EIS, as well as participation in meetings and workshops with CNSC staff. This participant funding opportunity was open for applications from May 25, 2020, to August 28, 2020, and the CNSC awarded funding to recipients on January 15, 2021.
- Stage 2 - Participant funding to support the final stages of the regulatory review process and participate in public Commission hearings. This participant funding opportunity was open for applications from March 10, 2025, to May 9, 2025, and the CNSC awarded funding to recipients on June 24, 2025.
- In addition, ACFN and CRDN received additional funding related to the Project. ACFN received $145,150 to conduct and Indigenous Knowledge study relating to the Project and other potential uranium and nuclear projects in Northwestern Saskatchewan. CRDN received $73,712 for meeting with CNSC staff to discuss a consultation protocol and the development of a rights impact assessment related to the Project.

Table 2: Approved participant funding

Indigenous Nation or Community	Stage 1 Approved Funding	Stage 2 Approved Funding	Total Approved Funding
Birch Narrows Dene Nation	$35,574.00	$66,665.50	$102,239.50
Buffalo River Dene Nation	$45,000.00	$58,950.00	$103,950.00
Métis Nation - Saskatchewan	$90,000.00	$65,505.73	$155,505.73
Clearwater River Dene Nation	$96,000.00 + 73,712 = $169,712.00	$101,033.70	$270,745.70
Athabasca Chipewyan First Nation	$20,000.00 + $145,150 = $165,150.00	$68,375.00	$233,525.00

Ya'thi Néné Lands and Resources Office	$47,945.00	$67,850.00	$115,795.00
Saskatchewan First Nations Natural Resource Centre of Excellence	$35,000.00[1]	n/a	$35,000.00
Mikisew Cree First Nation	n/a	$16,600.00	$16,600.00
Willow Lake Métis Nation	n/a	$20,000.00[2]	$20,000.00

[1] Saskatchewan First Nations Natural Resource Centre of Excellence declined the funding to participate in the project [to prevent overlap in consultation and engagement efforts]
[2] Willow Lake Métis Nation did not accept the funding to participate in the regulatory review process for the Project

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 Project application, CNSC staff provided early notifications of the expected Project application in April 2019 to identified Indigenous Nations and communities. Since that time, CNSC staff have provided Indigenous Nations and communities with multiple opportunities for consultation, dialogue and collaboration regarding their concerns and interests relating 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 funding provisions and capacity support. CNSC staff have also encouraged 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 propose resolutions to those concerns. Additional information about the specific consultation and engagement activities with each identified Indigenous Nation and community is provided in subsections below.

CNSC staff provided regular updates to each identified Indigenous Nation and community as part of its consultation process, keeping them informed of key developments, potential impacts to Indigenous and/or treaty rights, updates to the regulatory review and consultation processes and soliciting Nations' feedback and perspectives. CNSC staff offered Indigenous Nations and communities with opportunities for collaboration when reviewing and commenting on relevant sections of this Consultation Report, including the issues tracking tables in Appendix A. Additionally, CNSC staff continue to work with each potentially impacted Indigenous Nation to solicit feedback on Nation-specific RIAs for the Project, including discussions on concerns about potential impacts to rights and interests and how those might 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 NexGen. 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 NexGen'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

Further, CNSC staff have continued to consult and engage with identified Indigenous Nations and communities on nuclear projects and related activities in northern Saskatchewan. The CNSC has Terms of Reference (TORs) for long-term engagement established with YNLR and ACFN based on the proposed and ongoing uranium mining and milling facilities in northern Saskatchewan.

CNSC staff have also offered to develop a TOR for long-term engagement with the MN-S, CRDN, BNDN and BRDN. 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 NexGen Rook I Project, that are located within an Indigenous Nations' traditional and/or treaty territories.

In addition, CNSC staff meets regularly with other identified Indigenous Nations and communities including CRDN, BNDN and MN-S.

During these reoccurring meetings, CNSC staff provided updates specific to the Project and had consultations and discussions regarding interests, concerns and potential impacts to Indigenous

and/or Treaty rights. CNSC staff have offered and have held multiple NexGen-specific meetings to discuss issues of concern and collaborate proactively on an approach to consultation and engagement for the Project.

Table 3, below, contains a summary of key correspondence and opportunities to participate in the consultation and regulatory process for the Project since early notification was provided in April 2019.

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 includes correspondence associated with the consultation and engagement activities listed in Tables 3 through 9. This includes offers to meet and consult on the Project, opportunities to review and collaborate on CNSC documents and issues, concerns, comments or questions received and CNSC staff responses.

Table 3: Summary of general correspondence and opportunities to participate in consultation and regulatory processes

Date	Indigenous Nation or Community	Correspondence / Activity
April 2019	Athabasca Chipewyan First Nation Birch Narrows Dene Nation Black Lake First Nation Buffalo River Dene Nation Clearwater River Dene Nation English River First Nation Fond du Lac First Nation Meadow Lake Tribal Council Métis Nation-Saskatchewan Ya'thi Nené Lands and Resources Office	On April 2, 2019, CNSC staff sent emails and letters providing notice of NexGen Energy Ltd.'s proposed Project to identified Indigenous Nations and communities.
May 2019	All identified Indigenous Nations and communities.	On May 3, 2019, CNSC staff informed identified Indigenous Nations and communities of the submission of the Project description and offered the opportunity to comment within 30 days. On May 31, 2019, CNSC staff sent a reminder of

		the 30-day comment period on the Project description and offered an extension if needed.
January 2020	All identified Indigenous Nations and communities.	In Jan 2020, CNSC staff informed identified Indigenous Nations and communities that the Disposition Table of Public comments received on the Project description is now posted to the Impact Assessment Registry.
February 2020	Clearwater River Dene Nation Birch Narrows Dene Nation Buffalo River Dene Nation Métis Nation-Saskatchewan Ya'thi Nené Lands and Resources Office Athabasca Chipewyan First Nation	In February 2020, CNSC staff informed identified Nations and Communities that the Commission issued a decision on the scope of the EA for the proposed Project and shared a copy of the Record of Decision.
May 2020	Clearwater River Dene Nation Birch Narrows Dene Nation Buffalo River Dene Nation Métis Nation-Saskatchewan Ya'thi Nené Lands and Resources Office Athabasca Chipewyan First Nation	In May 2020, CNSC staff sent a Stage 1 PFP notice for the opportunity to review the draft EIS for the proposed Project.
September 2020	All identified Indigenous Nations and communities.	On September 28, 2020, CNSC staff held a virtual Regulatory Oversight Report (ROR) Engagement Session and invited potentially impacted Indigenous Nations and communities to discuss ongoing, new

		and decommissioned projects, EA processes and any updates in northern Saskatchewan, including updates on the proposed Project.
July 2022	All identified Indigenous Nations and communities.	Throughout July 2022, CNSC staff notified identified Indigenous Nations and communities that the Project's draft EIS will be going through a technical review by the Federal, Indigenous Review Team (FIRT) until September 2022.
August 2022	All identified Indigenous Nations and communities.	In August 2022, CNSC staff sent a Spring/Summer Project Bulletin on the Project. On August 24, 2022, CNSC staff sent a notice inviting Indigenous Nations and communities to a webinar on NexGen Energy Ltd.'s proposed Project on September 13, 2022.
December 2024	Clearwater River Dene Nation Métis Nation-Saskatchewan Birch Narrows Dene Nation Buffalo River Dene Nation	On December 17, 2024, CNSC staff sent notification letters regarding an Administrative Monetary Penalty (AMP) that was issued to NexGen Energy Ltd. for performing site preparation without a CNSC license.
February 2025	Athabasca Chipewyan First Nation Buffalo River Dene Nation Clearwater River Dene Nation	On February 14, 2025, CNSC staff sent letters to identified Indigenous Nations and communities which provided an update and shared a proposed

	Métis Nation-Saskatchewan Ya'thi Nené Lands and Resources Office Birch Narrows Dene Nation	consultation approach on the remaining steps of the regulatory review process for the Project.
March 2025	Clearwater River Dene Nation Birch Narrows Dene Nation Métis Nation-Saskatchewan Ya'thi Nené Lands and Resources Office Athabasca Chipewyan First Nation Buffalo River Dene Nation	In March 2025, CNSC staff sent a PFP notice regarding a funding opportunity to assist identified Indigenous Nations and communities in participating in the remaining steps of the EA process, license application and upcoming Commission hearing. This notice included details about upcoming public hearing dates, and the participant funding opportunity.
May 2025	Clearwater River Dene Nation Birch Narrows Dene Nation Métis Nation-Saskatchewan Ya'thi Nené Lands and Resources Office Athabasca Chipewyan First Nation Buffalo River Dene Nation	In late May/early June 2025, CNSC staff sent a notice that CNSC staff will be sharing sections of the EA report and Consultation Report pertaining to each Nation at the end of May 2025 which would involve a 30-day feedback period for relevant sections of the report.

4.1 Consultation activities with Clearwater River Dene Nation

Clearwater River Dene Nation has reviewed and provided feedback on section 4.1 of the Consultation Report. CNSC staff note that in 2022, 2023 and 2024, CRDN shared letters of support with CNSC for the Project including their consent for the Project to proceed.

4.1.1 Background on Clearwater River Dene Nation

Figure 3: CRDN logo

Clearwater River Dene Nation (CRDN) is a Treaty 8 signatory, and their reserve lands are also closest to the Project. CRDN has a long-established presence in northwestern Saskatchewan and northeastern Alberta. CRDN is a Dene speaking community. As of April 2025, there were 3,248 registered members with 1,162 members living on-reserve and 2,036 members living off-reserve. CRDN is also represented by Meadow Lake Tribal Council.

In their own words:

> "CRDN people's way of life depended on the availability of and access to preferred lands, waters and natural resources of sufficient quality and quantity to maintain the traditional seasonal harvesting cycles. CRDN's way of life also depended on the ability to pass knowledge about the traditional seasonal harvesting cycle, traditional hunting, trapping, fishing, and gathering practices and spiritual as well ceremonial beliefs and practices to successive generations. The knowledge of CRDN's way of life was passed to successive generations orally, through cultural and spiritual practices, and through participation in traditional hunting, trapping, fishing and gathering practices which depended on the availability of and access to preferred lands, waters and natural resources. Our community members continue to actively exercise these treaty rights through our Traditional Territory. To this day, our families depend on our ancient lands for a range of cultural, sustenance, livelihood, spiritual and socio-economic purposes. Our ability to depend and rely on our lands is still critical to our community. Our families generally face high levels of unemployment and must continue to depend on the land to put food on the table. Any impact, disruption or diminution of our community's ability to rely on our wildlife, fish, berries, plants, forests and water resources can result in serious impacts and ramifications."

The Project is located within Treaty 8 and the traditional territory of CRDN, known as "No Hoe Neneh" (Figure 6). The Project is located approximately 120 km in a straight line to the South from the main Clearwater reserve, near La Loche, Saskatchewan, or 150 km by road. CRDN maintains that it is the most directly impacted First Nation in relation to the proposed Project. NexGen has been engaging with CRDN since May 2014.

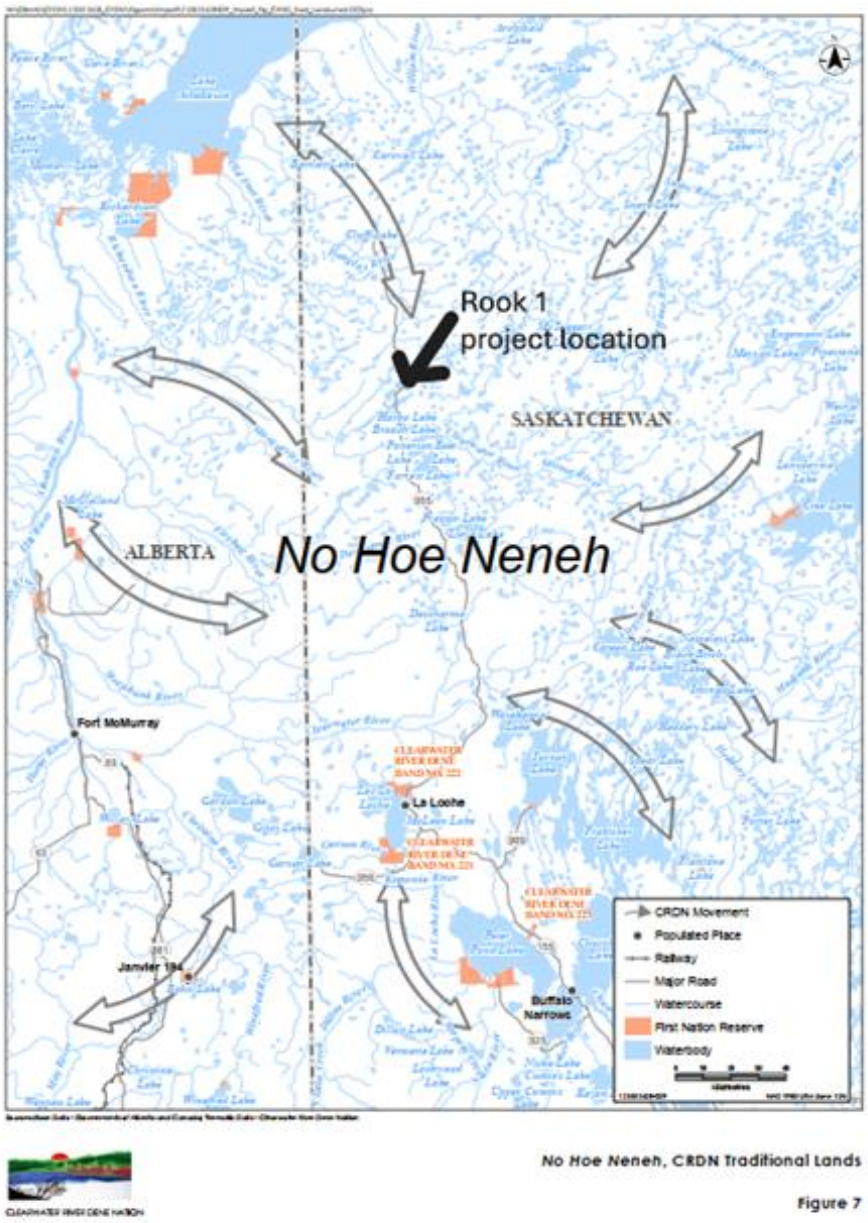

Figure 4: Clearwater River Dene Nation (CRDN) Traditional Lands as Understood and Conveyed by CRDN Elders

Map Notation: Within the area depicted in the above map, the CRDN has identified a 'Core Area' – an area to which the CRDN can demonstrate a deep, long standing and ongoing cultural connection with. Evidence of CRDN's intense occupation and use this area has been provided to the Crown for purposes of the review of the NexGen Rook I Project.

4.1.2 CNSC's consultation activities with Clearwater River Dene Nation

Since beginning the regulatory review process for the Project in 2019, CNSC staff have consulted and engaged with CRDN to keep the community informed of the Project and provided ongoing opportunities to meet and discuss any issues or concerns related to it. CNSC staff offered to develop both a TOR for long-term engagement and a project-specific TOR with CRDN. A Project-specific TOR was signed in November 2021 to support a mutually agreeable approach to consultation, collaboration on the regulatory review process and working together to understand the potential impacts of the proposed Project on CRDN's rights and interests. The TOR included opportunities for CRDN's participation in the consultation process, including their technical review of the EIS, reviews of responses to information requests, participation in the FIRT, collaboration on drafting relevant sections of CNSC staff's reports and collaborating on a CRDN-specific RIA process.

CNSC staff remain open to and interested in developing a TOR for long-term engagement that outlines how the CNSC and CRDN can continue engaging and collaborating on ongoing communication, oversight, monitoring and reporting for this Project and other nuclear projects in their territory. Since 2019, the CNSC and CRDN have been committed to a monthly meeting schedule to discuss the Project, working together to understand, assess and address the concerns that CRDN has raised.

In October 2021 with funding support from NexGen, CRDN completed a *Clearwater River Dene Nation Indigenous Rights and Knowledge Survey Related to the Proposed NexGen Energy Ltd. Rook I Project in the Patterson Lake Area* and shared it with NexGen and the CNSC. NexGen included the study results in the draft and final EIS. CNSC staff have collaborated with CRDN in reflecting and including information from the study to support CNSC staff's review of the NexGen EIS, as well as drafting CNSC reports, assessments and recommendations to the Commission. CNSC staff drafted a What We Heard Report (WWHR) based on the study and shared it with CRDN for review and accuracy.

CNSC and CRDN have had ongoing discussions to address project-specific concerns and potential impacts to their Indigenous and/or Treaty rights. CRDN has voiced concerns in about technical elements of the Project, and those concerns are summarized in the Appendix A.1 Issues Tracking Table.

CNSC staff have worked with CRDN and NexGen to respond to all the Nation's concerns, questions, and comments, and CRDN has concluded that they are satisfied with NexGen's and CNSC staff's consultation and engagement process to date. In April 2022, NexGen and CRDN signed an Impact Benefit Agreement (IBA) which addresses the interests of the Nation, as well as CRDN's concerns and priorities. In August 2022, CRDN sent a letter of support for the Project to the CNSC giving their consent for the Project to proceed. Since receiving CRDN's letters of consent and support for the Project, the CNSC has been working and meeting with CRDN to address questions and concerns about the remaining steps, timelines and requirements to complete the regulatory review process and finalize CNSC staff's recommendations to the Commission. The CNSC and CRDN have also continued to meet monthly to collaborate on drafting content for the CNSC staff's Consultation Report, to ensure that information specific to CRDN, their rights, knowledge, concerns and perspectives are captured accurately.

Appendix B.2 includes key correspondence relating to the consultation activities listed below.

Table 4: Summary of key consultation activities with Clearwater River Dene Nation

Date	Consultation Activity
April 2019 – June 2019	CNSC staff sent CRDN an email and letter providing notice that the CNSC had received an application for the Project. The letter outlined the CNSC's licensing and EA processes and opportunities for CRDN participation, including funding opportunities. CNSC staff reminded CRDN about the 30-day public comment period on the Project description. CRDN sent the CNSC initial comments on the Project Description submitted by NexGen.
July 2019 – December 2019	CNSC staff and CRDN met in person in Saskatoon to discuss their working relationship and the consultation process, including CRDN's expectations for consultation on the Project, the Cluff Lake renewal decision, and strategies for the CNSC and CRDN to build a meaningful long-term relationship.
January 2020 – June 2020	CNSC staff met with CRDN to discuss concerns on legacy uranium mining and CRDN's participation in the NexGen regulatory process. CRDN and CNSC staff discussed the consultation and engagement process for the Project. As a follow-up to the meetings, CNSC staff sent a draft Consultation TOR outlining the relationship between the CNSC and CRDN on the Project. In May 2020, CNSC staff sent a Stage 1 PFP notice for the opportunity to review the draft EIS for the proposed Project CNSC staff also sent a funding application to support the development of a TOR and CRDN-specific RIA process.
July 2020 – December 2020	CNSC staff met with CRDN to provide updates on the EA process, discuss the status of the TOR for consultation and receive updates on CRDN's engagement with proponents. CNSC staff and CRDN discussed plans for future meetings on the EA and RIA processes.
January 2021 – June 2021	CNSC awarded funding to CRDN to support their review of the EIS. CNSC staff and CRDN continued to meet to tailor the draft TOR based on CRDN's feedback and discussed the best way of consulting and engaging with CRDN on the Project. Both discussed options to establish monthly meetings with a working group to implement the TOR. CRDN had an election and paused engagement until the end of July so that the new Council could be briefed. CNSC responded

	by indicating a willingness to meet and discuss the Project when CRDN indicated readiness to resume engagement.
July 2021 – December 2021	CNSC staff and CRDN re-initiated monthly meetings, which included reconvening work on finalizing the draft TOR. CNSC staff and CRDN finalized and signed the TOR. Both discussed plans for a January meeting to outline next steps for the RIA process.
January 2022 – June 2022	CNSC staff and CRDN continued to meet monthly when possible, including meeting in person in Saskatoon to discuss updates and next steps on the Project. CRDN was invited to participate in the FIRT for the technical review of the EIS. CNSC staff explained the purpose and composition of the FIRT, as well as CRDN's anticipated role in the process. CRDN agreed to participate in the FIRT. CRDN provided their Indigenous Knowledge and Rights Study (IKRS) '*Clearwater River Dene Nation Indigenous Rights and Knowledge Survey Related to the Proposed NexGen Energy Ltd. Rook I Project in the Patterson Lake Area'* to CNSC staff and confirmed the confidentiality of the study. CNSC staff developed a WHR and shared it with CRDN for feedback to ensure IKRS accuracy. CNSC staff participated community information and outreach sessions in person and met with CRDN leadership in La Loche to discuss CRDN's concerns about the Project. This included an open house and celebration with CRDN, and a community dinner hosted by NexGen. CNSC staff participated in an in-person community information session in Turnor Lake.
July 2022 – December 2022	CNSC staff and CRDN continued to meet to provide updates on the technical review of the EIS. CRDN participated as a member for the FIRT by reviewing the EIS and providing comments. CNSC staff and CRDN discussed the review of the proposed NexGen airstrip at a hybrid meeting in Saskatoon. CNSC staff and CRDN met in person in Saskatoon to discuss the outcomes of the EIS review and the issues and concerns that CRDN outlined in the EIS. CRDN highlighted outstanding concerns, included road conditions, migratory birds and socio-economic challenges. CRDN provided CNSC Staff with a letter of support as part of the formal federal EIS public review for the Project. This letter emphasized NexGen's strong engagement with Indigenous Nations and communities, such as funding for the IRKS,

	consulting with CRDN throughout the process and signing an IBA.
January 2023 – June 2023	CNSC staff participated in a NexGen-led Western Athabasca Basin Outreach Tour, which included attendance at the Clearwater River Dene Nation Treaty Days in Clearwater River, SK and included in-person outreach and engagement on the Project by CNSC staff. CNSC staff participated in an in-person community information session in Turnor Lake.
July 2023 – December 2023	CNSC staff and CRDN discussed re-starting monthly meetings. CRDN was provided funding for a Community Liaison Officer to work with the CNSC on this and other projects through the CNSC's Indigenous Stakeholder Capacity Fund. In July 2023, CRDN provided CNSC staff with a letter indicating that all CRDN EIS information requests had been addressed in a manner acceptable to the CRDN leadership. In October 2023, CRDN provided CNSC staff with a letter of support that highlighted NexGen's and CRDN's positive relationship and the signing of an IBA. CNSC staff acknowledged receipt of the letter and outlined next steps for the EA and regulatory review process. In December 2023, CRDN provided CNSC staff with a letter confirming CRDN's acceptance of NexGen's responses to CRDN's FIRT information requests.
January 2024 – June 2024	CRDN and CNSC staff met in person in Saskatoon to discuss NexGen's most recent submission of the EIS. CNSC staff discussed CRDN, BNDN and I think BRDN and potentially MN-S additional opportunities for CRDN's participation, including collaborating on a CRDN-specific RIA and sections of CNSC staff's Consultation Report and EA report. CRDN provided CNSC staff with a letter of support that emphasized CRDN and NexGen's meaningful relationship, their IBA and their desire for rapid Project approval. In May, CNSC staff participated in an in-person community information session in Turnor Lake.
July 2024 – December 2024	CNSC staff offered to hold a community outreach event with CRDN. CRDN provided CNSC staff with a letter confirming that CRDN is satisfied with NexGen's responses to the CRDN comments submitted as part of the federal EA public review process.

	CRDN also emphasized the collaborative approach that NexGen championed and their desire for the project to be approved as soon as possible. CNSC staff and management met with CRDN and NexGen in Ottawa to discuss the status of the regulatory review process and CRDN's desire for an expedited Project approval. The CNSC responded to CRDN's questions and concerns and provided clarity regarding the remaining steps and requirements in the regulatory review and decision-making process. Following the meeting the CNSC sent a letter thanking CRDN for the meeting and the ongoing engaging with the CNSC on the Project. This letter provided updates and next steps for the Project, timelines and regulatory review process steps. CRDN sent additional letters to the CNSC underscoring their concerns about next steps and reiterating the importance of setting a Commission hearing date and approving the Project as soon as possible.
January 2025 – June 2025	CNSC staff and CRDN met in person in Edmonton to provide an update on the status of the regulatory review process for the Project. CNSC staff provided an overview of remaining steps, reports and outstanding technical items for NexGen to address for CNSC staff to finalize recommendations for the Commission. CNSC staff noted that the final EIS had been accepted and that staff would work with the Commission Registry to recommend a hearing date. CNSC staff provided an overview of key reports needed to support the Commission hearing process, including the EA report, CMD and Consultation Report. CRDN expressed concerns about timelines and emphasized the need for a hearing to take place as soon as possible. CNSC staff sent an email and letter with proposed next steps for consultation and engagement with CRDN for the remaining steps of the regulatory review process. This letter included updates on the acceptance of the final EIS, as well as next steps for developing the EA report, Consultation Report, and CMD. CNSC staff and CRDN also met on January 29, 2025, in Saskatoon to discuss the remaining steps of the CNSC's regulatory process, timelines, reporting requirements, Commission hearing process and opportunities to collaborate together to ensure all remaining work can be done in timely and efficient manner. CRDN provided a review of this section of the CR along with a letter of support for the Project to proceed on June 27, 2025.

July 2025 – December 2025	To be determined.

4.1.3 Clearwater River Dene Nation's key issues and concerns

The key issues and concerns specific to the Project that CRDN has raised to date are summarized below. CRDN raised these concerns in their November 2022 submission on the EIS, as well as during consultation activities with the CNSC. The detailed issues tracking table for CRDN can be found in Appendix A.1. The specific row discussing these issues can be found in Appendix A.1 and is listed beside each bullet. Please refer to this row in Appendix A.1 for additional context on the issue, CNSC staff's response and the issue's status.

1. Concerns around Treaty rights and Governance including:
    a. CRDN emphasized the importance of holding the government accountable for upholding treaty promises and obligations.
    b. CRDN is seeking active involvement in the co-development of management plans and expects to provide ongoing advice to the licensee and the government.

2. Concerns about Stewardship and Sacred Responsibility, given the deeply held belief that CRDN has a sacred obligation to protect and care for the land for future generations.

3. Concerns about Cumulative Effects and Monitoring based on:
    a. Concerns about the transparency and reliability of the Cumulative Effects Assessment, including understanding the methodologies used and lack of trust in predicted outcomes.
    b. A call from CRDN for co-developing a regional monitoring body with First Nations to manage cumulative effects, conduct ongoing monitoring and recommend adaptive management techniques.

4. Concerns about the social and cultural impacts of the proposed Project for the following topics:
    a. Fears of being displaced and experiencing reduced safety on the land, potentially leading to a decline in traditional harvesting.
    b. Loss of traditional knowledge, stories and practices.
    c. Continued avoidance of historically impacted areas, such as legacy mining sites.
    d. Threats to Denesuline identity, heritage and cultural practices.
    e. The importance of harvesting and processing traditional foods for family sustenance.
    f. Psychosocial impacts on CRDN members due to Project-related changes.

5. Environmental and Wildlife Concerns, including:
    a. Potential degradation of wildlife and fish habitats from construction and operations.
    b. Anticipated worsening of habitat destruction and species decline with uranium extraction.
    c. Specific concerns about moose populations and habitat.

   d. Risks of water contamination in Patterson Lake and the Clearwater River watershed, which are vital to Denesuline identity.
   e. Safety concerns regarding underground tailings.
   f. Concerns about radionuclides and conventional drilling toxins contaminating Patterson Lake and flowing downstream.
   g. Impacts of light and noise pollution on the night sky and bird migration.

6. Concerns about the health and safety impacts of the proposed Project, such as:
   a. Psychosocial effects of nearby mining activities, including transportation and employment.
   b. Concerns about cancer cases linked to mine-related employment and yellowcake transport.
   c. Potential health risks from consuming locally harvested plants and animals.
   d. Potential accidents or malfunctions affecting CRDN members and traditional lands.
   e. Restricted access to traditional lands and lease area, especially during decommissioning and closure, hindering knowledge transfer to younger generations.
   f. Limitations on waterway travel within CRDN traditional territory.

7. Concerns about community involvement and land use planning, including:
   a. A need for the presence of CRDN community members during site visits.
   b. A call to develop a regional land use plan that ensures CRDN lands remain healthy and viable for future generations.

Both NexGen and CNSC staff have responded to and addressed these concerns through the consultation and engagement process by providing clear technical responses and holding discussions about agreements, mitigations and accommodation measures. NexGen and CRDN also signed an IBA and has confirmed that all their Project specific concerns have been addressed and they provide their consent for the Project to be approved as soon as possible. CNSC acknowledges that CRDN has expressed disappointment about the timeline for Commission hearing dates and expressed a preference for earlier dates and for the Project to be approved as soon as possible. CNSC staff's key responses and proposed commitments are outlined below.

4.1.4 Views expressed

CRDN's position is that, through the engagement partnership and protocols established between CRDN and NexGen, fulsome engagement on the Project has occurred. CRDN also noted that sufficient engagement has occurred between the CRDN and the CNSC for the purposes of the EA. To date, CRDN noted that NexGen has addressed all issues and concerns that CRDN has raised regarding the Project EA. This was done through collaborative work between CRDN and NexGen to address all CNSC EA process requirements, including CRDN's endorsement of the EIS, signing off on NexGen's responses to all CRDN's comments provided during the CNSC's public review and FIRT processes and validating that NexGen has addressed all issues and concerns. CRDN remains interested in expediting Project approvals so that the benefits agreed to between NexGen and CRDN can be realized by Nation and community members.

4.1.5 CNSC staff's response

CNSC staff acknowledge the issues and concerns that CRDN has raised to date relating to the Project. CNSC appreciates the validation process undertaken by CRDN to confirm all issues and concerns have been addressed. CNSC maintains the consultation record to demonstrate how consultation and engagement activities have resolved issues and concerns raised by CRDN during the regulatory process. In addition, CNSC understands CRDN's position as it pertains to expediting Commission hearing and regulatory approvals. However, CNSC must follow appropriate regulatory guidelines and legislative requirements to independently assess the Rook I Project to ensure the Project will meet CNSC regulatory requirements including protection of people and the environment.

CNSC staff have worked to understand, assess and address CRDN's concerns to the greatest extent possible through consultation and engagement. This includes having regular, focused discussions to better understand CRDN's concerns and identifying paths forward to addressing them through mitigations, as well as providing detailed responses to questions and reflecting CRDN's views in CNSC documentation. CNSC staff's view is that the CNSC's approach to consultation for the Project aligns with best practices and is flexible based on the distinct needs and requests of potentially impacted Indigenous Nations and communities. CNSC staff will continue to monitor NexGen's engagement throughout the Project lifecycle, if the Project is approved, to ensure that NexGen is addressing CRDN's questions, concerns and requests, as well as implementing commitments made to CRDN. CNSC staff have provided and will continue to provide opportunities for CRDN to provide input and feedback on how they would like to be consulted and engaged on the Project in ways that are meaningful to them.

CNSC staff have made initial commitments to address CRDN's concerns, and these commitments are listed below. CNSC staff have discussed and will continue to discuss these commitments with CRDN. CNSC staff remain committed to working with CRDN throughout the RIA and consultation processes by identifying additional commitments, mitigations and paths forward to addressing concerns relating to the Project, as appropriate. The outcomes, including a final list of commitments, will be included in CNSC staff's supplemental submission to the Commission.

Information regarding specific responses to each of CRDN's concerns is included in the issues tracking table, found in Appendix A.1.

In summary, CNSC staff remain committed to:

- Continuing to discuss the requests for mitigation and accommodation that CRDN has raised, including with NexGen, as appropriate
- Collaborating on monitoring, oversight and engagement with CRDN
- Ongoing engagement and collaboration with CRDN for this Project through regular information sharing, including discussions through the proposed TOR for long-term engagement between the CNSC and CRDN
- Oversight of NexGen's commitments to CRDN
- Oversight of NexGen's engagement with CRDN and
- Continuing community visits and engagement with CRDN.

CNSC staff encourage NexGen to continue discussing and collaborating with CRDN to address any concerns the Nation might have. CNSC staff anticipate receiving an update from NexGen on their engagement efforts in an IER to be filed on the record, as part of upcoming Commission hearings.

CNSC staff have worked with CRDN and NexGen to respond to all the Nation's concerns, questions and comments and CRDN has concluded that they are satisfied with the CNSC's consultation process to date, as well as NexGen's engagement on the Project. CRDN has given their FPIC for the Project and have requested for the Project to be approved as soon as possible. NexGen's commitments to CRDN are summarized in section 5 and CNSC staff's supplemental submission to the Commission will include further information. CNSC looks forward to continuing to work with CRDN through its proposed long-term engagement TOR and throughout the Project lifecycle, if approved.

Information regarding specific responses to each of CRDN's concerns is included in the issues tracking table, found in Appendix A.1.

4.1.6 Conclusion

CNSC staff are committed to continuing to consult, engage and work collaboratively with CRDN and NexGen in advance of the Part-2 Commission hearing to address any outstanding concerns, should they arise. This includes working to draft a CRDN-specific RIA, which will provide updated information about potential impacts of the Project on CRDN's Indigenous and treaty rights. Mitigation and/or accommodation measures to address any identified impacts will be included in the supplemental submission, which will be submitted to the Commission prior to the Part-2 hearing.

4.2 Consultation activities with Métis Nation - Saskatchewan

Métis Nation - Saskatchewan has reviewed and provided feedback on section 4.2 of the Consultation Report. CNSC staff note that in 2023 and 2024, MN-S shared letters of support with CNSC for the Project. In response to the review of this section of the CR, MN-S provided a letter of support for the Project to proceed on July 14, 2025.

4.2.1 Background on Métis Nation - Saskatchewan

Figure 5: MN-S logo

Métis Nation – Saskatchewan (MN-S) 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 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 MN-S 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 to Ontario, British Columbia, Northwest Territories and the northern United States.

The Métis are recognized in Section 35 of the Canadian Constitution Act, 1982 which states "the existing aboriginal and treaty 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. The 2023 *Métis Nation within Saskatchewan Self-Government Recognition and Implementation Agreement* is between MN-S and His Majesty the King in Right of Canada. Section 5.02(e)(ii) recognizes MN-S as the exclusive representative of Métis rights in the context of the Crown's duty to consult and accommodate. MN-S has described how MN-S citizens may elect to become members of the community or "Local" in which they reside but emphasized that such elections are not required. Métis share rights across Saskatchewan, and many members of Locals outside of their region remain connected to those communities and continue to exercise their rights within the area. Within this context, MN-S has asserted that it has the authority and responsibility to represent Métis rights within northern Saskatchewan.

The Project site is located within Métis Northern Region 2 (MN-S NR-2) in northwest Saskatchewan, a region which extends geographically from Cree Lake, in the east, to the

Saskatchewan-Alberta border in the west, and from Buffalo Narrows in the south to just south of the geographic extent of Lake Athabasca in the north. Métis citizens from NR-2 have strong ties to and interests in the Project area and several key Métis communities within Métis NR-2 include the Métis Locals of La Loche, Buffalo Narrows, Turner Lake, Bear Creek, Michel Village, St. Georges Hill, and Black Point. These communities access the Project area by road, traveling north on highway 955 from their respective communities.

Figure 6: MN-S regions in the vicinity of the Project

4.2.2 CNSC's consultation activities with Métis Nation - Saskatchewan

CNSC staff have identified that MN-S citizens, including residents of Northern Region II (NR-2) as represented by MN-S, potentially have Indigenous rights in the area where the Project is proposed, defining them as a potentially impacted Indigenous Nation or community. NR-2, under the governance structure of MN-S, serves Métis citizens from the far-northwest of Saskatchewan, including in the communities of La Loche, Turnor Lake and Buffalo Narrows.

MN-S has advised CNSC staff that they represent the interests of Métis citizens across the province and are thus the single point of contact for consultation and engagement for the purposes of the Project. Consultations must take place with the Métis government structures that the Métis people elect and support. CNSC staff work through the MN-S and the respective Region, unless the Region has clearly delegated that MN-S will represent them for the purposes

of consultation for a project. MN-S has indicated that it is responsible for taking the lead on consultation and engagement in relation to all industrial activity that occurs within their traditional territory, including nuclear projects.

CNSC staff and MN-S have a long history of engagement and collaboration on nuclear projects in Saskatchewan, and CNSC staff have been engaging and consulting with MN-S on this Project since 2019. CNSC staff have offered to develop a TOR for long-term engagement with MN-S, as well as a project-specific TOR for consultation on this Project. In July 2022, MN-S and the CNSC signed a project-specific TOR. This included opportunities for MN-S' participation in the consultation process for this Project, including MN-S' technical review of the EIS and NR2 representatives' participation in the FIRT, reviews of responses to information requests, and collaboration on RIA process specific to MN-S. CNSC staff and MN-S, including representatives from NR2, have been meeting regularly to discuss the Project, including working towards understanding, assessing and addressing the concerns that MN-S has raised with regards to the Project.

NexGen entered into a capacity funding agreement with MN-S which included funding for MN-S to complete a Métis Knowledge Study (MKS). In July 2022, MN-S completed the *Métis Nation - Saskatchewan Northern Region 2 Traditional Land Use & Diet Study for the NexGen Rook I Project* and shared it with NexGen and the CNSC. NexGen included the results from the study in the draft and final EIS. CNSC staff have collaborated with MN-S by reflecting and including the information shared from the study to support CNSC staff's review of the EIS, as well as drafting the CNSC's reports, assessments and recommendations to the Commission. CNSC staff drafted a WWHR based on the MKS and shared it with MN-S for review to ensure accuracy.

CNSC staff and MN-S have had ongoing discussions to address Project-specific concerns and potential impacts to MN-S' Indigenous rights. MN-S has previously expressed concerns in relation to technical elements of the project. These are summarized in the Appendix A.3 issues tracking table.

CNSC staff have worked with MN-S and NexGen to respond to all the Nation's concerns, questions and comments and MN-S has indicated that they are satisfied with NexGen and CNSC's consultation and engagement process to date. In June 2023, NexGen, MN-S and MN-S NR2 signed an IBA which addresses the interests and priorities of MN-S in relation to the project. MN-S sent a letter of support to the CNSC in relation to the Project, including their Free, Prior and Informed Consent (FPIC) for the Project to proceed. Since receiving MN-S' consent letter and support for the project, CNSC staff have been working and meeting with MN-S to address their questions and concerns regarding the remaining steps, timelines and requirements, in view of completing the regulatory review process and drafting recommendations for the Commission. The MN-S has emphasized its desire to conclude the regulatory process in a timely manner and without unnecessary delay. CNSC staff and MN-S have also continued to meet to collaborate on drafting content for the Consultation Report, to ensure that information specific to MN-S, such as their rights, knowledge, concerns and perspectives, is captured accurately.

Appendix B.3 includes key correspondence relating to the consultation activities listed below.

Table 5: Summary of key consultation activities with Métis Nation - Saskatchewan

Date	Consultation Activity
April 2019 – June 2019	CNSC staff notified MN-S of the project, as well as of the forthcoming posting of the Notice of Commencement and Project Description. A reminder was sent soliciting comments on the Project Description following the 30-day public comment period. MN-S sought and was granted an extension for comments on the Project Description.
July 2019 – December 2019	No activity.
January 2020 – June 2020	CNSC staff met with MN-S virtually to discuss the Project and related updates. In May 2020, CNSC staff sent a Stage 1 PFP notice for the opportunity to review the draft EIS for the proposed Project
July 2020 – December 2020	CNSC staff met with MN-S virtually and MN-S submitted questions about PFP funding for reviewing NexGen's EIS.
January 2021 – June 2021	CNSC staff met with MN-S to provide an update on the status of the project, including MN-S' engagement with NexGen, and plans for the EA, regulatory process and engagement and consultation processes. CNSC staff outlined expectations of project proponents in terms of their role for Indigenous engagement. Staff shared the funding decision on MN-S' funding application for the EIS and provided an overview of the PFP funding opportunity, as well as options for the involvement and engagement of MN-S in the EA and regulatory review processes. CNSC staff met with MN-S three times to discuss concerns relating to the scope of work based on the value of funds awarded for the Project. Participants also discussed the approach to RIAs and the prospect of MN-S participating in the FIRT. CNSC staff shared information on the EA process, timelines and additional collaboration and funding opportunities.
July 2021 – December 2021	CNSC staff and MN-S continued to meet to discuss the Project. MN-S provided comments on the draft TOR for consultation on the project. CNSC provided information on funding opportunities, asking MN-S which funding they would like to pursue. CNSC staff became aware of a letter that MN-S sent to the Minister of Natural Resources which, although intended for the President of the CNSC, was not received due to a misspelling of the email address. The letter expressed concerns about the NexGen project and the level of engagement with MN-S. By the time the CNSC became aware of the correspondence, the relationship and level of engagement between NexGen and MN-S had improved. CNSC staff emailed both MN-S and NexGen to address the concerns in the letter.

	MN-S informed CNSC that they restarted the Joint Working Group (JWG) with NexGen.
January 2022 – June 2022	CNSC staff and MN-S corresponded and met to discuss funding and advance payment, as well as the review of the EIS, FIRT participation, development and implementation of the TOR for consultation on the Project, sharing of MN-S' IK study results, the RIA process, NSDF EA and the Independent Environmental Monitoring Program (IEMP). CNSC staff shared materials related to these topics, including an overview presentation of FIRT and guidance documents to support MN-S' participation. Both CNSC staff and MN-S met to discuss questions that MN-S had regarding the EIS. In a separate meeting, CNSC staff had an EIS process discussion with Two Worlds Consulting, a third-party consulting firm working on behalf of MN-S. CNSC staff and MN-S met in person on May 12th and virtually with NexGen on May 25th. CNSC staff suggested possible dates and topics for community engagement in Saskatchewan and MN-S expressed an interest in in-person engagement. CNSC staff confirmed with MN-S that NexGen did not share the EIS package with MN-S, despite MN-S requesting the NexGen share it during the 30-day conformity and CNSC staff recommending that NexGen do so on multiple occasions. CNSC staff indicated that NexGen had the authority to determine whether to share the EIS package in advance of conformity review and MN-S acknowledged that statement. CNSC staff participated in an in-person community information session in Turnor Lake.
July 2022 – December 2022	MN-S shared MNS' NR2 *Traditional Land Use (TLU) & Diet Study* with CNSC staff. CNSC and MN-S finalized the TOR for consultation on the Project. CNSC staff and MN-S had regular meetings to discuss the Project and opportunities for continued collaboration and engagement. Both met to discuss MN-S' concerns with NexGen's 2022 Provincial Site Program Application, as well as MN-S' role in the FIRT for the technical review of the EIS. Meetings touched on issues relating to the EA. MN-S invited CNSC staff to participate in in-person community meetings in La Loche and Buffalo Narrows. CNSC staff were unable to attend in person but participated virtually, providing updates on the regulatory review process for the Project. CNSC

	staff and MN-S met in person in Saskatoon to review MN-S' FIRT comments on the EIS and to share the CNSC's findings. MN-S thanked CNSC staff for meeting and indicated that the presentations and discussions were well-received.
January 2023 – June 2023	CNSC and MN-S met virtually to discuss updates on the Project. CNSC staff participated in an in-person community information session in Turnor Lake.
July 2023 – December 2023	CNSC staff shared a proposed approach to drafting WWHRs, with the goal of summarizing and confirming with Nations that reports accurately reflect information from IK studies. CNSC staff indicated how the CNSC would use the information contained within reports and welcomed MN-S' comments on the incorporation of NR2's *TLU & Diet Study*. MN-S sent a letter from their President to the CNSC concerning the IBA they had signed with NexGen. CNSC staff and MN-S met on several occasions to discuss projects in the NR2 region, including Rook I, NexGen's EIS, participation in the FIRT, MN-S' TLU, other action items and the CNSC's requirements for proponent engagement as per REGDOC 3.2.2. During an in-person meeting in Ottawa on October 30th between CNSC staff, MN-S, and NexGen, MN-S NR2 emphasized their desire for economic prosperity and expediency with regards to Project approvals, while acknowledging the need for the CNSC's due diligence and regulatory oversight.
January 2024 – June 2024	CNSC staff and MN-S met regularly to discuss several topics, including the status of NexGen's EIS and related information request responses. CNSC staff met with MN-S NR2 to discuss the NexGen EIS, explain the EA process, provide updates on the Project, and address any questions or concerns the Nation might have. CNSC staff set up quarterly meetings with MN-S NR2. CNSC staff participated in community engagement activities with a booth. Buffalo Métis Community Council expressed a desire to invite CNSC staff to the community to increase public awareness of the CNSC's mandate and role. CNSC staff indicated plans to visit in the fall and hold an open house independently from the proponents, with the Province of Saskatchewan and other regulators presenting information on projects, timelines, and opportunities. MN-S expressed an interest in planning for an open house in the fall.

	MN-S sent a letter of support for the Project to the CNSC. CNSC staff participated in an in-person community information session in Turnor Lake.
July 2024 – December 2024	CNSC staff confirmed receipt of MN-S' letter of support for the Project. CNSC staff shared the presentation materials with MN-S, following an in-person meeting on project updates and next steps with MN-S NR2. CNSC staff notified MN-S that NexGen had been issued an administrative monetary penalty resulting from the preparation and construction of a site without a CNSC license, including links to the online AMP notification. MN-S and CNSC staff corresponded to discuss an open house in Buffalo Narrows and La Loche that would include provincial and federal representatives, with the goal of answering questions and providing information related to the Project to community members. MN-S acknowledged that MN-S' Lands and Environment department is willing to support community engagement efforts.
January 2025 – June 2025	MN-S sent a letter to the CNSC in support of the Project, expressing the desire for a Commission hearing and decision as soon as possible. CNSC staff responded to the letter by providing information on the status of the project and next steps in the regulatory process. CNSC staff sent an email and letter with proposed next steps for consultation and engagement with MN-S for the remaining steps of the regulatory review process. This letter included updates on the acceptance of the final EIS, as well as next steps for developing the EA report, Consultation Report, and CMD. CNSC staff and MN-S met virtually to discuss the Project and next steps in the CNSC regulatory review.
July 2025 – December 2025	MN-S provided a review of this section of the CR along with a letter of support for the Project to proceed on July 14, 2025.

4.2.3 Métis Nation - Saskatchewan's key issues and concerns

The key issues and concerns specific to the Project that MN-S has raised to date are summarized below. MN-S raised these concerns in their October 2022 submission on the EIS, as well as during consultation activities with the CNSC. The MN-S has subsequently affirmed that their concerns regarding the Project have been satisfactorily accommodated by NexGen, including those concerns which have been previously described and are reflected below. The detailed issues tracking table for MN-S can be found in Appendix A.3. The specific row discussing these

issues can be found in Appendix A.3 and is listed beside each bullet. Please refer to this row in Appendix A.3 for additional context on the issue, CNSC staff's response and the issue's status.

1. Concerns about contamination and environmental safety on the following topics:
    a. Concerns about the safety and long-term integrity of the underground tailings management area, including potential health impacts on nearby communities.
    b. Concerns about the potential for seepage from the underground tailings management area during the construction and operation phases.
    c. Uncertainty about the duration and extent of solute mass loading into Patterson Lake and its long-term environmental effects.
    d. Concerns about increased risk of accidents and material spills due to increased traffic volumes.
    e. Potential release of uranium concentrates, radioactive materials, fuel and chemicals in the event of transportation incidents.

2. Concerns about cumulative effects and ecosystem integrity on the following topics:
    a. Concerns about the combined impacts of this Project and other nearby industrial projects.
    b. Concerns that the climate change analysis is overly simplistic and is not integrated into monitoring programs.
    c. Concerns about the vegetation and ecosystem assessment, including the dismissal of minor but cumulative vegetation changes, use of baseline data that may not reflect natural, pre-industrial conditions and a lack of transparency in field sampling data and soil characterization.

3. Concerns about water quality and aquatic health on the following topics:
    a. Concerns about the safety of consuming fish from Patterson Lake.
    b. Concerns about potential degradation of water quality in Patterson Lake and Clearwater River.
    c. Fears of contamination effects like Lake Athabasca, where fish are reportedly inedible.
    d. Potential impacts of copper exposure, effluent temperature and other stressors on aquatic life.

4. Concern about Indigenous involvement and monitoring including:
    a. Strong emphasis on involving MN-S in all stages of environmental monitoring.
    b. Requests for training Métis members in environmental sampling and data analysis.
    c. Desire for Métis involvement throughout the entire Project lifecycle.

5. Concerns about engagement and consultation including:
    a. Concerns that higher Indigenous engagement standards may hinder project approvals.
    b. Requests for meaningful collaboration in designing mitigation and monitoring programs.

6. Concerns about cultural and land use impacts on the following topics:
    a. Fears that uranium mining will negatively affect future generations.
    b. Concerns about potential adverse impacts on Métis land claims and traditional territories.
    c. Concerns about threats to animals, lands and waters central to Métis identity.
    d. Risks to the ability to harvest traditional foods.
    e. Concerns about the use, ownership and confidentiality of Métis knowledge in environmental assessments.

7. Concerns about economic and social impacts including:
    a. Concerns about a lack of clear economic opportunities, training and workforce support for Métis communities.
    b. Concerns about the anticipated strain on community well-being due to Project-related changes.

8. Concerns about long-term project impacts on the following topics:
    a. Concerns about potential long-term effects on community cohesion, health services, caribou populations terrestrial ecosystems.
    b. Concerns about increased traffic, dust and noise affecting vegetation and wildlife.
    c. Fears of improper hazardous waste storage and disposal methods, and abandonment without adequate remediation.
    d. Concerns about impacts to wildlife and traditional harvesting after Project decommissioning and closure.

4.2.4 CNSC staff's response

CNSC staff acknowledge the issues and concerns that MN-S has raised to date regarding the Project. CNSC staff have worked to understand, assess and address MN-S' concerns to the greatest extent possible. This was done through consultation, having focused discussions, providing detailed responses, reflecting MN-S' views in CNSC's documentation and discussing the Project at regularly scheduled meetings to better understand MN-S' concerns and identify paths forward to addressing concerns through commitments and mitigations, as necessary. CNSC staff's view is that the CNSC's approach to consultation for the Project aligns with best practices and is flexible based on the distinct needs and requests of potentially impacted Indigenous Nations and communities. CNSC staff will continue to monitor NexGen's engagement throughout the Project lifecycle, if the Project is approved, to ensure that NexGen is addressing MN-S' questions, concerns and requests, as well as implementing commitments made to MN-S. CNSC staff have provided and will continue to provide opportunities for MN-S to provide input and feedback on how they would like to be consulted on the Project in ways that are meaningful to them.

CNSC staff have made initial commitments to address MN-S' concerns, and these commitments are listed below. CNSC staff have discussed and will continue to discuss these commitments with MN-S. CNSC staff remain committed to working with MN-S throughout the RIA and

consultation processes by identifying additional commitments, mitigations and paths forward to addressing concerns relating to the Project, as appropriate. The outcomes, including a final list of commitments, will be included in CNSC staff's supplemental submission to the Commission.

Information regarding specific responses to each of MN-S' concerns is included in the issues tracking table, found in Appendix A.3.

In summary, CNSC staff remain committed to:

- Continuing to discuss the requests for mitigation and accommodation that MN-S has raised, including with NexGen, as appropriate
- Collaborating on monitoring, oversight and engagement with MN-S
- Ongoing engagement and collaboration with MN-S for this Project through regular information sharing, including discussions through the proposed TOR for long-term engagement between the CNSC and MN-S
- Oversight of NexGen's commitments to MN-S
- Oversight of NexGen's engagement with MN-S
- Continuing community visits and engagement with MN-S

CNSC staff encourage NexGen to continue discussing and collaborating with MN-S to address any concerns the Nation might have. CNSC staff anticipate receiving an update from NexGen on their engagement efforts in an IER to be filed on record, as part of upcoming Commission hearings.

CNSC staff have worked with MN-S and NexGen to respond to all the Nation's concerns, questions and comments and MN-S has concluded that they are satisfied with the CNSC's consultation process to date, as well as NexGen's engagement on the Project. MN-S has given their FPIC for the Project and indicated that they would like the Project to move forward as soon as possible. NexGen's commitments to MN-S are summarized in section 5 and CNSC staff's supplemental submission to the Commission will include further information. CNSC looks forward to continuing to work with MN-S through its proposed long-term engagement TOR and throughout the Project lifecycle, if approved.

Information regarding specific responses to each of MN-S' concerns is included in the issues tracking table, found in Appendix A.3.

4.2.5 Conclusion

CNSC staff are committed to continuing to consult, engage and work collaboratively with MN-S and NexGen in advance of the Part-2 Commission hearing to address any outstanding concerns, should they arise. This includes working to draft an MN-S-specific RIA, which will provide updated information about potential impacts of the Project on MN-S' Indigenous rights. Mitigation and/or accommodation measures to address any identified impacts will be included in the supplemental submission, which will be submitted to the Commission prior to the Part-2 hearing.

4.3 Consultation activities with Birch Narrows Dene Nation

Birch Narrows Dene Nation 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 BNDN. Views expressed by BNDN are shared in 4.3.3.

4.3.1 Background on Birch Narrows Dene Nation

Figure 7: BNDN 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 Turnor Lake, Saskatchewan. BNDN is approximately 2,693 hectares in size and has a total registered population of 807 members with 431 members living on-reserve and 299 members living at locations off-reserve. The Nation has year-round road access. 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, is located 230 km away by road from the Project; 2) Churchill Lake 193A, which contains the historic site of Clear Lake at the junction of Churchill Lake and Frobisher Lake, is located 36 km by water plus 256 km away by road from the Project; and 3) Turnor Lake 194, which is on Peter Pond east of Dillion, is located 330 km by road from the Project. In a straight-line distance, the Rook1 Project is located approximately 135 km in a straight line to the southeast and 230 km by road from the main Birch Narrows reserve, Turnor Lake 193B, and falls within BNDN's traditional territory.

CNSC has an established relationship with BNDN, and the Nation has expressed an interest in other CNSC-regulated facilities in northern Saskatchewan previously. NexGen has been engaging with BNDN since 2019 on the Project.

Figure 8: BNDN traditional territory in the vicinity of the Project

4.3.2 CNSC's consultation activities with Birch Narrows Dene Nation

Since 2019, CNSC staff have continued to consult, engage, and keep BNDN informed of the Project, providing ongoing opportunities to meet and discuss any of the Nation's comments or concerns. CNSC staff have offered to develop a TOR for long-term engagement with BNDN, as well as a project-specific TOR. To date, BNDN has not expressed an interest in developing specific consultation and engagement arrangements with the CNSC.

CNSC staff remain open to and interested in developing a mutually agreeable TOR for long-term engagement that outlines how the CNSC and BNDN could engage and collaborate on nuclear projects in in their territories. CNSC and BNDN continue to meet regularly to discuss the Project, including working towards understanding, assessing, and addressing the concerns that BNDN has raised with regards to the Project.

NexGen entered into a capacity funding agreement with BNDN in July 2021, which included funding for BNDN to complete and provide an Indigenous Rights and Knowledge Survey (IRKS). In December 2019, BNDN completed the Birch Narrows Dene Nation Traditional Knowledge and Use Study Specific to NexGen Energy Limited's Proposed Rook I Project, which was shared with NexGen and the CNSC. NexGen included the results from the study in the draft and Final EIS. CNSC staff have collaborated with BNDN in reflecting and including the

information shared in the study to support CNSC staff's review of the NexGen EIS, as well as in drafting the CNSC's reports, assessments, and recommendations to the Commission. CNSC staff drafted a What We Heard Report (WWHR) based on the study and shared it with BNDN for review and confirmation of accuracy.

CNSC and BNDN have had ongoing discussions to address Project-specific concerns and potential impacts to their Indigenous and/or Treaty rights. BNDN has previously expressed concerns in relation to technical elements of the project, which are summarized in Appendix A.4 Issues Tracking Table.

CNSC staff have worked with BNDN and NexGen to respond to all the Nation's concerns, questions, and comments. In July 2021, NexGen and BNDN signed a Mutual Benefit Agreement (MBA), which addresses the interests of the Nation, as well as their concerns and priorities in relation to the Project. In November 2022 and October 2023, BNDN sent letters of support for the Project to the CNSC.

Since submitting these letters of consent and support, BNDN sent an additional letter to the CNSC, in October 2024, indicating that they were rescinding their previous letters of support for the project as they had several outstanding issues and concerns in relation to the Project. The CNSC has been working and meeting with BNDN to address concerns raised by BNDN and working towards a consensus on outstanding issues and concerns. The CNSC has also encouraged BNDN and NexGen to continue to work together to resolve any outstanding issues and reach consensus on the proposed Project if possible. The CNSC and BNDN have also continued to meet regularly to collaborate on drafting content for the CNSC staff's Consultation Report, to ensure that information specific to BNDN, such as their rights, knowledge, concerns and perspectives, is captured accurately.

Appendix B.5 includes key correspondence relating to the consultation activities listed below.

Table 6: Summary of key consultation activities with Birch Narrows Dene Nation

Date	Consultation Activity
April 2019 – June 2019	CNSC staff sent BNDN an email and letter providing notice that the CNSC has received an application for the Rook I Project. The letter outlined CNSC's licensing and EA processes and opportunities for BNDN's participation and funding opportunities. CNSC staff followed up via phone to seek comments on the Project description.
July 2019 – December 2019	No activity.
January 2020 – June 2020	In May 2020, CNSC staff sent a Stage 1 PFP notice for the opportunity to review the draft EIS for the proposed Project.
July 2020 – December 2020	BNDN sent an application for participant funding and a request to meet to discuss the Project with CNSC staff. BNDN participated in a Joint Working Group (JWG) meeting with CNSC staff and NexGen. The JWG discussed the duty to consult, as well as the CNSC EA and licensing processes.

	BNDN expressed concerns about radiation and cancer stemming from uranium mining and CNSC staff agreed to coordinate a presentation on the health of uranium workers.
January 2021 – June 2021	BNDN and CNSC staff signed a Contribution Agreement to support BNDN in providing comments on the EIS, once ready. As a follow up to the JWG meeting in 2020, CNSC staff presented on the health impacts of uranium workers, including the CNSC's and Saskatchewan's oversight.
July 2021 – December 2021	BNDN signed an MBA with NexGen. CNSC staff reached out to establish regular meetings with BNDN on the Project.
January 2022 – June 2022	CNSC staff and BNDN met to discuss the sharing of Indigenous Knowledge and Land Use study which BNDN completed for the Project. BNDN shared the TLU confidentially and CNSC outlined how this information would be used to support the regulatory process. CNSC staff sent BNDN a letter which outlines the proposed consultation approach for the Project. This includes the option for BNDN to participate in the FIRT, collaborate on sections of the EA report, and develop a TOR or consultation protocol. CNSC staff participated in an in-person community information session in Turnor Lake and met with Chief and Council and the Mayor to discuss BNDN's concerns about the Project.
July 2022 – December 2022	BNDN submitted their review of the EIS to CNSC staff. CNSC staff met with BNDN in Saskatoon to discuss BNDN's review of the EIS and next steps in the regulatory process. In November 2022, BNDN submitted a letter of support to CNSC outlining that BNDN had signed an MBA with NexGen and that they would continue to engage with CNSC and NexGen throughout the lifespan of the Project.
January 2023 – June 2023	CNSC staff and BNDN met to discuss updates on the Project, as well as the potential to develop a TOR for long-term engagement. CNSC staff and BNDN met to discuss the Rook I EA process, including timelines for NexGen's EIS re-submissions. CNSC staff introduced their new Indigenous and Stakeholder Capacity Fund. CNSC staff discussed the RIA process with BNDN and shared other RIA examples. CNSC staff participated in an in-person community information session in Turnor Lake.

July 2023 – December 2023	CNSC staff developed a WWHR in response to BNDN's TLU and shared it BNDN for their feedback. In October 2023, BNDN provided a letter to CNSC indicating that all issues and concerns that BNDN identified that could have been addressed at that time had been resolved, and that NexGen and BNDN have developed a process for resolving other issues and concerns during the project lifespan. This letter was sent prior to BNDN receiving any formal responses from CNSC and NexGen on the EIS comments and recommendations. NexGen responded formally to BNDNs October 2022 EIS comments in September 2024.
January 2024 – June 2024	CNSC staff reached out to BNDN to organize a meeting to provide an update on the regulatory process, next steps and timelines. CNSC staff provided a status update on the Project and discussed planning a Fall tour to the community. In a meeting between the CNSC and BNDN, CNSC staff provided an update which included estimated timelines for the Project. CNSC staff provided examples of outstanding IRs and next steps in that process. BNDN expressed several outstanding technical concerns regarding the Rook I EIS. CNSC staff participated in an in-person community information session in Turnor Lake.
July 2024 – December 2024	CNSC staff met with BNDN to provide updates on the NexGen Project. BNDN provided a letter outlining that there are outstanding issues on the EIS, including issues with the proposed mitigation measures. CNSC staff and BNDN corresponded about the status of the EIS and noted that all responses to FIRT comments had been accepted. In October 2024, BNDN sent a letter notifying the CNSC that BNDN is formally rescinding their former letters to the CNSC dated November 15, 2022, and October 29, 2023, until all outstanding environmental, regulatory and consultation issues were addressed.
January 2025 – June 2025	CNSC staff, including CNSC SMEs, met with BNDN to discuss BNDN's outstanding concerns regarding water quality and to answer any additional questions BNDN might have on how CNSC staff completed their assessment to date. BNDN provided a letter to CNSC staff outlining the Nation's position on statements made by CRDN and MN-S, as well as disagreement with CNSC's assessment of the EIS. Specifically, BNDN expressed concerns about inadequate water quality

	modelling and noted flaws in the cumulative effects assessment. CNSC staff committed to sharing this feedback with technical specialists and arranging a follow-up meeting with BNDN. CNSC staff sent an email and letter from the CNSC President and CEO with proposed next steps for consultation and engagement with BNDN for the remaining steps of the regulatory review process. This letter included a status update on the acceptance of the final EIS, as well as next steps in developing an EA report, consultation report, and Commission Member Document.
July 2025 – December 2025	BNDN submitted their review of their section of the consultation report and EA report to the CNSC on July 08, 2025. BNDN and CNSC held monthly meetings to discuss unresolved environmental, regulatory and consultation issues. BNDN, CNSC and NexGen continue to work to resolve outstanding issues and concerns.

4.3.3 Birch Narrows Dene Nation's key issues and concerns

The key issues and concerns specific to the Project that BNDN has raised to date are summarized below. BNDN raised these concerns in their October 2022 submission on the EIS. The detailed issues tracking table for BNDN can be found in Appendix A.4. The specific row discussing these issues can be found in Appendix A.4 and is listed beside each bullet. Please refer to this row in Appendix A.4 for additional context on the issue, CNSC staff's response and the issue's status.

1. Concerns about wildlife and ecosystem health around the following topics:
    a. Concerns that contamination may harm wildlife and reduce the health of animals harvested by community members.
    b. Concerns there may be potential impacts on trapline species and broader ecological systems.

2. Concerns about water quality and aquatic health including concerns around the following topics:
    a. Concerns about risk of water contamination leading to diseased fish and declining fish populations.
    b. Concerns about potential degradation of water quality in Patterson Lake and connected waterways.
    c. Concerns about acute toxicity from elements such as uranium and zinc posing risks to fish and aquatic life.
    d. Concerns about long-terms risks of permanent impairment to Patterson Lake, affecting fish health and water quality.
    e. Concerns about the importance of ongoing, perpetual monitoring of water and fish quality.

3. Concerns about tailings and waste management including the following:
    a. Concerns about the stability and safety of the underground tailings management area.
    b. Concerns about the potential for acid rock drainage and sulphur dioxide emissions from waste rock piles impacting Patterson Lake.
    c. Concerns about uncertainty of the waste rock storage and water quality modelling assumptions.
    d. Need for revision of waste rock seepage and water quality models.
    e. Request for detailed understanding and surface-level management of tailings.

4. Concerns about effluent and discharge management including concerns around the following topics:
    a. Concerns that there is a preference for achieving water quality objectives at the point of discharge without reliance on mixing zones.
    b. Concerns that the proposed effluent guidelines are not stringent enough
    c. Concerns about the need for regular revision of effluent quality objectives
    d. Recommendation from BNDN that effluent discharge permits to expire every five years for reassessment.
    e. Concerns about synergistic effects of elevated metals in final effluent.

5. Concerns about social and cultural impacts of the proposed project around access and land use, and cultural heritage and identify including the following topics:
    a. Increased competition with non-Indigenous recreational users
    b. Loss of access to cabins, campsites and travel routes due project activities and security measures.
    c. Increased traffic volumes impeding access to fishing areas.
    d. Potential loss of access to leased lands, especially around Patterson Lake
    e. Exclusion of land users and interested individuals from communities farther from the Project.
    f. Loss of traditional knowledge, stories, and practices.
    g. Impacts from existing developments and other factors rendering cultural values vulnerable.
    h. Long-term impacts to Patterson Lake and Clearwater Lake affecting cultural and land-based practices.
    i. Disruption of sense of place due to increased human activity, traffic, garbage, and landscape changes.
    j. Violation of BNDN beliefs and norms governing human-nature interactions.

6. Concerns about human health including concerns around the following topics:
    a. Concerns about contamination of watercourses, food plants, and medicines.
    b. Concerns about airborne pollutants potentially affecting human health.
    c. Concerns about negative impacts on mental health within the BNDN community.
    d. Concerns about increased health risks due to cumulative effects from the project and existing industrial activities.

7. Concerns socioeconomics including concerns around the following topics:
    a. Concerns about the need to balance business, employment, and training opportunities among communities and Indigenous Groups.

   b. Concerns about potential substance abuse linked to increased income from the Project.
   c. Concerns expressed about the Socio-Economic Monitoring Plan to verify impact assessments and support adaptive management.
   d. Request for development of a Socio-Economic Monitoring Plan.

8. Concerns about cumulative effects including concerns around the following topics:
   a. Concerns about the combined impacts of multiple industrial projects within BNDN territory.
   b. Concerns about the legacy effects from past mining activities, transmission lines, and environmental stressors such as forest fires.
   c. Concerns about acidic precipitation from Alberta oil sands potentially affecting the Project site.
   d. Concerns about the need to include sulphur dioxide emissions in the cumulative effects assessment.

9. Specific requests and recommendations BNDN have made:
   a. Collaborate with BNDN to resolve concerns before submission of the Final EIS.
   b. Include a condition of approval to prevent significant changes to water levels in Patterson Lake and Clearwater River system.
   c. Obtain written consent from BNDN for final permitted effluent quality objectives.
   d. Present findings to the community on groundwater changes from baseline conditions.
   e. Ensure sufficient closure bonding for tailings disposal.
   f. Make baseline geochemical data publicly available.
   g. Conduct thorough review and analysis of geochemical baseline data before project approval.
   h. Mitigate and accommodate impacts to BNDN Treaty and Aboriginal rights.
   i. Assess alternatives to address long-term loading of cobalt and copper into Patterson Lake.
   j. Establish a trust fund for ongoing monitoring of water and fish quality in Patterson Lake.
   k. Secure BNDN Consent for surface water quality monitoring programs.
   l. Assessment of buffering capacity of lakes and rivers impacted by the Project.
   m. Develop mitigation and monitoring measures to prevent acidification of Patterson Lake.
   n. Concerns from the March 2025 technical memo submitted by BNDN which are noted in the EA report (see Appendix B).

Since notifying BNDN of the project in 2019, both NexGen and CNSC staff have worked towards addressing concerns raised through the consultation and engagement process using clear technical responses and discussions, agreements, mitigations and accommodation measures. However, BNDN has indicated that there are several outstanding concerns, largely related to water quality, caribou, and potential contamination, that have not been addressed to their satisfaction to date. CNSC staff responses and proposed commitments are outlined below.

CNSC staff will continue to work with BNDN and NexGen to address outstanding concerns.

4.3.4 Views Expressed

BNDN noted that following their October 2023 letter to the CNSC indicating that all issues and concerns were addressed and that a process with NexGen was in place to resolve outstanding issues, that NexGen did not formally respond to BNDN's comments from the October 2022 draft EIS until September 2024. In addition, BNDN submitted supplementary comments on engineering and safety risks associated with the Rook I Project in February 2025. The comments were focused primarily on the proposed underground tailings management facility ("UGTMF"), as well as safety risks. BNDN identified 16 concerns and to date BNDN has received no response from CNSC or NexGen on the Feb 2025 supplementary comments.

BNDN has indicated that the CNSC has a duty to consult, and, where appropriate, accommodate and/or mitigate potential impacts to Section 35 Aboriginal rights.

4.3.5 CNSC staff's response

CNSC staff acknowledge the issues and concerns that BNDN has raised to date relating to the NexGen Rook I Project. CNSC staff have worked to understand, assess and address the concerns to the greatest extent possible. This was done by having focused discussions and consultations, including providing detailed responses, reflecting BNDN's views in CNSC's documentation, and discussing the Project at regularly scheduled meetings to better understand BNDN's concerns and identify commitments, mitigations and a path forward to addressing their concerns. CNSC staff have continuously offered to meet with BNDN. 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. CNSC staff will continue to monitor NexGen's engagement with BNDN throughout the lifecycle of the Project, if approved, and ensure that NexGen is addressing BNDN's questions, concerns and requests, and implementing commitments made to BNDN. CNSC staff have and will continue to provide opportunities for BNDN to provide input and feedback on how they would like to be consulted and engaged for the Project in ways that are meaningful to them.

CNSC staff have made initial commitments to address BNDN's concerns, and these commitments are listed below. CNSC staff have discussed and will continue to discuss these commitments with BNDN. CNSC staff remain committed to working with BNDN throughout the RIA and consultation processes by identifying additional commitments, mitigations and a path forward to addressing concerns relating to the Project, as appropriate. The outcomes, including a final list of commitments, will be included in CNSC staff's supplemental submission to the Commission.

Information regarding specific responses to each of BNDN's concerns is included in the issues tracking table, found in Appendix A.4.

In summary, CNSC staff remain committed to:

- Continuing to discuss the requests for mitigation and accommodation that BNDN has raised, including with NexGen, as appropriate.
- Collaborating on monitoring, oversight and engagement with BNDN.

- Ongoing engagement and collaboration with BNDN for this Project on regular information sharing including discussions through a proposed TOR for long-term engagement between the CNSC and BNDN.
- Oversight of NexGen's commitments to BNDN.
- Oversight of NexGen's engagement with BNDN.
- Continuing ongoing community visits and engagement with BNDN.

CNSC staff encourage NexGen to continue discussing and collaborating with BNDN to address any concerns the Nation might have. CNSC staff anticipate receiving an update from NexGen on their engagement efforts in an IER to be filed on record, as part of upcoming Commission hearings.

CNSC staff have worked with BNDN and NexGen to respond to all of the Nation's concerns, questions and comments. BNDN has indicated that they still have outstanding concerns with the Project, which CNSC will continue to work to address, together with NexGen. NexGen's commitments to BNDN are summarized in section 5 and CNSC staff's supplemental submission to the Commission will include further information. The CNSC looks forward to continuing to work with BNDN throughout the lifecycle of the Project, if approved, and is committed to working with the Nation to address any outstanding concerns.

Information regarding specific responses to each of BNDN's concerns is included in the issues tracking table, found in Appendix A.4.

4.3.6 Conclusion

CNSC staff are committed to continuing to consult, engage and work collaboratively with BNDN and NexGen in advance of the Part-2 Commission hearing to address any outstanding concerns, should they arise. This includes working to draft a BNDN-specific RIA, which will provide updated information about potential impacts of the Project on BNDN's Indigenous and treaty Rights. Mitigation and/or accommodation measures to address any identified impacts will be included in the supplemental submission, which will be submitted to the Commission prior to the Part-2 hearing.

4.4 Consultation activities with Buffalo River Dene Nation

CNSC staff sent Buffalo River Dene Nation a copy of section 4.4 of the Consultation Report, requesting the Nation's review and feedback. BRDN sent in a letter of support for the Project to proceed in response to the request for review. CNSC provided flexibility regarding timelines for receiving BRDN's comments and suggested edits where additional time was required for BRDN to complete their review and provide input.

4.4.1 Background on Buffalo River Dene Nation

Figure 9: BRDN logo

Buffalo River Dene Nation (BRDN) is a Dene-speaking nation situated approximately 84 kilometres northwest of Île-à-la-Crosse, SK on the western shore of Peter Pond Lake near Dillon, SK. The Nation is approximately 8,259 hectares in size and has a total registered population of 1,233 with an on-reserve population of 640 members. The Nation is also affiliated with the Meadow Lake Tribal Council and the Federation of Sovereign Indigenous Nations.

The Rook1 Project is located approximately 190 km from the main BRDN reserve in a straight-line distance and is within BRDN's traditional territory. The CNSC has an established relationship with BRDN, and the Nation has expressed an interest in other CNSC-regulated facilities in northern Saskatchewan. NexGen has been engaging with BRDN since February of 2017 on the Rook I Project.

Figure 10: BRDN regional map in the vicinity of the Project

4.4.2 CNSC's consultation activities with Buffalo River Dene Nation

Since 2019, CNSC staff have continued to consult, engage and keep BRDN informed of the Project and provided ongoing opportunities to meet and discuss any comments or concerns. CNSC staff have offered to develop a TOR with BRDN for long-term engagement, as well as a project-specific TOR for consultation. To date, BRDN has not expressed an interest in developing an arrangement with the CNSC.

CNSC staff remain open to and interested in developing a mutually agreeable TOR for long-term engagement that outlines how the CNSC and BRDN engage and collaborate on nuclear projects in BNDN's traditional territory. CNSC and BRDN have continued to meet and discuss the Project, including working towards understanding, assessing and addressing concerns that BRDN has raised regarding the Project.

NexGen entered into a capacity funding agreement with BRDN in July 2021, which included funding for BRDN to complete an IKRS, which BRDN completed and shared with NexGen. The draft and final EIS also included findings from the IKRS. Although CNSC staff requested that BRDN share the IRKS, BRDN has declined to date to share it.

CNSC and BRDN have had ongoing discussions to address Project-specific concerns and potential impacts to BRDN's Indigenous and/or treaty rights. BRDN had expressed concerns about technical elements of the project previously, and those are summarized in the issues tracking table, found in Appendix A.5.

CNSC staff have worked with BRDN and NexGen to respond to all the Nation's concerns, questions and comments and BRDN has concluded that they are satisfied with the CNSC's consultation process to date, as well as NexGen's engagement on the Project. In July 2021, NexGen and BRDN signed an Impact Benefit Agreement (IBA), which addresses the interests, concerns, and priorities of the Nation regarding the Project. In October 2022, BRDN sent a letter of support to the CNSC stating that they are pleased with the strong collaboration and meaningful relationship established between NexGen and BRDN, outlining details on the collaborative work that has taken place between BRDN and NexGen thus far. In November 2023, BRDN sent a letter of support for the Project to the CNSC, indicating that all issues and concerns identified by BRDN had been addressed and resolved. The letter also included the Nation's consent for the Project to proceed. Since receiving BRDN's consent letter and support for the project, CNSC staff have been working and meeting with the Nation to address their questions and concerns regarding remaining steps, timelines and requirements, in view of completing the regulatory review process and drafting recommendations to the Commission. Although the CNSC has not received a response to date, the CNSC has communicated that it is seeking BRDN's collaboration on drafting content for the CNSC staff's Consultation Report, to ensure that information specific to BRDN's rights, knowledge, concerns and perspectives are captured accurately.

Appendix B.4 includes key correspondence relating to the consultation activities listed below.

Table 7: Summary of key consultation activities with Buffalo River Dene Nation

Date	Consultation Activity
April 2019 – June 2019	CNSC staff sent BRDN an email and letter, providing notice that the CNSC had received an application for the Project. The letter outlined CNSC's licensing and EA processes and opportunities for BRDN's participation, including funding opportunities.
July 2019 – December 2019	No activity.
January 2020-June 2020	In May 2020, CNSC staff sent a Stage 1 PFP notice for the opportunity to review the draft EIS for the proposed Project.
July 2020-December 2020	BRDN participated in a Joint Working Group (JWG) meeting with CNSC staff and NexGen. The JWG discussed the duty to consult, as well as the CNSC EA and licensing processes.
January 2021-June 2021	BRDN and CNSC staff developed a contribution agreement to support the Nation's review of the Project EIS. CNSC staff reached out to BRDN to organize a meeting to address any questions or concerns they might have on the Project. CNSC staff expressed an interest in hearing about how the proposed Project could have potential impacts on BRDN's Indigenous and/or treaty rights, as well as how those impacts could be mitigated. As a follow up to the JWG meeting in 2020, CNSC staff presented on the health impacts of uranium workers, including the CNSC's and Saskatchewan's oversight.
July 2021-December 2021	BRDN signed an IBA with NexGen. CNSC staff reached out to BRDN to provide an update on the Project timeline, including the upcoming submission of the EIS. CNSC staff also offered to organize a meeting to discuss any potential adverse impacts the Project might have on BRDN's Indigenous and/or treaty rights, mitigation measures, and consultation methods preferable to BRDN.
January 2022 – June 2022	CNSC staff sent BRDN a letter outlining the proposed consultation approach for the Project. This included the option for BRDN to participate in the Federal and Indigenous Review Team (FIRT), collaborate on sections of the EA report, and develop a TOR or consultation protocol. CNSC staff participated in an in-person community information session in Dillon to discuss BRDN's concerns about the Project which included an open house, celebration, and community dinner.
July 2022 – December 2022	CNSC staff and BRDN met in-person in Saskatoon to discuss the Rook I EIS submission and next steps. CNSC staff discussed BRDN's issues and concerns, as well as next steps in the regulatory process.

	BRDN shared a letter of support for the Project, emphasizing BRDN's strong collaboration and meaningful relationship with NexGen.
January 2023 – June 2023	CNSC staff participated in an in-person community information session in Dillon.
July 2023 – December 2023	In November, BRDN sent a letter of support for the Project to CNSC staff, indicating that all issues and concerns identified by BRDN had been addressed and resolved.
January 2024 – June 2024	CNSC staff reached out to BRDN to organize a meeting to provide an update on the regulatory process, next steps and timelines. CNSC staff provided a status update on the Project and discussed planning a Fall tour to the community. CNSC staff participated in an in-person community information session in Turnor Lake.
July 2024 – December 2024	CNSC staff met with BRDN Chief and Council in Saskatoon in August and October of 2024 to discuss BRDN's concerns about water quality and air emissions, including the safety of the underground tailings management facility. CNSC staff provided an explanation of next steps, including how commitments are throughout the licensing process.
January 2025 – June 2025	CNSC staff sent an email and letter with proposed next steps for consultation and engagement for the remainder of the regulatory review process. This letter provided a status update on the acceptance of the final EIS and outlined next steps for developing the EA report, Consultation Report, and Commission Member Document. CNSC staff reached out by email to newly elected Chief and Council in April and May of 2025 to re-establish regular project update meetings and to advise of a PFP opportunity for the Project hearings. In April 2025, CNSC staff shared documents for BRDN to review and comment including relevant sections of the Consultation Report as well as the EA Report. BRDN requested additional time to complete the review, which CNSC provided to BRDN as requested.
July 2025 – December 2025	In response to a request to review BRDN's section of the CR, BRDN provided the CNSC with a letter of support for the Project to proceed on July 17, 2025.

4.4.3 Buffalo River Dene Nation's key issues and concerns

The key issues and concerns specific to the Project that BRDN has raised to date are summarized below. BRDN raised these concerns in their October 2022 submission on the EIS. The detailed

issues tracking table for BRDN can be found in Appendix A.5. The specific row discussing these issues can be found in Appendix A.5 and 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.

1. Concerns about social impacts and BRDN community including concerns around the following topics:
    a. Concerns that restricted access to traditional lands and resources may impact the transmission of traditional knowledge.
    b. Concerns about the cumulative access restrictions within BRDN traditional territory.
    c. Concerns about limited community participation in knowledge collection due to time and budget constraints.
    d. Concerns about potential increase in social challenges (gambling, substance abuse, family violence) linked to increased income levels.
    e. Concerns about increased competition with non-Indigenous recreational users due to industrial activities.

2. Concerns about infrastructure and monitoring including concerns around the following topics:
    a. Concerns about deterioration of local road infrastructure due to project activities.
    b. Concerns about liability for road maintenance and repair.
    c. Concerns about increased traffic volumes contributing to road wear and dust pollution.

3. Concerns about environmental impacts and wildlife concerns including concerns around the following topics:
    a. Concerns about degradation of air quality from cumulative industrial activities.
    b. Concerns about potential contamination of water sources, particularly Patterson Lake.
    c. Concerns about negative effects on fish populations and aquatic habitat,
    d. Concerns about disruption to subsistence harvesting and commercial fishing practices.
    e. Concerns about health risks from consuming wildlife exposed to pollutants.
    f. Concern about decline in fowl populations affecting traditional harvesting.
    g. Concerns about reduced access to country foods, impacting food security and community well-being.
    h. Concerns about noise pollution from project construction and operation.
    i. Concerns about insufficient environmental monitoring and oversight for the project.

4. Concerns on human health and safety including concerns around the following topics:
    a. Concerns about human health and the cumulative health impacts from industrial exposure on human health.
    b. Concerns about road safety risks due to increased truck traffic and ensuring adequate spill response measures.
    c. Potential exposure to mine-related radiation and exhaust emissions.

4.4.4 CNSC staff's response

Since 2019, CNSC staff have continued to consult and engage with BRDN and keep the Nation informed of the Project, providing ongoing opportunities to meet and discuss any comments or concerns. CNSC staff acknowledge the issues and concerns that BRDN has raised to date regarding 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 BRDN's views in CNSC's documentation and discussing the Project at regularly scheduled meetings with BRDN to better understand their concerns and identify a path forward to addressing them through commitments and mitigations, as necessary. CNSC staff's view is that the approach to consultation conducted for the Project has been in line with best practices and is flexible, based on the specific needs and requests of each potentially impacted Indigenous Nation and community. CNSC staff will continue to monitor NexGen's engagement with BRDN throughout the lifecycle of the Project, if approved, and ensure that NexGen is addressing BRDN's questions, concerns and requests, and implementing commitments made to BRDN. CNSC staff have and will continue to provide opportunities for BRDN to provide input and feedback on how they would like to be consulted and engaged for the Project in ways that are meaningful to them.

CNSC staff have made initial commitments to address BRDN's concerns, and these commitments are listed below. CNSC staff have discussed and will continue to discuss these commitments with BRDN. CNSC staff remain committed to working with BRDN throughout the RIA and consultation processes by identifying additional commitments, mitigations and paths forward to addressing concerns relating to the Project, as appropriate. The outcomes, including a final list of commitments, will be included in CNSC staff's supplemental submission to the Commission.

In summary, CNSC staff remain committed to:

- Continuing to discuss the requests for mitigation and accommodation that BRDN has raised, including with NexGen, as appropriate.
- Collaborating on monitoring, oversight and engagement with BRDN.
- Ongoing engagement and collaboration with BRDN for this Project on regular information sharing including discussions through a proposed TOR for long-term engagement between the CNSC and BRDN.
- Oversight of NexGen's commitments to BRDN.
- Oversight of NexGen's engagement with BRDN.
- Continuing ongoing community visits and engagement with BRDN.

CNSC staff encourage NexGen to continue discussing and collaborating with BRDN to address any concerns the Nation might have. CNSC staff anticipate receiving an update from NexGen on their engagement efforts in an IER to be filed on the record, as part of upcoming Commission hearings.

CNSC staff have worked with BRDN and NexGen to respond to all the Nation's concerns, questions and comments and BRDN has concluded that they are satisfied with the CNSC's consultation process to date, as well as NexGen's engagement on the Project. NexGen's commitments to BRDN are summarized in section 5 and CNSC staff's supplemental submission

to the Commission will include further information. CNSC looks forward to continuing to work with BRDN throughout the Project lifecycle, if approved.

Information regarding specific responses to each of BRDN's concerns is included in the issues tracking table, found in Appendix A.5.

4.4.5 Conclusion

CNSC staff are committed to continuing to consult, engage and work collaboratively with BRDN and NexGen in advance of the Part-2 Commission hearing to address any outstanding concerns, should they arise. This includes working to draft a BRDN-specific RIA, which will provide updated information about potential impacts of the Project on BRDN's Indigenous rights. Mitigation and/or accommodation measures to address any identified impacts will be included in the supplemental submission, which will be submitted to the Commission prior to the Part-2 hearing.

4.5 Engagement activities with Athabasca Chipewyan First Nation

Athabasca Chipewyan First Nation has reviewed and provided feedback on section 4.5 of the Consultation Report. An updated traditional territory map was included in their response which has been included in 4.5.1. Views expressed by ACFN are shared in 4.5.3.

4.5.1 Background on Athabasca Chipewyan First Nation

Figure 11: ACFN logo

Athabasca Chipewyan First Nation (ACFN) is a signatory of Treaty 8 and is situated in northeastern Alberta with the current main settlement being in Fort Chipewyan, Alberta. ACFN has eight reserves with a combined area of 34,767 hectares. ACFN has a registered population of approximately 1,500 members. The reserves are located near the southwestern tip of Lake Athabasca, across the lake from Fort Chipewyan, and on the Athabasca River. It is accessible by air from Edmonton and Fort McMurray, and by winter road from Fort Smith (140 km to the north) or Fort McMurray (303 km to the south).

Fort Chipewyan is closest ACFN community to the Project and is located approximately 160 km to the northwest in a straight-line distance, or approximately 620 km by road, including a portion

of a winter road. The Project also overlaps ACFN's treaty territory and ACFN's claimed consultation notification territory, which includes the Clearwater River Watershed. Given ACFN'S previous interest in the Cluff Lake Project (ACFN members have a trapping and hunting cabin on the Cluff Lake site, which is located 80 kms north of Rook I) and that the Project site is located within ACFN's treaty and claimed consultation notification territories, ACFN has been identified as a community that should be engaged and consulted with for this Project.

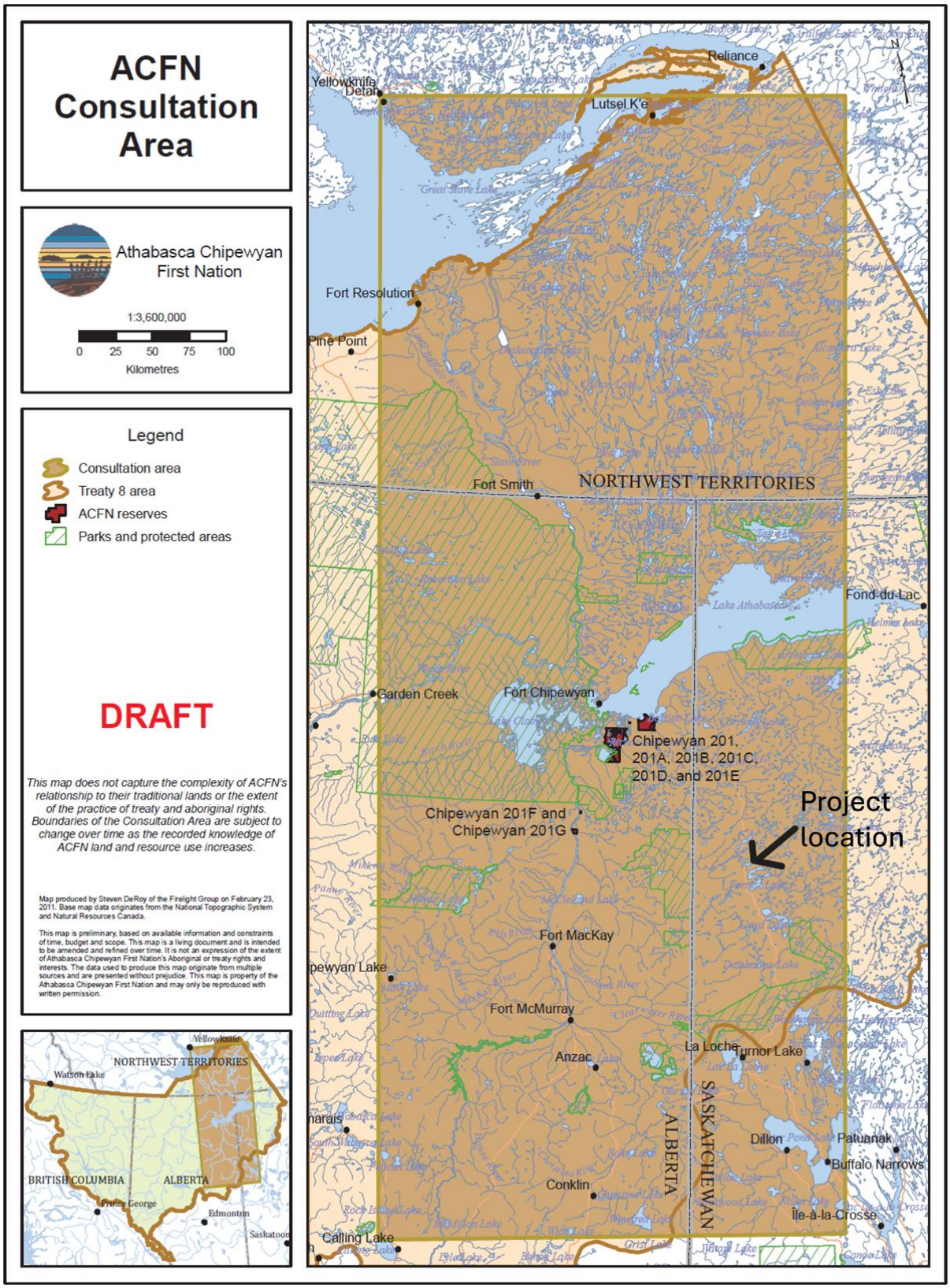

Figure 12: ACFN traditional territory

4.5.2 CNSC consultation activities with Athabasca Chipewyan First Nation

CNSC staff have been consulting and engaging with ACFN on the Project since 2019. In February 2023, the CNSC funded an ACFN TLUS to better understand the extent and use of ACFN's traditional territory in relation to CNSC-regulated projects and facilities. ACFN completed and shared the *Athabasca Chipewyan First Nation Traditional Land Use Study regarding Uranium Exploration and Development in ACFN Homelands in Northern Alberta and Northern Saskatchewan* with the CNSC in 2024. This TLUS provided CNSC staff with information and insights on current and past land use, as well as knowledge of the land as it relates to historic and current uranium development in ACFN's territory. CNSC staff drafted a WWHR based on the TLUS and shared it with ACFN for review and confirmation of accuracy. ACFN noted the TLUS was preliminary and based on the limited interviews of land users they were able to conduct and is continuing to conduct the TLUS. Based on what has been shared from the TLUS, CNSC staff concluded that ACFN did not demonstrate that the Project would impact specific traditional or current land use activities directly; however, CNSC staff and NexGen continued to engage with ACFN to address and respond to any outstanding concerns regarding the Project.

In May 2024, the CNSC and ACFN signed a TOR for long-term engagement that outlines how the CNSC and ACFN engage and collaborate on nuclear projects that are within ACFN's traditional territory. CNSC and ACFN have a regular quarterly meeting to discuss the Project, and other projects of interest, and work towards understanding, assessing and addressing the concerns that ACFN has raised.

CNSC and ACFN have had ongoing discussions to address Project-specific concerns and potential impacts. ACFN expressed concerns, previously, in relation to technical elements of the Project which are summarized in the Appendix A.6issues tracking table.

CNSC staff have worked and continue to work with ACFN and NexGen to respond to all the Nation's concerns, questions and comments about the Project. The CNSC has communicated to ACFN that it is seeking ACFN's feedback on the CNSC staff's Consultation Report, to ensure that information specific to ACFN's rights, knowledge, concerns and perspectives is captured accurately.

Appendix B.6 includes key correspondence relating to the consultation activities listed below.

Table 8: Summary of key engagement activities with Athabasca Chipewyan First Nation

Date	Engagement Activity
April 2019 – June 2019	CNSC staff sent ACFN an email and letter, giving notice that the CNSC has received an application for the Project. The letter outlined CNSC's licensing and EA processes and opportunities for ACFN participation, including funding opportunities.
July 2019 – December 2019	CNSC staff sent an email offering ACFN an additional review period of the Rook I Project Description, as the official comment period had already closed. ACFN provided comments on the Project Description to which CNSC responded to.

January 2020 – June 2020	In May 2020, CNSC staff sent a Stage 1 PFP notice for the opportunity to review the draft EIS for the proposed Project.
July 2020 – December 2020	No activity.
January 2021 – June 2021	CNSC staff called ACFN offering to have a meeting and share information and answer questions on the Project. ACFN sent the CNSC a signed Contribution Agreement in relation to the CNSC's PFP funding opportunity to review the draft EIS for the Project.
July 2021 – December 2021	No activity.
January 2022 – June 2022	CNSC staff sent an email and letter to ACFN with an update on the Project timelines and regulatory steps.
July 2022 – December 2022	CNSC staff met with ACFN to discuss their interest in reviewing the draft EIS. CNSC staff provided information on timelines, how ACFN can be involved in the regulatory process, and funding opportunities. ACFN shared a financial report for a partial technical review of the EIS and requested an extension to complete the review and CNSC staff granted the extension. ACFN provided their EIS review comments to the CNSC. In September 2022 CNSC staff participated in an Elders meeting as well as a community workshop in Fort Chipewyan to provide an overview of the CNSC's mandate and the existing and proposed nuclear projects in ACFN's territory, including the NexGen Rook I Project. CNSC staff answered questions and concerns of community members, Elders and leadership regarding the Project and committed to coming back to the community to discuss the Project in more detail. CNSC staff also participated in two virtual events coordinated by ACFN to provide community members who don't live in the Fort Chipewyan community. CNSC staff gave a presentation regarding the CNSC's mandate, role and information on key projects in ACFN's territory, including the NexGen Rook I Project.
January 2023 – June 2023	CNSC staff and ACFN discussed and finalized a funding agreement to support engagement, offering advance payment to ACFN which the Nation accepted. Other topics discussed during this period included CNSC's regulatory process, Project updates, and an IK study. CNSC staff noted that Project timelines might inhibit the inclusion of the IK study within the EIS, but stipulated that it would be included within the EA and CMD as appropriate. ACFN hosted a Fort Chipewyan Uranium TLUS Open House and CNSC staff shared presentation materials and participated.

	CNSC staff and ACFN continued to discuss the agenda and logistics for meeting, within the context of fires in the community. ACFN still expressed an interest in meeting with CNSC staff.
July 2023 – December 2023	CNSC staff and ACFN had a meeting and discussed ACFN's progress on developing a TLUS and development of a TOR for long-term engagement with the CNSC. ACFN enquired about additional funding to support the TLUS given the scope of the study. CNSC staff amended the funding agreement to support this request and shared the signed contribution agreement with ACFN. Both corresponded about the timelines and estimated completion date for the TLUS. CNSC staff and ACFN also discussed the Project's status and upcoming timelines, including the status of the re-submission of the draft EIS and the review of responses to information requests. CNSC staff requested that ACFN share comments on the provincial EIS, if of interest, and offered to discuss comments and concerns on their rights and interests. ACFN emphasized that the Nation is focused on obtaining environmental information from NexGen, not economic benefits.
January 2024 – June 2024	CNSC staff met with ACFN and provided updates on the status of the Project, including the status of NexGen's responses to information requests on the federal EA. CNSC staff noted that NexGen is expected to include ACFN's information and TLUS within the EIS if shared in a timely manner during the EIS drafting process. ACFN emphasized that they are approaching the Project strictly from an environmental protection perspective. ACFN indicated that NexGen had not been taking the Nation's concerns seriously and that the Nation is looking for NexGen to respond to ACFN's comments on the EIS. CNSC staff shared these concerns with NexGen and stated that the expectation is for NexGen to provide responses to ACFN's comments on the EIS as soon as possible. CNSC staff also offered to set up a meeting between the CNSC, ACFN, and NexGen to discuss the concerns and find a path forward. CNSC staff and ACFN continued discussing the TLUS, including means of sharing information confidentially. CNSC staff also shared a draft copy of the WWHR summarizing the TLUS completed by ACFN for the Nation's review.
July 2024 – December 2024	CNSC staff met with ACFN and provided updates on the status of NexGen's technical review and outstanding information requests. ACFN confirmed that they have received NexGen's

	responses to their review of the EIS. ACFN also provided comments on CNSC staff's draft WWHR and CNSC staff returned a final copy for ACFN's review. CNSC staff and ACFN planned an in-person community visit to discuss the status of NexGen with community members in Fort Chipewyan. ACFN shared that they have outstanding technical concerns on water quality, wildlife and vegetation monitoring. ACFN also shared that NexGen is unwilling to adopt mitigation measures that ACFN proposed. On September 26th, ACFN sent a letter to the CNSC requesting that the CNSC advise NexGen and all proposed industries within the consultation area to recategorize ACFN as a "Primary" Indigenous group, rather than as an "Other" Indigenous group, noting that the categorization of ACFN as a First Nation with minimal impacts is false and requires immediate reparation. On October 11th, CNSC staff and ACFN met to discuss the request. In September 2024 CNSC staff participated in a community meeting and workshop in Fort Chipewyan where the results of the TLUS was discussed. CNSC staff provided a presentation regarding the Project and answered questions from community members, Elders and leadership. CNSC staff also met with ACFN staff and representatives to discuss next steps in the regulatory process and an approach to collaborating on and supporting ACFN led environmental monitoring and data gathering activities.
January 2025 – June 2025	On February 14th, 2025, CNSC staff sent an email and letter with proposed next steps for consultation and engagement with ACFN for the remainder of the regulatory review process. This letter shared a status update on the acceptance of the final EIS, as well as next steps for developing an EA report, Consultation Report, and CMD. On March 6th, ACFN responded to e letter, expressing that the Nation looked forward to continuing engagement with the CNSC and requesting that CNSC staff share information on engagement timelines. ACFN also shared a document with technical responses and recommendations for the EIS. On March 18th, CNSC staff and ACFN met to discuss this correspondence and chart a path forward. CNSC staff followed up with ACFN after this meeting to clarify some of the language from the February 14th letter, noting the CNSC's acknowledgment of ACFN's position and concerns about the Project.
July 2025 – December 2025	To be determined.

4.5.3 Athabasca Chipewyan First Nation's key issues and concerns and CNSC staff's response

The key issues and concerns specific to the Project that ACFN has raised to date are summarized below. ACFN raised these concerns in their October 2022 submission on the EIS. The detailed issues tracking table for ACFN can be found in Appendix A.6. The specific row discussing these issues can be found in Appendix A.6 and is listed 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.

1. Concerns about treaty and aboriginal rights including the following topics:
    a. Concerns around that the project will infringe on ACFN's ability to practice their section 35 treaty rights to hunt, fish, trap, which are guaranteed by section 35 of the *Constitution Act, 1982.*
    b. Emphasis from ACFN that the land is integral to ACFN's culture, identity and spirituality.
    c. Concerns that ACFN requires funding for consultation and engagement meetings to better understand the potential project impacts.
    d. Concerns that access to the land is central for teaching cultural knowledge and language.
    e. Fears that is traditional practices aren't continued; Dene culture and language could be lost.

2. Concerns about land use and sustainability including concerns around the following topics:
    a. Concerns that ACFN members actively use the land for traditional practices.
    b. Concerns about the cumulative effects of development on ACFN's traditional lands.
    c. Concerns that a technical review and land use study are necessary to fully consider the impacts of the project.

3. Concerns about environmental impacts and wildlife concerns including concerns around the following topics:
    a. Concerns that the project description failed to provide sufficient information for understanding potential environmental impacts.
    b. Concerns about water quality, fish and aquatic habitat, wildlife and overall environmental health.

ACFN has noted that, due to a lack of internal capacity and a lack of information and responses to technical questions from NexGen, ACFN is conducting additional assessments to better understand the potential adverse impacts to the Nation that may arise from the Project.

4.5.4 Views expressed

ACFN has indicated that the CNSC has a duty to consult and, where appropriate, accommodate and/or mitigate potential impacts to Section 35 Aboriginal rights. ACFN has noted that

discussion and collaboration do not fulfil the duty to consult and accommodate, nor do they address potential impacts to Section 35 Aboriginal rights.

4.5.5 CNSC staff's response

CNSC staff will continue to work collaboratively with ACFN and NexGen to respond to and address the concerns raised to date including discussions on potential mitigations, and commitments to address the concerns ACFN has raised. This can include opportunities to collaborate on monitoring and follow up activities that aim to address ACFN's concerns on the Project.

Since 2019, CNSC staff have continued to consult and engage with ACFN and keep the Nation informed of the Project, providing opportunities to meet and discuss any comments or concerns. CNSC staff have offered additional meeting opportunities to understand, respond to and address concerns that ACFN has raised. To date, ACFN has not provided the CNSC with specific information regarding traditional or current land use in the proposed Project area. CNSC staff have offered and will continue to offer ACFN opportunities to provide input on how they would like to be engaged on the Project and what would constitute meaningful engagement for ACFN. Additionally, CNSC staff are satisfied with NexGen's responses to ACFN's concerns and comments on the EIS. However, CNSC staff note that ACFN has indicated they are not satisfied with NexGen's engagement and responses to their technical concerns and comments to date. CNSC staff will continue to monitor NexGen's engagement throughout the lifecycle of the Project, if approved. Please see the issues tracking table in Appendix A.6 for additional context.

CNSC staff encourage NexGen to continue engaging and collaborating with ACFN to address outstanding issues and concerns, with a goal of reaching consensus on the Project, where possible. CNSC staff anticipate receiving an update on NexGen's engagement efforts in an IER to be filed on record, as part of the upcoming Commission hearings.

4.5.6 Conclusion

CNSC staff's view is that the CNSC has conducted a thorough and flexible consultation and engagement process with ACFN to date. In addition, CNSC staff are satisfied with NexGen's consideration and responses to ACFN's questions, comments and concerns in relation to the Project. To date, ACFN has not provided specific information that demonstrates that the Project could lead to new impacts on their rights or interests directly. CNSC staff remain committed to engaging and sharing information with ACFN about the Project. CNSC staff are committed to continuing to consult, engage, and work collaboratively with ACFN and NexGen in advance of the Part-2 Commission hearing to address any outstanding concerns.

4.6 Engagement activities with Ya'thi Néné Lands and Resources

Ya'thi Néné Lands and Resources Office 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 views expressed listed in section 4.6.3 are views of the YNLR. CNSC provided flexibility

regarding timelines for receiving YNLR's comments and suggested edits where additional time was required for YNLR to complete their review and provide input.

4.6.1 Background on Ya'thi Néné Lands and Resources

Figure 13: YNLR logo

The Ya'thi Néné Lands and Resources Office (YNLR) was established by the Athabasca Denesuliné (AD) communities of Black Lake, Fond du Lac, and Hatchet Lake First Nations and the municipalities of Stony Rapids, Wollaston Post, Uranium City, and Camsell Portage to protect the land and promote the people of Nuhenéné. YNLR acts as a point of contact between industry, government, and local residents of the Athabasca Region. YNLR has been mandated by the Athabasca communities to represent their interests and conduct consultation and engagement activities with governments and industries conducting activities in the Athabasca Basin and their traditional and treaty territories.

CNSC staff have identified Fond du Lac First Nation (FDLFN) and Black Lake First Nation (BLFN) as potentially having Indigenous and/or Treaty rights in the proposed Rook I Project area and therefore as Indigenous Nations that should be engaged and consulted on the proposed Project. FDLFN and BLFN are signatories of Treaty 8, and their communities are located within the Athabascan Basin. Fond du Lac First Nation is the closest Athabasca Dene First Nation to the Project and is located approximately 180 km in a straight-line distance to the northeast or approximately 1,335 km by road. Black Lake is located approximately 260 km in a straight-line distance to the northeast or approximately 1,230 km by road. approximately 225 km northeast of the Project and over 1200 km by road. FDLFN and BLFN members practice their Treaty rights of hunting, fishing and trapping on a year-round basis.

FDLFN and BLFN are members of the Athabasca Denesuliné First Nations. Athabasca Denesuliné lay claim to a wide area that encompasses large portions of northern Saskatchewan, northern Manitoba, southern Nunavut, and southern Northwest Territories. The Project is situated within that portion of the claimed Athabasca Denesuliné traditional territory, falling within the boundaries of Saskatchewan.

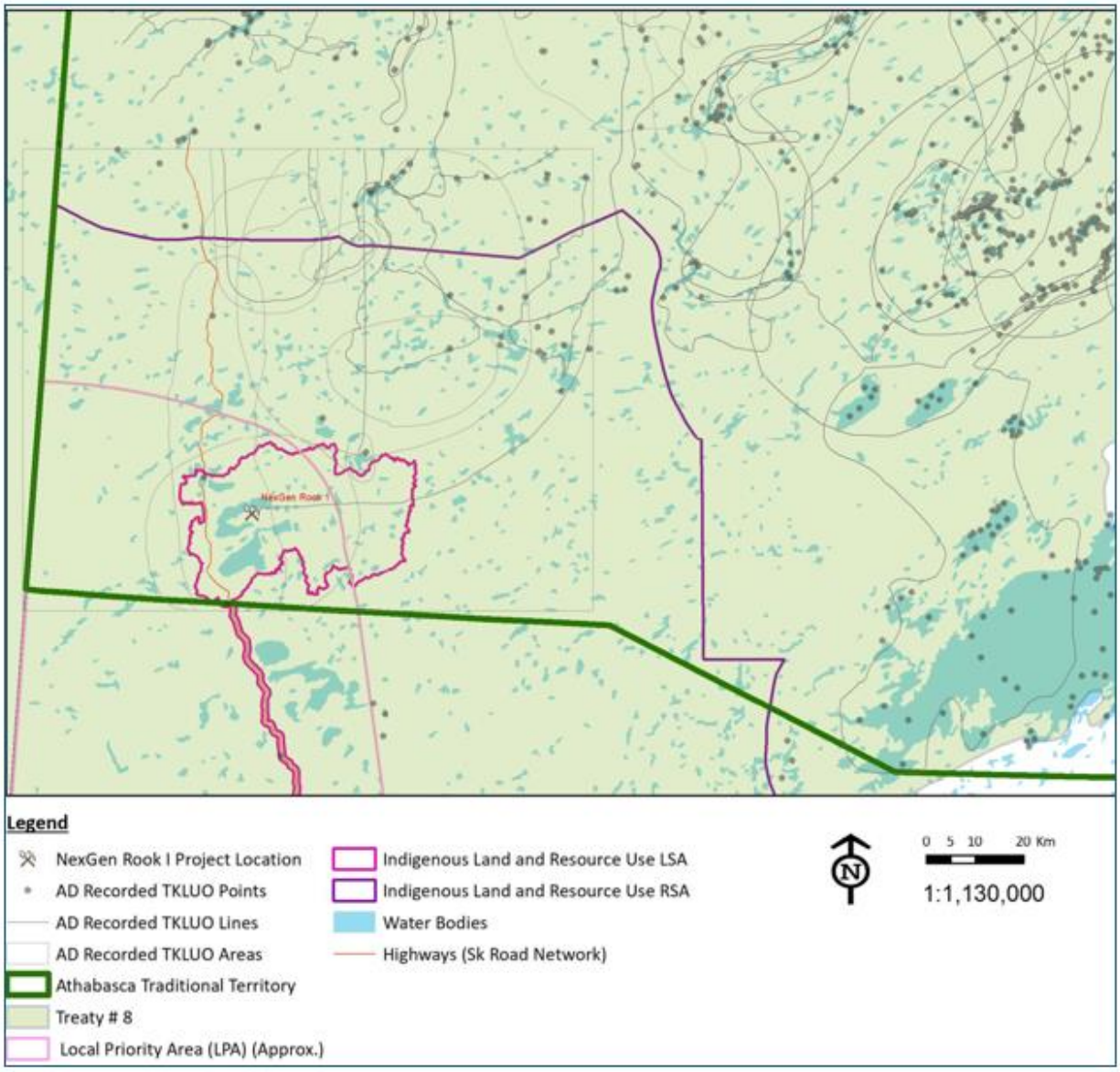

Figure 14: Athabasca Denesuline claimed traditional territory overlapping the Project area

The First Nations and communities that YNLR represents have directed the CNSC to consult and engage with YNLR leadership as the sole representative for the Athabasca Denesuliné First Nations for the Project.

4.6.2 CNSC consultation activities with Ya'thi Néné Lands and Resources

CNSC staff and YNLR have a history of engagement and collaboration and in June 2022 signed a TOR for long-term engagement, which formalized the CNSC's long-standing relationship with the Athabasca Denesuliné communities. Since the beginning of the regulatory review process for

NexGen's proposed Rook I Project in 2019, CNSC and YNLR have had regular meetings, providing updates, discussing issues and concerns, and engaging and consulting on the Project. As part of the regular meetings CNSC staff provides updates to YNLR representatives on the Project and answer any questions and concerns that are raised.

For the purposes of the Rook I Project, NexGen funded YNLR to complete a TLUS in 2020. Consequently, YNLR submitted a report to the CNSC and NexGen titled *An Exploration of Recorded Athabasca Denesuliné Traditional Knowledge, Land Use and Occupancy Information in the Vicinity of NexGen Mines Rook I 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 the report was not considered a site-specific study.

The Athabasca Denesuliné have participated in many traditional knowledge studies since the 1970s. This study provided the CNSC and NexGen with valuable information regarding the traditional land use activities of the Athabasca Denesuliné, with the goal of informing the regulatory and consultation process. The study documents the importance of caribou to the Athabasca Denesuliné, their history, maps showing land use and occupancy sites, as well as traditional knowledge of the Nuhenéné, which is the traditional territory of Athabasca Denesuliné. NexGen included the results of the study in the draft and final EIS. CNSC staff have collaborated with YNLR to reflect and include information from this study to support CNSC staff's review of the NexGen EIS, as well as to draft the CNSC's reports, assessments, and recommendations to the Commission.

CNSC and YNLR have had ongoing discussions to address Project-specific concerns and potential impacts. YNLR expressed concerns, previously, in relation to technical elements of the Project which are summarized in the Appendix A.2 issues tracking table.

CNSC staff have worked with YNLR and NexGen to respond to all YNLR's concerns, questions, and comments. CNSC staff have been working and meeting with YNLR to address questions and concerns about the remaining steps and requirements to complete the regulatory review process and finalize CNSC staff's recommendations to the Commission. CNSC staff have relayed that the CNSC is seeking YNLR's feedback on the CNSC staff's Consultation Report to ensure that information specific to YNLR's rights, knowledge, concerns, and perspectives is captured accurately.

Key correspondence relating to consultation activities listed below is included in Appendix B.7.

Table 9: Summary of key engagement activities with Ya'thi Néné Lands and Resources

Date	Engagement Activity
April 2019 – June 2019	CNSC staff sent YNLR notice of the new Project and indicated that the NOC and PD would be posted. YNLR provided comments to CNSC staff on the Project description.
July 2019 – December 2019	No activity.
January 2020 – June 2020	In May 2020, CNSC staff sent a Stage 1 PFP notice for the opportunity to review the draft EIS for the proposed Project.

July 2020 – December 2020	No activity.
January 2021 – June 2021	CNSC and YNLR signed contribution agreements for NexGen's Rook I Project and the Cigar Lake license renewal.
July 2021– December 2021	CNSC staff provided updates at UMM ROR virtual sessions to YNLR.
January 2022 – June 2022	CNSC staff sent YNLR notice of the remaining steps in the regulatory review process, including the EA for the proposed Project. CNSC and YNLR finalized and signed their TOR.
July 2022 – December 2022	YNLR submitted a cover letter and report to CNSC staff, with comments related to the EIS.
January 2023 – June 2023	CNSC staff provided an update to YNLR on all three EAs.
July 2023 – December 2023	No activity.
January 2024 – June 2024	YNLR submitted comments to NexGen concerning the NexGen License application for the Project, copying CNSC staff on the correspondence. CNSC staff met with YNLR in person and gave an update on major EAs. CNSC staff also visited Hatchet Lake in person and gave an update to ALPC.
July 2024 – December 2024	CNSC staff met with YNLR in person and gave project updates to ALPC. YNLR requested and received an update from CNSC staff on all upcoming hearings for the next 5 years.
January 2025 – June 2025	On February 14th, CNSC staff sent an email and letter with proposed next steps for consultation and engagement with YNLR for the remainder of the regulatory review process. This letter shared a status update on the acceptance of the final EIS, as well as next steps for developing an EA report, Consultation Report, and CMD CNSC staff met with YNLR to present on Project updates.
July 2025 – December 2025	PFP Contribution Agreement signed by YNLR and CNSC to support an intervention and hearing participation by YNLR for the Project. CNSC staff met with YNLR to present on Project updates.

4.6.3 Ya'thi Néné Lands and Resources' key issues and concerns and CNSC's staff's response

The key issues and concerns specific to the Project that YNLR has raised to date are summarized below. YNLR raised these concerns in their October 2022 submission on the EIS. The detailed

issues tracking table for YNLR can be found in Appendix A.2. The specific row discussing these issues can be found in Appendix A.2 and is listed beside each bullet. Please refer to this row in Appendix A.2 for additional context on the issue, CNSC staff's response and the issue's status.

1. Concerns about water resource management including concerns around the following topics:
    a. Concern about the sustainability of responsible use of water resources, including the design of water management systems to minimize freshwater intake by reusing and recycling water. Monitoring groundwater and effluent release, ensuring proper treatment and testing before release.
    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 especially in Patterson Lake.
    c. Concerns around the underground tailing management method.

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 NexGen'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 NexGen 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 NexGen has minimized potential cumulative effects of other mining developments, and that long-term project operation and increasing uranium demand necessitate thorough cumulative effects analysis.
    b. Concern about subjective and qualitative nature of impact assessment, and the potential cumulative impacts, such as additional harvest pressure on fish and wildlife may have been overlooked.
    c. Concern regarding how NexGen has represented YNLR, misclassifying them as "other Indigenous Group" rather than a "primary Indigenous Group", which diminishes the importance of their traditional land use. The 2020 report provided an overview of Athabasca Denesuline culture, history, treaties, way of life and traditional territory, including thematic maps of cultural and land use activities, and identified primary concerns and potential impacts related to the project.
    d. Concerns that terms like 'ecological integrity' and 'ecological health' are being used interchangeably without clear definition.

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 submitted several formal requests for accommodation and mitigation measures, including: a cumulative effects assessment of northern Saskatchewan, a caribou habitat offset plan and greater involvement in environmental monitoring and follow-up. At this time, no formal accommodations for a cumulative effects assessment nor increased involvement in environmental monitoring have been made for YNLR and the Athabasca Denesuline First Nations. NexGen is required to implement a caribou offset plan; while some Indigenous Nations may participate in that process, it is unclear whether YNLR is included.

YNLR has informed NexGen that their activities are contributing to cumulative effects on aquatic and terrestrial systems and YNLR has requested but not yet received any substantive information on aquatic monitoring and terrestrial mitigation and remediation plans, although there are further meetings set for September 2025 between NexGen and YNLR.

Regarding environmental monitoring, neither the CNSC nor NexGen have committed to a monitoring partnership with YNLR. This is based on current information indicating that YNLR does not traditionally use the project area. It is important to note that YNLR has raised the issue of cumulative effects for several years. In response, the CNSC has collaborated with them on the Independent Environmental Monitoring Program (IEMP) and the Environmental Athabasca Regional Monitoring Program (EARMP). Further, industry has committed to working with YNLR on their Community-Based Environmental Monitoring Program (CBEMP). These studies have not identified any significant cumulative environmental impacts to date due to uranium

mining and milling in northern Saskatchewan. CNSC staff's key responses and commitments are outlined below. Additional context can be found in the Appendix A.2 issues tracking table.

4.6.4 Views expressed

YNLR has noted that, at an operational level, NexGen has not addressed YNLR's requests for information concerning aquatic monitoring plans. YNLR has expressed that although NexGen has responded to YNLR's concerns, those responses remain inadequate. In addition, YNLR has criticized CNSC's IEMP, noting that despite its merits, it is not designed to quantify cumulative effects and only collects a limited number of water and traditional food samples for chemical analysis in areas surrounding existing and historical mines and mills.

CNSC Staff Response

CNSC staff will continue to work collaboratively with YNLR and NexGen to respond to and address the concerns raised to date including discussions on potential mitigations, and commitments to address the concerns YNLR has raised. This can include opportunities to collaborate on monitoring and follow up activities that aim to address YNLR's concerns on the Project.

CNSC notes that the IEMP is designed to build trust and confidence in CNSC's regulatory framework by collaborating with Indigenous Nations and communities to collect and analyze environmental media that are important to Indigenous Peoples' way of life and in areas where Indigenous Nations and communities actively exercise their rights. The IEMP provides an overview of potential cumulative effects at a particular point in time to allow for periodic comparison. In addition, the CNSC contributes to the Eastern Athabasca Monitoring Program (EARMP) which, similar to IEMP, collects and analyzes environmental media in collaboration with Indigenous Nations and communities in areas where Indigenous Nations and communities actively exercise their rights. This program provides a year over year comparison of analytical results that help quantify potential cumulative effects to the area watersheds. With the potential for the proposed Rook I mine to be developed, the CNSC, province of Saskatchewan and NexGen will be discussing expanding this program to the western Athabasca basin.

CNSC staff are satisfied with NexGen's responses to YNLR's concerns and comments on the EIS. However, CNSC staff note that YNLR has indicated they are not satisfied with NexGen's responses to their technical concerns and comments to date. CNSC staff will continue to monitor NexGen's engagement throughout the lifecycle of the Project, if approved. Please see the issues tracking table in Appendix A.2 for additional context.

CNSC staff encourage NexGen to continue engaging and collaborating with YNLR to address outstanding issues and concerns, with a goal of reaching consensus on the Project, where possible. CNSC staff anticipate receiving an update on NexGen's engagement efforts in an IER to be filed on record, as part of the upcoming Commission hearings.

4.6.5 Conclusion

CNSC staff's view is that NexGen has considered and addressed YNLR's questions adequately. To date, YNLR has not provided specific information that demonstrates that the Project could

lead to impacts on their rights or interests directly. CNSC staff remain committed to engaging and sharing information with YNLR about the Project. CNSC staff are committed to continuing to consult, engage, and work collaboratively with YNLR and NexGen in advance of the Part-2 Commission hearing to address any outstanding concerns. CNSC staff encourage NexGen to continue discussions and collaboration with YNLR to address any outstanding concerns. CNSC staff anticipate receiving an update from NexGen on their engagement efforts in an IER to be filed on record, as part of the upcoming Commission hearings.

4.7 Engagement activities with other interested Indigenous Nations and Communities

4.7.1 Background on Mikisew Cree First Nation

Figure 15: MCFN logo

Mikisew Cree First Nation (MCFN) is a Treaty 8 signatory located in Northeastern Alberta near Fort Chipewyan. They have 176 members living on reserve, and a total registered population of 3,288. MCFN initially contacted the CNSC via email on March 18, 2025, expressing an interest in the Project. The Rook I Project is located approximately 160 km from the main MCFN reserve in a straight-line distance.

CNSC held an introductory meeting to provide an overview of the Rook I Project, the current stage of the regulatory process, and to understand MCFN's concerns and interests. CNSC followed up with MCFN to provide information on the Project, the regulatory review process, and the PFP funding opportunity to support their participation in the Commission hearing process. As part of their PFP application submitted to the CNSC, MCFN indicated that they have no traditional or current land use or rights in the area; however, their reason for intervening in the Commission hearing process is to impress upon the Commission that the Project area in northwestern Saskatchewan is becoming an increasingly important area for traditional use of Indigenous peoples located in northeast Alberta, as the core traditional territories for many Indigenous Nations and communities in Alberta are under intense pressures from industrial development, including oil sands development.

CNSC staff are committed to engaging and sharing information with MCFN on the Project, as per MCFN's direction. CNSC staff will continue to engage and work collaboratively with MCFN

and NexGen and will provide an update on the status of engagement, as appropriate, as part of the supplemental submission to the Commission in advance of the NexGen Rook I Part-2 Commission hearing. CNSC staff encourage NexGen to continue discussions and collaboration with MCFN to address outstanding questions and concerns.

4.7.2 Background on Willow Lake Métis Nation

Figure 16: WLMN logo

Willow Lake Métis Nation has outlined their territory as having direct ancestral ties to the area located between Fort McMurray, Willow Lake and Portage La Loche, and includes areas south of Willow Lake including modern day Stony Mountain Wildland Park. Further historical reports and archival documents including the Royal Northwest Mounted Police patrol reports or fur trade post journals confirm the existence of the historical Métis community, as well as its connection to the present-day Willow Lake community.

Willow Lake Métis Nation initially contacted the CNSC via fax on May 9, 2025, expressing an interest in the Project and requesting that the CNSC and NexGen engage with them immediately to address their concerns and requests. CNSC staff had an initial meeting with WLMN on May 21, 2025. CNSC provided an overview of the proposed Project, its status and next steps for the regulatory review process. WLMN expressed concerns regarding potential downstream environmental impacts from the Project, given that Nation members have lived or currently live in the La Loche area. CNSC staff responded to all questions and concerns that were raised and offered to follow up with further discussions on any specific technical questions and concerns should that offer be of interest. CNSC staff also provided WLMN with a PFP application form, as WLMN expressed an interest in intervening in the Commission hearing for the Project. The CNSC requested that NexGen engage and follow up with WLMN to provide answers to WLMN's technical questions and concerns regarding the Project.

At the time of publishing this report WLMN filed a judicial review application on June 24th, 2025, with the Federal Court of Canada (file no. T-2177-25). The judicial review names the Minister of Crown Indigenous Relations and Norther Affairs Canada (CIRNAC), the Minister of Natural Resources Canada, NexGen Energy Ltd. (NexGen) and Paladin Energy Canada Ltd. (Paladin). The Applicant alleges that the Ministers ignored the Crown's duty to consult with WLMN regarding the proposed uranium mines in Northwest Saskatchewan. Among other things, WLMN is asking the court for an order directing the Ministers to consult, accommodate and negotiate with them as well as interim and permanent injunctions (stays of activity) to prevent the Ministers from causing or permitting the infringement of WLMN's rights, including approval of the proposed mines.

CNSC staff are committed to engaging and sharing information with WLMN on the Project, at the direction of WLMN. CNSC staff followed up with WLMN in early August by email to offer the Nation support to submit a written and/or oral intervention as part of the regulatory process for the Project. The support offered included the option to develop an understanding of potential impacts to WLMN if they shared historical evidence concerning their land use in the area of the Project. In early September 2025, CNSC staff met with WLMN to discuss a funding proposal submitted by WLMN to carry-out a work plan that helps build WLMN awareness and knowledge of CNSC processes and the nuclear sector. The funding will support WLMN's learnings of the CNSC through a presentation that CNSC staff will deliver to WLMN's leadership and steering committee in fall 2025 and support WLMN's submission to CNSC of their credible assertion documentation related to their land use in the Project area.

CNSC staff will continue to engage and work collaboratively with WLMN and NexGen and will provide an update on the status of engagement, as appropriate, as part of the supplemental submission to the Commission in advance of the NexGen Rook I Part-2 Commission hearing. CNSC staff encourage NexGen to continue discussions and collaboration with WLMN to address any outstanding questions and concerns.

5 NEXGEN'S ENGAGEMENT

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 that the discharge of the Duty to Consult, and where appropriate, accommodate, is fulfilled, the Commission will NexGen's engagement when determining whether consultation is adequate. The information NexGen collects, including measures NexGen proposes to avoid, mitigate, or offset potential adverse impacts from the Rook I Project are used to support the CNSC in meeting its consultation obligations.

CNSC staff have determined that REGDOC 3.2.2 was required for the Project. Since launching the regulatory review process in 2019, NexGen has submitted multiple versions and updates of their Indigenous engagement report to CNSC staff, covering the period between 2019 to 2024. CNSC staff have reviewed each version of the report, provided feedback, and held regular discussions and meetings with NexGen to assist in monitoring progress on NexGen's engagement activities, with the goal of meeting the requirements and expectations outlined in REGDOC 3.2.2.

CNSC staff note that NexGen 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 concerns raised to date. NexGen has offered capacity funding agreements to assist Indigenous Nations and communities in their engagement with NexGen, where appropriate. NexGen 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 Environmental Impact Statement (EIS) and technical documents submitted to the CNSC. CNSC staff recognize that NexGen has long-standing relationships and agreements with many of the identified Indigenous Nations and communities including CRDN, MN-S, BNDN and BRDN.

NexGen provides CNSC staff with regular updates regarding its engagement activities and has sought to include CNSC staff in its engagement activities, where appropriate, with the consent of participating Indigenous Nations or communities. CNSC staff acknowledge that Indigenous Nations and communities have raised concerns through NexGen's engagement process about the Rook I 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. NexGen continues to work and engage with these Indigenous Nations and communities to chart a path forward that includes proposed mitigations, accommodations, and commitments as part of the regulatory process for this Project.

NexGen has made commitments to identified Indigenous Nations and communities as part of the federal EA process. These commitments are included but not limited to the following topics, and range in scope depending on the identified Indigenous Nation:

- 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;
- Prioritization of Indigenous and non-Indigenous communities in the Local Study Area (LSA) for employment and training opportunities;
- Commitment to maintaining positive relationships with Indigenous Nations and communities; and
- Commitment to considering local and traditional knowledge in all facets of the Project.

Additional information on NexGen's and the CNSC's commitments will be included in the CNSC staff's supplemental submission to the Commission.

NexGen is working to support and maintain relationships with Indigenous Nations and communities, as well as to address items of concern relating to the Project. To date, NexGen has been responsive to questions, concerns, and comments and has met CNSC staff's expectations in terms of their approach and process for considering, responding to and addressing comments, questions and concerns raised by Indigenous Nations and communities, as well as providing updates to the CNSC. CNSC staff encourage NexGen to continue engagement and dialogue relating to the outstanding issues and concerns that Indigenous Nations and communities have raised, 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 of NexGen's engagement relating to the Rook I Project will be included as part of the supplemental submission prior to Part 2 of the Commission hearing.

6 ASSESSMENTS OF IMPACTS TO INDIGENOUS AND/OR TREATY RIGHTS

In support of the CNSC's consultation obligations and process for NexGen's Environmental Assessment (EA) and Licence to Prepare a Site and Construct Application, CNSC staff will complete RIAs in collaboration with 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, could be impacted by the Project directly. These Nations include CRDN, MN-S, BRDN and BNDN. All other identified Indigenous Nations and communities including ACFN, YNLR, WLMN and MCFN, have not shared specific information or data through NexGen's engagement nor CNSC staff's consultation activities and processes, identifying 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 resulting from 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 Indigenous 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 CRDN, MN-S, BNDN, BRDN, ACFN and YNLR on the proposed approach to assessing potential impacts on Indigenous and/or treaty rights in relation to the Project.

Through discussions and consultation with CRDN, MN-S, BNDN, and BRDN, 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 on the Project with the aim of assessing and identifying potential impacts and measures and commitments to address them to the greatest extent. No concerns were raised regarding this approach nor the proposed RIA framework by ACFN, YNLR, WLMN and MCFN.

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 Commission hearing.

7 CONCLUSION AND NEXT STEPS

CNSC staff have aimed to conduct a thorough, transparent, flexible and collaborative consultation and regulatory process for NexGen's Rook I 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 by 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 develop sections of the Consultation Report and issues tracking tables collaboratively.

CNSC staff will continue to monitor and assess NexGen's engagement activities throughout the regulatory review process, as per REGDOC 3.2.2. CNSC staff's conclusions and assessment

related to NexGen's engagement on the Project will be included in the supplemental submissions prior to the Part 2 hearing.

Additionally, CNSC staff continue to work collaboratively with CRDN, MN-S, BNDN and BRDN on Nation-specific RIAs for the Project. The completed assessments will include CNSC staff and Indigenous Nations' 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 regarding the adequacy of consultation and engagement for the Project. This information will be provided as part of the supplemental submission prior to the Part 2 Commission hearing.

In addition, CNSC staff continue to work, consult, and engage with all identified Indigenous Nations and communities to understand, assess, and address all outstanding concerns regarding the Project and regulatory process to date. CNSC staff will provide further updates on CNSC staff's ongoing consultation and engagement efforts in a supplemental report to the Commission as part of the Part 2 Commission hearing process. CNSC staff's final assessment, conclusions, and recommendations regarding the adequacy of consultation will be summarized in the supplemental report and include any feedback and perspectives shared by Indigenous Nations in their submissions to the Commission, as well as any additional information shared with CNSC staff.

REFERENCES

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[3] CNSC, "Indigenous Consultation Report: NexGen Rook I Environmental Assessment and Licence to Prepare a Site and Construct Application".

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[14] The United Nations, " United Nations Declaration on the Rights of Indigenous Peoples," September 2007.

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APPENDIX A: Issues Tracking Tables

A.1 Issues Tracking Table for Clearwater River Dene Nation (CRDN) with respect to the NexGen Rook I Project **To be posted following CRDN's review*

ID	Issue or concern (including impacts to Indigenous and/or Treaty Rights)	Theme	Crown response	Status of issue/concern

A.2 Issues Tracking Table for Ya' Thi Néné Lands and Resources (YNLR) with respect to the NexGen Rook I Project **To be posted following YNLRO's review*

ID	Issue or concern (including impacts to Indigenous and/or Treaty Rights)	Theme	Crown response	Status of issue/concern

A.3 Issues Tracking Table for Métis Nation- Saskatchewan (MN-S) with respect to the NexGen Rook I Project **To be posted following MN-S' review*

ID	Issue or concern (including impacts to Indigenous and/or Treaty Rights)	Theme	Crown response	Status of issue/concern

A.4 Issues Tracking Table for Birch Narrows Dene Nation (BNDN) with respect to the NexGen Rook I Project

ID	Issue or concern (including impacts to Indigenous and/or Treaty Rights)	Theme	Crown response	Status of issue/concern
BNDN01	**Contamination and Health of Wildlife** BNDN members have concerns about the decline in health of animals harvested by BNDN members, including potential impacts from radon emissions on food sources, wildlife and water. BNDN members have concerns about increased incidences of diseased or unhealthy fish that may arise due to Project activities. BNDN has concerns about potential Project impacts on Patterson Lake water quality and connected waterways. BNDN members have concerns about the stability and safety of tailings stored in the UGTMF as well as from acid rock drainage and sulfur dioxide emissions, potentially impacting Patterson Lake.	Terrestrial environment/ aquatic environment/ terrestrial biota/ cumulative effects/ fish and fish habitat	The CNSC regulates nuclear facilities throughout their entire lifecycle and CNSC staff perform various compliance activities to ensure the facilities are operating in ways that are safe for the environment and human health. CNSC staff are committed to engaging and collaborating with BNDN on monitoring, oversight, reporting, and follow-up activities throughout the Project's full lifecycle. The CNSC requires that both preliminary decommissioning plans and financial guarantees are in place for nuclear facilities, to ensure that decommissioning and waste management commitments and obligations are met by the licensee, including	CNSC staff's view is that this concern has and will continue to be addressed through the responses and commitments of NexGen and CNSC staff to the extent possible within the CNSC's mandate and regulatory requirements.

	Effluent Treatment BNDN notes that the proposed effluent guidelines are not as stringent as elsewhere in Canada and that members prefer effluent water quality objectives that are achieved at the point of release, without relying upon a mixing zone. BNDN has concerns about cobalt and copper level increases from the Project and requests an assessment of alternatives to address the long-term loading of cobalt and copper into Patterson Lake. **Long-term Impacts** BNDN members are concerned about the permanent impairment of Patterson Lake affecting fish health and water quality, as Patterson Lake and lakes in the surrounding area have low buffering capacities against acid generation and sulfur dioxide emissions from Alberta oil sands.		the safe handling and storage of all radioactive materials. NexGen has assessed the stability and safety of the UGTMF, as well as the potential environmental effects of the UGTMF and the PAG WMA during the environmental assessment and the Rook-I licensing for site preparation and construction, with mitigation measures proposed. The CNSC acknowledges BNDN's concerns regarding the potential for impacts on the aquatic environment, including on groundwater and water quality. NexGen is developing an adaptive management plan to further mitigate effects associated with tailings storage. CNSC staff are proposing a Project-specific license condition requiring NexGen to report progress on engagement and implementation of commitments to Nations, including BNDN, annually. CNSC staff remain committed to engaging and	

			collaborating with BNDN on follow-up and monitoring activities on this topic and other topics of concern, in relation to topics that are within the CNSC's mandate and authorities, should the Project be approved.	
BNDN02	**Access to Hunting and Fishing Areas** BNDN has expressed concerns about more non-Indigenous recreational users impeding access. BNDN has concerns about increased traffic impeding access. BNDN has concerns about impacts to fishing area access. BNDN has concerns about loss of access to cabins, campsites, and travel routes due to Project gating and security measures. BNDN has concerns about potentially losing access to land on lease areas, especially Patterson Lake. BNDN has concerns about the exclusion of land users and interested individuals from communities farther from the Project.	Indigenous land and resource use	CNSC staff are of the view that BNDN's concerns relating to long-term impacts have and will continue to be addressed through the responses and commitments of NexGen and CNSC staff. NexGen has included Indigenous land and resource use and cumulative effects assessments within their final EIS that consider impacts on numerous VCs. NexGen has also committed to ongoing engagement with interested Indigenous Nations and communities throughout the Project lifecycle, to ensure any issues or concerns are discussed and addressed as feasible. CNSC staff are committed to building a meaningful and trusting relationship with BNDN, collaborating with the Nation to address the Nation's issues and	CNSC staff's view is that this concern has and will continue to be addressed through the responses and commitments of NexGen and CNSC staff to the extent possible within the CNSC's mandate and regulatory requirements.

	BNDN has concerns about increased competition with non-Indigenous recreational land users.		concerns. This means engaging and working with BNDN on monitoring, oversight, reporting, and follow-up activities throughout the Project's full lifecycle.	
BNDN03	**Cultural Disruption** BNDN members predict a disrupted sense of place due to traffic, human activity, garbage and changes to landscape features. These potential impacts will disrupt cultural practices and the ability to transmit cultural knowledge to future generations. BNDN has concerns that these impacts will be long-lasting and will result in impacts to land users.	Human environment/ Indigenous land and resource use/ Indigenous knowledge	NexGen has committed to ongoing engagement with interested Indigenous Nations and communities throughout the lifecycle of the project, to ensure any issues or concerns are discussed and addressed as feasible. The effectiveness of the commitments that NexGen implements will be evaluated through oversight of NexGen's environmental assessment follow-up and monitoring program. The CNSC expects NexGen to continue to work collaboratively with BNDN to address access issues and concerns and to minimize disruptions on traditional practices and land use.	CNSC staff's view is that this concern has and will continue to be addressed through the responses and commitments of NexGen and CNSC staff to the extent possible within the CNSC's mandate and regulatory requirements.
BNDN04	**Human Health** BNDN members have concerns about the contamination of water courses, food	Human health/ groundwater/ terrestrial environment	The CNSC regulates nuclear facilities across their entire lifecycles and CNSC staff perform various compliance	CNSC staff's view is that this concern has and will continue to be addressed through the responses and

	plants and medicines and that contamination will lead to increased human health risks and result in avoidance behaviors for community members.		activities to ensure the facilities are operating in ways that are safe for the environment and human health and mitigating risks of accidents and malfunctions. The CNSC is committed to ensuring that Indigenous communities, including BNDN, are meaningfully involved in environmental oversight for the proposed Project, if it is approved, and recognizes the importance of community health and wellbeing. NexGen has committed to community-level engagement and support, and the CNSC expects NexGen to continue working with BNDN to identify and address health and well-being concerns throughout the facility lifecycle. NexGen has included assessments of the human environment and cumulative effects within their final EIS that consider impacts on physical and emotional health.	commitments of NexGen and CNSC staff to the extent possible within the CNSC's mandate and regulatory requirements.

			The CNSC reviews public health reports from relevant Northern Saskatchewan health authorities and conducts health studies of uranium workers to provide further independent verification that the health of people living near the uranium mines and mills is protected. Based on current environmental levels of radiation exposures near the uranium mines and mills, the current scientific knowledge about the sources, effects, and risks of ionizing radiation, and relevant local and provincial health information, CNSC staff have not observed and do not expect to observe any adverse health outcomes related to the environmental radiation exposures from the uranium mines and mills. CNSC staff remain committed to engaging and collaborating with BNDN on follow-up and monitoring activities on this topic and other topics of concern, in relation to topics that are within the CNSC's mandate and	

			authorities, should this Project be approved.	
BNDN05	**Economic and Social Impacts** BNDN members perceive a need to balance business, employment and training opportunities among communities and Indigenous Groups. BNDN requests a Socio-Economic Monitoring Plan to verify effects assessments and adaptive management. A Socio-Economic Monitoring Plan could help monitor issues such as substance abuse that may arise from residents' increased incomes from the Project.	Socio-economic considerations	The CNSC acknowledges BNDN's concerns about economic inclusion and is satisfied that NexGen's commitments to address these concerns. NexGen has committed to continued discussions with Indigenous groups regarding potential Project benefits, such as education, training, employment and contract opportunities through IBAs. NexGen has also committed to discussing specific employment policies with the Implementation Committee and socio-economic management plan developed with the Environmental Committee, as agreed upon in the IBA with BNDN. CNSC staff encourage BNDN to continue working with NexGen to address potential socio-economic impacts and opportunities for BNDN. CNSC staff are proposing a Project-specific license condition requiring NexGen to report	CNSC staff's view is that this concern has and will continue to be addressed through the responses and commitments of NexGen and CNSC staff to the extent possible within the CNSC's mandate and regulatory requirements.

			progress on engagement and implementation of commitments to Nations, including BNDN, annually, as feasible. CNSC staff remain committed to engaging and collaborating with BNDN on follow-up and monitoring activities on this topic and other topics of concern, in relation to topics that are within the CNSC's mandate and authorities, should this Project be approved.	
BNDN06	**Effluent Treatment Objectives** BNDN requests regular revisions of effluent quality objectives for the adaptive management resulting from effluent release monitoring.	Aquatic environment / environmental monitoring	NexGen has confirmed that Project effluent quality objectives will be set during licensing and will be derived to be protective of humans and the environment. Any required revisions will be determined based on monitoring results and managed through adaptive management. CNSC staff have reviewed NexGen's effluent monitoring plan and are satisfied that the proposed mitigation measures are protective of the environment and human health, and that the proposed Project was determined to have no significant adverse effects to surface water and	CNSC staff's view is that this concern has and will continue to be addressed through the responses and commitments of NexGen and CNSC staff to the extent possible within the CNSC's mandate and regulatory requirements.

			groundwater. CNSC staff remain committed to engaging and collaborating with BNDN on follow-up and monitoring activities on this topic and other topics of concern, in relation to topics that are within the CNSC's mandate and authorities, should this Project be approved.	
BNDN07	**Cumulative Effects** BNDN has concerns related to cumulative effects on BNDN Territory from multiple industrial projects. This includes impacts from past/proposed mining activities, forestry, transmission lines, roads, wildfires, acidic precipitation from the Alberta oil sands, etc. In particular, BNDN is concerned about cumulative effects on Patterson Lake and downstream environment from impacts related to NexGen Rook 1 Project and Fission Uranium Corp. Patterson Lake South Project.	Cumulative effects	NexGen has included a cumulative effects assessment within their final EIS that considers impacts on numerous VCs, including on ecosystems and Indigenous land and resource use. NexGen has also committed to ongoing engagement with interested Indigenous Nations and communities throughout the Project lifecycle, to ensure any issues or concerns are discussed and addressed as feasible. CNSC staff are committed to building a meaningful and trusting relationship with BNDN, collaborating with the Nation to address the Nation's issues and concerns. This means engaging and working with BNDN on monitoring, oversight, reporting, and follow-up activities	CNSC staff's view is that this concern has and will continue to be addressed through the responses and commitments of NexGen and CNSC staff to the extent possible within the CNSC's mandate and regulatory requirements.

			throughout the Project's full lifecycle.	
BNDN08	**Requests for Action** BNDN requests explicit written consent from BNDN for final permitted effluent quality objectives and that NexGen receive BNDN's consent for their surface water quality monitoring program. BNDN requests ongoing engagement and communication, including presentations to the community on groundwater changes from baseline conditions. BNDN requests sufficient closure bonding for tailings disposal, including allocating funding for ongoing monitoring of water and fish quality in Patterson Lake. BNDN requests the mitigation and accommodation of impacts to BNDN's Treaty and Aboriginal rights. BNDN requests that NexGen develop a wild food monitoring program in collaboration with local First Nation involvement.	Aquatic environment/ Indigenous consultation/ Treaty and Aboriginal rights	The requirements in REGDOC-2.9.2 (CNSC 2025) will be applied to the licensing activities for the Project. This requires NexGen to derive and implement effluent quality objectives that are protective of the environment and based on regulatory requirements concerning effluent discharge. NexGen has committed to limiting the Project footprint as feasible, including mitigation and accommodation of the impacts to BNDN Treaty and Aboriginal rights. NexGen has committed to further engagement with BNDN and CNSC staff remain committed to engaging and collaborating with BNDN on follow-up and monitoring activities on this topic and other topics of concern, in relation to topics that are within the CNSC's mandate and authorities, should this Project be approved.	CNSC staff's view is that this concern has and will continue to be addressed through the responses and commitments of NexGen and CNSC staff to the extent possible within the CNSC's mandate and regulatory requirements.

	BNDN requests that CNSC, working in collaboration with Indigenous communities and Proponents take reasonable steps to develop and implement a Regional Monitoring Program for Patterson Lake and downstream region.			

A.5 Issues Tracking Table for Buffalo River Dene Nation (BRDN) with respect to the NexGen Rook I Project

ID	Issue or concern (including impacts to Indigenous and/or Treaty Rights)	Theme	Crown response	Status of issue/concern
BRDN01	**Water Quality** BRDN is concerned about the project effects on water quality, especially Patterson Lake, which could lead to the contamination of aquatic resources such as fish and fish habitat. These potential impacts could lead land users to alter their behaviour by impacting subsistence and commercial fishing activities. **Wildlife and Food Security** BRDN members have concerns about Project effects on wildlife health and potential impacts to human health from consuming wildlife, as well as the safety and ability to harvest country foods, which has implications for food security and community well-being.	Aquatic environment / terrestrial biota/ human health	NexGen has initiated a Traditional Food Study and committed to further developing monitoring programs during licensing. NexGen has committed to avoiding disruption of critical fish habitats and implementing Project-specific Groundwater, Effluent, and Environmental Monitoring Plans. CNSC staff will ensure NexGen is meeting their commitments through oversight of NexGen's environmental assessment follow-up and monitoring programs. CNSC staff are proposing a Project-specific license condition requiring NexGen to report progress on engagement and implementation of commitments to Nations, including BRDN, annually. CNSC staff remain committed to engaging and collaborating with BRDN on follow-up and	CNSC staff's view is that this concern has and will continue to be addressed through the responses and commitments of NexGen and CNSC staff to the extent possible within the CNSC's mandate and regulatory requirements. BRDN has indicated that their concerns have been addressed and have provided their support for the Project to proceed.

			monitoring activities on this topic and other topics of concern, in relation to topics that are within the CNSC's mandate and authorities, should this Project be approved.	
BRDN02	**Human Health** BRDN is concerned about cumulative effects from industry, such as the potential exposure to mine radiation exhaust and related safety factors and their potential impacts on community members' health. **Transportation Safety** BRDN members have concerns about the safety of truck transportation, including the number of trucks on the road and whether activities, such as spill response, will be carried out safely.	Human health/ cumulative effects	The CNSC regulates nuclear facilities across their entire lifecycles and CNSC staff perform various compliance activities to ensure the facilities are operating ways that are safe for the environment and human health and mitigating risks of accidents and malfunctions. The CNSC is committed to ensuring that Indigenous communities, including BRDN, are meaningfully involved in environmental oversight for the proposed Project, if it is approved, and recognizes the importance of community health and wellbeing. NexGen has committed to community-level engagement and support, and the CNSC expects NexGen to continue working with BRDN to identify and address health and well-	CNSC staff's view is that this concern has and will continue to be addressed through the responses and commitments of NexGen and CNSC staff to the extent possible within the CNSC's mandate and regulatory requirements. BRDN has indicated that their concerns have been addressed and have provided their support for the Project to proceed.

			being concerns throughout the facility lifecycle. NexGen has included assessments of the human environment and cumulative effects within their final EIS that consider impacts on physical and emotional health. The CNSC reviews public health reports from relevant Northern Saskatchewan health authorities and conducts health studies of uranium workers to provide further independent verification that the health of people living near the uranium mines and mills is protected. Based on current environmental levels of radiation exposures near the uranium mines and mills, the current scientific knowledge about the sources, effects, and risks of ionizing radiation, and relevant local and provincial health information, CNSC staff have not observed and do not expect to observe any adverse health outcomes related to the environmental radiation exposures from the uranium mines and mills.	

			NexGen has assessed transportation-related risks within the final EIS and committed to mitigation measures, including adjusting speed limits, discussing a road upgrade and maintenance plan for Highway 955 with the Saskatchewan Ministry of Highways, driver training, and issuances of no-travel orders in unsafe conditions. CNSC staff remain committed to engaging and collaborating with BRDN on environmental assessment follow-up and monitoring activities on this topic and other topics of concern, in relation to topics that are within the CNSC's mandate and authorities, should this Project be approved.	
BRDN03	**Traditional Knowledge and Land Access** BRDN has concerns that the Project will limit access to lands and resources, affecting the transmission of traditional knowledge among community members. An increase in the number of projects will lead to cumulative access	Indigenous knowledge/ indigenous land and resource use/ socio-economic considerations	CNSC staff are of the view that BRDN's concerns relating to long-term impacts have and will continue to be addressed through the responses and commitments of NexGen and CNSC staff. NexGen has included Indigenous land and resource use and cumulative effects assessments within their final EIS that	CNSC staff's view is that this concern has and will continue to be addressed through the responses and commitments of NexGen and CNSC staff to the extent possible within the CNSC's mandate and regulatory requirements. BRDN has indicated that

	restrictions for members within BRDN traditional territory. **Social Issues** BRDN has concerns that the Project could increase social or family issues, due to an influx of workers/capital (gambling, drinking, substance abuse, family violence).		consider impacts on numerous VCs. NexGen has also committed to ongoing engagement with interested Indigenous Nations and communities throughout the Project lifecycle, to ensure any issues or concerns are discussed and addressed as feasible. NexGen has committed to working with local Indigenous Groups to implement independent environmental monitoring, in addition to standard Project monitoring processes. The independent Indigenous monitoring program is intended to provide unfettered access to the site during all Project phases and allow for opportunities such as independent environmental sampling. The effectiveness of the commitments that NexGen implements will be evaluated through oversight of NexGen's environmental assessment follow-up and monitoring program. The CNSC expects	their concerns have been addressed and have provided their support for the Project to proceed.

			NexGen to continue working collaboratively with BRDN to address access issues and concerns and to minimize disruptions on traditional practices and land use. CNSC staff are proposing a Project-specific license condition requiring NexGen to report progress on engagement and implementation of commitments to Nations, including BRDN, annually.	
BRDN04	**Traffic and Dust** BRDN members have concerns about increased traffic related to the Project and potential impacts on road conditions, including dust and noise. Increases in dust and noise could negatively impact wildlife and land users.	Atmospheric environment	NexGen has acknowledged that maintenance of Highway 955 is outside of NexGen's control but has committed to discussions with the Saskatchewan Ministry of Highways to develop a road upgrade and maintenance agreement to minimize noise and dust. CNSC staff are of the view that BRDN's concerns relating to adverse impacts of increased traffic will continue to be addressed through NexGen's responses and commitments. The effectiveness of the commitments that NexGen implements will be evaluated	CNSC staff's view is that this concern has and will continue to be addressed through the responses and commitments of NexGen and CNSC staff to the extent possible within the CNSC's mandate and regulatory requirements. BRDN has indicated that their concerns have been addressed and have provided their support for the Project to proceed.

			through oversight of NexGen's environmental assessment follow-up and monitoring program. CNSC staff are proposing a Project-specific license condition requiring NexGen to report progress on engagement and implementation of commitments to Nations, including BRDN, annually. The effectiveness of the commitments that NexGen implements will be evaluated through oversight of NexGen's environmental assessment follow-up and monitoring program, relation to topics that are within the CNSC's mandate and authorities.	
BRDN05	**Environmental Monitoring** BRDN members want to ensure there is adequate environmental monitoring for the Project.	Environmental monitoring	CNSC staff will ensure NexGen's incident response plans are robust and that they are meeting their commitments through oversight of NexGen's environmental assessment follow-up and monitoring program. NexGen will also have to meet the requirements in their licence conditions handbook throughout the applicable licensing phase.	CNSC staff's view is that this concern has and will continue to be addressed through the responses and commitments of NexGen and CNSC staff to the extent possible within the CNSC's mandate and regulatory requirements. BRDN has indicated that their concerns have been addressed and have

			NexGen has committed to working with local Indigenous Groups, including BRDN, to implement independent environmental monitoring, in addition to standard Project monitoring processes. The independent Indigenous monitoring program is intended to provide unfettered access to the site during all Project phases and allow for opportunities, such as independent environmental sampling. Further, NexGen has committed to engaging directly with Indigenous Groups, including BRDN, throughout the Project lifespan through either the Environmental Committees or Benefit Agreements Signed with primary Indigenous Groups. CNSC staff will ensure NexGen is meeting their commitments through oversight of NexGen's environmental assessment follow-up and monitoring program. CNSC staff are proposing a Project-specific license condition requiring NexGen to report progress on engagement and implementation	provided their support for the Project to proceed.

			of commitments to Nations, including BRDN, annually. CNSC staff are committed to building a meaningful and trusting relationship with BRDN, collaborating with the Nation to address the Nation's issues and concerns. This means engaging and working with BRDN on monitoring, oversight, reporting, and follow-up activities throughout the Project's full lifecycle, should the Project be approved.	
BRDN06	**Competition and Recreational Land Use** BRDN members have concerns about increased competition with non-Indigenous recreational land-users due to development and industrial activity.	Indigenous land and resource use/ socio-economic considerations	NexGen has included Indigenous land and resource use and cumulative effects assessments in their final EIS that consider impacts on numerous VCs. NexGen has also committed to ongoing engagement with interested Indigenous Nations and communities throughout the Project lifecycle, to ensure any issues or concerns are discussed and addressed as feasible. The effectiveness of the commitments that NexGen implements will be evaluated through oversight of NexGen's environmental assessment	CNSC staff's view is that this concern has and will continue to be addressed through the responses and commitments of NexGen and CNSC staff to the extent possible within the CNSC's mandate and regulatory requirements. BRDN has indicated that their concerns have been addressed and have provided their support for the Project to proceed.

			follow-up and monitoring program. CNSC staff are proposing a Project-specific license condition requiring NexGen to report progress on engagement and implementation of commitments to Nations, including BRDN, annually. CNSC staff are committed to building a meaningful and trusting relationship with BRDN, collaborating with the Nation to address the Nation's issues and concerns. This means engaging and working with BRDN on monitoring, oversight, reporting, and follow-up activities throughout the Project's full lifecycle, should the Project be approved.	

A.6 Issues Tracking Table for Athabasca Chipewyan First Nation (ACFN) with respect to the NexGen Rook I Project

ID	Issue or concern (including impacts to Indigenous and/or Treaty Rights)	Theme	Crown response	Status of issue/concern
ACFN01	**Potential Environmental Impacts**	Aquatic environment/ fish and fish habitat/	NexGen has considered impacts to the aquatic environment, fish and fish habitat and terrestrial	CNSC staff's view is that this concern has and will continue to be addressed

	ACFN members have serious concerns about water quality, fish habitat, wildlife and overall environmental health that could be impacted as a result of the Project	terrestrial biota/ cumulative effects	biota, as well as cumulative effects in the Final EIS. NexGen has committed to a range of mitigation measures to minimize adverse impacts to VCs and will continue to engage with ACFN throughout the lifecycle of the proposed Project to address potential environmental impacts that may arise. CNSC staff remain committed to engaging and collaborating with ACFN on follow-up and monitoring activities on this topic and other topics of concern, in relation to topics that are within the CNSC's mandate and authorities, should this Project be approved.	through the responses and commitments of NexGen and CNSC staff to the extent possible within the CNSC's mandate and regulatory requirements.
ACFN02	**Infringement of Rights** ACFN is concerned that the project will infringe on their ability to practice rights that are guaranteed by Section 35 of the Constitution Act, 1982.	Treaty and Aboriginal Rights	The CNSC ensures that all environmental assessments and licensing decisions uphold the honour of the Crown and Indigenous peoples' potential or established Indigenous and/or Treaty Rights, pursuant to Section 35 of the *Constitution Act,* 1982. CNSC staff are proposing a Project-specific license condition requiring NexGen to report progress on	CNSC staff's view is that this concern has and will continue to be addressed through the responses and commitments of NexGen and CNSC staff to the extent possible within the CNSC's mandate and regulatory requirements.

			engagement and implementation of commitments to Nations, including ACFN, annually.	
ACFN03	**Duty to Consult** Canada and Saskatchewan have a constitutional duty to consult with First Nations, which has not yet occurred. **Consultation Costs** ACFN requires funding for consultation and engagement meetings.	Indigenous consultation	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) 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. CNSC staff work in collaboration and consultation with potentially impacted Indigenous Nations and communities, including ACFN, to assess potential impacts on rights and propose	CNSC staff's view is that this concern has and will continue to be addressed through the responses and commitments of NexGen and CNSC staff to the extent possible within the CNSC's mandate and regulatory requirements.

			mitigation or accommodation measures to address identified impacts. The CNSC will ensure that the honour of the Crown is upheld and that ACFN's rights are respected. NexGen's approach to engagement is not intended to replace the Crown's duty to consult and accommodate with respect to the Project, though it is recognized that engagement conducted by NexGen may be used to inform the Crown's consultation process, including the assessment of impacts to Aboriginal and Treaty rights. The overall engagement process remains focused on enabling dialogue with Indigenous Nations and communities that could potentially be affected by the proposed Project and to meaningfully address identified issues and concerns. CNSC staff are committed to building a meaningful and trusting relationship with ACFN, collaborating with the Nation to address the Nation's issues and concerns. This means engaging	

			and working with ACFN on monitoring, oversight, reporting, and follow-up activities throughout the Project's full lifecycle.	
ACFN04	**Traditional Land Use** ACFN members use the land for traditional practices actively and have concerns about the cumulative effects of Project development on their traditional lands. The land is integral to ACFN's culture, identity and spirituality.	Indigenous land and resource use	NexGen has included Indigenous land and resource use and cumulative effects assessments within their final EIS that consider impacts to numerous VCs. NexGen has committed to limiting the Project footprint to as feasible, as well as ongoing engagement with interested Indigenous Nations and communities throughout the Project lifecycle, to ensure any issues or concerns are discussed and addressed as feasible. The effectiveness of the commitments that NexGen implements will be evaluated through oversight of NexGen's environmental assessment follow-up and monitoring program. CNSC staff are committed to building a meaningful and trusting relationship with ACFN, collaborating with the Nation to address the Nation's issues and	CNSC staff's view is that this concern has and will continue to be addressed through the responses and commitments of NexGen and CNSC staff to the extent possible within the CNSC's mandate and regulatory requirements.

			concerns. This means engaging and working with ACFN on monitoring, oversight, reporting and follow-up activities throughout the Project's full lifecycle.	
ACFN05	**Cultural Continuation** The land is essential for teaching cultural knowledge and language and ACFN has raised concerns that transfer of cultural knowledge will be adversely impacted by the Project. **Youth Education** ACFN has concerns that if traditional practices aren't continued, Dene culture and language could be lost.	Indigenous knowledge	NexGen has included Indigenous land and resource use, and cumulative effects assessments within their final EIS that consider impacts to numerous VCs. NexGen has also committed to ongoing engagement with interested Indigenous Nations and communities throughout the Project lifecycle, to ensure any issues or concerns are discussed and addressed as feasible. The effectiveness of the commitments that NexGen implements will be evaluated through oversight of NexGen's environmental assessment follow-up and monitoring program. CNSC staff are proposing a Project-specific license condition requiring NexGen to report progress on engagement and implementation of commitments to Nations,	CNSC staff's view is that this concern has and will continue to be addressed through the responses and commitments of NexGen and CNSC staff to the extent possible within the CNSC's mandate and regulatory requirements.

			including ACFN, annually. The CNSC expects NexGen to continue to work collaboratively with ACFN to address access issues and concerns and to minimize disruptions on traditional practices and land use. The effectiveness of the commitments that NexGen implements will be evaluated through oversight of NexGen's environmental assessment follow-up and monitoring program. CNSC staff are committed to building a meaningful and trusting relationship with ACFN, collaborating with the Nation to address the Nation's issues and concerns. This means engaging and working with ACFN on monitoring, oversight, reporting, and follow-up activities throughout the Project's full lifecycle.	
ACFN06	**Regulatory and Legal Concerns** ACFN submits that the project should not be approved at this time, due to unaddressed impacts on their rights.	Indigenous rights	The CNSC regulates nuclear facilities across their entire lifecycles and CNSC staff perform various compliance activities to ensure the facilities are operating in ways that are safe for the environment and	CNSC staff's view is that this concern has and will continue to be addressed through the responses and commitments of NexGen and CNSC staff to the extent possible within the

			human health, while conducting Indigenous engagement throughout the facilities' lifecycles. The CNSC ensures that all environmental assessments and licensing decisions uphold the honour of the Crown and Indigenous peoples' potential or established Indigenous and/or Treaty Rights, pursuant to Section 35 of the *Constitution Act,* 1982. CNSC staff are proposing a Project-specific license condition requiring NexGen to report progress on engagement and implementation of commitments to Nations, including ACFN, annually. The effectiveness of the commitments that NexGen implements will be evaluated through oversight of NexGen's environmental assessment follow-up and monitoring program. CNSC staff are committed to building a meaningful and trusting relationship with ACFN, collaborating with the Nation to	CNSC's mandate and regulatory requirements.

			address the Nation's issues and concerns. This means engaging and working with ACFN on monitoring, oversight, reporting and follow-up activities throughout the Project's full lifecycle, should the Project be approved.	
ACFN07	**Mitigation Measures** ACFN requests that NexGen adopt strategies, including proposed mitigation measures, to address their concerns regarding their rights and environmental impacts.		The CNSC is committed to ensuring that Indigenous communities, including ACFN, are meaningfully involved in environmental oversight for the proposed Project if it is approved. CNSC staff have determined that NexGen has demonstrated a commitment to working with identified Indigenous Nations and communities throughout the Project lifecycle, including establishing working relationships and developing engagement work plans. NexGen has also committed to sharing information on environmental monitoring plans with identified Indigenous Nations and communities as they develop them, engaging with Indigenous Nations on mitigation measures	CNSC staff's view is that this concern has and will continue to be addressed through the responses and commitments of NexGen and CNSC staff to the extent possible within the CNSC's mandate and regulatory requirements.

			and encouraging independent Indigenous monitoring programs. The CNSC ensures that all environmental assessment and licensing decision uphold the honour of the Crown and uphold Indigenous peoples' potential or established Indigenous and/or Treaty Rights, pursuant to Section 35 of the *Constitution Act*, 1982. If the proposed project is accepted. CNSC staff are proposing a Project-specific license condition requiring NexGen to report progress on engagement and implementation of commitments to Nations, including ACFN, annually. CNSC staff remain committed to engaging and collaborating with ACFN on follow-up and monitoring activities on this topic and other topics of concern, in relation to topics that are within the CNSC's mandate and authorities, should the Project be approved.	

APPENDIX B: KEY CORRESPONDENCE WITH INDIGENOUS NATIONS AND COMMUNITIES REGARDING THE NEXGEN ROOK I PROJECT **To be part of a supplemental filing prior to the Part 1 hearing*

B.1 General Correspondence with Indigenous Nations and communities

B.2 Key correspondence with Clearwater River Dene Nation

B.3 Key correspondence with Métis Nation-Saskatchewan

B.4 Key correspondence with Buffalo River Dene Nation

B.5 Key correspondence with Birch Narrows Dene Nation

B.6 Key correspondence with Athabasca Chipewyan First Nation

B.7 Key correspondence with Ya’thi Néné Lands and Resources Office

B.8 Key correspondence with Mikisew Cree First Nation

B.9 Key correspondence with Willow Lake Métis Nation

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 the CMD are listed below.

Acronym	Term
ACFN	Athabasca Chipewyan First Nation
ALARA	As Low as Reasonably Achievable
BATEA	Best Available Technology Economically Achievable
BLFN	Black Lake First Nation
BNDN	Birch Narrows Dene Nation
BRDN	Buffalo River Dene Nation
CEAA	Canadian Environmental Assessment Act
CMD	Commission Member Document
CNSC	Canadian Nuclear Safety Commission
CR	Consultation Report
CRDN	Clearwater River Dene Nation
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
FDLDFN	Fond du Lac Denesuline 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 Polyethylene
HHRA	Human Health Risk Assessment

HLFN	Hatchet Lake First Nation
HMI	Human-Machine Interface
IAA	Impact Assessment Act
IAEA	International Atomic Energy Agency
ISR	In-Situ Recovery
IWWTP	Industrial Wastewater Treatment Plant
JHA	Job Hazard Analysis
KML	Kineepik Métis Local
LCH	Licence Condition Handbook
LLRD	Long-Lived Radioactive Dust
LTC	License to Construct
LTI	Loss-Time Injury
LTPS	Licence to Prepare a Site application
MCFN	Mikisew Cree First Nation
MDMER	Metal and Diamond Mining Effluent Regulations
MN-S	Métis Nation – Saskatchewan
MN-S NRI	Métis Nation – Saskatchewan Northern Region I
MN-S NRII	Métis Nation-Saskatchewan Northern Region II

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
WLMN	Willow Lake Métis Nation
YNLR	Ya'thi Néné Lands and Resources

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.

D1: Environmental Assessment Conditions

Condition Number	EA Condition	Closure Criteria Requirements	Timeline Required By
EA1	The licensee shall collect and submit additional wetlands water level and water quality baseline data to verify conclusions of EIS of no impacts to wetlands.	Water quality samples will be collected from shallow standpipes within, as well as from groundwater piezometers upgradient of, the wetlands. This data can be submitted as part of the ERA documentation or submitted as an EPP supporting document. In this submission, NexGen is expected to: • Provide the methodology for water level and quality baseline data collection in wetlands • Demonstrate how the methodology ensures that wetland baseline data captures within-year (i.e., wet season and dry season) and between-year variation • Add wetland monitoring into their EMP to ensure wetland data is continued to be collected to assess potential effects due to the project. Wetland data will be reviewed and reported to the CNSC annually.	Prior to the commencement of site preparation activities

Condition Number	EA Condition	Closure Criteria Requirements	Timeline Required By
		Additionally, a five-year review of the data and trends shall be assessed as part of the Environmental Performance Report, which will also assess the need for additional mitigation measures or continued monitoring	
EA2	The licensee shall submit a revised woodland caribou mitigation and offset plan that utilizes 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	Prior to the commencement of site preparation activities

Condition Number	EA Condition	Closure Criteria Requirements	Timeline Required By
		• 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	
		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 revised 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.	Prior to the commencement of site preparation activities

Condition Number	EA Condition	Closure Criteria Requirements	Timeline Required By
EA3	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.

Condition Number	EA Condition	Closure Criteria Requirements	Timeline Required By

		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

Condition Number	EA Condition	Closure Criteria Requirements	Timeline Required By
EP-01	The licensee shall complete and provide a finalized Best Available Technology Economically Achievable (BATEA) assessment for the temporary effluent treatment plant.	Review and acceptance by a person authorized by the Commission of a final version of the BATEA that includes the proposed: • Environmental release targets • Maximum predicted design release characteristics	Ninety days prior to commencement of site preparation activities.
PD-01	The licensee shall provide detailed design for the mill as further detailed information is available.	Review and acceptance 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-02	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 elements (e.g. sulfate, chloride, etc.) and harsh environments (e.g. frozen ground), integration into the overall design (e.g. impacts of shrinkage, hydration heat, potential Delayed Ettringite Formation, corrosion of reinforcement, potential associated cracking, including at early-age, etc.), and QA/QC.	Review and acceptance by a person authorized by the Commission of the detailed requirements for all cementitious-based materials to be used for the project, which shall incorporate the elements listed in the column “Description of Requirement”.	Ninety days prior to commencing the construction activities

Condition Number	EA Condition	Closure Criteria Requirements	Timeline Required By
PD-03	The licensee shall provide detailed designs for the surface water management infrastructure, Potentially Acid Generating (PAG) and Non-Potentially Acid Generating (NPAG) waste rock stockpiles, the production and ventilation shafts, and the UGTMF.	Review and acceptance by a person authorized by the Commission of the detailed design that incorporates: • Safety analyses with updated site models/conditions and site-specific parameters • Monitoring and instrumentation plan • Design drawings Technical specifications	Ninety days prior to construction of each structure
PD-04	The licensee shall develop and implement a plan to measure in-situ stresses, and hydraulic conductivities of the overburden and the sedimentary rocks in the area of the shafts.	Review and acceptance by a person authorized by the Commission of the plan. • The plan is adequate to collect the required information The shaft and UGTMF designs shall be verified/confirmed with the measured parameters.	The plan shall be provided ninety days prior to the shaft sinking, and be implemented prior to or during the shaft sinking
PD-05	The licensee shall provide their detailed construction Quality Management System (QMS).	Review and acceptance by a person authorized by the Commission of the construction QMS. The QMS includes the following elements: QC requirements; Independent Quality Assurance (IQA) requirements; RACI (responsible, accountable, consulted, informed) matrices; approval processes; and responsibilities, etc.	Ninety days prior to commencing the 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 AND MILL LICENCE
NEXGEN ENERGY LTD.
ROOK I PROJECT

I) LICENCE NUMBER: UML-MINEMILL-ROOK1-00/20##

II) LICENSEE: Pursuant to section 24 of the *Nuclear Safety and Control Act*, this licence is issued to:

NexGen Energy Ltd.
3150 -1021 West Hastings Street
Vancouver, BC
Canada, V6E 0C3

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 Rook-I 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.

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 Rook-I 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 Rook-I Project Environmental Assessment (EA) regulatory commitments prescribed by the Commission. Review and closure of the EA regulatory commitments is administered by the Commission, or a person authorized by the Commission.

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.

SIGNED at OTTAWA, this _____ day of _____, 2022.

_____
, President
on behalf of the Canadian Nuclear Safety Commission

APPENDIX A

LOCATION OF THE ROOK-I OPERATION

The location of the Rook-1 Project (place holder for map of facility/footprint)

Draft Licence Conditions Handbook

Canada's Nuclear Regulator

e-Doc 7551646 (Word)
e-Doc XXXXX (PDF)

LICENCE CONDITIONS HANDBOOK

LCH-MINE-ROOK.00/20XX

ROOK I Project
Uranium Mine and Mill Licence

UML-MINEMILL-ROOK1.00/20XX

Revision 0

Canadian Nuclear Safety Commission
Commission canadienne de sûreté nucléaire

Canada

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Licence Conditions Handbook **Effective: Month X, 20XX**

LCH-MILLMILL-ROOK1.00/20XX, Rev 0

Rook I Mine and Mill Project

Uranium Mine Licence

UML-MINEMILL-ROOK1.00/20XX
(Month XX, 2026)

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

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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)

TABLE OF CONTENTS

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 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 NexGen Energy Ltd (NexGen) to conduct the following activities at the Rook I Project, for which the CNSC provides regulatory oversight:

- prepare site and construct
- storage of clean waste rock, potentially acid generating waste rock and low-grade mineralized material generated during site preparation and construction of Rook I
- authorized decommissioning and reclamation
- possession, storage, and use of nuclear substances and radiation devices necessary for the site preparation, construction and commissioning of the Rook I project.

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 XXmillion kilograms of uranium per year. Note that the licence associated with this version of the LCH does not authorize the operation of the Rook I 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-DocXXXX).

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 if 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 Rook I 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 20XX.

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
NexGen	Mining and Milling Facility Description Manual -ROOK-ENG-MAN-00001	Yes
NexGen	Preliminary Decommissioning Reclamation Plan -ROOK-DEC-PLN-00001	Yes
NexGen	Preliminary Decommissioning and Reclamation Cost Estimate -ROOK-DEC-PLN-00002	Yes

The financial guarantee for decommissioning the Rook I Project shall be reviewed and revised by the licensee every five years or when requested by the Commission; or following a revision of the Preliminary Decommissioning Plan or Preliminary Decommissioning Cost Estimate that impacts the financial guarantee. The current preliminary decommissioning plan and preliminary decommissioning cost estimate are dated Month 2025.

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
NexGen	Mining and Milling Facility Description Manual	Yes
NexGen	Indigenous and Public Engagement Program	Yes

G.5 Environmental Assessment Conditions and Regulatory Commitments

The licensee shall implement the Rook I Project Environmental Assessment (EA) conditions and regulatory commitments.

Preamble

The Rook I Project EA conditions and the NexGen Energy Ltd. Commitments Register identifies EA regulatory commitments, including mitigation measures and follow-up program measures, made by NexGen 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 the regulatory commitments outlined in Appendix B.1 of this document and the NexGen Energy Ltd. Federal Commitments Report (the "Commitments Registry") that are applicable to construction and pre-operation activities. This does not apply to NexGen commitments that are outside the scope of the CNSC's mandate. Other NexGen commitments not applicable to the site preparations, construction and pre-operation activities will be addressed in subsequent licensing phases.

Licensee Documents that Require Notification of Change

Source	Document Title	Prior Notification Required
NexGen	Mining and Milling Facility Description Manual	Yes
NexGen	Indigenous and Public Engagement Program	Yes
NexGen	NexGen Rook I Project Federal Commitments Report	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

G.6 Indigenous Engagement

The licensee shall implement and maintain an Indigenous engagement program.

Preamble

The Rook I site resides on lands in which many Indigenous Nations and communities have a vested interest and rights. The site is situated within historic Treaty 8 and lies within "No Hoe Nene" the traditional lands of CRDN, the homeland of the Métis and the Nuhenéné, the traditional territory of the Athabasca Denesuliné.

This licence condition requires the creation, submission and implementation of a program to ensure ongoing Indigenous engagement by NexGen on the Rook I 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 Rook I 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 Rook I Project:

- Clearwater River Dene Nation
- Buffalo River Dene Nation
- Birch Narrows Dene Nation and
- Métis Nation – Saskatchewan (Northern Region 2)

The following Indigenous Nations and communities were identified as having interest in the Rook I Project (herein referred to as "interested Indigenous Nations and communities"):

- Ya'thi Nene 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
- Athabasca Chipewyan First Nation
- Willow Lake Métis Nation and
- Mikisew Cree First Nation.

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 Rook I-specific Indigenous Engagement Program required by this licence condition, the licensee should engage with and seek feedback from the identified Indigenous Nations and communities.

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 NexGen stop sharing information regarding the Rook I 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 Rook I Project. Monitoring and follow-up activities will include 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 Rook I Project and work collaboratively to reflect feedback and Indigenous Knowledge within the licensee's activities, as appropriate.

Additionally, CNSC staff acknowledge that NexGen 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 NexGen that do not fall within the CNSC's mandate and authority will not form part of the compliance verification criteria. However, the CNSC encourages NexGen to provide summary

updates on progress in meeting all commitments made to Indigenous Nations and communities through annual reporting in relation to their Rook I Indigenous Engagement Program.

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
NexGen	Facility Licensing Manual	Yes
NexGen	Public and Indigenous Information Program	Yes
NexGen	Commitments Registry	Yes

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	N286-12
CNSC	Safety Culture	REGDOC-2.1.2

Licensee Documents that Require Notification of Change

Source	Document Title	Prior Notification Required
NexGen	Mining and Milling Facility Description Manual	Yes
NexGen	Integrated Management System Manual	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
NexGen	Mining and Milling Facility Description Manual	Yes
NexGen	Human Factor Engineering Program Plan	Yes
NexGen	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
NexGen	Mining and Milling Facility Description Manual	Yes
NexGen	Environmental Code of Practice	Yes
NexGen	Radiation Code of Practice	Yes
NexGen	Integrated Management System Manual	Yes
NexGen	Waste 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* set out requirements for notifications and reporting to the Commission following certain 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 must report 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 of the:

- Monitoring of worker exposure in the radiation protection program
- radiation monitoring program
- environmental monitoring program

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 must 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 and storage, 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 mining or ore-processing streams.

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
NexGen	Radiation Protection Program Appendix A: Nuclear Substance and Radiation Device Listing	Yes

The authorized possession limits for unsealed nuclear substances are:

Nuclear Substance	Maximum Total Quantity in Possession

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
NexGen	Mining and Milling Facility Description Manual	Yes
NexGen	Mine Waste Safety Case	Yes
NexGen	Waste Management Program	Yes
NexGen	Radiation Protection Program	Yes
NexGen	Health and Safety 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 and assess 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 updated site model and measured values to replace important assumptions for safety analyses 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
CNSC	Waste Management, Volume III: Safety Case for the Disposal of Radioactive Waste, Version 2	REGDOC-2.11.1

* 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

Licensee Documents that Require Notification of Change

Source	Document Title	Prior Notification Required
NexGen	Mining and Milling Facility Description Manual	Yes
NexGen	Construction Management Program	Yes

The physical design program will be assessed against:

5.1.1 Structures, systems, and components of the facility are constructed as designed to perform their intended functions.

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

Licensee Documents that Require Notification of Change

Source	Document Title	Prior Notification Required
NexGen	Mining and Milling Facility Description Manual	Yes
NexGen	Asset Management Program	Yes

The fitness for service program will also be assessed against:

6.1.1 Systems, structures, components, equipment, and devices are maintained in good working order or conditions 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.

FITNESS FOR SERVICE

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, 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
NexGen	Radiation Protection Program	Yes
NexGen	Radiation Code of Practice	Yes
NexGen	ALARA	Yes
NexGen	Mining and Milling Facility Description 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)
Weekly Action Level	1
Quarterly Action Level	5

The weekly AL is assessed against official dosimetry results or engineering monitoring data. The quarterly AL is assessed against official dosimetry results. 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.

While the regulation of non-radiological health and safety at uranium mines and mills is typically governed by the *Canada Labour Code Part II*, which is administered by Employment and Social Development Canada (ESDC); 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
NexGen	Mining and Milling Facility Description Manual	Yes
NexGen	Health and Safety 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.

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 at Class I 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
NexGen	Mining and Milling Facility Description Manual	Yes
NexGen	Environmental Protection Program	Yes
NexGen	Environmental Monitoring Plan	Yes
NexGen	Effluent and Emissions Plan	Yes
NexGen	Environmental Code of Practice	Yes
NexGen	Waste Management Program	Yes
NexGen	Environmental Risk Assessment for the Rook I Project, November 2024	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 shown in the table below. These are either sourced from the Metal and Diamond Mining Effluent Regulations (MDMER), or from NexGen Environmental Code of Practice (ECOP), whichever is lowest.

Deleterious Substance	Maximum Authorized Monthly Mean Concentration *(Source: NexGen ECOP)*	Maximum Authorized Concentration in a Composite Sample *(Source: MDMER)*	Maximum Authorized Concentration in a Grab Sample *(Source: MDMER)*
Arsenic (mg/L)	0.057	0.15	0.20
Copper (mg/L)	0.018	0.15	0.20
Lead (mg/L)	0.058	0.12	0.16
Nickel (mg/L)		0.38	0.50
Zinc (mg/L)	0.022	0.60	0.80
Un-ionized ammonia (mg/L)	0.18	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
Total Ammonia (mg/L)	29.0	N/A	N/A
Nitrate (mg/L)	33.0	N/A	N/A
Chloride (mg/L)	640	N/A	N/A
Phosphorus (mg/L)	0.045	N/A	N/A
Aluminum (mg/L)	1.1	N/A	N/A
Cadmium (mg/L)	0.00031	N/A	N/A
Cobalt (mg/L)	0.0079	N/A	N/A
Iron (mg/L)	1.0	N/A	N/A
Manganese (mg/L)	1.0	N/A	N/A
Molybdenum (mg/L)		N/A	N/A
Selenium (mg/L)	0.011	N/A	N/A
Strontium (mg/L)	29.0	N/A	N/A
Uranium (mg/L)		N/A	N/A
Flow Rate at MPOutlet (m3/h)	977.5	N/A	N/A

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
NexGen	Mining and Milling Facility Description Manual	Yes
NexGen	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	N393:22

*

Licensee Documents that Require Notification of Change

Source	Document Title	Prior Notification Required
NexGen	Mining and Milling Facility Description Manual	Yes
NexGen	Fire Protection Program	Yes
NexGen	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 Rook I 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
CNSC	Waste Management, Volume III: Safety Case for the Disposal of Radioactive Waste, Version 2	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
NexGen	Mining and Milling Facility Description Manual	Yes
NexGen	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/berms 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	Dam Safety Guidelines (2007, revised 2013)	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 principal 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
NexGen	Mining and Milling Facility Description Manual	Yes
NexGen	Preliminary Decommissioning and Reclamation Cost Estimate	Yes
NexGen	Preliminary Decommissioning and Reclamation Plan	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 significant changes in the site or nuclear facility. The current PDP and PDCE are dated XXX 2025.

Guidance

There is no guidance provided for this licence condition

WASTE MANAGEMENT

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
NexGen	Mining and Milling Facility Description Manual	Yes
NexGen	Security 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
NexGen	Security Program	Yes
NexGen	Mining and Milling Facility Description 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)

APPENDIX A

CNSC Outgoing Notification	e-Doc #	Date Sent
	http://e-accessweb/cyberdocs/cnsc-quickstart.asp?barcode=4212222&renderer=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
- NexGen Ltd.

A.6 Reporting to the Commission

CNSC staff will report on the changes made to the LCH in the applicable 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 NexGen and the Canadian Nuclear Safety Commission.

Document	Document Title	Document Number
Canadian Dam Association	Canadian Dam Association, Canadian Dam Safety Guidelines	N/A
CNSC	Measuring Airborne Radon Progeny at Uranium Mines and Mills	G-4
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	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	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
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

APPENDIX C

Document	Document Title	Document Number
CNSC	Waste Management, Volume II: Management of Uranium Mine Waste Rock and Mill Tailings	REGDOC-2.11.1
CNSC	Waste Management, Volume III: Safety Case for the Disposal of Radioactive Waste, Version 2	REGDOC
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
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	N288.7:23
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

APPENDIX C

Document	Document Title	Document Number
NRC	National Building Code of Canada 2020	N/A
NRC	National Fire Code of Canada 2020	N/A
CSA Group	Fire Protection for Facilities that Process, Handle, or Store Nuclear Substances	N393:22
Canadian Dam Association	Dam Safety Guidelines (2007, revised 2013)	N/A

APPENDIX C

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 collect and submit additional baseline wetlands water level and water quality data. The licensee shall also submit the plans for wetland monitoring over the lifecycle of the project to assess potential effects due to the Project and to verify conclusions of the Environmental Impact Statement (EIS).	CNSC staff review and acceptance of a report to the CNSC that: • Outlines the methodology, timing, and locations for additional wetland water level and quality baseline surveys with appropriate justification • Demonstrates that the baseline data is sufficient to obtain a basic understanding of within-year and between-year variation • Provides the results of the wetland water level and quality baseline surveys. CNSC staff review and acceptance of an updated Environmental Monitoring Plan (EMP) to the CNSC that includes: • Wetland monitoring methodology, timing, and locations throughout the lifecycle of the project • Discussion on how the methodology enables assessment of adverse effects and verification	Prior to the commencement of site preparation activities

		of the effectiveness of mitigation measures. Additionally, wetlands data shall also be incorporated into the next update of the ERA, as relevant.	
EA2	The licensee shall submit a revised woodland caribou mitigation and offset plan that utilizes 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)	Prior to the commencement of site preparation activities

APPENDIX D

		• 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	
EA2		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 revised 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.	Licence to operate application

APPENDIX D

		• 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.	
EA3	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.	Prior to the commencement of site preparation activities.

APPENDIX D

		• 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.	

APPENDIX D

EA3		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).

APPENDIX D

Appendix D.2: Licensing Regulatory Commitments

Condition Number	Description of Requirement	Closure Criteria Requirements	Timeline Required By
EP-01	The licensee shall complete and provide a finalized Best Available Technology Economically Achievable (BATEA) assessment for the temporary effluent treatment plant.	Review and acceptance by a person authorized by the Commission of a final version of the BATEA that includes the proposed: • Environmental release targets • Maximum predicted design release characteristics	Ninety days prior to commencement of site preparation activities.
PD-01	The licensee shall provide detailed design information for the mill and ore handling/storage facilities as further detailed information is available.	Review and acceptance by the Commission of detailed design information (including design drawings) for the mill that incorporates: • Ventilation and exhaust systems • Primary and secondary containment structures, sumps, etc. • Load bearing capacity for concrete	Ninety days prior to commencing the mill construction
PD-02	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 elements (e.g. sulfate, chloride, etc.) and harsh environments (e.g. frozen ground),	Review and acceptance by a person authorized by the Commission of the detailed requirements for all cementitious-based materials to be used for the project, which shall incorporate the elements listed in the column "Description of Requirement".	Ninety days prior to commencing the construction activities

~~APPENDIX D~~

	integration into the overall design (e.g. impacts of shrinkage, hydration heat, potential Delayed Ettringite Formation, corrosion of reinforcement, potential associated cracking, including at early-age, etc.), and QA/QC.		
PD-03	The licensee shall provide detailed designs for the surface water management infrastructure, Potentially Acid Generating (PAG) and Non-Potentially Acid Generating (NPAG) waste rock stockpiles, the production and ventilation shafts, and the UGTMF.	Review and acceptance by a person authorized by the Commission of the detailed design that incorporates: • Safety analyses with updated site models/conditions and site-specific parameters • Monitoring and instrumentation plan • Design drawings • Technical specifications	Ninety days prior to construction of each structure
PD-04	The licensee shall develop and implement a plan to measure in-situ stresses, and hydraulic conductivities of the overburden and the sedimentary rocks in the area of the shafts.	Review and acceptance by a person authorized by the Commission of the plan. • The plan is adequate to collect the required information • The shaft and UGTMF designs shall be verified/confirmed with the measured parameters.	The plan shall be provided ninety days prior to the shaft sinking, and be implemented prior to or during the shaft sinking

APPENDIX D

PD-05	The licensee shall provide their detailed construction Quality Management System (QMS).	Review and acceptance by a person authorized by the Commission of the construction QMS. The QMS includes the following elements: QC requirements; Independent Quality Assurance (IQA) requirements; RACI (responsible, accountable, consulted, informed) matrices; approval processes; and responsibilities, etc.	Ninety days prior to commencing the construction activities

APPENDIX D