Canadian Nuclear Safety Commission | Commission canadienne de sûreté nucléaire

CMD 25-H12.47

Date: 2025-01-15

Written Submission from the Athabasca Chipewyan First Nation

Mémoire de la Première Nation des Chipewyan d'Athabasca

In the matter of

À l'égard de

NexGen Energy Ltd.

NexGen Energy Ltd.

License application to prepare a site for and construct its Rook I uranium mine and mill project

Demande de permis concernant la préparation de l'emplacement et la construction de son projet de mine et d'usine de concentration d'uranium Rook I

Commission Public Hearing

Audience publique de la Commission

February 2026

Février 2026

Document ID: QQQVZZNDK725-166150894-9814

Canada

ACFN
DENE LANDS AND RESOURCE MANAGEMENT (DLRM)

January 9, 2025

Canadian Nuclear Safety Commission
280 Slater St
PO Box 1046 Stn B
Ottawa ON K1P 5S9

Subject: PFP 2025 NEX04 - ACFN submission for participation in the NexGen Energy Ltd.'s Rook 1 project hearing

On behalf of Athabasca Chipewyan First Nation (ACFN), ACFN Dene Lands and Resources Management (IDLRM) is writing to express ACFN's concerns regarding NexGen Energy Ltd.'s Rook 1 project**.** ACFN is concerned that the proposed Rook 1 project (the project) will contribute to cumulative impacts and infringements of ACFN's Aboriginal and Treaty rights outside of the footprint of the Rook 1 project **but** within ACFN traditional lands and waterways.

ACFN Dene Lands and Resource Management undertakes a consistent screening process to make a preliminary determination regarding the potential impact of the proposed project using the information provided over years of consultation. It is highly likely that there are gaps in the existing data record and that future traditional use studies will bring forward additional information that would be relevant to assessing the impacts of the proposed project activities on ACFN. Throughout the consultation process, there have been two Traditional Land Use Studies to prove active and historical use in the area of the project.

Background on ACFN and Rights

ACFN holds Aboriginal and Treaty rights under Treaty 8, to which it adhered in 1899. Members of ACFN continue to exercise the Aboriginal and Treaty rights guaranteed by Treaty 8 and section 35 of the Constitution, including hunting, trapping, gathering, and fishing rights, as their ancestors, have for generations on ACFN's Traditional Lands, including within the vicinity of the proposed project. Before settlers intervened with trade and Treaty, the ancestors of what is now ACFN have lived in the vicinity of your project and used the lands in those areas to sustain their traditional ways of life.

ACFN Concerns with Uranium Development and NexGen's proposed project

ACFN maintains a cautious and thorough approach to the assessment of Uranium Mining as there are significant immediate and long-term impacts to ACFN Treaty and Aboriginal rights and interests that arise from such projects. In the immediate term, these programs create linear disturbance, habitat fragmentation, disrupt animal movement patterns, increase the likelihood of animal

mortality through human interaction, and further reduce the available land base on which ACFN members can practice their Treaty and Aboriginal rights and traditional land uses.

More importantly, these activities are the prelude to long-term mining activities, which add to the cumulative impacts of regional industrial development. **These cumulative impacts include disruption of local and regional ecology, the contamination of water, land and air, impairment of wildlife and human health, contributions to climate change, and the impairment of ACFN's ability to practice Treaty and Aboriginal rights and traditional land uses.** We intend to continue advocating for the Commission to address the cumulative impacts of this and other projects.

Cumulative effects: Cumulative effects have significantly diminished ACFN's ability to exercise their rights in their traditional territory, because of increasing industrial activity and the associated impacts on environmental and cultural values.

Our submission includes:

- Technical Memo from Tedal Inc.
- Technical Memo from Integrated Toxicology Solutions
- Technical Memo from Thompson Aquatic Inc.
- Original Technical Review of NexGen EIS
- Presentation for Commission Hearing

Thank you for the opportunity to allow Athabasca Chipewyan First Nation participate in these proceedings. We hope that what we have submitted will be thoughtfully put into consideration prior to CNSC's approval.

Mahsi Cho,

Callie Davies-Flett
ACFN Member
Special Projects Advisor for ACFN's Dene Lands and Resource Management

Technical Memo from Tedal Inc.

TEDAL INC.

January 4, 2026

Mark Gerchikov, Owner

8750 Sideroad 27

Orton, ON L0N 1N0

Email: my.gerchikov@gmail.com

Phone: 519-993-1767

To:

Callie Davies-Flett, Regulatory Advisor

Dene Lands and Resource Management (DLRM)

Athabasca Chipewyan First Nation

Main Office, Box 336

Fort Chipewyan, AB T0P 1B0

Deliverable 2 (Revised Memo): NexGen Rook I Uranium Mine EIS Review – Priority Issues for February Hearings

Introduction

This memo updates the earlier draft and provides technical background and additional information to support the current draft hearing presentation (“Draft – technical issues MG.pptx”), which reflects additional review and tighter framing of the priority issues.

To make best use of effort, I focused on the issues that appear most likely to influence

- the defensibility of the environmental assessment conclusions and
- the credibility of the proponent’s claims that effects are adequately mitigated and risks are acceptable.

The priority issues below are listed in the same order as the draft hearing presentation and are structured as:
1) a short description of the issue,

2) why it is potentially problematic or uncertain, and
3) a draft question that ACFN could consider raising.

As requested by ACFN, I have also included a brief overview of legacy issues with Uranium mining in Canada.

Rook I Project – Concept Design: Key Features (brief context)

- Proposed underground uranium mine and mill centred on the Arrow Deposit on the Patterson Lake peninsula.
- Surface mill with underground tailings management facility (UGTMF) and backfilling of a portion of tailings with binder.
- Waste rock storage areas (including "special waste" rock) with seepage/contact-water collection routed to treatment.
- Central effluent treatment plant (ETP) and sewage treatment plant (STP) with treated effluent discharge to Patterson Lake via outfall/diffuser, supported by site-wide water balance and water quality modelling.

Priority Issues

1. BATEA and treatment technology definition for releases to water (contact/process water)

Issue

NexGen is seeking a CNSC licence to prepare the site for and construct the Rook I mine and mill without a consolidated, decision-grade Best Available Technology Economically Achievable (BATEA) assessment for operational liquid effluents and without a sufficiently defined treatment train to support a confident effluent source term.

The EIS and supporting documents describe a conceptual ETP/STP and a site-wide water balance model (TSD XVIII). However, key treatment components are still presented as placeholders (e.g., T02 pre-treatment and T03 enhanced post-treatment) and the unit operations, design criteria, redundancy/upset recovery, polishing steps, and residuals management basis are not clearly set out in a way that allows CNSC and intervenors to assess whether the chosen configuration is genuinely BATEA.

Why this is a problem

REGDOC-2.9.2 expects BATEA to inform design and the release-control framework for new facilities, including environmental release targets, predicted design release characteristics, and enforceable licensed release limits and action levels.

If construction proceeds while the ETP remains conceptual, there is a material risk that civil layout, building footprint, and hydraulic configuration will constrain future upgrades and polishing steps. In that situation, the ERA/HHRA conclusions become conditional on assumed removal efficiencies rather than a defined, demonstrably robust treatment train.

TSD XVIII sensitivity results indicate that key constituents (including arsenic) can approach or exceed proposed targets under modest reductions in treatment performance, suggesting limited contingency margin. This increases the importance of defining pre- and post-treatment modules (T02 and T03), clarifying

the intended unit operations, and demonstrating robustness before a construction authorization effectively "locks in" the treatment configuration.

Finally, the focus should be on minimization of routine discharge of contact/process water to the extent practical, not only on demonstrating compliance with end-of-pipe targets or mixing zone objectives. A near-zero routine discharge case should be included as an alternative to be evaluated and transparently dispositioned as part of the BATEA analysis.

Draft question

REGDOC-2.9.2 describes a sequence where environmental release targets, BATEA-based design, predicted design release characteristics and licensed release limits are used together to design and commission wastewater treatment systems. At this site preparation and construction licensing stage for Rook I:

- Where is the documented, consolidated BATEA assessment that compares feasible treatment alternatives (including pre-treatment and post-treatment options) and demonstrates selection of best available technology rather than legacy regional practice?
- What are the defined unit operations and design basis for the ETP treatment train, including T02 ("mine and runoff water pre-treatment") and T03 ("enhanced effluent post-treatment"), and what redundancy/upset recovery and residuals management provisions are included?
- What enforceable licensed release limits and action levels are proposed for key COPCs (including uranium, radium-226, arsenic, selenium, molybdenum, nickel, cobalt, copper), and how much performance margin exists between typical operation, action levels, and licensed limits under credible variability and upset conditions?
- What additional measures were evaluated to minimize routine discharge of contact/process water (high recycle, storage, operational controls), including an explicit near-zero routine discharge screening case, and why were they or were they not retained?

Technologies that should be explicitly evaluated in the BATEA (illustrative list)

Baseline chemical treatment upgrades: pH adjustment (lime/caustic) + ferric coagulation/co-precipitation; clarification/thickening + filtration; high density sludge (HDS) variants where compatible.

Polishing / robustness: Arsenic: adsorption media (GFO/GFH/activated alumina), granular media filtration and/or ion exchange (chemistry dependent). Radium: sulfate/barite co-precipitation (Ba addition) and/or radium-selective media/ion exchange. Uranium: ion exchange (typically anion exchange; chemistry dependent) and/or RO/NF polishing.

Advanced separation / discharge minimization: Membranes (RO/NF) with explicit concentrate management (brine, scaling, winter operability) and residuals disposal. Screen a near-zero routine discharge concept (e.g., RO/NF plus evaporation/crystallization or equivalent) with energy and residuals implications transparently assessed.

2. Arsenic cancer risk to high Traditional Food users at Patterson Lake South Arm

Issue

The Environmental Risk Assessment / Human Health Risk Assessment indicates that arsenic incremental lifetime cancer risk (ILCR) for the subsistence harvester receptor at Patterson Lake South Arm exceeds the "essentially negligible" benchmark often applied in Health Canada contaminated sites practice (1 x 10^-5, i.e., 1 in 100,000) in the application and upper-bound cases. Under the "Reasonably Foreseeable Development" case (including the Fission development), arsenic ILCR for additional receptors is also elevated.

Why this is a problem

The core concern is not only whether the incremental risk is "small compared to baseline," but whether it is acceptable to add further risk to a group already experiencing elevated baseline risk and whether the assessment is sufficiently grounded in site-specific Traditional Food use patterns.

The central-case assumptions rely on partial diet mixing with a reference area and reduced arsenic bioavailability in Traditional Foods. Detailed, site-specific data on Traditional Food consumption are acknowledged to be limited, so it is not clear that central assumptions are representative of the most exposed users.

The EIS does not clearly translate the arsenic risk finding into targeted, arsenic-specific mitigation and follow-up commitments (e.g., fish and wildlife tissue monitoring, explicit action levels, and defined escalation triggers if results trend toward the sensitivity case).

Draft question

Given that arsenic ILCR for the subsistence harvester at Patterson Lake South Arm is predicted to exceed the "essentially negligible" benchmark and that central results depend on assumptions about diet mixing and arsenic bioavailability, how do NexGen and CNSC staff justify the conclusion that arsenic risks are acceptable? What specific arsenic-focused commitments (mitigation measures, fish and Traditional Food monitoring, action levels and escalation triggers) will be implemented if post-construction monitoring indicates that harvesters' diets and exposures are closer to the sensitivity case than to the central assumptions?

3. Important hazards not analyzed: explosion scenarios and other low-probability, high-consequence events

Issue

The accidents and malfunctions assessment identifies numerous explosion mechanisms (underground incidents, fuel and process system explosions, LNG/power system events, and explosives inventory), but only a very limited subset appears to be developed as explicit bounding scenarios with quantified consequences. Explosives storage/handling hazards are screened out on the basis that regulatory controls make risks "always ALARP," and other credible explosion/fire combinations remain at screening level only.

Why this is a problem

Explosions are among the few mechanisms capable of producing rapid, high-consequence multi-system failures (loss of power, ventilation, containment, multiple casualties, and follow-on environmental releases). Regulatory compliance with the Explosives Act and associated standards does not replace the need for project-specific consequence evaluation of rare but severe events.

From a best-practice and public-confidence standpoint, it is normally expected that at least a small set of very unlikely but severe explosion scenarios will be explicitly developed with physical effects, likely damage states, and environmental and public health consequences, rather than relying solely on risk-matrix screening.

Draft question

Section 21 acknowledges numerous explosion-related hazards but only a very limited subset is carried forward for detailed consequence evaluation, while explosives hazards are excluded as "always ALARP." Could NexGen explain why no very low-probability, high-consequence explosion scenarios (e.g., major explosives accident, LNG/power system explosion, or explosion leading to large secondary fires and loss of containment) were explicitly evaluated for environmental and public health consequences?

4. Distribution coefficient (Kd) assumptions and disclosure at the November hearing

Issue

At the November 19 hearing, NexGen stated that a distribution coefficient (Kd) of zero was used for solute transport to Patterson Lake, and CNSC staff characterised this as conservative. However, the Hydrogeology TSD applies non-zero Kd values for uranium and radium (and some other constituents) in bedrock, while using Kd = 0 for many ions and for all solutes in overburden. The hearing description was therefore incomplete and may have left a misleading impression of the conservatism actually applied to radionuclide transport.

Why this is a problem

Kd strongly controls retardation and therefore the timing and magnitude of predicted radionuclide loading to Patterson Lake. The adopted uranium and radium Kd values are not based on Rook I-specific sorption testing and are known to vary by orders of magnitude in the literature. The hydrogeology sensitivity runs do not appear to vary Kd over plausible ranges.

Without site-specific Kd data and an explicit sensitivity/probabilistic treatment of Kd uncertainty, it is not possible to demonstrate that predictions of uranium and radium loading are robust and conservative.

Draft question

How do NexGen and CNSC staff reconcile the hearing statements about "zero Kd" with the Hydrogeology TSD parameterisation that applies non-zero Kd values for uranium and radium in bedrock? In the absence of site-specific sorption measurements for uranium and radium on Rook I host rocks and overburden, what evidence demonstrates that the adopted Kd values are sufficiently conservative, and will NexGen commit to obtaining Rook I-specific sorption testing and updating the assessment if those data indicate materially different radionuclide mobility or loading duration?

5. Narrow treatment of uncertainty in hydrogeological modelling

Issue

Uncertainty in groundwater flow and solute transport is addressed through a limited set of deterministic sensitivity runs that vary only a narrow subset of parameters (primarily hydraulic conductivities and source terms). Other key parameters and conceptual choices (e.g., Kd, porosity, dispersivity, recharge, lakebed sediments, alternative conceptual models and pathway geometries) appear to be held constant.

Why this is a problem

For long-lived radionuclides, the conclusions that matter (timing, magnitude and duration of loading to Patterson Lake) can be dominated by parameters and model-structure assumptions that have not been explored. The combination of single-value sorption assumptions, infinite-source representations, and a largely static post-closure hydraulic regime can produce outcomes driven by model structure rather than demonstrated site behaviour.

Without a structured uncertainty analysis or probabilistic treatment that varies multiple key parameters simultaneously, it is difficult for intervenors to judge whether the long-term predictions are robust.

Draft question

Why is uncertainty treatment for groundwater and solute transport limited to a narrow set of deterministic sensitivity runs? Will NexGen commit to additional sensitivity or probabilistic analyses that vary key sorption parameters (Kd), porosity, pathway geometry, recharge and lakebed sediment assumptions, and incorporate realistic long-term evolution of sources and hydrogeologic conditions, to demonstrate that conclusions regarding uranium, radium and key metal loadings to Patterson Lake remain robust?

Additional observations (lower priority; not emphasized in the current hearing deck)

Contamination control and radiological zoning

The EIS material reviewed provides limited description of radiological zoning, screening/decontamination of large mobile equipment moving between zones, and controls to prevent tracking contamination to surface facilities or off-site. Given ore grades and internal exposure pathways, this warrants clarification and may not be fully reflected in worker dose estimates. Radiation Protection program does provide a very high level indication that zoning and contamination control measures will be put into place but no detailed procedures are available at this time. If we raise this question now, CNSC will likely respond that detailed procedures will be prepared and reviewed by the CNSC at a later stage of the project.

Biota benchmarks and Canadian context values

For non-human biota protection, the use of U.S. DOE biota criteria without demonstration against Canadian-context screening benchmarks (e.g., NWMO ENEV-based values) may reduce conservatism for aquatic plants/biota. At minimum, a check against the more stringent Canadian-context values would improve confidence in conclusions. This is a relatively minor methodology issue which is unlikely to impact EIS findings.

Brief overview of legacy problems with Uranium mining in Canada.

Canada's uranium mining industry has evolved substantially since the mid 20th century. Nonetheless, the historic record demonstrates a consistent lesson: when mine and mill wastes, especially tailings and contact waters, are not contained and managed to a robust long term standard, liabilities can persist for decades and require major public expenditure long after closure. Early underground operations also provide a clear occupational health lesson. Inadequate control of radon progeny and mine aerosols can lead to measurable long term health consequences for workers [1],[2].

Worker doses and health consequences.

The most consistently demonstrated worker health outcome in the uranium mining literature is elevated lung cancer risk associated with cumulative exposure to radon decay products, historically expressed as Working Level Months. Canadian cohort analyses and related syntheses report dose response relationships between radon progeny exposure and lung cancer incidence and mortality, consistent with the wider international evidence base for uranium miners [1],[2]. While modern ventilation, exposure monitoring, and radiological protection programs have materially reduced exposures compared with historic conditions, the legacy evidence remains directly relevant because it shows that internal exposure pathways, especially radon progeny and contaminated dust, are controlling risks in underground uranium mining when controls are not demonstrably rigorous[1],[2].

Tailings and environmental effects as the dominant long term liability.

Uranium mill tailings are widely recognized as the most persistent environmental liability because they contain long lived radionuclides, notably Ra-226 and progeny, and can generate long term seepage and contact water contamination and radon emissions. This requires engineered containment and monitoring over extended periods. International guidance emphasizes that long term stabilization and performance assurance are central challenges and require designs that remain protective well beyond the active operating phase [3]. The Canadian experience with closed and legacy mine and tailings sites similarly underscores the long duration of monitoring and maintenance obligations and, for some sites, the need for institutional controls well after active decommissioning [4].

Rayrock as a Canadian example.

The Rayrock uranium mine and mill in the Northwest Territories operated briefly from 1957 to 1959 and was then abandoned as the business case for continued operation was no longer viable, leaving tailings and site hazards. Federal remediation, including tailings capping, was completed in 1996, and performance monitoring and reporting have continued since that time with further remediation efforts ongoing. This illustrates that even relatively small historic operations can require long lived stewardship and verification monitoring [4][5]. More recent federal project descriptions also reference the objective of reducing the local zone of avoidance, underscoring how legacy sites can influence land use and community confidence long after mining ends [5].

Scale of long term cleanup costs.

Across Canada's broader legacy contaminated site portfolio, including abandoned mines and northern sites, federal auditing indicates that estimated remediation costs have risen materially over time. The Commissioner of the Environment and Sustainable Development reported that the estimated cost of remediating known federal contaminated sites increased from $2.9B to $10.1B since the 2005 action plan, with northern sites representing a substantial share of total estimated costs [6]. In uranium specific legacy remediation, individual sites can also require major funding. Saskatchewan has publicly reported a total estimated cost of approximately $280M for cleanup of the abandoned Gunnar uranium mine site. [7] The key point for decision makers is the demonstrated pattern. Where containment and water treatment are under specified or not robust, or with operations ending earlier than planned, residual liabilities can persist for decades and require very large public expenditures later.

Acknowledgement of changes and relevance to Rook I.

Modern uranium projects are not direct analogues to 1950s to 1970s operations. Regulatory expectations, monitoring, and engineering practice have changed materially. In particular, underground tailings management and cemented or backfilled tailings concepts, where feasible and demonstrably robust, can address several legacy drivers by reducing the footprint of surface tailings facilities, limiting windblown dust potential, and potentially reducing the long term seepage source term. The historic record shows that long term costs are dominated by tailings and water management outcomes rather than short term construction impacts [3][4].

References

[1] Lane RSD, Frost SE, Howe GR, Zablotska LB. Mortality (1950 to 1999) and cancer incidence (1969 to 1999) in the cohort of Eldorado uranium workers. Radiation Research.

[2] Zablotska LB and co authors. Canadian uranium miner and worker epidemiology papers on radon progeny exposure and lung cancer risk. Peer reviewed literature, multiple cohort analyses.

[3] International Atomic Energy Agency. Technical guidance on uranium mill tailings management and long term stabilization, including waste management and environmental protection in uranium production.

[4] Canadian Nuclear Safety Commission. Closed uranium mine and tailings sites in Canada. Public reporting on legacy sites, long term monitoring, and controls, including Rayrock context.

[5] Crown Indigenous Relations and Northern Affairs Canada, Government of Canada. Rayrock remediation project summaries and objectives, including discussion of residual zone of avoidance reduction.

[6] Office of the Auditor General of Canada, Commissioner of the Environment and Sustainable Development. Federal contaminated sites reports describing remediation liability growth, including the increase from $2.9B to $10.1B since the 2005 action plan.

[7] Government of Saskatchewan. Public reporting on Gunnar Mine remediation cost estimates, including total estimated cleanup cost approximately $280M.

Sincerely,

Mark Gerchikov

Owner, TEDAL INC.

Technical Memo from Integrated Toxicology Solutions

Technical Memorandum: Comparative Analysis of CNSC Risk Assessment Requirements, Federal Guidance, and the ACFN Technical Review – Toxicology and Health Risk.

January 14th, 2025

To: Callie Davies-Flett
Dene Lands and Resource Management
Athabasca Chipewyan First Nation

From: Mandy Olsgard, M.Sc., P. Biol.
Principal/ Senior Toxicologist
Integrated Toxicology Solutions Ltd.

Executive Summary

This technical memorandum was compiled to support Athabasca Chipewyan First Nation (ACFN) participation in the Canadian Nuclear Safety Commission (CNSC) hearing for the NexGen Energy Ltd. Rook I Project by clarifying how CNSC regulatory requirements, embedded standards, and federal risk assessment guidance are intended to function together, and by identifying where material misalignments affect confidence in conclusions regarding protection of human health and the environment.

The memorandum identified CNSC environmental protection requirements (REGDOC-2.9.1 and REGDOC-2.9.2) and the CEAA 2012 Generic EIS Guidelines for Nuclear Projects with CSA N288.6, which provides the prescribed structural framework for environmental risk assessment (ERA) under CNSC oversight (CNSC, 2020a; CNSC, 2020b; CEAA, 2012; CSA Group, 2019).

The core conclusion is that CNSC regulatory instruments establish clear expectations that both ERA and Human Health Risk Assessments (HHRA) must be conducted for nuclear projects and address Indigenous land use and country-food exposure pathways, but the system relies on external guidance to supply the quantitative methods and pathway-specific requirements needed to support findings of "no unreasonable risk" (CNSC, 2020a; CEAA, 2012). Because CSA N288.6 provides structure but limited quantitative direction for HHRAs, the review evaluated the required reliance on federal methodological guidance; Health Canada IA HHRA guidance, Health Canada PQRA guidance, Health Canada country foods HHRA supplemental guidance, and CCME ecological risk assessment guidance, to ensure completeness, transparency, and defensibility of chemical HHRA and ERAs for nuclear projects (Health Canada, 2010; Health Canada, 2017; Health Canada, 2021a; CCME, 2020).

When CSA N288.6 is applied without parallel and explicit application of Health Canada HHRA/PQRA and CCME ERA methods, predictable methodological gaps arise, including inaccurate contaminant screening, incomplete exposure pathway assessment (particularly food-chain pathways), limited mixture toxicity consideration, and a lack of integrating ecological and human receptors in risk analysis and management (CSA Group, 2019; Health Canada, 2017; Health Canada, 2021a; CCME, 2020).

To evaluate whether NexGen adhered to federal risk assessment expectations under the CNSC framework, the memorandum compares this integrated regulatory architecture to issues identified in ACFN's technical review of the NexGen Rook I application and NexGen's responses (ITS Ltd., 2022). The findings demonstrate multiple instances where NexGen's HHRA/ERA approach and/or responses acknowledge that key pathways or analyses were not conducted, and where those omissions are inconsistent with federal guidance on exposure pathways, Indigenous country-food reliance, baseline-plus-project risk characterization, and explicit treatment of uncertainty (Health Canada, 2010; Health Canada, 2017; Health Canada, 2021a; CCME, 2020).

Across the findings, the most consequential deficiency is the failure to evaluate Indigenous country-food and food-chain exposure pathways, including air deposition to soil and surface water deposition to sediment and associated food web pathways, despite the centrality of these pathways to Indigenous Traditional Land Use exposure and despite guidance that emphasizes food ingestion, bioaccumulation, relevant media, and pathway completeness where such pathways are identified (Health Canada, 2010; Health Canada, 2017; CCME, 2020). This omission affects contaminant identification, exposure assessment, risk characterization, and the credibility of conclusions regarding protection of Indigenous Traditional Land Users. Other key misalignments include COPC identification/screening that does not incorporate critical effects and mode of action, persistence, bioaccumulation potential, and exposure relevance; lack of mixture/additivity treatment where co-exposures occur; incomplete characterization of total risk using baseline-plus-project scenarios; and incomplete treatment of sediment-related pathways and post-closure exposures where long-term transport and exposure persistence are plausible (Health Canada, 2017; Health Canada, 2021a; Health Canada, 2010; CCME, 2020).

The memorandum therefore provides the hearing panel with a structured set of considerations: (i) where federal guidance is explicit and NexGen's approach remains misaligned (constituting outstanding issues requiring correction), and (ii) where guidance is less prescriptive (requiring transparent uncertainty characterization and regulatory judgment rather than definitive non-compliance findings). The memorandum also outlines the components of a harmonized approach required for defensible decision-making: retain CSA N288.6 as the structural ERA framework required under CNSC oversight while explicitly integrating Health Canada HHRA, PQRA, and country foods guidance to strengthen methodology for assessing risks from exposure to chemical stressors (CSA Group, 2019; Health Canada, 2017; Health Canada, 2021a; Health Canada, 2010; CCME, 2020).

1.0 Introduction and Objectives

This technical memorandum was compiled to support Athabasca Chipewyan First Nation (ACFN) in its participation in the Canadian Nuclear Safety Commission (CNSC) hearing for the NexGen Energy Ltd. Rook I Project. The memorandum provides an analysis of the regulatory and methodological framework governing environmental protection and impact assessment for nuclear projects in Canada, with the intent of assisting ACFN and the hearing panel in understanding how applicable regulatory requirements and technical guidance are expected to function together.

The memorandum integrates the CNSC environmental protection requirements set out in REGDOC-2.9.1: Environmental Protection, Environmental Principles, Assessments and Protection Measures and REGDOC-2.9.2: Environmental Protection, Controlling Releases to the Environment (Canadian Nuclear Safety Commission [CNSC], 2020a; CNSC, 2020b), together with the CEAA 2012 Generic Environmental Impact Statement (EIS) Guidelines for Nuclear Projects (Canadian Environmental Assessment Agency [CEAA], 2012). It evaluates how these instruments are operationalized through CSA N288.6, which functions as the prescribed environmental risk assessment (ERA) methodology within the CNSC regulatory regime (CSA Group, 2019).

The analysis further examines the CNSC/CSA framework in relation to federal risk assessment guidance that provides the methodological detail required for defensible chemical human-health risk assessment (HHRA) and ecological risk assessment (ERA). This includes Health Canada's Guidance for Evaluating Human Health Effects in Impact Assessment (Health Canada, 2017), Health Canada's Preliminary Quantitative Risk Assessment (PQRA) guidance for federal contaminated sites (Health Canada, 2021a), Health Canada's Supplemental Guidance on Human Health Risk Assessment for Chemicals in Country Foods (Health Canada, 2010), and the CCME Ecological Risk Assessment Guidance Document (Canadian Council of Ministers of the Environment [CCME], 2020).

Finally, the regulatory documents governing nuclear facility risk assessment are compared with the issues identified in the ACFN technical review of the NexGen Rook I project application (ITS Ltd. 2022) to determine if NexGen adhered to federal health risk assessment guidance.

This memorandum is intended to support ACFN in articulating technical and regulatory considerations relevant to the hearing, and to assist the hearing panel by clarifying how these regulatory instruments and guidance documents are designed to operate collectively. Particular emphasis is placed on chemical HHRA, Indigenous and country-foods exposure pathways, cumulative and long-term exposure considerations, and the respective roles of CSA N288.6, Health Canada guidance, and CCME guidance in informing findings related to the protection of human health and the environment under the *Nuclear Safety and Control Act*.

The objectives of this memorandum are to:

- Support ACFN's participation in the CNSC hearing by providing a clear, technically grounded comparison of CNSC environmental protection and assessment documents (REGDOC-2.9.1, REGDOC-2.9.2) and the CEAA 2012 EIS Guidelines and explaining how each instrument requires the conduct of ERA and HHRA for nuclear projects (CNSC, 2020a; CNSC, 2020b; CEAA, 2012).

- Describe CSA N288.6 as the ERA structure embedded within CNSC oversight, including its role in problem formulation, exposure pathway identification, fate and transport assessment, effects evaluation, and uncertainty characterization for both radiological and non-radiological stressors (CSA Group, 2019).
- Clarify the extent to which CNSC documents rely on federal HHRA and ERA guidance to provide the quantitative methods, toxicity reference values, exposure defaults, mixture approaches, QA/QC expectations, and Indigenous and country-foods exposure parameters necessary for defensible chemical HHRA (Health Canada, 2010; Health Canada, 2017; Health Canada, 2021a).
- Identify similarities, differences, and areas of non-equivalence between CSA N288.6 and CCME ecological risk assessment guidance, including where CCME methods may strengthen ecological assessments under N288.6 but cannot replace radiological or human-health requirements (CCME, 2020; CSA Group, 2019).
- Identify methodological and structural gaps that arise when CSA N288.6 is applied without parallel application of Health Canada guidance, and explain why these gaps are relevant to ACFN's concerns regarding Indigenous exposure pathways, cumulative effects, long-term and intergenerational risk, and confidence in conclusions of "no unreasonable risk" (Health Canada, 2010; Health Canada, 2017; Health Canada, 2021a).
- Present considerations for a harmonized ERA–HHRA approach for nuclear projects that retains CSA N288.6 as the CNSC-required ERA framework while integrating Health Canada HHRA/PQRA and $HHRA_{foods}$ methods for chemical human-health risk characterization and CCME ERA methods for ecological methodological depth, with radiological modelling maintained under CSA/IAEA/ICRP frameworks.

2.0 Comparative Analysis of Regulatory Documents

This section summarizes the regulatory instruments and technical guidance that collectively define the environmental protection and risk assessment framework applicable to nuclear projects in Canada. It describes the respective roles of CNSC regulatory documents, federal impact assessment guidance, and external technical standards, and clarifies how these instruments are intended to function together in the conduct of environmental risk assessments (ERAs) and human health risk assessments (HHRAs).

The purpose of this section is to establish a clear foundation for subsequent analysis by outlining: (i) the mandatory CNSC requirements governing environmental protection and release controls; (ii) the role of CSA N288.6 as the prescribed structural framework for ERA; and (iii) the reliance on federal Health Canada and CCME guidance to provide the methodological detail necessary for quantitative human-health and ecological risk characterization. This context is essential for evaluating whether risk assessments prepared in support of a nuclear project are methodologically complete, appropriately aligned with federal guidance, and sufficient to support findings related to the protection of human health, Indigenous land users, and the environment.

REGDOC-2.9.1 Environmental Protection: Principles, Assessments, Protection Measures

REGDOC-2.9.1 establishes the overarching environmental protection framework applied by the CNSC. It requires proponents to conduct an environmental risk assessment comprising both an ERA and HHRA. The document adopts a tiered, risk-informed approach and outlines high-level expectations for baseline environmental and health characterization, including the assessment of Indigenous land-use patterns and country-food–based exposure pathways. It identifies both radiological and non-radiological stressors as relevant to environmental

protection. However, the document does not provide detailed methodological direction; instead, it explicitly relies on external technical standards such as CSA N288.6 to guide ERA implementation.

REGDOC-2.9.2 Environmental Protection: Controlling Releases to the Environment

REGDOC-2.9.2 defines the requirements for establishing and managing licensed radiological and chemical release limits. It stipulates that all release limits must ensure the protection of human health and the environment, and it requires the ERA, including HHRA components to be used in deriving acceptable limits. When releases exceed limits or action levels, proponents are required to conduct human-health and ecological evaluations to assess potential impacts. However, the document does not prescribe release limits but rather directs proponents to define and subsequently adhere to these. Radiological assessments are explicitly linked to public dose criteria and the CNSC's application of the ALARA (As Low As Reasonably Achievable) principle.

CEAA 2012 Generic EIS Guidelines for Nuclear Projects

The CEAA 2012 EIS Guidelines require proponents to complete both an ERA and an HHRA as part of federal impact assessment processes for nuclear projects. Human health is treated as a distinct valued component that must be assessed in relation to radiological and chemical exposures. The guidelines also require characterization of baseline community health conditions and country-food pathways. Importantly, they direct proponents to adopt Health Canada's HHRA guidance as the authoritative methodology for assessing human-health risks.

CSA N288.6 Environmental Risk Assessments at Nuclear Facilities and Uranium Mines and Mills

Although CSA N288.6 is an external standards document, it is fully integrated into the CNSC's environmental protection regime and functions as the prescribed methodology for conducting ERAs at Class I nuclear facilities and uranium mines and mills. Through REGDOC-2.9.1, its use is mandatory for all ERA related activities.

N288.6 provides the structural architecture for ERA, outlining processes for problem formulation, identification of exposure pathways, and the modelling of radiological and chemical fate and transport. It also describes how effects to ecological and human receptors should be evaluated and how risks and uncertainties should be characterized. This framework is assumed by CNSC oversight as the technical foundation for environmental protection.

Importantly, N288.6 incorporates both ecological and human health assessment components. It requires evaluation of radiological and chemical exposures under normal operating conditions as well as accident scenarios. Indigenous and community receptors are recognized, and country-food pathways are identified as critical exposure routes. However, the standard provides only structural guidance and does not supply the methodological detail required to complete a comprehensive HHRA. It does not specify toxicity reference values (TRVs), acceptable risk benchmarks, exposure factor defaults, or Indigenous-specific consumption parameters, nor does it include quantitative HHRA equations or peer-review expectations. These gaps are explicitly filled by federal Health Canada guidance, which defines the rigorous methods necessary for a defensible HHRA.

In summary, CSA N288.6 establishes the ERA framework required by CNSC, but federal HHRA guidance must be applied in parallel to address the methodological requirements for human-health risk characterization.

Consideration of Human Health in the CNSC Framework

Human-health risk assessment is clearly mandated within the CNSC environmental protection system. REGDOC-2.9.1 requires the inclusion of HHRA within the ERA, and REGDOC-2.9.2 stipulates that release limits must be set to protect human health. The CEAA 2012 EIS Guidelines further require proponents to conduct HHRA using Health Canada methodologies.

CNSC documents emphasize radiological pathways, including public dose assessments and doses associated with consumption of contaminated country foods. Although chemical contaminants are also included in the scope of assessment, methodological guidance for chemical HHRA is minimal. CNSC documents do not provide detailed HHRA calculation protocols, TRVs or dose-response factors, cancer or non-cancer risk criteria, default exposure rates, or procedures for Indigenous-specific exposure pathways. Accordingly, all technical HHRA work must rely on Health Canada guidance.

Comparison: CSA N288.6 and Federal HHRA Guidance

CSA N288.6 and federal HHRA guidance share a common conceptual foundation: both follow the standard risk-assessment paradigm of problem formulation, exposure assessment, effects characterization, and risk characterization, and both recognize the importance of characterizing risks to sensitive and Indigenous receptors. Both frameworks also support tiered and site-specific approaches.

However, the two differ substantially in methodological detail. N288.6 provides a high-level structural framework for ERA applicable to both radiological and chemical stressors, whereas Health Canada HHRA guidance offers highly prescriptive methods for human-health risk assessment. Federal HHRA guidance provides comprehensive exposure defaults, TRVs, cancer and non-cancer risk criteria, mixture rules, and Indigenous-specific consumption guidance, none of which are supplied by N288.6. Additionally, Health Canada requires formal QA/QC and peer-review procedures for HHRA, whereas N288.6 provides only minimal direction in this regard.

The result is a clear division of roles: N288.6 cannot be used alone to conduct a defensible chemical HHRA, and Health Canada guidance does not address nuclear-specific radiological modelling. A complete HHRA at a nuclear facility therefore requires integration of both sources.

Comparison: CSA N288.6 and CCME ERA Guidance

CSA N288.6 and CCME ERA guidance share structural similarities, including the application of a weight-of-evidence framework and the requirement for receptor identification and conceptual modelling. Both documents describe exposure and effects assessment processes and emphasize uncertainty characterization.

Key differences, however, limit substitutability. N288.6 includes radiological contaminants and human health components, whereas CCME ERA addresses only chemical stressors and ecological receptors. CCME ERA provides highly detailed ecological technical methods, including species sensitivity distributions (SSDs), bioavailability adjustments, and formal lines-of-evidence integration, whereas N288.6 offers more general ecological guidance. Conversely, CCME ERA lacks any relevance for radiological pathways or HHRA, and therefore cannot serve as the sole ERA approach for nuclear facilities.

These differences indicate that CCME ERA can strengthen the ecological component of an N288.6 ERA but cannot replace it.

3.0 Alignment of CNSC Documents with Federal Guidance

CNSC documents align conceptually with federal HHRA and ERA guidance in several respects: they use similar ERA structures, acknowledge both ecological and human receptors, incorporate Indigenous and country-foods exposures, and support tiered, risk-informed assessment approaches. However, they do not fully align in practice.

While CNSC documents provide a comprehensive regulatory framework requiring consideration of both ecological and human-health risks, they rely heavily on external technical guidance for methodological detail. CSA N288.6 supplies the ERA structure required by CNSC but lacks critical elements necessary for quantitative HHRA and robust ecological assessment, including toxicity benchmarks, exposure parameters, Indigenous-specific pathways, and QA/QC requirements. These gaps are explicitly filled by federal risk assessment guidance from Health Canada and CCME.

CNSC documents do not provide detailed HHRA methodology, and their reliance on qualitative standards such as "no unreasonable risk" contrasts with Health Canada's quantitative risk benchmarks. In addition, CCME ERA provides deeper ecological methodology than is reflected in N288.6. These gaps must be resolved through methodological integration rather than regulatory replacement.

Several gaps must be addressed to harmonize CSA N288.6 with federal human-health and ecological risk assessment requirements. As a result, federal guidance must be applied in parallel to ensure regulatory alignment and scientific defensibility. Key gaps and required integrations include:

- HHRA methodology: CSA N288.6 does not provide detailed HHRA methods, requiring adoption of Health Canada IA HHRA and PQRA guidance as the methodological foundation for human-health risk assessment.
- Risk benchmarks: N288.6 lacks chemical risk-acceptability thresholds, necessitating use of Health Canada cancer and non-cancer benchmarks (10^{-5} to 10^{-6} for carcinogens; HI ≤ 1 for non-carcinogens).
- Exposure parameters: Default exposure assumptions (intake rates, body weights, exposure frequencies) are not provided in N288.6 and must be taken from Health Canada guidance unless site-specific data are justified.
- Indigenous and country-foods pathways: Limited Indigenous-specific HHRA detail in N288.6 requires supplementation with Health Canada Indigenous and country-foods guidance.
- QA/QC and peer review: N288.6 does not establish an HHRA quality assurance or peer-review framework, requiring application of Health Canada HHRA QA/QC and peer-review expectations.
- Radiological and chemical integration: N288.6 does not provide a unified approach for radiological and chemical HHRA, necessitating combined use of CSA/IAEA/ICRP methods for radiological exposures and Health Canada HHRA methods for chemical exposures.
- Ecological methodology: Ecological assessment depth in N288.6 is limited relative to CCME ERA guidance, requiring incorporation of CCME methods to strengthen ecological, sediment, and food-web assessments.

Together, these integrations are necessary to harmonize the CSA N288.6 ERA framework with federal Health Canada and CCME guidance and to ensure that CNSC environmental assessments are methodologically complete, transparent, and protective of human health and Indigenous land use. Currently, this harmonization or integration is at the discretion of the proponent, NexGen, in the case of the Rook I Mine application.

Accordingly, a fully defensible ERA/HHRA for nuclear projects must integrate N288.6's structural framework with Health Canada HHRA guidance for human-health risk characterization and CCME ERA guidance for ecological methodology, while retaining radiological assessment requirements under CSA, IAEA, and ICRP. This integrated approach provides the scientifically defensible foundation required to meet CNSC, Health Canada, and CCME expectations for environmental and human-health protection.

4.0 ACFN Technical and Regulatory Guidance Alignment Review

This section presents the key technical findings arising from Integrated Toxicology Solutions' (ITS) review of NexGen Energy Ltd.'s Human Health Risk Assessment (HHRA) and their formal responses to review comments (Appendix A). The findings are intended to evaluate whether the assessment appropriately identifies and manages chemical exposure risks relevant to Indigenous Traditional Land Users (TLUs) and whether it aligns with applicable federal Health Canada and CCME guidance as expected under the CNSC regulatory framework.

Each finding is structured to clearly document: (i) the underlying technical issue or gap; (ii) evidence drawn from NexGen's own assessment approach and responses; (iii) the implications of the identified limitation for understanding and managing risks to Indigenous TLUs; and (iv) the corrective actions required to achieve alignment with federal HHRA and ERA guidance. Where relevant, the findings explicitly note instances where NexGen acknowledges that pathways or analyses were not conducted.

The purpose of this section is to provide a clear, regulator-ready record of outstanding issues that materially affect confidence in the HHRA and ERA conclusions, particularly with respect to country foods, long-term and intergenerational exposure pathways, cumulative effects, and exposure related risks.

Finding 1: Federal HHRA guidance referenced but methodological alignment and deviations are not documented

Evidence (ACFN Comment 412):

The EIS states that the HHRA and ERA are based on CSA N288.6/N288.1 and Health Canada HHRA/PQRA guidance; however, it does not identify which specific Health Canada methods were applied, which were modified, or which were not used. No comparison is provided between Health Canada-recommended approaches and NexGen's exposure pathways, receptor assumptions, toxicity reference values, or risk metrics. As a result, reviewers cannot determine whether deviations are conservative, equivalent, or risk-reducing.

NexGen response:

"NexGen followed CSA N288.6 and N288.1, which are consistent with Health Canada guidance. Health Canada documents were used where applicable."

Health Canada guidance:

Where non-standard assumptions or procedures different from Health Canada-prescribed methods are used, the implications for exposure and risk estimates must be explicitly described (Health Canada, 2021b, p. 33).

Consequence:

The HHRA cannot be independently verified for protectiveness or conservatism, resulting in reduced technical defensibility and uncertainty regarding whether Indigenous receptors are adequately protected.

Finding 2: COPC identification and screening are not protective of bioaccumulative substances and Indigenous ingestion pathways

Evidence (ACFN Comment 413):

Appendix A shows that NexGen omitted multiple COPCs known to be emitted from uranium mining activities, including metals in TSP and radionuclides deposited to terrestrial and aquatic environments. These omissions contradict PQRA requirements for pathway completeness. NexGen confirms that COPCs were screened based on predicted concentrations relative to selected benchmarks and did not revise the approach to incorporate end-of-pipe/ release point concentrations, persistence, bioaccumulation, mechanism of toxicity, or soil-to-tissue fate and transport, despite reviewer requests. NexGen relied solely on concentrations at the edge of the mixing zone, excluding COPCs that exceeded screening values at end of pipe or in runoff. PQRA and CSA N288.6 require screening that incorporates toxicity, mechanism of toxicity, and public concerns. COPC screening was primarily concentration-based and did not explicitly require inclusion of substances with persistence, bioaccumulation, or food-chain transfer potential. Substances relevant to traditional food and medicinal use pathways may therefore have been screened out prior to quantitative assessment. Screening did not demonstrate consideration of soil–plant–animal–human transfer or tissue residue pathways.

NexGen response:

"Best and standard practices were used for COPC screening. Additional criteria are not expected to change conclusions."

Health Canada guidance:

A sound justification is required before excluding any COPC, exposure pathway, or receptor from an HHRA (Health Canada, 2021b, p. 17).

Consequence:

Potentially relevant contaminants capable of accumulating in traditional foods and medicines were not assessed, resulting in unknown and unmanaged exposure risks for Indigenous land users.

Required Correction:

Re-screen COPCs using criteria that explicitly incorporate persistence, bioaccumulation, and ingestion-based exposure pathways, with documented justification for any exclusions.

Finding 3: Spatial and temporal boundary assumptions are fragmented and not evaluated for impact on HHRA results

Evidence (ACFN Comment 414):

ACFN raised concerns across multiple modelling sections regarding spatial extent, temporal duration, and predicted COPC concentrations. These concerns were not consolidated, nor was there an evaluation of how boundary assumptions influence exposure point concentrations or risk metrics (HQs, ILCRs, dose).

NexGen response:

"ACFN did not identify specific issues through engagement activities. No updates are required."

Health Canada guidance:

Spatial and temporal boundaries must be clearly defined and documented to ensure that risks are adequately characterized (Health Canada, 2019, p. 12).

Consequence:

It is not possible to confirm that the HHRA captures the locations, durations, and conditions under which Indigenous receptors may reasonably be exposed.

Finding 4: Far-future temporal boundaries are not defined or aligned with peak exposure timing

Evidence (ACFN Comment 416):

The HHRA references a "far-future" scenario but does not specify the timeframe used or demonstrate alignment with COPC-specific peak concentrations predicted by groundwater and surface water modelling.

NexGen response:

"Far-future effects were assessed using a precautionary approach, although long-term prediction is uncertain."

Health Canada guidance:

Temporal boundaries must be defined and documented, and post-closure risks should be evaluated where long-lived sources remain (Health Canada, 2019, pp. 12–13).

Consequence:

If HHRA exposure scenarios do not correspond to periods of maximum predicted exposure, health risks may be underestimated.

Required Correction:

Explicitly define the far-future period and demonstrate that exposure concentrations reflect predicted peak timing for each COPC.

Finding 5: Mixture toxicity and additive effects are not adequately evaluated

Evidence (ACFN Comment 418):

NexGen dismissed mixture toxicity despite documented co-occurrence of metals and radionuclides. PQRA requires evaluating contaminants with shared modes of action. NexGen does not dispute that risks were evaluated on a substance-by-substance basis and confirms that additive effects for chemicals with common target organs or carcinogenic mechanisms were not assessed. Only a limited subset of COPCs was quantitatively assessed, and additive effects among chemicals with shared target organs or mechanisms of toxicity were not evaluated, including for deposition-related contaminants.

NexGen response:

"Mixture toxicity was not required because endpoints differ."

Health Canada guidance:

Quantitative risk estimates for chemicals eliciting similar effects on the same target organ should be summed (Health Canada, 2021b, pp. 33–34).

Consequence:

Cumulative health risks from multiple contaminants may be underestimated.

Finding 6: COPC screening based solely on edge-of-mixing-zone exceedances excludes relevant exposure contexts

Evidence (ACFN Comment 419):

COPCs were only identified where benchmarks were exceeded at the edge of the mixing zone, even where exceedances occurred at end-of-pipe or runoff locations. No pathway-specific operability analysis was provided.

NexGen response:

"End-of-pipe exceedances are overly conservative because receptors are not regularly exposed there."

Health Canada guidance:

A sound justification is required before excluding exposure pathways or receptors (Health Canada, 2021b, p. 17).

Consequence:

Near-field, episodic, or culturally specific exposure scenarios may not have been assessed.

Finding 7: WHO air quality guidelines were not considered where more protective

Evidence (ACFN Comment 420):

Screening relied exclusively on Canadian and provincial benchmarks, despite reviewer identification of WHO air quality guidelines that are more protective for certain contaminants. NexGen confirms that air COPCs and benchmarks were selected using limited screening values and modelling durations and does not apply WHO air quality guidelines. The WHO prescribes more protective air quality guidelines for certain criteria air contaminants compared to Saskatchewan and Canada as shown below. WHO air quality guidelines apply globally and given the protective nature is sufficient rationale for why other jurisdictions should be appropriate for the assessment of risks to human health

NexGen response:

"Canadian benchmarks are appropriate thresholds."

Health Canada guidance:

Alternative benchmarks may be used, but their implications for risk estimates must be explained (Health Canada, 2021b, p. 33).

Consequence:

Chronic exposure risks may be understated where less protective benchmarks are applied.

Finding 8: Soil guideline application does not explicitly address soil-to-food bioaccumulation

Evidence (ACFN Comment 422):

Soil screening relied on CCME SQGs without explicit evaluation of soil-to-food transfer relevant to traditional food consumption, particularly for deposition-related contaminants. NexGen acknowledges reliance on CCME human-health soil guidelines and does not indicate that soil-to-plant or soil-to-food transfer modelling was conducted. NexGen did not apply criteria for traditional foods, medicinal plants, or untreated surface water pathways explicitly relevant to Indigenous land users. NexGen excluded air-deposited metals and radionuclides from HHRA, despite evidence of deposition

NexGen response:

"Current CCME soil quality guidelines are appropriate."

Health Canada guidance:

"Food ingestion can be a significant pathway of exposure, particularly when chemicals have the ability to bioaccumulate in the food chain and when the consumption of country foods constitutes a significant portion of an exposed person's diet" (Health Canada, 2010, p. 4). Relevant exposure pathways, including food ingestion, must be identified and justified if excluded (Health Canada, 2019, p. 12; Health Canada, 2021b, p. 17).

Consequence:

Health risks associated with food-chain transfer may be underestimated.

6.0 Discussion

This review evaluated whether the NexGen Energy Ltd. Rook I Project HHRA and ERA, together with NexGen's responses, align with applicable federal Health Canada and CCME guidance, and whether the issues raised by Integrated Toxicology Solutions (ITS) are supported by that guidance. The conclusions below distinguish between (i) findings where clear misalignment with federal guidance is demonstrated, resulting in outstanding issues, and (ii) findings where federal guidance is not sufficiently explicit to fully support the ITS issue as a formal non-alignment, although substantive uncertainties remain.

Findings Demonstrating Clear Misalignment with Federal Guidance (Outstanding Issues)

Several findings identify material departures from federal guidance where the guidance is explicit and prescriptive, and where NexGen's approach does not meet those expectations. These issues remain outstanding and require correction to achieve regulatory alignment.

First, COPC identification and screening (Finding 1) is misaligned with Health Canada guidance. Federal HHRA guidance explicitly requires consideration of toxicity, persistence, bioaccumulation, and exposure potential when identifying COPCs, and advises against screening out substances solely due to the absence of federal guidelines. NexGen's reliance on exceedance-based screening using selected benchmarks, without incorporating persistence, bioaccumulation, or fate and transport to biota, does not meet this requirement.

Second, mixtures and additive effects (Finding 2) are not assessed in a manner consistent with federal guidance. Health Canada guidance clearly states that non-cancer hazard quotients should generally be summed for substances with common target organs or mechanisms of action, and that cumulative cancer risk should be evaluated where concurrent exposure to multiple carcinogens is possible. NexGen's substance-by-substance approach is therefore misaligned with federal expectations.

Third, country foods and food-chain exposure pathways (Finding 4) are not adequately addressed. Health Canada's country foods guidance explicitly requires consideration of bioaccumulation into edible plants and animals and cautions against dismissing these pathways based on land use designation or regulatory restrictions. NexGen's reliance on soil guidelines without modelling uptake into traditional foods and medicines does not align with this guidance.

Fourth, air-deposition-driven food-chain exposure pathways (Finding 9) are misaligned with federal guidance. Health Canada guidance explicitly requires consideration of indirect exposure pathways where contaminants are emitted to air and subsequently deposit to soil, water, sediment, and biota, particularly where food-chain exposure is relevant. CCME ERA guidance similarly requires evaluation of transport and fate across environmental media and associated exposure pathways. NexGen's exclusion of deposition-driven contamination of soils, waters, sediments, and traditional foods from the HHRA represents a clear departure from these requirements.

Finally, sediment-related exposure pathways (Finding 8) show misalignment where federal guidance is explicit. Both Health Canada and CCME identify sediment as a relevant exposure medium when aquatic biota and food-web pathways are present. NexGen's exclusion of post-closure sediment effects and inconsistent sediment COPC

treatment, despite ERA screening identifying sediment as relevant, is not supported by federal guidance and remains an outstanding issue.

Findings Where Federal Guidance Is Less Explicit or Not Sufficiently Prescriptive

Some ITS issues identify important uncertainties or limitations, but federal guidance does not provide sufficiently specific direction to formally conclude misalignment, even though the issues may still warrant consideration in regulatory decision-making.

Air pathway modelling duration and the use of WHO air quality guidelines (Finding 3) represents such a case. While Health Canada guidance emphasizes the importance of evaluating chronic inhalation exposure where long-term exposure is anticipated, it does not explicitly require the use of WHO guidelines or specify minimum air modelling durations equivalent to multi-year CAAQS averaging. As a result, this issue represents a limitation and source of uncertainty rather than a clear non-compliance with federal guidance.

Similarly, long-term and intergenerational exposure timeframes (Finding 6) are not explicitly prescribed in federal HHRA or ERA guidance. Health Canada guidance requires exposure duration assumptions to reflect contaminant persistence and pathway longevity, but it does not specify multi-decadal or intergenerational assessment periods. Consequently, while NexGen's project-life-focused timeframe may under-represent long-term risks, federal guidance is not sufficiently explicit to conclude formal misalignment.

Finally, post-closure effects (Finding 7) highlight acknowledged data gaps. CCME guidance requires explicit identification of uncertainty and cautions against drawing conclusions for unassessed pathways, but it does not mandate assessment of specific climate-change pathways. In this case, the issue is that NexGen cannot conclude no effect where pathways were not assessed, rather than a failure to comply with a specific assessment requirement.

In summary, the review demonstrates that several core issues raised by ITS, particularly those related to COPC screening, mixture toxicity, country foods pathways, air-deposition-driven food-chain exposure pathways, baseline-plus-project risk characterization, and sediment exposure, are clearly supported by federal Health Canada and CCME guidance and remain outstanding due to misalignment in NexGen's assessment approach. Other issues identify meaningful uncertainties and limitations but are not explicitly mandated by current federal guidance and therefore cannot be characterized as formal non-compliance, although they remain relevant considerations for risk management and regulatory decision-making.

Taken together, this information clarifies which findings represent required corrective actions to achieve federal alignment, and which represent areas where federal guidance is silent or less prescriptive and therefore may require regulatory judgment or additional policy direction rather than strict compliance correction.

7.0 Conclusions

This memorandum was prepared to support Athabasca Chipewyan First Nation (ACFN) in the CNSC hearing for the NexGen Energy Ltd. Rook I Project by clarifying how CNSC regulatory requirements, embedded standards, and federal risk assessment guidance are intended to function together, and by identifying where material misalignments affect confidence in conclusions regarding protection of human health and the environment.

A review of the NexGen Rook I Project application demonstrates multiple instances where the ERA and HHRA did not align with the requirements of federal Health Canada HHRA/PQRA and CCME ERA guidance. Because CNSC environmental protection standards rely on CSA N288.6 for ERA structure and Health Canada HHRA guidance for methodological rigor, these omissions represent substantive departures from the technical expectations that underpin CNSC decision-making.

Health Canada PQRA guidance (2021b) requires comprehensive identification of all contaminants of potential concern (COPCs), complete exposure pathway assessment, consideration of additive toxicity, and use of appropriate toxicological benchmarks. The NexGen application did not meet these requirements in several documented areas. As a result, key deficiencies, including incomplete COPC lists, omission of radionuclides and metals, incorrect screening approaches, absence of additive toxicity assessment, and failure to assess Indigenous exposure pathways, mean that the NexGen assessment cannot satisfy REGDOC-2.9.1 requirements for protecting human health.

These deviations materially undermine CNSC's ability to determine "no unreasonable risk" under the Nuclear Safety and Control Act and therefore require revision to achieve CNSC compliance.

The most significant and consequential misalignment between NexGen Energy Ltd.'s application and applicable federal requirements under the CNSC framework is the failure to assess Indigenous country-food and food-chain exposure pathways, including air-to-deposition-to-soil/sediment-to-biota-to-human exposure pathways, despite explicit requirements in federal guidance.

As documented in the Integrated Toxicology Solutions (ITS) technical review and confirmed through NexGen's own responses, the HHRA did not evaluate the dominant exposure pathways relevant to Indigenous Traditional Land Users. NexGen screened COPCs primarily using predicted concentrations relative to selected environmental quality guidelines and did not extend fate and transport analyses to soils, sediments, aquatic systems, or biota supporting traditional harvesting. NexGen explicitly acknowledged that soil-to-plant, sediment-to-biota, air-deposition, and post-closure food-chain pathways were not assessed yet nevertheless concluded that human-health risks were acceptable.

This omission represents a clear departure from Health Canada human-health risk assessment guidance, including the Guidance for Evaluating Human Health Effects in Environmental Assessment, the Preliminary Quantitative Risk Assessment (PQRA) guidance, and the Supplemental Guidance on Human Health Risk Assessment of Chemicals in Country Foods. These documents explicitly require assessment of food ingestion pathways where country foods are consumed, consideration of bioaccumulation and biomagnification, evaluation of exposure through all relevant environmental media, and characterization of baseline-plus-project exposure. NexGen's exclusion of food-chain pathways directly conflicts with these requirements.

The omission is also inconsistent with CCME Ecological Risk Assessment guidance, which identifies sediment and sediment porewater as core exposure media where aquatic food webs are present and cautions against drawing conclusions for pathways that have not been assessed. By excluding sediment-mediated exposure while concluding no adverse effects, NexGen's assessment does not meet CCME expectations for pathway completeness or uncertainty treatment.

Because the CNSC environmental protection framework relies on CSA N288.6 for ERA structure and on Health Canada and CCME guidance for methodological rigor, this failure constitutes a substantive misalignment with CNSC regulatory expectations under REGDOC-2.9.1, REGDOC-2.9.2, and the CEAA 2012 Generic EIS Guidelines for Nuclear Projects. Indigenous land use and country-food consumption are explicitly recognized within these documents as critical exposure considerations, and omission of these pathways cannot support a defensible finding of "no unreasonable risk."

In summary, the failure to assess Indigenous country-food and food-chain exposure pathways is the most egregious deficiency identified in the NexGen application. This omission affects contaminant identification, exposure assessment, risk characterization, and overall conclusions, and materially undermines the ability of the HHRA to demonstrate that risks to Indigenous Traditional Land Users are understood, acceptable, or managed. Correction of this deficiency is required to achieve alignment with federal Health Canada and CCME guidance and to support defensible CNSC decision-making.

Overall, NexGen's HHRA does not consistently align with federal Health Canada HHRA/PQRA or CCME ERA guidance as required under CNSC regulatory documents. NexGen responses acknowledge multiple unassessed pathways and methodological exclusions identified by the technical review, while federal guidance explicitly requires consideration of persistence, bioaccumulation, mixtures, baseline-plus-project exposure, country-foods pathways, and explicit treatment of uncertainty. The assessment therefore cannot be relied upon to demonstrate that risks to Indigenous Traditional Land Users are understood, acceptable, or managed. Revisions to the HHRA to align with federal guidance, incorporate Indigenous traditional land-use exposure pathways, and address all acknowledged gaps are required prior to regulatory approval.

This memorandum demonstrates that while the CNSC regulatory framework clearly requires protection of human health, Indigenous land users, and the environment, that protection depends on the proper integration of external federal guidance to supply methodological rigor. Where federal guidance is explicit, misalignment in NexGen's assessment remains an outstanding issue requiring correction. Where guidance is less prescriptive, acknowledged gaps and uncertainties must be transparently considered by the hearing panel in its deliberations.

Closing

This document was prepared under the direction of a professional biologist registered in the Province of Alberta. Integrated Toxicology Solutions Ltd. trusts that it will provide ACFN DLRM with the information it requires to engage ibn the NexGen Rook I Project hearing. Should you have any questions or concerns, please do not hesitate to contact the undersigned.

Sincerely,

Mandy Olsgard, M.Sc., P. Biol.
Principal/ Senior Toxicologist
Integrated Toxicology Solutions Ltd.
Edmonton, AB

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Technical Memo from Thompson Aquatic Consulting

Hearing Preparation Research – NexGen Rook 1 Project – surface water quality and aquatic ecosystems

November 10, 2025

To: Callie Davies-Flett
Dene Lands and Resource Management
Athabasca Chipewyan First Nation

From: Megan Thompson, Ph.D., R.P. Bio., P. Biol.
Thompson Aquatic Consulting

Introduction

At the request of Athabasca Chipewyan First Nation (ACFN) Dene Lands and Resource Management (DLRM), Thompson Aquatic Consulting is pleased to provide the following scope of work and cost estimate to complete research and prepare a summary memo focused on the adequacy of the Canadian Nuclear Safety Commission (CNSC) Regulatory Documents (REGDOCs), in particular, those related to Environmental Protection (https://www.cnsc-ccsn.gc.ca/eng/acts-and-regulations/regulatory-documents/). This review will include consideration of the procedures followed by NexGen for the Rook 1 Project Application, in light of any inadequacies noted in the CNSC guidance.

The Project

The NexGen Rook 1 Project is a proposed underground uranium mine and mill that will be located on the south shore of Patterson Lake, in the Clearwater River watershed of northwestern Saskatchewan. The primary potential project effects on water and sediment quality are likely to be: (a) via direct discharges of treated domestic sewage and mine water effluent to Patterson Lake during the life of the Project, and; (b) via seepage from underground waste rock storage facilities into the far future.

Of note, the Rook 1 Project is being assessed jointly by Saskatchewan and Canada. At the federal level, the Project is subject to the older Canadian Environmental Assessment Act 2012, and not the more recent Impact Assessment Act.

Relevant CNSC Regulations

The primary regulatory guidance issued by the CNSC that were reviewed is the *Environmental Principles, Assessments and Protection Measures* (REGDOC-2.9.1, version

1.2) issued in 2020 and available at https://www.cnsc-ccsn.gc.ca/eng/acts-and-regulations/regulatory-documents/published/html/regdoc2-9-1-vol1-2/ . In addition, another related document – *Environmental Protection: Controlling Releases to the Environment* (RegDOC-2.9.2) is available at https://www.cnsc-ccsn.gc.ca/eng/acts-and-regulations/regulatory-documents/published/html/regdoc2-9-2/ .

Of note, the Rook 1 Project is being assessed jointly by Saskatchewan and Canada, and at the federal level, the Project is subject to the older Canadian Environmental Assessment Act 2012, and not the more recent Impact Assessment Act. For this reason, the CNSC's guidance document *Generic Guidelines for the Preparation of an Environmental Impact Statement – Pursuant to the Canadian Environmental Assessment Act, 2012* (available at https://www.cnsc-ccsn.gc.ca/eng/resources/environmental-protection/ceaa-2012-generic-eis-guidelines/).

Several Canadian Standards Association (CSA) publications were also cited as relevant to REGDOC-2.9.1, including Environmental or Effluent monitoring programs at Class 1 nuclear facilities and uranium mines and mills, however these documents are not freely available for review.

Application of CNSC Guidance

In general, the guidance documents provide direction that should result in a thorough, robust and technically valid environmental impact assessment, where one is required. For example, the *Generic Guidelines for the Preparation of an Environmental Impact Statement* includes the following guidance statements:

- "***Application of the precautionary approach:*** *In documenting the analyses included in the EIS, the proponent will demonstrate that all aspects of the project have been examined and planned in a careful and precautionary manner in order to avoid significant adverse environmental effects.*" (Section 2.5)
- "***Description of the environment - Baseline environment****: The EIS will include a description of the environment, including the components of the existing environment and environmental processes, their interrelations and interactions, and the variability in these components, processes and interactions over time scales appropriate to the EIS. In characterizing the environmental effects of the project, the proponent will consider the current baseline environment and environmental trends within the project area. The description of the existing baseline and environmental trends should consider past projects and activities carried out by the proponent and/or others in the project area. A document by Canada's Privy Council Office, A Framework for the Application of Precaution in Science-based Decision Making About Risk, sets out guiding principles for the application of precaution to science-based decision making…The baseline*

description should include results from studies done prior to any physical disruption of the environment due to initial project activities (e.g., site preparation)." (Section 8.1)

- "***Surface water environment:*** *The surface water environment includes all surface water features and hydrology that affect surface water at the site or in the local and regional study areas. The applicant or licensee should include delineation of drainage basins at appropriate scales. When documenting the water quality of all surface water, the applicant or licensee should demonstrate the use of appropriate sampling and analytical protocols for the range of analytical parameters that could potentially be influenced by the facility or activity. This information should be presented using tables, maps and figures to provide an understanding of surface water characteristics and conditions at the site and in the local and regional study areas.*" (Section 8.3)

On the face of it, this guidance is sound, however it is too high-level with too few details to ensure a standard and consistent application. The guidance could be interpreted and implemented by different people in different ways, and the potential for proponents to implement the guidance in a way that minimizes cost, effort and/or the risk of not obtaining an approval is considerable. This is a common pattern in other industries, including oil sands mining.

The concerns that were raised in the Thompson Aquatic Consulting technical review of the Environmental Impact Statement (EIS) for surface water and aquatic ecosystems tend to fall into the category of inadequately following the CNSC guidance, and not into the category of not following the guidance at all. For example, the concern with the statistical analysis used to establish the surface water quality baseline may seem like a technicality, but it results in an overinflated estimate of baseline, with real implications for the assessment and characterization of impacts. In the meantime, the guidance provides no details about preferred statistical approaches. Similarly, the concern about the selection of appropriate water or sediment quality guidelines, or the use of only a certain type of guideline to screen out constituents of potential concern from the assessment are not contraventions of the CNSC guidance, which doesn't specify the guidelines to be used or how exactly they should be used.

Since the interpretation of the high-level guidance is subjective, these concerns can easily be considered 'nit-picky' for an EIS that others may consider to adequately follow CNSC guidance. As a result, it is unlikely that that CNSC guidance can be considered out of date, but rather too general and high-level to ensure the production of a thorough, robust and technically valid environmental impact assessment, at least in the technical realm of surface water systems.

Closing

Thank you for the opportunity to provide this technical memo. I trust that it will provide ACFN DLRM with the information required to continue to effectively participate in the NexGen Rook 1 Project application process. Please contact me with any questions or concerns.

Sincerely,

Megan Thompson, Ph.D., P. Biol., R.P. Bio.
Limnologist, Principal
Thompson Aquatic Consulting

ACFN TECHNICAL REVIEW OF NEXGEN EIS

Environmental Impact Statement – Consolidated Comments from Indigenous Nations and Communities and the Public on the NexGen Rook I Project Draft EIS (ACFN Response)

Number	Source	Reference to EIS, appendix or TSD	Comment Summary (all original submissions can be found on Canadian Impact Assessment Registry reference: 80171)	NexGen Response	ACFN Technical Reviewer Response & Recommendation
389.	ACFN (October 28, 2022)		The EIS hydrology and climate-change components contain data and assessment gaps and methodological deficiencies that likely mean EIS effects assessments are unreliable and may underestimate potential effects. Shortcomings in methods involve model validation, characterization of future climates in effects assessments and temporal scope for change in future climates.	NexGen maintains that the hydrology assessment provides a reliable and accurate characterization of Project effects, including how Project effects could be modified by climate change. The anticipated effect of climate change on hydrology relative to the Base Case was assessed independently from the effects of the Project and other developments. Four sensitivity scenarios were also modelled to understand uncertainty in climate change projections and quantify sensitivity of the model to the range of potential climate change outcomes as presented in Draft EIS Appendix 9A (Hydrological Modelling Summary Report). This approach has produced a fulsome understanding of potential effects associated with climate change. NexGen acknowledges that direct validation of the hydrology model was not possible because all available hydrometric monitoring data were used for model calibration. However, potential model uncertainty was managed by conducting an independent validation using regional data to verify model performance. Therefore, NexGen is confident that the model outputs provide an accurate representation of expected changes to the hydrological environment. NexGen notes that, should the Project be approved, hydrological models will be further verified using measured data collected under the Environmental Monitoring Plan.	The ACFN comments referred to by NexGen in this item #389 are summary comments that were provided in the introduction to the ACFN's 2022 Hydrology Technical Review. The review comments associated with these comments are provided by ACFN in other NexGen numbered items here, as follows: • Concerns with model validation – NexGen item #393 • Deficiencies in climate change analysis – NexGen items #394 and #395 The comments provided here about the EIS climate change assessment by NexGen's in its response #389 are responded in items #394 and #395.
390.	ACFN (October 28, 2022)	Section 9.2.6.1-Hydrology	Inadequate baseline data, particularly at Project-specific monitoring stations undermines the reliability of outputs from hydrologic simulation modelling, particularly for smaller streams.	NexGen maintains that the baseline data collected for the Project was appropriate for the determination of Project effects and meets regulatory requirements. The baseline hydrometric data collection program is summarized in Draft EIS Section 9.2.6.1 (Baseline Hydrology Monitoring and Studies) and presented in greater detail in Draft EIS Annex IV.2 (Hydrometric Monitoring Report). The baseline period extended from August 2018 to October 2020 capturing seasonal variation and a range of hydrological conditions. For example, based on streamflow and water levels, summer 2018 and spring 2019 were dry and summer 2019 and spring 2020 were wet. NexGen confirms that hydrological monitoring has continued beyond the period presented in the Draft EIS (i.e., 2018 to 2020) and continues to improve the overall understanding of receiving environment hydrology. NexGen further confirms that monitoring data supports the Draft EIS modelling and is within the variation predicted. NexGen notes that the landscape in the RSA is highly permeable, resulting in relatively few small headwater watercourses. The model used for hydrological simulation modelling was developed to account for subsurface routing of runoff to the central lake chain. This approach is appropriate in consideration of the regional conditions.	The ACFN comments referred to in this item were summary comments provided in the introduction to ACFN's Hydrology review. Additional related comments were also provided on page 4 of ACFN's 2022 Technical Review of the Project. NexGen states that the "baseline data collected for the Project was appropriate for the determination of Project effects and meets regulatory requirements." Given that the project-specific monitoring data available in the EIS provide at best only one complete year and two partial years of field data and given the significant data gaps within these periods at several of the hydrometric stations including the only one under 100km^2 (see Appendix D of Annex IV.2), it is difficult to understand the basis of these assurances. In addition, although for support NexGen refers to other data sets it has monitored subsequent to preparing the EIS, those data sets are not provided in the EIS. **If NexGen is using additional non-EIS data sets to support the validity of its EIS modelling and interpretations, then it should provide these data to the EIS review process, otherwise these comments are unreliable and should be disregarded.** NexGen notes that there are "relatively few small headwater watercourses", however, NexGen does not define the spatial scale referred to by this comment. It is noted that the project-specific monitoring is available largely for catchments only over 120 km^2 yet streams of smaller sizes are of importance in the effects assessment. The following information requests are provided: **1. How has NexGen determined the suitability of the project-specific monitoring data, particularly in light of the fact that they consist of two partial years and only one full year of monitoring and with significant data gaps within these short periods?** **2. Which specific regulatory requirements are met by the short-duration project-specific monitoring that NexGen has carried out as provided in its EIS?** If the suitability of the project-specific hydrology monitoring data depends on data not included in the EIS, please provide these additional monitoring data.
391.	ACFN (October 28, 2022)	Hydrology	A predevelopment baseline is not provided. In the absence of a pre-development baseline, explain how cumulative effects on Traditional-use activities can be fully and appropriately determined.	NexGen notes that the assessment of cumulative effects on Indigenous land and resource use is provided in Draft EIS Section 16 (Cultural and Heritage Resources and Indigenous Land and Resource Use). The assessment of effects includes consideration of the Base	In this response #391, NexGen recognizes that its Base Case is an impacted case because it "includes influences from previous and existing developments". NexGen also understands that these influences contribute to the cumulative effects that are in place in its subsequent

Number	Source	Reference to EIS, appendix or TSD	Comment Summary (all original submissions can be found on Canadian Impact Assessment Registry reference: 80171)	NexGen Response	ACFN Technical Reviewer Response & Recommendation
				Case, which includes influences from previous and existing developments and natural factors (i.e., fire, floods, and drought), the Application Case, which includes the Base Case plus effects from the Project, and the Reasonably Foreseeable Development Case, which includes the Base Case, Application Case, and effects from reasonably foreseeable developments. Therefore, all cumulative effects on the Indigenous land and resource use valued component were considered and compared against the assessment endpoint of continued ability to participate in Indigenous land and resource use activities. For this reason, cumulative effects on Indigenous land and resource use have been fully and appropriately determined.	Cases including its Application Case and Reasonably Foreseeable Development Case. NexGen further acknowledges that it has not provided an assessment of these influences from previous and existing developments despite them being built into its Base Case. As explained by the initial reviewer comments, this gap in the EIS could be addressed through the provision of a pre-development baseline. It is contradictory and unsupported for NexGen to recognise these gaps yet to conclude: "[t]therefore, all cumulative effects on the Indigenous land and resource use valued component were considered and compared against the assessment endpoint" and that as a result "cumulative effects on Indigenous land and resources have been fully and appropriately determined." As a result of these recognised gaps: **1. It is requested that a predevelopment baseline be determined and compared against the Base Case to identify the "influences from previous and existing developments" the existence of which is clearly acknowledged by NexGen.** It is further requested that the results of the above assessment be included with the partial cumulative effects assessments currently provided in EIS Section 16 and that the additional information be used to complete the cumulative effects assessment.
392.	ACFN (October 28, 2022)	Section 9.2.6.1-Hydrology	The absence of systematic documentation of Indigenous navigability and its requirements is of concern given the importance of water-based access for carrying out Traditional-use activities.	NexGen confirms that the Draft EIS incorporated Indigenous Knowledge regarding the navigability of the Clearwater River and an assessed the potential changes to surface water flow and stream channel parameters. As referenced in Draft EIS Section 9.3.6 (Stream Channel Parameters), the CRDN have reported that seasonal water level changes affect river travel in general within their traditional lands and that travel on the Clearwater River is very difficult and technically challenging for canoes because of the many rapids and need for portages (TSD V.2: CRDN). The CRDN also expressed concerns about changes to water levels and flows on the Clearwater River from the Project, which could affect travel on the river (TSD V.2: CRDN). Increases in flows downstream of the Project may result in small changes in Clearwater River channel parameters. Predicted changes in river channel parameters using wetted area as the representative parameter are provided in Table 9.6-8 of Draft EIS Section 9.6.1.3 (Stream Channel Parameters). Increases in wetted area are predicted to be a maximum of 1.2% at all locations and are not expected to be large enough to be detectable or to affect navigation, including water-based access. Therefore, changes in water surface elevations are not expected to affect open water navigation of the Clearwater River or downstream lakes for Indigenous land and resource users or recreationists (Draft EIS Section 9.6.1.3).	The ACFN comments referred to by NexGen in this item #392 are part of a summary originally provided in the introduction to ACFN's 2022 Hydrology review. The associated detailed comments were provided elsewhere in that review (see page 4 of ACFN's 2022 Technical Review of the Project) and responded to by NexGen in item #396 (below). NexGen's response here is identical to its response to item #396 so please refer to that item for the ACFN response to this item.
393.	ACFN (October 28, 2022)	Section 9.2.6.2.6; Section 9.8; Section 9A5 – Hydrology	Confirm whether the hydrologic model was validated at non-regional scales. If it wasn't validated, also explain why it was subsequently applied in the EIS effects assessments at these non-regional scales.	NexGen acknowledges that direct validation of the hydrology model was not possible because all available hydrometric monitoring data were used for model calibration. However, potential model uncertainty was managed by conducting an independent validation using regional data to verify model performance. NexGen maintains that the application of indirect model validation based on regional data over a lengthy time period demonstrates that the continuous simulations reflect natural variations observed for a longer period than Project-specific baseline monitoring would permit. Therefore, NexGen is confident that the model outputs provide an accurate representation of expected changes to the hydrological environment, including localized changes from the Project. NexGen notes that, should the Project be approved, hydrological models will be further verified using measured data collected under the Environmental Monitoring Plan.	NexGen confirms here and in EIS section 9A3.9 that its hydrologic model has not been validated using Project-specific field monitoring data. Instead of validating the model (what NexGen refers to as "direct validation"), it uses simulated data based on regional monitoring from a hydrometric station at a scale of 1690 km^2.(See section 9A3.9 for further discussion).In its response #393, NexGen does not suggest that this is a suitable alternative to model validation, but instead refers to natural variations in streamflow that all long-term monitoring would reflect and would be available to NexGen regardless in this case from the regional Water Survey of Canada station 07MA003 Douglas River near Cluff Lake. Unfortunately, this approach doesn't address the EIS shortcoming that the model has not been validated using project-specific data gathered at the appropriate spatial scales. Watershed-area prorating of data gathered at a coarse scale cannot be equivalent to project-specific data gathered at the spatial scale at which effects are to be determined. It is noteworthy that for several of the monitored watercourses. even the project-specific baseline (calibration) data contain significant monitoring gaps within the already short monitoring period of August 2018 to October 2020 (as reviewed here in response item #390). As a result, it is evident that overall, the EIS hydrologic modelling is largely based on

Number	Source	Reference to EIS, appendix or TSD	Comment Summary (all original submissions can be found on Canadian Impact Assessment Registry reference: 80171)	NexGen Response	ACFN Technical Reviewer Response & Recommendation
					simulated data with little calibration or validation support from field data measured at appropriate spatial scales.
394.	ACFN (October 28, 2022)	Appendix 22A5.1; Section 9.4-Hydrology	Revise EIS section 9 (hydrology) to include the range of future climates, carrying forward this range through to the end of the effects assessments.	NexGen maintains that the methods used for the hydrology assessment are appropriate and that further evaluation of various ranges of future climates is not warranted. The intent of the hydrology assessment was to characterize the effects of the Project on measurement indicators in the receiving environment. The anticipated effect of climate change on hydrology relative to the Base Case was assessed independently from the effects of the Project and other developments. This enabled the assessment to examine the relative contributions of effects from Project, reasonably foreseeable developments, and climate change and predict the combined effects.	In ACFN's original hydrology review comments associated with this NexGen response #394, technical deficiencies were identified related to how NexGen has characterised future climates and then used that information in its effects assessments. In its response, NexGen rejects those concerns, maintaining that its hydrology methods are "appropriate" and that no further work is needed in this respect. However, its view of its own methods is unsupported by widely accepted scientific practice as detailed in ACFN's original review comments. The EIS states that the hydrology assessment, "Section 9 of the Environmental Impact Statement (EIS) provides a comprehensive assessment of potential effects of the Rook 1 Project (Project) on hydrology". This can only be done if the range of future climates is appropriately characterised. In its response #394, NexGen refers to "the effects of the Project on measurement indicators in the receiving environment" however this would also require suitable characterisation of future climates. In its response #394, NexGen further states that the "effect of climate change on hydrology relative to the Base Case was assessed independently from the effects of the Project and other developments." This implies that effects due to development and climate are additive. NexGen does not speak to the weakness of this fragmented approach to characterising Project effects. Given the significant gaps in how the EIS characterises and applies future climates, the following information requests are made: **1. With reference to published scientific methods from relevant authoritative bodies (e.g., Ouranos) explain how NexGen concludes that a mean of its climate change scenarios (and including RCP2.6) can represent "the most probable of the climate change scenarios." (EIS s.9.4)** Explain how it is appropriate to determine future climate effects on site hydrology and Valued Components independently from those due to development.
395.	ACFN (October 28, 2022)	Section 9.2.7; Section 6.10; Appendix 22A – Hydrology	a) Revise the future projected climate to include the full extent of climate change expected during Project lifespan – i.e., to 2067 rather than to 2055. b) Revise EIS section 9 (hydrology) to include the full temporal range of projected climates (to 2067) carrying forward this range through to the end of the effects assessments.	NexGen confirms that the future projected climate change predictions include the anticipated Project lifespan temporal range. As noted in Draft EIS Section 9.2.7 (Climate Change), monthly climate change factors developed for the 2050s includes the years 2041 through 2070, which were applied to the full climate time series used as input to the climate change hydrological simulations. The 2050s (i.e., 2041 to 2070) represents a reasonable upper bound in terms of climate change during the Project lifespan. No changes to the EIS are required.	In ACFN's original hydrology review comments associated with this NexGen response #395, a detailed explanation was provided as to why the 2050s does not capture the full range of climate during Project lifespan. Those comments explained that the EIS does not bracket the projected changes in climate during Project lifespan and clarified how the 2041-2070 period, as a result, does not sufficiently represent the "reasonable upper bound in terms of climate change during the Project lifespan" that NexGen claims in its EIS. NexGen's #395 response does not speak to the detailed explanation provided by ACFN and simply restates its view that using the 2050s is adequate. The following comments were provided in ACFN's original hydrology review: "The EIS repeatedly claims that it is aligned with the precautionary principle and its effects assessments are conservative because they overestimate effects. For example, the EIS states (p6-3): "To align with the precautionary principle a conservative approach is applied in EAs when information is limited so that effects are typically overestimated." Again, on p6-34, the EIS states: "The assessment applied a precautionary approach to address uncertainty by using the largest magnitude, duration, and geographic extent of potential adverse effects when a range of possible outcomes could be possible." In addition, it is repeated in effects assessments and specifically in the hydrology section (see section 9.2.11). Given its approach to dealing with the change in climate associated with the years after 2055 and given the increments in change associated with those additional years, the EIS is evidently not as conservative as it believes." Given NexGen's apparent lack of concern for it not bracketing future climate in its assessments, it is unclear how it can also claim that this is conservative and precautionary. Given the expected significant influence of climate on the determination of Project effects,

Number	Source	Reference to EIS, appendix or TSD	Comment Summary (all original submissions can be found on Canadian Impact Assessment Registry reference: 80171)	NexGen Response	ACFN Technical Reviewer Response & Recommendation
					the following information requests are made: **1. With reference to scientific literature, explain how it is appropriate to exclude the 2080s from the determination of future climates during full Project lifespan.** Explain how it is precautionary to not include the full range of change in climate projected during the Project lifespan.
396.	ACFN (October 28, 2022)	Section 6.3.1 (p6-12); Section 6.3.2 (p6-12); Section 9 Executive Summary (pi-iii); Section 9.3.2.1 (p9-39 & 9-40); Section 9.3.2.2 (p9-48 to 9-51); Section 9.3.6 (p9-58); Section 9.6.3 (p9-85 to 9-91); Section 16.2.2.3 (p16-15); Section 16.2.7 (p16-26); Section 16-5 – Hydrology	Provide an Indigenous navigation effects assessment including a thorough and systematic description of the navigation requirements of Traditional-use activities.	NexGen confirms that the Draft EIS incorporated Indigenous Knowledge regarding the navigability of the Clearwater River and assessed the potential changes to surface water flow and stream channel parameters. As referenced in Draft EIS Section 9.3.6 (Stream Channel Parameters), the CRDN have reported that seasonal water level changes affect river travel in general within their traditional lands and that travel on the Clearwater River is very difficult and technically challenging for canoes because of the many rapids and need for portages (TSD V.2: CRDN). The CRDN also expressed concerns about changes to water levels and flows on the Clearwater River from the Project, which could affect travel on the river (TSD V.2: CRDN). Increases in flows downstream of the Project may result in small changes in Clearwater River channel parameters. Predicted changes in river channel parameters using wetted area as the representative parameter are provided in Table 9.6-8 of Draft EIS Section 9.6.1.3 (Stream Channel Parameters). Increases in wetted area are predicted to be a maximum of 1.2% at all locations and are not expected to be large enough to be detectable or to affect navigation, including water-based access. Therefore, changes in water surface elevations are not expected to affect open water navigation of the Clearwater River or downstream lakes for Indigenous land and resource users or recreationists (Draft EIS Section 9.6.1.3).	In its item #396 response, NexGen recognises the importance of gathering and incorporating Indigenous Knowledge regarding Indigenous navigability and of determining the potential for the Project to bring about adverse effects to it. However, NexGen has dismissed the need for an Indigenous navigation effects assessment and its judgment in this regard is based on unsuitable information: • According to NexGen's item #396 response, the Clearwater River Dene Nation has confirmed there are navigation issues requiring assessment in relation to the Project. • In ACFN's original hydrology review comments associated with this NexGen response #396, ACFN has previously pointed out that Indigenous navigability should have been selected as a Valued Component within the EIS. • The EIS interprets long-term flow means (seasonal, annual) rather than the flow and stream channel parameters associated with the specific periods when Indigenous water-based access is needed but is limiting in the river. For example, small changes in mean annual flow mask larger changes in weekly or daily flow, particularly under the projected extremes of future climates. • NexGen asserts mistakenly that mean project effects within the range of natural seasonal and annual variability provides assurance that the effects are insignificant and do not require assessment. Instead, and as indicated above, such interpretations must be reached on the basis of metrics suitably representing limiting-use scenarios. • The effects due to climate change (shown in EIS Table 9.7-1) are unreliable due to the deficiencies of the climate change assessment as discussed in items #394 and #395. Additionally, the EIS does not consider changes in climate extremes. • Based on unsuitable information, NexGen states that project effects "are not expected to affect open water navigation" however, significant determinations regarding Indigenous Territorial access should not be based on expectations but rather on outcomes of suitable and objective assessments. The following information request is provided: **Given the critical importance of Indigenous navigability in enabling Traditional-use activities and Territorial access and in light of the numerous EIS gaps identified, explain how NexGen can justify not providing an assessment of Project effects on Indigenous navigability associated with the Project RSA.**
397.	ACFN (October 28, 2022)	Section 9.8; Section 9.2.11 – Hydrology	Given the short duration of the Project-specific baseline data, the inappropriate consideration of projected climates within the effects assessments, and the lack of RSA model validation at non-regional scales, explain how the EIS can justify claiming a high confidence for its hydrology predictions.	NexGen confirms that the approach undertaken to characterize the existing environment and assess Project effects meets regulatory requirements and has included conservative approaches and assumptions applied to industry-standard models based on measured data, in conjunction with Intergovernmental Panel on Climate Change-endorsed climate scenarios. Therefore, NexGen disagrees with the reviewer's opinions regarding insufficient baseline data, inappropriate consideration of projected climates, and lack of model validation and maintains that predictions based on the methods utilized in the hydrology assessment carry a high degree of confidence (Draft EIS Section 9.8 [Prediction Confidence and Uncertainty]).	NexGen's #397 response is modest in comparison with the assertions provided in the EIS (s.9.2.11) that the "assessment applied a precautionary approach to address uncertainty by identifying the greatest magnitude, duration, and geographic extent of potential adverse effects when a range of possible outcomes was possible." For example, as indicated in ACFN's original hydrology review comments associated with this NexGen response #397, taking forward climate projections based on a mean of three emissions scenarios which includes RCP2.6 does not meet this claim and is not supported scientifically. **While the EIS does utilise climate scenarios provided by the IPCC, it uses them in a way that is inconsistent with accepted practice and not in a manner that can be described as precautionary.**
398.	ACFN (October 28, 2022)	10.2.8.3.3 Productivity Status Thresholds, p. 10-48 to 10-49 Table 10.2-8 10.3.1.3 Productivity Status	Please revise the total phosphorous water quality Project Threshold to 10 µg/L, from 20 µg/L.	NexGen maintains that the proposed total phosphorous Project water quality threshold of 20 µg/L is appropriate. The limit used for setting the Project threshold for aquatic productivity using total phosphorus (i.e., 20 µg/L) is based on the associated trophic condition at the upper bound of the mesotrophic status per the interim Ontario provincial guideline for phosphorus (MOEE 1994), which is consistent with the same trophic category using total phosphorus in Canadian lakes and rivers (Environment Canada 2004; CCME 2004). NexGen selected this specific limit for the total phosphorus Project threshold because below this concentration, nuisance concentrations of algae in the local lakes would be expected to be avoided.	NexGen's response confirms that it has chosen a total phosphorus threshold that will detect and protect against only the most severe effects of eutrophication, specifically nuisance algae growth. NexGen has explicitly chosen, not to use the lower total phosphorus threshold recommended in the Ontario provincial guideline for phosphorus for lakes with total phosphorus naturally below 10 ug/L (MOEE 1994). As a result, adherence to NexGen's higher total phosphorus water quality Project Threshold will mean that impacted lakes, including Patterson Lake, can shift to an entirely different, higher trophic classification (i.e., oligotrophic to mesotrophic) without any impact being

Number	Source	Reference to EIS, appendix or TSD	Comment Summary (all original submissions can be found on Canadian Impact Assessment Registry reference: 80171)	NexGen Response	ACFN Technical Reviewer Response & Recommendation
		Constituent Concentration, p. 10-62 to 10-64 Table 10.3-7 – Thompson Aquatic		**References** CCME. 2004. Canadian Water Quality Guidelines for the Protection of Aquatic Life: Phosphorus: Canadian Guidance Framework for the Management of Freshwater Systems. In: Canadian Environmental Quality Guidelines, 2004. Winnipeg, MB, Canada. Environment Canada. 2004. Canadian guidance framework for the management of phosphorus in freshwater systems. Scientific Supporting Document. National Guidelines and Standards Office, Water Policy and Coordination Directorate, Environment Canada, Ottawa, ON. MOEE (Ontario Ministry of Environment and Energy). 1994. Water management: policies, guidelines, provincial water quality objectives. Accessed September 2021. Available at https://www.ontario.ca/page/water-management-policies-guidelines-provincial-water-quality-objectives.	recognized. Such a change would have significant implications for all aquatic biota in the lakes, including fish, as well as other wildlife and people who use these lakes. The chemical risk posed by the lake water and sediment quality may also be impacted, because of the associated potential effects on oxidation-reduction conditions in the lake. **The total phosphorus water quality Project Threshold chosen by NexGen is unacceptable, does not follow the cited guidance documents, and is permissive enough to allow major ecosystem shifts to occur without recognizing an impact.** **The threshold should be changed, as previously requested.** MOEE (Ontario Ministry of Environment and Energy). 1994. Water management: policies, guidelines, provincial water quality objectives. Accessed September 2021. Available at https://www.ontario.ca/page/water-management-policies-guidelines-provincial-water-quality-objectivesphosphorus (MOEE 1994),
399.	ACFN (October 28, 2022)	10.2.8.3.4 Sediment Quality Thresholds Table 10.2-9 – Thompson Aquatic	Please explain why sediment quality Project Thresholds were not selected for constituents with existing guidance thresholds available.	The selection of contaminants of potential concern (COPCs) for Project thresholds for sediment quality (i.e., arsenic, cobalt, copper, molybdenum, uranium, lead-210, polonium-210, uranium-234, uranium-238, thorium-230, and radium-226) was driven by the environmental risk assessment (ERA) screening. For a sediment quality constituent to be screened in as a COPC, at least one of the following conditions needed to be met: ▪ The maximum predicted sediment concentration of a sediment quality constituent in Patterson Lake North Arm – West Basin during the Application Case, including the maximum upper bound scenario and the far-future projection, was greater than a sediment quality guideline (the sediment constituents that met this condition were arsenic, molybdenum, lead-210, and polonium-210). ▪ The sediment constituent was identified as a COPC in the surface water quality assessment (the sediment constituents that met this condition were cobalt and copper). ▪ The sediment constituent required an evaluation for toxicity and radiotoxicity (the sediment constituent that met this condition was uranium). ▪ The sediment constituent was a Project-focused radionuclide (the sediment constituents that met this condition were uranium-234, uranium-238, thorium-230, and radium-226). Sediment quality constituents with existing guidelines that did not meet any of the listed conditions above (e.g., cadmium, chromium, lead, nickel, mercury, selenium, vanadium, zinc) did not screen in as COPCs for the Project and therefore did not require a sediment quality Project threshold. For each of these non-COPC sediment constituents, NexGen maintains there is a negligible risk that increasing concentrations in sediment would present a hazard to aquatic biota or other users. As such, they were not evaluated further in the sediment quality assessment or the ERA. The sediment quality guidelines and literature sources specific to the uranium industry used for the assessment included the following (Draft EIS TSD XXI [Environmental Risk Assessment], Section 4.2.3.3): ▪ Saskatchewan reference values for uranium operations (Burnett-Seidel and Liber 2013), which were prioritized as they are specific to Saskatchewan waterbodies. ▪ reference values for uranium mining and milling industry in Canada (Thompson et al. 2005), as these guidelines are specific to uranium mining and milling; and ▪ the CCME sediment quality guidelines (CCME 1999), which are generic guidelines that are applicable to all waterbodies in Canada. **References**	NexGen's response has clarified that the COPC included in Table 10.2-9 that were screened out in the ERA do not have a listed selected project threshold. That response is clear and adequate; however, this should be made clear in Table 10.2-9 for the relevant COPC. For example, the project threshold value for zinc is blank, but has a footnote attached that clarifies that zinc was screened out of the AERA. **An explanatory footnote should be added to the COPCs listed in Table 10.2-9 that have guideline values but were screened out of the ERA, as has been done for zinc.**

Number	Source	Reference to EIS, appendix or TSD	Comment Summary (all original submissions can be found on Canadian Impact Assessment Registry reference: 80171)	NexGen Response	ACFN Technical Reviewer Response & Recommendation
				Burnett-Seidel C, Liber K. 2013. Derivation of no-effect and reference-level sediment quality values for application at Saskatchewan uranium operations. Environmental Monitoring and Assessment. 185(11): 9481-9494. CCME (Canadian Council of Ministers of the Environment), 1999. Canadian Sediment Quality Guidelines for the Protection of Freshwater Aquatic Life (updated September 2007). Thompson PA, Kurias J, Mihok S. 2005. Derivation and use of sediment quality guidelines for ecological risk assessment of metals and radionuclides released to the environment from uranium mining and milling activities in Canada. Environmental Monitoring and Assessment. 110:71-85.	
400.	ACFN (October 28, 2022)	10.3.1.2 Water Quality (Risk to Aquatic Life and Terrestrial Life) and Drinking Water Quality Constituent Concentrations, p. 10-57 10.3.1.3 Productivity Status Constituent Concentration, p. 10-62 – Thompson Aquatic	a) Please revise the water and sediment quality data compilations and related analyses, so that censored data points are not substituted at all. Please instead use the above-mentioned newer and more robust approaches for the water and sediment quality data used in this study. b) For any future monitoring, please plan analytical sample analyses accordingly, so that whenever possible detection limits are not near to or above the applicable thresholds. In interpreting data, please note that there is a large degree of uncertainty inherent in values near the detection limit, including when detection limits are below but close to thresholds.	a) NexGen agrees that there are aspects of the baseline water and sediment quality data characterized in Draft EIS Section 10 (Surface Water Quality and Sediment Quality) that reference multiple samples being reported as less than a detection limit. However, the application of setting half the detection limit (1/2 DL) substitutes for non-detect data for the COPCs in characterizing the baseline condition for the COPCs is considered reasonable. The high proportion of non-detect data for certain constituents of potential concern (COPCs) (e.g., total phosphorus, most metals and radionuclides) suggests that the substitution of 1/2 DL may represent an overestimate of baseline concentrations. This overestimation represents a level of conservatism when evaluating the incremental effects of the Project discharges to the receiving environment. b) NexGen agrees that monitoring needs to consider the analytical resolution of constituent analysis (e.g., total phosphorus) to reduce the uncertainty of measured results at or below detection. NexGen has reviewed the limits of detection for monitored COPCs through ongoing baseline programs and the Effluent and Emissions Monitoring Plan and/or the Environmental Monitoring Plan and has arranged to use analytical packages with lower detection limits for ongoing and future monitoring. Consequently, constituents with relatively low Project Threshold concentrations will be measured with greater certainty.	a) NexGen's response to this request indicates that it believes that overestimating a baseline concentration is 'conservative' when evaluating the incremental effects of the Project discharges to the receiving environment. NexGen does not define conservative in this case, however the approach taken by NexGen is likely to underestimate the relative size of incremental impacts to the receiving environment. This is because a predicted project-related incremental increase in environmental concentrations would be minimized where the base case concentration is inflated, since the size of the change in concentration relative to the base case concentration would be smaller. This is exactly the opposite understanding that NexGen appears to have. **NexGen should revise the water and sediment quality data compilations and related analyses, so that censored data points are not substituted at all. If NexGen fails to do this, then it should, at a minimum, explain that the size of predicted impacts relative to the base case is likely an underestimation where the base case has been estimated via substitution.** b) NexGen has addressed the request adequately
401.	ACFN (October 28, 2022)	10.3.2 Sediment Quality- Thompson Aquatic	Please clarify – were sediment concentration data standardized to particle size for the purposes of sediment quality QA/QC and comparisons or summaries between sites and years?	NexGen confirms that sediment quality data were not standardized to particle size for the sediment quality baseline setting; particle size distribution was reported for each sample taken in 2019 and 2020 at each sample site. NexGen maintains that providing the non-standardized baseline data represents an appropriate approach and notes that data monitoring stations were co-located for sediment quality and benthic invertebrate sampling, which allows the evaluation of exposure of benthic invertebrates to sediment-associated constituents of potential concern.	NexGen has addressed the request adequately.
402.	ACFN (October 28, 2022)	10.3.1.2 Water Quality (Risk to Aquatic Life and Terrestrial Life) and Drinking Water Quality Constituent Concentrations Tables 10.3-3 through 10.3-6, p. 10-58 to 10-61 – Thompson Aquatic	a) Please justify the pooling of the site data in calculating and presenting base case summary statistics, including as a base case for further impacts assessment steps. b) If this pooling cannot be justified, please recalculate and present summary statistics for each lake, lake basin (in the case of Patterson Lake), and each river sampling site separately.	NexGen confirms that data were not pooled to derive the existing condition setting for downstream assessment nodes. To derive the existing conditions setting, water quality data from the 11 waterbodies and five watercourse sites sampled between 2015 and 2020 within and near the local study area were collated and evaluated. Summary existing condition surface water quality data for each lake are presented in Table 10.3-3 through Table 10.3-6 of Draft EIS Section 10.3.1.2 (Water Quality [Risk to Aquatic Life and Terrestrial Life] and Drinking Water Quality Constituent Concentrations) and Table 8 in Attachment 10A-1 of Draft EIS Appendix A (Surface Water Quality Modelling Report), which were generated from lake-specific baseline data.	NexGen has addressed the request adequately.
403.	ACFN (October 28, 2022)	Section 10: Surface Water Quality and Sediment Quality-	Please refrain from refer to existing or base case conditions as "naturally occurring" or "natural" without supporting evidence. It is contrary to the stated assessment approaches and methods and is also invalid.	NexGen acknowledges the reviewer's comment though notes that the regional study area has been relatively undisturbed by direct human development (<1%). As a result, Base Case conditions largely reflect natural factors.	**NexGen should revise the EIS, and in future should refrain from refer to existing or base case conditions as "naturally occurring" or "natural" without supporting evidence. NexGen's response provides no such evidence, with no citations or data as support.**

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		Thompson Aquatic			
404.	ACFN (October 28, 2022)	10.4 Project Interactions and Mitigations Table 10.4-1-Thompson Aquatic	Please include in the impact assessment an assessment of the potential for acidification of lakes and rivers as a result of emissions from the Project depositing to surface water systems.	NexGen's Qualified Professional confirms that guidance outlined in Section 11.5 of the Saskatchewan Air Quality Modelling Guideline (SAQMG; ENV 2012) has been reasonably applied in the determination that acid deposition modelling is not warranted for the proposed Project. NexGen also included the step to solicit feedback from the ENV regarding the application of its approach prior to preparing the Draft EIS, which also aligns with the SAQMG (ENV 2012). The following information summarizes the approach taken in the Draft EIS to determine whether an acid deposition assessment should be undertaken and addresses the specific considerations raised by the ENV – Environmental Protection Branch reviewer regarding the potential influence of acid emissions and buffering capacity of the surrounding area in contributing to acid deposition. As outlined in Section 7A2.1 of Draft EIS Appendix 7A (Air Dispersion Modelling Report), preliminary screening results showed that the total hydrogen ion (H^+) equivalent from the Project considering emissions of sulphur dioxide (SO_2), and nitrogen oxides (NO_X) would be approximately one-tenth of the modelling threshold criterion of 0.175 tonne per day (t/d). The H^+ equivalent criterion has been presented as one of the criteria in the SAQMG that can be used to determine if the acid emissions from a project could result in acid deposition concerns. Due to the low potential for contribution to acid input, an acid deposition assessment was not warranted. This approach was carried forward in the Draft EIS after consultation with the ENV on 21 January 2021. Feedback received from the ENV was in alignment with this approach. NexGen acknowledges that the preliminary screening of total H^+ equivalent did not consider the direct emissions of sulphuric acid (H_2SO_4) from the acid plant in the Draft EIS. The total H^+ equivalent has been recomputed to include the H_2SO_4 emissions. These results indicate that due to the very low emissions of H_2SO_4, the total H_+ equivalent considering all acidifying emissions (i.e., NO_X, SO_2, ammonia [NH_3], and H_2SO_4) remains approximately one-tenth of the criterion for Project Operations. Measured rainfall data support the exclusion of acidifying emissions from the air dispersion model (Draft EIS Appendix 7A). As part of NexGen's air quality baseline monitoring program, pH values of rainwater have been monitored at the Project site since September 2018. The average pH value of the rainwater is 6.45, which is less acidic than clean, unpolluted rain, for which the pH value is approximately 5.6. Due to the relatively low acidity of the rainwater at the Project site, the potential for acid emissions to cause acid deposition issues is likely to be low. In summary, the acidifying emissions from the proposed Project are predicted to be low, as shown by the total H^+ equivalent, which is about one-tenth of the criterion of 0.175 t/d of H^+ equivalent. The pH values of the rainwater in the Project site indicate that potential for acid deposition issues is low. NexGen will continue to monitor and report the pH values of rainwater, which continue to show low acidity to date. Section 7A2.1 of Final EIS Appendix 7A will be updated to include H_2SO_4 emissions in the total H^+ equivalent calculation and the monitored pH value of rainwater. **References** ENV (Saskatchewan Ministry of Environment). 2012. Saskatchewan Air Quality Modelling Guideline. Government of Saskatchewan. March 2012.	NexGen's response refers to the air dispersion modeling report, which this reviewer did not review. The potential for acidifying emissions from the Project were determined to be below the modelling threshold criterion and/or the criterion for Project Operations. It isn't clear how the criteria were determined, and specifically whether the criteria included information about the capacity of lakes in the Project area to buffer acidifying inputs. **Nex Gen should clarify how the modelling threshold criterion and/or the criterion for Project Operations, and specifically should clarify whether the criteria included information about the capacity of lakes in the Project area to buffer acidifying inputs**
405.	ACFN (October 28, 2022)	Section 10.2.5, p. 10-20 – Thompson Aquatic	Please explain the decision to remove consideration of Project effects on sediment quality following the life of the Project. Why would water quality effects continue, but not sediment quality effects?	NexGen notes that Project-related changes to sediment quality were not assessed past Closure in the surface water quality and sediment quality assessment as the key activity that would have the potential to affect sediment quality is the discharge of treated sewage and effluent to Patterson Lake, which would end during the Closure Phase.	NexGen's response has not adequately explained or justified why it believes that post-closure seepage from various waste rock stored underground would not impact sediment quality. It is also unclear why sediment quality effects were not included in the assessment if they were required to be quantitatively assessed according to the ERA. How were these assessed as part of the ERA but not included in the surface water quality and sediment quality effects assessment?

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				NexGen confirms that far-future effects to sediment quality were assessed in the environmental risk assessment (Draft EIS TSD XXI). A sediment screening exercise was conducted that determined that arsenic, molybdenum, uranium, and radionuclides were required to be quantitatively assessed (Draft EIS TSD XXI, Section 4.2.3.3, Table 4-3).	**NexGen should explain and justify the decision to remove consideration of Project effects on sediment quality following the life of the Project, when seepage from various waste rock stored underground is expected to occur. Why would water quality effects continue, but not sediment quality effects?** **In addition, NexGen should explain why and how far-future effects to sediment quality were assessed in the ERA but not in the surface water quality and sediment quality effects assessment.**
406.	ACFN (October 28, 2022)	Table 6A-1, p. 2 10.5.2.1.6 Climate Change Sensitivity Scenario, p. 10-110 to 10-112 – Thompson Aquatic	a) Please clarify, were climate change-induced effects on surface water temperatures included in climate change scenarios assessed for Project and cumulative effects? b) If the answer is no, please include climate change-induced effects on surface water temperatures in the assessment of impacts to water quality and surface water systems from the Project, other developments and climate change.	NexGen confirms that climate change-induced effects on surface water temperatures were not included in climate change scenarios assessed in the Draft EIS. However, incorporation of changes to surface water temperature associated with climate change, should changes to water temperature be predicted, is not expected to influence the findings of the EA. No changes to the EIS are required.	NexGen's response is asserting that it did not include climate change-induced effects on surface water temperatures in the climate change scenarios assessed in the Draft EIS, but also that should change to water temperature be predicted, NexGen somehow knows that it would not be expected to influence the findings of the EA. **If NexGen does not include climate change-induced effects on surface water temperatures in the climate change scenarios assessed for Project and cumulative effects, then it must clearly state this fact and point out that it is an unknown and unassessed effects pathway. NexGen cannot credibly assert that the findings would not influence the findings of the effects assessment, if the effects pathway has not been assessed.**
407.	ACFN (October 28, 2022)	10.4.2 Secondary Pathways, p. 10-71- Thompson Aquatic	Please confirm that snow quality will be monitored in future to confirm that air emissions to land and subsequently to surface water systems is unlikely to result in non-negligible residual effects on surface water and sediment quality.	NexGen confirms that as part of the Environmental Monitoring Plan, winter monitoring programs will include sampling snow quality near the Project site during Operations to confirm that the deposition of Project air emissions to land and subsequently to surface water systems are localized and result in only minor changes to total suspended solids and COPC concentrations. NexGen also notes that the Environmental Monitoring Plan would be periodically reviewed and, where required, revised to verify monitoring activities are meeting Project environmental needs.	NexGen has addressed the request adequately. **The Environmental Monitoring Plan should be shared with ACFN for feedback, and ACFN feedback should be used to improve the Plan.**
408.	ACFN (October 28, 2022)	10.5.1.2.6 Sensitivity Analysis, p. 10-96 Figure 10.5-12- Thompson Aquatic	a) Please remove the final sentence in the paragraph proceeding Figure 10.5-12. It is scientifically invalid. b) Please assess the predicted trophic status shift in the Patterson Lake basins for residual effects, without explaining away the likelihood of such a shift. This applies to the Application Case reasonable upper bound and the cumulative (RFD) scenarios. c) Please note that, in light of the above, the following statement in Section 10.5.3.1.1 (p. 10- 114) appears to be incorrect: "The Project effects on the measurement indicators during the lifespan of the Project for the reasonable upper bound sensitivity scenario would be consistent with the effects described for the Application Case, albeit with higher projected COPC concentrations." This statement fails to acknowledge the predicted shift in trophic status under the reasonable upper bound scenario. Please revise it to include this predicted impact.	a) NexGen acknowledges the reviewer's comments regarding the total phosphorus indicator concentration including inorganic and organic (e.g., algal) forms of phosphorus. The intent of the statement in the final sentence preceding Figure 10.5-12 of Draft EIS Section 10.5.1.2.6 (Sensitivity Analysis) was to highlight conservatism associated with the modelled predictions for total phosphorus during Operations as surface water quality modelling did not account for parts of the phosphorus cycle in the receiving aquatic environment that led to sinks and losses from the water column over the annual seasonal cycle. NexGen will amend the wording in Final EIS Section 10.5.1.2.6 (Sensitivity Analysis) to state the following: "Note, however, that the modelling considered conservative phosphorus inputs in the discharge from the Project and did not account for in-lake sinks and settlement of inorganic and organic forms of phosphorus; therefore, basin-wide concentrations are likely overestimated." b) NexGen maintains that the modelling as presented in Draft EIS Section 10 (Surface Water Quality and Sediment Quality) is sufficient to assess the receiving environment surface water quality for the Project and that the interpretation of the modelling for the EA is reasonable and justified. NexGen notes that monitoring of Project discharges and receiving environment conditions during Operations will provide data to verify assessment results. c) NexGen acknowledges the reviewer's comment and will revise the text in Final EIS Section 10.5.3.1.1 (Application Case) to acknowledge the predicted temporary shift in trophic status in Patterson Lake North Arm – West Basin and Patterson Lake South Arm under the reasonable upper bound scenario.	a) While NexGen's response acknowledges and attempts to address the review request, the revised wording is still incorrect. Algal phosphorus is not necessarily a sink from the water column. Phosphorus cycles rapidly between compartments within the water column, and between sediments and the water column. Internal loading of phosphorus from sediments to the water column is a very common mechanism by which eutrophication impacts are prolonged, even many years after the anthropogenic supply of phosphorus to a lake has stopped. This is one of the reasons why eutrophication due to oversupply of phosphorus is such an intractable environmental problem. It is also one reason why the estimated total phosphorus concentrations are not necessarily an overestimate, as NexGen proposes. There is no conservatism evident in NexGen's modeling or revised wording, only potential error and uncertainty. **As previously requested, please remove the final sentence in the paragraph proceeding Figure 10.5-12. Please do not replace that sentence with the proposed revised wording.** b) This reviewer maintains that the trophic status shift in the Patterson Lake basins should be assessed for residual effects. The purpose of monitoring is not to compensate for errors in an effects assessment. **As previously requested, please assess the predicted trophic status shift in the Patterson Lake basins for residual effects, without explaining away the likelihood of such a shift. This applies to the Application Case reasonable upper bound and the cumulative (RFD) scenarios.** c) NexGen has addressed the request adequately, except that it may need to explain the inclusion of "temporary' in the revised wording
409..	ACFN (October 28, 2022)	10.5.3 Residual Effects	Please clarify, of the mitigations listed in point form in section 10.5.3, where any included in the predictive models, especially the Project site wide model? If any were included in the model and subsequently the	NexGen confirms that the mitigations listed in Draft EIS Section 10.4 (Project Interactions and Mitigations) were inherent in the assumptions used in the site-wide water quality model used to generate inputs to the near-field and regional water quality models. For example, it was	NexGen has provided the requested clarification. **NexGen should confirm that the residual effects classification did not include adjusting predicted effects for the mitigations listed in point form in section 10.5.3,**

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		Classification, p. 10-112 to 10-113 – Thompson Aquatic	model predictions, then would any of these mitigations contribute to a further decrease when determining residual effects?	assumed that the effluent treatment plant and sewage treatment plant would treat any site contact water so that discharges would not exceed Metal and Diamond Mining Effluent Regulations or acute toxicity thresholds, and the diffuser design would be sufficient to effectively assimilate discharges so that Project thresholds for constituents of potential concern would be met at a regulated mixing zone boundary distance of 100 m.	**since they were already included in the predictive models and the Project site wide model.**
410.	ACFN (October 28, 2022)	10.5.3.1.1 Application Case, p. 10-113 to 10-114 – Thompson Aquatic	a) Please clarify, are predicted changes to each COPC in water under the Application Case and RFD scenario expected to return to base case concentrations, or reach a pseudo-steady state? If it is the latter, will the pseudo-steady state establish at a concentration higher than the base case or the Project threshold? A table might help to present the results for each COPC. b) In each case, please clarify, are the effects considered reversible?	a) NexGen confirms that predicted changes for each constituent of potential concern (COPC) in the Application Case, reasonable upper bound scenario, and Reasonably Foreseeable Development (RFD) Case are shown to reach a pseudo steady-state condition in the far future. Except for hardness, phosphorus, and chromium, all future COPC concentrations are projected to be higher than characterized baseline concentrations because a small amount of residual seepage would be present from both the underground workings and waste rock storage areas, and this seepage is conservatively assumed to last in perpetuity. In the far-future projections, all COPCs except cobalt and copper remain below their respective Project thresholds. Supplemental information regarding the assessment of residual effects for the far future for the Application Case/reasonable upper bound scenario and RFD Case is presented in Draft EIS Section 10.5.1.2 (Regional Surface Water Quality Model) and Draft EIS Section 10.5.2 (Reasonably Foreseeable Development Case), respectively. The residual effects classification that describes the reversibility of the residual effects during the far future is discussed in Draft EIS Section 10.5.3.2 (Far-Future Projection). b) NexGen notes that the residual effects for water quality constituent concentrations and drinking water quality measurement indicators were determined to be permanent and irreversible for the Application Case, reasonable upper bound scenario, and RFD Case as surface runoff and the slow migration of certain COPCs through groundwater would persist in the receiving environment in the far future. However, NexGen further notes water quality in the receiving environment that would be affected by incremental loadings of COPCs associated with the treated discharges during Operations would return to concentrations and values similar to their baseline concentrations following the cessation of discharges. In the far-future projection, infiltration and seepages from the Project footprint to the groundwater regime invoke a long-term, continuous period of extremely slow migration of COPC metals and radionuclides from the underground tailings management facility and waste rock storage areas to the receiving environment (i.e., Patterson Lake). This would result in incremental mass loading of a select group of COPC metals (i.e., aluminum, cobalt, copper, iron, manganese, molybdenum, nickel, selenium, uranium, and zinc) that attenuate downstream. Although increases are noted for these COPCs, only cobalt and copper were shown to exceed their surface water quality thresholds for the water quality measurement indicator in the far future. However, no significant adverse effects to valued components were predicted as a result of predicted cobalt and copper threshold exceedances (Draft EIS Section 11 [Fish and Fish Habitat], Draft EIS Section 13 [Vegetation], Draft EIS Section 14 [Wildlife and Wildlife Habitat], Draft EIS Section 15 [Human Health], Draft EIS Section 16 [Cultural and Heritage Resources and Indigenous Land and Resource Use], Draft EIS Section 17 [Other Land and Resource Use]).	a) NexGen has provided the requested clarification. b) NexGen has confirmed that the "the residual effects for water quality constituent concentrations and drinking water quality measurement indicators were determined to be permanent and irreversible for the Application Case, reasonable upper bound scenario, and RFD Case…" The additional context provided by NexGen is informative but does not change the reversibility of the noted residual effects. As NexGen states, they are permanent and irreversible. The magnitude and direction of these effects may be informed by the contextual information provided. The effects to valued components are dealt with elsewhere. **NexGen should revise the quoted wording that describes the assessment results as indicating that the Project-related changes to COPC concentrations in Patterson Lake and downstream waterbodies in the LSA are reversible, to reflect that they are instead permanent and irreversible. This should be done in section 10.5.3.1.1 and for all other instances where these effects assessment results are discussed.**
411.	ACFN (October 28, 2022)	10.6.1.4 Regional Surface Water Quality Model, p. 10-123 – Thompson Aquatic	In a discussion of the regional surface water quality model, NexGen claims that the prediction of effects from the nearby Fission Project were conservative, in part because effluent concentrations from the Fission Project were assumed to be equivalent to the median effluent concentrations from the Project. But why would an assumption like that, using the median quality from another project, be considered conservative? Please explain, how is the approach discussed above conservative, and not just reasonable?	NexGen acknowledges the reviewer's comment and will modify the text in Final EIS Section 10.6 (Prediction Confidence and Uncertainty) to state the following: "The estimated surface runoff quality from the Fission Patterson Lake South Property waste rock storage facility and above-ground tailings management facility was assumed to be equal to the median treated effluent quality from the Project. Given these assumptions, predictions generated by the RSWQM are considered to be reasonable in lieu of a lack of project-specific available data for the Fission Patterson Lake South Property". NexGen notes that the assessment applied a precautionary approach to address uncertainty by identifying the greatest magnitude, duration, and geographic extent of potential adverse effects when a range of possible outcomes was possible (Draft EIS Section 10.6 [Prediction Confidence and Uncertainty]). Therefore, NexGen maintains that the assessment of effects in the Reasonably Foreseeable Development Case are conservative.	NexGen has addressed the request for clarification and has proposed revised wording. It should be noted that treated effluent from the Project could well have better water quality than untreated surface runoff quality from the Fission waste rock storage facility and above-ground tailings management facility. Whether the Project assessment of effects in the RFD case is consistently conservative could be discussed and clarified further.

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412.	ACFN (October 28, 2022)	Section 1.3.4; 15.2.8 - ITS	a) Please update section 1.3.4 to include available federal human health and ecological risk assessment guidance documents, and b) Confirm that federal health risk assessment guidance was relied on to conduct the HHRA (Section 15) and ERA (TSD XXI), please specify where federal guidance was modified or not adopted to undertake the ERA	a) NexGen notes that Draft EIS Section 1.3.4 (Relevant Standards, Codes, and Guidelines) is relevant to the standards, codes, and guidelines of the EA process rather than discipline-specific guidelines such as ones associated with the environmental risk assessment. As stated in Draft EIS Section 1.3.4, discipline-specific standards, codes, and guidelines used in the assessment of effects are identified within each discipline EIS section (Section 7 [Air Quality, Noise, and Climate Change] through Section 19 [Community Well-Being]), as appropriate. b) NexGen confirms that, as described in Draft EIS Section 15.2.8 (Risk Assessment), the methods used in the environmental risk assessment (ERA) are based on guidance provided by the CNSC (2021), the Canadian Standards Association Group (CSA Group; 2012, 2020), and Health Canada (2010, 2021). The software used for the exposure pathways analysis and the calculation of radiological doses was IMPACT Version 5.6.0, which is consistent with the COPC transport equations and radiological dose calculations outlined in CSA N288.1-20 (CSA Group 2020). Equations used for non-radiological dose calculations are consistent with those from CSA N288.6-12 (CSA Group 2012), which have generally been obtained from Health Canada guidance (2010, 2021). Also, as described in Section 1.1 of Draft EIS TSD XXI (Environmental Risk Assessment), the ERA encompasses a human health risk assessment and an ecological risk assessment, which have been prepared to be compliant with Canadian Standards Association Group (CSA) N288.6-12 Environmental Risk Assessments for Class I Nuclear Facilities and Uranium Mines and Mills (CSA 2012). The ERA also meets the requirements outlined in Section 4.1 of Regulatory Document-2.9.1, Environmental Principles, Assessments and Protection Measures (CNSC 2020). **References** Canadian Nuclear Safety Commission (CNSC). 2020. REGDOC-2.9.1, Environmental Principles, Assessments and Protection Measures, Version 1.2. September 2020. ISBN 978-0-660-06255-6. Available at http://nuclearsafety.gc.ca/eng/pdfs/REGDOCS/REGDOC-2-9-1-Environmental-Principles-Assessments-and-Protection-Measures-eng.pdf. CNSC. 2021. Generic Guidelines for the Preparation of an Environmental Impact Statement pursuant to the Canadian *Environmental Assessment Act, 2012*. Available at https://nuclearsafety.gc.ca/eng/resources/environmental-protection/ceaa-2012-generic-eis-guidelines.cfm. CSA Group (Canadian Standards Association Group). 2012. CSA N288.6-12: Environmental Risk Assessments at Class I Nuclear Facilities and Uranium Mines and Mills. CSA Group. 2020. CSA N288.1-20: Guidelines for calculating derived release limits for radioactive material in airborne or liquid effluents for normal operation of nuclear facilities. Health Canada. 2010. Federal Contaminated Site Risk Assessment in Canada, Part I: Guidance on Human Health Preliminary Quantitative Risk Assessment (PQRA), Version 2.0. Contaminated Sites Program. September. Health Canada. 2021. Federal Contaminated Site Risk Assessment in Canada: Guidance on Human Health Preliminary Quantitative Risk Assessment (PQRA). Version 3.0.	a) Proponents' response indicates lack of consistent adherence to federal health risk assessment guidance. It is acknowledged that the Canadian Nuclear Safety Commission (CNSC) and Canadian Standards Association Group (CSA Group) has published supplemental guidance for nuclear facilities, but review of the cited sources identifies that CNSC directs proponents to federal health risk assessment sources to support the EA process. Request b is outstanding. Please see original rationale provided to support the request. **Please provide the requested information clearly describing similarities and differences between Health Canada and FCSAP risk assessment guidance and that published by CNSC and CSA Group.**
413.	ACFN (October 28, 2022)	Section 15.2.8.2; 4.2.3; 4.3.3- ITS	a) It is requested that the proponent re-evaluate the predictive modelling data for air, surface water (end of pipe), sediment and soils in the ERA to first identify bioaccumulative and persistent substances as per CEPA Persistence and Bioaccumulation	a) The environmental risk assessment used best and standard practices to screen COPCs and focus the assessment on those constituents with the potential to affect valued components and receptors. This process included applying maximum predicted or observed concentrations, utilizing the most conservative applicable and available federal and provincial guidelines protective of both human and ecological health, and defining	Please see original rationale provided to support the request. a) Request is outstanding.

Number	Source	Reference to EIS, appendix or TSD	Comment Summary (all original submissions can be found on Canadian Impact Assessment Registry reference: 80171)	NexGen Response	ACFN Technical Reviewer Response & Recommendation
			Regulations (SOR/2000-107) and include these as COPCs, without the application of any additional screening criteria. b) If the proponent chooses to identify COPCs by comparing predicted concentrations of COPCs to screening values, it is requested that additional criteria from the US EPA and WHO be included.	receptor locations based on Indigenous and Local Knowledge so that effects would not be underestimated. No re-evaluation is required. b) Based on the use of best practices described above in response Part (a) of this response, applying additional screening criteria is not expected to change the confidence in effects predictions or the assessment conclusions. No further assessment is required.	As noted by NexGen maximum concentrations were relied on for the screening exercise as directed in clauses 6.2.5.5 (CSA Group 2012). However, the cited guidance does not direct proponents to screen contaminant stressors in this manner, rather screening to identify COPCs is identified as an option and should be conducted in consideration of factors noted in clause 6.2.5.7, which includes consideration of toxicity and mechanism of toxicity (6.2.5.7e) and concerns raised by members of the public (6.2.5.7g) which relate to the concerns and requests identified by ACFN. Further, the screening does not align with comparative Uranium mines in the same geographical area which identified additional COPCs based on project related activities and chemical emissions (IEC, 2024 Appendix D). **NexGen is once again requested to repeat the screening exercise by considering the mechanism of toxicity for chemicals associated with project activities and chemical emissions to air and water and update the fate and transport modelling to predict soil and tissue residues in the ERA to support the assessment of potential health risks in both the ERA and HHRA.** b) Request is outstanding. Risk practitioners are directed by both Health Canada (2021) and CSA Group (2012) to identify appropriate screening values if COPCs are identified through this method. Canada and Saskatchewan do not have environmental quality guidelines that consider the protection of human health from the ingestion of biota or untreated surface water. In order to screen project activity chemical emissions to air and water which can affect sediment, soil and biological tissue concentrations and accurately identify COPCs for each operable exposure pathways additional criteria are required (as directed by CSA clause 6.2.5.7 a, c, d, i, h, m). **In addition to addressing the request in (a), it is requested that NexGen identify appropriate screening criteria to identify COPCs associated with ingestion exposure pathways for human receptors, including:** - Tissue residue criteria for chemical concentrations in traditional foods and medicinal species. As previously requested, CEPA persistence and bioaccumulation criteria could be relied on to identify COPCs based on the potential to accumulate in traditional foods and medicines and expose human receptors. - Surface water quality criteria which consider human consumption of traditional water sources (i.e., lakes, creeks, muskeg, springs). As previously requested, it is recommended that the proponent adopt the US EPA National Recommended Water Quality Criteria as described in the Human Health Criteria Table (National Recommended Water Quality Criteria - Human Health Criteria Table | US EPA) - Contaminants potentially released to ambient air from project related activities should be expanded to align with previous EAs completed for other Uranium mines and consider metals deposited to aquatic and terrestrial environments from total suspended particulates (TSP) (see response and recommendations to issue 418). Once a and b are completed, it is **further requested that air (section 7), surface water and sediment (section 10), and soils (Section 12) modelling be updated to predict concentrations for additional COPCs and the HHRA (Section 15) and ERA (TDS XXI) be updated accordingly based on new model results.**
414.	ACFN (October 28, 2022)	15.2.3 (Table 15.2-2; Figure 15.2-1); 14.2.4 - ITS	a) It is requested that the proponent provide a summary of ACFN identified issues related to the spatial and temporal boundaries and predicted concentrations of COPCs in air, soil, and water modelling (Sections 6,7,8,9,10,11, 12, 13, and 14). b) Based on the summary of issues, it is requested that the proponent update the ERA (TSD XXI) and the HHRA (Section 15) accordingly and	Through engagement activities offered by NexGen prior to the submission of the Draft EIS, the ACFN has not identified or presented any specific issues related to spatial and temporal boundaries and predicted concentrations of COPCs in air, soil, and water modelling. Notwithstanding the above, completing assessments on a Nation-by-Nation basis is outside the scope of the requirements of an EA of a designated project under the *Canadian Environmental Assessment Act, 2012*.	a) Request is outstanding. Please see original rationale provided to support the request. **Proponent response does not provide requested information even though it should be readily available through the modelling exercises. It should be noted that a Nation specific assessment but rather a summary of issues**

Number	Source	Reference to EIS, appendix or TSD	Comment Summary (all original submissions can be found on Canadian Impact Assessment Registry reference: 80171)	NexGen Response	ACFN Technical Reviewer Response & Recommendation
			c) Provide a summary of how updates based on ACFN comments affected the predicted risks (i.e. HQs, ILCRs, Radiation Dose) in the HHRA.	No changes to the Draft EIS are required in this regard. **References** *Canadian Environmental Assessment Act, 2012*. SC 2012, c 19, s 52. Repealed, 2019, c 28, s 9. Available at https://laws-lois.justice.gc.ca/eng/acts/C-15.21/20170622/P1TT3xt3.html.	**identified by ACFN and communicated to NexGen to determine how spatial and temporal boundaries considered ACFN provided information.** Requests in b and c dependent on response to a.
415.	ACFN (October 28, 2022)	Section 15.2.5 - ITS	It is requested that the proponent provide an additional assessment case "pre development" and results from this additional assessment case are used to develop risk-based adaptive monitoring, management and mitigation plans that address cumulative effects and support collaboration between industrial stakeholders to reclaim the environment to pre disturbance condition.	NexGen notes that an assessment of effects compared to predevelopment conditions is outside the scope of the requirements of an EA of a designated project under the *Canadian Environmental Assessment Act, 2012*. Therefore, no additional assessment case is required to be considered. NexGen further notes that the regional study area has been relatively undisturbed by direct human development (<1%) and mostly influenced by wildfire and water level fluctuations. As a result, Base Case conditions largely reflect natural factors prior to development. As stated in Draft EIS Section 5.5.3 (Decommissioning and Reclamation [Closure]), NexGen's preliminary objective for closure is to design the landscape to allow for unrestricted traditional use by Indigenous Groups and local communities, and for functional, self-sustaining, locally common ecosystems on the reclaimed landscape as soon as practicable. As further described in Draft EIS Section 5.3.2 (Design Objectives and Guiding Principles), as part of the Preliminary Decommissioning and Reclamation Plan developed for the Project, a returning land use plan will be developed that focuses on target ecosystems that existed prior to the Project (i.e., prior to Project Construction). **References** *Canadian Environmental Assessment Act, 2012*. SC 2012, c 19, s 52. Repealed, 2019, c 28, s 9. Available at https://laws-lois.justice.gc.ca/eng/acts/C-15.21/20170622/P1TT3xt3.html.	Please see original rationale provided to support the request. Response does not provide reference to the section of CEAA being cited therefore response cannot be verified as accurate. Reviewer cannot find reference to pre-development baseline as being out of scope for completion of EAs under CEAA. Proponent does not provide details to support claims that regional study area has been relatively undisturbed. Proponent does not provide response discussing local study area. Proponents preliminary objective for closure is noted and supports the request to clearly define pre-development conditions in the local and regional study areas to support successful reclamation to "allow for unrestricted traditional use by Indigenous Groups and local communities, and for functional, self-sustaining, locally common ecosystems on the reclaimed landscape as soon as practicable". Reviewer response to issue 418 applies to any concerns related to closure objectives as it is likely that potential health risks have been underestimated due to the proponents exclusion of metal deposition associated with TSP project related emissions to local aquatic and terrestrial environments and partitioning of these to sediment, soils, and biota. Request for pre-development assessment case is outstanding. It is further requested that the proponent provide citation for the section of CEAA 2012 being referred to in support of the statement "assessment of effects compared to predevelopment conditions is outside the scope of the requirements of an EA of a designated project under the *Canadian Environmental Assessment Act, 2012*. Therefore, no additional assessment case is required to be considered."
416.	ACFN (October 28, 2022)	TSD XXI, Section 15 - ITS	It is recommended that the proponent adjust the Project life to align with outputs from the predictive modelling, which indicate project-related contaminants released from the UGTMF and waste rock seepage to groundwater may intercept Patterson Lake and affect surface water quality and risks to human health from contamination of Traditional Foods from 77 to >1000 years. At a minimum, the ERA should 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 with the predicted future development case.	NexGen confirms that potential far-future Project effects have been assessed in the Draft EIS. The long-term effects on human health and aquatic and terrestrial ecosystems associated with seepage from underground workings and waste rock were evaluated by increasing the temporal boundary of the assessment beyond Project Closure. Effects beyond Closure were assessed using a far-future projection; while not a Project phase; the far-future projection encompasses the long-term period of extremely slow migration of COPCs from the underground workings and waste rock storage areas (WRSAs) via the groundwater pathway to the receiving surface water environment (Draft EIS Section 15.2.4 [Temporal Boundaries]; Section 1.3.2 of Draft EIS TSD XXI [Environmental Risk Assessment]). While it is not possible to predict potential effects thousands of years into the future with certainty, the temporal extent and mass loading inputs of the far-future assessment were developed so that the modelled results provide a reasonable, precautionary representation of the maximum potential changes to surface water quality in Patterson Lake and the downstream environment.	Based on the response and content in Section 15.2.4 the timeframe for the far future Project effects remain unclear. Request partially addressed, further clarification required. Please see original rationale provided to support the request. It is requested that the proponent clearly indicate the time period (year) of the far future Project effects and the case (i.e., application, reasonably foreseeable development) in which the far future Project effects were assessed. Review of Section 10 (Surface Water Quality and Sediment Quality) identify various timeframes for peak concentrations dependent on chemical parameter making it difficult to verify the fat future time period, again requiring the proponent to clarify that the far future scenario considered in the HHRA aligns with the predicted peak concentration timeframes for each COPC.
417.	ACFN (October 28, 2022)	TSD XXI, Section 15 - ITS	Please provide a comparison of the predicted risks from exposure to the project-only scenario to the scenario which accounts for exposure to baseline conditions and the project related effects by comparing to the hazard quotients (HQ) of 1.0 (for all exposure pathways) to	As indicated in Section 5.4.1 of Draft EIS TSD XXI (Environmental Risk Assessment), the hazard quotients (HQs) can be compared to a benchmark value of 1 if all exposure pathways (exposures from all pathways including background and store-bought foods) are considered. To account for uncertainty in pathways beyond Project activities (i.e., exposure to background sources unrelated to the Project), a benchmark HQ value of 0.2 per medium	Response partially addresses original request. Review of TDS XXI identifies potential risks to human receptors from project related emissions of molybdenum and arsenic and uptake by terrestrial mammals and consumption by certain human receptor groups (summarized below) and not all exposure pathways were

Number	Source	Reference to EIS, appendix or TSD	Comment Summary (all original submissions can be found on Canadian Impact Assessment Registry reference: 80171)	NexGen Response	ACFN Technical Reviewer Response & Recommendation
			indicate if the adopted methods are a representative measure of the predicted risks to human health.	(e.g., water, soil, food, air) represented a conservative assumption to make sure a precautionary assessment was undertaken. This approach is consistent with the approach taken by Health Canada in its guidance on human health preliminary quantitative risk assessment (Health Canada, 2021). NexGen notes that the total HQ (baseline + Project) can be determined by adding together the "Base Case" and "Incremental Project Risk" rows for each COPC in Table 5-18 of Section 5.4.1 of Draft EIS TSD XXI. The total HQs are all below 1 for all exposure pathways, indicating the results are acceptable and no significant adverse effects to human health are anticipated. **References** Health Canada. 2021. Federal Contaminated Site Risk Assessment in Canada: Guidance on Human Health Preliminary Quantitative Risk Assessment (PQRA). Version 3.0.	included so a threshold of 0.2 was appropriate. This conflicts with the statement by the proponent that because HQs are below 1.0 "the results are acceptable and no significant adverse effects to human health are anticipated". The results summarized below also conflict with the conclusions presented on pg. 8.1 (pdf pg. 267 TSD XXI) which concluded no significant adverse effects on any human receptors were likely and that potential risks predicted from exposure to arsenic in Patterson Lake South Arm were considered negligible as they are localized. ACFN members may preferentially harvest from localized areas and as such these results are significant for members who may harvest terrestrial mammals from the area around the South Arm of Patterson Lake. Additionally, ACFN members consumption rates for traditional foods and medicines are substantially higher (Olsgard, M. et., al. 2023) than those reported regionally as adopted in the HHRA (Chan, L. et., al. 2019). Therefore the rationalization that adopted rates of traditional food consumption were conservative is inaccurate. - Table 5-18 in subsistence harvesters in the project lifespan and far future from exposure to molybdenum associated with project activities from ingestion of terrestrial animals. - Table 5-19 identifies potential risks of increased cancer cases from exposure to arsenic from consuming terrestrial mammals during the operations phase. - Table 5-21 identifies potential risk from exposure to molybdenum concentrations consumed from terrestrial mammals by subsistence harvesters, seasonal and permanent residents in Patterson Lake South Arm, Beet Lake, Lloyd Lake. - Table 5-22 identifies potential cancer risks for the adult camp worker, subsistence harvesters, and seasonal resident harvester (Patterson Lake South Arm) in the RFD which considers cumulative effects from future developments. As noted in Section 8.3, air quality impacts and potential risks to human health were predicted for TSP and PM10 exposures at the fence line. This finding and required monitoring supports the request by ACFN for consideration of metal deposition from TSP and an update to the air modelling, surface water and sediment modelling, and soil modelling conducted in various sections including the ERA and relied on in the HHRA (see Request 418 and response comments and new request).

<table>
<tr>
<td>418.</td>
<td>ACFN
(October 28, 2022)</td>
<td>TSD XXI, Section 15 - ITS</td>
<td>It is recommended that the screening process to identify COPCs associated with surface water, sediment, air ,and soil be re-evaluated to consider complex mixtures as per Health Canada guidance and identify individual COPCs and mixture based COPC classes that reflect similar target organs/ effects/ mechanism of action and that these new COPCs be reflected in an updated HHRA and EcoRA</td>
<td>The environmental risk assessment used best and standard practices to screen COPCs and focus the assessment on those constituents with the potential to affect valued components and receptors. This process included applying maximum predicted or observed concentrations, utilizing the most conservative applicable and available federal and provincial guidelines protective of both human and ecological health, and defining receptor locations based on Indigenous and Local Knowledge so that effects would not be underestimated. No re-evaluation is required.

Based on the screening process, the following COPCs were evaluated quantitatively in the human health risk assessment: arsenic, cobalt, copper, molybdenum, and uranium. A summary of the critical endpoints for each of the toxicity reference values used is provided below. As seen in the table, the various critical endpoints are different for exposures to the COPCs evaluated; therefore, the ERA did not combine the exposure to multiple COPCs.

<table>
<tr><th>COPC</th><th>Critical Endpoint for TRV</th></tr>
<tr><td>Arsenic</td><td>bladder, lung, liver cancer</td></tr>
<tr><td>Cobalt</td><td>hematological effects (increased levels of erythrocytes)</td></tr>
<tr><td>Copper</td><td>gastrointestinal toxicity and hepatotoxicity (liver function)</td></tr>
<tr><td>Molybdenum</td><td>developmental and reproductive effects</td></tr>
<tr><td>Uranium</td><td>nephrotoxicity (renal lesions)</td></tr>
</table>
</td>
<td>Response does not address the request. Please see original rationale provided to support the request.

Section 7.2.4 (Potential effects and Proposed Mitigations) does not provide details of the chemical parameters associated with the identified project activities (pdf pg. 792) and it is unclear how the proponent determined that only Criteria Air Contaminants (CACs) would be associated with project activity emissions and assessed further (Section 7.2.5; pdf pg. 793). The proponent notes that “Similar activities that could affect air quality would be expected to occur for the Fission Patterson Lake South Property (pdf pg. 792). Review of the Fission PLS Air Quality Technical Supporting Document (IEC, 2024) indicates that emissions of particulates from project related activities include metals adsorbed to total suspended particles (TSP). NexGen has not considered these COPCs in their air quality model or in the assessment of potential health risks to human and ecological receptors. The weight of evidence indicates that project related activities during construction and operations have the potential to emit metals to the ambient air with subsequent deposition to terrestrial and aquatic environments and exposure of biological receptors. At a minimum the NexGen EIS should be updated to include air modelling, deposition and fate and transport, and exposure of ecological and human receptors to the following COPCs (in alignment with the Fission PLS mine air quality modelling; Appendix D.1 (IEC, 2024; Appendix B CanNorth 2024) Tables A-11 a and b (air concentrations), c and d (deposition rates)).

Metals in TSP:
Arsenic (As)
Cadmium (Cd),
Cobalt (Co),
Copper (Cu),
Lead (Pb),
Nickel (Ni)
Selenium (Se),
Uranium (U),
Acrolein (as a surrogate for total volatile compounds [VOC]),
Radon (Rn-222).
Thorium-230
Radium-226
Lead-210
Polonium-210a

As noted in the response to request 418, NexGen has identified the following COPCs as associated with project activity releases to water only and excluded exposure estimates from air deposition of these COPCs from the air modelling study and the ERA and HHRA. The adopted methods and COPC screening would likely underestimate potential exposure to these additional COPCs and results of the risk analysis would likey be underestimated.

In response to request 418, the potential for additive toxicity from mixtures of multiple COPCs associated with the same critical effect was unlikely and mixture toxicity was not required in the ERA and HHRA. However, inclusion of the metals associated with particulate deposition identified in the Fission PLS project from project activities indicates there could be potential additive effects and additional health effects, if these additional COPCs were considered (Health Canada 2021) as shown in the updated table below.
<table>
<tr><td>Arsenic</td><td>bladder, lung, liver cancer</td></tr>
<tr><td>Lead 210
Radium 226</td><td>Cancer of the lung, breast, thyroid, bone, digestive organs and skin; leukaemia</td></tr>
<tr><td>Cobalt</td><td>hematological effects (increased levels of erythrocytes)</td></tr>
<tr><td>Copper</td><td>gastrointestinal toxicity and hepatotoxicity (liver function)</td></tr>
<tr><td>Lead</td><td>Neurodevelopmental (cognitive function)</td></tr>
</table>
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</tr>
</table>

Molybdenum **Nickel (chloride)**	developmental and reproductive effects
Nickel (sulfate)	**Dermal (exacerbation of eczema in sensitive subjects)**
Selenium	**Hair and nail brittleness and loss**
Uranium Cadmium	nephrotoxicity (renal lesions)

Furthermore, releases of radionuclides (carcinogens) to ambient air are related to project activities associated with Uranium mines (IEC 2024) and were predicted in the air deposition to waterbodies (excerpt from Section 10.5.1.2.5 below) but were not considered in the ERA or HHRA.

10.5.1.2.5 Atmospheric Deposition

Results from the atmospheric deposition assessment (Appendix 7A) for the Application Case indicate that effects solely from air deposition would be localized and result in minor changes to COPC concentrations and TSP in Lake C, Lake E, Unnamed Lake 1, and Unnamed Lake 2. These effects were limited to the lifespan of the Project and associated with Project air emissions during Operations.

The increase in COPC concentrations in Lake C, Lake E, Unnamed Lake 1, and Unnamed Lake 2 from air deposition in the Application Case relative to the Base Case was minor and did not result in any COPC threshold exceedances (Table 10.5-5). The COPCs with the greatest predicted concentration increase relative to the Base Case were mercury, polonium-210, radium-226, thorium-230, and uranium (Table 10.5-5). The largest increases in COPC concentration based on maximum predicted monthly average concentrations were observed in Unnamed Lake 2, followed by Lake E, Lake C, and Unnamed Lake 1. The larger increases predicted in Unnamed Lake 2 were attributed to this waterbody being in the predominant downwind direction from the Project site. The mercury air deposition concentration calculated from the air quality dispersion model was below the detection limit for all lakes, so the source input to the deposition assessment for mercury was set at the detection limit, meaning there is some uncertainty with mercury concentration projections; however, these concentrations are likely to be lower than predicted (i.e., a conservative assumption).

Additional context regarding the air quality dispersion model is provided in Section 7.2, Air Quality. Detailed results of the atmospheric deposition assessment in the RSWQM are presented in Appendix 10A.

Table 10.5-5: Maximum Predicted Water Quality Concentrations as a Result of Atmospheric Deposition in Lake C, Lake E, Unnamed Lake 1, and Unnamed Lake 2 for the Application Case

Constituent	Units	COPC Threshold	Base Case Concentration	Maximum Predicted Monthly Average Concentration during Lifespan of the Project			
				Lake C	Lake E	Unnamed Lake 1	Unnamed Lake 2
Mercury	mg/L	0.000026	0.0000015	0.0000031	0.0000035	0.0000034	0.0000053
Uranium	mg/L	0.015	0.000056	0.00015	0.00024	0.00014	0.00027
Lead-210	Bq/L	22	0.012	0.013	0.015	0.013	0.015
Polonium-210	Bq/L	13.5	0.0043	0.0078	0.0116	0.0094	0.013
Radium-226	Bq/L	0.11	0.0033	0.0047	0.0062	0.0041	0.0062
Thorium-230	Bq/L	95	0.0052	0.0066	0.0081	0.0060	0.0081

COPC = constituent of potential concern; Bq/L = becquerels per litre.

Air emissions of radionuclides are linked to multiple exposure pathways (inhalation, deposition and ingestion) and as per Health Canada 2021b and CSA 2012, when COPCs are identified with exposure pathways they should be assessed for potential health risks. While Health Canada does not prescribe TRVs for exposure to radionuclides (2021a), maximum acceptable concentrations (MACs) for radionuclides are available for assessing exposures through drinking water (Health Canada 2024 Table 3) and can be relied on to assess exposure via ingestion of biota, water, soils, and sediment.

The following is requested to address noted limitations in Sections 7 and TSD XXI of the NexGen EIS

1. Update list of COPCs to align with air emissions identified at similar facilities (i.e. Fission PLS) and include the COPCs identified in this comment.
2. Update air modelling in Section 7 to consider the additional COPs identified here and potential additive toxicity for COPs with similar critical effects.
3. Update the exposure assessment, toxicity assessment, and risk analysis components of the ERA and HHRA completed in TSD XXI to consider the

Number	Source	Reference to EIS, appendix or TSD	Comment Summary (all original submissions can be found on Canadian Impact Assessment Registry reference: 80171)	NexGen Response	ACFN Technical Reviewer Response & Recommendation
					additional COPCs identified here and potential additive toxicity for COPs with similar critical effects. References Health Canada 2021a. Federal Contaminated Site Risk Assessment in Canada: Toxicological Reference Values (TRVs). Version 3. Health Canada. 2021b. Federal Contaminated Site Risk Assessment in Canada: Guidance on Human Health Preliminary Quantitative Risk Assessment (PQRA). Version 3.0 Health Canada. 2024. Guidelines for Canadian Drinking Water Quality – Table 3. Radiological parameters. Independent Environmental Consultants (IEC). 2024. Appendix D.1. ir Quality Technical Supporting Document Fission Uranium Corp. – PLS Project. CSA Group (Canadian Standards Association Group). 2012. CSA N288.6-12: Environmental Risk Assessments at Class I Nuclear Facilities and Uranium Mines and Mills.
419.	ACFN (October 28, 2022)	TSD XXI, Section 15 - ITS	a) Please clarify if the screening process identified COPCs which exceeded screening values at each of the identified areas (end of pipe, boundary of mixing zone, runoff) or if a COPC was only identified if predicted concentrations exceeded at each of the areas **b)** If the response indicates that COPCs were identified only if predicted concentrations exceeded screening values at the end of pipe and boundary of the chronic mixing zone, please re-screen the predicted concentrations and identify COPCS as those project-related contaminants which exceeded screening values at the end of pipe.	a) As stated in Draft EIS Section 15.2.8.2 (Constituents of Potential Concern), as a first step, upper bound end-of-pipe treated effluent concentrations were compared against the Project chronic surface water quality objectives (SWQOs). Those constituents with predicted upper bound treated effluent concentrations above SWQOs were considered further for additional screening; these upper bound constituents were then compared against the SWQOs at the edge of the mixing zone. Those constituents at the edge of the mixing zone with concentrations above SWQOs were identified as COPCs. In other words, if a COPC only exceeded its SWQO in runoff or end of pipe but not at the edge of the mixing zone, it was not identified as a COPC (Draft EIS Section 15.2.8.2 [Constituents of Potential Concern], Figure 15.2-4). b) NexGen maintains that classifying certain constituents as COPCs due to end-of-pipe effluent concentration exceedances of Project chronic SWQOs is overly conservative as no human or ecological receptors would be regularly exposed to end-of-pipe effluent concentrations. NexGen further maintains that screening against concentrations at the edge of the mixing zone is more realistic and also a conservative approach as few receptors would be isolated at the edge of the mixing zone. NexGen would implement monitoring through the Environmental Monitoring Plan that would include collection of surface water, sediment, fish tissue, and benthic invertebrate tissue samples to verify the predictions made by the environmental risk assessment (ERA), refine the models used in the ERA, and reduce the uncertainty in the predictions made by the ERA (Draft EIS Section 15.8 [Monitoring, Follow-Up, and Adaptive Management]).	a) Response addresses request. a) Request outstanding. Please see original rationale provided to support the request. Proponent response discusses industry best practice. The federal regulation for Metal and Diamond Mine Effluent under the Fisheries Act applies at the discharge point (i.e. end of pipe) and therefore, COPCs should be identified using the same method and at a minimum the identified deleterious substances should be included in the assessment of risks (Government of Canada, 2002). Considering the lack of consideration for metals deposited in TSP from air emissions, minimal consideration for effects to non-aquatic receptors, and results of the risk assessment which identify terrestrial receptors as the primary risk drivers (for ecological and human health risks), it is recommended COPCs be re-evaluated by screening concentrations at the end of mine/effluent release point and the ERA and HHRA updated accordingly. References Government of Canada. 2002 (current to 2024). Metal and Diamond Mining Effluent Regulations. Available at SOR-2002-222.pdf (justice.gc.ca)
420.	ACFN (October 28, 2022)	TSD XXI - ITS	It is recommended that the air quality guidelines (AQGs) published by the WHO be added to the sources of air quality screening values and considered in the selection of final screening values to identify air related COPCs.	The environmental risk assessment used best and standard practices to screen COPCs and focus the assessment on those constituents with the potential to affect valued components and receptors. This process included applying maximum predicted or observed concentrations, utilizing the most conservative applicable and available federal and provincial guidelines protective of both human and ecological health, and defining receptor locations based on Indigenous and Local Knowledge so that effects would not be underestimated. No re-evaluation is required. With respect to air quality, the screening guidelines used were focused on Canadian guidelines, which included Saskatchewan Ambient Air Quality Standards, Alberta Ambient Air Quality Objectives, and Ontario Ambient Air Quality Criteria. All of the above guidelines and criteria represented appropriate thresholds for the EA as they are based on protection of health endpoints as outlined in Table 4-6 of Section 4.3.3 of Draft EIS TSD XXI (Environmental Risk Assessment).	Request outstanding. Please see original rationale provided to support the request. The WHO prescribes more protective air quality guidelines for certain criteria air contaminants compared to Saskatchewan and Canada as shown below. WHO air quality guidelines apply globally and given the protective nature is sufficient rationale for why other jurisdictions should be appropriate for the assessment of risks to human health. - PM2.5 annual = 5 ug/m3 (SAAQS = 10 ug/m3; CAAQS = 8.8 ug/m3)) 24 hour = 15 ug/m3 (SAAQS = 28 ug/m3; CAAQS = 27 ug/m3)) - PM10 Annual = 15 ug/m3 24 hour = 45 ug/m3 (SAAQS = 50 ug/m3) - Ozone

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					Peak season (average 8 hr daily max) = 60 ug/m3 (SAAQS = 124 ug/m3) Daily max (8 hour) = 100 ug/m3 (CAAQS = 60 ppb) - NO2 Annual = 10 ug/m3 (SAAQS = 45 ug/m3; CAAQS = 17 ppb) 24 hour = 25 ug/m3 (SAAQS = 200 ug/m3) - SO2 24 hour = 40 ug/m3 (99th percentile annual distribution 24 hour average concentrations) (SAAQS = 125 ug/m3) - CO 24 hour = 4 mg/m3 (99th percentile annual distribution 24 hour average concentrations) References Government of Saskatchewan. Undated. Saskatchewan Environmental Quality Guidelines. Table 20. Saskatchewan Ambient Air Quality Standards. Available at: Table20-SEQS-SAAQS.pdf (saskatchewan.ca) World Health Organization (WHO). 2021. WHO global air quality guidelines: particulate matter (PM2.5 and PM10), ozone, nitrogen dioxide, sulfur dioxide and carbon monoxide. Available at: WHO global air quality guidelines: particulate matter (PM2.5 and PM10), ozone, nitrogen dioxide, sulfur dioxide and carbon monoxide Canadian Council of Ministers of the Environment (CCME). 2021. Canadian Ambient Air Quality Standards. Available at: Air Quality (ccme.ca)
421.	ACFN (October 28, 2022)	TSD XXI - ITS	a) Please provide rationale describing how the air dispersion modeling study is representative of long-term exposures and supports the assessment of health risks. b) It is recommended that the air dispersion modelling be updated to a 3-year period to allow for comparison to federal air quality standards (CAAQS) and that this comparison be undertaken and results reflected in the EIS	a) NexGen notes that the air dispersion modelling study considers a simulation from a five-year meteorological modelling period that included the combined maximum emission rates from all Project sources and sources from reasonably foreseeable developments (i.e., the Fission Patterson Lake South Project). Results of the five-year simulation were added to a mandated background concentration and were summarized to include 1-hour, 24-hour, and annual maximum predicted values. The annual values were used to evaluate long-term exposure in the environmental risk assessment (Draft EIS TSD XXI) and human health assessment (Draft EIS Section 15). The inherent conservativeness of the modelling process (e.g., five-years of hourly meteorological data [43,824 simulated hours]) to capture worst-case meteorological conditions combined with simultaneous maximum emission rates generated a modelled scenario that is representative of possible maximum short-term, medium-term, and long-term air quality conditions where maximum ground-level concentrations are unlikely to be exceeded. Therefore, the air dispersion modelling used for the EA represents conservative information for the purposes of assessing health risks. b) NexGen confirms that the information requested by the reviewer has been provided for information purposes within the Draft EIS. Although the Canadian Ambient Air Quality Standards (CAAQS) were designed to be evaluated against long-term monitoring data in populous areas, the air quality assessment (Draft EIS Section 7.2) includes a comparison of the CAAQS to the predicted concentrations from the modelling. The modelling assessment used a provincially mandated five-year meteorological data set approved by the Province of Saskatchewan. This data set included the meteorological years from 2012 through 2016; within this five-year period, there are three possible three-year periods (i.e., 2012-2014, 2013-2015, and 2014-2016) that could be used to approximate the three-year monitoring data period called for in the CAAQS evaluation metrics. The values compared to the CAAQS in the Draft EIS used the highest predictions from the three possible three-year periods predicted over the five modelling years. Results of this comparison can be found in Table 7.2-12 of Draft EIS Section 7.2.5.1.1.2 (Air Dispersion Modelling Predictions).	a) See responses to other air emission related requests (418 and 420). b) Response addresses request.

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422.	ACFN (October 28, 2022)	TSD XII - ITS	a) It is recommended that the ERA be updated with soil screening values derived using the CCME (2006) guidance for metals associated with air deposition of total suspended particles, b) the derived values be included in the screening process to identify air associated COPCs, and c) the HHRA be updated to reflect any additional COPCs which were identified though this conservative approach	The environmental risk assessment (ERA) used best and standard practices to screen COPCs and focus the assessment on those constituents with the potential to affect valued components and receptors. With respect to soil quality guidelines, the latest soil quality guidelines from the CCME were utilized to screen predicted soil quality from air deposition (CCME 2024). Derivation of CCME soil quality guidelines follows the recommended process published by the CCME. As the guidelines utilized in the ERA are appropriate, no updates to the human health risk assessment are required. **References** CCME (Canadian Council of Ministers of the Environment). 2024. Canadian Environmental Quality Guidelines. Available at https://ccme.ca/en/resources/soil-and-groundwater.	a) Request is outstanding. Please see response to Request 418 and supporting rationale originally provided (below). Rationale / Review Comments: Predicted concentrations of Total Suspended Particles (TSP) were predicted to exceed screening values for deposition (Section 4.3.3.1) based on this exceedance, deposition of dust to soil and potential risks of bioaccumulation of COPCs in traditional foods was evaluated by comparing the predicted concentration of metals to soil quality guidelines. This method is supported and appropriate, however, the CCME soil quality guidelines for the protection of human health are limited and do not consider bioaccumulation of contaminants from soil to foods as stated in "A Protocol for the Derivation of Environmental and Human Health Soil Quality Guidelines (CCME, 2006). As per the CCME derivation protocol, to evaluate potential risks to humans from consumption of traditional foods which may take up contaminants from soil, soil quality guidelines must be derived using the calculations provided in "Derivation of Soil Quality Guidelines for Soil and Food Ingestion". The proponent has not derived soil quality guidelines to consider this exposure pathway and the air associated COPCs may not reflect all metals potentially deposited to soils that could cause risks to human health (see request 418 for additional concerns related to screening to identify air related COPCs, deposition or metals, and soil exposure pathways and risks).
423.	ACFN (October 28, 2022)	TSD XXI - ITS	a) It is recommended that the ERA be updated with all known carcinogenic substances as per Health Canada toxicity reference values (TRV) guidance (2021) b) It is recommended that the HHRA be updated to reflect carcinogenic substances which may act through additive mechanisms.	As per Health Canada human health risk assessment (HHRA) guidance, human health risks were calculated in the problem formulation for all chemicals, receptors, and exposure pathways identified as being of potential concern. For the HHRA, the following COPCs were assessed: arsenic, cobalt, copper, molybdenum, and uranium. Of these COPCs, only arsenic is identified in the Health Canada toxicity reference value guidance as a carcinogen; therefore, arsenic was quantitatively assessed in the HHRA. No other carcinogenic substances are required to be added to the ERA.	Requests are outstanding. See request 418 response. Please address the original request based on the rational provided previously (below). As discussed previously, there are concerns related to the lack of screening to identify COPCS which consider additivity from complex mixtures. Further to this, screening values for metals in air using the identified guidelines do not reflect Health Canada Toxicity Reference Values which identifies additional substances as carcinogenic via inhalation exposure, specifically cadmium, chromium, and nickel. Considering that the HHRA identified potential carcinogenic risks from exposure to arsenic, a conservative approach to assess carcinogenicity would be to include all carcinogenic substances regardless of whether predicted concentrations exceeded the identified screening value.
424.	ACFN (October 28, 2022)	Section 13-MSES	a) Please explain which non-native plant species may be used in reclamation and why that species would be used instead of a native plant species. **b)** For each non-native plant species to be used, explain how that species will be prevented from becoming established within the reclaimed plant community and altering species composition relative to pre-disturbance.	NexGen notes that the intent during reclamation activities is to use native plant species. However, flexibility is required should the use of native species not be practical for ensuring reclamation success. As examples, non-native species may be required if insufficient native species seeds/seedlings are available or if a fast-establishing annual plant species is required to minimize erosion. While potential non-native plant species have not been identified at this time, these species, if used, would be non-aggressive and demonstrated to be non-invasive (Draft EIS Section 13.4 [Project Interactions and Mitigations], Table 13.4-1). These species would be early successional plants that establish quickly and decrease soil erosion enabling non-native species to establish and grow. The focus would be on using annual species such as wild rye or barley that would establish and die off over winter. When required, mowing or clipping would be used to cut off the grass tops before they go to seed.	It is not clear from NexGen's response if their intention is to use non-native plant species when native species are not available to reclaim a plant community, or only to prevent erosion. If NexGen is suggesting that they may use non-native species to establish a reclaimed plant community, then this is not acceptable. However, using non-native annual plant species such as barley or rye may be acceptable if they are being used strictly for erosion control and evidence and/or monitoring shows that these species are not invasive. Unfortunately, it is difficult to evaluate the appropriateness of using a particular non-native annual species to prevent erosion if the species to be used is not identified. **It is recommended that prior to the use of any non-native species, NexGen be required to provide evidence that the particular species will not be invasive and become part of the plant community being reclaimed.**
425.	ACFN (October 28, 2022)	Section 13-MSES	Please provide evidence from the scientific literature that the mitigations for fugitive dust and constituent emissions will be successful in preventing dust or other emissions from coating the leaves of plant species in the vicinity of Project construction and operations activities	As indicated in Draft EIS Section 13.4.2 (Secondary Pathways), dust deposition rates from the Project (0.072 to 0.095 mg/cm^2/30 d) are predicted to be much less than rates shown in the scientific literature to cause effects on plants (0.3 to 7.2 mg/cm^2/30 d) (Walker and Everett 1987). Any changes would be negligible and localized and not result in significant effects to self-sustaining and ecologically effective upland, wetland, or riparian ecosystems and traditional use plants. NexGen will monitor dust deposition and other constituents, and soil and vegetation chemistry to determine the effectiveness of mitigation and apply adaptive management, if necessary. **References** Walker DA, Everett KR. 1987. Road dust and its environmental impact on Alaskan taiga and tundra. Arctic & Alpine Research 19(4):479 489.	The response that NexGen will monitor the deposition of dust and other constituents, and soil and vegetation chemistry, and apply adaptive management, if necessary, is adequate.

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426.	ACFN (October 28, 2022)	Section 13-MSES	Please provide evidence from the scientific literature that mitigations for fugitive dust and constituent emissions are effective at preventing significant impacts on the nutritional quality, growth, and survivorship of plant species, particularly those that have been shown to be sensitive to dust and other emissions.	As indicated in Draft EIS Section 13.4.2 (Secondary Pathways), dust deposition rates from the Project (0.072 to 0.095 mg/cm^2/30 d) are predicted to be much less than rates shown in the scientific literature to cause effects on plants (0.3 to 7.2 mg/cm^2/30 d) (Walker and Everett 1987). Any changes would be negligible and localized and not result in significant effects to self-sustaining and ecologically effective upland, wetland, or riparian ecosystems and traditional use plants. NexGen will monitor dust deposition and other constituents, and soil and vegetation chemistry to determine the effectiveness of mitigation and apply adaptive management, if necessary. **References** Walker DA, Everett KR. 1987. Road dust and its environmental impact on Alaskan taiga and tundra. Arctic & Alpine Research 19(4):479 489.	The response that NexGen will monitor the deposition of dust and other constituents, and soil and vegetation chemistry, and apply adaptive management, if necessary, is adequate.
427.	ACFN (October 28, 2022)	Section 13-MSES	If site roads and the haul route from the headworks to the waste rock piles are unpaved, please provide justification for why the speed limit of 25 km/hr will not apply in these areas.	NexGen notes that the 25 km/h speed limit for heavy equipment involved in material movement and earthworks on the mine / mill terrace during Construction (Draft EIS Section 13.4 [Project Interactions and Mitigations], Table 13.4-1) is a specific mitigation that was derived based on findings from iterative air quality modelling during Draft EIS development. More specifically, limiting speed in this area was predicted to limit emissions to more acceptable levels. While this mitigation measure was not shown to be required for other areas of the Project site or for other Project phases, NexGen further notes that Project site speed limits for Operations have not yet been determined and could be applied at a future date, if deemed required.	The reasoning for NexGen enforcing "*a 25 km/hr speed limit for heavy equipment involved in material movement and earthworks on the mine/mill terrace,*" but not on other unpaved roads remains unclear. Did NexGen conduct air quality testing on the site road and haul route from the headworks to the waste rock piles and found no air quality issues? **It is recommended that NexGen clarify whether air quality testing was done in these areas and provide any results to stakeholders to provide assurance that no issues were detected on the site road and haul routes from the headworks to the waste rock piles. If issues are detected, then NexGen should be required to implement and enforce the 25 km/hr speed limit.**
428.	ACFN (October 28, 2022)	Section 13-MSES	Will all other mitigations in the Project effects pathway (Table 13-4.1) be applied to site roads and the haul route from the headworks to the waste rock piles to prevent dust, radon, and other emissions from being generated and impacting nearby plant species?	Except where specific details are noted (e.g., 25 km/h speed limit for heavy equipment involved in material movement and earthworks on the mine / mill terrace during Construction), NexGen is committed to implementing all dust-limiting mitigation measures presented in Table 13.4-1 of Draft EIS Section 13.4 (Project Interactions and Mitigations) site-wide, where applicable, to avoid and minimize effects from the Project on vegetation.	The response that NexGen is committed to implementing all dust-limiting mitigation measures presented in Table 13.4-1 of Draft EIS Section 13.4, is adequate.
429.	ACFN (October 28, 2022)	Section 13-MSES	Please explain how NexGen will promote propagation and regeneration	NexGen confirms that propagation and regeneration of plant species would be promoted by: ▪ salvaging the organic surface soil to the extent practical and, during reclamation, replacing this soil in variable patterns that mimic natural ecosystems; ▪ placing woody debris to create microsites, provide seed sources, and mimic natural ground surfaces; ▪ using site preparation techniques such as recontouring, ripping, and rough mounting to integrate with the surrounding landscape, add surface variability, and increase biodiversity and vegetation survival; and ▪ to the extent practical, promoting ecosystem development through planting of native trees and shrubs that suit the target ecosystems that are common to the area.	Some of the basic techniques listed by NexGen are essential for reclaiming a disturbed site. However, it is not clear when salvaging surface soil is not practical and what are the variable patterns of replacing soil that mimics natural ecosystems. All surface soils should be salvaged and carefully placed for reuse in reclamation. NexGen's EIS states that one of its mitigations for a loss of vegetation from the fibre optic line is to *promote natural propagation and regeneration to enhance reclamation along the access road and other Project rights-of-way*. The listed techniques will contribute to the natural regeneration of some native plant species in reclamation areas. However, some of the site preparation techniques expose mineral soil, and experience has shown that these exposed soils often become populated by several non-native plant species instead of a diversity of native plant species. Planting trees and shrubs is one step in re-establishing a plant community similar to pre-disturbance. However, it is a misconception that by planting trees and shrubs, one is promoting ecosystem development, i.e., creating conditions, for other native plant species to return on their own. **It is recommended that instead of relying on natural propagation and regeneration to mitigate vegetation losses, NexGen should be required to include in their planting prescriptions other understory plant species (i.e., native forbs, mosses, lichens, grasses) such that plant communities being reclaimed within disturbed sites will be similar to pre-disturbance plant communities.**
430.	ACFN (October 28, 2022)	Section 13-MSES	Please provide evidence from the scientific literature or data from other projects to show the effectiveness of the techniques used to promote propagation and regeneration.	The *Best Management Practices for Conservation of Reclamation Materials in the Mineable Oil Sands Region of Alberta* (CEMA 2011) provides best management practices (BMP) supported by scientific literature and experience at mine sites in the boreal forest. Relevant BMPs include: ▪ BMP 3: use of woody debris as a reclamation material. ▪ BMP 5: salvage transitional soils. ▪ BMP 18 to 21: soil placement. ▪ BMP 23: leave cover soil rough on the surface.	As noted above, the basic techniques listed by NexGen are essential for reclaiming a disturbed site, and it is agreed that they are best management practises for reclamation of mine sites. However, these techniques alone will not result in the diverse plant communities that are present prior to disturbance and ACFN expects to be re-established in reclamation. Therefore, while it is acknowledged that the techniques listed are in important part of any reclamation program, additional planting of the appropriate understory native plant species must be included in NexGen's reclamation plan. **It is recommended that instead of relying on natural propagation and regeneration to mitigate vegetation losses, NexGen should**

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				Other relevant references include Polster (2016), which explains the benefit of creating irregular surfaces for reclamation, and Pyper and Vinge (2012), which discusses the benefits of use and proper placement of coarse woody debris for reclamation. **References** CEMA. 2011. Best Management Practices For Conservation of Reclamation Materials in the Mineable Oil Sands Region of Alberta. Prepared by Dean Mackenzie, for the Terrestrial Subgroup, Best Management Practices Task Group. 9 March 2011. Polster, David, F. 2016. Natural Processes for the Restoration of Drastically Disturbed Sites. Journal American Society Mining and Reclamation (JASMR), 2016 Volume 5 Issue 2. Pyper, M. and T. Vinge. 2012. Managing woody materials on industrial sites: Meeting economic, ecological and forest health goals through a collaborative approach. Department of Renewable Resources, University of Alberta. 32 pp.	**be required to include in their planting prescriptions native understory plant species such that plant communities being reclaimed within disturbed sites will be similar to pre-disturbance plant communities.**
431.	ACFN (October 28, 2022)	Section 13-MSES	Given the prevalence of invasive species in the disturbed areas of the Project, and their prevalence in human-disturbed areas generally, including in reclamation sites, will NexGen consider carrying forward the invasive species pathway in the assessment of Project effects?	As indicated in Draft EIS Section 13.3 (Existing Conditions), baseline field studies found the occurrence of invasive plant species to be limited to existing disturbed upland ecosites; invasive species were not detected in wetlands and riparian habitats or undisturbed areas. NexGen has committed to mitigation measures such as inspecting and cleaning equipment, certified seed mixes, and monitoring for and removing invasive species, which are anticipated to avoid and minimize the introduction of noxious and nuisance weeds within and adjacent to disturbed areas of the Project footprint. Through the use of mitigation measures, invasive species are not predicted to result in greater-than-negligible effects (Draft EIS Section 13.4.2 [Secondary Pathways]). For this reason, NexGen maintains that a detailed assessment of this pathway is not required.	NexGen's response that they will commit to the listed mitigation measures is partially adequate. However, given the prevalences of non-native species within disturbed areas of the site, and their success within disturbances generally, it is questionable whether they will be able to eradicate these species in reclamation. **It is recommended that NexGen carry forward the invasive species pathway in the assessment of Project effects and continue to monitor for the presence of these species until reclamation is deemed successful.**
432.	ACFN (October 28, 2022)	Section 13-MSES	Given that many of the predominant species (i.e., lichens, mosses) found in the plant communities to be disturbed by the Project footprint, including traditional use plant species, are difficult to re-establish in reclamation, please provide justification for the prediction that the impacts on the availability of upland and riparian ecosystems are reversible.	Plant communities in the boreal forest have evolved with fire and other natural factors (drought, floods, extreme temperature variation) for millennia. Fire is often a highly intense disturbance that covers a large area. The continued re-establishment and succession of plant communities in the boreal forest exemplifies the resilience and adaptive capacity of plants in upland and riparian ecosystems. The prediction that effects to upland and riparian ecosystems are reversible considers this resilience and the much smaller area of disturbance from the Project relative to fire, along with the reclamation, monitoring, and adaptive management processes that would be implemented. NexGen acknowledges that a lengthy period of time could be required for effects to be reversible (i.e., 60 to 80 years or longer following the Active Closure Stage) (Draft EIS Section 13.5.1.3.1 [Classification Summary]; Draft EIS Section 13.5.3.3.1 [Classification Summary]).	It is certainly correct that the boreal forest is a fire-dominated ecosystem and is resilient to natural disturbances. However, anthropogenic disturbances such as the NexGen project disturb soils in a manner that is very different from that of naturally occurring disturbances, particularly wildfire, which is the predominant natural boreal forest disturbance. NexGen anticipates that a lengthy period of time could be required for effects to be reversible. However, there is currently no scientific evidence to support the re-establishment of these sensitive plant species after large-scale anthropogenic disturbance. Indigenous communities have been told for decades that the re-establishment of diverse native plant communities after anthropogenic disturbances will take decades, and this has yet to materialize. Instead, there is ample evidence throughout the boreal forest that reclaimed disturbances result in novel plant communities that lack many of the native plant species present prior to disturbance. **Consequently, it is recommended that NexGen revise their prediction that the impacts of the Project on the availability of diverse upland and riparian ecosystems are reversible.**
433.	ACFN (October 28, 2022)	Section 13.5.5-MSES	Please provide evidence from the scientific literature that the plant species that predominate pre-disturbance plant communities (e.g., lichen, feathermosses) can be reestablished within reclamation sites in the boreal forest.	Mosses can be effectively reclaimed using the spreading of moss clippings on reclaimed areas. Some approaches are discussed in the *Peatland Restoration Guide* (Quinty and Rochefort 2003). Although this manual focusses on peatland restoration, some of these techniques are transferable to the Project. Site-specific research would be conducted to confirm the most effective methods of propagating locally common mosses at Project site. Lichen propagation is still a relatively new science; therefore, the amount of scientific literature is limited. Propagation of *Cladonia* / *Cladina* using spreading of fragments was shown to be successful in research trials completed by Ronalds and Grant (2018) and Rapai et al (2023). Site-specific research would be conducted to confirm the most effective methods of propagating locally common lichens at the Project site. **References**	The literature provided does show that research into the re-establishment of mosses and liches has been underway for some time. However, as demonstrated by the examples provided, these studies are in their infancy, and given the long time span and relative lack of progress, it is clear that we are far from understanding how best to re-establish these species across widespread anthropogenic disturbances. To suggest that NexGen will conduct site-specific research at their Project sites to re-establish these species ignores the difficulty that has yet to be overcome by researchers who have spent years investigating this topic. **Given the difficulties of re-establishing mosses and lichens, it is recommended that NexGen's prediction that the impacts of "the Project on biodiversity will be *low* in magnitude because effects on biodiversity are *reversible* in the long term for some natural ecosystems and plant communities that can regenerate or can be reclaimed," should be revised to *high* in magnitude and *irreversible*.**

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				Quinty, F. and L. Rochefort. 2003. *Peatland Restoration Guide*, second edition. Canadian Sphagnum Peat Moss Association and New Brunswick Department of Natural Resources and Energy, Québec, Québec. Ronalds, I. and L. Grant. 2018. *Tweedsmuir Lichen Restoration Trial Year 1 Report.* Skeena Region, Ministry of Forests, Lands, Natural Resource Operations, and Rural Development. Rapai, S.B., D. McColl, B. Collis, T. A. Henry, and D. Coxson. 2023. *Terrestrial Lichen Caribou Forage Transplant Success : Year 5 and 6 Results.* Restoration Ecology. 10.1111/rec.13867.	
434.	ACFN (October 28, 2022)	Section 6.5-MSES WILDLIFE	Please quantitatively assess changes in wildlife habitat from pre-disturbance to existing conditions to understand the degree and rate of change in wildlife habitat quality and quantity. If not, please provide rationale.	NexGen notes that an assessment of effects compared to predevelopment conditions is outside the scope of the requirements of an EA of a designated project under the *Canadian Environmental Assessment Act, 2012*. Therefore, no additional assessment case is required to be considered. NexGen further notes that the regional study area has been relatively undisturbed by direct human development (<1%) and mostly influenced by wildfire and water level fluctuations. As a result, Base Case conditions largely reflect natural factors prior to development. **References** *Canadian Environmental Assessment Act, 2012*. SC 2012, c 19, s 52. Repealed, 2019, c 28, s 9. Available at https://laws-lois.justice.gc.ca/eng/acts/C-15.21/20170622/P1TT3xt3.html.	It is understood that the regulations fail to require a quantitative assessment. This said, the qualitative statements about past, current, and future effects on wildlife remain undetected. **We recommend that NexGen work with the ACFN to better understand the project impacts on wildlife in a quantitative manner. Quantification is particularly relevant for the development of mitigation and monitoring programs.**
435.	ACFN (October 28, 2022)	Section 14.2.2 - MSES WILDLIFE	Please discuss further how Project Application and RFD impacts on upland and wetland ecosystems are indicative of impacts on grouse and ptarmigan.	NexGen notes that ptarmigan are generally classified as upland game birds that prefer open subarctic habitats with deciduous shrubs and trees for food and cover, and are most commonly found in the northern extent of the province (Conkin 2018). Therefore, potential effects to the upland ecosystem valued component (VC) are expected to be representative of effects to ptarmigan. NexGen notes that spruce grouse generally occupy lowland bogs and forest edges. Therefore, potential effects to the upland ecosystem and wetland ecosystem VCs are expected to be representative of effects to spruce grouse. **References** Conkin, Katherine R. 2018. Management Plan for Upland Game Birds in Saskatchewan 2018-2028. Wildlife Unit, Fish, Wildlife and Lands Branch, Saskatchewan Environment. 35pp. https://pubsaskdev.blob.core.windows.net/pubsask-prod/109412/109412-Upland_Game_Bird_Management_Plan.pdf.	In a qualitative manner the response is adequate. However, **we recommend that NexGen works with the ACFN to develop mitigation and monitoring programs to the satisfaction of the community.**
436.	ACFN (October 28, 2022)	Section 14.2.2-MSES WILDLIFE	Please summarize magnitude of Project and RFD impacts to fisher and marten given the predictions and significance outcomes for caribou, little brown myotis and upland habitats assessments.	Effects of the Project and reasonably foreseeable developments (RFDs) on fisher are represented by grey wolf and black bear, which use similar habitats. The magnitude of effects on habitat availability, habitat distribution, and survival and reproduction were negligible to low; as such, the effects were predicted to be not significant on wolf and black bear. A similar magnitude of effects and conclusion are predicted for fisher. Effects of the Project and RFDs on marten are represented by woodland caribou and little brown myotis, which use similar habitats. The magnitude of effects from changes in habitat availability, habitat distribution, and survival and reproduction on little brown myotis was negligible to moderate, while the magnitude on woodland caribou was high due the amount of existing disturbance in the regional study area (largely due to fire) and the associated species-specific undisturbed habitat requirements for woodland caribou in the SK2 West Caribou Administrative Unit (i.e., 65% undisturbed habitat). The magnitude of effects on marten are expected to be less than the magnitude of effects on little brown myotis and woodland caribou because of the difference in species status (i.e., marten are not a species at risk in Saskatchewan) and predicted current higher resilience and adaptive capacity of marten (i.e., marten are not in decline due to habitat loss [woodland caribou] or disease [little	The statement that wolf and bear use similar habitats like fisher is a gross generalization. While wolf and bear may at times frequent the habitat of fisher, wolf and bear use of the habitat that fisher use is entirely different. The three species occupy entirely different ecological niches. While we accept the response regarding the effects on marten, **we recommend that NexGen works with the ACFN to develop mitigation and monitoring programs for woodland caribou, brown myotis, and fisher to the satisfaction of the community.**

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				brown myotis]). In addition, mitigation measures implemented for black bear dens would also benefit marten during denning periods by avoiding and reducing Project-related adverse effects to their survival and reproduction (Section 14.4.4.2). Adverse effects to fisher and marten are anticipated to be not significant.	
437.	ACFN (October 28, 2022)	Section 14.4-MSES WILDLIFE	Please provide explanation as to how the effluent treatment plant (ETP) final diffuser design will mitigate changes to ice thickness.	NexGen confirms that the final diffuser design depth, port configuration, and port orientation will be refined to mitigate changes to water velocity at the surface of Patterson Lake that could result in changes to ice thickness.	Ice thickness is an important issue for many ecological reasons. **We recommend that the final design, the potential effects, and the actual effects of the diffuser be discussed with the ACFN in a collaborative manner.**
438.	ACFN (October 28, 2022)	Section 14.2-MSES WILDLIFE	Please clarify what species were included in the ecological risk assessment.	NexGen confirms 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 receptors in the ecological risk assessment.	The clarification on what species were included in the ecological risk assessment is adequate.
439.	ACFN (October 28, 2022)	Section 14.2-MSES WILDLIFE	Please describe what wildlife species will be monitored and how they will be monitored to verify the predictions in the risk assessment.	NexGen confirms that the Environmental Protection Program and supporting documentation (e.g., Environmental Monitoring Plan) and processes will outline considerations for the wildlife monitoring, including factors associated with species-specific monitoring, where required. Monitoring would aim to evaluate the effectiveness of environmental protection measures and contribute to adaptive management measures, if required, to verify that the assessment endpoints assessed in the EA are maintained. Development of the monitoring programs will be completed as part of the provincial permitting and federal licensing processes. In addition to NexGen monitoring activities, independent Indigenous monitoring would also be conducted by the primary Indigenous Groups. Each Indigenous Monitor (one per primary Indigenous Group) would have access to conduct environmental sampling for the Project, subject to the Indigenous Monitor complying with appropriate health and safety and other reasonable site-specific policies (Draft EIS Section 14.7 [Monitoring, Follow-Up, and Adaptive Management]).	We noted in our initial review that "The proponent's commitment to support the establishment of Indigenous monitoring groups is encouraging". However, the response does not provide any more information that would help us understand what exactly will be done for mitigation and monitoring plans. NexGen's response correctly highlights the need for adaptive management. We note that for management to be adaptive there must be measurable and clearly defined triggers that prompt adaptive measures to be taken. **We recommend that NexGen work with the ACFN to better understand the projects impacts on wildlife in a quantitative manner. Quantification is particularly relevant for the development of triggers that prompt an adaptive response.**
440.	ACFN (October 28, 2022)	Section 14.4-MSES WILDLIFE	Please discuss whether the PM10 exceedances may pose a risk to wildlife that consume aquatic vegetation.	NexGen notes that, as stated in Draft EIS Section 14.4.2 (Secondary Pathways), during Construction, most of the area of exceedance of particulate matter with a diameter of 10 µm or less (PM_{10}) would overlap Patterson Lake North Arm and extend approximately 1.2 km from the boundary of the maximum disturbance area. In contrast, during Operations, the area of exceedance towards the North Arm would be substantially reduced and extend 203 m from the boundary of the maximum disturbance area. Since exceedances would occur mostly over Patterson Lake North Arm, it is anticipated that there would be minimal changes to vegetation ecosystems (Section 13.4.2). To verify adverse effects to wildlife would not be significant, an ecological risk assessment was completed to determine Project-related health risks to aquatic and terrestrial wildlife receptors, which included inhalation and ingestion (i.e., soil, sediment, water, plants, and animals) exposure pathways. The risk assessment modelled exposure pathways during Operations and an upper bound scenario (i.e., a more conservative, precautionary model). Results indicated that predicted levels of metals and radionuclides in the environment from the proposed Project for the upper bound scenario would not cause significant adverse effects on the health of wildlife valued components or other wildlife receptors.	We note that exceedances of particulate matter are a concern for wildlife and the vegetation they consume. However, we did not review the risk assessment; therefore, we refrain from further comment on this topic.
441.	ACFN (October 28, 2022)	Section 14.4-MSES WILDLIFE	Please define what "adverse" effects represents.	Adverse or negative effects represent a net loss or degradation to a wildlife valued component from a change in a measurement indicator (Draft EIS Section 14.2.9 [Residual Effects Classification and Determination of Significance], Table 14.2-7). For example, Project clearing would reduce habitat availability (a measurement indicator) for certain valued components (e.g., moose). This would represent an adverse effect to moose.	This response is adequate.
442.	ACFN (October 28, 2022)	Section 14.4-MSES WILDLIFE	How will NexGen monitor for potential changes in wildlife habitat availability and quality due to these predicted exceedances, particularly for woodland caribou.	NexGen confirms that the Environmental Protection Program and supporting documentation (e.g., Environmental Monitoring Plan) and processes will outline considerations for the wildlife monitoring, including factors associated with wildlife health. Monitoring would aim to evaluate the effectiveness of environmental protection measures and contribute to adaptive management measures, if required, to verify that the assessment endpoints assessed in the EA are maintained. Development of the monitoring programs will be completed as part of the provincial permitting and federal licensing processes.	We agree with NexGen as to what the intent of monitoring should be, and the plan to involve indigenous monitoring groups is promising. However, at this stage of the information we received, we cannot evaluate whether or not the mitigation and monitoring plans will be effective. **We recommend that NexGen works with the ACFN to develop mitigation and monitoring plans.**

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				In addition to NexGen monitoring activities, independent Indigenous monitoring would also be conducted by the primary Indigenous Groups. Each Indigenous Monitor (one per primary Indigenous Group) would have access to conduct environmental sampling for the Project, subject to the Indigenous Monitor complying with appropriate health and safety and other reasonable site-specific policies (Draft EIS Section 14.7 [Monitoring, Follow-Up, and Adaptive Management]). Specific to woodland caribou, NexGen further confirms that a Caribou Mitigation and Offset Plan that includes monitoring is currently being developed through discussions with the provincial and federal governments and Indigenous Groups.	
443.	ACFN (October 28, 2022)	Section 14.5-MSES WILDLIFE	In addition to the discussion of habitat distribution under the Application and RFD cases, please provide further details on size of the suitable habitat patches and distance between these habitat patches from the LSA for each wildlife VC.	Habitat availability and distribution for each wildlife VC is described in Draft EIS Section 14.3 (Existing Conditions) and Draft EIS Section 14.5 (Residual Effects Analysis). Habitat availability presents the quantity of different suitable habitat categories (i.e., quality) while habitat distribution describes the arrangement and connectivity of suitable habitats. The quantity and arrangement of suitable habitats is described both quantitatively and qualitatively for the Base Case, Application Case, and RFD Case. More refined calculations on the exact size and distance between patches of suitable habitats would not change the assessment conclusions. Therefore, no changes are required for the Final EIS.	We do not agree with NexGen that more quantification would not change the assessment. It may or it may not. At this mostly qualitative level of wildlife impact assessment, the degree of impact to wildlife is in the eye of the beholder. As above, **we recommend that NexGen work with the ACFN to better understand the projects impacts on wildlife in a quantitative manner.**
444.	ACFN (October 28, 2022)	Section 14.5-MSES WILDLIFE	Please provide connectivity analyses as part of the impact assessment. If not, provide ecologically supported rationale for not doing so.	Habitat availability and distribution for each wildlife VC is described in Draft EIS Section 14.3 (Existing Conditions) and Draft EIS Section 14.5 (Residual Effects Analysis). Habitat availability presents the quantity of different suitable habitat categories (i.e., quality) while habitat distribution describes the arrangement and connectivity of suitable habitats. The quantity and arrangement of suitable habitats is described both quantitatively and qualitatively for the Base Case, Application Case, and RFD Case. More refined calculations on the exact size and distance between patches of suitable habitats would not change the assessment conclusions. Therefore, no changes are required for the Final EIS.	As above, **we recommend that NexGen work with the ACFN to better understand the projects impacts on wildlife in a quantitative manner.**
445.	ACFN (October 28, 2022)	Section 14.4-MSES WILDLIFE	Please discuss mortality risk for smaller wildlife VCs in the residual effects assessment.	Mortality risk is described in the residual effects assessment for each wildlife valued component (VC), including smaller wildlife, under the section heading 'Survival and Reproduction' (e.g., Draft EIS Section 14.5.7.1.3 [Survival and Reproduction] for olive-sided flycatcher). Survival and reproduction are described as "changes to animal abundance from altering survival and/or recruitment" (Draft EIS Section 14.2.2.2 [Measurement Indicators]). Effects of habitat loss and sensory disturbance (e.g., noise, light) on survival and reproduction were considered for all wildlife VCs. Survival and reproduction also considered the results from the ecological health risk assessment and exposure of aquatic and terrestrial species or receptors to chemical substances or metals. Overall, no significant adverse effects were predicted for smaller wildlife VCs.	While we did not review the health risk assessment sections, we did review all sections that describe impacts to wildlife. Therefore, **simply referring us to the sections that we read does not provide the information we seek.**
446.	ACFN (October 28, 2022)	Section 14.4-MSES WILDLIFE	How will mitigation effectiveness be assessed given that smaller species may be under reported or unknown at the time of collision?	NexGen confirms that the Environmental Protection Program and supporting documentation (e.g., Environmental Monitoring Plan) and processes will outline considerations for the wildlife monitoring, including factors associated with species-specific monitoring, where required. Monitoring would aim to evaluate the effectiveness of environmental protection measures and contribute to adaptive management measures, if required, to verify that the assessment endpoints assessed in the EA are maintained. Development of the monitoring programs will be completed as part of the provincial permitting and federal licensing processes. In addition to NexGen monitoring activities, independent Indigenous monitoring would also be conducted by the primary Indigenous Groups. Each Indigenous Monitor (one per primary Indigenous Group) would have access to conduct environmental sampling for the Project, subject to the Indigenous Monitor complying with appropriate health and safety and other reasonable site-specific policies (Draft EIS Section 14.7 [Monitoring, Follow-Up, and Adaptive Management]). Notwithstanding the planned monitoring activities described above, NexGen acknowledges that challenges exist when monitoring effects to smaller species as effects may not be as visible as with larger species. To help address these challenges, NexGen would consider	We agree with NexGen as to what the intent of monitoring should be, and the plan to involve indigenous monitoring groups is promising. However, at this stage of the information we received, we cannot evaluate whether the mitigation and monitoring plans will be effective. **We recommend that NexGen works with the ACFN to develop mitigation and monitoring plans.**

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				successful practices at other operations. For example, monitoring at operating mines in the Northwest Territories has documented direct mine-related and unknown mortality of small species such as ptarmigan, ground squirrel, songbirds, and muskrat. In addition, opportunities would exist within the Environmental Committees comprised of NexGen and members of the primary Indigenous Groups to discuss potential monitoring measures for smaller species.	
447.	ACFN (October 28, 2022)	Section 14.2 MSES WILDLIFE	What other movement corridors were identified in the RSA that would support wildlife movement due to the loss of the narrows, and the area between Patterson Lake and Forrest Lake? Please identify areas on a map	NexGen confirms that the movement route at the narrows of Patterson Lake was the only route identified through Project engagement activities such as the Joint Working Groups.	We understand this response confirms there was only one wildlife movement corridor identified. **We recommend that NexGen works with the ACFN to develop mitigation and monitoring plans, particularly considering the movement route at the narrows of Patterson Lake.**
448.	ACFN (October 28, 2022)	Section 14.2 MSES WILDLIFE	What feedback was shared from the Indigenous working groups regarding the removal of these areas and its impact to wildlife and member access/movement for traditional activities.	As noted in Draft EIS Section 3.6.2.2 (Incorporating Indigenous and Local Knowledge), available Indigenous and Local Knowledge shared by Indigenous Groups was considered in the assessment of effects for each discipline section, including Wildlife and Wildlife Habitat (Draft EIS Section 14). To show where Indigenous Knowledge was considered, citations are noted throughout Draft EIS Section 14; these references can be identified as “TSD …” for Indigenous Knowledge and Traditional Land Use (IKTLU) Studies or “JWG…” for Joint Working Group meetings. For example, in Draft EIS Section 14.5.1.1.2 (Habitat Distribution), it is recognized that community members expressed concern about impacts of the Project on caribou migration routes (BNDN-JWG 2019b). Other feedback and Indigenous and Local Knowledge related to loss of habitat were also shared with NexGen. Regarding member access/movement, the CRDN mapped travel routes from Highway 955, along existing access road, and east to destinations on the Clearwater and Mirror rivers (TSD V.1: CRDN and TSD V.2: CRDN). Travel routes identified by the BNDN were provided in TSD II: BNDN. Trails and travel routes used by the BRDN and other Indigenous Groups to access areas in the past and today are discussed in TSD III: BRDN. NexGen notes that the information presented in the IKTLU studies is confidential; therefore, specific figures are not provided within the EIS.	Feedback shared from the Indigenous working groups, and local and Indigenous knowledge in general, are important for the development of mitigation and monitoring plans. We raised our question here to highlight this important part of work on wildlife protection and management. However, we refrain from commenting on whether such work has been conducted to the satisfaction of the ACFN.
449.	ACFN (October 28, 2022)	Section 14.2 MSES WILDLIFE	How did the impact assessment consider Indigenous values and importance of the movement route in the impact significance determination?	As noted in Draft EIS Section 3.6.2.2 (Incorporating Indigenous and Local Knowledge), available Indigenous and Local Knowledge shared by Indigenous Groups was considered in the assessment of effects for each discipline section, including Wildlife and Wildlife Habitat (Draft EIS Section 14). To show where Indigenous Knowledge was considered, citations are noted throughout Draft EIS Section 14; these references can be identified as “TSD …” for Indigenous Knowledge and Traditional Land Use (IKTLU) Studies or “JWG…” for Joint Working Group meetings. For example, in Draft EIS Section 14.5.1.1.2 (Habitat Distribution), it is recognized that community members expressed concern about impacts of the Project on caribou migration routes (BNDN-JWG 2019b). Other feedback and Indigenous and Local Knowledge related to loss of habitat were also shared with NexGen. Regarding member access/movement, the CRDN mapped travel routes from Highway 955, along existing access road, and east to destinations on the Clearwater and Mirror rivers (TSD V.1: CRDN and TSD V.2: CRDN). Travel routes identified by the BNDN were provided in TSD II: BNDN. Trails and travel routes used by the BRDN and other Indigenous Groups to access areas in the past and today are discussed in TSD III: BRDN. NexGen notes that the information presented in the IKTLU studies is confidential; therefore, specific figures are not provided within the EIS.	Feedback shared from the Indigenous working groups, and local and Indigenous knowledge in general, are important for the development of mitigation and monitoring plans. We raised our question here to highlight this important part of work on wildlife protection and management. However, we refrain from commenting on whether or not such work has been conducted to the satisfaction of the ACFN.
450.	ACFN (October 28, 2022)	Section 14.7 MSES WILDLIFE	Please discuss how wildlife use of reclaimed habitat will be assessed in follow up programs.	NexGen confirms that the Environmental Protection Program and supporting documentation (e.g., Environmental Monitoring Plan) and processes will outline considerations for the wildlife monitoring, including factors associated with wildlife use of reclaimed habitat, where required. Monitoring would aim to evaluate the effectiveness of environmental protection measures and contribute to adaptive management measures, if required, to verify that the assessment endpoints assessed in the EA are maintained. Development of the monitoring programs will be completed as part of the provincial permitting and federal licensing processes. In addition to NexGen monitoring activities, independent Indigenous monitoring would also be conducted by the primary Indigenous Groups. Each Indigenous Monitor (one per primary Indigenous Group) would have access to conduct environmental sampling for the Project,	Given that in the EIS we could not find any confirmation of NexGen planning to monitor wildlife in reclaimed sites, the response here is a step in the correct direction. However, at this stage of the information we received, we cannot evaluate whether or not the mitigation and monitoring plans will be effective. **We recommend that NexGen works with the ACFN to develop mitigation and monitoring plans.**

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				subject to the Indigenous Monitor complying with appropriate health and safety and other reasonable site-specific policies (Draft EIS Section 14.7 [Monitoring, Follow-Up, and Adaptive Management]).	
451.	ACFN (October 28, 2022)	Section 14.7 MSES WILDLIFE	Provide an outline of what predicted impacts the monitoring program for wildlife will address and methods for studying those impacts.	NexGen confirms that the Environmental Protection Program and supporting documentation (e.g., Environmental Monitoring Plan) and processes will outline considerations for the wildlife monitoring. Monitoring would aim to evaluate the effectiveness of environmental protection measures and contribute to adaptive management measures, if required, to verify that the assessment endpoints assessed in the EA are maintained. Development of the monitoring programs will be completed as part of the provincial permitting and federal licensing processes.	At this stage of the information we received, we cannot evaluate whether or not the mitigation and monitoring plans will be effective. **We recommend that NexGen works with the ACFN to develop mitigation and monitoring plans.**
452.	ACFN (October 28, 2022)	Appendix 14B MSES WILDLIFE	Can the classification of burns be modified to correspond with optimal moose habitat to make the moose HSI more accurate?	NexGen confirms that no modifications are necessary as previous and existing data and literature on burn age associated with optimal moose habitat were incorporated into the habitat suitability index model for the Project (Draft EIS Appendix 14B [Wildlife Habitat Models]).	We question the accuracy of NexGen's moose habitat model. Our own research has shown how important it is for wildlife habitat models to be prepared by quantitative methods and statistically verified. Not doing so typically results in underestimating the effects on wildlife habitat. **We recommend that NexGen takes the quantification of wildlife habitat impact seriously and that NexGen works with the ACFN to develop mitigation and monitoring plans.**
453.	ACFN (October 28, 2022)	Appendix 14B MSES WILDLIFE	Is there any forestry activity in the area that needs to be considered in the HSI?	NexGen confirms that there are no forestry operations in the wildlife regional study area. As noted in Draft EIS Section 14.2.5 (Assessment Cases), Carrier Forest Products and Mistik Management Ltd. have forest management plans south of La Loche; however, these forest management plans are well south of the regional study area.	This response is adequate.
454.	ACFN (October 28, 2022)	Appendix 14B MSES WILDLIFE	Can the HSI model be adjusted to reflect the ecological interaction of recently logged or burned areas (moose forage) with roads (predator access)?	The moose habitat suitability index model considers the age of burns, quality of moose forage, and the habitat quality of linear features (due to sensory disturbance and predation), which were given poor and low suitability values. NexGen notes that there is no forestry activity in the regional study area. Linear features that intersected moderate and high-quality habitats decreased the quality of those habitats in consideration of the interaction between moose forage and predator access. The assessment also qualitatively examined moose-predator interactions (Draft EIS Section 14.3.2 [Moose]).	Although we question the accuracy of the moose habitat model, as stated above, the response regarding forestry activity is adequate.
455.	ACFN (October 28, 2022)	Appendix 14B MSES WILDLIFE	Are pools of existing data and scientific consensus regarding moose populations available for the area?	NexGen confirms that available previous and existing data and literature on moose populations in the region are provided in Draft EIS Section 14.3.2 (Moose) and Draft EIS Annex VIII.1 (Wildlife Baseline Report 1 [Mammals, Waterfowl, and Raptors]).	We question the accuracy of NexGen's moose habitat model. Our own research has shown how important it is for wildlife habitat models to be prepared by quantitative methods and statistically verified. Not doing so typically results in underestimating the effects on wildlife habitat. **We recommend that NexGen takes the quantification of wildlife habitat impact seriously and that NexGen works with the ACFN to develop mitigation and monitoring plans.**
456.	ACFN (October 28, 2022)	Appendix 14B MSES WILDLIFE	Are other moose models available for a similar region that have been developed with validation?	NexGen confirms that available previous and existing data and literature on moose habitat selection and suitability were incorporated into the habitat suitability index model for the Project. The model was validated by Dr. P. McLoughlin, University of Saskatchewan (Draft EIS Appendix 14B [Wildlife Habitat Models]).	We question the accuracy of NexGen's moose habitat model. Our own research has shown how important it is for wildlife habitat models to be prepared by quantitative methods and statistically verified. Not doing so typically results in underestimating the effects on wildlife habitat. **We recommend that NexGen takes the quantification of wildlife habitat impact seriously and that NexGen works with the ACFN to develop mitigation and monitoring plans.**
457.	ACFN (October 28, 2022)	Appendix 14B MSES WILDLIFE	Can additional pre-disturbance data be collected for the purpose of model validation?	Evaluating habitat suitability index (HSI) models is often, by definition, difficult because this model type is most frequently used when data are insufficient to support empirical modelling approaches (e.g., resource selection functions or other statistical methods). Most of the wildlife valued components (VCs) occupy the regional study area (RSA) at low density (e.g., moose, wolf, olive-sided flycatcher, rusty blackbird), making it challenging to collect sufficient data for model validation using techniques such as winter track counts and breeding bird surveys. Therefore, models were developed based on the relevant scientific literature, and knowledge of specifies life history and land cover types in the RSA. For wolf and black bear, the models used the results from resource selection functions generated for populations north of the Project to help classify ecosites into habitat suitability categories. Also, five of the eight models were evaluated by third party experts (University of Saskatchewan professors) and adjustments were made when recommended (i.e., wolf and olive-sided flycatcher). Overall, the structure and predictive outputs of the HSI models fit with the current state of knowledge regarding the ecology and habitat preferences of VCs. Any refinements to the	We question the accuracy of NexGen's moose habitat model. Our own research has shown how important it is for wildlife habitat models to be prepared by quantitative methods and statistically verified. Not doing so typically results in underestimating the effects on wildlife habitat. **We recommend that NexGen takes the quantification of wildlife habitat impact seriously and that NexGen works with the ACFN to develop mitigation and monitoring plans.**

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				models from the collection of additional baseline data are not expected to change confidence in the effects predictions or the assessment conclusions.	
458.	ACFN (October 28, 2022)	Appendix 14B MSES WILDLIFE	Please provide a brief justification / explanation for the application of the various zone of influence (ZOI) distances for each Valued Component and disturbance type.	The spatial extent of zones of influence (ZOI) of Project effects and other existing and future disturbances were developed for each valued component and each type of human development feature based on existing information about species sensitivities to disturbances (Draft EIS Appendix 14B [Wildlife Habitat Models]). For example, habitat for moose is considered unsuitable (i.e., has a ZOI) within 500 m of existing access roads while the same disturbance type has a ZOI of 100 m for mallard (Draft EIS Appendix 14B, Section 14B2.3, Table 14B2-2). The ZOI for woodland caribou (500 m) is based on federal criteria for calculating disturbance to caribou habitat (Section 14.3.1.1).	This response is adequate.
459.	ACFN (October 28, 2022)	Appendix 14B MSES WILDLIFE	Please provide information on the overall level of linear disturbance in the RSA.	Linear disturbance types and densities are described in the existing conditions sections for caribou and moose (Draft EIS Section 14.3.1 [Woodland Caribou] and Draft EIS Section 14.3.2 [Moose], respectively). For example, in the regional study area, linear feature density is estimated at 0.55 km/km^2. The current density of roads (i.e., Highway 955, existing access road, and rough roads) is 0.15 km/km^2. Other linear features (i.e., trails, cutlines, and seismic lines) contribute an additional 0.40 km/km^2, with most of the disturbance aggregated near the western boundary of the RSA. Changes in linear disturbance are described in Section 14.5 (Residual Effects Analysis).	This response is adequate.
460.	ACFN (October 28, 2022)	Appendix 14B MSES WILDLIFE	Consider that wolf use of linear features may change depending on the overall amount of linear disturbance in the landscape. Does this change any of the classifications of existing disturbance in the wolf habitat models?	NexGen confirms that existing linear disturbances were included in the wolf habitat suitability model (Draft Appendix 14B [Wildlife Habitat Models], Section 14B.3.2, Table 14B3-2). Wolf use of linear disturbances is described in Draft EIS Section 14.3.3 (Grey Wolf) and is further considered in the Draft EIS Section 14.5.3 (Grey Wolf). As the Project would use existing access, no changes in linear feature density in the local study area and regional study area are anticipated (Draft EIS Section 14.5.3.1.2 [Habitat Distribution]). Therefore, NexGen maintains that the classifications in the wolf habitat modelling are accurate.	This response does not address our question regarding the changing relationship between density of linear disturbances and impacts on wolves and their prey. We maintain that NexGen has not addressed the effects of predator-prey relationships and how they change with the landscape context. Given the lack of validation of wildlife models in the effects assessment, ignoring predator-prey relationships makes the validity of the model suspect. **We recommend that the wolf model along with other wildlife models be carefully reviewed and that accuracy be improved. Statistically meaningful quantification of models must be done to avoid underestimating the effects on wildlife.**
461.	ACFN (October 28, 2022)	Section 14.5.13 MSES WILDLIFE	Please quantitatively assess changes in biodiversity including providing metrics on existing biodiversity in the study area compared to similar areas in the region	NexGen confirms that Draft EIS Section 14.5.13 (Effects on Biodiversity) summarizes the quantitative and qualitative changes to ecosystems and wildlife VCs. No further assessment is required.	NexGen does not provide any answer to our question. **We recommend that NexGen provide metrics on biodiversity with the goal to quantitatively understand effects on biodiversity.**
462.	ACFN (October 28, 2022)	Section 1.2.3	Section 1.2.3 of the EIS makes a distinction between Local, or Primary, Indigenous Groups, and Other Indigenous Groups. The ACFN identify as an “Other Indigenous Group”. The Rationale for this is cited in Table 1.2-2 and includes the following statement/bullet point: “Potential overlap with traditional territory but no access link or known residency/land use.” This statement is factually incorrect, as the ACFN maintains active use in the area. 1) Please explain what information was used as the basis for the above statement, and provide references, if any to these sources of information 2) Please describe what efforts were undertaken, if any, to confirm the above statement directly with the ACFN	As noted in Draft EIS Section 2.4.1 (Identification of Indigenous Groups for Engagement), multiple factors were considered by NexGen when determining the Indigenous Groups identified for full engagement (i.e., primary Indigenous Groups) and the Indigenous Groups identified for information sharing (i.e., other Indigenous Groups). These factors included the process undertaken by NexGen to determine engagement requirements, mapping Indigenous Groups identified for potential engagement along the Consultation Activity Spectrum (CNSC 2022), and considering information contained within letters sent to Indigenous Groups by the CNSC and the Saskatchewan Ministry of Environment (ENV). The NexGen process to determine Indigenous Groups who may be engaged on the Project included consideration of: ▪ historical and modern treaties; ▪ proximity of the Project to Indigenous communities; ▪ traditional territories; ▪ traditional and current land uses; ▪ settled or ongoing land claims and/or litigation; ▪ existing relationships between Indigenous communities and NexGen or the CNSC; and ▪ potential Project effects on health and safety, the environment, and any potential or established Aboriginal or treaty rights and related interests of Indigenous Groups. Following the identification process, Indigenous Groups that were identified for potential engagement were mapped along the consultation activity spectrum as outlined in REGDOC-3.2.2 Version 1.1 (CNSC 2019), which considered each group’s potential to be affected by or to influence the Project, their proximity to the Project, their traditional territory, and their level of interest expressed in the Project.	**To be addressed during future engagement activities between ACFN and NexGen.**

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				As an additional measure, NexGen reviewed the letters drafted by the CNSC and the ENV to provide notice of the proposed Project to Indigenous Groups. In the CNSC letters dated 2 April 2019, the information articulated within the "Indigenous Consultation" section varied between Indigenous Groups. Certain Indigenous Groups (i.e., the Indigenous Groups ultimately defined as 'primary' by NexGen) were encouraged to advise the CNSC of potential Project effects to rights, note which rights the Indigenous Group felt may be affected, provide local and traditional knowledge to support determination of potential impacts to rights and mitigation measures, and advise the CNSC how the Indigenous Group would like to be consulted by the Crown during the regulatory review process. The other Indigenous Groups (i.e., the Indigenous Groups ultimately defined as 'other' by NexGen such as the ACFN) were simply requested to provide any views they may have regarding the Project. With respect to the ENV correspondence, letters were only sent to the Indigenous Groups ultimately defined as primary by NexGen. These Indigenous Groups collectively represent the First Nation and Métis communities for which the ENV assigned procedural aspects of the Duty to Consult for the Project to NexGen. NexGen further notes that available information, including information provided by the ACFN through Project engagement activities, did not demonstrate that the ACFN have documented traditional land use activities within any of the Project local study areas (LSAs). Map 1 of *Níh boghodi: We are the stewards of our land* (ACFN 2012) shows that the proposed Project location is located outside the ACFN self-declared protection and stewardship zones; the Project location is only within the ACFN self-declared consultation area. This information is consistent with Map 1 of the *Athabasca Chipewyan First Nation Advice to the Government of Alberta Regarding the Lower Athabasca Regional Plan* (ACFN 2010), which shows the proposed Project is located outside of the ACFN Homeland. In addition, through both attempted and directly conducted engagement activities with the ACFN to date, no specific traditional land uses have been identified within any of the Project LSAs (Draft EIS Appendix 2A [Summary of Indigenous Group Engagement Activities], Table 2A-6; Draft EIS TSD I [Indigenous Engagement Report], Appendix B, Table B-6). Based on the detailed process to determine which Indigenous Groups would be directly affected by the Project and currently known information presented above, NexGen maintains that the ACFN are not expected to experience direct effects for the Project and the designation of the ACFN as an "other Indigenous Group" is appropriate. NexGen has shared Project information on this basis. **References** CNSC (Canadian Nuclear Safety Commission). 2019. REGDOC-3.2.2, Indigenous Engagement, Version 1.1. August 2019. ISBN: 978 0 660 04518 4. Available at http://www.nuclearsafety.gc.ca/pubs_catalogue/uploads/REGDOC-3-2-2-Aboriginal-Engagement-version-1.1-eng.pdf. CNSC. 2022. REGDOC-3.2.2, Indigenous Engagement, Version 1.2. February 2022. Available at http://nuclearsafety.gc.ca/eng/acts-and-regulations/regulatory-documents/published/html/regdoc3-2-2-v1-2/index.cfm.	
463.	ACFN (October 28, 2022)	Section 1.3.2	Please indicate whether any meetings were held, whether in person or virtual, with ACFN Leadership, Staff, or Community, to enable dialogue regarding the Project and how the ACFN could be potentially affected by it.	Since initiating engagement on the proposed Project with the ACFN in 2019, NexGen has provided regular updates on the Project and offered to meet with the ACFN on multiple occasions. A detailed summary of attempted or conducted engagement activities with the ACFN may be found in Table 2A-6 of Draft EIS Appendix 2A (Indigenous Group Engagement Activities).	**To be addressed during future engagement activities between ACFN and NexGen.**
464.	ACFN (October 28, 2022)	Section 1.3.2	Section 1.3.2 of the EIS states "NexGen's approach to the EA process has been focused on enabling dialogue with and seeking feedback from Indigenous Groups who could be potentially affected by the proposed Project".	As noted in Draft EIS Section 2.4.1 (Identification of Indigenous Groups for Engagement), multiple factors were considered by NexGen when determining the Indigenous Groups identified for full engagement (i.e., primary Indigenous Groups) and the Indigenous Groups identified for information sharing (i.e., other Indigenous Groups). These factors included the process undertaken by NexGen to determine engagement requirements, mapping Indigenous Groups identified for potential engagement along the Consultation Activity	**To be addressed during future engagement activities between ACFN and NexGen.**

Number	Source	Reference to EIS, appendix or TSD	Comment Summary (all original submissions can be found on Canadian Impact Assessment Registry reference: 80171)	NexGen Response	ACFN Technical Reviewer Response & Recommendation
			On the basis of inaccurate information, NexGen categorized the ACFN as an "Other Indigenous Group" and sought only to inform ACFN of the project. Through inclusion of ACFN as an "Other Indigenous Group", NexGen acknowledges that ACFN "could be potentially affected by the proposed Project". However, NexGen did not demonstrate effort or interest in enabling dialogue with ACFN, for the purpose of seeking ACFN's input." Please describe what efforts were undertaken, if any, to confirm the above statement directly with the ACFN prior to including it in the EIS.	Spectrum (CNSC 2022), and considering information contained within letters sent to Indigenous Groups by the CNSC and the Saskatchewan Ministry of Environment (ENV). The NexGen process to determine Indigenous Groups who may be engaged on the Project included consideration of: ▪ historical and modern treaties; ▪ proximity of the Project to Indigenous communities; ▪ traditional territories; ▪ traditional and current land uses; ▪ settled or ongoing land claims and/or litigation; ▪ existing relationships between Indigenous communities and NexGen or the CNSC; and ▪ potential Project effects on health and safety, the environment, and any potential or established Aboriginal or treaty rights and related interests of Indigenous Groups. Following the identification process, Indigenous Groups that were identified for potential engagement were mapped along the consultation activity spectrum as outlined in REGDOC-3.2.2 Version 1.1 (CNSC 2019), which considered each group's potential to be affected by or to influence the Project, their proximity to the Project, their traditional territory, and their level of interest expressed in the Project. As an additional measure, NexGen reviewed the letters drafted by the CNSC and the ENV to provide notice of the proposed Project to Indigenous Groups. In the CNSC letters dated 2 April 2019, the information articulated within the "Indigenous Consultation" section varied between Indigenous Groups. Certain Indigenous Groups (i.e., the Indigenous Groups ultimately defined as 'primary' by NexGen) were encouraged to advise the CNSC of potential Project effects to rights, note which rights the Indigenous Group felt may be affected, provide local and traditional knowledge to support determination of potential impacts to rights and mitigation measures, and advise the CNSC how the Indigenous Group would like to be consulted by the Crown during the regulatory review process. The other Indigenous Groups (i.e., the Indigenous Groups ultimately defined as 'other' by NexGen such as the ACFN) were simply requested to provide any views they may have regarding the Project. With respect to the ENV correspondence, letters were only sent to the Indigenous Groups ultimately defined as primary by NexGen. These Indigenous Groups collectively represent the First Nation and Métis communities for which the ENV assigned procedural aspects of the Duty to Consult for the Project to NexGen. NexGen further notes that available information, including information provided by the ACFN through Project engagement activities, did not demonstrate that the ACFN have documented traditional land use activities within any of the Project local study areas (LSAs). Map 1 of *Níh boghodi: We are the stewards of our land* (ACFN 2012) shows that the proposed Project location is located outside the ACFN self-declared protection and stewardship zones; the Project location is only within the ACFN self-declared consultation area. This information is consistent with Map 1 of the *Athabasca Chipewyan First Nation Advice to the Government of Alberta Regarding the Lower Athabasca Regional Plan* (ACFN 2010), which shows the proposed Project is located outside of the ACFN Homeland. In addition, through both attempted and directly conducted engagement activities with the ACFN to date, no specific traditional land uses have been identified within any of the Project LSAs (Draft EIS Appendix 2A [Summary of Indigenous Group Engagement Activities], Table 2A-6; Draft EIS TSD I [Indigenous Engagement Report], Appendix B, Table B-6). Based on the detailed process to determine which Indigenous Groups would be directly affected by the Project and currently known information presented above, NexGen maintains that the ACFN are not expected to experience direct effects for the Project and the designation of the ACFN as an "other Indigenous Group" is appropriate. NexGen has shared Project information on this basis.	

Number	Source	Reference to EIS, appendix or TSD	Comment Summary (all original submissions can be found on Canadian Impact Assessment Registry reference: 80171)	NexGen Response	ACFN Technical Reviewer Response & Recommendation
				With respect to efforts undertaken to engage with the ACFN, a detailed summary of attempted or conducted engagement activities with the ACFN may be found in Table 2A-6 of Draft EIS Appendix 2A (Indigenous Group Engagement Activities). **References** CNSC (Canadian Nuclear Safety Commission). 2019. REGDOC-3.2.2, Indigenous Engagement, Version 1.1. August 2019. ISBN: 978 0 660 04518 4. Available at http://www.nuclearsafety.gc.ca/pubs_catalogue/uploads/REGDOC-3-2-2-Aboriginal-Engagement-version-1.1-eng.pdf. CNSC. 2022. REGDOC-3.2.2, Indigenous Engagement, Version 1.2. February 2022. Available at http://nuclearsafety.gc.ca/eng/acts-and-regulations/regulatory-documents/published/html/regdoc3-2-2-v1-2/index.cfm.	
465.	ACFN (October 28, 2022)	Section 2.4.1	Please provide further rational for determining the ACFN as a group who would not require the same level of consultation as a primary Indigenous group	As noted in Draft EIS Section 2.4.1 (Identification of Indigenous Groups for Engagement), multiple factors were considered by NexGen when determining the Indigenous Groups identified for full engagement (i.e., primary Indigenous Groups) and the Indigenous Groups identified for information sharing (i.e., other Indigenous Groups). These factors included the process undertaken by NexGen to determine engagement requirements, mapping Indigenous Groups identified for potential engagement along the Consultation Activity Spectrum (CNSC 2022), and considering information contained within letters sent to Indigenous Groups by the CNSC and the Saskatchewan Ministry of Environment (ENV). The NexGen process to determine Indigenous Groups who may be engaged on the Project included consideration of: ▪ historical and modern treaties; ▪ proximity of the Project to Indigenous communities; ▪ traditional territories; ▪ traditional and current land uses; ▪ settled or ongoing land claims and/or litigation; ▪ existing relationships between Indigenous communities and NexGen or the CNSC; and ▪ potential Project effects on health and safety, the environment, and any potential or established Aboriginal or treaty rights and related interests of Indigenous Groups. Following the identification process, Indigenous Groups that were identified for potential engagement were mapped along the consultation activity spectrum as outlined in REGDOC-3.2.2 Version 1.1 (CNSC 2019), which considered each group's potential to be affected by or to influence the Project, their proximity to the Project, their traditional territory, and their level of interest expressed in the Project. As an additional measure, NexGen reviewed the letters drafted by the CNSC and the ENV to provide notice of the proposed Project to Indigenous Groups. In the CNSC letters dated 2 April 2019, the information articulated within the "Indigenous Consultation" section varied between Indigenous Groups. Certain Indigenous Groups (i.e., the Indigenous Groups ultimately defined as 'primary' by NexGen) were encouraged to advise the CNSC of potential Project effects to rights, note which rights the Indigenous Group felt may be affected, provide local and traditional knowledge to support determination of potential impacts to rights and mitigation measures, and advise the CNSC how the Indigenous Group would like to be consulted by the Crown during the regulatory review process. The other Indigenous Groups (i.e., the Indigenous Groups ultimately defined as 'other' by NexGen such as the ACFN) were simply requested to provide any views they may have regarding the Project. With respect to the ENV correspondence, letters were only sent to the Indigenous Groups ultimately defined as primary by NexGen. These Indigenous Groups collectively represent the First Nation and Métis communities for which the ENV assigned procedural aspects of the Duty to Consult for the Project to NexGen.	**To be addressed during future engagement activities between ACFN and NexGen.**

Number	Source	Reference to EIS, appendix or TSD	Comment Summary (all original submissions can be found on Canadian Impact Assessment Registry reference: 80171)	NexGen Response	ACFN Technical Reviewer Response & Recommendation
				NexGen further notes that available information, including information provided by the ACFN through Project engagement activities, did not demonstrate that the ACFN have documented traditional land use activities within any of the Project local study areas (LSAs). Map 1 of *Níh boghodi: We are the stewards of our land* (ACFN 2012) shows that the proposed Project location is located outside the ACFN self-declared protection and stewardship zones; the Project location is only within the ACFN self-declared consultation area. This information is consistent with Map 1 of the *Athabasca Chipewyan First Nation Advice to the Government of Alberta Regarding the Lower Athabasca Regional Plan* (ACFN 2010), which shows the proposed Project is located outside of the ACFN Homeland. In addition, through both attempted and directly conducted engagement activities with the ACFN to date, no specific traditional land uses have been identified within any of the Project LSAs (Draft EIS Appendix 2A [Summary of Indigenous Group Engagement Activities], Table 2A-6; Draft EIS TSD I [Indigenous Engagement Report], Appendix B, Table B-6). Based on the detailed process to determine which Indigenous Groups would be directly affected by the Project and currently known information presented above, NexGen maintains that the ACFN are not expected to experience direct effects for the Project and the designation of the ACFN as an "other Indigenous Group" is appropriate. NexGen has shared Project information on this basis. **References** CNSC (Canadian Nuclear Safety Commission). 2019. REGDOC-3.2.2, Indigenous Engagement, Version 1.1. August 2019. ISBN: 978 0 660 04518 4. Available at http://www.nuclearsafety.gc.ca/pubs_catalogue/uploads/REGDOC-3-2-2-Aboriginal-Engagement-version-1.1-eng.pdf. CNSC. 2022. REGDOC-3.2.2, Indigenous Engagement, Version 1.2. February 2022. Available at http://nuclearsafety.gc.ca/eng/acts-and-regulations/regulatory-documents/published/html/regdoc3-2-2-v1-2/index.cfm.	
466.	ACFN (October 28, 2022)	Section 2.4.1	Please enter into a full Study Agreement with the ACFN, which would commence with the ACFN undertaking a TLU/IK study to further enhance NexGen's understanding of the ACFN use and ACFN Indigenous Knowledge. This information, and subsequent studies as deemed relevant, must then be used to re-evaluate the EIS, including relevant impact predictions and proposed mitigations.	NexGen notes that as the ACFN are not anticipated to be directly affected by the Project due to the Project location being located outside of the ACFN Homeland (ACFN 2010), implementing a Project-specific full study agreement that includes capacity funding for an Indigenous Knowledge and Traditional Land Use Study is not warranted. However, NexGen confirms that since May 2023, NexGen and the ACFN have been working on advancing an engagement agreement. The intent of this agreement is to provide a framework for engagement between NexGen and the ACFN for an appropriate level of engagement related to both the Project (i.e., continuing to engage with the ACFN at a level consistent with the "other Indigenous Groups") and other NexGen tenure activities where the ACFN may be directly or indirectly affected. An important goal to NexGen is to have an "open-door policy" to engagement, while respecting each group's desired engagement approach and topics of interest (Draft EIS Section 2.5 [Engagement Approach]).	**To be addressed during future engagement activities between ACFN and NexGen.**
467.	ACFN (October 28, 2022)	Section 2.4.1	NexGen identified the ACFN as having "Weak Claim" on the basis of the statement that there is "no access link or known residency/land use", which is inaccurate and incorrect. Even if this statement was accurate, NexGen has entered into study agreements with other communities who are classified as "Other" Indigenous Groups at an "inform" level. Please enter into a study agreement with the ACFN to provide TLU/IK Study, site visits, meetings with the ACFN and ACFN leadership.	NexGen notes that available information, including information provided by the ACFN through Project engagement activities, did not demonstrate that the ACFN have documented traditional land use activities within any of the Project local study areas (LSAs). Map 1 of *Níh boghodi: We are the stewards of our land* (ACFN 2012) shows that the proposed Project location is located outside the ACFN self-declared protection and stewardship zones; the Project location is only within the ACFN self-declared consultation area. This information is consistent with Map 1 of the *Athabasca Chipewyan First Nation Advice to the Government of Alberta Regarding the Lower Athabasca Regional Plan* (ACFN 2010), which shows the proposed Project is located outside of the ACFN Homeland. In addition, through both attempted and directly conducted engagement activities with the ACFN to date, no specific traditional land uses have been identified within any of the Project LSAs (Draft EIS Appendix 2A [Summary of Indigenous Group Engagement Activities], Table 2A-6; Draft EIS TSD I [Indigenous Engagement Report], Appendix B, Table B-6). NexGen further notes that as the ACFN are not anticipated to be directly affected by the Project due to the Project location being located outside of the ACFN Homeland (ACFN	**To be addressed during future engagement activities between ACFN and NexGen.**

Number	Source	Reference to EIS, appendix or TSD	Comment Summary (all original submissions can be found on Canadian Impact Assessment Registry reference: 80171)	NexGen Response	ACFN Technical Reviewer Response & Recommendation
				2010), implementing a Project-specific full study agreement that includes capacity funding for an Indigenous Knowledge and Traditional Land Use Study is not warranted. However, NexGen confirms that since May 2023, NexGen and the ACFN have been working on advancing an engagement agreement. The intent of this agreement is to provide a framework for engagement between NexGen and the ACFN for an appropriate level of engagement related to both the Project (i.e., continuing to engage with the ACFN at a level consistent with the "other Indigenous Groups") and other NexGen tenure activities where the ACFN may be directly or indirectly affected. An important goal to NexGen is to have an "open-door policy" to engagement, while respecting each group's desired engagement approach and topics of interest (Draft EIS Section 2.5 [Engagement Approach]).	
468.	ACFN (October 28, 2022)	Section 2.5.2	**1)** Please provide information on the reclamation-related caribou research project. **2)** Please include the ACFN in the reclamation-related caribou research project.	NexGen notes that the caribou reclamation research project referenced in Draft EIS Section 2.5.2 (Indigenous Engagement Methods) is being conducted outside of the scope of the EA; however, NexGen is able to share information with the ACFN through engagement activities between NexGen and the ACFN.	**To be addressed during future engagement activities between ACFN and NexGen.**
469.	ACFN (October 28, 2022)	Section 2.5.2	The following is stated in the EIS as an example of collaboration and engagement: "NexGen has maintained an open-door policy of informing as a minimum and continues to regularly provide groups with opportunities for enhanced engagement options that range from consult to collaborate participation levels, as appropriate." The above statement is false as the ACFN has requested funding for a study in 2019 and was denied funding. Please include the ACFN as a full participator in this process	NexGen maintains that the quote referenced by the reviewer is accurate. NexGen notes that available information, including information provided by the ACFN through Project engagement activities, did not demonstrate that the ACFN have documented traditional land use activities within any of the Project local study areas (LSAs). Map 1 of Níh boghodi: We are the stewards of our land (ACFN 2012) shows that the proposed Project location is located outside the ACFN self-declared protection and stewardship zones; the Project location is only within the ACFN self-declared consultation area. This information is consistent with Map 1 of the Athabasca Chipewyan First Nation Advice to the Government of Alberta Regarding the Lower Athabasca Regional Plan (ACFN 2010), which shows the proposed Project is located outside of the ACFN Homeland. In addition, through both attempted and directly conducted engagement activities with the ACFN to date, no specific traditional land uses have been identified within any of the Project LSAs (Draft EIS Appendix 2A [Summary of Indigenous Group Engagement Activities], Table 2A-6; Draft EIS TSD I [Indigenous Engagement Report], Appendix B, Table B-6). Therefore, the ACFN are not anticipated to be directly affected by the Project, and in alignment with the quote referenced by the reviewer, providing funding for a Project Indigenous Knowledge and Traditional Land Use Study or to include the ACFN as a full participator in the engagement process along with the primary Indigenous Groups would not be appropriate. NexGen will continue to have an engage with the ACFN at a level consistent with the "other Indigenous Groups".	**To be addressed during future engagement activities between ACFN and NexGen.**
470.	ACFN (October 28, 2022)	Section 2.5.5	Please explain what efforts NexGen will undertake to engage with the ACFN, including providing the ACFN with site visits, meetings and other project-information sharing activities, and meetings with ACFN Leadership	As evidence of this continued engagement effort, NexGen confirms that since May 2023, NexGen and the ACFN have been working on advancing an engagement agreement. The intent of this agreement is to provide a framework for engagement between NexGen and the ACFN for an appropriate level of engagement related to both the Project (i.e., continuing to engage with the ACFN at a level consistent with the "other Indigenous Groups") and other NexGen tenure activities where the ACFN may be directly or indirectly affected. An important goal to NexGen is to have an "open-door policy" to engagement, while respecting each group's desired engagement approach and topics of interest (Draft EIS Section 2.5 [Engagement Approach]). NexGen confirms that the exact engagement activities to be conducted in the future with respect to the Project will be defined through continued discussions with the ACFN, including any mechanisms and activities resulting from a formalized engagement agreement.	**To be addressed during future engagement activities between ACFN and NexGen.**
471.	ACFN (October 28, 2022)	Section 2.7.1.1	The following are activities NexGen's planned engagement with the ACFN: - Joint Working Groups - Joint Working Group Summaries - Joint Working Group Breakout Sessions - Indigenous Group Leadership and Staff - Benefit Agreements The ACFN has not been included in any of the above engagement opportunities to date	NexGen notes that the list of engagement activities referenced by the reviewer refer to the key activities being undertaken with both primary Indigenous Groups and other Indigenous Groups. As the ACFN are classified as an other Indigenous Group, not all of these engagement activities will apply. NexGen confirms that since May 2023, NexGen and the ACFN have been working on advancing an engagement agreement. The intent of this agreement is to provide a framework for an appropriate level of engagement between NexGen and the ACFN related to both the Project (i.e., continuing to engage with the ACFN at an inform level consistent with the "other Indigenous Groups") and other NexGen tenure activities where the ACFN may be directly or indirectly affected. The exact engagement activities to be conducted in the future with respect to the Project will be defined by the engagement agreement.	**To be addressed during future engagement activities between ACFN and NexGen.**

Number	Source	Reference to EIS, appendix or TSD	Comment Summary (all original submissions can be found on Canadian Impact Assessment Registry reference: 80171)	NexGen Response	ACFN Technical Reviewer Response & Recommendation
			1) Please provide an invitation to join the working groups **2)** Please include the ACFN on any indigenous collaboration efforts as a priority Indigenous Group		
472.	ACFN (October 28, 2022)	Section 2.5.5, 2.6.1.2.2, 3.1.1	Please include the ACFN within the local priority area.	NexGen notes that available information, including information provided by the ACFN through Project engagement activities, did not demonstrate that the ACFN have documented traditional land use activities within any of the Project local study areas (LSAs). Map 1 of Níh boghodi: We are the stewards of our land (ACFN 2012) shows that the proposed Project location is located outside the ACFN self-declared protection and stewardship zones; the Project location is only within the ACFN self-declared consultation area. This information is consistent with Map 1 of the Athabasca Chipewyan First Nation Advice to the Government of Alberta Regarding the Lower Athabasca Regional Plan (ACFN 2010), which shows the proposed Project is located outside of the ACFN Homeland. In addition, through both attempted and directly conducted engagement activities with the ACFN to date, no specific traditional land uses have been identified within any of the Project LSAs (Draft EIS Appendix 2A [Summary of Indigenous Group Engagement Activities], Table 2A-6; Draft EIS TSD I [Indigenous Engagement Report], Appendix B, Table B-6). Therefore, including the ACFN in the local priority area alongside the primary Indigenous Groups who would be directly affected by the Project would not be appropriate. While NexGen is committed to prioritizing local training, employment, and business opportunities for the Project within the local priority area (i.e., those communities closest to the Project that would experience most of the Project effects), NexGen has and will continue to engage with and include non-LPA communities and Nations in training, employment, and business opportunity initiatives related to the Project.	**To be addressed during future engagement activities between ACFN and NexGen.**
473.	ACFN (October 28, 2022)	Section 2.5.2, 2.5.5, 2.6.1.2.2, 3.1.1,6, 7, 8, 9, 10, 11, 12 ,13, 14, 15, 16, 17, 18, 19	Please enter into a study agreement with the ACFN to provide TLU/IK Study, site visits, meetings with the ACFN and ACFN leadership.	NexGen confirms that since May 2023, NexGen and the ACFN have been working on advancing an engagement agreement. The intent of this agreement is to provide a framework for an appropriate level of engagement between NexGen and the ACFN related to both the Project (i.e., continuing to engage with the ACFN at a level consistent with the "other Indigenous Groups") and other NexGen tenure activities where the ACFN may be directly or indirectly affected. An important goal to NexGen is to have an "open-door policy" to engagement, while respecting each group's desired engagement approach and topics of interest (Draft EIS Section 2.5 [Engagement Approach]). NexGen confirms that the exact engagement activities to be conducted in the future with respect to the Project will be defined through continued discussions with the ACFN, including any mechanisms and activities resulting from a formalized engagement agreement.	**To be addressed during future engagement activities between ACFN and NexGen.**
474.	ACFN (October 28, 2022)	Section 3.1.1	NexGen states: "The inclusion of Indigenous and Local Knowledge in the EA aligns with the Government of Canada's commitment to advancing reconciliation through a renewed relationship based on the recognition of rights, respect, cooperation and partnership" Please provide instances in which NexGen illustrated reconciliation with the ACFN when it comes to rights, respect, cooperation, and partnership.	NexGen notes that the quote referenced by the reviewer is with respect to the practice of incorporating Indigenous Knowledge within the EA and the reference to advancing reconciliation is specific to a Government of Canada commitment. With respect to NexGen's commitment to respectful engagement, as noted in Table 2A-6 of Draft EIS Appendix 2A (Indigenous Group Engagement Activities), NexGen engaged with the ACFN following submission of a Project Description to the CNSC and ENV in 2019. In the communication with the ACFN, NexGen noted that available information showed that the ACFN's traditional territory does not include the Project location; however, it was requested that the ACFN notify NexGen if there is additional information that indicates otherwise. Following these communications, the ACFN did not provide any information supporting a claim that the Project was located within the ACFN traditional territory. Since the submission of the Project Description in 2019, NexGen has provided updates to the ACFN regarding major Project milestones, which were accompanied by offers to meet and discuss any related items of interest to the ACFN. This approach is in alignment with NexGen's vision and values and consistent with engagement requirements for an other Indigenous Group.	**To be addressed during future engagement activities between ACFN and NexGen.**
475.	ACFN (October 28, 2022)	Section 3.2.1	The ACFN is highly active in the area of the project and practices our treaty rights within the territory and will be affected by the proposed Project. Though the above-mentioned regulatory bodies (CNSC, Government of Saskatchewan) have not identified the ACFN as a	NexGen respectfully disagrees with the reviewer's statement that the ACFN is highly active within the area of the Project. NexGen notes that available information, including information provided by the ACFN through Project engagement activities, did not demonstrate that the ACFN have documented traditional land use activities within any of the Project local study	**To be addressed during future engagement activities between ACFN and NexGen.**

Number	Source	Reference to EIS, appendix or TSD	Comment Summary (all original submissions can be found on Canadian Impact Assessment Registry reference: 80171)	NexGen Response	ACFN Technical Reviewer Response & Recommendation
			primary Indigenous group it still does not excuse the lack of adequate consultation. Please provide further references to the selection of priority Indigenous Groups	areas (LSAs). Map 1 of *Níh boghodi: We are the stewards of our land* (ACFN 2012) shows that the proposed Project location is located outside the ACFN self-declared protection and stewardship zones; the Project location is only within the ACFN self-declared consultation area. This information is consistent with Map 1 of the *Athabasca Chipewyan First Nation Advice to the Government of Alberta Regarding the Lower Athabasca Regional Plan* (ACFN 2010), which shows the proposed Project is located outside of the ACFN Homeland. In addition, through both attempted and directly conducted engagement activities with the ACFN to date, no specific traditional land uses have been identified within any of the Project LSAs (Draft EIS Appendix 2A [Summary of Indigenous Group Engagement Activities], Table 2A-6; Draft EIS TSD I [Indigenous Engagement Report], Appendix B, Table B-6). Therefore, no changes are required for the Final EIS. As noted in Draft EIS Section 2.4.1 (Identification of Indigenous Groups for Engagement), multiple factors were considered by NexGen when determining the Indigenous Groups identified for full engagement (i.e., primary Indigenous Groups) and the Indigenous Groups identified for information sharing (i.e., other Indigenous Groups). These factors included the process undertaken by NexGen to determine engagement requirements, mapping Indigenous Groups identified for potential engagement along the Consultation Activity Spectrum (CNSC 2022), and considering information contained within letters sent to Indigenous Groups by the CNSC and the Saskatchewan Ministry of Environment (ENV). The NexGen process to determine Indigenous Groups who may be engaged on the Project included consideration of: ▪ historical and modern treaties; ▪ proximity of the Project to Indigenous communities; ▪ traditional territories; ▪ traditional and current land uses; ▪ settled or ongoing land claims and/or litigation; ▪ existing relationships between Indigenous communities and NexGen or the CNSC; and ▪ potential Project effects on health and safety, the environment, and any potential or established Aboriginal or treaty rights and related interests of Indigenous Groups. Following the identification process, Indigenous Groups that were identified for potential engagement were mapped along the consultation activity spectrum as outlined in REGDOC-3.2.2 Version 1.1 (CNSC 2019), which considered each group's potential to be affected by or to influence the Project, their proximity to the Project, their traditional territory, and their level of interest expressed in the Project. As an additional measure, NexGen reviewed the letters drafted by the CNSC and the ENV to provide notice of the proposed Project to Indigenous Groups. In the CNSC letters dated 2 April 2019, the information articulated within the "Indigenous Consultation" section varied between Indigenous Groups. Certain Indigenous Groups (i.e., the Indigenous Groups ultimately defined as 'primary' by NexGen) were encouraged to advise the CNSC of potential Project effects to rights, note which rights the Indigenous Group felt may be affected, provide local and traditional knowledge to support determination of potential impacts to rights and mitigation measures, and advise the CNSC how the Indigenous Group would like to be consulted by the Crown during the regulatory review process. The other Indigenous Groups (i.e., the Indigenous Groups ultimately defined as 'other' by NexGen such as the ACFN) were simply requested to provide any views they may have regarding the Project. With respect to the ENV correspondence, letters were only sent to the Indigenous Groups ultimately defined as primary by NexGen. These Indigenous Groups collectively represent the First Nation and Métis communities for which the ENV assigned procedural aspects of the Duty to Consult for the Project to NexGen.	
476.	ACFN (October 28, 2022)	Section 3.2.1.6	The ACFN's homelands are mapped along the boundary of the Firebag River south of Lake Athabasca and west of the Project.	NexGen confirms that Project engagement was conducted with the ACFN prior to the determination of potential overlap of the Project and the ACFN traditional territory. As noted in Table 2A-6 of Draft EIS Appendix 2A (Indigenous Group Engagement Activities), NexGen engaged with the ACFN in 2019 following submission of a Project Description to the CNSC	**To be addressed during future engagement activities between ACFN and NexGen.**

Number	Source	Reference to EIS, appendix or TSD	Comment Summary (all original submissions can be found on Canadian Impact Assessment Registry reference: 80171)	NexGen Response	ACFN Technical Reviewer Response & Recommendation
			The map referenced is not part the ACFN consultation policy. The map referenced shows the ACFN priority protection areas and protecting the Woodland caribou, barren ground caribou, and wood bison within the consultation map. The map referenced is not a comprehensive area of the ACFN consultation zones. Please provide the rationale for determining the ACFN territory without adequate consultation with the ACFN	and ENV. Following this initial engagement, the ACFN requested shape files of the Project location. NexGen provided the shape files to the ACFN shortly following the ACFN's request. In the communication with the ACFN, NexGen noted that available information showed that the ACFN's traditional territory does not include the Project location; however, it was requested that the ACFN notify NexGen if there is additional information that indicates otherwise. Following these communications, the ACFN did not provide any information supporting a claim that the Project was located within the ACFN traditional territory. To confirm that the Project is not located within the ACFN traditional territory, publicly available information was reviewed, including *Níh boghodi: We are the stewards of our land* (ACFN 2012) and the *Athabasca Chipewyan First Nation Advice to the Government of Alberta Regarding the Lower Athabasca Regional Plan* (ACFN 2010). Map 1 of *Níh boghodi: We are the stewards of our land* (ACFN 2012) shows that the proposed Project location is located outside the ACFN self-declared protection and stewardship zones; the Project location is only within the ACFN self-declared consultation area. This information is consistent with Map 1 of the *Athabasca Chipewyan First Nation Advice to the Government of Alberta Regarding the Lower Athabasca Regional Plan* (ACFN 2010), which shows the proposed Project is located outside of the ACFN Homeland. In addition, through both attempted and directly conducted engagement activities with the ACFN to date, no specific traditional land uses have been identified within any of the Project LSAs (Draft EIS Appendix 2A [Summary of Indigenous Group Engagement Activities], Table 2A-6; Draft EIS TSD I [Indigenous Engagement Report], Appendix B, Table B-6). Therefore, no changes are required for the Final EIS. In summary, NexGen maintains that appropriate measures to engage with the ACFN were undertaken and available information shows that the Project is not located within the ACFN traditional territory. Therefore, the ACFN would not be expected to be adversely affected by the Project.	