

## Rook I Project

# Environmental Impact Statement

Abbreviations and Units of Measure, Glossary, and References

#### Submitted to:

Canadian Nuclear Safety Commission Saskatchewan Ministry of Environment

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## **Abbreviations and Units of Measure**





## **Abbreviations**

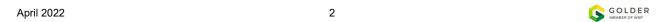
Abbreviation	Definition
%HA	percent highly annoyed
1-D	one-dimensional
3-D	three-dimensional
AAAQO	Alberta Ambient Air Quality Objective
ACFN	Athabasca Chipewyan First Nation
AEGL	acute exposure guideline level
AER	Alberta Energy Regulator
AERMOD	American Meteorological Society / Environmental Protection Agency Regulatory Model
ALARP	as low as reasonably practicable
ALOHA	Areal Locations of Hazardous Atmospheres
ATV	all-terrain vehicle
BLM	biotic ligand model
BNDN	Birch Narrows Dene Nation
BRDN	Buffalo River Dene Nation
BSA	baseline study area
CAAQS	Canadian Ambient Air Quality Standards
CAC	criteria air contaminant
CanNorth	CanNorth Environmental Services Ltd.
CCME	Canadian Council of Ministers of the Environment
CEA A 2012	Canadian Environmental Assessment Agency  Canadian Environmental Assessment Act. 2012
CEAA 2012	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
CEC	cation exchange capacity
CH <sub>4</sub>	methane
CNSC	Canadian Nuclear Safety Commission
CO <sub>2</sub>	carbon dioxide
CO₂e COPC	carbon dioxide equivalent
COSEWIC	constituent of potential concern  Committee on the Status of Endangered Wildlife in Canada
CPB	
CPT	cemented paste backfill cemented paste tailings
CPUE	catch per unit effort
CRDN	Clearwater River Dene Nation
CSA Group	Canadian Standards Association Group
CVMPP	Community Vitality Monitoring Partnership Process
CWD	chronic wasting disease
DFO	Fisheries and Oceans Canada
DL DO	detection limit
	dissolved oxygen
EA	Environmental Assessment
EC	electrical conductivity
ECAC	European Civil Aviation Conference
ECCC	Environment and Climate Change Canada
EcoRA	ecological risk assessment
EEM	environmental effects monitoring
EFAP	employee and family assistance program



Abbreviations and Units of Measure, Glossary, and References



Abbreviation	Definition
EIS	Environmental Impact Statement
ELC	Ecological Land Classification
ENV	Saskatchewan Ministry of Environment
ERA	environmental risk assessment
ERFN	English River First Nation
ERPG	·
ETP	Emergency Response Planning Guideline effluent treatment plant
EXP	exposure
FEED	front-end engineering design
FFMC	Freshwater Fishing Marketing Commission
FMEA	failure modes and effects analysis
FMP	Forest Management Plan
FNFNES	
	First Nations Food, Nutrition and Environment Study
FS	Feasibility Study
FTE	full-time equivalent
GBMU	Game Bird Management Unit
GDI	Gabriel Dumont Institute
GDP	gross domestic product
GHG	greenhouse gas
GIS	Geographic Information System
GISTM	Global Industry Standard on Tailings Management
GPS	global positioning system
H:V	horizontal to vertical
HABISask	Hunting, Angling and Biodiversity Information of Saskatchewan
HBC	Hudson's Bay Company
HDPE	high-density polyethylene
HEC-RAS	Hydrologic Engineering Center – River Analysis System
HHRA	human health risk assessment
HQ	hazard quotient
HRIA	Heritage Resources Impact Assessment
HVAC	heating, ventilation, and air conditioning
Hwy	Highway
I/O	input/output
IAP2	International Association for Public Participation
ID	identifier
IKTLU	Indigenous Knowledge and Traditional Land Use
ILCR	incremental lifetime cancer risk
IMS	Integrated Management System
IPCC	Intergovernmental Panel on Climate Change
IR	Indian Reserve
ISO	International Organization for Standardization
ISQG	interim sediment quality guideline
IT	information technology
Joint Panel	Joint Federal-Provincial Panel on Uranium Mining Developments in Northern Saskatchewan
JWG	Joint Working Group
KP	key person
L <sub>dn</sub>	combined day-night sound level





Abbreviations and Units of Measure, Glossary, and References



Abbreviation	Definition
LEL	lowest effect level
L <sub>eq,day</sub>	energy equivalent sound level for the daytime period
Leq,night	energy equivalent sound level for the nighttime period
LFN	low frequency noise
LHD	load-haul-dump
LiDAR	light detection and ranging
LLRW	low-level radioactive waste
L <sub>max</sub>	maximum sound level
LNG	liquified natural gas
LPA	local priority area
LSA	local study area
MAA	multiple accounts analysis
MBR	membrane bioreactor
MDMER	Metal and Diamond Mining Effluent Regulations
MLR	multiple linear regression
MLTC	Meadow Lake Tribal Council
MN-S	Métis Nation – Saskatchewan
MPTP	Multi-Party Training Plan
MSLA	Mineral Surface Lease Agreement
N <sub>2</sub> O	nitrous oxide
NBCC	National Building Code of Canada
NCQ	Northern Career Quest Inc.
NE2	no-effect (sediment quality)
NexGen	NexGen Energy Ltd.
NF	nanofiltration
NFWQM	near-field water quality model
NLSD	Northern Lights School Division
NPAG	non-potentially acid generating
NR2	Northern Region 2
NWT	Northwest Territories
ODAL	omni-directional approach lighting
OPC	ordinary Portland cement
PAG	potentially acid generating
PAH	polyaromatic hydrocarbon
PEA	Preliminary Economic Assessment
PEL	probable effect level
PEM	Predictive Ecosite Map
PFS	Pre-feasibility Study
рН	potential of hydrogen
PM	particulate matter
PM <sub>10</sub>	particulate matter with a nominal diameter of 10 microns or less
PMP	probable maximum precipitation
Project	Rook I Project
RCMP	Royal Canadian Mounted Police
REF	reference
RFD	reasonably foreseeable development
RIA	Rights Impact Assessment
RMZ	regulatory mixing zone



Abbreviations and Units of Measure, Glossary, and References



Abbreviation	Definition
RO	reverse osmosis
RSA	regional study area
RSWQM	regional surface water quality model
SAAQS	Saskatchewan Ambient Air Quality Standards
SAQMG	Saskatchewan Air Quality Model Guideline
SAR	sodium adsorption ratio
SARA	Species at Risk Act
SDI	Simpson's Diversity Index
SEASB	Saskatchewan Environmental Assessment and Stewardship Branch
SEI	Simpson's Evenness Index
SEL	severe effect level
SERM	Saskatchewan Environment and Resource Management
SHA	Saskatchewan Health Authority
SIL	
SK	Survey Intensity Level
	Saskatchewan
SK2 West	SK2 West Administration Unit
SMU	soil map unit
sp.	species
spp.	multiple species
ssp.	subspecies
STP	sewage treatment plant
SWWBM	site-wide water balance and water quality model
TDS	total dissolved solids
TOR	Terms of Reference
TP	total phosphorus
TRV	toxicity reference value
TSD	Technical Support Document
TSL	Term Supply Licence
TSP	total suspended particulates
TSS	total suspended solids
U <sub>3</sub> O <sub>8</sub>	triuranium octoxide
UGTMF	underground tailings management facility
UO <sub>2</sub> .nH <sub>2</sub> O	uranium peroxide
USEPA	United States Environmental Protection Agency
VC	valued component
VWP	vibrating wire piezometer
WMZ	Wildlife Management Zone
WNS	white nose syndrome
WQO	water quality objective
WRSA	waste rock storage area
WSA	Saskatchewan Water Security Agency
WSE	water surface elevation
YLNR	Ya'thi Néné Lands and Resources
YNLRO	Ya'thi Néné Lands and Resources Office
ZOI	zone of influence
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## **Units of Measure**

Unit	Definition
#	number
\$	Canadian dollars unless otherwise stated
%	percent
<	less than
±	plus or minus
<u>≤</u>	less than or equal to
0	degree
°C	degrees Celsius
μg/g	micrograms per gram
μg/kg	micrograms per kilogram
μg/L	micrograms per litre
μg/m³	micrograms per cubic metre
μm	micron
μS/cm	microsiemens per centimetre
Bq/g	becquerels per gram
Bq/L	becquerels per litre
Bq/m <sup>3</sup>	becquerels per cubic metre
cfu/100 mL	colony forming units per 100 millilitres
cm	centimetre
cm/s	centimetres per second
cm <sup>2</sup>	square centimetre
cm <sup>3</sup>	cubic centimetre
CO <sub>2</sub> e/kWh	carbon dioxide equivalent per kilowatt hour
d/yr	days per year
dB	decibel
dBA	A-weighted decibel
dBC	C-weighted decibel
dS/m	decisiemens per metre
g	gram
g/h	grams per hour
g/m <sup>2</sup>	grams per square metre
g/m²/d	grams per square metre per day
g/m²/yr	grams per square metre per year
g/s	grams per second
g/yr	grams per year
GJ	gigajoule
Gt	gigatonne
h	hour
h/d	hours per day
ha	hectare
Hz	hertz
kg	kilogram
kg/h	kilograms per hour
kg/ha/yr	kilograms per hectare per year
kg/m <sup>3</sup>	kilograms per cubic metre
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Abbreviations and Units of Measure, Glossary, and References



kg/yr         kilograms per year           kitz         kilohertz           km         kilometre           km/h         kilometres per hour           km/m²         kilometres per square kilometre           km²         kilometres per square kilometre           km²         kilometres per square metre           km²         kilometres           ki         kilotone           kt CO,elyr         kilotonnes of carbon dioxide equivalent per year           kV         kilovoit           kWh         kilowath bour           L         litre           U/h         litre sper hour           L/min         litres per hour           L/min         litres per munte           m         metre           Mkm         million per kilometre           mL         metres per munte           ms         metre           Mkm         million per kilometre           mL         metres per munte           ms         metres per littre           mill         metres per munte           ms         metres per kilometre           mill         metres per second           m²         square metre           m²<	Unit	Definition
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org/L     organisms per litre       org/m²     organisms per square metre		
org/m² organisms per square metre		
, DDITI I DAITS DEF MILION	ppm	parts per million



#### Rook I Project

#### **Environmental Impact Statement**

Abbreviations and Units of Measure, Glossary, and References



Unit	Definition
t	tonne
t CO <sub>2</sub> e/yr	tonnes of carbon dioxide equivalent per year
t/d	tonnes per day
t/yr	tonnes per year





## Glossary



i



## **Glossary**

Term	Definition
A-weighted decibel	An expression of sound level that has been A-weighted, or filtered to match the response of the human ear.
Alevin	A newly hatched fish in the larval stage, dependent upon a yolk sac for nutrients while their digestive system develops.
Ambient	The conditions surrounding an organism or area.
Anoxic	Deficient in oxygen or having no oxygen.
Anthropogenic	Coming from, or caused by, human activity.
Application Case	Assessment case including the project that is the subject of the Environmental Assessment, existing environmental conditions, and existing and approved projects or activities.
Assay	A test to determine the content of a material such as ore.
Assessment endpoints	Qualitative expressions used to represent the key properties of the valued component that should be protected for future generations and are used to support the assessment residual effects on valued components and the determination of significance.
Bag limit	The maximum harvest, or the maximum number of fish or game animals that one person can take.
Base Case	Assessment case that includes existing environmental conditions as well as existing and approved projects or activities.
Bedrock	The solid body of rock that underlies gravel, soil, or other surficial material.
Benthic invertebrates	General term referring to bottom-dwelling organisms (e.g., worms, snails, clams, crustaceans, insects) living on or within the sediments of waterbodies and watercourses.
Bioaccumulation	The process through which chemicals build up in organisms from sources in food and water.
Biodiversity	The variety of life in a particular habitat or ecosystem (e.g., plant community). Biodiversity includes all levels of organization, from genes to landscapes, and the ecological processes through which these levels are connected.
Bog	Mineral-poor, acidic, and peat-forming wetland that receives water mainly from precipitation.
Borehole	A narrow hole advanced into the ground by means of a drilling rig to investigate and/or access subsurface resources (e.g., minerals, surficial geology, water).
Brunisolic soil	An order of soils (usually forested soils) whose horizons are developed sufficiently to exclude the soils from the Regosolic order, but that lack the degrees or kinds of horizon development specified for soils of the other orders. Brunisolic soils, which occur under a wide variety of climatic and vegetative conditions.
Bryophyte	Non-vascular plants from the phylum Bryophyta. Species within this phylum include mosses, liverworts, and hornworts.
C-weighted decibel	An expression of sound level that has been C-weighted to assess the low-frequency content of complex sound environments. The C-weighted audible frequency spectrum is more sensitive to sounds at low frequencies than the A-weighted sound level.
Cancer slope factor	A carcinogenic effect toxicity reference value used to evaluate upper-bound lifetime probabilities of developing cancer. The cancer slope factor is expressed as the lifetime cancer risk per unit of dose.
Carbon dioxide equivalent	A measure used to compare emissions from various greenhouse gases by converting to the equivalent amount of carbon dioxide.
Carbon monoxide	A colourless, odourless, and tasteless gas. Carbon monoxide is a product of incomplete combustion of fossil fuels.
Carcinogen	A substance that can cause cancer.
Cation	An ion having a positive charge.
Cation exchange capacity	The sum total of exchangeable cations that a soil can adsorb. Cation exchange capacity is usually expressed in milliequivalents per 100 grams of soil.
Combined day-night sound level	The average of the daytime and nighttime energy equivalent sound levels, after adding a 10 A-weighted decibel penalty to the nighttime energy equivalent value since nighttime noise is generally considered more disruptive than daytime noise.
Community Vitality Monitoring Partnership Process	Initiated in 1998 as an outcome of the Joint Federal-Provincial Panel on Uranium Mining in northern Saskatchewan. The goal of the Community Vitality Monitoring Partnership Process is to provide information and insight to Indigenous Groups and stakeholders so that they can actively engage in maintaining and improving the quality of life for residents of northern Saskatchewan.
Connectivity	A measure of how connected or spatially continuous a corridor or ecosystem is. For wildlife, connectivity refers to the ability of animals to move among habitat patches.
Constituent of potential concern	A focused list of conventional water quality parameters, nutrients, major ions, metals, and radionuclides that have the potential to pose a risk to aquatic and terrestrial life and/or human health should they increase as a result of the Project.





Term	Definition
Contact water	Water that may have been physically, chemically, or radiologically altered by construction, mining, or milling activities.
Corvid	Birds belonging to the family Corvidae, including crows, ravens, rooks, jackdaws, jays, magpies, treepies, choughs, and nutcrackers.
Country foods	Dietary items that are harvested from the environment and used for sustenance. Country food items include wild animals and plants such as berries, herbs, medicinal plants, fish, and game.
Criteria air contaminants	Compounds for which the permissible levels in ambient air are governed at the federal level in the form of either a National Ambient Air Quality Objective or a Canada-Wide Standard (e.g., carbon monoxide, nitrogen dioxide, ozone, particulate matter, sulphur dioxide).
Crysolic soil	An order of soils found in arctic and tundra regions that is characterized by the presence of permafrost.
Cultural landscape	Represents the combined works of nature and human activity, illustrative of the evolution of human society and settlement over time, under the influence of the physical constraints and/or opportunities presented by the natural environment and of successive social, economic, and cultural forces. For Indigenous communities, the cultural landscape is a way to consider the relationship between Indigenous Peoples and a broader area.
Decibel	The standard unit of measure in acoustics. A logarithmic ratio of the measured pressure fluctuation and reference pressure.
Direct employment	Employment opportunities associated with working directly for the Project, including employees as well as contractors working on site.
Discouraged worker	Someone who, while willing and able to engage in a job, is not seeking work or has ceased to seek work because they believe there are no suitable available jobs.
Duty to consult	In Canada, the duty to consult and accommodate with Indigenous peoples arises when the Crown contemplates actions or decisions that may affect an Indigenous person's Aboriginal or Treaty rights.
Ecological risk assessment	The process of estimating the potential risk of contaminants on environmental indicators under defined conditions.
Ecosite	Ecological units that develop under similar environmental influences (climate, moisture and nutrient regime). Ecosites are groups of one or more ecosite phases that occur within the same portion of the moisture/nutrient grid. Ecosite is a functional unit defined by the moisture and nutrient regime. It is not tied to specific landforms or plant communities, but is based on the combined interaction of biophysical factors that together dictate the availability of moisture and nutrients for plant growth.
Ecosystem	An integrated and stable association of living and non-living resources functioning within a defined physical location. A community of organisms and its environment functioning as an ecological unit.
Edge habitat	Habitat found where one habitat type meets another (e.g., where forest verges on a recent cutblock, grassland, or riparian area).
Employment rate	The number of persons employed in the reference period expressed as a percentage of the total population aged 15 years and over. Statistics Canada defines an employed person as someone who completed paid work as either an employee for a company or through self-employment; someone who completed unpaid family work contributing directly to the operation of a business owned and operated by a related member of the same household; or someone who had a job but was not at work as a result of illness, family responsibilities, or other factors.
Energy equivalent sound level	The average sound level over a specified period of time. It is a single number representation of the total fluctuating acoustical energy measured over a time interval. The energy equivalent sound level for the daytime period represents the average noise level over the 15-hour daytime period, which begins at 07:00 and ends at 22:00. The energy equivalent sound level for the nighttime period represents the average noise level over the nine-hour nighttime period, which begins at 22:00 and ends at 07:00.
Entrainment	The process of drawing a fish into a water intake, where mechanical stress can cause injury or mortality.
Environmental Assessment	A process to identify, predict, and evaluate the potential environmental and social effects of a proposed project.
Environmental Impact Statement	A detailed technical document prepared by the proponent of a designated project to be assessed pursuant to the <i>Canadian Environmental Assessment Act, 2012</i> . The Environmental Impact Statement identifies the potential adverse environmental effects of a designated project including cumulative effects, measures to mitigate those effects, and an evaluation of whether the designated project is likely to cause any significant adverse environmental effects.
Environmental risk assessment	A process that identifies, quantifies, and characterizes the risk posed by contaminants (nuclear or hazardous substances) and physical stressors in the environment.
Eutrophic	Trophic state classification for lakes characterized by high productivity and nutrient inputs (particularly total phosphorus).
Fen	Wetland (peatland) condition that receives its moisture from (sometimes fluctuating) mineral-rich groundwater and precipitation and is dominated by Sphagnum mosses, shrubs, and graminoids; fens may be treed or treeless.
Fluvial	Relating to a stream or river.





Abbreviations and Units of Measure, Glossary, and References



Term	Definition
Fluvial sediment	Sediment that has been transported and deposited by streams and rivers, generally consisting of gravel
_	and sand with a minor fraction of silt and rarely clay.
Fry	The early stage of development for a fish from hatching until its yolksac is gone and it can feed itself.
Fugitive dust	Small airborne particulate matter. Fugitive dust is suspended in the air by wind action and human activities.
Geotechnical domains	Rock mass units with similar structural, geological, and material characteristics.
Gleysolic soil	An order of soils that have properties indicating prolonged, intermittent, or continuous saturation with water during soil development.
Glide	Glides are stream sections characterized by smooth flow (as opposed to turbulent flow), high channel uniformity, and a lack of scour in the channel bed.
Government transfer	Cash benefits received from federal, provincial, territorial, or municipal governments during the reference period, such as Old Age Security pension, employment insurance benefits, child benefits, social assistance benefits, and workers compensation benefits.
Greenhouse gases	Any of various gases in the atmosphere that absorb and emit radiation within the thermal infrared range. The primary greenhouse gases in the Earth's atmosphere are water vapor, carbon dioxide, methane, nitrous oxide, and ozone.
Groundwater	That part of the subsurface water that occurs beneath the water table, in soils and geologic formations that are fully saturated.
Hazard quotient	A measure of the ratio of the predicted exposure to a non-carcinogen (i.e., a non-cancer-causing substance) relative to its toxicity reference value.
Hibernaculum	A place of refuge occupied by animals, such as bats, during the winter when the species hibernates.
Human health risk assessment	The process of defining and quantifying risks to human health and determining the acceptability of those risks to human life.
Hydraulic conductivity	The capacity of soil or rock to allow water to pass through its pore spaces.
Hydraulic head	The elevation, with respect to a specified reference level, at which water stands in a piezometer connected to an aquifer in the soil.
Hydrogeology	The study of the factors that govern subsurface water (groundwater) movement, storage, and quality.
Hydrology	The study of waters, their occurrence, distribution, and circulation.
Hydroperiod	The annual period during which an area (e.g., pond, wetland) is inundated with water.
Hydrostratigraphic unit	A formation, part of a formation, or group of formations in which there are similar hydrologic characteristics, allowing grouping into aquifers or confining layers.
Impingement	Occurs when a fish becomes trapped against a water intake screen and is unable to free itself.
Incremental lifetime cancer risk	The predicted increase in lifetime cancer risk from exposure to a carcinogen related to Project activities; represents risk above background cancer risk.
Indicator species	A species that is sensitive to, and can serve as early warning of, environmental changes.
Indigenous Knowledge	The unique and collective knowledge of Indigenous Peoples that has been built up over time and passed on through generations of living in close contact with the land and natural environment.
Indirect employment	Employment in sectors supplying goods and services to the Project (e.g., through the supply chain).
Induced employment	Employment as a result of consumer expenditures generated by direct and indirect employment (e.g., food, clothing, entertainment).
Interim sediment quality guideline	Recommended maximum concentration of a chemical in sediment, intended to be protective of aquatic organisms.
Intermediate component	Physical attributes of the biophysical environment or media upon which valued components rely, such as air quality and hydrology. Intermediate components are assessed to support the assessment of valued components.
Institutional Control	Under the custodial responsibility of the government (i.e., the Province of Saskatchewan).
lonizing radiation	Energy that can damage cells and tissues by detaching electrons from atoms.
Keystone species	A species whose addition to or loss from an ecosystem leads to major changes in at least one other species.
Light trespass	The light or illuminance that strays from its intended purpose onto nearby areas where lighting may be undesirable.
Littoral zone	The zone in a lake that is closest to the shore, between the highest water level and the depth where there is enough light for rooted aquatic plants to colonize the bottom sediments.
Local Knowledge	The knowledge of local people who may or may not be Indigenous and who hold knowledge that is based on personal and collective experiences of their local environments over time, without necessarily having generational connections to a place. Represents information from a local priority area citizen or representative, but without Indigenous Group/Elder sanction, and is therefore not considered Indigenous Knowledge.







Term	Definition
Local priority area	Local communities closest to the Project that would experience most of the Project effects and for which NexGen would prioritize local training, employment, and business opportunities for the Project. These communities are located along, or accessed via, Highways 155 and 955 north of the intersection of
	Highways 155 and 925.
Local study area	The spatial boundary within which all (or most) potential Project effects are expected to occur.
Long hole stoping	The process of extracting ore by drilling, blasting, and excavating material from underground, leaving behind an open space, known as a stope, which is subsequently backfilled to support further development in the surrounding workings.
Low frequency noise	Refers to noise that is perceived by human listeners as being low in pitch (i.e., where a clear tone is present below and inclusive of 250 Hz). Low frequency noise can be determined by subtracting the overall C-weighted from the overall A-weighted sound level, or as the overall C-weighted sound level by itself.
Lowest effect level	In toxicity testing, the concentration below which harmful effects on benthic invertebrates are not expected to occur.
Luvisolic soil	An order of forest soils formed in parent materials derived from sedimentary rocks.
Maximum disturbance area	The 981 ha area where direct effects of the proposed Project on soils, vegetation, and wildlife could occur. The maximum disturbance area includes all Project footprint infrastructure and is larger than the anticipated Project footprint so that adverse terrestrial surface effects are not underestimated.
Maximum sound level	The maximum sound level over a specified period of time.
Measurement indicators	Measurement indicators represent physical and biological/human attributes of the biophysical, cultural, and socio-economic environments that can be measured and, when changed, could result in or contribute to an effect on a valued component.
Mesotrophic	Trophic state classification for lakes characterized by moderate productivity and nutrient inputs.
Métis	A person who self-identifies as Métis, is of Métis ancestry, is distinct from other Indigenous Peoples, and is accepted by the Métis Nation. The original Métis were a people of mixed Indigenous and European ancestry. The establishment of Métis communities over time and marriages between Métis men and Métis women led to the emergence of the Métis as a new Indigenous People.
Mill terrace	A graded pad area where processing facilities and other ancillary support features for the operation of the process plant would be located.
Mineral soil	Soils containing low levels of organic matter. Soils that have evolved on fluvial, glaciofluvial, lacustrine, and morainal parent material. The A, B, and C horizons and underlying material from which the soil was formed.
Mine terrace	A graded pad area surrounding the production shaft, exhaust shaft, and associated laydown areas. Includes most of the mine surface infrastructure required to support underground mining as well as the office and mine dry, fresh air intake, and diesel fuel storage.
Morphometry	Measurements of a body size; in fish, this typically includes length and weight.
Nitrogen dixode	One of the component gases of oxides of nitrogen.
Nitrogen oxides	Gaseous compounds such as nitrogen oxide and nitrogen dioxide, but may also include additional nitrogen species.
No-effect values	Toxicity values from sites where benthic invertebrates were exposed to, but were unaffected by, treated effluent.
Noise attenuation	A reduction in sound level that occurs with sound propagation over distance by means of physical dissipation or absorption mechanisms, or a reduction in sound level that occurs by means of noise control measures applied to a sound source.
Non-carcinogen	A chemical that does not cause cancer and has a threshold concentration, below which adverse effects are unlikely.
Non-contact water	Water that has not been physically, chemically, or radiologically altered by construction, mining, or milling activities.
Oligotrophic	Trophic state classification for lakes characterized by low productivity and low nutrient inputs (particularly total phosphorus).
Ore	Natural rock or sediment that contains minerals that can be economically mined. For the Project, ore is defined as mine rock with 0.26% triuranium octoxide or greater.
Organic soil	A soil order that have developed primarily on organic deposits. Soils containing high percentages of organic matter (i.e., fibric and humic inclusions).
Participation rate	The total number of employed and unemployed people in a reference period expressed as a percentage of the population aged 15 years and over.
Particulate matter	A mixture of small particles and liquid droplets, often including a number of chemicals, dust, and soil particles. Particulate matter is a major component of smog, consisting of airborne particles in solid or liquid form.
Passerine	Any bird of the order Passeriformes; also referred to as perching birds or songbirds.





Term	Definition
Pathway	The interactions or ways by which Project components or activities could cause potential effects on valued
Pelagic	components or intermediate components of the natural or human environment.  Inhabiting open water in a lake.
Peat	A material composed almost entirely of organic matter from the partial decomposition of plants growing in
	wet conditions.  Permanently frozen ground (subsoil). Permafrost areas are divided into more northern areas in which
Permafrost	permafrost is continuous, and those more southern areas in which patches of permafrost alternate with unfrozen ground (i.e., discontinuous).
Persons not in the labour force	Persons aged 15 or older but not employed or unemployed. This can include people who are permanently unable to work, retired, full-time students, and discouraged workers.
pH	The degree of acidity (or alkalinity) of soil or solution. The pH scale is generally presented from 1 (most acidic) to 14 (most alkaline). A difference of one pH unit represents a ten-fold change in hydrogen ion concentration.
Phytoplankton	Algae that live suspended in the water.
Piezometer	A screened pipe standing vertically in the ground in which the elevation of water levels can be measured.
Piscivorous	An animal that eats fish.
Plankton	Algae and small animals that live suspended in the water.
PM <sub>2.5</sub>	Particulate matter with a nominal diameter of 2.5 µm or less, the main particle size of concern for human health.
PM <sub>10</sub>	Particulate matter with a nominal diameter of 10 µm or less.
Point source	Any single identifiable source of pollution from which pollutants are discharged (e.g., a stack).
Post-closure	Refers to any time after the Project has been returned to Institutional Control under Provincial management.
Potable water	Water that is suitable for drinking.
Probable effect level	In toxicity testing, the concentration above which harmful effects on benthic invertebrates are expected to frequently occur.
Probable maximum precipitation	The greatest amount of precipitation for a given duration that is meteorologically possible for a design watershed or a given storm area at a particular location at a particular time of year, with no allowance made for long-term climatic trends.
Project footprint	The 228 ha area where physical infrastructure would be constructed for the proposed Project; this area includes the main site access road for the Project that connects to Highway 995.
Radiation	The emission by a nuclear substance, the production using a nuclear substance, or the production at a nuclear facility of an atomic or subatomic particle or electromagnetic wave with sufficient energy for ionization.
Radionuclide	A material with an unstable atomic nucleus that spontaneously decays or disintegrates, producing radiation.
Reasonably foreseeable developments	Projects and activities that are currently under regulatory review or have officially entered a formal regulatory application process, have been publicly disclosed by other proponents, or may be induced by the Project and that occur in the spatial assessment boundary defined by the valued components and intermediate components and have the potential to change the Project or effects predictions.
Reasonably Foreseeable Development Case	Assessment case that includes the Base Case, Application Case, and reasonably foreseeable developments that have not yet been approved.
Receiving environment	The natural aquatic environment that receives the deposit or discharge of waste from the mine.
Reclamation	Mitigation that returns the land to a useful and productive state (e.g., covering and revegetating a surface facility).
Reference value	Toxicity values derived solely on sediment metal and trace element concentrations from reference sites. Exceedances of reference values indicate elevated metal concentrations compared to typical natural background conditions.
Regional study area	The spatial boundary larger than the local study area used to provide broader context for the assessment of Project effects and for the assessment of cumulative (combined) effects of the Project and other past, existing, or planned developments (including reasonably foreseeable developments).
Regosolic soil	An order of soils with either no or a very thin (i.e., less than 5 cm) B horizon. Regosolic soils form in unconsolidated materials and are common on recently deposited or erosion susceptible materials.
Regulatory mixing zone	A defined column of water surrounding a discharge point where exceedances of chronic water quality thresholds are permitted through an approved water licence for a project, provided the discharges meet a number of protective criteria.
Rehabilitation	Mitigation that aims to restore basic ecological functions and/or ecosystem services which have been altered or eliminated by disturbance.
Restoration	Mitigation that tries to return an ecosystem to a close approximation of its condition prior to disturbance.

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Abbreviations and Units of Measure, Glossary, and References



Term	Definition
Riffle	A reach of stream that is characterized by shallow, fast-moving water broken by the presence of rocks and
Riparian	boulders, and/or surface disturbance.  Terrain or vegetation adjacent to and surrounding a stream, floodplain, or waterbody.
Run	A stream section that is characterized by shallow, moderate to high velocity flow and largely smooth
TAUT	surface flows; deeper than a riffle.
Salinity	The amount of salt present. In terms of soil, a saline soil is a nonsodic soil containing sufficient soluble salt to adversely affect growth of most crop plants.
Secchi depth	A parameter used to evaluate the clarity or transparency of surface waters. The measurement is made with a "Secchi" disk, a black and white disk that is lowered into the water and the depth is recorded at which it is no longer visible.
Sensory disturbance	A visual, auditory, or olfactory (i.e., smell) stimulus that creates a negative response in wildlife species.
Seral stage	In an ecological succession, the series of biotic communities that follow one another on the way to the stable stage, or climax community.
Severe effect level	In toxicity testing, the concentration above which harmful effects on benthic invertebrates are expected to occur.
Sign	Evidence indicating the presence of wildlife. As examples, caribou sign could include tracks or scat (i.e., feces), and beaver sign could include teeth marks on trees and active or inactive lodges.
Sky glow	Stray light that is scattered in the atmosphere, brightening the natural sky, and reducing star visibility.
Sodicity	The amount of sodium present. In terms of soil, a sodic soil is a soil without salt containing sufficient exchangeable sodium to adversely affect crop production and soil structure under most conditions of soil and plant type.
Soil	The naturally occurring, unconsolidated mineral and organic material at least 10 cm thick that occurs at the Earth's surface.
Soil horizon	A layer of mineral or organic soil material approximately parallel to the land surface that has characteristics altered by processes of soil formation. Each horizon (A, B, or C horizon) has distinct characteristics based on the process of soil formation. A horizons are the mineral horizons that form at or near the ground surface, B horizons generally lie below A horizons, and C horizons are the underlying mineral horizons consisting of parent materials that are relatively unaffected by the processes of soil development.
Soil map unit	Soil map units are individual surficial areas representing the dominant soil types and are delineated based on the soil classification, surficial soil texture, surficial material, and drainage characteristics.
Soil quality	Refers to the productivity of the soil as a growth medium on the landscape. Metrics used to evaluate soil quality include soil chemistry, soil suitability for reclamation, erosion sensitivity, sensitivity to acidification, permafrost potential, and sensitivity to compaction.
Source term	The predicted composition or mass loading of water that drains from a Project-related material (e.g., stockpiled ore, explosives residues, treated sewage effluent).
Stope	Large underground open space or cavity left after mine rock has been excavated.
Sulphur dioxide	A colourless gas with a pungent odour. Sulphur dioxide belongs to a group of sulphur-containing gases called sulphur oxides.
Sulphuric acid	A brownish, odourless, oily mineral acid. When emitted to the atmosphere, sulphuric acid can contribute to haze and smog and affect public health.
Topsoil	Topsoil includes the organic layer and mineral A horizon.
Total dissolved solids	The total concentration of all dissolved compounds in water.
Total suspended particulate	A measure of the total particulate matter suspended in the air. Total suspended particulate represents all airborne particles up to 100 μm in diameter.
Total suspended solids	The amount of suspended substances in water, which may include silt, clay, fine particles of organic and inorganic matter, soluble organic compounds, plankton, and other microscopic organisms.
Toxicity	The inherent potential of a material to cause adverse effects to a living organism.
Toxicity reference value	A toxicological index associating specific health effects with a level of exposure to a chemical. Examples include slope factors and unit risks for carcinogens and reference doses, tolerable daily intakes, or acceptable daily intakes for non-carcinogens. Toxicity reference values are meant to protect the most sensitive individuals.
Triuranium octoxide	A compound of uranium. The term is used to refer to the cutoff grade of uranium ore mined for the Project. After processing, ore material is referred to as uranium concentrate.
Terrain	Surficial materials and topography (elevation and slope) used to describe a landscape.
Terrain unit	Terrain units are represented as individual surficial areas representing the dominant terrain types that are defined by slope, aspect, topography, elevation, and surficial geology.
Traditional Foods	Animals and plants that are fished, hunted, or gathered from the land and consumed as part of a traditional diet.







Term	Definition
Traditional Land Use	Past, present, and future activities involving the harvest of traditional resources such as hunting and trapping, fishing, and gathering medicinal plants; conducting ceremonies; and travelling to engage in these activities.
Traditional use plants	Plants used by Indigenous Peoples of a region as part of their traditional lifestyle for food, ceremonial, medicinal, and other purposes.
Trophic level	Pertaining to part of a food chain; for example, the primary producers are a trophic level just as tertiary consumers are another trophic level.
Trophic status	Trophic status is a system of classifying lakes and describing lake processes in terms of the biological productivity of the system. Waterbodies are usually categorized into one of three classes: oligotrophic, mesotrophic, or eutrophic.
Umbrella species	A species with large home ranges and specific habitat requirements that can serve as a representative for the conservation of other species that occur in the same area.
Unemployment rate	The number of unemployed people expressed as a percentage of the total labour force. Statistics Canada defines an unemployed person as someone who was without paid work or self-employment work, was available for work and had actively looked for paid work in the past four weeks, was on temporary lay-off and expected to return to their job, or had definite arrangements to start a new job in four weeks or less.
Ungulate	Large hoofed mammals including animals such as deer, moose, and caribou.
Upland	Land where the water table is rarely above the ground surface. Substrates consist of mineral parent materials, and organic matter accumulation less than 40 cm in depth.
Upland zone	Area of higher, dry ground located adjacent to the riparian zone of a waterbody or watercourse.
Uranium concentrate	The Project term used for triuranium octoxide once the material has been processed and is ready for shipment off site.
Waterbody	Standing water such as a lake, pool, or pond.
Watercourse	Riverine systems such as creeks, brooks, streams, and rivers.
Watershed	The area of land bounded by topographic features that drains water to a common waterbody such as a river, wetland, or lake. Watersheds can range in size from a few hectares to thousands of kilometres.
Water surface elevation	A measure of the surface water levels relative to a local or geodetic vertical datum (i.e., the vertical elevation of a point relative to a vertical control network) at each hydrometric station or assessment location.
Wetland	Land where the water table is at, near, or above the surface, or that is saturated for a long enough period to promote such features as wet-altered soils and water tolerant vegetation. Wetlands include organic wetlands or peatlands, and mineral wetlands or mineral soil areas that are influenced by excess water but produce little or no peat.
White nose syndrome	A fungal disease caused by <i>Pseudogymnoascus destructans</i> that affects hibernating bats by causing unusual winter behaviour such as abnormally frequent or abnormally long arousal from hibernation.
Valued component	Aspects of the biophysical, cultural, and socio-economic environments that are considered to have scientific, social, cultural, economic, historical, archaeological, or aesthetic importance and that have been identified to be of concern by the proponent, government agencies, Indigenous Peoples, the scientific community, or the public.
Vascular plant	Plants possessing conductive tissues (e.g., veins) for the transport of water and food.
Wildlife	Under the Species at Risk Act, wildlife is defined as a species, subspecies, variety or geographically or genetically distinct population of animal, plant or other organism, other than a bacterium or virus that is wild by nature and is native to Canada or has extended its range into Canada without human intervention and has been present in Canada for at least 50 years.
Wildlife guild	A group of species that use the same ecological resources (habitat) in similar ways, independent of their relationship to other species.
Wildlife trees	A tree or group of trees (often dead or decaying) that provide wildlife habitat features such as cavities for refuge, breeding, or roosting.
Zooplankton	Small (often microscopic) aquatic animals suspended or weakly swimming in water.







## References





## **Abbreviations Used in References**

Abbreviation	Definition
BC Reg	British Columbia Regulation
c, s	chapter, section
CCSM	Continuing Consolidation of the Statutes of Manitoba
CRC	Consolidated Regulation of Canada
O. Reg.	Ontario Regulation
RRNWT	Revised Regulation of the Northwest Territories
RRO	Revised Regulation of Ontario
RRS	Revised Regulation of Saskatchewan
RSA	Revised Statues of Alberta
RSBC	Revised Statutes of British Columbia
RSC	Revised Statutes of Canada
RSNWT	Revised Statutes of the Northwest Territories
RSO	Revised Statue of Ontario
SA	Statute of Alberta
SBC	Statute of British Columbia
SC	Statue of Canada
SNWT	Statute of the Northwest Territories
so	Statute of Ontario
SOR	Statutory Orders and Regulations (Canada)
SS	Statute of Saskatchewan





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#### TECHNICAL SUPPORT DOCUMENTS

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- Technical Support Document XXI. Environmental Risk Assessment for the Rook I Project Environmental Impact Statement. Prepared for NexGen Energy Ltd. by Ecometrix Inc.
- Technical Support Document XXII. Climate Adaptation Framework for the Rook I Project Environmental Impact Statement. Prepared for NexGen Energy Ltd. by Golder Associates Ltd.

#### **BASELINE ANNEXES**

- Annex I. Atmospheric Baseline Report for the Rook I Project Environmental Impact Statement. Prepared for NexGen Energy Ltd. by Golder Associates Ltd.
- Annex II. Noise and Light Baseline Report for the Rook I Project Environmental Impact Statement. Prepared for NexGen Energy Ltd. by Golder Associates Ltd.
- Annex III. Hydrogeology Baseline Report for the Rook I Project Environmental Impact Statement. Prepared for NexGen Energy Ltd. by Golder Associates Ltd.
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- Annex IV.4. Patterson Lake Currents Assessment Report for the Rook I Project Environmental Impact Statement. Prepared for NexGen Energy Ltd. by Golder Associates Ltd.





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