

## GLOSSARY

Term	Definition
acute exposure limit	The amount or dose of a chemical that can be tolerated by humans without evidence of adverse health risks on a short-term basis.
additive interaction	Additive interactions apply to chemicals that are structurally similar, act toxicologically through similar mechanisms or affect the same target tissue in the body ( <i>i.e.</i> , share common health endpoint).
adenomas	Refers to benign tumours of glandular structure.
adolescent	12 years – 19 years old.
adult	20 years and older.
Agency, the	The Canadian Environmental Assessment Agency.
air contaminant emissions	For stationary sources, the release or discharge of a contaminant from a facility or operation into the ambient air either by means of a stack or as a fugitive dust, mist or vapour.
airshed	The atmospheric environment above some reference point
albedo	The ability of a surface to reflect light.
allometric model	Relationship between a certain parameter and size ( <i>e.g.</i> , example body mass and toxicity).
allometric model	A model relating the scaling the effect concentration of a chemical to relative growth and size of each part of the animal, or each animal relative to the others.
ambient sound	All-encompassing sound that is associated with an outdoor environment, usually a composite of sounds from many sources near and far. Ambient noise is the unwanted component of this sound.
anadromous	Describes the migration pattern of certain fish, such as salmon, that spend most of their life in oceanic waters before travelling to reproduce in the upper reaches of rivers and streams.
anthropogenic	Resulting from the influence of humans on nature.
aquifer	A geological formation, group of formations or part of a formation that contains sufficient saturated permeable material to yield economical quantities of groundwater to wells or springs.
Archaeological Field Research Licence	A licence granted to a professional archaeologist, through application to ASU, and necessary under legislation to undertake archaeological field work and HRIAs in the Province of New Brunswick.
artesian well	A well in a confined aquifer in which the water in the well rises higher than the top of the aquifer because of confining pressure.
Assessment Area	The geographic area that may be affected by the Construction or Operation of the Project facilities, directly or indirectly.

Term	Definition
attenuation	The reduction of sound intensity by various means ( <i>e.g.</i> , absorption in air, geometrical spreading, or topographic barriers).
avian	Pertaining to or derived from birds.
a-weighted decibel (dB <sub>A</sub> )	Logarithmic unit of sound intensity; 10 times the logarithm of the ratio of the sound intensity to the reference A-weighted scale, which has the same frequency response as the human ear.
A-weighting	The weighting network used to account for changes in level sensitivity as a function of frequency, with the objective of simulating human sensitivity to different frequencies. The A-weighting network de-emphasizes the high (6.3 kHz and above) and low (below 1 kHz) frequencies, and emphasizes the frequencies between 1 kHz and 6.3 kHz, in an effort to simulate the relative response of the human ear.
background sound	All-encompassing sound of a given environment without the sound source of interest.
baseline	Background, existing, pre-activity, pre-Construction, or pre-Project environmental conditions.
Baseline Case	The existing environment potentially affected or baseline conditions that were measured or reported analytical data.
bedrock	A general term for rock that underlines soil or other unconsolidated material.
bedrock outcrop	A general term for rock that is exposed at the earth's surface.
benchmark	A regulatory agency target against which predictions of risks are assessed.
benthic	Of, or relating to, the bottom or floor of a water body.
benthivore	Feeding on organisms found in or on the seabed.
bioaccumulation	A term used to describe the process by which chemicals are accumulated in an organism directly from exposure to water or soil.
bioavailability	The amount of an exposure dose that reaches the circulatory system.
biodiversity	The number and variety of organisms found within a specified geographic region.
biomagnification	The term generally refers to the sequence of processes that result in higher concentrations of chemicals in organisms at higher levels in the food chain (at higher trophic levels). These processes result in an organism having higher concentrations of a chemical than is present in the organism's food.
biota	The organisms, including animals, plants, fungi, and micro-organisms, found in a given area.
bioturbation	The mixing of sediment by biological organisms.

Term	Definition
Borden No.	Borden Number, a catalogue number system designed by Charles Borden in the 1950s. In this system, a number is assigned to an archaeological site following a latitude and longitude based grid system used throughout Canada. Each grid square is 16 km x 16 km (based on 10 minute latitude/longitude segments). A Borden Number consists of four letters and a number. The first two letters refer to the latitude position and the second two letters refer to the longitude position. The number portion (e.g. 1 or 5) is assigned consecutively as sites are documented and indicates that the archaeological site was, for example, the first (e.g., BhDm-1) or fifth (e.g., BhDm-5) site found within that Borden grid square.
CALPUFF	California Puff Model. A non-steady-state Gaussian puff dispersion model which can simulate the effects of time and space-varying meteorological conditions on pollutant transport, transformation, and removal.
Cambrian	A major division of the geologic timescale between approximately 542 ± 1 million years ago and 488.3 ± 1.7 million years ago.
candela	The SI unit of measure for luminous intensity of a light source in a specific direction.
Carboniferous	A major division of the geologic timescale. It marks the period between the Devonian Period (approx. 359.2 ± 2.5 million years ago) and the Permian Period (approx. 299.0 ± 0.8 million years ago).
carcinogen	A chemical directly involved in the promotion of cancer.
carcinomas	Cancers of the epithelium. Is the most common type of cancer, found in body tissues that line or cover surfaces of organs, glands, or body structures.
cardiomyopathy	Disease of the heart muscle.
carnivore	An organism that eats animals.
catadromous	Describes the migration pattern of certain fish, such as American eel, that spend most of their life in freshwater before travelling to deep oceanic waters to reproduce.
Chemicals of Potential Concern (COPC)	Chemicals which have the potential to be released in substantive quantities or elevated concentrations from sources associated with the Project, or which, because of their toxicological properties, are considered to be of concern.
child	5 years – 11 years old.
chronic exposure limit	Amount or dose of a chemical that people can be exposed to without experiencing ill health, even when exposure occurs continuously or regularly over extended periods (e.g., longer than a year).
<i>circa</i>	About (with respect to an approximate date)
climate	Defined as a description of the regularities and extremes in weather conditions in a particular geographical location over a certain period. Usually refers to long term trends in weather for time periods which may range from months to centuries, or the more widely recognised 30-year timeframe as advocated by the World Meteorological Organisation (WMO)

Term	Definition
climate change	The term climate change is used to refer to changes in the earth's climate, which can be caused both by natural forces and human activities. Most commonly associated with global warming and the global greenhouse effect, which highlight discernable changes to the earth's climate, ( <i>i.e.</i> , increasing temperatures, due to man-made activities and processes).
Comprehensive Review	A detailed environmental impact assessment to assess the nature and significance of potential environmental impacts of an undertaking under the <i>New Brunswick Environmental Impact Assessment Regulation – Clean Environment Act</i> . A Comprehensive Review is undertaken following a Determination Review, when it is determined that a more detailed environmental impact assessment is required.
conglomerate	A type of sedimentary rock in which individual rocks have been cemented together.
Construction phase	The time during which the Project would be constructed and commissioned (beginning in quarter 2 of 2010, will last for a period of about 8 to 10 years and will be carried out in two phases).
Criteria Air Contaminants (CAC)	A group of eight common air contaminants released into the air from various processes including industrial production and fuel combustion. They include total particulate matter (PM), particulate matter less than 10 microns (PM <sub>10</sub> ), particulate matter less than 2.5 microns (PM <sub>2.5</sub> ), sulphur dioxide (SO <sub>2</sub> ), nitrogen oxides (NO <sub>x</sub> , expressed as NO <sub>2</sub> ), carbon monoxide (CO), and ammonia (NH <sub>3</sub> ). Abbreviated in this document as CAC.
cumulative environmental effects	As defined in the <i>Canadian Environmental Assessment Act (CEAA)</i> , the environmental effects that are likely to result from a project in combination with other projects or activities that have been or will be carried out.
cyprinid	Fish belonging to the family <i>Cyprinidae</i> , which includes carp and some of the fish known as minnows.
debitage	Stone debris from the making of stone tools, such as waste materials like chips, chunks, and flakes. These waste materials may sometimes have been used themselves as tools.
decibel	One tenth of a bel. A logarithmic measure of the ratio of any measured physical quantity to a reference quantity, commonly used in the measurement of sound. The decibel provides the possibility of representing a large span of signal levels in a simple manner as opposed to using the basic unit of linear pressure, Pascal. The difference between the sound pressure level for silence versus a loud sound is a factor of 1,000,000:1 or more, therefore it is less cumbersome to use a small range of equivalent values: 0 to 130 decibels.
deciduous	Sheds all leaves annually.
Decommissioning and Abandonment	Decommissioning, refers to the activities associated with the decommissioning and deconstruction of the Project and the restoration of the land to pre-development conditions or the chosen end-use.
Decommissioning and Abandonment Phase	The time after the Project would cease to operate. Activities are normally limited to decommissioning, post-closure monitoring and property maintenance.
diadromous	Fish that migrate between freshwater and salt water.
dilution	The process of making weaker or less concentrated.

Term	Definition
diurnal	Relating to or occurring in a 24-hour period; daily.
drainage basin	The area of land from which surface water run-off drains into lakes, streams, reservoirs or other bodies of water.
drawdown	The change in water level (between the static water level and the surface of the cone of depression) caused by pumping a groundwater well.
dug well	A hand dug well.
easting	A term used to describe a location within a Universal Transverse Mercator (UTM) zone. The midline of each zone is given an easting value of 500,000 m. A point to the west of the midline has an easting value less than 500,000 m, and a point to the east of the midline has an easting value greater than 500,000 m.
ebb (tide)	A falling tide. The transition from high tide to low tide.
Ecological Risk Assessment (ERA)	A scientific method used to examine the nature and magnitude of risks from the exposure of plants and animals to contaminants in the environment.
ecosystem	A spatially defined system including all biological organisms and abiotic media.
eddies	Circular movements of water.
emission factor	A representative value that relates the quantity of pollutant released to the atmosphere with an activity or input associated with the release of that pollutant.
emissions	Technically, all solid, liquid, or gaseous discharges from a processing facility, but normally referring to gaseous and particulate air emissions (with solids referred to as residue and liquids as effluent).
Endangered	A species facing imminent extirpation or extinction.
Energy Equivalent Sound Level ( $L_{eq}$ )	The level of a constant sound over a specific time period that has the same sound energy as the actual (unsteady) sound over the same period, e.g., over a 1 hour period, $L_{eq}$ (1 h) or over a 24 hour period, $L_{eq}$ (24 h).
environment	<p>As defined under CEAA, environment “<i>means the components of the Earth, and includes:</i></p> <p>(a) <i>air, land and water, including all layers of the atmosphere;</i></p> <p>(b) <i>all organic and inorganic matter and living organisms; and</i></p> <p>(c) <i>the interacting natural systems that include components referred to in paragraphs (a) and (b).”</i></p> <p>As defined under the New Brunswick <i>Clean Environment Act</i>, environment “<i>means the air, water or soil.</i>”</p>

Term	Definition
Environmental Assessment	<p>A process to evaluate the potential environmental effects of proposed projects before they are carried out to meet the requirements of the federal <i>Canadian Environmental Assessment Act (CEAA)</i>. An EA identifies possible environmental effects, proposes measures to mitigate adverse environmental effects, predicts whether or not there will be significant adverse environmental effects after the mitigation is implemented, and considers the requirements for follow-up.</p> <p>In relation to the Project, the federal EA to be conducted under <i>CEAA</i> shall assess the potential environmental effects of the Construction, Operation, and Decommissioning and Abandonment of the marine terminal and other marine-based infrastructure to be built and operated in support of Project Eider Rock.</p>
environmental effect	<p>As defined under <i>CEAA</i>, in respect of a project:</p> <p>(a) <i>“any change that the project may cause in the environment, including any change it may cause to a listed wildlife species, its critical habitat or the residences of individuals of that species, as those terms are defined in subsection 2(1) of the Species at Risk Act,</i></p> <p>(b) <i>any effect of any change referred to in paragraph (a) on</i></p> <p>i). <i>health and socio-economic conditions,</i></p> <p>ii). <i>physical and cultural heritage,</i></p> <p>iii). <i>the current use of lands and resources for traditional purposes by aboriginal persons, or</i></p> <p>iv). <i>any structure, site or thing that is of historical, archaeological, paleontological or architectural significance, or</i></p> <p>(c) <i>any change to the project that may be caused by the environment whether any such change or effect occurs within or outside Canada.”</i></p> <p>For convenience in this HHERA, environmental effect shall be taken to be synonymous to impact as defined below.</p>
Environmental Impact Assessment (EIA)	<p>New Brunswick’s <i>Environmental Impact Assessment Regulation</i> (Regulation 87-83) under the <i>Clean Environment Act</i> provides the legislative framework for proactive environmental planning of proposed undertakings. The purpose of an EIA is to identify the environmental effects associated with development proposals at the planning stages, well in advance of their implementation, so that the potential environmental effects can be considered, avoided or reduced to acceptable levels before they occur. An EIA gives technical specialists from government agencies, including the federal departments of Fisheries and Oceans Canada (DFO), Transport Canada (TC), and Environment Canada (EC), as well as local residents and the general public, a chance to provide their input in the decision-making process regarding specific development proposals. An EIA review (either a Determination Review or Comprehensive Review) must be completed before any undertaking subject to EIA can proceed.</p> <p>In relation to the Project, the provincial EIA to be conducted shall assess the potential environmental effects of the construction, operation, and decommissioning and abandonment of the refinery, marine terminal, and other land-based and marine-based infrastructure to be built and operated as part of Project Eider Rock.</p>
epithelium	The cells or membrane covering the outer surface of organs and the body.
equivalent sound pressure level ( $L_{eq}$ )	The equivalent continuous level which is a measure of the energy content of a sound over a time period. It gives a single figure expressing the equivalent of a varying level.

Term	Definition
estuarine environment	The aquatic environment where a river meets the sea. See estuary.
estuary	That part of a river or stream or other body of water having unimpaired connection with the open sea, where the sea water is measurably diluted with freshwater derived from land drainage.
evapotranspiration	The sum of evaporation and transpiration from the earth's surface to the atmosphere. It incorporates the loss of water due to free-water evaporation, plant transpiration and soil-moisture evaporation.
existing ambient	All sounds in a given area (includes all natural sounds as well as all mechanical, electrical and other human-caused sounds).
exposure limit	Maximum dose or amount of chemical that a person or ecological receptor can be exposed to for a specified period without experiencing an adverse health outcome.
extinction	In biology and ecology, extinction is the ceasing of existence of a species or group of taxons. The moment of extinction is generally considered to be the death of the last individual of that species.
extirpation	To eliminate completely from a region.
fauna	Animal species.
feedstock	A raw material required as an input to an industrial process. In the context of the Project, a feedstock refers to the input material for any of the processing units.
Final Guidelines	The Final Guidelines for an environmental impact assessment issued by the New Brunswick Minister of Environment that establish the issues and environmental components that the environmental impact assessment must address.
firm yield	Represented the sustained (daily average) draw from a watershed/lake reservoir system throughout a historical dry year and is equal to the usable storage in the reservoir plus the usable inflow to the reservoir during a critical historical period (Linsley and Franzini, 1964).
fish	Under Section 2 of the <i>Fisheries Act</i> , includes (a) parts of fish; (b) shellfish, crustaceans, marine animals and any parts of shellfish, crustaceans or marine animals; and (c) the eggs, sperm, spawn, larvae, spat and juvenile stages of fish, shellfish, crustaceans and marine animals.
fish bearing watercourse	A watercourse in which water and habitat quality is sufficient to support fish, and where there are no barriers to the upstream passage of fish.
fish habitat	As defined under the <i>Fisheries Act</i> , fish habitat includes the spawning grounds and nursery, rearing, food supply and migration areas on which fish depend directly or indirectly in order to carry out their life processes.
flora	Plant species
flow (tide)	A rising tide. The transition from low tide to high tide.
fluvial	Landforms or deposits defined and formed by flowing water.
forage	The act of looking or searching for food or provisions.
fossils	Preserved traces or remains of a pre-existing organism of a past geologic age.

Term	Definition
fugitive emission	Result from small leaks that while individually very small, can collectively be substantial for large, complex facilities
Future Case	The evaluation that covers the emissions of the Project and all existing, current and future planned projects together
geodetic	Relates the geometry of exact positions of points and lines drawn on the earth's surface that make corrections for the curvature of the earth's surface. For example, geodetic elevation of the water surface, usually expressed in metres (m), is the exact vertical position of the waterline on the earth's surface and can be directly compared to other geodetic measurements.
geomorphology	The study of landforms and the processes that created them.
geosyncline	A geologic term used to describe a subsiding linear trough.
glaciofluvial	Pertains to the deposits or landforms formed by streams fed by melting glaciers. The term also refers to the streams fed by the melting glaciers.
glaciolacustrine	The sediments or processes involving a lake that has received meltwater from glacial ice.
glaciomarine	The sediments or processes involving areas in which marine water and glacial ice were in contact.
glare	A potential environmental effect where intense, harsh, or contrasting lighting conditions reduce human, birds, and other organisms' ability to see. The unit of measure for glare is lumens per steradian, which is equal to a candela.
greenhouse gases (GHG)	Gaseous compounds that inhibit the release of heat from the atmosphere. The greenhouse gases considered in this Study are carbon dioxide (CO <sub>2</sub> ), methane (CH <sub>4</sub> ), and nitrous oxide (N <sub>2</sub> O).
gyre	A circular or spiral motion, especially a circular ocean current.
haematological toxicant	Blood toxicant.
half-life	The period of time required for the loss or decay of one-half the original quantity of a substance.
headwater	A small stream which is the most distant point from the river mouth in the drainage basin from which the surface water flows.
hemangioma	A benign tumour developed from blood vessels.
hemangiosarcomas	Rare, rapidly growing, highly invasive form of cancer.
heptatoxicant	Liver toxicant.
herbivore	An organism that eats only plants.
heritage and archaeological resources	Any physical remnants found on top of and/or below the surface of the ground, including the sea floor, that inform us of past human use of and interaction with the physical environment. This includes resources of historical, cultural, archaeological, palaeontological, and architectural significance.

Term	Definition
Heritage Resource Impact Assessment (HRIA)	An assessment completed under licence following guidelines from the Province of New Brunswick (Ferguson 2004) and designed to determine the presence or absence of heritage resources within the area of a project and what effect, if any, a project may have on heritage resources
Heritage Resources, Saint John	A historical resources consultant located in Saint John, New Brunswick
historic period	The period after European arrival in Canada, referring to the time for which written history records are available.
hydraulic conductivity (K)	The volume of water that is transmitted through a unit area of aquifer under a unit decline in hydraulic head (expressed as metres per day per metre of drawdown (m/d or cm/s), and is the transmissivity divided by the aquifer thickness contributing to the well.
hydric soil	A soil that is saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in the upper part.
hydrodynamics	Relates to the motion of fluids (usually water) and the forces that act on solid bodies immersed in fluids.
hydrology	Study of the properties, distribution and circulation of water.
hydrophytic vegetation	Plant life growing in water or on a substrate that is at least periodically deficient in oxygen as a result of excessive water content.
hyperpigmentation	Excessive pigmentation of the skin.
hyperplasia	Excessive growth of normal cells of an organ or tissue.
hypoxic	Deficient in oxygen.
illuminance	The density of incident luminous flux on a surface and is measured in lux.
illumination	The use of light to see objects or tasks at particular location and/or job site.
impact	An environmental effect associated with a project or undertaking, as used in the context of an EIA under the New Brunswick <i>Environmental Impact Assessment Regulation</i> . In this HHERA, impact shall be taken to be synonymous to environmental effect as defined previously.
<i>in situ</i>	A Latin term meaning in place or not removed. In general, this refers to artifacts being found in their originally deposited context.
indigenous	Originating and living or occurring naturally in an area or environment.
infant	0 months – 6 months old.
infiltration	The movement of water from the land surface into the soil.
intertidal	The region between the high tide mark and the low tide mark.
invertebrates	Animals lacking a backbone or spinal column
ISO 9613	The specific ISO Standard dealing in part 1 with the absorption of sound energy in the air, and in part 2 with the transmission of sound energy through the air.

Term	Definition
keratosis	A growth on the skin due to overproduction of Keratin.
$K_{ow}$	The octanol-water partition coefficient. The ratio of the concentration of a chemical in octanol and in water at equilibrium and at a specified temperature.
ks	A soil loss term, accounting for the loss of COPC by several mechanisms, including leaching, erosion, runoff, degradation (biotic and abiotic), and volatilization.
Land-based Infrastructure	The part of the Project consisting of the petroleum refinery and associated physical works.
landlocked	Describes formerly anadromous fish populations (e.g., salmon) which no longer migrate back to sea, but have become established and spawn in freshwater lakes.
$LC_{50}$	Median lethal concentration of a toxic substance or radiation. The concentration required to kill half the members of a tested population.
$L_D$	$L_D$ is an average sound pressure level over the day time period. In this study the day time period was set at 6:00 to 22:00.
$LD_{50}$	Median lethal dose of a toxic substance or radiation. The dose required to kill half the members of a tested population.
LFCSA	An area (approximately 4 km in width) between the Project and east Saint John that defines the area within which preferred and alternative linear facility corridors will be selected for the EIA/EA.
light trespass	Sometimes referred to as illumination on surrounding properties or light spill, refers to the spilling of light from fixtures within a facility to the environment and receptors outside the facility. The unit of measure for light trespass is a lux. A lux is equal to 1 lumen per square metre ( $\text{lumen/m}^2$ ).
linear facilities	Pipelines, a rail line, a transmission line, water mains, and conveyors to be constructed in support of the operation of the Project.
Linear Facilities Corridors Assessment Area	A broad area (approximately 4 km in width) between the Project and east Saint John that defines the area within which preferred and alternative linear facility corridors will be selected for the EIA/EA.
linear facility (linear facilities)	Pipelines, rail spurs, transmission lines, water mains, product conveyors and roads.
linear stone feature	A feature, usually consisting of locally available stones, arranged in a linear fashion to form, for example, a stone fence, retaining face, building foundation, or similar structure.
lithology	Refers to both the bulk characteristics or the microscopic description and classification of a rock mass or formation.
littoral	Shallow shore area (less than 6 m) of a water body where light can usually penetrate to the bottom.
livestock	Agricultural foods
$L_N$	$L_N$ is an average sound pressure level over the night time period. In this study the night time period was set at 22:00 to 6:00.

Term	Definition
Local Modelling Domain (LMD)	The 15 km by 15 km area in which the most substantive changes in air quality due to Project activities are expected to occur.
Local Study Area (LSA)	The Local Study Area (LSA) consists primarily of the Refinery Study Area and the Linear Facilities Corridor Study Area (LFCSA), extending north from the existing Saint John Refinery, south to the Red Head area, east from the Mispec area, and west towards the Saint John Harbour.
long-range transport (LRT)	The transport of air contaminants released in distant locations to the region of interest by prevailing winds.
Lowest Observed Adverse Effect Level (LOAEL)	The lowest concentration or dose of a chemical where specifically defined adverse effects have been observed in test organisms.
lumen	A unit of measure that expresses the total quantity of light given off by a source, regardless of direction.
luminaire	A complete lighting installation including the lamp/lamps and parts involved in distributing the light.
luminance	A measure of the luminous intensity or brightness of light. The unit of measure is candelas per square metre.
lux	A unit of measure for illuminance and is equal to lumens per square metre.
Lymphocyte	A white blood cell.
Marine Environment Assessment Area	The coastal waters of the Bay of Fundy from Cape Spencer, west to include the outer Saint John Harbour up to the entrance of the major shipping lanes in the Bay of Fundy.
marine terminal	The infrastructure where crude oil is unloaded and finished petroleum products are loaded into marine vessels.
Marine-based Infrastructure	The part of the Project consisting of the marine terminal and associated physical works.
Maximum Acceptable Level	As part of the federal National Ambient Air Quality Objectives (NAAQO), this is a long-term goal for air quality and provides a basis for anti-degradation policy for unpolluted parts of the country, and for the continuing development of control technology.
Maximum Desirable Level	As part of the federal NAAQO, this criterion is intended to provide adequate protection against environmental effects on soil, water, vegetation, materials, animals, visibility, personal comfort and well-being.
Measured Baseline	Measured concentrations of COPC in the LSA were used to predict existing potential risk to humans and the environment.
Metaplasia	A condition in which one type of cell transforms into another type of cell ( <i>i.e.</i> , from normal to abnormal).
meteorology	The science of weather and weather forecasting.

Term	Definition
microclimate	The local climate or weather conditions of usually a small site of habitat, such as higher temperatures in urban areas of a city due to heat release and reflection from vehicles, roads and buildings, and strong winds channelling through gaps at the base of tall buildings.
Mitigation	With respect to a project, refers to the elimination, reduction or control of the adverse environmental effects of the project, including restitution for any damage to the environment caused by such environmental effects through replacement, restoration, compensation or other means.
model calibration	The method by which an independent variable or a number of independent variables are varied in a computer model in order to calibrate a dependant variable.
Monitoring	Periodic or continuous surveillance or testing to determine the characteristics of a substance or the level of compliance with statutory requirements and/or contaminant levels in various media or in humans, plants, and animals.
moraine	“A mound, ridge, or other distinct accumulation of unsorted unstratified glacial drift, predominantly till, deposited chiefly by direct action of glacier ice” (Driscoll 1989).
neap tide	A less than average tide occurring near the first and third quarters of the moon.
nephrotoxicity	Kidney toxicant.
neurotoxicant	Nervous system toxicant.
No Observed Adverse Effect Level (NOAEL)	The highest tested dose of a substance that has been reported to have no adverse health effects on laboratory animals.
noise	Noise is defined as unwanted, undesired, or unpleasant sound. A subjective term, as sounds that may be unwanted and undesired by some may be wanted and desirable by others.
Non-CAC	Non-criteria air contaminants, that is chemicals of potential concern which are neither criteria air contaminants nor greenhouse gases ( <i>e.g.</i> , metals).
non-carcinogen	A chemical that does not cause cancer.
northing	A term used to describe a location within a UTM zone. Northing values are measured in metres relative to the Equator.
obtrusive light	Spilled light which gives rise to annoyance, discomfort, distraction, and a reduction in the ability to see essential information.
omnivorous	Feeding on both meat (animal) and plant tissues.
Operation Phase	The time after the Construction Period during which the refinery would be operated, expected to be approximately 50 years. This lifetime could be extended by maintenance or refurbishment as determined feasible by the Proponent. To account for this potential extension, the HHERA is based on a lifetime of 70 years.
order of magnitude	The expression “an order of magnitude” refers to a value that is roughly ten times greater than the value against which it is being compared.
outdoor lighting	Any form of exterior or interior lighting systems that have an environmental effect on the outdoor environment.

Term	Definition
overburden	Material in the top later of the earth's surface.
parameter	A variable that defines a system and can be varied in an experiment to determines its behaviour.
peak run-off	The highest recorded flow event for watercourses in the Assessment Area on record, based on precipitation data recorded at the Saint John Airport.
photosynthesis	The process that a plant uses to combine sunlight, water and carbon dioxide to produce oxygen and carbohydrates (sugars).
phylogenetically	Related to the evolutionary history or line of decent of a particular species or higher taxonomic group.
phytotoxicity	Refers to toxic effects on plants.
piscivore	Feeding primarily on fish
post-curfew	The time between 23:00 and 06:00 during which stricter requirements for the control of light may be employed because of overnight sensitivity to higher light levels. No curfew applies in New Brunswick.
potable water	Potable water is water that is fit for drinking by humans and other animals.
potential acid input (PAI)	The difference between deposited acidic anions and basic cations.
potential corridor	Potential corridors, approximately 100 m in width, are evaluated based on set criteria. Preferred and alternative corridors are selected from the Potential Corridors.
Precambrian	Describes the period of time in the geologic timescale that came before the current Phanerozoic eon.
Pre-contact period	The period before European arrival in Canada.
pre-curfew	The time after sunset, between 19:00 and 23:00, when lighting may be in use but activity levels are still high.
preferred corridor	The most favourable corridor in which to construct and operate linear facilities.
probability density function	A mathematical function that describes the probability of failure occurring over time. This function can be utilized to determine the probability that a failure takes place in a given time interval.
process upset	Short-term abnormal emissions may occur due to flaring or equipment upsets such that sulphur recovery units may operate outside of their normal range of specifications.
Project	As described herein, the Project is "Project Eider Rock – Proposed Petroleum Refinery and Marine Terminal in Saint John, New Brunswick". The Project is a project as defined under <i>CEAA</i> and an Undertaking under the <i>New Brunswick Environmental Impact Assessment Regulation</i> .
Project Case	Baseline conditions plus emissions from either the Land-based Infrastructure or the Marine-based Infrastructure.

Term	Definition
Project Development Area (PDA)	A 1,132 ha area including the refinery complex and extending to the coast of the Bay of Fundy to include the product storage tanks.
Project Development Area for Marine Infrastructure Facilities	The area within which marine-base Project infrastructure will be located.
Proponent	In the context of the Project, the Proponent is Irving Oil Company, Limited.
proteinuria	Presence of protein in the urine.
pumping test	A well is pumped for a specific period of time and the change in hydraulic head is measured during the specified time period. A pumping test can be used to determine the capacity of the well or the hydraulic characteristics of the aquifer.
raw water	Raw water is untreated freshwater
reach	A section of watercourse of defined length (usually 100 m) in which fish and fish habitat surveys are completed, and water quality measurements are taken.
receptor	The person, plant or wildlife species that may be affected due to exposure to a contaminant.
Refinery Assessment Area	Area of study for land-based components of the Project.
refinery complex	The land-based portion of the Project, containing process units for the conversion of crude oil to finished petroleum products.
Refinery Study Area (RSA)	Area of study for siting the refinery process units and other land based components of the Project.
Regional Modelling Domain (RMD)	A 70 km by 45 km area in which changes in air quality due to Project activities may occur.
Regional Study Area	The Regional Study Area consists of an area that is beyond the limits of the local study area that may be affected by the Project. For the purposes of this technical study, the regional study area was defined to be an area 70 km by 45 km spanning the Saint John airshed. The regional study area was used for modelling regional emissions sources and to assess transport to sensitive receptors for the HHERA modelling.
renal toxicant	Kidney toxicant.
Responsible Authority	In relation to a project, means a federal authority that is required, pursuant to Subsection 11(1) of <i>CEAA</i> , to ensure that an environmental assessment of the Project is conducted.
rhinitis	Inflammation of the nasal passages.
run-off	The portion of precipitation that does not infiltrate into the ground surface and flows to surface water bodies.
run-off coefficient	Indicates the percentage of total precipitation which leaves a watershed as surface run-off.

Term	Definition
safe well yield	The practical volume of water discharged from a well within a specific time period (e.g., 1 day, 10 days, continuous) in litres per minute (L/min), US gallons per minute (USgpm) or cubic metres per second (m <sup>3</sup> /s), based on the apparent transmissivity of the well, and allowable drawdown to pump intake or a major water-bearing zone.
salmonid	A species of fish belonging to the family <i>Salmonidae</i> – a group of fish including salmon and trout.
saturated thickness	The vertical thickness of an aquifer that has all its pore spaces filled with water.
scour	To clear, dig, or remove by a powerful current of water.
secchi depth	Used to assess light penetration in water as an indication of trophic state of the water body.
Secondary Particulate Matter (SPM)	Particles, formed after release to the atmosphere, which result from a series of chemical and physical reactions involving different precursor gases. In terms of this Project, SPM shall be considered to consist of sulphate, nitrate, and ammonium that are formed by secondary reaction of the emissions of sulphur, nitrogen oxides, and ammonia.
Secure Species	A secure species is one that is listed or known to be secure (including those designated S4 or S5 by AC CDC, or designated as “Secure” by NBDNR).
sediment	Fragmented material from weathered rocks and organic material that is suspended in, transported by and eventually deposited by water or air.
sedimentary rock	One of the three main rock groups (including metamorphic and igneous rock).
selenosis	Selenium poisoning.
sexual dimorphism	Systematic difference in form (e.g., colour, shape, or size) between individuals of different sex within the same species.
shovel test pit	A 50 cm by 50 cm hand dug hole, dug in areas of elevated archaeological potential, to confirm the presence or absence of archaeological materials.
significance	A measure of the degree to which an environmental effect may be adverse or beneficial.
sky glow	The illumination of the clouds, and haze in the atmosphere that replaces the natural nighttime sky with a translucent to opaque lighted dome. The unit of measure for sky glow is in magnitudes per square arcsecond (mag/arcsec <sup>2</sup> ).
soil half-life	The length of time required for the concentration of a compound to decrease to half of its initial value in soil.
sound	A wave motion in air, water, or other media. It is the rapid oscillatory compressional changes in a medium that propagates to distant points.
sound power level (L <sub>w</sub> )	The total sound energy radiated by a source per unit time. The unit of measurement is the decibel expressing the ratio of power of the source, in watts to a reference level (conventionally 10 <sup>-12</sup> watts).

Term	Definition
sound pressure level (L <sub>p</sub> , SPL)	The logarithmic form of sound pressure. In air, 20 times the logarithm (to the base 10) of the ratio of the actual sound pressure to a reference sound pressure (which is 20 micropascals, and by convention has been selected to be equal to the approximate threshold of human hearing). It is also expressed by attachment of the word decibel to the number.
Species at Risk	Species at Risk include species that are listed under Schedule 1 of the <i>Species at Risk Act (SARA)</i> as “extirpated”, “endangered”, or “threatened” and/or listed under the New Brunswick <i>Endangered Species Act</i> as “endangered” or “regionally endangered”.
Species of Conservation Concern	Species of conservation concern includes those listed species that are not currently under the protection of <i>SARA</i> of the New Brunswick <i>Endangered Species Act (i.e.,</i> are listed as “special concern” in Schedule 1 of <i>SARA</i> ; listed in Schedule 2 or 3 of <i>SARA</i> ; or ranked as S1, S2, or S3 by AC CDC; and/or ranked as “May Be At Risk” or “Sensitive” in the New Brunswick <i>Endangered Species Act</i> ).
species rank (srank)	A provincial rarity ranking assigned for the purpose of setting protection priorities for a species and/or ecological community. This ranking system is used by conservations data centres (CDCs) and natural heritage programs.
spill	An accidental chemical release.
spring tide	Tide with large amplitude occurring twice a lunar month, near full moon and new moon.
stratified	To form, arrange, or deposit in layers.
stratigraphy	The layering of deposits in archaeological sites.
stream order	A simple classification system developed by Arthur Newell Strahler (Strahler 1952) which is used to define stream size based on a hierarchy of its tributaries. Streams range from first order (headwater) streams to very large twelfth order streams. Streams become higher order streams as more tributaries join to them.
Study Area	The area modelled in the marine ecological risk assessment.
sub-chronic	Intermediate between acute and chronic, typically of duration between 30 and 90 d.
sub-lethal	Long-term growth or survival effects.
synchronization	To occur at the same time; be simultaneous.
Technical Study	Linear Facilities Corridor Selection Technical Study
terrestrial	Living on or in the ground.
terrestrial wildlife species	A terrestrial wildlife species is one that inhabits a terrestrial ecosystem for the majority of its lifecycle. Marine birds are summarized in this Technical Study but will be assessed in the Marine Component of the EIA/EA.
the Proponent	Irving Oil Company Limited.
thermocline	A steep temperature gradient that exists in the middle zone of a lake which gives rise to thermally induced stratification of the water.

Term	Definition
Threatened	A wildlife species that is likely to become an endangered species if nothing is done to reverse the factors leading to its extirpation or extinction.
tidal inlet	An opening along the shoreline where water extends at high tide.
tidal marshes	A marsh found along coasts and estuaries in which the characteristics of the marsh are determined by the tidal movements (of the adjacent sea, ocean or estuary).
toddler	7 months to 4 years old.
topographic	The configuration of a surface including its relief and the position of its natural and man-made features.
toxicity reference values (TRVs)	The dose level selected to represent a threshold above which adverse environmental effects to the health of a given type of organism may be expected.
trajectories	A chosen or taken course.
Triassic	The division of the geologic timescale between approximately 251 to 199 million years ago.
tsunamis	A long-period gravity wave generated by a submarine earthquake, volcanic eruption, or large submarine landslides.
Undertaking	A project, physical works, or activity that requires registration under the New Brunswick <i>Environmental Impact Assessment Regulation</i> . Analogous to project, as defined under <i>CEAA</i> . In the context of this HHERA, project is used synonymously and in place of undertaking.
UTM	Universal Transverse Mercator. A mapping grid developed by the National Imagery and Mapping Agency (USA). The globe is divided into numbered zones, and within each zone northing and easting values are used to locate any point on the Earth's surface.
vascular plants	Group of plants including ferns, flowering plants, and conifers.
volcanic rock	A volcanic origin igneous rock.
watercourse	As defined under the <i>Clean Water Act</i> , watercourse means the full width and length, including the bed, banks, sides, and shoreline, or any part, of a river, creek, stream, spring, brook, lake, pond, reservoir, canal, ditch or other natural or artificial channel open to the atmosphere, the primary function of which is the conveyance or containment of water whether the flow be continuous or not.
watershed	Defined by the New Brunswick Watershed Protection Program as an area of land that drains a connected system of watercourses such as lakes, streams and rivers.
well casing	A piece of steel or PVC plastic pipe used to keep a well constructed in unconsolidated material or fractured and/or unstable rock open.
well log	A record of the soil and rock encountered in a borehole from the ground surface to the bottom of the borehole. Also known as a lithologic log.
well recovery	The reverse of drawdown. It is the rate at which the water level in a well rises after the pump is turned off.
well screen	A filtering device used in a water well to prevent sediment from entering the well.

Term	Definition
Wellfield Protected Area	Defined as the area (surface and subsurface) surrounding a water well or wellfield which supplies a public water supply system by New Brunswick's Wellfield Protection Program (New Brunswick Regulation 2000-47).
wetland	Land that is transitional between aquatic and terrestrial ecosystems and is covered with water for at least part of the year.
wildlife species	As defined in the federal <i>Species at Risk Act</i> (SARA), "wildlife species" means 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 (a) is native to Canada; or (b) has extended its range into Canada without human intervention and has been present in Canada for at least 50 years.
zenith	The point in the sky directly above the observer.

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**AC CDC Status Rank Definitions (AC CDC 2007)**

- S1 Extremely rare: May be especially vulnerable to extirpation (typically 5 or fewer occurrences or very few remaining individuals).
- S2 Rare: May be vulnerable to extirpation due to rarity or other factors (6 to 20 occurrences or few remaining individuals).
- S3 Uncommon, or found only in a restricted range, even if abundant at some locations (21 to 100 occurrences).
- S4 Usually widespread, fairly common, and apparently secure with many occurrences, but of longer-term concern (e.g., watch list) (100+ occurrences).
- S5 Widespread, abundant, and secure, under present conditions.
- S#S# Numeric range rank: A range between two consecutive ranks for a species/community. Denotes uncertainty about the exact rarity (e.g., S1S2).
- SH Historical: Previously occurred in the province but may have been overlooked during the past 20-70 years. Presence is suspected and will likely be rediscovered; depending on species/community.
- SU Unrankable: Possibly in peril, but status is uncertain - need more information.
- SX Extinct/Extirpated: believed to be extirpated from its former range.
- S? Unranked: not yet ranked.
- SA Accidental: Accidental or casual, infrequent and far outside usual range. Includes species (usually birds or butterflies) recorded once or twice, or only at very great intervals, hundreds or even thousands of miles outside their usual range.
- SE Exotic: An exotic established in the province (e.g., Purple Loosetrife or Coltsfoot); may be native in nearby regions.
- SE# Exotic numeric: An established exotic that has been assigned a rank.
- SP Potential: Potentially occurs, but no occurrences have been reported.
- SR Reported but without persuasive documentation (e.g., misidentified specimen).
- SRF Reported falsely: erroneously reported and the error has persisted in the literature.
- SZ Zero: not of practical conservation concern because there are no definable occurrences, although the species is native and appears regularly. An SZ rank is generally used for long distance migrants that pass through the province occasionally.

**Qualifiers**

- B Breeding (Migratory species)
- N Non-breeding (Migratory species)
- ? Inexact or uncertain (the "?" qualifies the character immediately preceding it in the S-rank)
- C Captive or cultivated

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**Provincial General Status Rank Definitions (NBDNR 2007a)**

At Risk	Species for which a formal assessment has been completed, and determined to be at risk of extirpation or extinction. Includes species either listed as Endangered or Threatened by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), or as Endangered or Regionally Endangered under the New Brunswick <i>Endangered Species Act</i> and accompanying regulations.
May Be At Risk	Species or populations that may be at risk of extirpation or extinction, and are therefore candidates for a detailed risk assessment.
Sensitive	Species which are not believed to be at risk of extirpation or extinction, but which may require special attention or protection to prevent them from becoming at risk.
Secure	Species that are not believed to be At Risk, May Be At Risk, or Sensitive. These were generally species that were widespread and/or abundant.
Status Undetermined	Species for which there is insufficient data, information, or knowledge available to evaluate their status. These are usually species for which there were few documented occurrences in New Brunswick.
Not Assessed	Species known or believed to be present in New Brunswick but which have not yet been assessed.
Exotic	Species that have been introduced to the province as a result of human activity ( <i>i.e.</i> , non-native).
Extirpated	Species that are no longer thought to be present in New Brunswick, although they exist elsewhere.
Extinct	Species that are no longer thought to exist anywhere.
Accidental	Vagrants, or species occurring infrequently and unpredictably, for which New Brunswick is outside of their usual range. For NBDNR general status ranks it was used only for birds and dragonflies.
Occurrence Not Verified	Species which have been reported in New Brunswick, but for which there is no documented evidence, or species which are suspected to occur in New Brunswick because they occur in neighbouring provinces or states.

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## Wetland Indicator Categories (Reed 1988)

Wetland Indicator (Code)	Comment
Obligate (OBL)	Occurs almost always (estimated probability 99%) under natural conditions in wetlands.
Facultative Wetland (FACW)	Usually occurs in wetlands (estimated probability 67%-99%), but occasionally found in non-wetlands.
Facultative (FAC)	Equally likely to occur in wetlands or non-wetlands (estimated probability 34%-66%).
Facultative Upland (FACU)	Usually occurs in non-wetlands (estimated probability 67%-99%), but occasionally found on wetlands (estimated probability 1%-33%).
Obligate Upland (UPL)	Occurs in wetlands in another region, but occurs almost always (estimated probability 99%) under natural conditions in non-wetlands in the regions specified. If a species does not occur in wetlands in any region, it is not on the National List.

Note: A positive (+) or negative (-) sign is used with the Facultative Indicator categories to more specifically define the regional frequency of occurrence in wetlands. The positive sign indicates a frequency toward the higher end of the category (more frequently found in wetlands), and a negative sign indicates a frequency toward the lower end of the category (less frequently found in wetlands).

