IMPACT CHARACTERIZATION

Category	Rank	Score	Description
Direction	Positive	+ / -	Improvement over baseline conditions
	Neutral		No change from baseline conditions
	Negative		Deterioration from baseline conditions
Probability	Low	1	Previous research, knowledge, experience, and / or traditional knowledge indicates that there is a small likelihood that the environmental component has experienced the same impact from activities of similar project types; < 25 % chance of occurring
	Moderate	2	Previous research, knowledge, experience, and / or traditional knowledge indicates that the environmental sub-component may have experienced the same impact from activities of similar project types; 25 % to 75 % chance of occurring
	High	3	Previous research, knowledge, experience, and / or traditional knowledge indicates that the environmental sub-component has experienced the same impact from activities of similar project types; > 75 % chance of occurring
Magnitude	Low	1	Imperceptible change from baseline conditions
	Moderate	2	Observable increase over baseline conditions, but not substantial
	High	3	Substantially above baseline conditions
Extent	Local	1	Confined to the Project boundaries
	Regional	2	Extending beyond the Project boundaries, but confined to the Saint John region
	Provincial	3	Extending beyond the Saint John region
Duration	Short-Term	1	< 25 % of the time during the Project phase
	Medium-Term	2	25 % to 75 % of the time during the Project phase
	Long-Term	3	> 75 % of the time during the Project phase
Frequency	Temporary	1	Occurs for a limited period during the Project phase
	Intermittent / Irregular	2	Occurs more than once, but does not occur all the time during the Project phase
	Permanent / Continuous	3	Occurs throughout the entire Project phase
Reversibility	Reversible	1	Impacts that are not permanent and can be changed back to the original condition
	Irreversible	3	Impacts that are permanent and there is no chance to change back to the original condition

For Negative Impacts

Overall Score	Impact Significance	Symbol
≤ 8	Favourable or little to no impact	
9 to 14	Potential impacts that may require some degree of mitigation	
≥ 15	Not favorable or a major impact	

FUNDY Engineering

For Positive Impacts

Overall Score	Impact Significance	Symbol
≥ 15	Favourable or little to no impact	
10 to 14	Potential impacts that may require some degree of mitigation	
≤ 9	Not favorable or a major impact	

IMPACT ASSESSMENT WORKSHEET

VEC Category: PHYSIO-CHEMICAL

VEC: AIR QUALITY

	SPECIFIC POTENTIAL IMPACT	DIRECTION	PROBABILITY	MAGNITUDE	EXTENT	DURATION	FREQUENCY	REVERSIBILITY	PATHWAYS	MITIGATION	CUMULATIVE	SIGNIFICANCE	SYMBOL
Stage II: Construction	Micro-climate (*i.e.* , temperature and humidity)	Neutral										BLUE	
	CO emissions	-	3	2	1	2	2	1	a, b	A to K	11	YELLOW	
	NO_x emissions	-	3	2	1	2	2	1	a, b	A to K	11	YELLOW	
	SO_2 emissions	-	3	2	1	2	2	1	a, b	A to K	11	YELLOW	
	VOC emissions	-	3	2	1	2	2	1	a, b	A to K	11	YELLOW	
	PM emissions (*e.g.* , exhausts, dusts, *etc.*)	-	3	2	1	2	2	1	a, b, c	A to O	11	YELLOW	
	Airborne bacteria	Neutral										BLUE	
Stage III: Operation and Maintenance	Micro-climate (*i.e.* , temperature and humidity)	-	2	2	1	2	3	1	d	P, Q	11	YELLOW	
	CO Emissions	-	3	2	2	2	3	1	e, f, g	A to K, R	13	YELLOW	
	NO_x Emissions	-	3	2	2	2	3	1	e, f, g	A to K, R	13	YELLOW	
	SO_2 Emissions	-	3	2	2	2	3	1	e, f, g	A to K, R	13	YELLOW	
	VOC Emissions	-	3	2	2	2	3	1	e, f, g	A to K, R	13	YELLOW	
	PM Emissions (*e.g.* , exhausts, dusts, *etc.*)	-	3	2	2	2	3	1	e, f, g	A to N	13	YELLOW	
	Airborne bacteria	-	1	2	2	1	1	1	h, i	S to V	8	GREEN	
Stage V: Mishaps, Errors, and / or Unforeseen Events	Micro-climate (*i.e.* , temperature and humidity)	Neutral										BLUE	
	CO Emissions	-	3	2	1	2	2	1	j	A, B, C, W	11	YELLOW	
	NO_x Emissions	-	3	2	1	2	2	1	j	A, B, C, W	11	YELLOW	
	SO_2 Emissions	-	3	2	1	2	2	1	j	A, B, C, W	11	YELLOW	
	VOC Emissions	-	3	2	1	2	2	1	j	A, B, C, W	11	YELLOW	
	PM Emissions (*e.g.* , exhausts, dusts, *etc.*)	-	3	2	1	2	2	1	j	A, B, C, W	11	YELLOW	
	Airborne bacteria	-	1	2	2	1	1	1	h, i	S to X	8	GREEN	

PATHWAYS

a An increase in personal and construction vehicles could impact the local air quality through the emission of combustion gases.

b Construction equipment is a major source of combustion emissions which potentially will have an effect on local air quality. During the 27 month construction period, it is estimated that about 6 900 tonnes CO_{2eq} of greenhouse gases will be emitted.

c Fugitive dusts may be generated while clearing trees, moving materials, and operating vehicles on dirt and gravel roadways / surfaces.

d The microclimate in the immediate vicinity of the indirect air coolers will be affected by the evaporative cooling process (*i.e.* , air temperatures will be higher and humidity levels may sometimes be higher in a zone around the indirect air coolers). The zone of impact is expected to be small as the volume of air going through the systems is small compared to the size of the local airshed.

e About five full-time permanent employees will be required to operate and maintain the environmental treatment facility (*i.e.* , one operator per shift), which will not perceptibly change the greenhouse gas emissions in the local area.

f Deliveries of product (*e.g.* , polymers, acids, *etc.*) for operating the environmental treatment facility will be minimal, which will not perceptibly change the greenhouse gas emissions in the local area.

g To operate the Project, it is estimated that an additional 4 MW of electricity per day will have to be purchased from NB Power. Purchasing 4 MW of electricity per day from NB Power, travel by the Project operators, and transporting the solids / fibre to the compost facility will result in the emission of about 450 tonnes per year CO2eq of greenhouse gases.

h In New Brunswick, some airborne bacteria disease outbreaks have been linked to industrial direct cooling towers.

i Direct cooling towers can release aerosolized water to the atmosphere and if bacteria are present, the aerosolized water can spread the bacteria over several kilometers.

j In the event of an emergency, equipment with pollutant reduction technologies may not be readily available; however, it will be more important to correct the mishap, error, and / or unforeseen event.

MITIGATION

A A Project-specific environmental protection plan will be developed to provide best-management practices that all Project personnel should follow in order to limit the potential for impacts to air quality to occur.

B All Project personnel should be briefed on the potential impacts that equipment emissions can have on the quality of the local airshed and briefing information should range from describing emissions that are released from equipment during operation to how those emissions can be reduced.

C Mitigation measures developed and included in the Project-specific environmental protection plan should be adhered to in order to adequately address potential impacts.

D Construction, operation, and maintenance equipment should only be operated at optimum loading rates.

E Heavy equipment should be turned off when not in use and / or when practical (*i.e.* , anti-idling policy).

F The number of vehicle kilometers travelled should be kept to a minimum (*i.e.* , there should be no unnecessary operation of equipment in and around the site).

G Heavy equipment should be operated using clean fuels (*i.e.* , ultra-low sulphur diesels), where available and practical.

H Heavy equipment exhaust emission systems should meet the recommended standards.

I Equipment should be maintained according to manufacturer recommended servicing periods.

J Heavy equipment should be refueled using a protocol designed to mitigate environmental risks.

K No solid waste should be burned onsite.

L Construction, operation, and maintenance vehicles should comply with the posted / recommended speed limits and, as appropriate, reduce speed when travelling on surfaces where dusts are generated (*i.e.* , gravel or dirt roadways).

M If the application of water as a dust suppressant is deemed necessary on local gravel roadways (*n.b.* , this is the preferred method of dust suppression), it should be applied using suitable equipment (*e.g.* , a tanker truck equipped with spray bars and methods of controlling water flow, *etc.*).

N Material stock piles (*e.g.* , soil, sand, aggregate, *etc.*) and spoils piles should be sited in locations that minimize the impact from prevailing winds.

O Allowing vegetation to re-establish itself should reduce impacts to air quality, especially those associated with fugitive dusts generated from wind blowing over bare soils.

P The indirect air coolers, which are an indirect cooling technology, should be operated as per the manufacturer's recommendations to ensure they operate efficiently.

Q Planting vegetation or allowing vegetation, including grasses, shrubs, and trees, to regenerate / grow, can moderate the micro-climate changes at the Project site. This could include planting additional trees and bushes along the landscaped berm.

R If possible, recovered fibre and / or dewatered solids should be incinerated in the onsite power boiler to generate electricity and offset that required for purchase from NB Power.

S The indirect air coolers should be registered with the City of Saint John when applying for the Project's building permit.

T The plume abatement systems of the indirect air coolers should be in operation and, where possible, the indirect air coolers should be operated in a dry mode during winter months.

U ASHRAE Standard 188-2018 should be followed.

V Regular monitoring of microorganisms should be undertaken when the indirect air coolers are operational.

W Emergency response and contingency plans should be designed to prevent any major and / or sustained environmental damage during any errors, mishaps, and / or unforeseen events.

X A contingency response plan should be developed to monitor, control, and eliminate bacteria growth.

IMPACT ASSESSMENT WORKSHEET

VEC Category: PHYSIO-CHEMICAL

VEC: SOUND EMISSIONS

	SPECIFIC POTENTIAL IMPACT	DIRECTION	PROBABILITY	MAGNITUDE	EXTENT	DURATION	FREQUENCY	REVERSIBILITY	PATHWAYS	MITIGATION	CUMULATIVE	SIGNIFICANCE	SYMBOL
Stage II: Construction	Sound pressure levels (*i.e.* , intensity)	-	3	2	1	2	3	1	a to e	A to M	12	YELLOW	
	Sound duration	-	3	2	1	2	3	1	f	A to M	12	YELLOW	
	Sound repetition	-	3	2	1	2	3	1	a, b, d, e	A to M	12	YELLOW	
	Ground vibration	-	3	2	1	2	2	1	a, g	A to M	11	YELLOW	
Stage III: Operation and Maintenance	Sound pressure levels (*i.e.* , intensity)	Neutral										BLUE	
	Sound duration	Neutral										BLUE	
	Sound repetition	Neutral										BLUE	
	Ground vibration	Neutral										BLUE	
Stage V: Mishaps, Errors, and / or Unforeseen Events	Sound pressure levels (*i.e.* , intensity)	-	1	2	2	1	1	1	a, h	A to G, N	8	GREEN	
	Sound duration	-	1	2	2	1	1	1	a, h	A to G, N	8	GREEN	
	Sound repetition	-	1	2	2	1	1	1	a, h	A to G, N	8	GREEN	
	Ground vibration	-	1	2	2	1	1	1	a, h	A to G, N	8	GREEN	

PATHWAYS

a The heavy equipment planned for constructing the Project may emit sound at levels less than or greater than those currently emitted during normal Mill operations. That heavy construction equipment may also cause ground vibrations.

b Back-up alarms on heavy equipment used during Project construction will emit sounds around 120 dBA. The use of those alarms will be intermittent and similar to the alarms on loaders, bulldozers, and other heavy equipment currently used at the Mill site for normal operations.

c Although the site is almost devoid of vegetation, removal of remaining vegetation and grading within the Project footprint may affect the attenuation of sounds from the Project site.

d About 150 steel piles will be driven into the subsurface as part of the structural foundations for this Project. Pile driving emits loud and repetitive sounds, which can be annoying for nearby human receptors.

e Pneumatic hammers may be required to break up bedrock during excavation of the Project site for erecting the environmental treatment facility. Instantaneous impulse sounds from pneumatic hammers are generally < 100 dBA. Rock breaking with pneumatic hammers typically emits repetitive sounds that can be annoying to nearby human receptors.

f Sound levels as a result of the Project will be intermittent during construction; regular work hours will normally occur from 7 AM to 7 PM Monday through Friday.

g Ground vibrations are generated by heavy equipment travelling across the ground surface, pile driving causes ground vibration as the hammer forces the steel pile into the subsurface and rock breaking with pneumatic hammers causes ground vibrations as the hammer repeatedly comes into contact with the rock.

h Equipment brought in to mitigate any mishaps, errors, and / or unforeseen events may not have appropriate noise dampening measures or vibration reduction devices, but their operation would be expected to be of short duration.

MITIGATION

A A Project-specific environmental protection plan will be developed to provide best-management practices that all Project personnel should follow in order to limit the potential for impacts to the sound environment to occur.

B All Project personnel should be briefed on the potential impacts the Project may have on sound and sound levels; this could range from explaining that daily inspections and regular maintenance should be done on all heavy equipment to ensure they running as designed and are not unnecessarily contributing to construction noise.

C Mitigation measures developed and included in the Project-specific environmental protection plan should be adhered to in order to adequately address potential impacts.

D Project personnel should ensure that all equipment is equipped with the appropriate manufacturer designed sound level abatement equipment (*i.e.* , mufflers and shrouds).

E The exhaust systems of all Project equipment should be inspected regularly (*i.e.* , daily or weekly) to ensure that sound level abatement equipment is operating properly.

F Equipment should be maintained according to manufacturer's recommended servicing periods.

G The idling of all heavy equipment should be kept to a minimum and excessive engine throttling should be avoided.

H Engineered controls should be implemented to reduce sound levels emitted from equipment (*i.e.* , shrouds and barriers) and at the source to reduce vibrations that can be transferred to the ground surface and propagate outwards (*i.e.* , cushions and dampening pads).

I Loud construction activity (*e.g.* , pile driving and rock breaking, *etc.*) should be scheduled / planned to occur during normal workday / daylight hours (*i.e.* , 7 AM through 7 PM Monday through Saturday), where possible, to limit any potential annoyance to residential receptors. Loud activities should be scheduled to occur concurrently and all loud activity should conform to the City of Saint John's By-Law Respecting the Prevention of Excessive Noise in the City of Saint John [M-22].

J If blasting activities are undertaken then it should be undertaken according to the procedures identified in Schedule A of the Blasting Code Approval Regulation [89-108] under the New Brunswick *Local Governance Act* [S.N.B. 2017, c.18].

K If blasting activities are undertaken, then blasting mats should be used to help attenuate sound levels.

L Nearby residents and businesses should be notified one week prior to the start of pile driving activities.

M The pile driver should be equipped with the appropriate manufacturer designed sound emission abatement equipment and, where practical, shrouds should be used to help minimize sounds emitted from pile driving activity.

N Where possible, hydraulic impact pile drivers should be used instead of conventional diesel drop hammers in order to reduce sounds emitted from pile driving activity.

O A protocol should be developed for receiving, investigating, managing, and tracking residential complaints in a timely manner regarding sound and vibrations emitted from the Project site.

P Where practical and feasible, pneumatic hammers should be used instead of blasting to break up rock.

Q In the event of an emergency, equipment with proper sound abatement technologies may not be readily available. What will be more important at this stage is correcting the error, mishap, and / or unforeseen event to limit any and all permanent environmental impact(s).

IMPACT ASSESSMENT WORKSHEET

VEC Category: PHYSIO-CHEMICAL

VEC: SURFACE WATER QUALITY AND QUANTITY

	SPECIFIC POTENTIAL IMPACTS	DIRECTION	PROBABILITY	MAGNITUDE	EXTENT	DURATION	FREQUENCY	REVERSIBILITY	PATHWAYS	MITIGATION	CUMULATIVE	SIGNIFICANCE	SYMBOL
Stage II: Construction	Surface water physical quality (*i.e.* , turbidity, suspended sediment, and temperature)	-	2	1	1	2	2	1	a, b, c	A to H	9	YELLOW	
	Surface water biological quality (*i.e.* , microbiology)	-	1	1	1	1	1	1	d, e	A, B, C, I	6	GREEN	
	Surface water chemical quality (*i.e.* , general chemistry and trace metals)	-	1	1	1	1	1	1	e, f	A, B, C, I	6	GREEN	
	Surface water quantity (*i.e.* , runoff volume, drainage patterns, and discharges)	-	2	1	1	2	2	1	g, h	A to F, J	9	YELLOW	
	Contamination by hydrocarbons / hazardous chemicals	-	2	1	1	2	2	1	i, j	A, B, C, K to T	9	YELLOW	
Stage III: Operation and Maintenance	Surface water physical quality (*i.e.* , turbidity, suspended sediment, and temperature)	+	3	2	1	3	3	1	k, l	A, B, C, U	13	GREEN	
	Surface water biological quality (*i.e.* , microbiology)	+	2	2	1	3	3	1	k	A, B, C, U	12	GREEN	
	Surface water chemical quality (*i.e.* , general chemistry and trace metals)	+	3	2	1	3	3	1	k to o	A, B, C, U, V	13	GREEN	
	Surface water quantity (*i.e.* , runoff volume, drainage patterns, and discharges)	+	3	3	2	3	3	1	p, q	A, B, C	15	GREEN	
	Contamination by hydrocarbons / hazardous chemicals	+	3	3	2	3	3	1	r	A, B, C, I, L, M, W	15	GREEN	
Stage V: Mishaps, Errors, and / or Unforeseen Events	Surface water physical quality (*i.e.* , turbidity, suspended sediment, and temperature)	-	1	3	1	1	2	1	s	A, B, C, X	9	YELLOW	
	Surface water biological quality (*i.e.* , microbiology)	-	1	3	1	1	2	1	s	A, B, C, X	9	YELLOW	
	Surface water chemical quality (*i.e.* , general chemistry and trace metals)	-	1	3	1	1	2	1	s	A, B, C, X	9	YELLOW	
	Surface water quantity (*i.e.* , runoff volume, drainage patterns, and discharges)	-	1	2	1	1	2	1	s	A, B, C, X	8	GREEN	
	Contamination by hydrocarbons / hazardous chemicals	-	1	3	1	1	2	1	s	A, B, C, X	9	YELLOW	

PATHWAYS

a Construction activities, especially those activities that occur in the presence of exposed soils and / or within 30 m of the Saint John River, have the potential to increase the amount of sediment entering the River, which can increase turbidity / suspended sediment concentrations.

b Clearing and levelling the site may alter overland flow conditions across the Project site (*i.e.* , timing, duration, frequency, and volume) due to changes in slope, removal of vegetation, ditching, *etc.* , may cause water to be quickly dispersed from the site, and conditions may become "flashy".

c Runoff from stockpiles may contain increased sediment loads that are subsequently transported to the Saint John River.

d Vegetation clearing and landscaping will lead to altered surface conditions that may affect the pathogens / bacteria (*i.e.* , total coliforms and *Escherichia coli*) that are introduced to the Saint John River from the Project site.

e Leaks or spills on the ground during use or maintenance of temporary construction personnel sanitary facilities may cause untreated sanitary waste to be introduced to the Saint John River.

f Clearing vegetation may affect the quality of water being introduced to the Saint John River from the Project site, such as nutrient levels, dissolved oxygen levels, temperature, woody debris, and sediment concentrations.

g Exposure of rock and sediment during Project construction may alter the quality of surface water flowing from the Project site.

h Foundations and asphalt roadways / parking areas create impermeable surfaces, which may alter overland flow conditions across the Project site (*i.e.* , timing, duration, frequency, and volume).

i There is a potential that hydrocarbons, through their storage and use onsite, could be introduced to the Saint John River.

j There is a potential that hazardous chemicals, through their storage and use onsite, could be introduced to the Saint John River.

k The environmental treatment facility will yield marked decreases of BOD_5, TSS, and COD_{TOTAL} in the effluent discharged to the Saint John River.

l Extracting brackish water from the Saint John River, using it to cool process water through a non-contact loop within the Mill, and returning it warmer to the Saint John River is expected to have little impact on the thermal regime of Mill Cove (*i.e.* , ~ 0.03 °C). There will be an overall reduction in warm water discharged to the Saint John River because of the overall reduced effluent flow.

m Three-dimensional hydrodynamic plume modelling completed by the Ocean, Coastal, and River Engineering Research Centre of the National Research Council indicate that mixing processes, which are driven by the highly turbulent ambient flow conditions at Reversing Falls, dominate the behaviour and dilution of the effluent from the Main Mill Outfall.

n Surface and near-bed modelling suggest that the effluent plume from the Main Mill Outfall extends further under existing conditions compared to when the environmental treatment facility and water use reduction project is in operation and is largely a result of a decrease in effluent discharge.

o Modelling suggests that effluent concentrations reduce to < 1 % within 300 m and 200 m from the Main Mill Outfall at the surface and near the bed of the Saint John River.

p Once the Project is in operation, raw industrial freshwater drawn from the Spruce Lake Watershed and subsequently discharged to the brackish Saint John River will reduce by up to 50 %, which reduces the volume of water transferred from one watershed to another.

q Reducing the raw industrial freshwater drawn from the Spruce Lake Watershed may yield other benefits, such as increased water levels within the Spruce Lake Watershed during periods of low flow / drought sometimes experienced during the summer. This may yield indirect benefits, such as improved water levels for recreational users of the various waterways within the Watershed.

r Not only will the Project provide additional treatment yielding a higher quality effluent, but a diversion basin will be incorporated to allow operators to divert effluent in the event of an extreme upset event (*i.e.* , the tank will provide for spill diversion and surge protection).

s If a major mishap, error and / or unforeseen event were to occur at the site (*e.g.* , a treatment tank ruptures, a valve fails during the transfer of effluent to the diversion tank during an upset event, *etc.*), there is a possibility that the Saint John River could be impacted.

MITIGATION

A A Project-specific environmental protection plan will be developed to provide best-management practices that all Project personnel should follow in order to limit the potential for impacts to the surface water environment.

B All Project personnel should be briefed on the potential impacts the Project may have on surface water quality and quantity; this could range from explaining that soil erosion may increase due to vegetation removal, to possible contamination by hydrocarbons due to spills.

C Mitigation measures developed for this Project should be adhered to in order to adequately address potential impacts on surface water quantity and quality.

D An erosion and sedimentation control plan, which may form part of the Project-specific environmental protection plan, should be developed and implemented prior to completing any onsite works and may include the installation and management of structures, such as strawbale barriers, rock check dams, silt fences, *etc.* , to limit and control erosion and sedimentation.

E Erosion and sediment control structures should be regularly inspected and maintained according to the Project-specific environmental protection plan to ensure they continue to protect against erosion and sedimentation.

F A surface water drainage management plan, which may form part of the Project-specific environmental protection plan, should be developed and implemented prior to completing any onsite works and may include the use of ditches and settling basins to control surface water flow and to reduce sediment concentrations in water prior to discharge from the site.

G Material stockpiles should be located at least 30 m from the Saint John River.

H Material stockpiles should not be located in areas where there is a concentration of surface water runoff. Perimeter erosion control, such as silt fencing, should be erected around material stockpiles to protect them from surface water runoff.

I During construction activities, all sanitary waste associated with those construction activities should be collected using self-contained portable washroom facilities and those wastes should be handled and disposed of by a licensed waste disposal operator.

J Trenching and ditching may be required at the base of any large rock faces that are created in order to collect and direct any groundwater discharge from the rock faces.

K All heavy equipment used onsite should be in good repair and free of excess oil and grease, the equipment should be equipped with appropriately-sized spill response equipment (*i.e.* , spill kits), all Project personnel will be trained in the use of such equipment, and the equipment should be regularly maintained and inspected to minimize the risk of hydrocarbon-based fluid spills that may pose a threat to the Saint John River.

L Concrete slurry wastes should not be allowed to spill on to the ground and concrete equipment should only be washed up in designated areas where concrete wastes can set, be broken up, and subsequently disposed of appropriately. To do this, temporary concrete washout facilities should be constructed using an impermeable liner and designed and maintained in sufficient quantity and size to contain all liquid and concrete waste generated by onsite washout operations.

M Construction debris, surplus materials, and other solid waste materials should not be disposed of onsite (*n.b.* , this does not apply to excavated soils and rock) and waste receptacles / bins should be made available for containing construction debris and other solid waste materials for temporary storage before offsite disposal at an approved facility.

N Road sweeping units should be equipped with sediment collection hoppers to limit the spread of contaminants that could possibly be entrained in surface water runoff and be subsequently introduced to the Saint John River. Should dust suppression be required, the preferred method of control is by applying water.

O Sand should be used for winter roadway maintenance instead of salt because the majority of sand can be collected through roadway sweeping whereas salt dissolves in water and can be more easily introduced to the Saint John River.

P Vehicle speeds on the site should be limited to that necessary to limit the generation of dusts.

Q Designated refueling locations should be identified within the Project-specific environmental protection plan (*e.g.* , > 30 m from the edge of watercourse, *etc.*) and those locations should be equipped with appropriately stocked and maintained spill response equipment (*i.e.* , spill kits). Refueling should only be done by trained and competent personnel using a means of spill containment, such as completing the operation atop an impermeable liner or using spill collection pans. Any materials used to clean-up spills, contaminated materials, and recovered spilled material that is not suitable for reuse should be stored and disposed of appropriately.

R All potential contaminants and contaminated materials will be stored in a contained area where they cannot become mobilized or access the ground surface (*i.e.* , be placed atop and within spill containment pads).

S Regular maintenance and inspection of equipment onsite should be performed to minimize the risk of spills of oil based fluids that pose a threat to the Saint John River.

T All spills of hazardous materials should be reported immediately to the appropriate Regulator(s).

U Throughout operations, monitoring of effluent quality should be undertaken by IPP personnel and / or accredited third-party laboratories to assess quality of the treated effluent and compliance with regulations.

V Water quality sampling, which is focused on the final effluent discharge from the Main Miil Outfall, should be conducted once the Project is in operation to validate that the effluent data input to the three-dimensional hydrodynamic plume model was appropriate or needs to be adjusted.

W Operators should ensure that if an upset event occurs, effluent is directed to the diversion tank until the effluent can be treated appropriately.

X Emergency response / contingency plans should be designed to prevent any major and / or sustained environmental damage during any errors, mishaps, and / or unforeseen events.

IMPACT ASSESSMENT WORKSHEET

VEC Category: PHYSIO-CHEMICAL

VEC: GROUNDWATER QUALITY AND QUANTITY

	SPECIFIC POTENTIAL IMPACTS	DIRECTION	PROBABILITY	MAGNITUDE	EXTENT	DURATION	FREQUENCY	REVERSIBILITY	PATHWAYS	MITIGATION	CUMULATIVE	SIGNIFICANCE	SYMBOL
Stage II: Construction	Groundwater quality	-	1	1	1	2	3	3	a	A to F	11	YELLOW	
	Groundwater quantity	-	1	1	1	2	3	3	a	A to F	11	YELLOW	
	Hydrocarbon / hazardous chemical contamination	-	2	2	1	1	2	1	a, b, c	A, B, C, G to S	9	YELLOW	
	Groundwater recharge areas	-	2	1	1	2	2	1	d	A, C	9	YELLOW	
	Groundwater discharge areas	Neutral									0	BLUE	
Stage III: Operation and Maintenance	Groundwater quality	-	1	1	1	1	1	1	e	A, B, C	6	GREEN	
	Groundwater quantity	-	1	1	1	1	1	1	e	A, B, C	6	GREEN	
	Hydrocarbon / hazardous chemical contamination	-	1	2	1	1	2	1	a, b, c, f	A, B, C, G, K to N, Q to S	8	GREEN	
	Groundwater recharge areas	Neutral										BLUE	
	Groundwater discharge areas	Neutral										BLUE	
Stage V: Mishaps, Errors, and / or Unforeseen Events	Groundwater quality	-	1	2	1	3	3	3	g	A, B, C, G	13	YELLOW	
	Groundwater quantity	Neutral										BLUE	
	Hydrocarbon / hazardous chemical contamination	-	1	2	1	3	3	3	g	A, B, C, G, K to N, Q to S	13	YELLOW	
	Groundwater recharge areas	Neutral										BLUE	
	Groundwater discharge areas	Neutral										BLUE	

PATHWAYS

a Surrounding properties served by individual onsite groundwater wells for potable water are located upgradient. Therefore, no impact is anticipated.

b Spills can occur during refueling operations, while operating and maintaining heavy equipment, or during the storage of such products. The potential impacts from a hydrocarbon / hazardous chemical spill would be dictated by the size, duration and location of the spill.

c Some properties in the surrounding area are served by individual onsite groundwater wells for potable water. If a hydrocarbon or hazardous chemical spill migrates to the groundwater system, the potential impacts could be long lasting because groundwater systems are complex and often difficult to remediate once contaminated.

d Further developing the lands and installing impermeable surfaces, such as concrete and asphalt, will reduce the amount of greenspace available for groundwater recharge.

e Once the Project is operational there will be little additional impact to the groundwater environment.

f During operation and maintenance, there will be minimal use of hydrocarbon / hazardous chemicals on the site; however, there is a potential for spills, including effluent, to occur.

g If the mishap, error, and / or unforeseen event is significant, there is a potential for the damage to be severe and / or irreversible.

MITIGATION

A A Project-specific environmental protection plan will be developed to provide best-management practices that all Project personnel should follow in order to limit the potential for impacts to the groundwater environment to occur.

B All Project personnel should be briefed on the potential impacts that the Project could have on ground water quality.

C Mitigation measures developed for this Project should be adhered to in order to adequately address potential impacts on groundwater quantity and quality.

D An erosion and sedimentation control plan, which may form part of the Project-specific environmental protection plan, will be developed and implemented prior to completing any onsite works and may include the installation and management of structures, such as strawbale barriers, rock check dams, silt fences, *etc.* , to limit and control erosion and sedimentation.

E Erosion and sediment control structures will be regularly inspected and maintained according to the Project-specific environmental protection plan to ensure they continue to protect against erosion and sedimentation.

F A surface water drainage management plan, which may form part of the Project-specific environmental protection plan, will be developed and implemented prior to completing any onsite works and may include the use of ditches and settling basins to control surface water flow and to reduce sediment concentrations in water prior to discharge from the site.

G Where possible and feasible, rock should be broken using pneumatic hammers instead of explosives. Due to the amount of rock to be removed, it is likely that explosives will be required.

H Pre-blast surveys should be conducted on residences as per the City of Saint John requirements; a distance in all directions from the basting area of $(32\ m \cdot kg^{-1})^{1/2}$.

I The blasting area is a zone extending 50 m in all directions from the location where explosives are handled, prepared, or used, or in which unexploded charges exist.

J If a structure within the pre-blast survey area is connected to an individual onsite groundwater well, the pre-blast survey should include interviewing residents about groundwater quantity and quality. Water samples should be collected for analysis of microbiology, general chemistry, and trace metals.

K If blasting activities are undertaken then a blast design and monitoring program that specifies when and where blasting will occur, the sizes of charges, *etc.* should be undertaken and then the procedures identified in Schedule A of the Blasting Code Approval Regulation [89-108] under the New Brunswick *Local Governance Act* [S.N.B. 2017, c.18] should be followed.

L All heavy equipment used onsite should be in good repair and free of excess oil and grease, the equipment should be equipped with appropriately-sized spill response equipment (*i.e.* , spill kits) and all Project personnel will be trained in the use of such equipment, and the equipment should be regularly maintained and inspected to minimize the risk of hydrocarbon-based fluid spills that may pose a threat to groundwater systems.

M A protocol for managing residential complaints regarding groundwater quality and quantity issues should be developed and complaints made by residents regarding their groundwater well quantity and quality should be followed up on and any remediation deemed necessary, such as providing a short-term or long-term potable water supply for any impacted residential wells.

N Concrete slurry wastes should not be allowed to spill on to the ground and concrete equipment should only be washed up in designated areas where concrete wastes can set, be broken up, and subsequently disposed of appropriately. To do this, temporary concrete washout facilities should be constructed using an impermeable liner and designed and maintained in sufficient quantity and size to contain all liquid and concrete waste generated by onsite washout operations.

O Construction debris, surplus materials, and other solid waste materials should not be disposed of onsite (*n.b.* , this does not apply to excavated soils and rock) and waste receptacles / bins should be made available for containing construction debris and other solid waste materials for temporary storage before offsite disposal at an approved facility.

P Material stockpiles should not be located in areas where there is a concentration of surface water runoff and perimeter erosion control, such as silt fencing, should be erected around material stockpiles to protect them from surface water runoff.

Q Road sweeping units should be equipped with sediment collection hoppers to limit the spread of contaminants that could possibly be entrained in surface water runoff and be subsequently introduced to groundwater systems. Should dust suppression be required, the preferred method of control is by applying water.

R Sand should be used for winter roadway maintenance instead of salt because the majority of sand can be collected through roadway sweeping whereas salt dissolves in water and can be more easily introduced to groundwater systems.

S Vehicle speeds on the site should be limited to that necessary to limit the generation of dusts.

T Connection to alternative water supplies, such as a municipal distribution system, is most often required when an aquifer is contaminated.

U During construction activities, all sanitary waste associated with those construction activities should be collected using self-contained portable washroom facilities and those wastes should be handled and disposed of by a licensed waste disposal operator.

V Designated refueling locations should be identified within the Project-specific environmental protection plan (*e.g.* , > 30 m from the edge of watercourse, *etc.*) and those locations should be equipped with appropriately stocked and maintained spill response equipment (*i.e.* , spill kits). Refueling should only be done by trained and competent personnel using a means of spill containment, such as completing the operation atop an impermeable liner or using spill collection pans. Any materials used to clean-up spills, contaminated materials, and recovered spilled material that is not suitable for reuse should be stored and disposed of appropriately.

W All potential contaminants and contaminated materials will be stored in a contained area where they cannot become mobilized or access the ground surface (*i.e.* , be placed atop and within spill containment pads).

X Regular maintenance and inspection of equipment onsite should be performed to minimize the risk of spills of oil based fluids that pose a threat to groundwater systems.

Y All spills of hazardous materials should be reported immediately to the appropriate Regulator(s).

Z Trenching and ditching may be required at the base of any large rock faces that are created in order to collect and direct any groundwater discharge from the rock faces.

IMPACT ASSESSMENT WORKSHEET

VEC Category: BIOLOGICAL ENVIRONMENT
VEC: TERRESTRIAL FLORA AND FAUNA

	SPECIFIC POTENTIAL IMPACTS	DIRECTION	PROBABILITY	MAGNITUDE	EXTENT	DURATION	FREQUENCY	REVERSIBILITY	PATHWAYS	MITIGATION	CUMULATIVE	SIGNIFICANCE	SYMBOL
Stage II: Construction	Species of concern (*i.e., SARA* and COSEWIC listed)	-	1	1	1	3	3	3	a to d	A to E	12	YELLOW	
	Flora and habitat	-	2	1	1	3	3	1	a, b, e to h	A, B, C, F	11	YELLOW	
	Flora associations and biodiversity	Neutral										BLUE	
	Fauna (*i.e.* , birds, animals, and mammals) and habitat (*i.e.* , direct and indirect)	Neutral										BLUE	
	Fauna and habitat fragmentation	Neutral										BLUE	
	Fauna migration patterns (*i.e.* , migratory birds), nesting, and food chains	-	1	1	1	3	3	1	i, j, k	A to U	10	YELLOW	
Stage III: Operation and Maintenance	Species of concern (*i.e., SARA* and COSEWIC listed)	-	1	1	1	3	2	3	a to d	A to E	11	YELLOW	
	Flora and habitat	-	1	1	1	1	2	1	a, b, g	A, B, C	7	GREEN	
	Flora associations and biodiversity	Neutral										BLUE	
	Fauna (*i.e.* , birds, animals, and mammals) and habitat (*i.e.* , direct and indirect)	Neutral										BLUE	
	Fauna and habitat fragmentation	Neutral										BLUE	
	Fauna migration patterns (*i.e.* , migratory birds), nesting, and food chains	-	1	1	1	1	2	1	l, m	A to E, H, J to U	7	GREEN	
Stage V: Mishaps, Errors, and / or Unforeseen Events	Species of concern (*i.e., SARA* and COSEWIC listed)	-	1	1	1	3	2	3	a to d, n	A to E, V	11	YELLOW	
	Flora and habitat	-	1	1	1	3	3	1	a, b, g, n	A, B, C, V	10	YELLOW	
	Flora associations and biodiversity	Neutral										BLUE	
	Fauna (*i.e.* , birds, animals, and mammals) and habitat (*i.e.* , direct and indirect)	Neutral										BLUE	
	Fauna and habitat fragmentation	Neutral										BLUE	
	Fauna migration patterns (*i.e.* , migratory birds), nesting, and food chains	-	1	2	1	3	2	3	n	A to E, H, J to V	12	YELLOW	

PATHWAYS

a The Project site is almost devoid of any terrestrial flora and fauna (*n.b.* , transients / vagrants / migrants can make their way through the site).

b No *Species At Risk Act* listed species (*i.e.* , provincial and federal) or Committe On the Status of Endangered Wildlife In Canada listed species were observed during the various field assessments completed at the Project site.; however, Atlantic Canada Conservation Data CentreC records suggest that some transient / vagrant / migrant species of special conservation concern or rare species do exist within a 5 km radius of the site, such as the barn swallow, Drummond's rockcress, or the monarch butterfly. Therefore, there is a possibility that they could pass through the site on occasion.

c Sound and light emitted from heavy equipment and / or construction / operation activity may scare away / displace wildlife from the Project site and / or adjacent areas.

d The New Brunswick Department of Natural Resources and Energy Development lists the wood turtle, bald eagle, and peregrine falcon as location-sensitive species for the area, but the various assessments completed at the Project site did not yield their presence. Regardless, there is a possibility that they could exist or pass through the site on occasion.

e Loss of vegetation could result in the loss of a species of special concern.

f Topsoil removal could result in the loss of the native plant seed bank, nutrients, organic matter, and microorganisms that are essential for plant growth.

g Dusts emitted from the Project site (*e.g.* , vehicle traffic on roadways, wind erosion of aggregate stockpiles, *etc.*) may land on vegetation and affect primary production (*i.e.* , by impacting photosynthesis, respiration, and transpiration and allowing the penetration of phytotoxic gaseous pollutants).

h Increased overland flow due to vegetation clearing and grubbing may reduce the amount of water available, captured, and stored for vegetation.

i Ground spills of hydrocarbons during refueling operations (*i.e.* , gasoline and diesel) may contaminate food and water sources for wildlife.

j If refuse from Project personnel is not stored properly, it may be an attraction for wildlife, which could result in unwanted interactions between humans and wildlife.

k During vegetation clearing, injury or death of invertebrates, amphibians, reptiles, birds, and / or small mammals may occur.

l If refuse from Project personnel is not stored properly, it may be an attraction for wildlife, which could result in unwanted interactions between humans and wildlife.

m Once the Project is in operation, there should be little impact to natural wildlife migration, nesting, and food chains.

n Hydrocarbon (*e.g.* , lubricating oils, gasoline, diesel, *etc.*) and chemical leaks (*e.g.* , polymers, acids, *etc.*) from the various processing equipment may spill on to the ground and could contaminate food and water sources for wildlife.

o Depending on the mishap, error, and / or unforeseen event, there is a possibility the impact could be long-lasting and could extend offsite to affect a species of special conservation concern.

MITIGATION

A A Project-specific environmental protection plan will be developed to provide best-management practices that all Project personnel should follow in order to limit the potential for impacts to terrestrial flora and fauna to occur.

B All Project personnel should be briefed on the potential impacts the Project may have on terrestrial flora and fauna.

C Mitigation measures developed and included in the Project-specific environmental protection plan should be adhered to in order to adequately address potential impacts.

D A perimeter fence should be erected at the boundary of the Project site to keep the majority of land-based wildlife from accessing the site.

E Extremely loud, intrusive, or otherwise potentially harassing activities (*e.g.* , pile driving, *etc.*) should be avoided or limited during periods of the year when wildlife are under severe environmental and physiological stress, such as the spring breeding season for birds.

F Any sensitive flora should be salvaged and relocated from the Project site.

G Any vegetation clearing activity should be undertaken outside of the migration and breeding season for migratory birds (*i.e.* , 5 April through 31 August in the Greater Saint John region).

H If species listed under the federal *Species At Risk Act* [S.C. 2002, c. 29] are observed on the Project site, then their sightings will be reported to Environment and Climate Change Canada's Canadian Wildlife Service branch and if a species listed under the provincial *Species At Risk Act* [R.S.N.B. 2012, c 6] are observed on the Project site, then their sightings will be reported to the New Brunswick Department of Natural Resources and Energy Development.

I Equipment should arrive at the Project site in a clean condition free of invasive and noxious weeds.

J All Project personnel should report all unusual wildlife encounters to the Project supervisor during construction and to the Environmental Manager during operation.

K Project personnel should properly dispose of food scraps and garbage in the appropriate onsite receptacles, such as "predator-proof" garbage bins provided by the contractor or proponent.

L Waste stored onsite should be stowed in an appropriate manner and be transported to an appropriate disposal facility (*e.g.* , Crane Mountain Landfill, *etc.*) on a regular basis.

M Project personnel should be advised, prior to working on the Project site, to not feed or harass nuisance wildlife (*e.g.* , varmint, pigeons, sea gulls, rodents, *etc.*).

N Heavy equipment and other vehicles used on the Project site should yield the right-of-way to wildlife.

O No attempt should be made to chase, catch, divert, follow, or otherwise harass any wildlife by vehicle or on foot.

P If injured or deceased wildlife are encountered, then personnel with the New Brunswick Department of Natural Resources and Energy Development and Canadian Wildlife Service should be contacted to determine the appropriate course of action.

Q If deceased animals are encountered, they should be removed and disposed of as soon as possible in consultation with representatives of the New Brunswick Department of Natural Resources and Energy Development and Canadian Wildlife Service.

R No Project personnel should affect wildlife populations by either hunting or trapping and firearms should be strictly prohibited on the Project site.

S If an active nest, den, *etc.* is encountered, a no-disturbance buffer zone of 30 m+ should be established around the area (*n.b.* , flagging tape should not be used to mark the feature as it increases the chance of predation and representatives with the Canadian Wildlife Service should be contacted to determine the appropriate buffer size) until a qualified biologist determines if the buffer zone shall remain, if the size should be increased, or if the buffer zone can be eliminated (*i.e.* , the animal has abandoned the feature).

T No Project personnel should deposit or permit to be deposited oil, oil wastes, or any other substance harmful to wildlife in any waters or any area frequented by wildlife.

U An oil spill prevention and response plan should be developed as part of the Project-specific environmental protection plan.

V Emergency response and contingency plans should be designed to prevent any sustained environmental damage during any mishaps, errors, and / or unforeseen events.

IMPACT ASSESSMENT WORKSHEET

VEC Category: BIOLOGICAL ENVIRONMENT

VEC: AQUATIC FLORA AND FAUNA

	SPECIFIC POTENTIAL IMPACTS	DIRECTION	PROBABILITY	MAGNITUDE	EXTENT	DURATION	FREQUENCY	REVERSIBILITY	PATHWAYS	MITIGATION	CUMULATIVE	SIGNIFICANCE	SYMBOL
Stage II: Construction	Species of concern (*i.e., SARA* and COSEWIC listed)	-	1	1	1	1	1	3	a to d	A to L	8	GREEN	
	Flora and habitat	-	1	1	1	1	1	1	b to e	A to L	6	GREEN	
	Flora associations and biodiversity	Neutral										BLUE	
	Fauna (*e.g.* , fishes, mammals, *etc.*) and habitat (*i.e.* , direct and indirect)	-	1	1	1	1	1	1	b to e	A to L	6	GREEN	
	Fauna and habitat fragmentation	Neutral										BLUE	
	Fauna migration patterns (*i.e.* , anadromous fishes) and food chains	Neutral										BLUE	
	Fish impingement and entrainment	Neutral										BLUE	
Stage III: Operation and Maintenance	Species of concern (*i.e., SARA* and COSEWIC listed)	-	1	1	1	1	1	3	f, g	A to I	8	GREEN	
	Flora and habitat	-	1	1	1	1	1	1	f, g	A to I	6	GREEN	
	Flora associations and biodiversity	Neutral										BLUE	
	Fauna (*e.g.* , fishes, mammals, *etc.*) and habitat (*i.e.* , direct and indirect)	-	1	1	1	1	1	1	f, g	A to I	6	GREEN	
	Fauna and habitat fragmentation	Neutral										BLUE	
	Fauna migration patterns (*i.e.* , anadromous fishes) and food chains	Neutral										BLUE	
	Fish impingement and entrainment	-	1	2	2	1	3	1	h, i	M to R	10	YELLOW	
Stage V: Mishaps, Errors, and / or Unforeseen Events	Species of concern (*i.e., SARA* and COSEWIC listed)	-	1	1	1	3	2	3	j	A to I, S	11	YELLOW	
	Flora and habitat	-	1	1	1	3	3	1	j	A to I, S	10	YELLOW	
	Flora associations and biodiversity	Neutral										BLUE	
	Fauna (*e.g.* , fishes, mammals, *etc.*) and habitat (*i.e.* , direct and indirect)	-	1	1	1	1	1	1	j	A to I, S	6	GREEN	
	Fauna and habitat fragmentation	Neutral										BLUE	
	Fauna migration patterns (*i.e.* , anadromous fishes) and food chains	Neutral										BLUE	
	Fish impingement and entrainment	-	1	2	2	1	3	1	j	M to S	10	YELLOW	

PATHWAYS

a Installation of the cooling water intake could affect known species of conservation concern that frequent the estuarial waters of the Saint John River in the vicinity of the Mill (*i.e.* , American eel and striped bass).

b Increased erosion potential and exposed sediments due to vegetation clearing may be entrained in overland flow and transported to the Saint John River via engineered surface water runoff collection systems (*i.e.* , ditches, trenches, and ponds) where entrained sediments (*i.e.* , elevated levels of total suspended sediments) may affect the water quality.

c Ground spills of hydrocarbons during refueling operations (*i.e.* , gasoline and diesel) may allow hydrocarbons to be introduced to surface water systems and cause contamination with lethal or sub-lethal results.

d Shock waves and vibrations from rock breaking activities and pile driving activities could have lethal (*i.e.* , damage to the swim bladder of fishes or rupture of internal organs) or sub-lethal (*i.e* , behavioural) effects on aquatic fauna (i.e., avoidance of preferred habitat, changes to migration, reduced feeding, and / or reduced schooling that could increase predation).

e Installation of the cooling water intake could affect aquatic flora and fauna and / or their habitat within Mill Cove.

f The long-term operation and maintenance of the Project is expected to have little to no impact on any aquatic flora and fauna.

g Spills from the environmental treatment facility during operation and maintenance activities may allow untreated effluent to be introduced to surface water systems and cause contamination with lethal or sub-lethal results to aquatic flora and / or fauna.

h Intake of water for the cooling water system could impinge or entrain known species of conservation concern that frequent the estuarial waters of the Saint John River in the vicinity of the Mill (*i.e.* , American eel and striped bass).

i Intake of water for the cooling water system could impinge or entrain aquatic flora and fauna within Mill Cove.

j If there is a mishap, error, and / or unforeseen event it may have an impact on aquatic flora and fauna.

MITIGATION

A A Project-specific environmental protection plan will be developed to provide best-management practices that all Project personnel should follow in order to limit the potential for impacts to aquatic flora and fauna to occur.

B All Project personnel should be briefed on the potential impacts the Project may have on aquatic flora and fauna.

C Mitigation measures developed and included in the Project-specific environmental protection plan should be adhered to in order to adequately address potential impacts.

D An erosion and sedimentation control plan, which may form part of the Project-specific environmental protection plan, should be developed and implemented prior to completing any onsite works and may include the installation and management of structures, such as strawbale barriers, rock check dams, silt fences *etc.* , to limit and control erosion and sedimentation.

E Erosion and sediment control structures should be regularly inspected and maintained according to the Project-specific environmental protection plan to ensure they continue to protect against erosion and sedimentation.

F A surface water drainage management plan, which may form part of the Project-specific environmental protection plan, should be developed and implemented prior to completing any onsite works and may include the use of ditches and settling basins to control surface water flow and to reduce sediment concentrations in water prior to discharge from the site.

G Refueling and maintenance of equipment should occur in designated areas, on level terrain, a minimum of 30 m from any watercourse and / or wetland.

H Appropriately stocked and maintained spill response equipment (*i.e.* , spill kits) should be located at all fuel storage and fueling / lubricating / servicing locations.

I Heavy equipment working within or in 30 m of watercourses and / or wetlands should use eco-friendly biodegradable and non-toxic hydraulic fluids as opposed to petroleum-based hydraulic fluids.

J When pile driving within Mill Cove, contractors should position their vessels and water-borne equipment associated with pile driving in a manner that will prevent damage to fish habitat and the work should be done during periods of reduced sensitivity, such as between 1 June and 30 September.

K Vibratory hammers should be used whenever possible to drive piles underwater instead of high-energy drop hammers.

L Underwater peak pressures associated with pile driving should not exceed 30 kPa, which are levels likely to adversely affect fish. The use of netting and silt curtains should be used to prevent fish from entering the work area where underwater pile driving shock waves might exceed 30 kPa and the use of a bubble curtain should be used to attenuate shock waves radiating out from the pile where underwater shock waves might exceed 30 kPa.

M The design of the high capacity, low-velocity passive intake screens will be included in the *Fisheries Act* authorization application.

N The high-capacity, low-velocity passive intake screens should be located in areas and depths of water with low concentrations of fish throughout the year.

O The high-capacity, low-velocity passive intake screens should be located away from natural and anthropogenic structures that may attract fish that are migrating, spawning, or in rearing habitat.

P The high-capacity, low-velocity passive intake screens should be oriented parallel to the Saint John River's flow.

Q The high-capacity, low-velocity passive intake screens should be located a minimum of 300 mm above the bed of the Saint John River to prevent entrainment of sediment and benthic organisms.

R The high-capacity, low-velocity passive intake screens should be cleaned regularly and maintained in good condition to protect against fish impingement and entrainment.

S Emergency response and contingency plans should be designed to prevent any sustained environmental damage during any errors, mishaps, and / or unforeseen events.

IMPACT ASSESSMENT WORKSHEET

VEC Category: SOCIO-ECONOMIC

VEC: LABOUR AND ECONOMY

	SPECIFIC POTENTIAL IMPACT	DIRECTION	PROBABILITY	MAGNITUDE	EXTENT	DURATION	FREQUENCY	REVERSIBILITY	PATHWAYS	MITIGATION	CUMULATIVE	SIGNIFICANCE	SYMBOL
Stage II: Construction	Employment / workforce retention	+	3	3	2	3	3	1	a and b	A, B	15	GREEN	
	Skills training	+	3	2	2	3	3	1	c and d	C	14	GREEN	
	Local spending	+	3	3	2	3	3	1	e	D	15	GREEN	
	Livelihood	+	2	2	2	2	3	1	f	D	12	GREEN	
Stage III: Operation and Maintenance	Employment / workforce retention	+	3	2	2	3	3	1	g, h		14	GREEN	
	Skills training	+	2	2	2	3	3	1	i		13	GREEN	
	Local spending	+	3	3	3	3	3	1	g, j, k	D	16	GREEN	
	Livelihood	+	3	1	2	3	3	1	g	D	13	GREEN	
Stage V: Mishaps, Errors, and / or Unforeseen Events	Employment / workforce retention	-	1	1	2	2	1	1	l	E	8	GREEN	
	Skills training	-	1	1	2	2	1	1	l	E	8	GREEN	
	Local spending	+	2	2	2	2	1	1	m, n	E	10	YELLOW	
	Livelihood	-	1	1	2	2	1	1	l	E	8	GREEN	

PATHWAYS

a There will be an increase in employment for the local and regional construction labour market.

b The COVID-19 global pandemic has impacted the local, regional, provincial, national, and international economies. In Canada, unemployment rates have been high in transportation, service, and manufacturing industries as a consequence of the virus mitigation measures, such as social-distancing. As vaccination rates increase, the spread of the virus is being stemmed through safe practices, and socio-economic support programs are begining to wind down, there is a need for employment opportunities. Unemployment rates in the Saint John region are still high indicating the need for employment opportunities and this Project will help generate and promote economic development.

c Many of the Project construction jobs require skilled labour, such as surveyors, engineers, carpenters, heavy equipment operators, electricians, pipefitters, boilermakers,*etc.*

d Should other large-scale industrial projects be announced for the region, demand for skilled labour during peak construction periods may be too much for the local labour market to bear, which could put upward pressure on wages.

e The Project has an anticipated capital expenditure of $150 million, which should result in considerable spending in the local and regional economy for many goods and services (e.g., construction materials, construction equipment, restaurants and hospitality, income taxes, property taxes, etc.).

f This Project may allow some individuals in the local and regional area to maintain their livelihood as construction workers instead of having to look outside the region during periods of limited work availability. It is not expected that this Project will specifically lead people to launch a career in skilled trades.

g About five full-time permanent employees will be required to operate and maintain the environmental treatment facility generating wages and salaries that will be spent locally.

h Shutdowns will require additional skilled labour to maintain the specialized Project equipment.

i Operators will require routine training to ensure their skills are maintained.

j Goods and services, such as polymers and nutrients, will be required to operate and maintain the Project.

k Annual property taxes will be paid to the City of Saint John and provincial and federal taxes will also be generated annually.

l Errors, mishaps, and / or unforeseen events could result in a short-term or long-term stoppage in work.

m Depending on the error, mishap, and / or unforeseen event, third-party employment may be generated (*e.g.* , cleanup of a spill, etc.).

n Depending on the error, mishap, and / or unforeseen event, there may be a need for new or upgraded infrastructure.

MITIGATION

A Data indicate that there is ample room to grow employment in the local labour market (*i.e.* , unemployment rates remain at or above 8.5 %).

B Considering local unemployment rates, but subject to skills, availability, costs, and quality, hiring from the local workforce should be a priority for contractors to the maximum extent possible before going outside the region.

C Local and regional construction associations and labour unions may have to coordinate the quantity of available workers with the contractors should other large-scale industrial projects be announced for the region.

D The proponent should develop employment and procurement programs that promote opportunities for local workers and local businesses.

E Mitigation measures developed for this Project should be adhered to in order to adequately address any potential impacts in order to minimize the amount of lost work time.

IMPACT ASSESSMENT WORKSHEET

VEC Category: SOCIO-ECONOMIC

VEC: ARCHAEOLOGICAL AND CULTURAL RESOURCES

	SPECIFIC POTENTIAL IMPACTS	DIRECTION	PROBABILITY	MAGNITUDE	EXTENT	DURATION	FREQUENCY	REVERSIBILITY	PATHWAYS	MITIGATION	CUMULATIVE	SIGNIFICANCE	SYMBOL
Stage II: Construction	Damage / destruction of archaeological sites and landmarks	-	1	2	1	1	1	3	a to j	A to G	9	YELLOW	
	Damage / destruction of cultural sites and landmarks	-	1	2	1	1	1	3	a to j	A to G	9	YELLOW	
	Conflict with ancestral remains	-	1	2	1	1	1	3	a to j	A to H	9	YELLOW	
	Conflict with cultural domains	-	1	2	1	1	1	3	a to j	A to H	9	YELLOW	
Stage III: Operation and Maintenance	Damage / destruction of archaeological sites and landmarks	-	1	1	1	1	1	3	a, d, i. k, l	E, F, G	8	GREEN	
	Damage / destruction of cultural sites and landmarks	-	1	1	1	1	1	3	a, d, i, k, l	E, F, G	8	GREEN	
	Conflict with ancestral remains	-	1	1	1	1	1	3	a, d, i, k, l	E to H	8	GREEN	
	Conflict with cultural domains	-	1	1	1	1	1	3	a, d, i, k, l	E to H	8	GREEN	
Stage V: Mishaps, Errors, and / or Unforeseen Events	Damage / destruction of archaeological sites and landmarks	-	1	2	1	1	1	3	a, d, g, i, l	A, B	9	YELLOW	
	Damage / destruction of cultural sites and landmarks	-	1	2	1	1	1	3	a, d, g, i, l	A, B	9	YELLOW	
	Conflict with ancestral remains	-	1	2	1	1	1	3	a, d, g, i, l	A, B, H	9	YELLOW	
	Conflict with cultural domains	-	1	2	1	1	1	3	a, d, g, i, l	A, B, H	9	YELLOW	

PATHWAYS

a There are no known archaeological and / or cultural resources within the Project footprint; however, accidental disruption / destruction of unknown buried resources is possible should an unknown resource be encountered.

b Vegetation removal and ground disturbing exercises during clearing, grubbing, and site development can damage or destroy archaeological and / or cultural resources.

c Vandalism of the archaeological and cultural resources could occur after site preparation has begun.

d Vibrations from heavy equipment could cause damage to buried archaeological and / or cultural resources.

e Fracturing of rock through the use of pneumatic hammers can increase oxygen ingress into undisturbed layers, which could cause increased decay or corrosion of buried resources.

f Shock waves and vibrations could cause damage to buried resources.

g Ground spills of hydrocarbons during refueling operations (*i.e.* , gasoline and diesel) may allow hydrocarbons to infiltrate the ground and impact buried resources.

h Dewatering activities during footing, foundation, and pipeline construction may cause sediment layers to dry out, which could stimulate biodegradation of preserved resources.

i Hydrocarbon (*e.g.* , lubricating oils, gasoline, diesel, *etc.*) and chemical leaks (*e.g.* , polymers, acids, *etc.*) from the various treatment equipment may spill on to the ground and could contaminate surface waters and / or groundwater that eventually come in to contact with bruied resources.

j Dust suppressants for controlling roadway dusts could come into contact with buried resources and result in damage.

k Salt for winter roadway maintenance could come into contact with buried resources and result in damage.

l Leaks or spills from effluent pipelines or effluent tanks could come into contact with buried resources and result in damage.

MITIGATION

A An archaeological resources protection plan, which may form part of the Project-specific environmental protection plan, should be developed and implemented prior to completing any onsite Project works.

B IPP will engage the Wolastoqey Nation in New Brunswick to train contractors and employees on their *Accidental Discovery of Archaeological Resources Protocol* .

C If deemed necessary, an archaeological testing regime should be conducted to determine the presence or absence of buried cultural resources within the footprint of the environmental treatment facility.

D Site security measures, in the form of a perimeter fence, should be erected prior to Project construction in order to limit entry to the site in order to protect any potential archaeological and cultural resources that may exist.

E Any archaeological or cultural resource discovered should be reported immediately to the appropriate Regulator(s) as per the New Brunswick *Heritage Conservation Act* [S.N.B. 2010, c. H-4.05].

F The Wolastoqey Nation in New Brunswick should be contacted immediately at 506.459.6341 if any archaeological or cultural resource is discovered as outlined in the *Accidental Discovery of Archaeological Resources Protocol* .

G If archaeological or cultural resources require removal to facilitate Project development, then excavation, recording, and reporting should occur for those features as per the New Brunswick *Heritage Conservation Act* [S.N.B. 2010, c. H-4.05].

H Should any human remains be discovered, the Saint John Police Force will be contacted to determine if the remains are an archaeological or cultural resources whereupon they will contact the appropriate authorities to have a licensed Resource Archaeologist examine the remains.

IMPACT ASSESSMENT WORKSHEET

VEC Category: SOCIO-ECONOMIC

VEC: TRANSPORTATION NETWORK

	SPECIFIC POTENTIAL IMPACT	DIRECTION	PROBABILITY	MAGNITUDE	EXTENT	DURATION	FREQUENCY	REVERSIBILITY	PATHWAYS	MITIGATION	CUMULATIVE	SIGNIFICANCE	SYMBOL
Stage II: Construction	Traffic hazards	-	1	2	1	1	1	1	a, b, c	A to F	7	GREEN	
	Damage to infrastructure	-	1	1	2	1	1	1	d and e	F, G	7	GREEN	
	Conflict with existing traffic	-	1	2	2	1	1	1	f, g, h	F, H	8	GREEN	
Stage III: Operation and Maintenance	Traffic hazards	-	1	1	1	1	2	1	h, i, j	A to C, E, F	7	GREEN	
	Damage to infrastructure	-	1	1	1	1	2	1	d, e, k	F, G	7	GREEN	
	Conflict with existing traffic	-	1	1	1	1	2	1	f	F	7	GREEN	
Stage V: Mishaps, Errors, and / or Unforeseen Events	Traffic hazards	-	1	1	1	1	1	1	l	A to C, E, F	6	GREEN	
	Damage to infrastructure	-	1	1	1	1	1	1	d, e, k	F, G	6	GREEN	
	Conflict with existing traffic	-	1	1	1	1	1	1	l	F, H	6	GREEN	

PATHWAYS

a There will be an increase in heavy equipment traffic along local roadways to deliver construction equipment and supplies.

b There will be an increase in personal vehicles entering and exiting the Mill site as it is projected that up to 130 contractor employees could be onsite during peak Project construction.

c There may be an increase in traffic accidents surrounding the Mill site on public roads as a result of increased traffic associated with the Project.

d There may be additional damage to road surfaces *(e.g.,* potholes, rutting, cracking, *etc.*) and associated infrastructure (*e.g.* , bridges, interchanges, *etc.*) due to wide and / or heavy loads or traffic volumes.

e Existing infrastructure is designed to standards capable of supporting the movement of heavy equipment to and from the Project site (*e.g.* , truck routes are designed for specific load limits, turning radii, *etc.*).

f There may be an increase in traffic volumes along local roadways.

g There may be a change in traffic volumes and patterns along local roadways (*i.e.* , peak traffic times may shift and / or be extended).

h There may be traffic delays or disruptions to accommodate wide loads (*i.e.* , due to escorts or loads that are too wide for single lane transportation).

i There will be a slight increase in the number of trucks going to and from the Mill site to deliver consumables required for the Project (*e.g.* , polymers, nutrients, *etc.*) and potentially for the transportation offsite of reclaimed fibre and solids for environmentally-responsible disposal.

j About five full-time permanent employees will be required to operate and maintain the environmental treatment facility (i.e., one operator per shift), which will not perceptibly change the existing traffic patterns.

k Property tax revenue increases, which may result from this Project, would increase the amount of money available to the municipal and provincial governments for maintaining and improving public infrastructure.

l In the event of a major mishap, error, and / or unforeseen event, there may be a temporary increase in traffic until the impacts are mitigated. It would be expected that any increase in traffic would be short-lived.

MITIGATION

A All Project vehicles used on local roadways should be maintained according to provincial regulations with respect to licensing, insurance, and safety inspection.

B No vehicles associated with Project work (*i.e.* , personnel vehicles, construction vehicles, heavy equipment, *etc.*) should be allowed to park along roadways; parking should only occur in safe and identified locations.

C All Project personnel operating vehicles permitted on local roadways should obey the posted speed limits and other posted signs, such as weight restrictions.

D Carpooling of workers, while adhering to social distancing measures while under COVID-19 restrictions, should be encouraged during Project construction in order to reduce traffic volumes.

E Road traffic control measures (*e.g.* , use of flaggers, escort crews, *etc.*) should be used when transporting over-sized loads on public roadways using trained traffic personnel in accordance with the New Brunswick Department of Transportation and Infrastructure standards and practices.

F Any additional mitigation measures developed for this Project should be adhered to in order to adequately address any potential impacts.

G Heavy equipment haulers and shippers should adhere to weight restrictions and load limits as designated by the New Brunswick Department of Transportation and Infrastructure.

H To avoid traffic congestion, movement of heavy equipment and materials to and from the Mill site during Project construction should be scheduled outside of normal peak traffic hours (*i.e.* , 7:30 AM to 8:30 AM and 4:30 PM to 5:30 PM Monday through Friday).

IMPACT ASSESSMENT WORKSHEET

VEC Category: SOCIO-ECONOMIC

VEC: AESTHETICS

	SPECIFIC POTENTIAL IMPACT	DIRECTION	PROBABILITY	MAGNITUDE	EXTENT	DURATION	FREQUENCY	REVERSIBILITY	PATHWAYS	MITIGATION	CUMULATIVE	SIGNIFICANCE	SYMBOL
Stage II: Construction	Visual pollution (*i.e.* , industrial infrastructure and water vapour plumes)	-	3	2	1	1	2	1	a, b	A	10	YELLOW	
	Light pollution (*i.e.* , light trespass)	-	2	1	1	1	1	1	c, d	B	7	GREEN	
	Local compatibility	-	3	1	1	2	2	1	b, e	A, B, C	10	YELLOW	
	Odour	-	2	1	1	2	2	1	f	D, E	9	YELLOW	
Stage III: Operation and Maintenance	Visual pollution (*i.e.* , industrial infrastructure and water vapour plumes)	-	1	1	1	1	1	1	g, h	F, G, H	6	GREEN	
	Light pollution (*i.e.* , light trespass)	-	1	1	1	1	1	1	i	I	6	GREEN	
	Local compatibility	Neutral										BLUE	
	Odour	-	1	1	1	1	1	1	j, k	D, E, J, K	6	GREEN	
Stage V: Mishaps, Errors, and / or Unforeseen Events	Visual pollution (*i.e.* , industrial infrastructure and water vapour plumes)	-	1	2	1	2	2	1	l	L	9	YELLOW	
	Light pollution (*i.e.* , light trespass)	-	1	2	1	2	2	1	l	L	9	YELLOW	
	Local compatibility	-	1	2	1	2	2	1	l	L	9	YELLOW	
	Odour	-	1	2	1	2	2	1	l	L	9	YELLOW	

PATHWAYS

a Tall heavy lift cranes (*i.e.* , up to 40 m tall) may obstruct skyline views as the structures may be visible for many kilometers.

b Heavy equipment will be working in an area of the Mill site that has experienced little activity in recent years.

c Temporary construction lighting used during low-light and nighttime conditions may spill beyond the work areas and into adjacent commercial and residential areas.

d Construction activities at the site will conform with other developments undertaken at the Mill.

e Heavy industrial activity, including construction projects, have occurred at this site for at least 185 years. Residents living in adjacent residential neighbourhoods would be accustomed to this type of activity.

f Any odours generated through Project construction (*e.g.* , exhausts, *etc.*) should dissipate before reaching nearby residential receptors.

g The site topography has the advantage of concealing much of the environmental treatment facility from view; the hillside will be excavated to create benches for the Project infrastructure whereby only the top few meters will be visible from the nearest residential receptors along Milford Road.

h Depending on meteorological conditions (*e.g.* , temperature, wind direction and speed, humidity, *etc.*), water vapour plumes may be visible from the exhaust fans of the indirect air coolers and the exterior process tanks.

i Permanent Project lighting will be similar in quantity to the existing; however, the lighting will be of a newer technology that limits potential offsite impacts.

j Odour prevention during operation was a criterion used for selecting the environmental treatment facility (*e.g.* , indirect effluent cooling, subsurface air blowers, continuous solids removal, enclosing dissolved air flotation units in the process building, *etc.*); when the system is operating normally there should be little to no odour associated with the environmental treatment facility.

k There will be a limited amount of heavy equipment onsite required to complete maintenance on the environmental treatment facility during shutdowns.

l In the event of a major mishap, error, and / or unforeseen event, there may be short-lived impacts to aesthetics (*e.g.* , the erection of several tall cranes, the use of additional temporary lighting, the release of an unpleasant odour, *etc.*).

MITIGATION

A Heavy lift cranes should be lowered when no longer required.

B Construction will normally be confined to Monday through Friday from 7 AM to 7 PM to limit the use of work site lighting; however, there may be instances when construction work is required during the evening or overnight and / or on weekends.

C Construction lighting required for personnel safety during low-light conditions and evening hours should be confined to areas actively being worked, be downshielded, and extinguished when not in use.

D Heavy equipment and vehicles should be turned off when not in use and / or when practical in order to limit the amount of exhaust and associated nuisance odours that have the potential to migrate offsite.

E Heavy equipment exhaust systems should meet the recommended standards.

F The plume abatement systems of the indirect air coolers should be in operation to limit the size and scale of visible water vapour plumes.

G The indirect air coolers should be operated in a dry mode during winter months to eliminate visible water vapour plumes.

H There is an option to construct a several meter high and wide berm in three sections along a largely unoccupied stretch of Milford Road to help mask the view of the infrastructure associated with the environmental treatment facility.

I Permanent Project lighting will be limited to that necessary for Project personnel to perform their work safely and the lighting should be designed to minimize light trespass, which may include tilting or aiming luminaires away from neighbouring spaces, using light-emitting diode lights that provide targeted lighting levels, and controlling lights to turn off or dim when not necessary.

J Odour abatement systems (*i.e.* , air scrubbers in the process building), or systems that help mitigate the generation of odours (*e.g.* , subsurface air blowers, solids removal system, *etc.*), should be maintained on appropriate schedules to limit the amount of odours generated.

K IPP's protocol for handling odour complaints should be reviewed to ensure that measures exist for receiving, investigating, managing, and tracking odour complaints from the environmental treatment facility in a timely manner.

L Mitigation measures developed for this Project should be adhered to in order to adequately address any potential impacts.

IMPACT ASSESSMENT WORKSHEET

VEC Category: SOCIO-ECONOMIC

VEC: RECREATION AND TOURISM

	SPECIFIC POTENTIAL IMPACTS	DIRECTION	PROBABILITY	MAGNITUDE	EXTENT	DURATION	FREQUENCY	REVERSIBILITY	PATHWAYS	MITIGATION	CUMULATIVE	SIGNIFICANCE	SYMBOL
Stage II: Construction	Site visitation and access	Neutral							a			BLUE	
	Visitor numbers	Neutral							a			BLUE	
	Economy and income generation	+	3	2	2	2	3	1	b		13	GREEN	
	Scenic character	-	3	2	1	1	1	1	c to f	A, B	9	YELLOW	
Stage III: Operation and Maintenance	Site visitation and access	Neutral							a			BLUE	
	Visitor numbers	Neutral							a			BLUE	
	Economy and income generation	+	3	1	2	1	3	1	b		11	GREEN	
	Scenic character	-	3	2	1	3	3	1	g, h	C	13	YELLOW	
Stage V: Mishaps, Errors, and / or Unforeseen Events	Site visitation and access	-	1	3	2	1	1	1	i	D, E	9	YELLOW	
	Visitor numbers	-	1	3	2	1	1	1	i	D, E	9	YELLOW	
	Economy and income generation	-	1	3	2	1	1	1	i	D, E	9	YELLOW	
	Scenic character	-	1	3	2	1	1	1	i	D, E	9	YELLOW	

PATHWAYS

a The Reversing Falls Mill site is a private industrial site and there is no public access.

b Increasing local employment may translate to increased spending on local extra-curricular activities like recreation and tourism.

c Loss of some of the limited natural features remaining on the Mill site may subjectively affect the overall aesthetics of the area.

d Operation of heavy equipment can emit loud sounds (*e.g.* , general operation, back up alarms, *etc.*), which can be an annoyance to users of nearby recreation and tourist sites.

e Additional tall structures at the Mill during construction (*i.e.* , cranes) may affect the scenic nature of the area, but people are still going to visit the top local attractions such as the renowned Reversing Falls at Fallsview Park on the opposite side of the Saint John River from the Mill.

f Highly impulsive sounds (*e.g.* , pneumatic rock hammering, *etc.*) coupled with ground vibrations may be an annoyance and may affect the peacefulness of nearby recreation and tourism spaces.

g Once Project construction is complete, the new buildings and infrastructure will blend into the industrial landscape.

h Additional light emitted from the environmental treatment facility may increase light levels during the nighttime, which could affect low-light activities such as star-gazing.

i Depending on the type / degree of event, there may be a possibility that access to one of the immediately adjacent tourist sites (*e.g.* , Fallsview Park, Wolastoq Park, *etc.*) could be restricted for a short period of time, which could reduce the number of visitors.

MITIGATION

A Use of tall cranes during construction should be scheduled to complete the necessary hoisting activities within a coordinated window to limit their operational (*i.e.* , erection) period.

B Construction work that has the potential to emit highly impulsive sounds (*e.g.* , pneumatic rock hammering, *etc.*) should be coordinated to be completed jointly and within the shortest period possible.

C Lighting should be designed to minimize the amount of light that leaves the facility; down facing and shielded lighting should be employed to the maximum extent practicable.

D Mitigation measures should be developed for this Project to minimize any potential impacts to recreation and tourism.

E Emergency response and contingency plans should be designed to prevent any major and / or sustained environmental damage.

IMPACT ASSESSMENT WORKSHEET

VEC Category: SOCIO-ECONOMIC

VEC: HEALTH AND SAFETY

	SPECIFIC POTENTIAL IMPACT	DIRECTION	PROBABILITY	MAGNITUDE	EXTENT	DURATION	FREQUENCY	REVERSIBILITY	PATHWAYS	MITIGATION	CUMULATIVE	SIGNIFICANCE	SYMBOL
Stage II: Construction	Occupational and personal hazards	-	2	2	1	1	2	1	a to d	A to J	9	YELLOW	
	Airshed contamination	-	2	2	2	2	2	1	e	A to D, K	11	YELLOW	
	Water contamination	-	1	1	1	2	1	1	f	F, J, L	7	GREEN	
	Solid waste and sanitary waste generation	-	1	1	1	1	1	1	g	B	6	GREEN	
	Traffic hazards	-	1	2	1	1	1	1	h	B, M	7	GREEN	
Stage III: Operation and Maintenance	Occupational and personal hazards	-	1	1	1	1	1	1	a to d, i	A to J	6	GREEN	
	Airshed contamination	-	1	1	1	1	1	1	j	B, K	6	GREEN	
	Water contamination	-	1	2	2	2	1	1	f, k	F, J, L, N	9	YELLOW	
	Solid waste and sanitary waste generation	-	1	1	1	1	1	1	g	B	6	GREEN	
	Traffic hazards	-	1	1	1	1	2	1	h, i	B, M	7	GREEN	
Stage V: Mishaps, Errors, and / or Unforeseen Events	Occupational and personal hazards	-	1	2	1	1	2	1	a to d, l	A to J, O	8	GREEN	
	Airshed contamination	-	1	2	2	2	2	1	l	B, K, O	10	YELLOW	
	Water contamination	-	1	2	2	2	2	1	f, k	F, J, L, O	10	YELLOW	
	Solid waste and sanitary waste generation	-	1	1	1	1	1	1	g	B, O	6	GREEN	
	Traffic hazards	-	1	1	1	1	1	1	h, i	B, M, O	6	GREEN	

PATHWAYS

a The implementation of health and safety protocols is a fundamental component to the operation of the Mill and during maintenance upgrades and shutdowns. If there is not currently a developed health and safety protocol for a specific task, it is expected that one will be developed to protect the health and safety of Project personnel.

b Workers may be involved in activities that will include the potential exposure to dust, loud sounds, hazardous chemicals (*e.g.* , hydrocarbons, paints, solvents, polymers, acids, *etc.*), excavations, working at heights, working in confined spaces, working around tanks filled with effluent, diving during construction of the cooling water intake line and potentially during operations, *etc.*

c Accidents could cause personal injury (*e.g.* , if back up alarms are not used, if inattentiveness occurs during operation, *etc.*) and infrastructure damage.

d The general public could be harmed if adequate precautions are not taken to keep them from accessing the Project site during construction and keeping them away from hazards (*e.g.* , operation of heavy equipment, *etc.*) and during operations and protecting them from dangerous situations (*e.g.* , steep banks, tanks filled with effluent, *etc.*).

e As noted in the Air Quality Valued Environmental Component Impact Assessment table, there is expected to be a moderate, though localized, impact on air quality during Project construction primarily as a result of the increased operation of heavy equipment emitting pollutants to the local airshed.

f Spills of hazardous chemicals (*e.g.* , hydrocarbons, paints, solvents, *etc.*) could cause contamination.

g Sanitary and solid wastes generated during Project construction and operation and maintenance activities should be handled appropriately (*e.g.* , sanitary waste should be collected and disposed of using a licensed wastewater hauler, approved construction debris and operation and maintenance waste will be sent to the Crane Mountain Landfill, collected fibre and solids will be sent to the onsite biomass boiler or a compost facility, *etc.*).

h As noted in the Transportation Network Valued Environmental Component Impact Assessment table, there is expected to be an increase in potential traffic hazards throughout all Project stages, but it will be the greatest during construction.

i There will still be risks during operation and maintenance, but they will be considerably lower than construction and there will be a limited compliment of employees assigned to the environmental treatment facility (*i.e.* , ~ five).

j As noted in the Air Quality Valued Environmental Component Impact Assessment table, there is expected to be minimal impact on air quality during Project operations considering the mitigation measures that have been designed in to the Project (*e.g.* , closed piping within the indirect air coolers, installing the dissolved air flotation tanks within an enclosed building, *etc.*).

k A release of effluent outside of the parameters noted in the Pulp and Paper Effluent Regulations could have an impact on the receiving environment (*i.e.* , Saint John River) and waters downstream (*i.e.* , Saint John Harbour, and Bay of Fundy).

l All mishaps, errors, and / or unforeseen events by their nature pose potential impacts to health and safety of Project personnel.

MITIGATION

A All Project personnel should make occupational health and safety and public health and safety a primary objective in all their activities related to the Project.

B All Project personnel should be instructed on what personal protective equipment is required to be worn, what guards should be in place, what measures should be taken to protect other workers and the general public, and how rules and regulations with respect to the environment, roadways, and equipment should be strictly adhered to, with no exceptions.

C All Project personnel should be adequately trained to do their job so that they conform to the occupational health and safety standards and public health and safety standards.

D The Proponent should ensure that occupational health and safety standards and general public health and safety standards are part of the Project working environment and should ensure that Project personnel have appropriate personal protective equipment available to wear for the tasks they are performing.

E All hazardous materials (*e.g.* , hydrocarbons, paints, solvents, polymers, acids, *etc.*) should be labelled appropriately and stored and used as per the manufacturer's recommendations.

F Project personnel working with hazardous chemicals should be trained appropriately for their safe use, handling, and storage, they should be provided with the appropriate personal protective equipment for their safe use, handling, and storage, and they should have access to the Material Safety Data Sheet information.

G Project personnel working at heights and / or within confined spaces and / or conducting diving activities should be trained appropriately for working under those conditions and should be provided with the appropriate personal protective equipment.

H Project personnel should immediately report any serious accident that results in lost time or property damage and those reports should be submitted promptly by the Proponent to the appropriate regulatory authority.

I A perimeter security fence should be erected to protect against non-authorized persons circulating within the Project site and appropriate signage should be erected on the fence (*e.g.* , no trespassing, steep banks, high-voltage, *etc.*) at regular intervals along the security fences to warn the general public of potential risks from entering the Project site.

J All specialized work (*e.g.* , electrical work, operating heavy equipment, refuelling heavy equipment, diving operations, *etc.*) should only be completed by trained, competent, and / or certified / licensed professionals.

K Mitigation measures noted in the assessment of the Air Quality Valued Environmental Component should be implemented and followed.

L Mitigation measures noted in the assessment of the Surface Water Quantity and Quality Valued Environmental Component and the Groundwater Quantity and Quality Environmental Component should be implemented and followed.

M Mitigation measures noted in the assessment of the Transportation Network Valued Environmental Component should be implemented and followed.

N In the event of a spill and / or malfunction of equipment, the effluent should be directed to the diversion tank where it can be held and treated in an environmentally safe manner.

O Emergency response and contingency plans should be designed to prevent any major and / or sustained environmental damage.