

APPENDIX 'E'

ENVIRONMENTAL EFFECTS ANALYSIS SUMMARY

APPENDIX 'E' – ENVIRONMENTAL EFFECTS ANALYSIS SUMMARY

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Environmental Effects Analysis Summary – Construction Phase

Potential Effect	Spatial Area	Frequency and Duration	Reversible	Magnitude	Nature of Impact	Mitigation/Comments	Significance
CONSTRUCTION							
Air Quality							
Construction vehicle/machinery emissions, including increase in greenhouse gases	Footprint and local area	Once/Short term	Yes	Low	Negative	<ul style="list-style-type: none"> Construction vehicles and machinery will be kept in good working order and Idling of construction vehicles will be kept to a minimum as feasible 	Not Significant
Increase in airborne particulates (road dust) during road construction	Footprint and local area	Once/Short term, sporadic	Yes	Low to moderate	Negative	<ul style="list-style-type: none"> Work areas will be dampened with water or approved chemicals to minimize airborne dust, as required Trucks hauling excavated material will utilize tarpaulin covers during transport 	Not Significant
Hydrology - Surface and Subsurface							
Effects to surface water quality due to sedimentation (runoff and culvert construction), road dust/particulates and potential contamination from land clearing, road construction machinery / vehicles	Local Area	Once/Short term	Yes	Low to moderate	Negative	<ul style="list-style-type: none"> Measures outlined in the EPP¹, DFO guidance and provincial stream crossing guidelines will be followed to minimize sedimentation and potential contamination of surface waters 	Not Significant

¹ EPP – Environmental Protection Plan

Environmental Effects Analysis Summary – Construction Phase

Potential Effect	Spatial Area	Frequency and Duration	Reversible	Magnitude	Nature of Impact	Mitigation/Comments	Significance
Net increase in surface water runoff due to impermeable road surface as construction progresses	Local Area	Continuous/Intermediate term	Yes	Low to moderate	Negative	<ul style="list-style-type: none"> Sufficient drainage ditching / land contouring to contain and direct surface water runoff will be part of the Project design 	Not Significant
Effects to groundwater quality due to hydrocarbon / other contaminants from road construction machinery / vehicles and site cleanup activities	Footprint Area	Once/Short term	Yes	Low to moderate	Negative	<ul style="list-style-type: none"> Regulatory compliance, contract specifications and the EPP will be followed to prevent and limit soil contamination 	Not Significant
Changes to shallow groundwater flow and potential for seepage due to roadbed construction	Local Area	Continuous/Intermediate term	Yes	Low	Negative	<ul style="list-style-type: none"> Project design will minimize impacts/changes to the groundwater regime 	Not Significant
Terrain and Soils							
Soil compaction, surface soil removal, erosion and rutting due to site access, land clearing, road construction and traffic	Footprint Area	Continuous/Intermediate term for roads	Yes	High	Negative	<ul style="list-style-type: none"> Soil will be retained to rehabilitate and revegetate disturbed areas not required for operations 	Not Significant
Sub-surface soil disturbance due to roadbed construction	Footprint Area	Intermediate term	Yes	Low	Negative	<ul style="list-style-type: none"> Subsurface soil disturbance will be minimized to the extent feasible and will be used as backfill as required 	Not Significant
Terrestrial Environment							
Loss of vegetative communities on Project footprint	Footprint	Short to intermediate term	Yes	High	Negative	<ul style="list-style-type: none"> Top soil will be retained to rehabilitate and revegetate disturbed areas not required for operation 	Not Significant

Environmental Effects Analysis Summary – Construction Phase

Potential Effect	Spatial Area	Frequency and Duration	Reversible	Magnitude	Nature of Impact	Mitigation/Comments	Significance
Reduced use of local area by wildlife due to noise and human presence	Footprint and Local Area	Short to intermediate term	Yes	Low to moderate	Negative	<ul style="list-style-type: none"> Clearing activities will take place outside the most sensitive breeding and brood-rearing season for birds and other wildlife (i.e., May, June and July) 	Not Significant
Aquatic Environment							
Increase in TSS ² concentration due to runoff during storm events, due to disturbed soils during construction activities	Footprint and Local Area	Sporadic (influenced by precipitation)	Yes	Low to Moderate	Negative	<ul style="list-style-type: none"> Provincial and federal guidelines for fish habitat protection for road construction and stream crossings will be followed in accordance with the EPP and DFO guidance conditions 	Not Significant
Potential disruption of fish habitat from culvert extension construction	Footprint and Local Area	Once	Yes	High (for fish habitat); Moderate (for fish)	Negative	<ul style="list-style-type: none"> Culvert will be constructed in accordance provincial stream crossing guidelines, the EPP and DFO guidance conditions 	Not Significant
Potential loss of aquatic vegetation due to culvert construction	Footprint and Local Area	Once	Yes	High	Negative	<ul style="list-style-type: none"> Culvert will be constructed in accordance provincial stream crossing guidelines, the EPP and DFO guidance conditions 	Not Significant

² TSS – Total Suspended Solids

Environmental Effects Analysis Summary – Construction Phase

Potential Effect	Spatial Area	Frequency and Duration	Reversible	Magnitude	Nature of Impact	Mitigation/Comments	Significance
Potential for the introduction of hazardous materials (e.g. fuel / oil) into nearby waterbodies	Footprint and Local Area	Sporadic	Yes	Low to Moderate	Negative	<ul style="list-style-type: none"> Machinery / vehicle maintenance and refuelling will occur at a sufficient distance to minimize potential for hazardous substance introduction to adjacent waterbodies as per provincial and federal guidance 	Not Significant
Noise / Vibration							
Increased noise and vibrations from construction machinery and vehicles	Local Area	Sporadic and short term	Yes	High	Negative	<ul style="list-style-type: none"> Timing of construction activities will comply with the City of Winnipeg Neighbourhood Liveability By-law No. 1/2008 to minimize disturbance to local residents 	Not Significant
Public Health / Well Being / Aesthetics							
Increased safety hazard associated with construction zone	Footprint and adjacent areas	Short term	Yes	Low to high	Negative	<ul style="list-style-type: none"> Appropriate construction zone speed limit and warning signage will be posted in accordance with construction specification and the EPP 	Not Significant
Construction of the Project will temporarily decrease aesthetics of the area	Footprint and adjacent areas	Short term	Yes	High	Negative	<ul style="list-style-type: none"> Materials handling and storage will be in accordance with construction specification and the EPP 	Not Significant

Environmental Effects Analysis Summary – Construction Phase

Potential Effect	Spatial Area	Frequency and Duration	Reversible	Magnitude	Nature of Impact	Mitigation/Comments	Significance
Heritage Resources							
Disturbance / destruction of undiscovered heritage resources	Footprint	Short term	Yes (heritage resources can be preserved)	Moderate	Negative	<ul style="list-style-type: none"> If heritage material is located during construction, activities should be conducted in accordance with the EPP 	Not Significant
ACCIDENTS AND MALFUNCTIONS							
Soils, Surface and Groundwater Impacts							
Effects to soils, surface and groundwater quality due to leaks and spills of oil and gas from construction and maintenance machinery	Footprint Area	Sporadic/ Short term	Yes	High but very low probability	Negative	<ul style="list-style-type: none"> Hazardous material handling, storage and spill response should be conducted in accordance with provincial and federal legislation and the EPP 	Not Significant
Aquatic Environment							
Potential for contamination of aquatic habitat due to accidental spill or leak of hydrocarbons or other fluids during construction or operation and maintenance as a result of vehicle collision accidents	Footprint and Local Area	Sporadic in the Intermediate term	Yes	Low	Negative	<ul style="list-style-type: none"> Hazardous materials will be handled in accordance with applicable provincial and federal guidelines; All fuel storage and equipment servicing areas will be located a minimum of 100 m away from any waterbody and will have materials on-site to contain and recover fuel spills; The EPP for the Project outlines procedures to attend to, report and clean-up accidental spills 	Not Significant