



# Chapter 10 – Summary of Project Effects

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## 10. SUMMARY OF PROJECT EFFECTS

After a systematic review and assessment of all project interactions with valued ecological, social and cultural components of the Minago Project environment, it has been determined that the project will have no significant adverse environmental effects. The design and project development process includes measures for ongoing assessment and action to ensure Victory Nickel Inc. (VNI) can meet their commitments to environmental protection. Adaptive management, including monitoring and refinement of mitigation measures, in consultation with the Manitoba Government (MBG), the Communities of Interest (COI) and other stakeholders, as appropriate will ensure project success.

### 10.1 Key Findings

#### 10.1.1 Aquatic Habitat

The proposed TWRMF and its appurtenances differ from the current TWRMF in a way that there will be no discharge to Oakley Creek. The effluent from the Polishing Pond will be discharged to the Minago River. The current design called for 30% and 70% to Oakley Creek and Minago River during the summer month respectively. While effluent from the Polishing Pond will be discharged to the Minago River.

Project effects on in stream flows will be limited to:

- Increased flow in Oakley Creek during construction and mine operations due to effluent discharge from the Polishing Pond (PP).
- Increased flow in the Minago River during construction and mine operations due to effluent discharge from the Polishing Pond (PP).

Summaries of project effects on the receiving environment and proposed mitigation measures are given in Tables 10.1-1, 10.1-2, 10.1-3 and 10.1-4 for the construction, operations, decommissioning and closure phases, respectively.

Overall, no significant adverse effects on in stream fish habitat are expected.

Metals and nitrate levels will be elevated above baseline conditions for short sections of the Oakley Creek and the Minago River between the effluent discharge points and upstream of the mixing zones. Baseline metals levels for aluminum, iron and cadmium in the Minago River at times exceed *CCME Guidelines for the Protection of Aquatic Life*. Site-specific water quality criteria for the protection of aquatic life will be established at the baseline monitoring sites (OCW1 for the Oakley Creek and MRW1 for the Minago River), in consultation with the MBG. Accordingly, no toxic effects on aquatic biota or fisheries are expected.

Environmental effects monitoring (EEM) results will be used to track trends in metals levels in waters and stream sediments. Increasing trends will trigger additional monitoring of fish and plant tissue to assess the risk of bioaccumulation and to guide adaptive management (improved treatment), if necessary. No significant effects on water quality or fish in the Minago River and Oakley Creek are expected.

**Table 10.1-1 Summary of Project Effects on the Receiving Environment (VECC's) and Proposed Mitigation Measures and Monitoring Programs during Construction**

TABLE 10.1 SUMMARY OF PROJECT EFFECTS ON THE RECEIVING ENVIRONMENT (VECCs) AND PROPOSED MITIGATION MEASURES AND MONIROTING PROGRAMS DURING CONSTRUCTION				
VECCs	EFFECTS	COMMENTS	MITIGATION MEASURES	MONITORING PROGRAMS
<b>1. CLIMATE</b>				
Localized increases in snowpack depth, water content and melt rate	Not significant		There will be no significant effects of the project on climate parameters; therefore, no mitigation measures are proposed	Automated climate data collection with periodic downloads as required
Localized changes in wind speed and direction, precipitation deposition, and solar radiation due to site clearing and project structures	Not significant			Manual data collection on monthly or periodic basis for snowpack depth and snow water equivalent
<b>2. AIR QUALITY</b>				
Fugitive dust emissions from ground disturbance, heavy construction equipment, and vehicles with potential effects on human health, vegetation and wildlife	Not significant		<p>Apply dust suppressant (such as water spray to unconsolidated working surfaces and development rock and ore stockpiles) to minimize fugitive dust during periods of heavy activity and/or dry periods</p> <p>Minimize activities that generate large quantities of fugitive dust when windy</p> <p>Reseed disturbed areas and topsoil stockpiles to prevent fugitive dust from wind erosion</p>	There are no monitoring programs identified for project effects or cumulative effects.
Fugitive dust and emissions of CACs from mining equipment and auxiliary site vehicles	Not significant		<p>Recover waste heat from the generators to heat the process building, assay lab and camp</p> <p>Use low sulphur fuels including diesel fuel with a sulphur content, 15 ppm and propane with negligible sulphur content</p> <p>Meet applicable criteria with respect to emission quality on all combustion-related equipment and provide maintenance according to manufactures specifications</p>	
Particulates and VOC emissions from site clearing and burning of woody debris	Not significant		<p>Apply best practices regarding clearing</p> <p>Do not use prohibited materials (waste oil, tires) as accelerants</p>	

Table 10.1-1 Summary of Project Effects on the Receiving Environment (VECC's) and Proposed Mitigation Measures and Monitoring Programs during Construction (cont'd)

VECCs	EFFECTS	COMMENTS	MITIGATION MEASURES	MONITORING PROGRAMS
<b>3. TERRAIN, SURFICIAL DEPOSITS AND GEOLOGY</b>				
Modification of surficial materials and reduction in soil capability	Not significant		<p>Pre-site inspections will allow avoidance, where applicable, of sensitive, of sensitive soil types</p> <p>Site clearing will be timed to minimize soil compaction. To the extent possible, top soil will be removed and stored</p> <p>Where possible, borrow pit locations will be selected based on sites that can be easily reclaimed</p> <p>Where possible, disturbed sites will be promptly revegetated (progressive reclamation) with appropriate plant materials and fertilization</p> <p>During the decommissioning and closure phases, overburden (surficial materials) will be re-sloped and laid down to avoid the creation of impermeable material</p> <p>Site clearing will be minimized during all project phases</p>	<p>Seasonal terrain stability assessments will determine site specific stability issues</p> <p>Seasonal erosion assessments will determine site specific stability issues</p> <p>Soil sampling will determine if soils have been contaminated or not</p>

**Table 10.1-1 Summary of Project Effects on the Receiving Environment (VECC's) and Proposed Mitigation Measures and Monitoring Programs during Construction (cont'd)**

VECCs	EFFECTS	COMMENTS	MITIGATION MEASURES	MONITORING PROGRAMS
Increased soil erosion	Not significant		<p>Sites will be assessed for soil erosion potential and measures to minimize the effects of any such erosion will be employed</p> <p>Installation of the site water management system (Section 2.14) during construction and operation throughout the project will minimize drainage and erosion from disturbed areas</p> <p>Implementation of the Erosion and Sedimentation Control Plan (Section 9: Environmental Management Plan) throughout the life of the project will reduce soil erosion</p> <p>Immediate revegetation with appropriate plant materials and fertilization on all disturbed sites (except roads and mining sites) will minimize this effect</p> <p>Where possible, disturbed slopes will be re-sloped to a 2H:1V ratio</p> <p>Sites will be cleaned up and progressively revegetated with appropriate plant species when no longer in use</p>	
Terrain stability concerns	Not significant		<p>Most disturbances will be restricted to times when soils are dry</p> <p>Where possible, disturbed slopes will be re-sloped to a 2H:1V ratio</p> <p>Where possible, subsurface and surface drainage will be controlled to prevent slope instability. This includes re-establishing surface drainage as soon as possible</p> <p>Pre-site inspections will allow avoidance, where applicable, of unstable or potentially unstable sites</p>	



**Table 10.1-1 Summary of Project Effects on the Receiving Environment (VECC's) and Proposed Mitigation Measures and Monitoring Programs during Construction (cont'd)**

VECCs	EFFECTS	COMMENTS	MITIGATION MEASURES	MONITORING PROGRAMS
Potential contamination of soils	Not significant		Develop appropriate contingency and response measures  Develop appropriate transport, storage and handling procedures to control spills  Track the volume of hydrocarbons on site (used versus supplied)  Ensure that the oil transfer systems are contained appropriately  Develop monitoring programs that will identify, if any, contaminated soils	
<b>4. SURFACE WATER HYDROLOGY</b>				
Increased flows in the Minago River due to Polishing Pond Discharges	Not significant		An adaptative monitoring program will be implemented to monitor the effects of the final effluent on the receiving watercourses  Implement the Erosion and Sediment Control Plan (Section 9.2: Environmental Protection Plan) and Site Water Management Plan (Section 2.14)	Install new manual monitoring stations  Installation of automated monitoring equipment in Oakley Creek and the Minago River (both upstream and downstream of the Polishing Pond Discharge points)  Develop stage/discharge relationship to assess effects on wetted stream habitat  Ongoing operation of recording pressure transducers on Oakley Creek and Minago River  Monthly summer manual monitoring at stations on Oakley Creek and Minago River (upstream and downstream of the Minago Project discharges)  Manual discharge measurements in conjunction with water quality sampling  Photos taken annually during similar flow periods or times of year

**Table 10.1-1 Summary of Project Effects on the Receiving Environment (VECC's) and Proposed Mitigation Measures and Monitoring Programs during Construction (cont'd)**

VECCs	EFFECTS	COMMENTS	MITIGATION MEASURES	MONITORING PROGRAMS
<b>5. SURFACE WATER AND SEDIMENT QUALITY</b>				
Changes in water sediment quality in Oakley Creek from contaminated construction site runoff, waste rock storage, ore and frac sand stockpile	Not significant		Implement the Erosion and Sediment Control Plan (Section 9.2: Environmental Protection Plan) and Site Water Management Plan (Section 2.14) to ensure no contaminated drainage water enters Oakley Creek	Monitor TSS at settling basins and in receiving waters according to permit schedule  Concurrent with EEM program on three-year cycle  Initiate fish tissue sampling based on results of sediment analysis
Mine site clearing of vegetation and increased sediment input to Oakley Creek	Not significant		Minimize vegetation removal and soil disturbance within the RSA  Implement the Erosion and Sediment Control Plan and the Site Water Management Plan (Section 2.14) to ensure no sediment laden water enters Oakley Creek  Revegetate disturbed areas as soon as possible	
Sediment inputs during the construction of transportation corridors in the Oakley Creek watershed basin	Not significant		Implement the Erosion and Sediment Control Plan (Section 9.2: Environmental Protection Plan)  Adhere to appropriate guidance documents for work around watercourses  Revegetate cleared areas with native flora	
<b>6. GROUNDWATER AND HYDROGEOLOGY</b>				
Pit dewatering resulting in groundwater table depression and reduced base flows in Oakley Creek	Not significant		Based on follow up studies of effects of reduced low flows on fish habitat, evaluate options to reduce groundwater pumping or return more water from the Polishing Pond to Oakley Creek	Recording of climate data such as precipitation and temperature  Year-round (i.e., monthly) monitoring of flow, temperature and water quality in Oakley Creek  Monitor water levels in mine area piezometers and record dewatering pumping rates  Monitor pit water and surface water quality in Oakley Creek

Table 10.1-1 Summary of Project Effects on the Receiving Environment (VECC's) and Proposed Mitigation Measures and Monitoring Programs during Construction (cont'd)

VECCs	EFFECTS	COMMENTS	MITIGATION MEASURES	MONITORING PROGRAMS
<b>7. BENTHOS AND PERIPHYTON</b>				
<p>Altered benthic communities resulting from changes in water and sediment quality in Oakley Creek from contaminated construction site runoff, waste rock storage, and ore stockpiles</p>	<p>Not significant</p>		<p>Implement Erosion and Sediment Control Plan (Section 9: Environmental Management Plan) and water management plan (Section 2.14: Site Water Management) to ensure no contaminated drainage water enters Oakley Creek; muskegs will act as filters</p>	<p>Monitor TSS at settling basins and in receiving waters according to the Environmental Protection Plan schedule</p> <p>Conduct an EEM program on 3-year cycle following EEM methods</p> <p>Concurrent with EEM program, periphyton collection from natural substrates (using same methods as were used during the baseline studies)</p> <p>Concurrent with EEM program on three-year cycle</p> <p>Initiate benthic invertebrate or fish tissue sampling based on results of sediment analysis</p> <p>Assess phytoplankton, invertebrates and plants in TWRMF pond at closure</p>

**Table 10.1-1 Summary of Project Effects on the Receiving Environment (VECC's) and Proposed Mitigation Measures and Monitoring Programs during Construction (cont'd)**

VECCs	EFFECTS	COMMENTS	MITIGATION MEASURES	MONITORING PROGRAMS
<b>8. FISHERIES</b>				
Effects of site clearing, grubbing, grading and sedimentation of in stream fish habitat	Not significant	No work will be done near riparian management areas	<p>Locate buildings, TWRMF and facilities outside of Riparian Management Areas</p> <p>There will be no infrastructure in the vicinity of the riparian zone</p> <p>Implement a Sediment Control Plan (Section 9: Environmental Protection Plan)</p> <p>Implement a Fish Habitat Protection Plan (Section 9: Environmental Protection Plan)</p> <p>Implement a Site Water Management Plan (Section 2.14: Site Water Management)</p> <p>Revegetate stream banks with native plants, grasses, shrubs and trees</p> <p>Obtain required DFO and MB Gov.'t Authorizations for in stream and riparian works, if any such works were to be needed</p>	<p>Turbidity and TSS monitoring during construction as required by permit</p> <p>Post-construction evaluation of in stream habitat in the vicinity of culvert installations (sedimentation, fish passage, bank erosion, culvert effectiveness)</p> <p>Complete remedial action for any failed culvert, bank protection measures, etc.</p> <p>Conduct EEM Monitoring (Section 7.5: Surface Water Quality)</p> <p>Set aside contingency to initiate fish tissue sampling &amp; analysis</p> <p>Collect fish samples at identified monitoring sites, and analyze for metal levels</p>

Table 10.1-1 Summary of Project Effects on the Receiving Environment (VECC's) and Proposed Mitigation Measures and Monitoring Programs during Construction (cont'd)

VECCs	EFFECTS	COMMENTS	MITIGATION MEASURES	MONITORING PROGRAMS
Effects of culvert placement on fish and fish egg mortality and sedimentation of in stream fish habitat	Not significant	THERE ARE NO CULVERT OR STREAM CROSSINGS CONTEMPLATED FOR THE PROJECT	<p>Adhere to Standards and Best Practices for Instream Works, if any such works were to be needed</p> <p>If any crossing construction will be needed, it will be completed in the dry during the summer low flow period or in winter when streams are frozen solid (surface to substrate), i.e. during the period of least risk to fish and fish habitat</p> <p>Implement a sediment and erosion control plan (Section 9: Environmental Management Plan)</p> <p>Implement a Fish Habitat Protection Plan (Section 9: Environmental Protection Plan)</p>	
			<p>Where applicable, conduct blasting in accordance with Guidelines for Use of Explosives in Canadian Fisheries Waters</p> <p>Maintain all culverts in good working order; replace dysfunctional culverts as required in association with sedimentation control measures</p>	
Changes in stream flow (Minago River and Oakley Creek) due to discharges from the Polishing Pond with potential effects on in stream habitat	Not significant		Implement the Site Water Management Plan (Section 2.14: Site Water Management and Section 7.4: Surface Water Hydrology)	

**Table 10.1-1 Summary of Project Effects on the Receiving Environment (VECC's) and Proposed Mitigation Measures and Monitoring Programs during Construction (cont'd)**

VECCs	EFFECTS	COMMENTS	MITIGATION MEASURES	MONITORING PROGRAMS
<p>Potential introduction of contaminants to fish habitat from fuel spills and concrete mixing</p>	<p>Not significant</p>		<p>Discharge all wastewater in accordance with MB Gov.'t regulations and more than 100 m from fish habitat</p> <p>Implement a Site Water Management Plan (Section 2.14: Site Water Management)</p> <p>Implement an Erosion and Sediment Control Plan</p> <p>Adhere to protocols for refuelling and equipment inspection and maintenance</p> <p>Implement the Mine Closure Plan</p> <p>Ensure stabilization of water quality prior to closure</p> <p>Maintain a water cover on the TWRMF as designed</p> <p>Conduct regular/routine monitoring of the TWRMF water quality and for potential leaks</p>	
<p>Potential increase in angling pressure from construction crews</p>	<p>Not significant</p>		<p>Implement personnel environmental awareness training and environmental protection policy (Section 9: Environmental Management Plan)</p> <p>All personnel will abide by applicable MB Gov.'t fishing regulations</p> <p>Signage will be posted along access road / PTH6 intersection describing responsible angling techniques</p>	

**Table 10.1-1 Summary of Project Effects on the Receiving Environment (VECC's) and Proposed Mitigation Measures and Monitoring Programs during Construction (cont'd)**

VECCs	EFFECTS	COMMENTS	MITIGATION MEASURES	MONITORING PROGRAMS
<b>9. VEGETATION</b>				
New clearing or other vegetation disturbance over 1718.70 ha	Not significant	The only permanent vegetation losses will be the areas occupied by the waste rock and overburden dumps, TWRMF and the pit area	Implement an Erosion and Sediment Control Plan  Develop a Reclamation Plan (revegetation program)	The revegetated areas will be subject to scheduled periodic inspections for the first five years in order to track the revegetation success and to make adjustments to the program as required
<b>10. WILDLIFE</b>				
Increased mortality risk from collisions, hunting and poaching	Not significant		Implement a Wildlife Protection Plan (Section 9.5)  Implement a Site Waste Management Plan (Section 9.5)	Conduct ongoing Manitoba regional moose and caribou population monitoring
Disruption to movement patterns from sensory disturbance, habitat fragmentation or Transportation Corridors	Not significant			Record observations of bear signs and activities in the project area
Reduction to seasonal habitat availability from Transportation Corridors	Not significant			Record and report incidents with problem wildlife, including vehicle collisions  Consult with Manitoba First Nations, Norway House Resource Management Board and other interested parties relevant to the development of a wildlife protection plan for the Transportation Corridors at closure
<b>11. LAND USE</b>				
Transportation Infrastructure - increased traffic on PTH 6 during operations	Not significant		Consultation with the Manitoba Government, COI and other interest holders	Establish standard procedures, with appropriate avoidance windows in consultation with MBG and affected communities of interest
<b>12. FIRST NATION AND TRADITIONAL KNOWLEDGE</b>				
N/A	Not significant	Information provided during community engagement meetings with government and community members was also used to guide the development of baseline studies. In addition to the Communities of Interest, early input to baseline studies and information provided in subsequent meetings to VNI by members of the communities and Chiefs and Councils were used to guide project planning	Existing information on First Nations land use, water use, fish and terrestrial wildlife use was reviewed and compiled to assist in the identification and mitigation of the potential impacts from the project	N/A

**Table 10.1-1 Summary of Project Effects on the Receiving Environment (VECC's) and Proposed Mitigation Measures and Monitoring Programs during Construction (cont'd)**

VECCs	EFFECTS	COMMENTS	MITIGATION MEASURES	MONITORING PROGRAMS
<b>13. ARCHAEOLOGY</b>				
Based on their work, Quaternary Consultants Ltd. (2008) concluded that the proposed mine development will have no impact upon archaeological resources	Not significant	Quaternary Consultants Ltd. (2008) found that: <ul style="list-style-type: none"> <li>• it is highly improbable that the area was used by inhabitants prior to the introduction of the fur trade,</li> <li>• the possibility of finding any evidence of Pre-contact utilization of the area is next to impossible, and</li> <li>• the likelihood of locating any evidence of Fur Trade or later use, other than prospecting and mining activities, is extremely minimal</li> </ul>	N/A	N/A
<b>14. SOCIO-ECONOMIC</b>				
Effects on community health and amenities	Not significant	Employees will be housed the mine to avoid interaction with the locals		Utilization of the mine camp for the majority of the workers



**Table 10.1- 1 Summary of Project Effects on the Receiving Environment and Proposed Mitigation Measures and Monitoring Programs during Operations**

TABLE 10.2 - DURING OPERATIONS				
SUMMARY OF PROJECT EFFECTS ON THE RECEIVING ENVIRONMENT (VECCs) AND PROPOSED MITIGATION MEASURES AND MONIROTING PROGRAMS				
VECCs	EFFECTS	COMMENTS	MITIGATION MEASURES	MONITORING PROGRAMS
<b>1. CLIMATE</b>				
Localized increases in snowpack depth, water content and melt rate	Not significant		There will be no significant effects of the project on climate parameters; therefore, no mitigation measures are proposed	Automated climate data collection with periodic downloads as required
Localized changes in wind speed and direction, precipitation deposition, and solar radiation due to site clearing and project structures	Not significant			Manual data collection on monthly or periodic basis for snowpack depth and snow water equivalent
<b>2. AIR QUALITY</b>				
Fugitive dust emissions from ore crushing and vehicle use with potential effects on human health, vegetation and wildlife	Not significant		<p>Apply dust suppressant (such as water spray to unconsolidated working surfaces and development rock and ore stockpiles) to minimize fugitive dust during periods of heavy activity and/or dry periods</p> <p>Minimize activities that generate large quantities of fugitive dust when windy</p> <p>Reseed disturbed areas and topsoil stockpiles to prevent fugitive dust from wind erosion</p>	There are no monitoring programs identified for project effects or cumulative effects.
Fugitive dust and emissions of CACs from mining equipment and auxiliary site vehicles	Not significant		<p>Recover waste heat from the generators to heat the process building, assay lab and camp</p> <p>Use low sulphur fuels including diesel fuel with a sulphur content, 15 ppm and propane with negligible sulphur content</p> <p>Meet applicable criteria with respect to emission quality on all combustion-related equipment and provide maintenance according to manufactures specifications</p>	

Table 10.1- 2 Summary of Project Effects on the Receiving Environment and Proposed Mitigation Measures and Monitoring Programs during Operations (cont'd)

VECCs	EFFECTS	COMMENTS	MITIGATION MEASURES	MONITORING PROGRAMS
<b>3. TERRAIN, SURFICIAL DEPOSITS AND GEOLOGY</b>				
Modification of surficial materials and recalculation in soil capability	Not significant		<p>Pre-site inspections will allow avoidance, where applicable, of sensitive, of sensitive soil types</p> <p>Site clearing will be timed to minimize soil compaction. To the extent possible, top soil will be removed and stored</p> <p>Where possible, borrow pit locations will be selected based on sites that can be easily reclaimed</p> <p>Where possible, disturbed sites will be promptly revegetated (progressive reclamation) with appropriate plant materials and fertilization</p> <p>During the decommissioning and closure phases, overburden (surficial materials) will be re-sloped and laid down to avoid the creation of impermeable material</p> <p>Site clearing will be minimized during all project phases</p>	<p>Seasonal terrain stability assessments will determine site specific stability issues</p> <p>Seasonal erosion assessments will determine site specific stability issues</p> <p>Soil sampling will determine if soils have been contaminated or not</p>

**Table 10.1- 3 Summary of Project Effects on the Receiving Environment and Proposed Mitigation Measures and Monitoring Programs during Operations (cont'd)**

VECCs	EFFECTS	COMMENTS	MITIGATION MEASURES	MONITORING PROGRAMS
Increased soil erosion	Not significant		<p>Sites will be assessed for soil erosion potential and measures to minimize the effects of any such erosion will be employed</p> <p>Installation of the site water management system (Section 2.14) during construction and operation throughout the project will minimize drainage and erosion from disturbed areas</p> <p>Implementation of the Erosion and Sedimentation Control Plan (Section 9: Environmental Management Plan) throughout the life of the project will reduce soil erosion</p> <p>Immediate revegetation with appropriate plant materials and fertilization on all disturbed sites (except roads and mining sites) will minimize this effect</p> <p>Where possible, disturbed slopes will be re-sloped to a 2H:1V ratio</p> <p>Sites will be cleaned up and progressively revegetated with appropriate plant species when no longer in use</p>	
Terrain stability concerns	Not significant		<p>Most disturbances will be restricted to times when soils are dry</p> <p>Where possible, disturbed slopes will be re-sloped to a 2H:1V ratio</p> <p>Where possible, subsurface and surface drainage will be controlled to prevent slope instability. This includes re-establishing surface drainage as soon as possible</p> <p>Pre-site inspections will allow avoidance, where applicable, of unstable or potentially unstable sites</p>	

**Table 10.1- 4 Summary of Project Effects on the Receiving Environment and Proposed Mitigation Measures and Monitoring Programs during Operations (cont'd)**

VECCs	EFFECTS	COMMENTS	MITIGATION MEASURES	MONITORING PROGRAMS
Potential contamination of soils	Not significant		Develop appropriate contingency and response measures Develop appropriate transport, storage and handling procedures to control spills Track the volume of hydrocarbons on site (used versus supplied) Ensure that the oil transfer systems are contained appropriately Develop monitoring programs that will identify, if any, contaminated soils	
<b>4. SURFACE WATER HYDROLOGY</b>				
Increased flows in the Minago River due to Polishing Pond Discharges	Not significant		An adaptative monitoring program will be implemented to monitor the effects of the final effluent on the receiving watercourses Implement the Erosion and Sediment Control Plan (Section 9.2: Environmental Protection Plan) and Site Water Management Plan (Section 2.14)	Install new manual monitoring stations Installation of automated monitoring equipment in the Minago River (both upstream and downstream of the Polishing Pond Discharge points) Develop stage/discharge relationship to assess effects on wetted stream habitat Ongoing operation of recording pressure transducers on the Minago River Monthly summer manual monitoring at stations on Oakley Creek and Minago River (upstream and downstream of the Minago Project discharges) Manual discharge measurements in conjunction with water quality sampling Photos taken annually during similar flow periods or times of year

**Table 10.1- 5 Summary of Project Effects on the Receiving Environment and Proposed Mitigation Measures and Monitoring Programs during Operations (cont'd)**

VECCs	EFFECTS	COMMENTS	MITIGATION MEASURES	MONITORING PROGRAMS
<b>5. SURFACE WATER AND SEDIMENT QUALITY</b>				
Changes in Oakley Creek flow regime related to Open pit dewatering and diversion, affecting dilution capacity	Not significant		Implement the Site Water Management Plan (Section 2.14: Site Water Management and Section 7.4: Surface Water Hydrology)	<p>Monitor TSS at settling basins and in receiving waters according to permit schedule</p> <p>Concurrent with EEM program on three-year cycle</p> <p>Initiate fish tissue sampling based on results of sediment analysis</p>
Changes in water and sediment quality from TWRMF seepage to the Oakley Creek and the Minago River (metals, TSS, nutrients)	Not significant		Intercept seepage in collection ditches and recycle back to the TWRMF; ultimate discharge to the receiving environment will be via the Polishing Pond  Monitor effluent and receiving water quality and initiate adaptive management as required	
Changes in water and sediment quality in Oakley Creek from various discharges (metals, TSS, nutrients)	Not significant		Ensure effluent quality meets CCME / Manitoba Tier II guidelines at Station OCAWR  Discharge wastewater in accordance with Manitoba and federal regulations  Monitor effluent and receiving water quality and initiate adaptive management as needed	
Changes in nitrate levels in the and Minago River from effluent discharges	Not significant		Ensure effluent quality meets CCME / Manitoba Tier II guidelines at Station OCAWR  Discharge wastewater in accordance with Manitoba and federal regulations  Monitor effluent and receiving water quality and initiate adaptive management as needed	
Accumulation of metals in sediment of Oakley Creek and Minago River with a potential for bioaccumulation in benthic communities and higher trophic levels	Not significant		Monitor water and sediment concentrations in Oakley Creek and Minago River; if results indicate an increasing trend, collect benthic invertebrates and sculpin for tissue metals analysis  Apply adaptive management measures, if necessary	

**Table 10.1- 6 Summary of Project Effects on the Receiving Environment and Proposed Mitigation Measures and Monitoring Programs during Operations (cont'd)**

VECCs	EFFECTS	COMMENTS	MITIGATION MEASURES	MONITORING PROGRAMS
Introduction of sediment and other road runoff contaminants into Oakley Creek and Minago River	Not significant		Reclaim/revegetate disturbed areas that are no longer in use  Implement the Erosion and Sediment Control Plan (Section 9: Environmental Protection Plan)	
<b>6. GROUNDWATER AND HYDROGEOLOGY</b>				
Pit dewatering resulting in groundwater table depression and reduced base flows in Oakley Creek	Not significant		Based on follow up studies of effects of reduced low flows on fish habitat, evaluate options to reduce groundwater pumping or return more water from the Polishing Pond to Oakley Creek	Recording of climate data such as precipitation and temperature  Year-round (i.e., monthly) monitoring of flow temperature and water quality in Oakley Creek  Monitor water levels in mine area piezometers and record dewatering pumping rates  Monitor pit water and surface water quality in Oakley Creek

**Table 10.1- 7 Summary of Project Effects on the Receiving Environment and Proposed Mitigation Measures and Monitoring Programs during Operations (cont'd)**

VECCs	EFFECTS	COMMENTS	MITIGATION MEASURES	MONITORING PROGRAMS
<b>7. BENTHOS AND PERIPHYTON</b>				
Altered benthic communities in the Minago River from Polishing Pond discharges (metals, TSS)	Not significant		Implement Approved Water Management Plan based on approvals from federal and provincial governments regarding flow conditions in Minago River  Intercept seepage in collection ditch, and recycle back to the TWRMF. Discharge to Minago River will be via the Polishing Pond (PP)  Monitor effluent and receiving water quality and initiate adaptive management as required  Ensure effluent quality meets MMER objectives for the protection of aquatic life  Discharge wastewater in accordance with Manitoba and Federal regulations  Monitor water and sediment quality concentrations in Minago River; if results indicate (an) increasing trend(s), initiate collection of benthic invertebrates and fish for tissue metals analysis	Monitor TSS at settling basins and in receiving waters according to the Environmental Protection Plan schedule  Conduct an EEM program on 3-year cycle following EEM methods  Concurrent with EEM program, periphyton collection from natural substrates (using same methods as were used during the baseline studies)  Concurrent with EEM program on three-year cycle  Initiate benthic invertebrate or fish tissue sampling based on results of sediment analysis  Assess phytoplankton, invertebrates and plants in TWRMF pond at closure
Increased benthic productivity in the Minago River from nitrate and ammonia in effluent discharges	Not significant			

Table 10.1- 8 Summary of Project Effects on the Receiving Environment and Proposed Mitigation Measures and Monitoring Programs during Operations (cont'd)

VECCs	EFFECTS	COMMENTS	MITIGATION MEASURES	MONITORING PROGRAMS
<b>8. FISHERIES</b>				
Effects of vegetation management on the mine site and transportation corridors right-of-way on sedimentation of in stream fish habitat	Not significant	<p>No work will be done near riparian management areas</p> <p>There are no culvert or stream crossings contemplated for the project</p>	<p>Locate buildings, TWRMF and facilities outside of Riparian Management Areas</p> <p>There will be no infrastructure in the vicinity of the riparian zone</p> <p>Implement a Sediment Control Plan (Section 9: Environmental Protection Plan)</p> <p>Implement a Fish Habitat Protection Plan (Section 9: Environmental Protection Plan)</p> <p>Implement a Site Water Management Plan (Section 2.14: Site Water Management)</p> <p>Revegetate stream banks with native plants, grasses, shrubs and trees</p> <p>Obtain required DFO and MB Gov.'t Authorizations for in stream and riparian works, if any such works were to be needed</p> <p>Adhere to Standards and Best Practices for Instream Works, if any such works were to be needed</p> <p>If any crossing construction will be needed, it will be completed in the dry during the summer low flow period or in winter when streams are frozen solid (surface to substrate), i.e. during the period of least risk to fish and fish habitat</p> <p>Where applicable, conduct blasting in accordance with Guidelines for Use of Explosives in Canadian Fisheries Waters</p> <p>Maintain all culverts in good working order; replace dysfunctional culverts as required in association with sedimentation control measures</p>	<p>Turbidity and TSS monitoring during construction as required by permit</p> <p>Post-construction evaluation of in stream habitat in the vicinity of culvert installations (sedimentation, fish passage, bank erosion, culvert effectiveness)</p> <p>Complete remedial action for any failed culvert, bank protection measures, etc.</p> <p>Conduct EEM Monitoring (Section 7.5: Surface Water Quality)</p> <p>Set aside contingency to initiate fish tissue sampling &amp; analysis</p> <p>Collect fish samples at identified monitoring sites, and analyze for metal levels</p>



**Table 10.1- 9 Summary of Project Effects on the Receiving Environment and Proposed Mitigation Measures and Monitoring Programs during Operations (cont'd)**

VECCs	EFFECTS	COMMENTS	MITIGATION MEASURES	MONITORING PROGRAMS
Changes in stream flow and habitat capability due to pit dewatering in Oakley Creek.	Not significant		Implement the Site Water Management Plan (Section 2.14: Site Water Management and Section 7.4: Surface Water Hydrology)	
Potential increase in angling pressure from project personnel	Not significant		Implement personnel environmental awareness training and environmental protection policy (Section Environmental Management Plan)  All personnel will abide by applicable MB Gov.'t fishing regulations  Signage will be posted along access road / PTH6 intersection describing responsible angling techniques	
<b>9. VEGETATION</b>				
Progressive land reclamation as areas are abandoned and revegetated<	Not significant	The only permanent vegetation losses will be the areas occupied by the waste rock and overburden dumps, TWRMF and the pit area	Implement an Erosion and Sediment Control Plan  Develop a Reclamation Plan (revegetation program)	The revegetated areas will be subject to scheduled periodic inspections for the first five years in order to track the revegetation success and to make adjustments to the program as required
<b>10. WILDLIFE</b>				
Increased mortality risk from collisions, hunting and poaching	Not significant			Conduct ongoing Manitoba regional moose and caribou population monitoring
Disruption to movement patterns from sensory disturbance, habitat fragmentation or Transportation Corridors	Not significant		Implement a Wildlife Protection Plan (Section 9.5)  Implement a Site Waste Management Plan (Section 9.5)	Record observations of bear signs and activities in the project area  Record and report incidents with problem wildlife including vehicle collisions
Reduction to seasonal habitat availability from Transportation Corridors	Not significant			Consult with Manitoba First Nations, Norway House Resource Management Board and other interested parties relevant to the development of a wildlife protection plan for the Transportation Corridors at closure

**Table 10.1- 10 Summary of Project Effects on the Receiving Environment and Proposed Mitigation Measures and Monitoring Programs during Operations (cont'd)**

VECCs	EFFECTS	COMMENTS	MITIGATION MEASURES	MONITORING PROGRAMS
<b>11. LAND USE</b>				
Transportation Infrastructure - increased traffic on PTH 6 during operations	Not significant		Consultation with the Manitoba Government, CC and other interest holders	Establish standard procedures, with appropriate avoidance windows in consultation with MBG and affected communities of interest
	Not significant			
<b>12. FIRST NATION AND TRADITIONAL KNOWLEDGE</b>				
N/A	Not significant	Information provided during community engagement meetings with government and community members was also used to guide the development of baseline studies. In addition to the Communities of Interest, early input to baseline studies and information provided in subsequent meetings to VNI by members of the communities and Chiefs and Councils were used to guide project planning	Existing information on First Nations land use, water use, fish and terrestrial wildlife use was reviewed and compiled to assist in the identification and mitigation of the potential impacts from the project	N/A
<b>13. ARCHAEOLOGY</b>				
Based on their work, Quaternary Consultants Ltd. (2008) concluded that the proposed mine development will have no impact upon archaeological resources	Not significant	Quaternary Consultants Ltd. (2008) found that: <ul style="list-style-type: none"> <li>• it is highly improbable that the area was used by inhabitants prior to the introduction of the fur trade,</li> <li>• the possibility of finding any evidence of Pre-contact utilization of the area is next to impossible, and</li> <li>• the likelihood of locating any evidence of Fur Trade or later use, other than prospecting and mining activities, is extremely minimal</li> </ul>	N/A	N/A
<b>14. SOCIO-ECONOMIC</b>				
Effects on community health and amenities	Not significant	Employees will be housed the mine to avoid interaction with the locals		Utilization of the mine camp for the majority of the workers

**Table 10.1- 11 Summary of Project Effects on the Receiving Environment and Proposed Mitigation Measures and Monitoring Programs during Decommissioning**

VECCs	EFFECTS	COMMENTS	MITIGATION MEASURES	MONITORING PROGRAMS
<b>1. CLIMATE</b>				
Localized increases in snowpack depth, water content and melt rate	Not significant		There will be no significant effects of the project on climate parameters; therefore, no mitigation measures are proposed	Automated climate data collection with periodic downloads as required
Localized changes in wind speed and direction, precipitation deposition, and solar radiation due to site clearing and project structures	Not significant			Manual data collection on monthly or periodic basis for snowpack depth and snow water equivalent
<b>2. AIR QUALITY</b>				
No effect				
<b>3. TERRAIN, SURFICIAL DEPOSITS AND GEOLOGY</b>				
Modification of surficial materials and re-caution in soil capability	Not significant		<p>Pre-site inspections will allow avoidance, where applicable, of sensitive, of sensitive soil types</p> <p>Site clearing will be timed to minimize soil compaction. To the extent possible, top soil will be removed and stored</p> <p>Where possible, borrow pit locations will be selected based on sites that can be easily reclaimed</p> <p>Where possible, disturbed sites will be promptly revegetated (progressive reclamation) with appropriate plant materials and fertilization</p> <p>During the decommissioning and closure phases, overburden (surficial materials) will be re-sloped and laid down to avoid the creation of impermeable material</p> <p>Site clearing will be minimized during all project phases</p>	<p>Seasonal terrain stability assessments will determine site specific stability issues</p> <p>Seasonal erosion assessments will determine site specific stability issues</p> <p>Soil sampling will determine if soils have been contaminated or not</p>

**Table 10.1- 12 Summary of Project Effects on the Receiving Environment and Proposed Mitigation Measures and Monitoring Programs during Decommissioning (cont'd)**

VECCs	EFFECTS	COMMENTS	MITIGATION MEASURES	MONITORING PROGRAMS
Increased soil erosion	Not significant		<p>Sites will be assessed for soil erosion potential and measures to minimize the effects of any such erosion will be employed</p> <p>Installation of the site water management system (Section 2.14) during construction and operation throughout the project will minimize drainage and erosion from disturbed areas</p> <p>Implementation of the Erosion and Sedimentation Control Plan (Section 9: Environmental Management Plan) throughout the life of the project will reduce soil erosion</p> <p>Immediate revegetation with appropriate plant materials and fertilization on all disturbed sites (except roads and mining sites) will minimize this effect</p> <p>Where possible, disturbed slopes will be re-sloped to a 2H:1V ratio</p> <p>Sites will be cleaned up and progressively revegetated with appropriate plant species when no longer in use</p>	
Terrain stability concerns	Not significant		<p>Most disturbances will be restricted to times when soils are dry</p> <p>Where possible, disturbed slopes will be re-sloped to a 2H:1V ratio</p> <p>Where possible, subsurface and surface drainage will be controlled to prevent slope instability. This includes re-establishing surface drainage as soon as possible</p> <p>Pre-site inspections will allow avoidance, where applicable, of unstable or potentially unstable sites</p>	

Table 10.1- 13 Summary of Project Effects on the Receiving Environment and Proposed Mitigation Measures and Monitoring Programs during Decommissioning (cont'd)

VECCs	EFFECTS	COMMENTS	MITIGATION MEASURES	MONITORING PROGRAMS
<b>4. SURFACE WATER HYDROLOGY</b>				
Increased flows in the Minago River due to Polishing Pond Discharges	Not significant		<p>An adaptative monitoring program will be implemented to monitor the effects of the final effluent on the receiving watercourses</p> <p>Implement the Erosion and Sediment Control Plan (Section 9.2: Environmental Protection Plan) and Site Water Management Plan (Section 2.14)</p>	<p>Install new manual monitoring stations</p> <p>Installation of automated monitoring equipment in the Minago River (both upstream and downstream of the Polishing Pond Discharge points)</p> <p>Develop stage/discharge relationship to assess effects on wetted stream habitat</p> <p>Ongoing operation of recording pressure transducers in the Minago River</p> <p>Monthly summer manual monitoring at stations on Oakley Creek and Minago River (upstream and downstream of the Minago Project discharges)</p> <p>Manual discharge measurements in conjunction with water quality sampling</p> <p>Photos taken annually during similar flow periods or times of year</p>

**Table 10.1- 14 Summary of Project Effects on the Receiving Environment and Proposed Mitigation Measures and Monitoring Programs during Decommissioning (cont'd)**

VECCs	EFFECTS	COMMENTS	MITIGATION MEASURES	MONITORING PROGRAMS
<b>5. SURFACE WATER AND SEDIMENT QUALITY</b>				
Changes in water and sediment quality in Oakley Creek from site runoff where facilities have been removed and/or the ground has been recontoured	Not significant		Implement the Erosion and Sediment Control Plan (Section 9: Environmental Protection Plan) and the Site Water Management Plan (Section 2.14) to ensure no contaminated drainage water enters Oakley Creek  Reseed recontoured areas as soon as possible	Monitor TSS at settling basins and in receiving waters according to permit schedule  Concurrent with EEM program on three-year cycle
<b>GROUNDWATER AND HYDROGEOLOGY</b>				
Pit dewatering resulting in groundwater table depression and reduced base flows in Oakley Creek	Not significant		Based on follow up studies of effects of reduced low flows on fish habitat, evaluate options to reduce groundwater pumping or return more water from the Polishing Pond to Oakley Creek	Recording of climate data such as precipitation and temperature  Year-round (i.e., monthly) monitoring of flow, temperature and water quality in Oakley Creek  Monitor water levels in mine area piezometers and record dewatering pumping rates  Monitor pit water and surface water quality in Oakley Creek

**Table 10.1- 15 Summary of Project Effects on the Receiving Environment and Proposed Mitigation Measures and Monitoring Programs during Decommissioning (cont'd)**

VECCs	EFFECTS	COMMENTS	MITIGATION MEASURES	MONITORING PROGRAMS
<b>7. BENTHOS AND PERIPHYTON</b>				
Reduced benthic productivity in Oakley Creek resulting from changes in water quality from site runoff where facilities have been removed and/or the ground has been recontoured	Not significant		Implement the Erosion and Sediment Control Plan and water management plan to ensure no contaminated drainage water enters Oakley Creek or the Minago River	Monitor TSS at settling basins and in receiving waters according to the Environmental Protection Plan schedule  Conduct an EEM program on 3-year cycle following EEM methods
			Reseed recontoured areas as soon as possible  Ensure effluent quality meets MMER objectives for the protection of aquatic life  Discharge wastewater in accordance with Manitoba and Federal regulations  Monitor effluent and receiving water quality and initiate adaptive management as required	Concurrent with EEM program, periphyton collection from natural substrates (using same methods as were used during the baseline studies)  Concurrent with EEM program on three-year cycle  Initiate benthic invertebrate or fish tissue sampling based on results of sediment analysis

**Table 10.1- 16 Summary of Project Effects on the Receiving Environment and Proposed Mitigation Measures and Monitoring Programs during Decommissioning (cont'd)**

VECCs	EFFECTS	COMMENTS	MITIGATION MEASURES	MONITORING PROGRAMS
<b>8. FISHERIES</b>				
Effects of mine infrastructure removal on riparian and in stream fish habitat in Oakley Creek (sedimentation)	Not significant	No work will be done near riparian management areas		Post-construction evaluation of in stream habitat in the vicinity of culvert installations (sedimentation, fish passage, bank erosion, culvert effectiveness)  Complete remedial action for any failed culvert, bank protection measures, etc.  Conduct EEM Monitoring (Section 7.5: Surface Water Quality)
Effects of Polishing Pond decant on in stream fish habitat (water quality) and fish tissue metals levels in Oakley Creek and Minago River	Not significant	There are no culvert or stream crossings contemplated for the project	Implement the Site Water Management Plan (Section 2.14: Site Water Management and Section 7.4: Surface Water Hydrology)	
Changes in stream flow and habitat capability due to the recovery of the groundwater table in the Oakley Creek basin	Not significant		Implement the Site Water Management Plan (Section 2.14: Site Water Management and Section 7.4: Surface Water Hydrology)	
Potential increase in angling pressure from project personnel	Not significant		Implement personnel environmental awareness training and environmental protection policy (Section 9: Environmental Management Plan)  All personnel will abide by applicable MB Gov.'t fishing regulations  Signage will be posted along access road / PTH6 intersection describing responsible angling techniques	
<b>9. VEGETATION</b>				
Progressive land reclamation as areas are abandoned and revegetated	Not significant	The only permanent vegetation losses will be the areas occupied by the waste rock and overburden dumps, TWRMF and the pit area	Implement an Erosion and Sediment Control Plan  Develop a Reclamation Plan (revegetation program)	The revegetated areas will be subject to scheduled periodic inspections for the first five years in order to track the revegetation success and to make adjustments to the program as required



**Table 10.1- 17 Summary of Project Effects on the Receiving Environment and Proposed Mitigation Measures and Monitoring Programs during Decommissioning (cont'd)**

VECCs	EFFECTS	COMMENTS	MITIGATION MEASURES	MONITORING PROGRAMS
<b>10. WILDLIFE</b>				
Increased mortality risk from collisions, hunting and poaching	Not significant		Implement a Wildlife Protection Plan (Section 9.5)  Implement a Site Waste Management Plan (Section 9.5)	Conduct ongoing Manitoba regional moose and caribou population monitoring
Disruption to movement patterns from sensory disturbance, habitat fragmentation or Transportation Corridors	Not significant			Record observations of bear signs and activities in the project area
Reduction to seasonal habitat availability from Transportation Corridors	Not significant			Record and report incidents with problem wildlife, including vehicle collisions
<b>11. LAND USE</b>				
Transportation Infrastructure - increased traffic on PTH 6 during operations	Not significant		Consultation with the Manitoba Government, COI and other interest holders	Establish standard procedures, with appropriate avoidance windows in consultation with MBG and affected communities of interest
<b>12. FIRST NATION AND TRADITIONAL KNOWLEDGE</b>				
N/A				
<b>13. ARCHAEOLOGY</b>				
N/A				

14. SOCIO-ECONOMIC				
Effects on community health and amenities	Not significant	Employees will be housed the mine to avoid interaction with the locals		Utilization of the mine camp for the majority of the workers

**Table 10.1- 18 Summary of Project Effects on the Receiving Environment and Proposed Mitigation Measures and Monitoring Programs at Closure**

TABLE 10.4 - AT CLOSURE SUMMARY OF PROJECT EFFECTS ON THE RECEIVING ENVIRONMENT (VECCs) AND PROPOSED MITIGATION MEASURES AND MONIROTING PROGRAMS				
VECCs	EFFECTS	COMMENTS	MITIGATION MEASURES	MONITORING PROGRAMS
<b>1. CLIMATE</b>				
Ongoing localized effects of clearing and snow plowing on wind, solar radiation and snowpack	Not significant		There will be no significant effects of the project on climate parameters; therefore, no mitigation measures are proposed	N/A
<b>2. AIR QUALITY</b>				
No effect				
<b>3. TERRAIN, SURFICIAL DEPOSITS AND GEOLOGY</b>				
No effect				
<b>4. SURFACE WATER HYDROLOGY</b>				
Reduced low flows in Oakley Creek and Minago River to base flow due to discontinued discharges to the watersheds	Not significant		Implement the Site Water Management Plan (Section 2.14: Site Water Management and Section 7.4: Surface Water Hydrology)	Conduct EEM Monitoring (Section 7.5: Surface Water Quality)
<b>5. SURFACE WATER AND SEDIMENT QUALITY</b>				
Changes in water and sediment quality of the Minago River from ongoing TWRMF supernatant discharge	Not significant		Adhere to the Mine Closure Plan Monitor water and sediment quality during decommissioning to confirm the effectiveness of management Maintain a water cover on top of the TWRMF as designed to minimize ARD/ML concerns	Conduct EEM Monitoring (Section 7.5: Surface Water Quality)

**Table 10.1- 19 S of Project Effects on the Receiving Environment and Proposed Mitigation Measures and Monitoring Programs at Closure**

VECCs	EFFECTS	COMMENTS	MITIGATION MEASURES	MONITORING PROGRAMS
<b>6. GROUNDWATER AND HYDROGEOLOGY</b>				
Flooding of Pit and gradual recovery of groundwater levels and base flows in Oakley Creek	Not significant		N/A	N/A
Contaminated Pit water from flooded Pit discharging to Oakley Creek basin and ultimately to Oakley Creek	Not significant		Monitor pit water quality. Based on results, initiate enhanced surface water quality monitoring in Oakley Creek as required.  Evaluate contingency measures for enhanced management of groundwater quality at closure	Conduct EEM Monitoring (Section 7.5: Surface Water Quality)
<b>7. BENTHOS AND PERIPHYTON</b>				
Uptake of metals by invertebrates in the TWRMF, and their consumption by birds and other wildlife	Not significant		Adhere to the Mine Closure Plan requirements	Monitor TSS at settling basins and in receiving waters according to the Environmental Protection Plan schedule  Conduct an EEM program on 3-year cycle following EEM methods  Concurrent with EEM program, periphyton collection from natural substrates (using same methods as were used during the baseline studies)
Reduced wetted habitat and benthic productivity in the Minago River resulting from flow changes related to discontinued discharge of Polishing Pond effluent at closure	Not significant		Test of water quality during decommissioning to confirm effectiveness of adaptive management  Maintain water cover over the disposed tailings and ultramafic waste rock as designed	Concurrent with EEM program on three-year cycle  Initiate benthic invertebrate or fish tissue sampling based on results of sediment analysis  Assess phytoplankton, invertebrates and plants in TWRMF pond at closure

**Table 10.1- 20 S of Project Effects on the Receiving Environment and Proposed Mitigation Measures and Monitoring Programs at Closure (cont'd)**

VECCs	EFFECTS	COMMENTS	MITIGATION MEASURES	MONITORING PROGRAMS
<b>8. FISHERIES</b>				
Effects of Polishing Pond decant on in stream fish habitat (water quality) and fish tissue metals levels in the Minago River	Not significant		Implement the Site Water Management Plan (Section 2.14: Site Water Management and Section 7.4: Surface Water Hydrology)	Conduct EEM Monitoring (Section 7.5: Surface Water Quality)
Potential increase in angling pressure from public access	Not significant		Implement personnel environmental awareness training and environmental protection policy (Section 9: Environmental Management Plan)  All personnel will abide by applicable MB Gov.'t fishing regulations  Signage will be posted along access road / PTH6 intersection describing responsible angling techniques	
<b>9. VEGETATION</b>				
Progressive land reclamation as areas are abandoned and revegetated	Not significant	The only permanent vegetation losses will be the areas occupied by the waste rock and overburden dumps, TWRMF and the pit area	Implement an Erosion and Sediment Control Plan  Develop a Reclamation Plan (revegetation program)	The revegetated areas will be subject to scheduled periodic inspections for the first five years in order to track the revegetation success and to make adjustments to the program as required

**Table 10.1- 21 S of Project Effects on the Receiving Environment and Proposed Mitigation Measures and Monitoring Programs at Closure (cont'd)**

<b>VECCs</b>	<b>EFFECTS</b>	<b>COMMENTS</b>	<b>MITIGATION MEASURES</b>	<b>MONITORING PROGRAMS</b>
<b>10. WILDLIFE</b>				
Increased mortality risk from collisions, hunting and poaching	Not significant		Implement a Wildlife Protection Plan (Section 9.5)  Implement a Site Waste Management Plan(Section 9.5)	Conduct ongoing Manitoba regional moose and caribou population monitoring
Disruption to movement patterns from sensory disturbance, habitat fragmentation or Transportation Corridors	Not significant			Record observations of bear signs and activities in the project area
Reduction to seasonal habitat availability from Transportation Corridors	Not significant			Record and report incidents with problem wildlife, including vehicle collisions
Consult with Manitoba First Nations, Norway House Resource Management Board and other interested parties relevant to the development of a wildlife protection plan for the Transportation Corridors at closure				
<b>11. LAND USE</b>				
N/A				
<b>12. FIRST NATIONS AND TRADITIONAL KNOWLEDGE</b>				
N/A				
<b>13. ARCHAEOLOGY</b>				
N/A				
<b>14. SOCIO-ECONOMIC</b>				
N/A				

Summaries of project effects on the receiving environment and proposed mitigation measures are given in Tables 10.1-1, 10.1-2, 10.1-3 and 10.1-4 for the construction, operations, decommissioning and closure phases, respectively.

### **10.1.2 Wildlife**

The project results in disturbance of a relatively small area within a region that is poor in wildlife habitat and some existing disturbances from quarrying operations within the RSA and the PTH 6. Using conservative assumptions about the size of the project disturbance footprint and low wildlife levels, effects on habitat availability for all valued species assessed are expected to be low in magnitude and therefore not significant.

Barrier effects to wildlife movement are predicted to be low. The project is outside of the perimeter of the William Caribou Herd. Frac sand and concentrate haul south to Winnipeg will avoid potential effects on utilized caribou range to the north. The relatively confined area for the industrial area and controlled level of traffic will allow wildlife to cross with little impediment. Accordingly, effects on wildlife movement patterns are expected to be not significant.

Potential wildlife mortality due to wildlife collisions and hunting on the LSA and RSA may be a concern due to increased traffic. However, due to the low levels of wildlife present in the LSA and RSA, wildlife collisions will be minimal. Mitigation measures to manage hunting/collision mortality will be implemented as part of the Environmental Protection Plan. Mitigation will include:

- Access to the private mine transportation corridors will be restricted by a locked gate during the construction, operations, and decommissioning and closure phases of the project.
- Firearms will not be permitted.
- Hunting and fishing will be prohibited at all times on or in the vicinity of the project site. This restriction will apply to all mine employees, managers and contractors. It will be in effect throughout the life of the project from construction through to closure and reclamation. Infringement of this policy is to be reported.
- The maximum speed limit on all access roads will be set at 60 km/hr.
- Posted speed limits on PTH 6 will be adhered to any observed wildlife corridors will be signed to alert drivers to potential wildlife crossings.
- Any wildlife mortality on the transportation corridors will be recorded and reported and any modifications to the mitigation measures will be considered in consultation with MBG, as required. Based on the effectiveness of these mitigation measures, effects of the access road on wildlife mortality during construction, operations and decommissioning are expected to be of low magnitude and not significant.
- Summaries of project effects on the receiving environment and proposed mitigation measures are given in Tables 10.1-1, 10.1-2, 10.1-3 and 10.1-4 for the construction, operations, decommissioning and closure phases, respectively.

### 10.1.3 Socio-Economic Conditions

The Minago Project will be under construction between 2011 and 2013, at a capital cost of approximately \$596 million. Construction will require more than 600 people that will be housed in a camp, located near the mine. Construction workers will be sourced locally as much as possible.

The direct impact in Manitoba of the construction of the mine will directly increase the GDP by \$202.6 million. When purchases in Manitoba are accounted for, the province's GDP will be increased to \$268.2 million total. Manitoba's GDP in the year 2008 was approximately \$51,000,000,000 (Stats Canada). The \$268.2 million total (direct + indirect, excluding \$51 Billion reported in 2008) impact in Manitoba will therefore, likely account for a 0.5% boost in GDP.

The company will employ 422 workers to operate and maintain the project, in addition to approximately 220 contract truckers and related maintenance workers.

Overall, construction of the project is estimated to yield \$6.3 million in personal income taxes to governments in Canada and about \$4.3 million in personal income taxes to governments in Manitoba.

VNI is committed to sourcing workers and providers of goods and services for the Minago Project in Manitoba, wherever that is commercially feasible. In addition, the company is committed to ensuring the modest increase in road traffic resulting from frac sand and concentrate haul and incidental travel has little or no effect on orderly traffic flow and traffic safety.

Lastly, although many Manitoba residents will be employed at the mine, the company will work to ensure that First Nations and Metis employees in particular will have opportunities to balance traditional pursuit on the land with participation in the wage economy.

Summaries of project effects on the receiving environment and proposed mitigation measures are given in Tables 10.1-1, 10.1-2, 10.1-3 and 10.1-4 for the construction, operations, decommissioning and closure phases respectively.

### 10.1.4 The Communities of Interest

The COI (Grand Rapids, Moose Lake and Cross Lake (Norway House is expected to participate)) are currently working on a Socio-Economic Participation Agreement (SEPA) with VNI. The SEPA will provide a basis for participation by all COI in: 1) project exploration and development activities; 2) the review of environmental, social and economic matters related to these activities; and, 3) the environmental assessment and permitting of the Minago Project. The SEPA provides the COI with the following during exploration and development activities:

- Employment and service contract opportunities;
- The establishment of a management committee to deal with all matters related to the Project; and

- Funding for education, training and local economic development initiatives.

VNI will benefit from access to the local work force and from their support for responsible exploration and development for the Minago Project. In recognition of the achievement of reaching the mutually beneficial SEPA, VNI is open to the idea of COI to become potential shareholders of the Company.