

Appendix G2: Alternatives Evaluation – Process Water Supply

Alternative Method Design Assumptions		
Reclaim water recycled from tailings management facility (TMF) and contact water collection system	Dewatering from Historical Underground Workings	Surface Water Takings
<ul style="list-style-type: none"> The system would provide a 'closed loop' for reclaiming water from the TMF and contact water from the collection system would be reused to the extent feasible in processing. Infrastructure would be installed primarily above ground. Standard mitigation measures would be applied to control construction effects, and address the risk of spills during operation. Infrastructure would align with access roads within the Project development area (PDA), and would not result in additional disturbance over other construction activities. 	<ul style="list-style-type: none"> The system would draw from water stored in the historical underground workings connected to the open pit. Infrastructure would be installed primarily above ground. Standard mitigation measures would be applied to control construction effects, and address the risk of spills during operation. Infrastructure location would be in close proximity to the open pit and process plant within the PDA, and would not result in additional disturbance over other construction activities. 	<ul style="list-style-type: none"> The system would require the establishment of a new surface water source from Kenogamisis Lake, with surface infrastructure located within the PDA. Infrastructure would be installed primarily above ground, and would require some shoreline footprint. Standard mitigation measures would be applied to control construction effects, and address the risk of spills during operation. Considered in this analysis for the primary source of process water (does not address the occasional need for additional surface water supply from the lake).

Valued Component (VC)/Criteria	Indicators	Alternative Method		
		Reclaim water recycled from TMF and contact water collection system	Dewatering from Historical Underground Workings	Surface Water Takings
Natural Environment				
Atmospheric Environment	Climate change as measured by change in greenhouse gases (GHGs)	<p>Construction: Limited increase in GHG emissions from construction machinery to construct the contact water collection system.</p> <p>Operation: Limited increase in GHG emissions from pumping operations.</p> <p>Closure: Limited increase in GHGs because the decommissioning of the contact water collection system would require limited vehicle or mobile equipment use.</p>	<p>Construction: Limited increase in GHG emissions from construction machinery for the installation of the dewatering system.</p> <p>Operation: Limited increase in GHG emissions from pumping operations.</p> <p>Closure: The capping/closure of historical shafts would be required regardless of whether water was used for processing, so no additional effects are anticipated.</p>	<p>Construction: Limited increase in GHG emissions from the installation of an intake and pumping structure.</p> <p>Operation: Limited increase in GHG emissions from pumping operations.</p> <p>Closure: Limited increase in GHGs because the decommissioning of a surface water source would require limited vehicle or mobile equipment use.</p>
	Change in ambient air quality parameters	<p>Construction: Limited increase in ambient air quality parameters from construction machinery to construct the contact water collection system.</p> <p>Operation: Limited increase in ambient air quality parameters from pumping operations.</p> <p>Closure: Limited increase in ambient air quality parameters because the decommissioning of the contact water collection system would require limited vehicle or mobile equipment use.</p>	<p>Construction: Limited increase in ambient air quality parameters from construction machinery for the installation of the dewatering system.</p> <p>Operation: Limited increase in ambient air quality parameters from pumping operations.</p> <p>Closure: The capping/closure of historical shafts would be required regardless of whether water was used for processing, so no additional effects are anticipated.</p>	<p>Construction: Limited increase in ambient air quality parameters from the installation of an intake and pumping structure.</p> <p>Operation: Limited increase in ambient air quality parameters from pumping operations.</p> <p>Closure: Limited increase in ambient air quality parameters because the decommissioning of a surface water source would require limited vehicle or mobile equipment use.</p>
Overall Atmospheric Environment Ranking <i>Not a key differentiating factor – the potential for effects is comparable across all identified alternatives.</i>		<p>Neutral</p> <p>Limited atmospheric environment effects can be expected from the use of construction and pumping equipment, but effects will be largely limited to the PDA, and will result in a limited cumulative contribution to the effects from other Project activities.</p>	<p>Neutral</p> <p>Limited atmospheric environment effects can be expected from the use of construction and pumping equipment, but effects will be largely limited to the PDA, and will result in a limited cumulative contribution to the effects from other Project activities.</p>	<p>Neutral</p> <p>Limited atmospheric environment effects can be expected from the use of construction and pumping equipment, but effects will be largely limited to the PDA, and will result in a limited cumulative contribution to the effects from other Project activities.</p>
Acoustic Environment	Change in noise or vibration levels	<p>Construction: Limited increase in noise and vibration from the construction of the contact water collection system.</p> <p>Operation: Limited increase in noise and vibration from pumping operations.</p> <p>Closure: Limited increase in noise and vibration because the decommissioning of the contact water collection system would require limited vehicle or mobile equipment use.</p>	<p>Construction: Limited increase in noise and vibration from construction machinery for the installation of the dewatering system.</p> <p>Operation: Limited increase in noise and vibration from pumping operations.</p> <p>Closure: The capping/closure of historical shafts would be required regardless of whether water was used for processing, so no additional effects are expected.</p>	<p>Construction: Limited increase in noise and vibration from the installation of an intake and pumping structure.</p> <p>Operation: Limited increase in noise and vibration from pumping operations.</p> <p>Closure: Limited increase in noise and vibration because the decommissioning of a surface water source would require limited equipment use.</p>

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		Reclaim water recycled from TMF and contact water collection system	Dewatering from Historical Underground Workings	Surface Water Takings
Overall Acoustic Environment Ranking <i>Not a key differentiating factor – the potential for effects is comparable across all identified alternatives.</i>		Neutral Limited acoustic environment effects can be expected from the use of construction and pumping equipment, but effects will be limited to the PDA, and will result in a limited cumulative contribution to the effects from other Project activities.	Neutral Limited acoustic environment effects can be expected from the temporary use of construction machinery and the long-term use of pumping equipment, but effects will be limited to the PDA, and will result in a limited cumulative contribution to the effects from other Project activities.	Neutral Limited acoustic environment effects can be expected from the temporary use of construction machinery and the long-term use of pumping equipment, but effects will be limited to the PDA, and will result in a limited cumulative contribution to the effects from other Project activities.
Groundwater	Change in groundwater quantity or flow	Construction: Construction of the system would be limited to surficial disturbance and is not anticipated to affect groundwater resources. Operation: No effect on groundwater quantity and flow anticipated because the system will enhance the reuse of reclaim and contact water, with no groundwater taking required. Closure: No effect on groundwater quantity and flow anticipated because the decommissioning of the contact water collection system would be limited to surficial disturbance and would not require water taking or change natural groundwater flow.	Construction: Construction of the system would be limited to surficial disturbance and is not anticipated to affect groundwater resources. Operation: No additional effect on groundwater quantity anticipated because the dewatering of the historical underground workings is required for the open pit development. Closure: Closure of the open pit and historical underground workings would be required regardless of whether dewatering is used for process water, so no additional effects are anticipated.	Construction: Construction of the system would be limited to surficial disturbance and is not anticipated to affect groundwater resources. Operation: Potential for localized effects on surface water levels and as a result may affect shallow groundwater taking from wells directly connected to Kenogamisis Lake (i.e., water supply wells that are Groundwater Under the Direct Influence of Surface Water (GUDI) where the water level in the well would be controlled primarily by the surface water level. Closure: No effect on groundwater quantity and flow anticipated because the decommissioning of an intake and pumping structure would be limited to surficial disturbance and would not require water taking or change natural groundwater flow.
	Change in groundwater quality	Construction: Construction of the contact water collection system would be limited to surficial disturbance and is not anticipated to affect groundwater resources. Operation: No effect on groundwater quality anticipated because the contact water collection system would be designed with mitigation features for seepage to groundwater. Closure: No effect on groundwater quality anticipated because the decommissioning of the contact water collection system would be limited to surficial disturbance and would not affect groundwater chemistry.	Construction: Construction of the contact water system would be limited to surficial disturbance and is not anticipated to affect groundwater resources. Operation: Potential positive effect on groundwater quality anticipated because the dewatering reduces the potential for discharge of groundwater to the natural environment that has been affected by operation. Closure: Closure of the open pit and historical underground workings would be required regardless of whether dewatering is used for process water, so no additional effects are expected.	Construction: Construction of the system would be limited to surficial disturbance and is not anticipated to affect groundwater resources. Operation: Potential for localized changes to groundwater chemistry from effects on groundwater supplies under the direct influence of surface water. Closure: No effect on groundwater quality anticipated because the decommissioning of an intake and pumping structure would be limited to surficial disturbance and would not affect groundwater chemistry.
Overall Groundwater Ranking <i>Key differentiating factor – the potential for effects is different between identified alternatives.</i>		Advantage No effects on groundwater anticipated because reclaim water from the TMF and contact water collection system will not require groundwater taking.	Advantage No effects on groundwater anticipated because the dewatering from historical underground workings is required for open pit development.	Disadvantage Potential for localized effects on GUDI well levels and quality due to the substantial water taking from Kenogamisis Lake and its potential influence on groundwater.
Surface Water	Change in surface water quantity or flow	Construction: Limited construction effects related to drainage and sedimentation would be managed within the PDA. The piping system would be co-located with other infrastructure to limit effects on waterbodies. Operation: No effect on surface water quantity and flow anticipated because the system reuses contact and TMF reclaim water and will reduce the need for surface water takings. Closure: Decommissioning would involve limited surficial effects managed by standard mitigation measures, and is not anticipated to affect surface water features.	Construction: Limited construction effects related to drainage and sedimentation would be managed within the PDA. The piping system would be co-located with other infrastructure to limit effects on waterbodies. Operation: No effect on surface water quantity and flow anticipated because dewatering of the historical underground workings will reduce the need for surface water takings. Closure: No effect on surface water quantity and flow anticipated because there is no direct hydraulic connection between the historical workings and surface water features.	Construction: Limited construction effects related to drainage and sedimentation would be managed with standard mitigation measures. Operation: Adverse effect on surface water quantity and flow because of the substantial water takings from surface water sources. Closure: Decommissioning would involve limited surficial effects managed by standard mitigation measures, and is not anticipated to affect surface water features.

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		Reclaim water recycled from TMF and contact water collection system	Dewatering from Historical Underground Workings	Surface Water Takings
	Change in surface water quality	<p>Construction: Limited construction effects related to drainage and sedimentation would be managed within the PDA.</p> <p>Operation: The use of contact water and TMF reclaim systems will limit Project effects on surface water quality by reducing effluent discharge and loading to surface water features.</p> <p>Closure: Decommissioning would involve limited surficial effects managed by standard mitigation measures, and is not anticipated to affect surface water features.</p>	<p>Construction: Limited construction effects related to drainage and sedimentation would be managed within the PDA.</p> <p>Operation: The use of a reclaim system will limit Project effects on surface water quality by reducing effluent discharge and loading to surface water features.</p> <p>Closure: The capping/closure of historical shafts would be required regardless of whether water was used for processing, so no additional effects are expected.</p>	<p>Construction: Limited construction effects related to drainage and sedimentation would be managed with standard mitigation measures.</p> <p>Operation: Comparatively higher potential for effects on surface water quality, as not using a reclaim system would increase water management requirements and effluent discharge volumes.</p> <p>Closure: Decommissioning would involve limited surficial effects managed by standard mitigation measures, and is not anticipated to affect surface water features.</p>
Overall Surface Water Ranking <i>Key differentiating factor – the potential for effects is different between identified alternatives.</i>		Advantage The use of contact water and TMF reclaim systems will limit Project effects on surface water quality.	Advantage The use of contact water and TMF reclaim systems will limit Project effects on surface water quality.	Disadvantage Higher potential for effects on surface water due to increased water management requirements.
Fish and Fish Habitat	Change in fish habitat	<p>Construction: No effect on fish habitat anticipated because the construction of the contact water collection system would not interact with fish habitat.</p> <p>Operation: No effect on fish habitat anticipated because the TMF reclaim water will operate in a closed loop and contact water will either be reused or treated prior to discharge.</p> <p>Closure: No effect on fish habitat anticipated because the decommissioning of the contact water collection system would not interact with fish habitat.</p>	<p>Construction: No effect on fish habitat anticipated because the installation of a dewatering system would not interact with fish habitat.</p> <p>Operation: No effect on fish habitat from dewatering the historical underground workings because no direct connections to surface water features are expected.</p> <p>Closure: No effect on fish habitat anticipated because there is no direct hydraulic connection between the historical underground workings and surface water features.</p>	<p>Construction: Potential effect on fish habitat from the installation of an intake and pumping structure.</p> <p>Operation: Potential effect on fish habitat due to the water taking in Kenogamisis Lake.</p> <p>Closure: No effect on fish habitat anticipated because the decommissioning of an intake and pumping structure would not substantially affect water quality, sediment composition, riparian vegetation, or in-stream cover.</p>
	Change in fish	<p>Construction: No mortality or sub-lethal effects anticipated because the construction of the contact water collection system would not interact with fish.</p> <p>Operation: No mortality or sub-lethal effects anticipated because the TMF reclaim water will operate in a closed loop and contact water will either be reused or treated prior to discharge.</p> <p>Closure: No mortality or sub-lethal effects anticipated because the decommissioning of the contact water collection system would not interact with fish.</p>	<p>Construction: No mortality or sub-lethal effects anticipated because the installation of a dewatering system would not interact with fish habitat.</p> <p>Operation: No effect on fish from dewatering the historical underground workings because no direct connections to surface water features are expected.</p> <p>Closure: No mortality or sub-lethal effects anticipated because there is no direct hydraulic connection between the historical underground workings and surface water features.</p>	<p>Construction: No mortality or sub-lethal effects anticipated because it would be expected that the methods used for installation of the surface water source system would not cause the direct mortality of fish.</p> <p>Operation: Limited potential for fish entrainment in intake structures causing fish mortality.</p> <p>Closure: No mortality or sub-lethal effects anticipated because it would be expected that the methods used for decommissioning of the surface water source system would not cause the direct mortality of fish.</p>
Overall Fish and Fish Habitat Ranking <i>Key differentiating factor – the potential for effects is different between identified alternatives.</i>		Advantage No effects on fish or fish habitat are anticipated because the construction and decommissioning of the collection system would not interact with fish or fish habitat. No parameters of potential concern affecting fish health are anticipated to be discharged to the aquatic environment.	Advantage No effects on fish or fish habitat are anticipated because the construction and decommissioning of the dewatering system would not interact with fish or fish habitat. No parameters of potential concern affecting fish health are anticipated to be discharged to the aquatic environment.	Disadvantage High potential for negative effects on fish habitat due to volume of water required from a fresh water source resulting in reductions in baseflows to creeks and wetlands, resulting in reduced habitat quantity and potentially quality.
Vegetation Communities	Change in abundance of vegetation species of interest	<p>Construction/Operation/Closure: Infrastructure would be isolated to the PDA and would not result in additional disturbance to vegetation. Closure of the site will provide rehabilitation opportunities.</p>	<p>Construction/Operation/Closure: Infrastructure would be isolated to the PDA and would not result in additional disturbance to vegetation. Closure of the site will provide rehabilitation opportunities.</p>	<p>Construction/Operation/Closure: Infrastructure would be isolated to the PDA and would not result in additional disturbance to vegetation. Closure of the site will provide rehabilitation opportunities.</p>
	Change in abundance and condition of upland vegetation communities			

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		Reclaim water recycled from TMF and contact water collection system	Dewatering from Historical Underground Workings	Surface Water Takings
	Change in wetland function or connectivity	Construction/Operation/Closure: Infrastructure would be isolated to the PDA and would not result in additional disturbance to wetlands. Closure of the site will provide rehabilitation opportunities.	Construction: Infrastructure would be isolated to the PDA and would not result in additional disturbance to wetlands. Operation: Dewatering activities may affect wetlands, but dewatering would be required for Project open pit operation regardless of whether this alternative is used. Closure: Closure of the site will provide rehabilitation opportunities.	Construction/Operation/Closure: Infrastructure would be isolated to the PDA and would not result in additional disturbance to wetlands. Closure of the site will provide rehabilitation opportunities.
Overall Vegetation Communities Ranking <i>Not a key differentiating factor – the potential for effects is comparable across all identified alternatives.</i>		Neutral Infrastructure would be isolated to the PDA and would not result in additional disturbance.	Neutral Infrastructure would be isolated to the PDA and would not result in additional disturbance.	Neutral Infrastructure would be isolated to the PDA and would not result in additional disturbance.
Wildlife and Wildlife Habitat	Change in movement, health or mortality risk of wildlife	Construction/Operation/Closure: Infrastructure would be isolated to the PDA and would not result in additional disturbance to wildlife or wildlife habitat.	Construction/Operation/Closure: Infrastructure would be isolated to the PDA and would not result in additional disturbance to wildlife or wildlife habitat.	Construction/Operation/Closure: Infrastructure would be isolated to the PDA and would not result in additional disturbance to wildlife or wildlife habitat.
	Change in wildlife habitat			
Overall Wildlife and Wildlife Habitat Ranking <i>Not a key differentiating factor – the potential for effects is comparable across all identified alternatives.</i>		Neutral Infrastructure would be isolated to the PDA and would not result in additional disturbance.	Neutral Infrastructure would be isolated to the PDA and would not result in additional disturbance.	Neutral Infrastructure would be isolated to the PDA and would not result in additional disturbance.
Social Environment				
Community Services and Infrastructure	Change in capacity of housing and accommodation	Construction/Operation/Closure: Any infrastructure required will be localized to the PDA, and will not result in any additional effects on community services and infrastructure because there will be no increase in population or demand on provincial and municipal infrastructure.	Construction/Operation/Closure: Any infrastructure required will be localized to the PDA, and will not result in any additional effects on community services and infrastructure, because there will be no increase in population or demand on provincial and municipal infrastructure.	Construction/Operation/Closure: Any infrastructure required will be localized to the PDA, and will not result in any additional effects on community services and infrastructure because there will be no increase in population or demand on provincial and municipal infrastructure.
	Change in capacity of health and emergency services and infrastructure			
	Change in the capacity of recreation and entertainment services and infrastructure			
	Change in the capacity provincial and municipal services and infrastructure			
Overall Community Services and Infrastructure Ranking <i>Not a key differentiating factor – the potential for effects is comparable across all identified alternatives.</i>		Neutral No effects on the capacity of community services and infrastructure are anticipated because infrastructure will be localized to the PDA.	Neutral No effects on the capacity of community services and infrastructure are anticipated because infrastructure will be localized to the PDA.	Neutral No effects on the capacity of community services and infrastructure are anticipated because infrastructure will be localized to the PDA.
Operational Health and Safety	Health and safety of mine workers	Construction/Operation/Closure: No effect on the health and safety of mine workers or local residents expected because the Project will be designed in consideration of avoiding the potential for operational failures that could lead to injury of workers and in consideration of providing a safe environment for local residents outside the Project.	Construction/Operation/Closure: No effect on the health and safety of mine workers or local residents expected because the Project will be designed in consideration of avoiding the potential for operational failures that could lead to injury of workers and in consideration of providing a safe environment for local residents outside the Project.	Construction/Operation/Closure: No effect on the health and safety of mine workers or local residents expected because the Project will be designed in consideration of avoiding the potential for operational failures that could lead to injury of workers and in consideration of providing a safe environment for local residents outside the Project.
	Health and safety of local residents			

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Overall Operational Health and Safety Ranking <i>Not a key differentiating factor – the potential for effects is comparable across all identified alternatives.</i>		Neutral No effect on health and safety anticipated because the Project will be designed in consideration of providing a safe environment for mine workers and local residents.	Neutral No effect on health and safety anticipated because the Project will be designed in consideration of providing a safe environment for mine workers and local residents.	Neutral No effect on health and safety anticipated because the Project will be designed in consideration of providing a safe environment for mine workers and local residents.
Economic Environment				
Cost	Capital cost, Operational/maintenance cost, Rehabilitation/closure cost	Construction: Infrastructure costs are anticipated to be relatively comparable across alternatives. Operation: The use of reclaim water would reduce the cost of treating TMF and contact water prior to discharging. Closure: Closure or removal of existing infrastructure or facilities would not result in substantially different closure costs between alternatives.	Construction: Infrastructure costs are anticipated to be relatively comparable across alternatives. Operation: The use of water from the historical underground workings would reduce the cost of treating the water prior to discharging. Ongoing pumping costs would be required for Project dewatering regardless of the use of this alternative. Closure: Closure or removal of existing infrastructure or facilities would not result in substantially different closure costs between alternatives.	Construction: Infrastructure costs are anticipated to be relatively comparable across alternatives. Operation: Comparable costs associated with the taking of water from a surface water source, but no treatment efficiencies for other water management needs. Closure: Closure or removal of existing infrastructure or facilities would not result in substantially different closure costs between alternatives.
Overall Cost Ranking <i>Key differentiating factor – the potential for effects is different between identified alternatives.</i>		Advantage Reduced cost of treating effluent discharge because water from the TMF is being recycled and contact water is being reused to the extent feasible.	Advantage Reduced cost of treating effluent discharge by using a reclaim system.	Disadvantage No treatment efficiencies for other water management needs.
Labour and Economy	Change in labour Change in economy	Construction/Operation/Closure: The labour force required for the installation of all alternative methods would be comparable. No effects on local economic income or municipal government revenue are anticipated because the potential income to local businesses would be minimal and no municipal taxes would be required.	Construction/Operation/Closure: The labour force required for the installation of all alternative methods would be comparable. No effects on local economic income or municipal government revenue are anticipated because the potential income to local businesses would be minimal and no municipal taxes would be required.	Construction/Operation/Closure: The labour force required for the installation of all alternative methods would be comparable. No effects on local economic income or municipal government revenue are anticipated because the potential income to local businesses would be minimal and no municipal taxes would be required.
Overall Labour and Economy Ranking <i>Not a key differentiating factor – the potential for effects is comparable across all identified alternatives.</i>		Neutral No substantial changes in labour or economy are expected because there will be no change in employment or contribution to the local economy.	Neutral No substantial changes in labour or economy are expected because there will be no change in employment or contribution to the local economy.	Neutral No substantial changes in labour or economy are expected because there will be no change in employment or contribution to the local economy.
Technical Feasibility	Ability to implement /commonly used technology in similar applications	Construction: Proven technology. Water collection systems and associated piping are commonly installed in mining sites. Operation: Proven technology. Water management would be required regardless of whether it is used as a reclaim source. Closure: Proven technology. Pumping of the collection ponds to the open pit is within ability of Greenstone Gold Mines GP Inc. to implement.	Construction: Proven technology. Dewatering infrastructure and associated piping are commonly installed in mining sites. Operation: Proven technology. Active dewatering is commonly implemented in mining sites. Closure: Proven technology. Dewatering systems are commonly decommissioned.	Construction: Proven technology. Surface water intake systems and associated piping are commonly installed. Operation: Proven technology. Surface water is commonly used as a water source. Closure: Proven technology. Surface water intake systems are commonly decommissioned.
	Effectiveness/reliability	Construction: The construction of all alternatives will enhance the long-term viability of the Project. Operation: The use of reclaim water provides a reliable source of process water, but may require a supplemental source to meet full process demands. Closure: The decommissioning of all alternatives involves effective and reliable technology.	Construction: The construction of all alternatives will enhance the long-term viability of the Project. Operation: The use of historical underground workings provides a reliable source of process water and an increase in storage capability for a reclaim system. Closure: The decommissioning of all alternatives involves effective and reliable technology.	Construction: The construction of all alternatives will enhance the long-term viability of the Project. Operation: Effective and reliable to meet process water demand. Closure: The decommissioning of all alternatives involves effective and reliable technology.
Overall Technical Feasibility Ranking <i>Not a key differentiating factor – the potential for effects is comparable across all identified alternatives.</i>		Neutral Technically feasible and provides an effective and reliable method to meet process water demands, in combination with dewatering from underground workings.	Neutral Technically feasible and provides an effective and reliable method to meet process water demands as a supplemental source for reclaim water.	Neutral Technically feasible and provides an effective and reliable method to meet process water demands.

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Cultural Environment				
Heritage Resources	Change in archaeological sites	Construction/Operation/Closure: No change in archaeological sites, architectural resources or historical resources expected because any infrastructure required will be localized to the PDA, and will not result in any additional removal, disruption or displacement of known archaeological sites or architectural or historical resources.	Construction/Operation/Closure: No change in archaeological sites, architectural resources or historical resources expected because any infrastructure required will be localized to the PDA, and will not result in any additional removal, disruption or displacement of known archaeological sites or architectural or historical resources.	Construction/Operation/Closure: No change in archaeological sites, architectural resources or historical resources expected because source would be sited to avoid known archaeological sites or architectural or historical resources.
	Change in architectural or historical resources			
Overall Heritage Resources Ranking <i>Not a key differentiating factor – the potential for effects is comparable across all identified alternatives.</i>		Neutral No effects on heritage resources are anticipated because installation effects would be limited to the PDA and there will be no additional removal, disruption or displacement of known archaeological sites or architectural or historical resources.	Neutral No effects on heritage resources are anticipated because installation effects would be limited to the PDA and there will be no additional removal, disruption or displacement of known archaeological sites or architectural or historical resources.	Neutral No effects on heritage resources are anticipated because a source would be sited to avoid additional removal, disruption or displacement of known archaeological sites or architectural or historical resources.
Traditional Land and Resource Use	Change in Aboriginal communities' cultural practices	Construction/Operation/Closure: Any infrastructure required will be localized to the PDA, and is not anticipated to result in any additional effects on the use of cultural or spiritual sites or traditional land use areas.	Construction/Operation/Closure: Any infrastructure required will be localized to the PDA, and is not anticipated to result in any additional effects on the use of cultural or spiritual sites or traditional land use areas.	Construction/Operation/Closure: Any infrastructure required will be localized to the PDA, but navigation would be restricted around surface water intake structure. Navigation restrictions around surface water intake structure in Kenogamisis Lake, which has been identified as a fishing area by Long Lake #58 First Nation and the Métis Nation of Ontario.
	Change in Aboriginal communities' traditional land uses (including hunting, fishing, trapping and harvesting)			
Overall Traditional Land and Resource Use Ranking <i>Not a key differentiating factor – the potential for effects is comparable across all identified alternatives.</i>		Advantage No effects on traditional land and resource use are anticipated because infrastructure will be localized to the PDA or near vicinity, and will not result in additional effects on traditional land and resource use.	Advantage No effects on traditional land and resource use are anticipated because infrastructure will be localized to the PDA or near vicinity, and will not result in additional effects on traditional land and resource use.	Disadvantage Navigation restrictions around surface water intake structure.
Built Environment				
Land and Resource Use	Change in recreational land and resource use	Construction/Operation/Closure: Any infrastructure required will be localized to the PDA, and is not anticipated to result in any additional land and resource access or navigation restrictions.	Construction/Operation/Closure: Any infrastructure required will be localized to the PDA, and is not anticipated to result in any additional land and resource access or navigation restrictions.	Construction/Operation/Closure: Any infrastructure required will be localized to the PDA, but navigation would be restricted around surface water intake structure.
	Change in navigation			
	Change in commercially-based land and resource uses			
Overall Land and Resource Use Ranking <i>Key differentiating factor – the potential for effects is different between identified alternatives.</i>		Advantage No effects on land and resource use are anticipated because infrastructure will be localized to the PDA or near vicinity and will not result in additional land and resource access or navigation restrictions.	Advantage No effects on land and resource use are anticipated because infrastructure will be localized to the PDA or near vicinity and will not result in additional land and resource access or navigation restrictions.	Disadvantage Navigation restrictions around surface water intake structure.

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OVERALL ALTERNATIVE RANKING BASED ON KEY DIFFERENTIATING FACTORS

Key Differentiating Factors	Reclaim water recycled from TMF and contact water collection system	Dewatering from Historical Underground Workings	Surface Water Takings
Groundwater	Advantage - No effects on groundwater anticipated because reclaim water from the TMF and contact water collection system will not require groundwater taking.	Advantage - No effects on groundwater anticipated because recycling water from the historical underground workings is required for open pit development.	Disadvantage - Potential for localized effects on GUDI well levels and quality due to the substantial water taking from Kenogamisis Lake and its potential influence on groundwater.
Surface Water	Advantage - The use of contact water and TMF reclaim systems will limit Project effects on surface water quality.	Advantage - The use of contact water and TMF reclaim systems will limit Project effects on surface water quality.	Disadvantage - Higher potential for effects on surface water due to increased water management requirements.
Fish and Fish Habitat	Advantage - No effects on fish or fish habitat are anticipated because the construction and decommissioning of the contact water collection system would not interact with fish or fish habitat. No parameters of potential concern affecting fish health are anticipated to be discharged to the aquatic environment.	Advantage - No effects on fish or fish habitat are anticipated because the construction and decommissioning of the dewatering system would not interact with fish or fish habitat. No parameters of potential concern affecting fish health are anticipated to be discharged to the aquatic environment.	Disadvantage - Higher potential for negative effects on fish habitat due to volume of water required from a fresh water source resulting in reductions in baseflows to creeks and wetlands, resulting in reduced habitat quantity and potentially quality.
Cost	Advantage - Reduced cost of treating effluent discharge because water from the TMF is being recycled and contact water is being reused to the extent feasible.	Advantage - Reduced cost of treating effluent discharge by using a reclaim system.	Disadvantage - No treatment efficiencies for other water management needs.
Traditional Land and Resource Use	Advantage - No effects on traditional land and resource use are anticipated because infrastructure will be localized to the PDA or near vicinity, and will not result in additional effects on traditional land and resource use.	Advantage - No effects on traditional land and resource use are anticipated because infrastructure will be localized to the PDA or near vicinity, and will not result in additional effects on traditional land and resource use.	Disadvantage - Navigation restrictions around surface water intake structure.
Land and Resource Use	Advantage - No effects on land and resource use are anticipated because infrastructure will be localized to the PDA or near vicinity and will not result in additional land and resource access or navigation restrictions.	Advantage - No effects on land and resource use are anticipated because infrastructure will be localized to the PDA or near vicinity and will not result in additional land and resource access or navigation restrictions.	Disadvantage - Navigation restrictions around surface water intake structure
OVERALL	PREFERRED - IN COMBINATION (provides an effective water supply, but will not meet mill demand alone)	PREFERRED - IN COMBINATION (provides a viable secondary source water supply while limiting the potential for environmental effects)	NOT PREFERRED