

---

**AMENDED EIS/EA REPORT  
CHAPTER 4: ASSESSMENT OF ALTERNATIVES  
VERSION 3**

---



# TABLES

**AMENDED EIS/EA REPORT  
CHAPTER 4: ASSESSMENT OF ALTERNATIVES  
VERSION 3**



**Table 4-1: Alternative Means of Carrying Out the Project Assessed for the Hammond Reef Gold Project**

Project Component	Project Aspect	Alternative Means Assessed
Ore Processing Facility	Ore Processing Method	Use of a cyanide destruction circuit
		Natural degradation of cyanide
Sewage Treatment Facility	Site Location	Single centrally-located facility
		Dedicated facilities for the camp and the mine site area
	Sewage Treatment Technology	Septic tank and tile field
		Pre-engineered and designed sewage treatment plant (Packaged plant)
Water Management	Water Discharge Location	Underwater pipeline with discharge to Lynxhead Bay Narrows
		Overland pipeline with discharge to Lynxhead Bay
		Overland pipeline to the northwest with discharge into the central portion of Sawbill Bay
		Overland pipeline to the south with discharge to the south end of Sawbill Bay
Access Road	Access Road Alignment	Hardtack/Sawbill Road
		Raft Lake Road
Power Supply	Transmission Line Alignment	Transmission line along Hardtack/Sawbill Road
		Transmission line along Raft Lake Road
		Transmission line along Hardtack/Sawbill Road and crossing Sawbill Bay
Office and Support Facilities	Worker Accommodation	On-site worker accommodation camp
		Off-site worker accommodation

**Table 4-2: Summary of Preferred Alternative Means of Carrying out the Hammond Reef Gold Project**

Project Component	Preferred Alternative
Ore processing method	Processing using cyanide including a cyanide destruction circuit
Project transmission line	Transmission line along Hardtack/Sawbill Road and crossing Sawbill Bay
Sewage treatment facility location	Dedicated facilities for the camp and the Mine
Sewage treatment technology	Package sewage treatment plant
Water discharge location	Overland pipeline to the south with discharge to the south end of Sawbill Bay
Access road	Hardtack/Sawbill Road
Worker accommodation	On-site worker accommodation camp
Tailings Deposition	Thickened tailings

**AMENDED EIS/EA REPORT  
CHAPTER 4: ASSESSMENT OF ALTERNATIVES  
VERSION 3**



**Table 4-3: Mine Waste Disposal Alternatives Assessed for the Hammond Reef Gold Project**

Project Aspect	Alternatives to Be Assessed
Tailings Management Facility siting	Tailings Management Facility Alternative 1
	Tailings Management Facility Alternative 2
	Optimized Base Case (TMF Alternative 3)
Waste Rock Stockpile Siting	Waste rock stockpile 1
	Waste rock stockpile 2
	Waste rock stockpile 3
	Waste rock stockpile 4 (suggested by EC)

**Table 4-4: Indicators Added to the Assessment based on Consultation with the Government Review Team**

Account or Sub-Account	Suggested Indicator	Added to Assessment?
Terrestrial Habitat	Impact on terrestrial flora and fauna	Yes
	Potential effects on wildlife	Yes
	Potential effects on bird habitat	Yes
Aquatic Habitat	Permanent streams impacted	Yes
	Ephemeral streams impacted	Yes
	Indirect impacts such as downstream flow reductions	Yes (indirectly through impacts to streams and fish-bearing lakes)
	Number of fish-bearing lakes affected	Yes
Economic	Area of fish-bearing lakes affected	Yes
	Capital and operating costs provided in dollars	Yes
Socio-Economic	Aboriginal and Public Perception/Opinion	<ul style="list-style-type: none"> <li>■ Considered on an ongoing basis without including in accounting format.</li> <li>■ Detailed in Chapter 7 of the EIS/EA Report and Section 2.5 of this report.</li> </ul>
	Effects on land use such as hunting, fishing and tourism	Yes
Technical	Seismic risks	Considered to be non-distinguishing

**AMENDED EIS/EA REPORT  
CHAPTER 4: ASSESSMENT OF ALTERNATIVES  
VERSION 3**



**Table 4-5: Aboriginal Community Concern Concordance Table with Multiple Accounts  
Assessment Account/Sub-account**

<b>Community</b>	<b>Concern</b>	<b>Corresponding MAA (Account/Sub-account)</b>
Seine River First Nation	Water Quality	Environment/Water Resources
	Aquatic biology	Environment/Aquatic Habitat
	Terrestrial Biology	Environment/Terrestrial Habitat
	Hydrology	Environment/Water Resources
	Closure Planning	Technical/Closure
Naicatchewenin First Nation	Tailings and water management	Technical/Water Management & Technical/Complexity of Design and Construction
	Water quality	Environment/Water Resources
Mitaanjigamiing First Nation	Ground water	Environment/Water Resources
	Mitta Lake	<i>Environment/Aquatic Habitat</i>
	Air Quality	Environment/Air Quality
Lac des Mille Lacs First Nation	Mitta Lake	Environment/Aquatic Habitat
	Water management	Technical/Water Management
	Ore processing	Not included in Mine Waste Disposal Assessment – Considered in Alternative Means for the Project in Chapter 4
	Tailings management	Technical/Complexity of Design and Construction

**AMENDED EIS/EA REPORT  
CHAPTER 4: ASSESSMENT OF ALTERNATIVES  
VERSION 3**



**Table 4-5: Aboriginal Community Concern Concordance Table with Multiple Accounts  
Assessment Account/Sub-account**

<b>Community</b>	<b>Concern</b>	<b>Corresponding MAA (Account/Sub-account)</b>
Metis Nation of Ontario	Mitta Lake	<i>Environment/Aquatic Habitat</i>
	Aquatic biology	<i>Environment/Aquatic Habitat</i>
	Terrestrial biology	Environment/Terrestrial Habitat
	Socio-economics	Socio-economics/Effects on Land Use
	Traditional Use Study	Socio-economics/Archaeology & Socio-economics/Effects on Land Use
	Closure planning	Technical/Closure
	Project Alternatives	
	Transmission line	Not included in Mine Waste Disposal Assessment – Considered in Alternative Means for the Project in Chapter 4
	Workers camp	Not included in Mine Waste Disposal Assessment – Considered in Alternative Means for the Project in Chapter 4
	Ore Processing	Not included in Mine Waste Disposal Assessment – Considered in Alternative Means for the Project in Chapter 4
	Tailings management	Technical/Complexity of Design and Construction
	Harvesting access	Socio-economics/Effects on Land Use
	Community consultation	Not included in Mine Waste Disposal Assessment – Considered in Chapter 7
EA Methods	Not included in Mine Waste Disposal Assessment – Considered in Chapter 2	

**AMENDED EIS/EA REPORT  
CHAPTER 4: ASSESSMENT OF ALTERNATIVES  
VERSION 3**



**Table 4-6: Environmental Multiple Accounts Assessment**

Account	Sub-Account	Indicator	Metric	Unit
Environmental	Terrestrial Habitat	Impact on flora and fauna due to WRMF infrastructure	Haul road footprint length	m
		Impact on flora and fauna due to WRMF footprint	WRMF footprint area	km <sup>2</sup>
		Effects on wildlife	Distance from mine pits	km
		Effects on bird habitat	Qualitative Rank	-
	Water Resources	Impact on surface water	Number of watersheds affected	#
		Ability to limit impact on Sawbill Bay and Lynxhead Bay	Qualitative Rank	-
		Impact to groundwater	Number of collection ponds required	#
	Aquatic Habitat	Number of stream crossings by haul road	Value	#
		Permanent streams impacted	Length of stream impacted	M
		Ephemeral Streams Impacted	Length of stream impacted	M
		Number of fish-bearing lakes affected	Value	#
		Area of fish-bearing lakes affected	Area	Ha
	Air Quality	Potential for dust generation	Life of Mine Dust Emissions	M-Kg
		Potential for greenhouse gas emission	Life of Mine CO <sub>2</sub> Emissions	tonnes
	Noise	Haul road distance	Length of haul roads	M

**Table 4-7: Technical Multiple Accounts Assessment**

Account	Sub-Account	Indicator	Metric	Unit
Technical	Complexity of Design and Construction	Foundation conditions	Qualitative Rank	-
		Topography containment	Qualitative Rank	-
		Maximum height	Maximum height of stockpile	m
		Potential impact to other infrastructure	Qualitative Rank	#
	Water Management	Number of potential collection ponds required	Value	#
		Seepage collection ditches	Length of seepage collection ditches	km
	Closure	Complexity of closure	Slope Area	#

**AMENDED EIS/EA REPORT  
CHAPTER 4: ASSESSMENT OF ALTERNATIVES  
VERSION 3**



**Table 4-8: Economics Multiple Accounts Assessment**

Account	Sub-Account	Indicator	Metric	Unit
Economics	Capital Cost	Total estimated capital cost	Dollar value	\$
	Operating Cost	Total estimated operational costs per year	Dollar value per year	\$/year
	Closure Cost	Total estimated closure cost	Dollar value	\$
	Fish Habitat Compensation	Total estimated fish habitat compensation cost	Dollar value	\$

**Table 4-9: Socio-economics Multiple Accounts Assessment**

Account	Sub-Account	Indicator	Metric	Unit
Socio-Economics	Archaeology	Effects on cultural heritage sites	Number of areas with archaeological potential	#
	Visual Impacts	Maximum height of stockpile	Height	M
		Minimum Distance from Marmion Reservoir	Length	M
	Land Claims	Number of known claims	Value	#
	Effects on Land Use	Effects on hunting	Number of trap lines, trapper cabins and/or bear baiting stations	#
		Effects on fishing	Number of fish bearing lakes and/or permanent streams	#

**Table 4-10: Base Case and Sensitivity Analysis Results**

Sensitivity Case		WRMF 1	WRMF 2	WRMF 3	WRMF 4
Base Case	Guideline recommended account weighting	3.1	3.9	4.2	3.6
Sensitivity Case 1	Economics removed	3.2	4.0	4.2	3.8
Sensitivity Case 2	Only environmental and socio-economic accounts considered	3.0	4.2	4.3	3.7
Sensitivity Case 3	All accounts weighted equally	3.2	3.8	4.2	3.5
Sensitivity Case 4	All weighting factors (i.e., accounts, sub-accounts, indicators) weighted equally	3.3	3.8	4.1	3.9

**AMENDED EIS/EA REPORT  
CHAPTER 4: ASSESSMENT OF ALTERNATIVES  
VERSION 3**



**Table 4-11: Environmental Multiple Accounts Assessment**

Account	Sub-Account	Indicator	Metric	Unit
Environmental	Terrestrial Habitat	Impact on flora and fauna due to TMF infrastructure	Length of tailings pipeline	km
		Impact on flora and fauna due to TMF footprint	TMF footprint area	ha
		Percentage of pipeline following existing road	Percent	%
		Effects on wildlife	Qualitative Rank	-
		Effects on birds	Qualitative Rank	-
	Aquatic Habitat	Number of stream crossings by tailings pipeline	Value	#
		Permanent streams impacted	Length of stream impacted	m
		Ephemeral streams impacted	Length of stream impacted	m
		Number of fish-bearing lakes affected	Value	#
		Area of fish-bearing lakes affected	Area	ha
	Water Resources	Impact on surface water	Number of watersheds affected	#
		Ability to limit impact to water quality in surrounding water bodies	Qualitative Rank	-
		Impact to groundwater	Number of collection ponds required	#
	Air Quality	Potential for dust generation	Tailings surface area	ha
		Potential for greenhouse gas emission due to construction	Distance from waste rock stockpile	km

**Table 4-12: Technical Multiple Accounts Assessment**

Account	Sub-Account	Indicator	Metric	Unit
Technical	Complexity of Design and Construction	Foundation conditions	Qualitative Rank	-
		Topography containment	Dam fill volume	-
		Pumping requirements	Tailings pipeline length	m
		Percentage of pipeline following existing road	Percent	%
		Tailings pipeline length	Length	m
		Geotechnical Risk	Maximum height of dams	m
		Dam hazard classification	Dam Class based on CDA Dam Safety Guidelines	-
	Water Management	Net run-off from tailings area	Area of tailings	ha
		Number of collection ponds required	Value	#
		Seepage collection ditches	Length of seepage collection ditches	km
	Closure	Complexity of closure	Qualitative Rank	-



**AMENDED EIS/EA REPORT  
CHAPTER 4: ASSESSMENT OF ALTERNATIVES  
VERSION 3**



**Table 4-13: Economics Multiple Accounts Assessment**

Account	Sub-Account	Indicator	Metric	Unit
Economics	Capital Cost	Total estimated capital cost	Dollar value	\$
	Operating Cost	Total estimated annual operating cost	Dollar value per year	\$/year
	Closure Cost	Total estimated closure cost	Dollar value	\$
	Fish Habitat Compensation	Total estimated fish habitat compensation cost	Dollar value	\$

**Table 4-14: Socio-economics Multiple Accounts Assessment**

Account	Sub-Account	Indicator	Metric	Unit
Socio-Economics	Archaeology	Effects on cultural heritage sites	Number of areas with archaeological potential	#
	Visual Impacts	Maximum height of TMF	Height	m
		Distance from Marmion Reservoir	Distance	m
	Land Claims	Number of known claims	Value	#
	Effects on Land Use	Effects on hunting	Number of trap lines, trapper cabins and/or bear baiting stations	#
		Effects on fishing	Number of fish bearing lakes and/or permanent streams	#
		Effects on tourism and recreation	Number of tourism establishments and/or known camping areas	#

**Table 4-15: Base Case and Sensitivity Analysis Results**

Sensitivity Case		TMF 1	TMF 2	TMF 3
Base Case	Guideline recommended account weighting	3.1	3.2	<b>3.9</b>
Sensitivity Case 1	Economics removed	3.2	3.3	<b>3.9</b>
Sensitivity Case 2	Only environmental and socio-economic accounts considered	3.2	3.4	<b>4.0</b>
Sensitivity Case 3	All accounts weighted equally	3.2	3.1	<b>3.9</b>
Sensitivity Case 4	All weighting factors (i.e., accounts, sub-accounts, indicators) weighted equally	3.3	3.5	<b>4.1</b>

**AMENDED EIS/EA REPORT  
 CHAPTER 4: ASSESSMENT OF ALTERNATIVES  
 VERSION 3**



**Table 4-16: Summary of Preferred Alternative Means of Carrying out the Hammond Reef Gold Project**

<b>Project Component</b>	<b>Preferred Alternative</b>
Ore processing method	Processing using cyanide including a cyanide destruction circuit
Project transmission line	Transmission line along Hardtack/Sawbill Road and crossing Sawbill Bay
Sewage treatment facility location	Dedicated facilities for the camp and the Mine
Sewage treatment technology	Package sewage treatment plant
Water discharge location	Overland pipeline to the south with discharge to the south end of Sawbill Bay
Access road	Hardtack/Sawbill Road
Worker accommodation	On-site worker accommodation camp
Tailings Deposition	Thickened tailings
Tailings management facility	“Optimized “Base Case”, located approximately 9 km northeast of the processing plant (TMF 3)
Waste rock management facility	Located immediately east of the open pit and mine processing plant (WRMF 3)

---

**AMENDED EIS/EA REPORT  
CHAPTER 4: ASSESSMENT OF ALTERNATIVES  
VERSION 3**

---



# FIGURES

# AMENDED EIS/EA REPORT

## CHAPTER 4: ASSESSMENT OF ALTERNATIVES

### VERSION 3

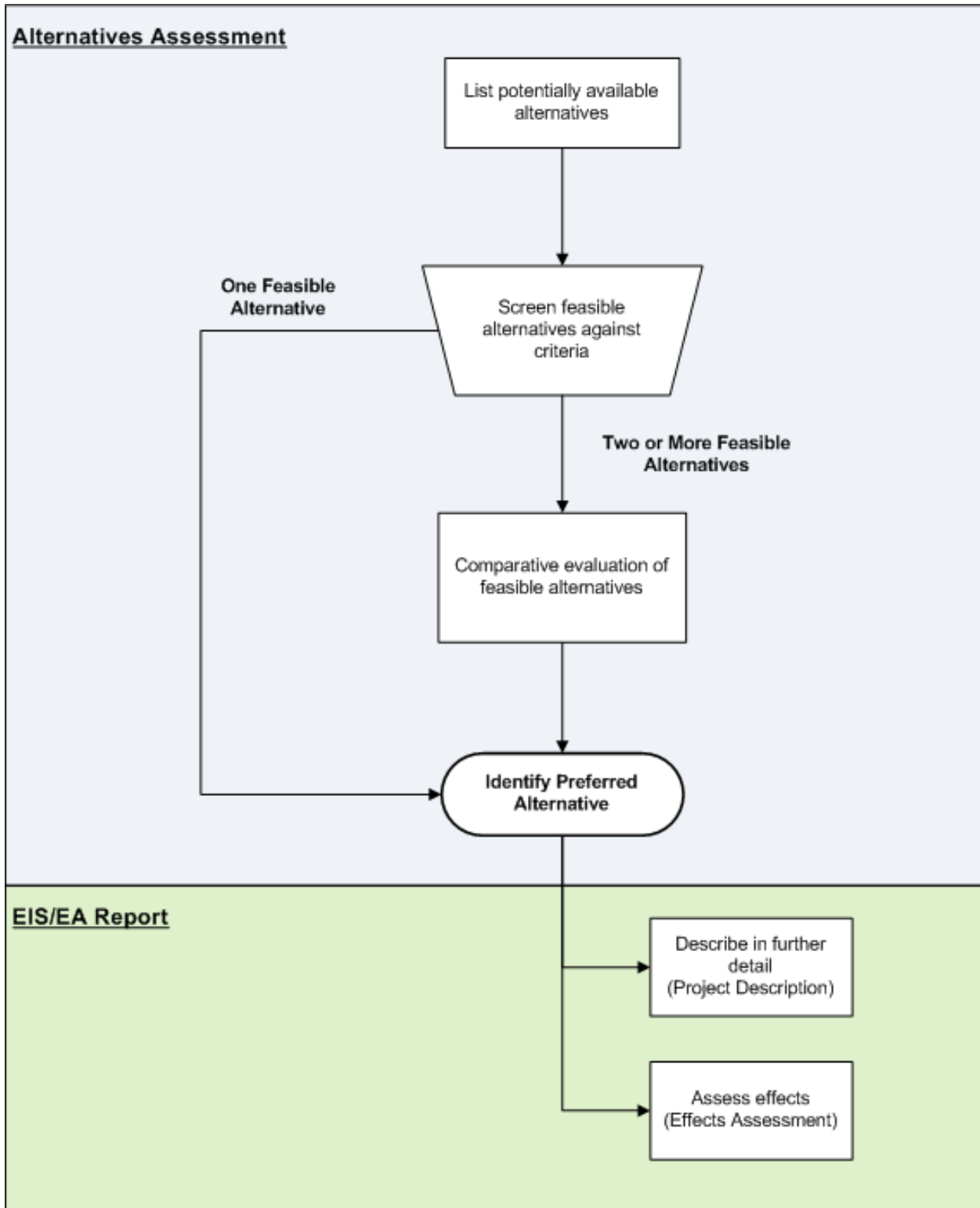
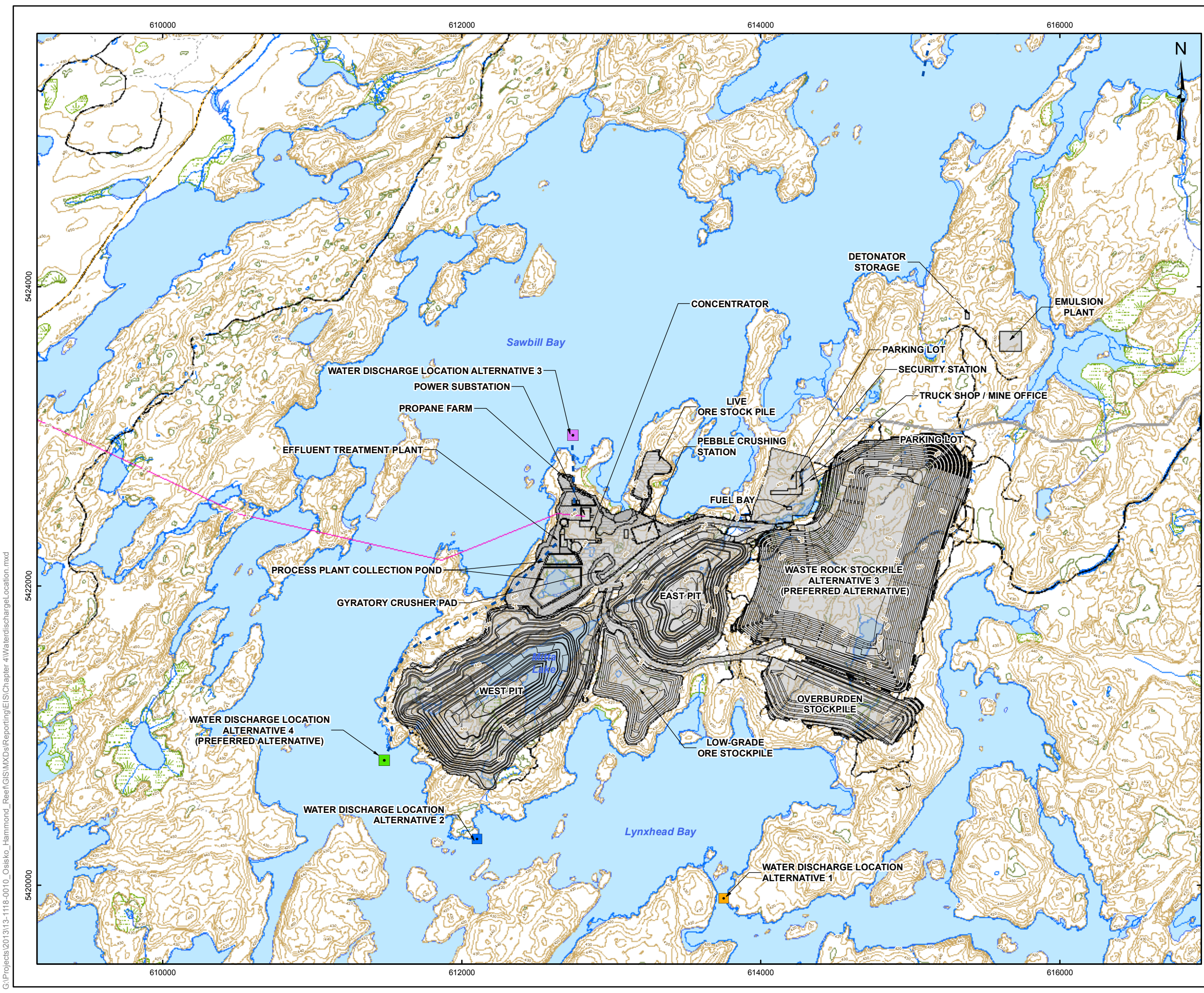


Figure 4-1: Assessment Approach for Alternative Means of Carrying Out the Project



**LEGEND**

- Possible Route for Water Intake or Discharge Line
- Index Contour (5m interval)
- Ditch
- Marsh/Swamp
- River/Stream
- Road
- Trail
- Lake
- Wetland

**Water Discharge Location Alternatives**

- Alternative 1 - Underwater Pipeline with Discharge to Lynxhead Bay Narrows
- Alternative 2 - Overland Pipeline with Discharge to Lynxhead Bay
- Alternative 3 - Overland Pipeline to the Northwest with Discharge into the Central Portion of Sawbill Bay
- Alternative 4 - Overland Pipeline to the South with Discharge to the South End of Sawbill Bay (Preferred Alternative)

— Mine Site Road  
 — Access Road  
 — Project Transmission Line  
 ■ Project Facilities

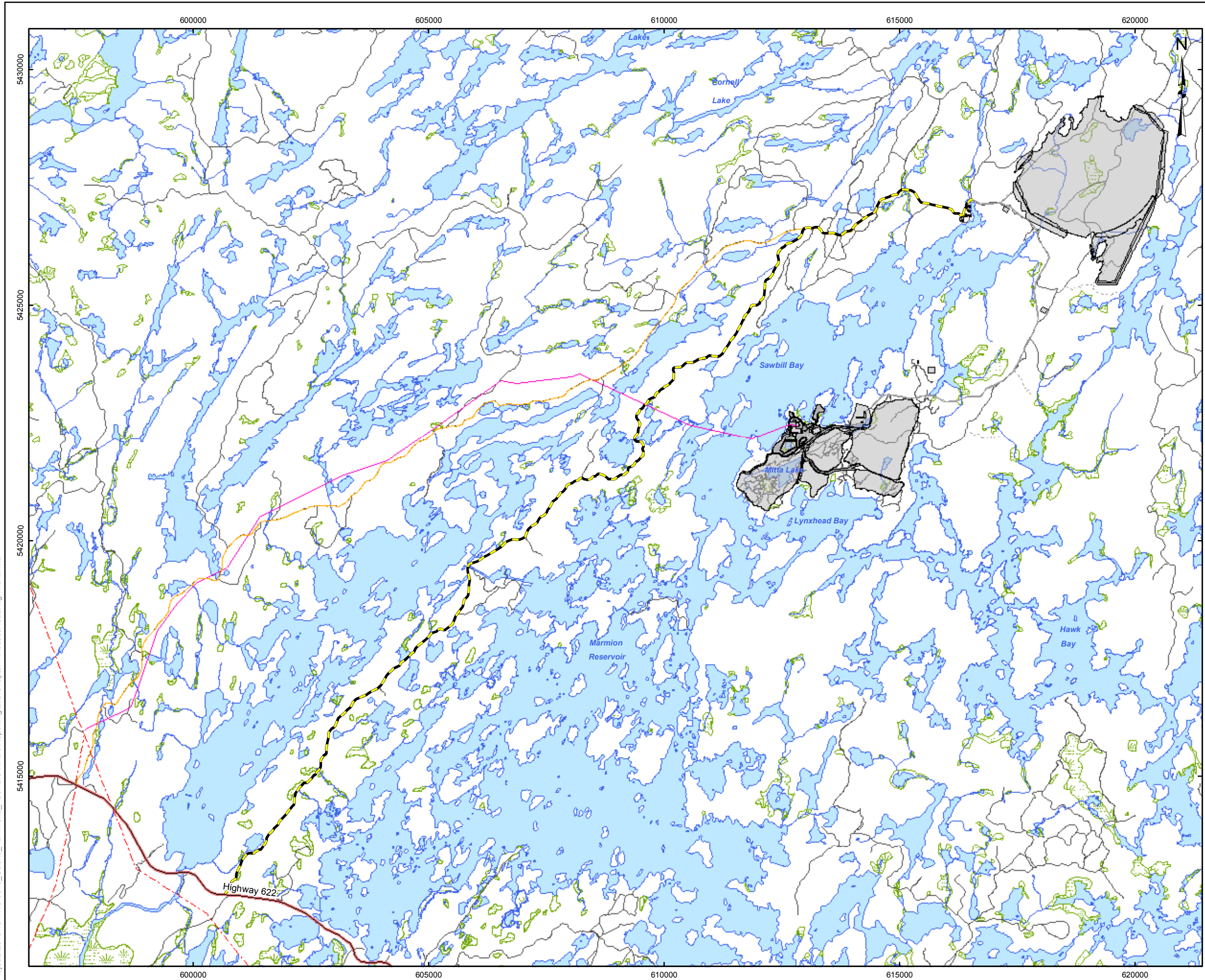
**REFERENCE**

Base Data - Provided by OSISKO Hammond Reef Gold Project Ltd.  
 Base Data - MNR NRVIS, obtained 2004  
 Produced by Golder Associates Ltd under licence from Ontario Ministry of Natural Resources, © Queens Printer 2008  
 Projection: Transverse Mercator Datum: NAD 83 Coordinate System: UTM Zone 15N



<b>PROJECT</b>		HAMMOND REEF GOLD PROJECT ATIKOKAN, ONTARIO, CANADA	
<b>TITLE</b>		WATER DISCHARGE LOCATION ALTERNATIVES	
 Golder Associates Mississauga, Ontario	PROJECT NO. 13-1118-0010	SCALE AS SHOWN	VERSION 2
	DESIGN CGE 14 Nov. 2008		
	GIS JO 2 Dec. 2013		
	CHECK SP 2 Dec. 2013		
REVIEW SP 2 Dec. 2013			FIGURE: 4-2

G:\Projects\2013\13-1118-0010\_Osisko\_Hammond\_Reef\GIS\MXD\Reporting\EIS\Chapter 4\WaterDischargeLocation.mxd



**LEGEND**

- Provincial Highway
- Road
- - - Trail
- - - Power Transmission Line
- River/Stream
- Lake
- Wetland

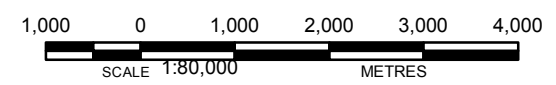
**Access Road Alternatives**

- Alternative 1 - Hardtack / Sawbill Road (Preferred Alternative)
- Alternative 2 - Raft Lake Road

- Mine Site Road
- Project Transmission Line
- Project Facilities

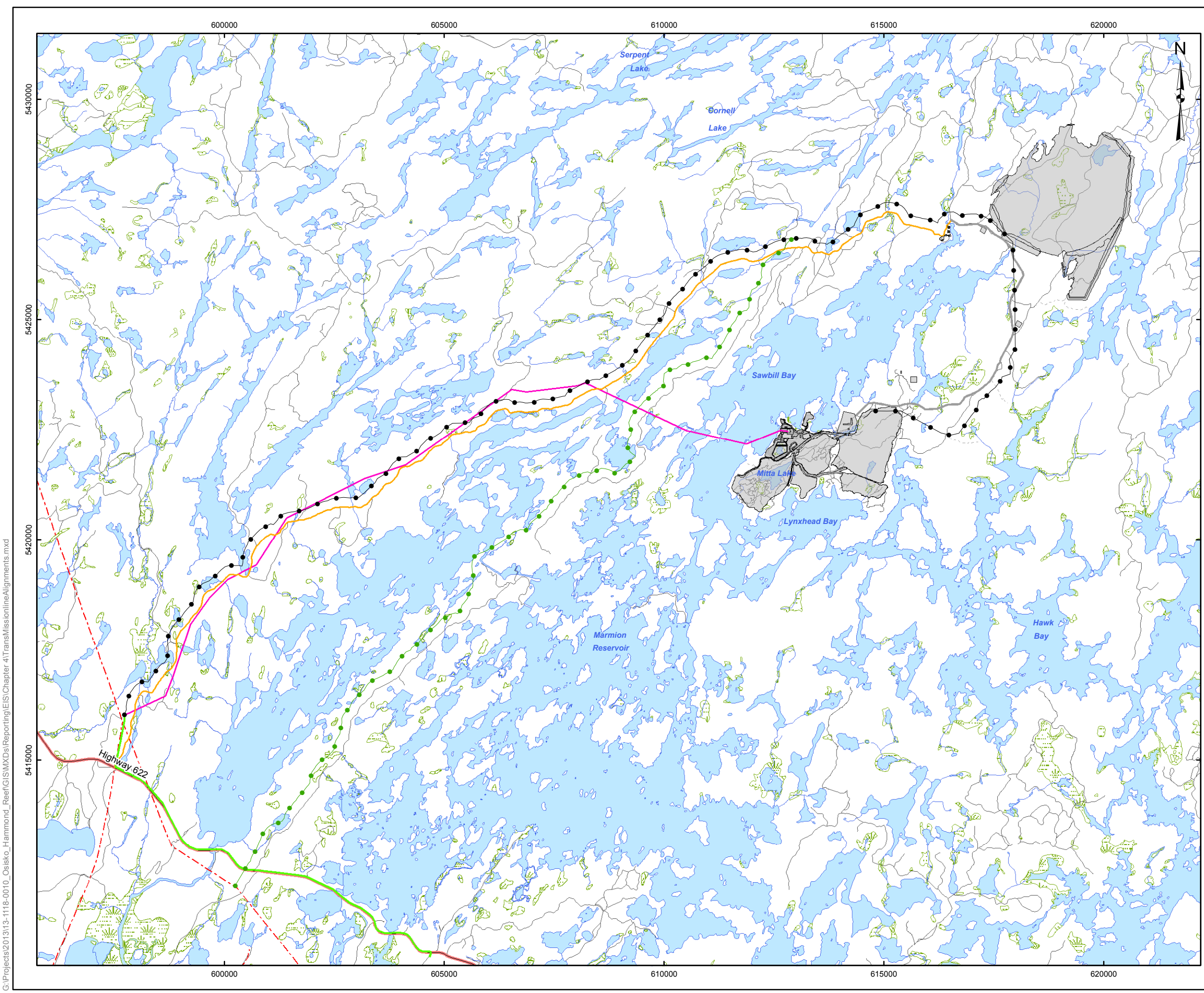
**REFERENCE**

Base Data - Provided by OSISKO Hammond Reef Gold Project Ltd.  
 Base Data - MNR NRVIS, obtained 2004  
 Produced by Golder Associates Ltd under licence from  
 Ontario Ministry of Natural Resources, © Queens Printer 2008  
 Projection: Transverse Mercator Datum: NAD 83 Coordinate System: UTM Zone 15N



<b>PROJECT</b>	<b>HAMMOND REEF GOLD PROJECT ATIKOKAN, ONTARIO, CANADA</b>		
<b>TITLE</b>	<b>ACCESS ROAD ALIGNMENT ALTERNATIVES</b>		
 Golder Associates Mississauga, Ontario	PROJECT NO. 13-1118-0010	SCALE AS SHOWN	VERSION 2
	DESIGN	CGE	14 Nov. 2008
	GIS	JO	2 Dec. 2013
	CHECK	SP	2 Dec. 2013
	REVIEW	SP	2 Dec. 2013
			FIGURE: 4-3

G:\Projects\2013\13-1118-0010\_Osisko\_Hammond\_Reef\GIS\MapDocs\Reporting\EIS\Chapter 4\AccessRoadAlignment.mxd



**LEGEND**

- Provincial Highway
- Road
- - - Trail
- - - Power Transmission Line
- Auxiliary Power Line
- River/Stream
- Lake
- ▨ Wetland

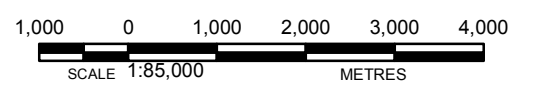
**Transmission Line Alternatives**

- Alternative 1 - Transmission Line Along Hardtack / Sawbill Road
- Alternative 2 - Transmission Line Along Raft Lake Road
- Alternative 3 - Transmission Line Along Hardtack / Sawbill Road and Crossing Sawbill Bay (Preferred Alternative)

- Access Road
- Project Facilities

**REFERENCE**

Base Data - Provided by OSISKO Hammond Reef Gold Project Ltd.  
 Base Data - MNR NRVIS, obtained 2004  
 Produced by Golder Associates Ltd under licence from  
 Ontario Ministry of Natural Resources, © Queens Printer 2008  
 Projection: Transverse Mercator Datum: NAD 83 Coordinate System: UTM Zone 15N



<b>PROJECT</b>	<b>HAMMOND REEF GOLD PROJECT ATIKOKAN, ONTARIO, CANADA</b>		
<b>TITLE</b>	<b>TRANSMISSION LINE ALIGNMENT ALTERNATIVES</b>		
 Golder Associates Mississauga, Ontario	PROJECT NO. 13-1118-0010	SCALE AS SHOWN	VERSION 2
	DESIGN	CGE	14 Nov. 2008
	GIS	JO	2 Dec. 2013
	CHECK	SP	2 Dec. 2013
	REVIEW	SP	2 Dec. 2013
			FIGURE: 4-4

G:\Projects\2013\13-1118-0010\_Osisko\_Hammond\_Reef\GIS\MXDs\Reporting\EIS\Chapter 4\TransmissionLine\Alignments.mxd

616000

617000

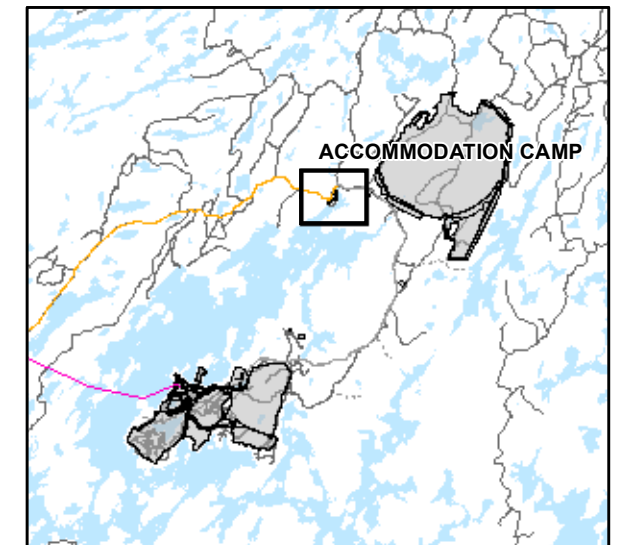


5427000

5427000

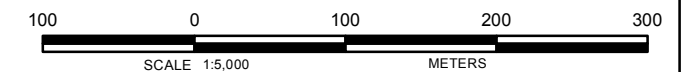
**LEGEND**


- Road
- - - Trail
- Index Contour (5m interval)
- River/Stream
- Lake
- - - Mine Site Road Centre Line
- Access Road
- Project Facilities



**REFERENCE**

Base Data - Provided by OSISKO Hammond Reef Gold Project Ltd  
 Base Data - MNR NRVIS, obtained 2004  
 Produced by Golder Associates Ltd under licence from  
 Ontario Ministry of Natural Resources, © Queens Printer 2008  
 Projection: Transverse Mercator Datum: NAD 83 Coordinate System: UTM Zone 15N



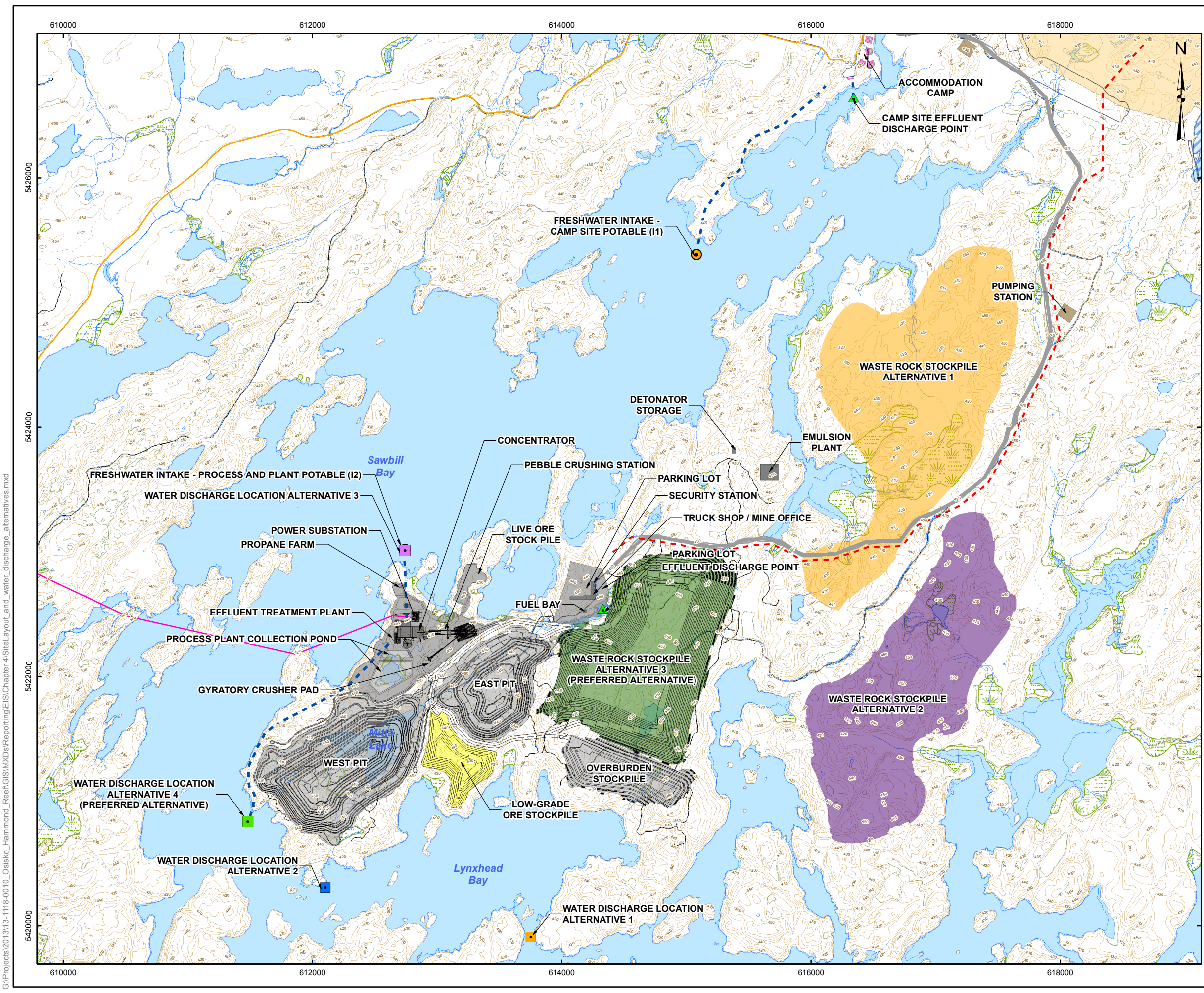
PROJECT		HAMMOND REEF GOLD PROJECT ATIKOKAN, ONTARIO, CANADA	
TITLE		ON-SITE ACCOMMODATION CAMP LOCATION	
 Golder Associates Mississauga, Ontario	PROJECT NO.	13-1118-0010	SCALE AS SHOWN
	DESIGN	CGE 14 Nov. 2008	VERSION 2
	CHECK	SP 2 Dec. 2013	
	REVIEW	SP 2 Dec. 2013	

**FIGURE: 4-5**

616000

617000





**LEGEND**

- ▲ Effluent Discharge Point
- Freshwater Intake - Camp Site Potable
- Freshwater Intake - Process and Plant Potable
- Possible Route for Water Intake or Discharge Line
- Index Contour (5m interval)
- Ditch
- Marsh/Swamp
- River/Stream
- Road
- - - Trail
- Lake
- Wetland

**Water Discharge Location Alternatives**

- Alternative 1 - Underwater Pipeline with Discharge to Lynthead Bay Narrows
- Alternative 2 - Overland Pipeline with Discharge to Lynthead Bay
- Alternative 3 - Overland Pipeline to the Northwest with Discharge into the Central Portion of Sawbill Bay
- Alternative 4 - Overland Pipeline to the South with Discharge to the South End of Sawbill Bay (Preferred Alternative)

**Low-Grade Ore Stockpile**

- Only Alternative

**Waste Rock Stockpile Alternatives**

- Alternative 1
- Alternative 2
- Alternative 3 (Preferred Alternative)

— Mine Site Road  
— Access Road  
— Project Transmission Line  
- - - Tailings Pipeline Alignment  
■ Project Facilities

**REFERENCE**

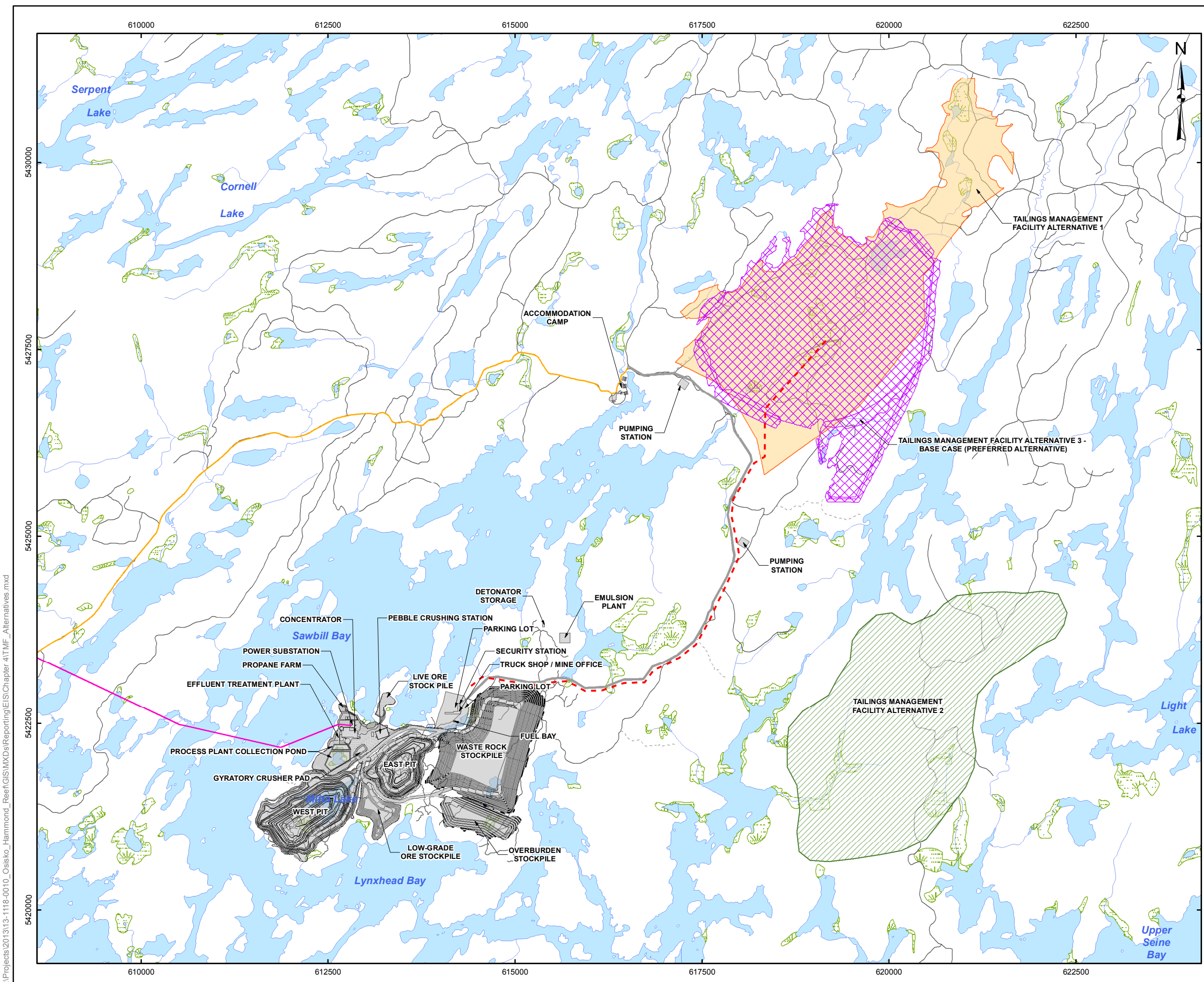
Base Data - Provided by OSISKO Hammond Reef Gold Project Ltd.  
 Base Data - MNR NRVIS, obtained 2004  
 Produced by Golder Associates Ltd under licence from Ontario Ministry of Natural Resources, © Queens Printer 2008  
 Projection: Transverse Mercator Datum: NAD 83 Coordinate System: UTM Zone 15N



PROJECT		HAMMOND REEF GOLD PROJECT ATIKOKAN, ONTARIO, CANADA	
TITLE		WASTE ROCK MANAGEMENT FACILITY SITING ALTERNATIVES	
 Golder Associates Mississauga, Ontario	PROJECT NO.	13-1118-0010	SCALE AS SHOWN
	DESIGN	CGE 14 Nov. 2008	VERSION 2
	CHECK	SP 2 Dec. 2013	
	REVIEW	SP 2 Dec. 2013	

**FIGURE: 4-6**

G:\Projects\2013\13-1118-0010\_Osisko\_Hammond\_Reef\GIS\MXD\Reporting\EIS\Chapter 4\SiteLayout\_and\_water\_discharge\_alternatives.mxd



**LEGEND**

- Road
- River/Stream
- Lake
- Wetland

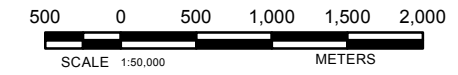
**Tailings Management Facility Alternatives**

- Alternative 1
- Alternative 2
- Alternative 3 - Base Case (Preferred Alternative)

- Tailings Pipeline Alignment
- Mine Site Road
- Access Road
- Project Transmission Line
- Project Facilities

**REFERENCE**

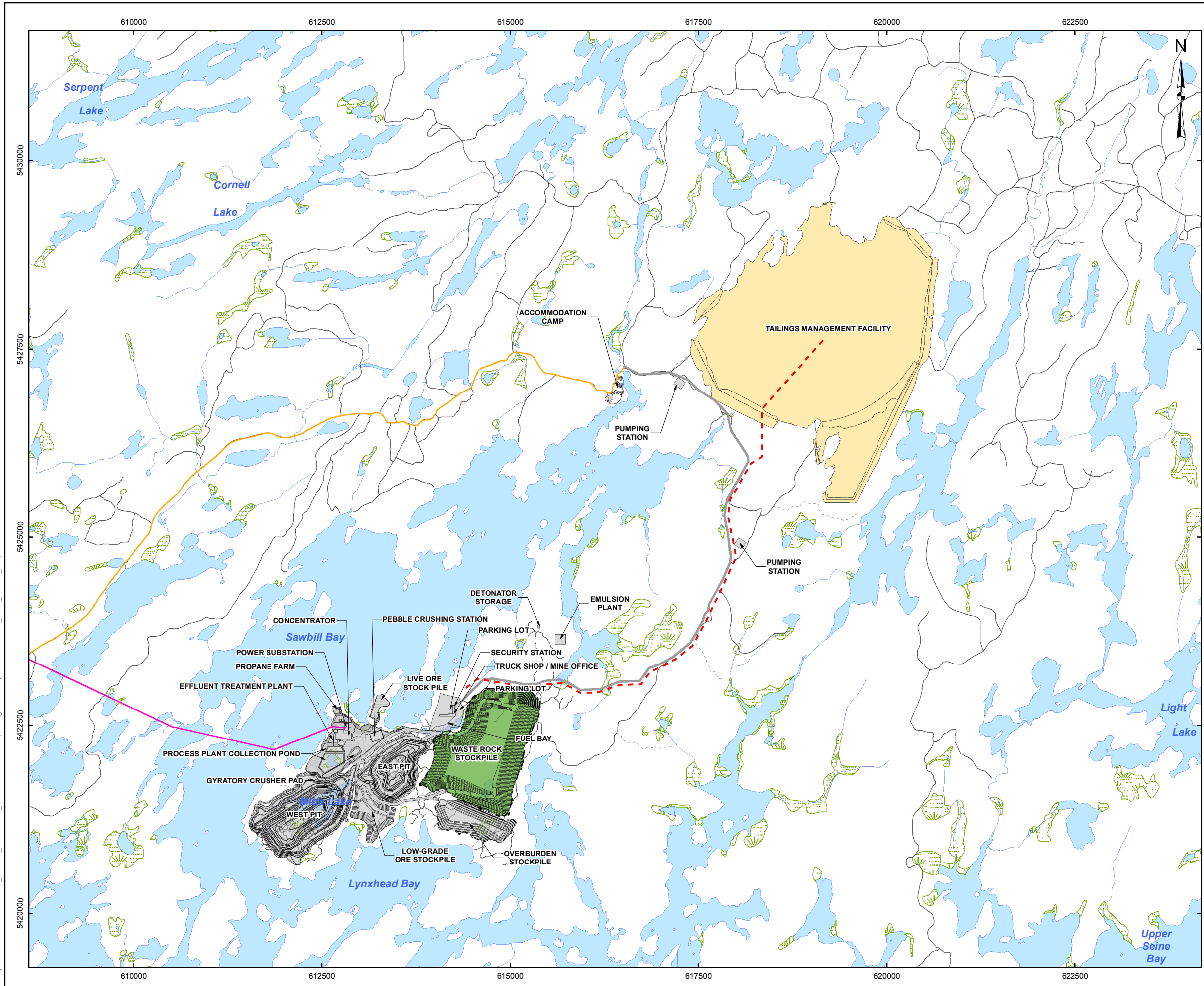
Base Data - Provided by OSISKO Hammond Reef Gold Project Ltd.  
 Base Data - MNR NRVIS, obtained 2004  
 Produced by Golder Associates Ltd under licence from Ontario Ministry of Natural Resources, © Queens Printer 2008  
 Projection: Transverse Mercator Datum: NAD 83 Coordinate System: UTM Zone 15N



PROJECT		HAMMOND REEF GOLD PROJECT ATIKOKAN, ONTARIO, CANADA	
TITLE		TAILINGS MANAGEMENT FACILITY SITING ALTERNATIVES	
<p>Golder Associates Mississauga, Ontario</p>	PROJECT NO. 13-1118-0010	SCALE AS SHOWN	VERSION 2
	DESIGN	CGE	14 Nov. 2008
	GIS	JO	2 Dec. 2013
	CHECK	SP	2 Dec. 2013
	REVIEW	SP	2 Dec. 2013

**FIGURE: 4-7**

G:\Projects\2013\13-1118-0010\_Osisko\_Hammond\_Reef\GIS\MXDs\Reporting\EIS\Chapter 4\TMF\_Alternatives.mxd



**LEGEND**

- Road
- River/Stream
- Lake
- Wetland

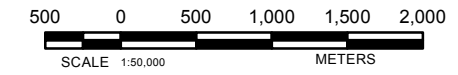
**Preferred Mine Waste Disposal Alternatives**


- - - Tailings Pipeline Alignment
- Waste Rock Stockpile
- Tailings Management Facility

— Mine Site Road  
 — Access Road  
 — Project Transmission Line  
 ■ Project Facilities

**REFERENCE**

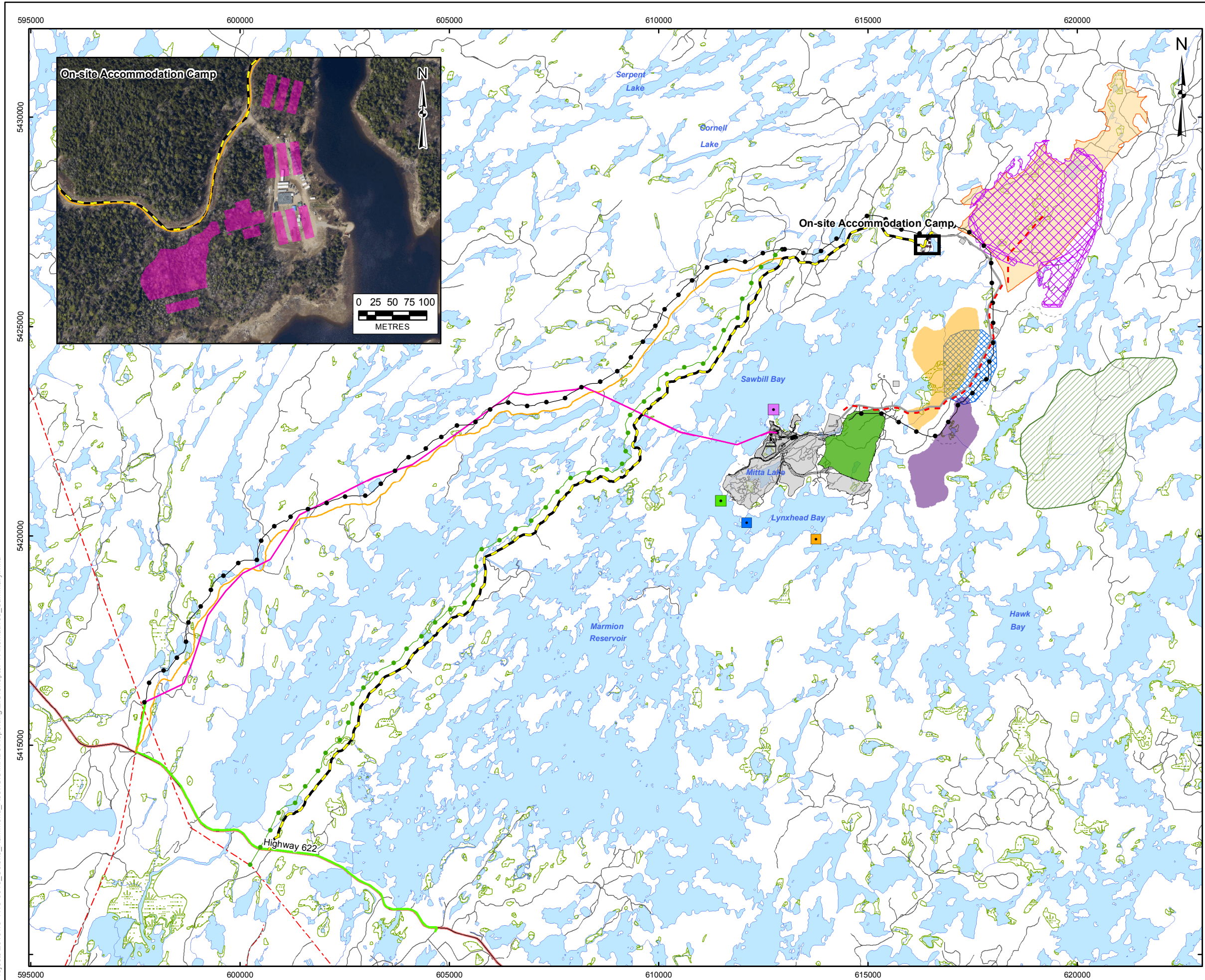
Base Data - Provided by OSISKO Hammond Reef Gold Project Ltd.  
 Base Data - MNR NRVIS, obtained 2004  
 Produced by Golder Associates Ltd under licence from  
 Ontario Ministry of Natural Resources, © Queens Printer 2008  
 Projection: Transverse Mercator Datum: NAD 83 Coordinate System: UTM Zone 15N



PROJECT	HAMMOND REEF GOLD PROJECT ATIKOKAN, ONTARIO, CANADA		
TITLE	PREFERRED MINE WASTE DISPOSAL ALTERNATIVES		
 Golder Associates Mississauga, Ontario	PROJECT NO.	13-1118-0010	SCALE AS SHOWN
	DESIGN	CGE 14 Nov. 2008	VERSION 2
	CHECK	SP 2 Dec. 2013	
	REVIEW	SP 2 Dec. 2013	

**FIGURE: 4-8**

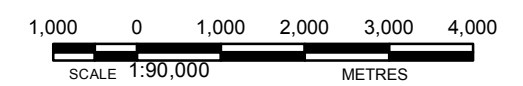
G:\Projects\2013\13-1118-0010\_Osisko\_Hammond\_Reef\GIS\MXDs\Reporting\EIS\Chapter 4\Preferred\_Mine\_Waste\_Disposal.mxd



- LEGEND**
- Provincial Highway
  - Road
  - - - Trail
  - - - Power Transmission Line
  - Auxiliary Power Line
  - River/Stream
  - Lake
  - Wetland
  - - - Tailings Pipeline Alignment
  - Mine Site Road
  - Project Facilities
  - On-site Accommodation Camp
- Water Discharge Location Alternatives**
- Alternative 1 - Underwater Pipeline with Discharge to Lynxhead Bay Narrows
  - Alternative 2 - Overland Pipeline with Discharge to Lynxhead Bay
  - Alternative 3 - Overland Pipeline to the Northwest with Discharge into the Central Portion of Sawbill Bay
  - Alternative 4 - Overland Pipeline to the South with Discharge to the South End of Sawbill Bay (Preferred Alternative)
- Access Road Alternatives**
- Alternative 1 - Hardtack / Sawbill Road (Preferred Alternative)
  - Alternative 2 - Raft Lake Road
- Transmission Line Alternatives**
- Alternative 1 - Transmission Line Along Hardtack / Sawbill Road
  - Alternative 2 - Transmission Line Along Raft Lake Road
  - Alternative 3 - Transmission Line Along Hardtack / Sawbill Road and Crossing Sawbill Bay (Preferred Alternative)
- Waste Rock Stockpile Alternatives**
- Alternative 1
  - Alternative 2
  - Alternative 3 (Preferred Alternative)
- Tailings Management Facility Alternatives**
- Alternative 1
  - Alternative 2
  - Alternative 3 - Base Case (Preferred Alternative)
  - Alternative 4

**REFERENCE**

Base Data - Provided by OSISKO Hammond Reef Gold Project Ltd.  
 Base Data - MNR NRVIS, obtained 2004  
 Produced by Golder Associates Ltd under licence from Ontario Ministry of Natural Resources, © Queens Printer 2008  
 Projection: Transverse Mercator Datum: NAD 83 Coordinate System: UTM Zone 15N



PROJECT		HAMMOND REEF GOLD PROJECT ATIKOKAN, ONTARIO, CANADA	
TITLE		SUMMARY OF ALTERNATIVES	
Golder Associates Mississauga, Ontario	PROJECT NO.	13-1118-0010	SCALE AS SHOWN
	DESIGN	CGE 14 Nov. 2008	VERSION 2
	CHECK	SP 2 Dec. 2013	FIGURE: 4-9
	REVIEW	SP 2 Dec. 2013	

G:\Projects\2013\13-1118-0010\_Osisko\_Hammond\_Reef\GIS\MapDocs\Reporting\EIS\Chapter 4\Alternatives\_Summary.mxd