

**NORTHGATE MINERALS CORPORATION**

**LEAVE TO CONSTRUCT TRANSMISSION FACILITIES**

**RESPONSES TO**

**BOARD STAFF INTERROGATORIES**

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**MAY 31, 2010**

## ALTERNATIVES

### Interrogatory 1

Note: This interrogatory requires that the Applicant, in cases where it cannot answer because it does not have the data, to make a request to Hydro One to respond to all questions, clarifications and requests included below before the deadline.

#### Reference:

- 1.(1) Exh. B/Tab 4/Sch. 1/p. 1/lines 2-5
- 1.(2) Exh. B/Tab 1/Sch. 1/p.1
- 1.(3) Exh. B/Tab 3/Sch. 1/p. 1/paragraph 2.

#### Preamble:

- (1) The Applicant stated in part in Reference 1.(1) that:

*Northgate is not a rate regulated utility and intends to turn the Transmission Line over to Hydro One Networks after construction in accordance with the terms of the Transmission System Code. As such, Northgate is not providing cost information regarding the Project.*

- (2) The evidence shows that the Applicant will transfer the new transmission line to Hydro One Networks Inc. ("Hydro One"). Any price impacts of the Project, therefore, will appear to consumers through Hydro One and the transmission portion of the bill. This is due to the fact that a portion of the costs of the constructed line will be added to Hydro One's Transmission Rate Base, subject to the economic evaluation required by the Transmission System Code ("TSC"). For this reason, Board staff believes that having information from Hydro One will assist the Board in considering this application.

It should be noted that economic evaluation, would determine what capital contribution is required. What goes into Rate Base is the amount financed through the pool via the transmission rates (either Line Connection Pool rate, or Transformation Connection Pool rate or both (but separately evaluated), depending on what is included (Reference the TSC, section 6.3.1).

- (3) It is important to note that reinforcement of the transmission system (refurbishment of the 47.5 kilometres of the Hydro One line) and expansion of the transmission line (7 km) are subject to the cost responsibility rules of the TSC, and would therefore impact the transmission system customers.
- (4) The applicant stated in Reference 1.(2) that:

*The current advanced mineral exploration activities at the Young-Davidson Project site are supplied by a 44 kV transmission line connected to the provincial electrical grid. The line is heavily loaded and the forecasted 17.3 MW peak load of the new mine would exceed the design capacity of the existing 44 kV transmission line.*

- (5) The Applicant stated in part in Reference 1.(3) that:

*Obtaining power from the provincial electrical grid will require construction of a 115 kV transmission line, as the existing 44 kV transmission cannot meet the technical requirements. A higher voltage line (such as 230 kV) is not required to meet the technical requirements of the Young-Davidson Project.*

**Questions/Requests:**

- (i) Please provide a description of the existing 44 kV line including:
  - (a) the name of the supplying Transformer Station;
  - (b) the distance from that Transformer Station to the Mine site;
  - (c) age of the line;
  - (d) existing load points and size of each;
- (ii) In regard to Reference 1.(3), please provide a detailed description of the technical requirement of the 17 MW load at the mine that a 44 kV line cannot meet.
- (iii) Indicate whether an alternative was explored to construct another 44 kV circuit on the existing pole line or not? If not provide the reasons why such an alternative was not explored.
- (iv) If construction of a second 44 kV circuit on the same pole is feasible, please provide the cost of such an alternative, which may include possible extension to the pole i.e., over-build the line, or perhaps it can be constructed below the existing circuit.
- (v) If construction of a second 44 kV circuit is feasible, provide a response to whether a second 44 kV circuit would meet the technical requirement of the 17 MW at the mine site? If not, provide the reasons for that and to also discuss what remedies are needed to meet these technical requirements such as larger conductor sizes, use of Shunt Capacitors and SVCs...etc.

**RESPONSE:**

**(i) Northgate did not have the information and received the following response from Hydro One on May 28, 2010:**

- (a) supply station is Kirkland Lake TS;
- (b) the mine site is 75.4 kilometres away from Kirkland Lake TS as measured along the existing 44 KV ROW;
- (c) age of the line – various- the line was originally constructed in 1927. There has been various replacements of the wood tower sections since then The steel towers sections between Elk Lake and Matachewan are original.
- (d) Lateral taps load nodes on the 44 KV 16G3K circuit

Load #1 – 1350 kVA, 8.8 kms from station.

Load #2 – Hydro One DS - 1245 kVA, 7.3 kms from station

Load #3 – Hydro One DS – 2873 kVA, 16.5 kms from station

Load #4 – 75 kVA, 39.8 kms from station

Load #5 – 75 kVA, 52.6 kms from station

**MAIN TAP HEADING NORTH TO MINE SITE**

Load #6 – Hydro One DS - 1035 kVA, 72.1 kms from the station

Load #7 – Northgate Minerals Mine Site – 3 MVA, 76 kms from the station

Load #8 – 150 kVA – 80 kms from the station

**MAIN TAP HEADING SOUTH**

Load #10 - Hydro One DS - 1371 kVA, 67.7 kms from the station

Load #11 – 3.8 MVA – 70.2 kms from the station

**(ii) Northgate did not have the information and received the following response from Hydro One on May 28, 2010:**

The current peak feeder loading (G3K) totals 15 MVA, our guideline for an acceptable 44 kV feeder loading is 25 MVA, therefore, based on an additional 18 MW of loading we would be exceeding the allowable feeder loading. Due to the long feeder length voltage regulation is also a major concern. Current voltage conditions near the Hydro One DS (Load #6) prove to be unable to support additional load downstream of this node.

Loading limits notwithstanding, if the loading at Northgate Minerals exceeds its present value to forecast levels and taking into account projected motor starting inrush currents , acceptable voltage regulation along the feeder length would not be possible. Hydro One has a plan to install voltage regulators on the G3K in 2011 however this installation will not change the ability of the G3K to handle the projected increased loading.

(iii) **Northgate did not have the information and received the following response from Hydro One on May 28, 2010:**

A 44 kV express feeder to support the projected 18 MW of load via the existing K4 - 115 kV ROW to the Northgate Minerals site would be an approximate distance of 60 kms. The alternative to construct a separate 44 KV express feeder from Kirkland Lake TS was not explored in detail for the following reasons;

- a) Lack of a suitable distribution ROW that minimized the distance to the customer
- b) Gross inefficiencies with distribution losses at that load level and distance;
- c) Static load levels would produce voltage conditions as low as 105 V
- d) The proposed 10 MVA of motor inrush would cause the voltage on the feeder to collapse beyond Hydro One's acceptable voltage flicker standard. Values of voltage flicker exceed 18% voltage dip would be seen at the station, potentially causing the TS bus to trip based on over/under voltage relay protections.
- e) Installation of a suitable feeder bay and breaker at Kirkland Lake TS at a ball park cost of \$1.2 million
- f) Additional transformation service connection tariffs of \$1.71/kw/month would be the responsibility of the customer compared to a transmission line connection option

(iv) **Northgate did not have the information and received the following response from Hydro One on May 28, 2010:**

"Not Feasible."

(v) **Northgate did not have the information and received the following response from Hydro One on May 28, 2010:**

"Not Feasible."

## **Interrogatory 2**

Note: This interrogatory requires that the Applicant, in cases where it cannot answer because it does not have the data, to make a request to Hydro One to respond to all questions, clarifications and requests included below before the deadline.

### **Reference:**

2.(1) Exh. B/Tab 3/Sch. 1/p.1/paragraph 4.

### **Preamble:**

- (1) Exploring the costs of the alternatives and the rationale for selecting the preferred alternative is important because it is related to the cost responsibility aspects covered by the TSC, which is a condition of the Transmission Licence of Hydro One Transmission Network Inc. In other words, the chosen alternative does impact the costs to consumers.
- (2) The Applicant stated in Reference 2.(1) that:

*“Northgate considered a number of alternative routes for the proposed transmission facilities, see Exhibit B, Tab 3, Schedule 1, page 3 and Route C was chosen as the preferred alternative.”*

### **Questions/Requests:**

- (i) Please provide the costs of all the alternatives considered in Reference 2.(1) and restated in Preamble (2), and the criteria used to select the preferred alternative (c). In providing the costs for the alternatives, please break them down, where appropriate, as follows:
  - (a) Materials, by major component
  - (b) Labour
  - (c) Land acquisition
  - (d) Engineering
  - (e) Other, identify major components
  - (f) Commissioning
  - (g) Contingencies
  - (h) Overheads
  - (k) AFUDC

## RESPONSE

### (i) **Routing Alternatives:**

The first step was to determine the appropriate point of connection to electrical grid. Two potential locations for connection to the provincial electrical grid were investigated: (i) at Matachewan Junction, approximately 7 km east of the Young-Davidson Project site; and (ii) at approximately 6 km south of Matachewan Junction. Once the preferred point of connection was determined, various alignments were considered for the proposed transmission line.

#### Point of Connection

Connection to the electrical grid at Matachewan Junction requires construction of approximately 7 km of new transmission line parallel with the existing 44 kV transmission line to the Matachewan substation, and then following the previous transmission line ROW to the south of the community of Matachewan and across the West Montreal River. An historical / existing ROW is available over the entire route, although an additional 10 m pole-to-pole allowance may be necessary from Matachewan Junction to the Matachewan substation, when the new line is in parallel with the existing 44 kV transmission line.

The Extender Minerals private transmission line connects to the Hydro One system approximately 6 km southeast of Matachewan Junction and runs due west from this junction. Hydro One indicated that this approx. 6 km transmission line section south Matachewan Junction and approx. 8 km of the Extender Mineral line would require reconditioning, in addition to the need for a new 4 km transmission line from the Extender Mineral line to the Young-Davidson Project site. The Extender Mineral line is over rugged terrain and the ROW is partially overgrown. In addition, the 4 km new transmission line would be cross country, with limited access, over rugged, well-treed terrain.

Connection to the electrical grid at Matachewan requires less infrastructure, have less environmental impact, is more economical and is therefore preferred.

#### Alignment from Preferred Point of Connection

A number of routing alternatives were considered during the initial engineering stage from Matachewan Junction to the Young-Davidson Project site as listed below and shown schematically on Figure 3, see Tab 2(i):

- **Alignment A:** a cross-country, mostly Greenfield routing from Matachewan Junction to the mine site.
- **Alignment B:** Utilizing the existing 44 kV transmission line ROW from Matachewan Junction through the centre of the community of Matachewan to the Montreal River and following Highway 566 to the mine site.

- **Alignment C:** Utilizing the existing / historic transmission line ROW from Matachewan Junction to the Young-Davidson Project site, passing through the southern portion of the community of Matachewan, and crossing the Montreal River at the historic crossing location.
- **Alignment D:** Recondition the Extender Minerals private transmission line that connects to the Hydro One system approximately 6 km southeast of Matachewan Junction and build a new 4 km transmission line from the Extender Minerals line to the Young-Davidson Project site.

Table 1 lists and compares each of these potential routing options.

- **Alignment A:** Although the shortest alignment, this option is associated with relatively high costs for the construction of a new ROW and construction activities would have the potential to have a greater impact the natural environment than the other routes considered. It would also require a new ROW across the West Montreal River and Montreal River Waterway Park, for which is may be difficult to obtain environmental approvals. A total clearing area of 16.5 ha has been calculated for this option.
- **Alignment B:** This is the second shortest alignment. It follows an existing ROW; hence construction effects of this option on the natural environment would be minimal. A total clearing area of 13.8 ha has been calculated for this option. However, this alignment goes through the centre of the community of Matachewan. Due to its size the transmission line would negatively affect the visual landscape. Also, although not further investigated, there is a potential that noise from the line has the potential to be considered a nuisance by nearby residents.
- **Alignment C:** A historical / existing ROW is available over the entire route, although an additional 10 m pole-to-pole allowance may be necessary from Matachewan Junction to the Matachewan substation, when the new line parallels the existing 44 kV transmission line. A total clearing area of 13.3 ha has been calculated for this option. Also, by mostly avoiding the community of Matachewan, there would be minimal negative socio-economic effects.
- **Alignment D:** The Extender Mineral line is over rugged terrain and the ROW is partially overgrown. Approximately 13.8 km of existing transmission line will require reconditioning in addition to a requirement to construct 4 km of new transmission line cross country, with limited access, over rugged, well-treed terrain. A total clearing area of 39.6 ha has been calculated for this option.

Alternatives A, B and C are preferred over Alternative D, as connection to the electrical grid at Matachewan requires less infrastructure and is more economical.



Only connection to the Ontario electrical grid by means of a 115 kV transmission line along the existing and historic ROW (Alignment C) meets the needs of the YDPP. Table 1 lists and compares each of these potential routing options.

**Table 1: Results of Screening of Routing 'Alternatives Methods' of the Project**

	ALTERNATE ROUTE A	ALTERNATE ROUTE B	ALTERNATE ROUTE C	ALTERNAT E ROUTE D
Do they provide a viable solution the problem or opportunity to be addressed?	✓	✓	✓	✓
Are they proven technologies (at the scale required)?	✓	✓	✓	✓
Are they technically feasible (at the scale required)?	✓	✓	✓	✓
Are they consistent with other planning objectives, policies and decisions?	x	✓	✓	✓
Are they consistent with government priorities?	?	✓	✓	?
Could they affect any sensitive environmental features?	?	x	x	x
Are they practical, realistic financially and economically viable?	x	x	✓	x
Are they within the ability of the proponent to implement?	✓	✓	✓	✓
Are they appropriate to the proponent doing the study?	x	x	✓	x
Are they able to meet the purpose of the Environmental Assessment Act?	✓	✓	✓	✓

✓ Yes      x      No      ?      Unknown

Detailed costs were not provided for Alternatives A, B, and D. Alternative D was significantly longer and would have a greater impact and cost more money. Given the explanations provided in response (i) above, the cost of Alternatives A and D would exceed the cost of Alternative C and would have a significantly greater environmental impact.

Alternative B was not selected as the distance was only marginally shorter than Alternative C and the costs would be higher through the built up area in Matachewan and would have a greater environmental impact.

	<b>Alternative A</b>	<b>Alternative B</b>	<b>Alternative C</b>	<b>Alternative D</b>
<b>Material</b>	\$1,250,221 (Transmission line cost material and labour with water crossings)  \$420,000 Tree Clearing (Close cutting)	\$1,300,000 (Transmission line cost material and labour)  \$330,000 Tree Clearing (Close cutting)  \$200,000 Blasting, rock mount	\$1,420,000 (Transmission line cost material and labour)  \$300,000 Tree Clearing (Close cutting)	\$2,969,879 (Transmission line cost material and labour)  \$960,000 Tree Clearing (Close cutting)
<b>Labour</b>	Included in the above	Included in the above	Included in the above	Included in the above
<b>Land Acquisition*</b>	Not Available*	Not Available*	Not Available*	Not Available*
<b>Engineering</b>	\$50,000	\$50,000	\$50,000	\$70,000
<b>Other</b>	N/A	N/A	N/A	N/A
<b>Commissioning</b>	\$50,000	\$55,000	\$50,000	\$120,000
<b>Overheads</b>	\$165,000	\$183,000	\$165,000	\$390,000
<b>AFUDC</b>	\$85,000	\$91,000	\$85,000	\$200,000
<b>Total</b>	\$2,022,221	\$2,209,000	\$2,070,000	\$4,709,879

\* Note 1 - Cost for Land Acquisition is not included. It is expected that the cost for Land Acquisition for alternative "A" would be much higher than the Land Acquisition for alternative "C" since there is no ROW available. It is anticipated that Alternative "D" would be higher than other alternatives. It is anticipated that Alternative "B" and Alternative "C" would have similar land costs.



## **COST RESPONSIBILITY FOR THE PROPOSED TRANSMISSION LINES [ECONOMIC EVALUATION AND CONTESTABILITY PROTOCOL]**

### **Interrogatory 3**

Note: This interrogatory requires that the Applicant, in cases where it cannot answer because it does not have the data, to make a request to Hydro One to respond to all questions, clarifications and requests included below before the deadline.

#### **Reference:**

- 3.(1) Exh. A/Tab 3/Sch. 1/p. 1/lines 7-10
- 3.(2) Exh. B/Tab 2/Sch. 1/p. 1/lines 4-7
- 3.(3) Transmission System Code /section 6.5 - Economic Evaluation of New and Modified Connections & section 6.6 - Contestability

#### **Preamble:**

- (1) In Reference 3.(1) the Applicant stated that:

*"In order for the project to be completed Hydro One Networks Inc. ("Hydro One") will be refurbishing 47.5km of 115kV transmission line from Macassa Shaft No. 3 to Matachewan Junction. Northgate has been informed by Hydro One that the upgrade does not require leave to construct."*

- (2) In Reference 3.(2) the Applicant stated in part that:

*"A decommissioned 47.5 km section of 115 kV circuit K4 will be upgraded from Macassa Shaft No.3 to Matachewan Junction, and another 7 km of new 115 kV line will be constructed to complete the electrical connection. The substation will supply power to the Young-Davidson gold mine."*

It should be noted that Section 92 creates the obligation on any person to seek leave of the Board for transmission construction or reinforcement if it is above 50 kV and is 2 km or longer in length. The evidence indicated that the line was idle for 10 years and that there was an increase in Capacity. Various sections of the TSC deal with various conditions such as: (1) for modifications (see section 6.3.2 of the TSC); (2) for replacement upon retirement of a connection facility, no capital contribution is required, (see Section 6.7.2 of TSC).

#### **Questions/Clarifications:**

- (i) Provide information regarding the refurbishing project for the 47.5 km of line between from Macassa Shaft No. 3 to Matachewan indicating:

- (a) Is the capacity of the line increased over and above the capacity of the decommissioned line? If so indicate the original capacity level and the upgraded capacity level in MW;
- (b) Describe in detail the reinforcements undertaken in terms of system element replacements...etc;
- (c) What section of the TSC and/or the Ontario Energy Board Act, 1998 did Hydro One rely on as justification for not requiring leave to construct?;
- (d) Did Hydro One perform an economic evaluation in regard to the reinforcement of the 47.5 km section in order to establish the capital contribution that would be required at Reference 3.(3) and in particular per section 6.5 of the TSC? If not please explain the reasons for not performing such an economic evaluation;
- (e) Did Hydro One perform an economic evaluation in regard to constructing the 7 km of new transmission line in order to establish the capital contribution that would be required at Reference 3.(3) and in particular per section 6.5 of the TSC? If yes please provide the information regarding the line cost and summary of the results of the economic evaluation indicating the key input parameters such as study horizon, the discount rate used in the capital contribution calculation, the estimated cost of the project...etc, as well as the printout of the economic evaluation study itself.
- (f) If the response to question (e) above is negative, please explain how would Hydro One implement subsection 6.6.2 (h) of the TSC, where it is indicated that it is an "obligation on the transmitter to pay a transfer price that is the lower of the cost to the load customer (read Northgate Minerals Corporation) or the transmitter's reasonable cost to do the same work..."

## RESPONSE

- (i) **Northgate did not have the information and received the following response from Hydro One on May 28, 2010:**
  - (a) The capacity of the line will not be increased over and above the capacity of the decommissioned line. The refurbishment will involve the replacement of any materials that are no longer manufactured with those that meet current standards.
  - (b) The scope of the work for the Northgate Connection includes:
    1. (Line Connection Pooled) K4 refurbishing project includes rebuilding the 47 km line segment between Macassa Jct #3 and Matachewan Jct; by replacing all 450 wood structures in existing locations using existing span lengths , replacing the existing 133 Cu conductor (an obsolete size) by new 4/0 ACSR to facilitate the same tower spacing ,

and replacing the existing groundwire by new 7#10 AW and replacing the existing insulators and hardware;

2. (Line Connection Pooled) Install a tapping structure at Matachewan Jct to facilitate connection of customer-built line tap;

3. (Line Connection Pooled) Install line drops and connect customer-built line tap to the K4 circuit at Matachewan Jct;

4. (Network Connection Pooled) Replace existing K4 line protections at Kirkland Lake TS due to setting inadequacy on existing protections.

- (c) Hydro One did not apply to the Board for leave to construct for the refurbishment of the existing K4 electricity transmission line, as the scope of the reconstruction work involved no new construction, expansion or reinforcement. Furthermore, no acquisition of additional land or authority to use additional land was needed. Therefore, in accordance with s. 92 (2) of the OEB Act, no leave to construct is required for this reconstruction work.
- (d) An economic evaluation was performed for the reconstruction of the 47.5 km section. This idled section was originally planned to be removed in 2008. However, in anticipation of the possibility of the new Northgate connection, the removal did not proceed as planned. Given these circumstances, it is Hydro One's view that the applicable cost responsibility treatment in this case should be similar to that of a new connection.
- (e) No an economic evaluation for the contestable section was not performed.
- (f) Hydro One will utilize the Customers design detail of the contestable section in order to produce an accurate estimate suitable to satisfy subsection 6.6.2 (h) of the TSC . This is a much more accurate and timely solution compared to producing a higher level estimate based on an unknown route early on in the project. On the proposed Transfer Date for the contestable asset, a new economic evaluation will be completed to accommodate the appropriate Transfer Price in the line connection cost pool . Capital contributions will be adjusted to accommodate the new economic evaluation.

## **IMPACT ON RELIABILITY AND QUALITY OF ELECTRICITY SERVICE**

### **Interrogatory 4**

Note: This interrogatory requires that the Applicant, in cases where it cannot answer because it does not have the data, to make a request to Hydro One to respond to all questions, clarifications and requests included below before the deadline.

#### **Reference:**

4.(1) Exh. A/Tab 3/Sch. 1/p.2/line 6

#### **Preamble:**

(1) In Reference 4.(1), it is stated in part that:

*The Project will have a positive impact on the reliability and quality of electricity service.*

#### **Questions/Requests:**

- (i) Please identify the customers that are expected to experience improved reliability or quality of electricity service attributed to the proposed project.
- (ii) Please describe the measurable parameters that define reliability and quality of electricity service to these customers.
- (iii) For each customer identified, please provide quantitative results of the parameters identified in (ii) above, prior to the project implementation as well as projection of those parameters' results to reflect the effect of the proposed project on them.

## **RESPONSE**

- (i) Northgate does not have information on specific customer identities.
  - (a) Northgate will receive service for the projected load which would not be available from the 44kV system. The mine would not be developed without the additional capacity provided by the proposed 115kV line. As is evident from the response to IR#1(ii) and (iii), Northgate can't be served by the existing 44kV system or a by an express 44kV feeder.
  - (b) Other users of the 44kV circuit would see improvements as the existing 3MW load of Northgate would be transferred off the 44kV circuit. The removal of this load will result in improved voltage regulation or "quality of service" for such customers.

- (c) Removal of the approximately 1kM of customer tap structures and customer substation would improve the reliability for existing customers. The level of improvement has not been determined and would be difficult to quantify.
  - (d) In addition, there will be available capacity, approximately 3MW, for use by any new customer.
- (ii) See response to (i).
- (iii) See response to (i).



## **EXPECTED TIMELINE FOR BOARD DECISION**

### **Interrogatory 5**

#### **Reference:**

- 5.(1) Exh. B/Tab 5/Sch. 1
- 5.(2) Exh. A/Tab 2/Sch. 1/paragraph 7
- 5.(3) Procedural Order No. 1, dated May 4, 2010

#### **Preamble:**

- (1) In Reference 5.(1), the Project Schedule indicates that the Applicant expects to start construction by August, 2010.
- (2) In Reference 5.(2), the Applicant expects commissioning to occur in December 2010, and January 2011.
- (3) In Procedural Order No. 1, the Board stated in part that:

*"If the proceeding does not encounter unusual circumstances, it is expected that a decision would be rendered on or about July 13, 2010."*

#### **Question/Request:**

- (i) Please elaborate on steps the Applicant may take to address delays to the expected Project commissioning, planned in December, 2010 and January 2011, should unusual circumstances delay a Board Decision as stated in Reference 5.(3).

## **RESPONSE**

- (i) A very minor delay of a week or two will still permit the Project to be completed on time, without increased cost.

If further delay is incurred, it is likely the first response will be to increase the size of the contractor work crews and to increase the amount of overtime that such crews would be expected to work. In this way, the number of construction days will be reduced, or put another way, the schedule would be more compressed. This will have an impact on the labour component of the project and will increase costs. However, the construction schedule and planned commissioning could still take place as currently planned.

If the delay becomes very lengthy, Northgate may have to alter its plans regarding the development of the mine including potentially with the current 44 kV service and possibly temporary diesel generation. This would have very significant cost implications.

**STATUS OF CUSTOMER IMPACT ASSESSMENT (TSC REQUIREMENT)**

**Interrogatory 6**

**Reference:**

6.(1) Exh. B/Tab 4/Sch. 1/p. 1/lines 7-8

**Question/Request:**

- (i) Please provide an estimate of when the final Customer Impact Assessment is expected to be issued by Hydro One.

**RESPONSE**

- (i) See attached Customer Impact Assessment dated March 16, 2010.



**Hydro One Networks Inc.**  
483 Bay Street  
Toronto, Ontario  
M5G 2P5

CUSTOMER IMPACT ASSESSMENT

**NORTHGATE MINERALS CORPORATION**  
YOUNG DAVIDSON PROJECT

Project #: AR-18067 / IP-15308  
Revision: 0  
Date: March 16, 2010

Issued by:  
Transmission Planning Department  
System Development  
Hydro One Networks Inc.

Prepared by:  
Kirpal Bahra  
Transmission Planning – North  
416-345-5171

Approved by:  
Ibrahim El-Nahas  
Transmission Planning  
Manager - North

AR#: 18067 CIA – Northgate Minerals Corp (Young Davidson Project)

## 1.0

### Project Description

Northgate Minerals Corporation (the Applicant) is proposing to construct a new substation, Young-Davidson Project (the Project), in the Northeastern region in the City of Matachewan area approximately 60 km west of Kirkland Lake. A decommissioned 47.5 km section of 115 kV circuit K4 will be upgraded from Macassa Shaft No.3 to Matachewan Junction, and another 7 km of new 115 kV line will be constructed to complete the electrical connection. The substation will supply power to the gold mine, which includes several large synchronous and induction motors. The Applicant has advised that the commissioning date is in December 2010, with an initial station peak load of 1.8 MW, and with an ultimate peak load of 17.3 MW in December 2012.

The Young-Davidson substation will comprise two 120-13.8 kV transformers operating in parallel, supplying two 13.8 kV buses. The Project will include a reactive power compensation system consisting of one 8 Mvar switchable shunt capacitor and three SVC units, each with a minimum continuous capability of  $-2 / + 5.3$  Mvar, a minimum short term capability of 12 Mvar for 10 seconds, and maximum initial response time of 500 milliseconds.

The capacitor bank will be installed on the Young Davidson's high voltage bus and operated normally in service. One SVC unit will be installed on the high voltage bus and the remaining two SVC units will be installed on the two main low voltage buses at the station. All three units will be configured to control the high voltage bus to a setpoint of 118 kV.

The proposed facility is a *load connection project* connected to the transmission system. See figure 1.

## 2.0

### Technical Studies

Hydro One conducted studies to assess the impact of incorporating the Young Davidson mine on other Hydro One customer.

#### Study Assumptions:

- Studies were conducted using the winter 08/09 PSS/E model.
- Proponent equipment data was acquired from IESO SIA, (dated August 31, 2009)
- Short circuit data was provided with all Generation at Kirkland Lake & Lower Notch O/S

## 2.1

### Customers Affected by Young Davidson Project

The following is a list of major customers connected to the existing 115kV K4 circuit from Kirkland Lake TS. Steady state voltage studies were carried to determine the effect of the Young Davidson project on these customers.

Circuit Designation	(kV)	Customer	Approx Load Size (MVA)
K4	115	Macassa Mill CTS	2
K4	115	Macassa Shaft CTS	3.4

## 2.2

### Short-Circuit Study Analysis

Short-circuit studies were conducted by the IESO to simulate the fault contribution from the Young Davidson facility. Results are published in the SIA dated August 31, 2009.

The short circuit levels for Hydro One customers on the K4 line are within acceptable limits.

AR#: 18067 CIA – Northgate Minerals Corp (Young Davidson Project)

## 2.3

### Steady State Voltage Performance

The study area consists of two customer buses and the 115kV/44kV buses at Kirkland Lake TS. Steady State voltages were assessed under different operating scenarios which include:

- #1a, 1b, 1c Young Davidson facility In service (AG Mill operating at 0.9 lag – 0.9 lead)  
#2 Young Davidson facility In service with 8MVar capacitor bank out of service  
(AG Mill at 0.9 lag for worst case)  
#3 Sudden Loss of Young Davidson Facility (Main circuit breaker trip)

Bus	Voltage (pu)										
	Scenario #										
		1a		1b		1c		2		3	
	Existing System	YD Facility I/S (0.9 lead pf)	$\Delta V$ (%)	YD Facility I/S (pf 1.0)	$\Delta V$ (%)	YD Facility I/S (pf 0.9 lag)	$\Delta V$ (%)	8MVar Cap Bank O/S	$\Delta V$ (%)	Loss of YD facility	$\Delta V$ (%)
Kirkland Lake 118.05kV	1.077	1.080	0.3	1.078	0.1	1.076	-0.1	1.072	-0.5	1.079	0.2
Macassa Shaft #3 118.05kV	1.076	1.078	0.2	1.075	-0.1	1.073	-0.3	1.066	-1.0	1.079	0.3
Macassa Mill 118.05kV	1.076	1.078	0.2	1.076	0	1.073	-0.3	1.067	-0.9	1.079	0.3
Kirkland Lake 44kV	1.060	1.063	0.3	1.061	0.1	1.059	-0.1	1.055	-0.5	1.062	0.2

#### Note:

1. p.u values based on 118.05kV base
2. Tap changers locked for scenario 3.

#### Results

Scenario 1 – Voltage levels on all buses are within acceptable limits with the incorporation of the YD facility. The AG Mill motor will normally operate at 0.9 leading pf.

Scenario 2 – The worst case voltage scenario will occur if the AG Mill motor operates at 0.9 lagging pf and the fixed 8MVar capacitor bank is out of service. In this case, voltage levels are all within acceptable limits.

Scenario 3 – The loss of the entire YD facility could occur if the single main customer circuit breaker opens. In this case, all voltages are within acceptable limits.

## 2.4

### Transient Studies

Full Transient analysis with SVC modeling was completed by IESO and AMEC. As per the SIA dated August 31, 2009 voltage variations during motor starting are within acceptable ranges. As per the Transmission System Code (Appendix 2), voltage fluctuations should remain within the following limits:

AR#: 18067 CIA – Northgate Minerals Corp (Young Davidson Project)

Voltage Flicker shall be tabulated as follows	
Magnitude (%)	Limit
0.5	3 per second
1.0	20 per minute
2.0	45 per hour
3.0	4 per day
A higher flicker may be acceptable for infrequent starts.	

It is calculated that non staggered motor starting would cause the PCC (point of common coupling) voltage to drop approximately 2.7% which limits motor starting to 4 times / day. (without SVC operation)  
As recommended by the IESO (SIA, August 31, 2009) Northgate minerals corporation must stagger large motor starting in order to prevent excessive voltage sag to further reduce voltage variations on other buses on the K4 line.

## 2.5

### **Connection Reliability**

#### **Facility Connection**

Northgate Minerals will install a 115kV circuit breaker to allow automatic and manual isolation of the Young Davidson facility from Hydro One as required. As shown in figure 1, this will be installed at the connection point between Hydro One and the Young Davidson substation. Also, manual openers will be installed at Matachewan Junction to facilitate faster line sectionalizing in event of a permanent fault.

It is expected that the incorporation of Northgate Minerals project will not reduce the existing reliability of the 115kV K4 line below the transmission delivery point performance standards and codes set forth under the Transmission System Code and IESO market rules.

#### **Transmission Line**

The existing reliability of the K4 circuit is comparable to other 115kV customers on the K2, A9K, A8K, D3K circuits. The existing K4 delivery point performance, measured for both frequency and duration is also comparable to other customers on the K2, A9K, A8K, D3K circuits.

Although the additional line length allows for greater exposure to weather related automatic outages, it is expected that the 54km extension of the K4 circuit will not reduce the reliability levels below the performance standards set forth by the Transmission System Code and IESO market rules.

The newly constructed K4 circuit will be comparable to the K2 and A9K circuits from Kirkland Lake TS. Both have line lengths greater than 40km, and continue to show reliability results in line with the 115kV Hydro One circuit pool.

## 3.0

### **Conclusions and Recommendations**

The proposed connection of Northgate Minerals Young Davidson facility can be incorporated into the 115kV K4 transmission line from Kirkland Lake TS. Northgate Minerals is requested to stagger motor starting to minimize any voltage variations on the line.

Hydro One customers connected to this line will experience voltage variations within acceptable limits.

## **STATUS OF THE ENVIRONMENTAL ASSESSMENT**

### **Interrogatory 7**

#### **Reference:**

7.(1) Exh. B/Tab 6/Sch. 1/p. 1

#### **Questions/Requests:**

- (i) Please indicate whether there were comments or requests received to elevate the project to an individual environmental assessment since the date of publishing the Environmental Screening Report in January 2010.
- (ii) Please provide an estimate of when the final Environmental Assessment approval is expected;
- (iii) Please confirm that the federal-provincial Memorandum of Understanding with Ontario, which combines the federal screening with the provincial environmental review, is applicable to this Project.

#### **RESPONSE**

- (i) A summary of comments are provided See Attached Tab 7(i). No elevation requests were made.
- (ii) The Environmental Assessment process is complete. See Attached Tab 7(ii).
- (iii) Not Applicable. A federal environmental assessment was not performed as there was no obligation to complete such under the *Canadian Environmental Assessment Act*.



April 30, 2010  
TC 101503

Ms. Doris Dumais  
Director, Environmental Assessment and Approvals Branch  
Ministry of the Environment  
2 St. Clair Avenue West, Floor 12A  
Toronto, Ontario  
M4V 1L5

Dear Ms. Dumais:

**Re: Statement of Completion, Young-Davidson Power Project: Transmission Line from Matachewan Junction to the Young-Davidson Project Site – Environmental Study Report**

AMEC Earth & Environmental (AMEC), on behalf of Northgate Minerals Corporation, is pleased to submit the attached Statement of Completion (Appendix G) as required by the *Guide to Environmental Assessment Requirements for Electricity Projects* to identify that the environmental assessment process for a new 115 kV transmission line between Matachewan Junction and the Young-Davidson Project site, has been completed.

The "Young-Davidson Power Project: Transmission Line from Matachewan Junction to the Young-Davidson Project Site" Environmental Study Report (ESR) was made available, through individual notification, to government, First Nation, and other stakeholders. Furthermore, a series of open houses were held in December 2009 in the Matachewan First Nation Reserve, the community of Matachewan and surrounding communities, which provided information regarding the Young-Davidson Power Project.

A Notice of Commencement related to the Young-Davidson Power Project was published in the Northern News on November 23, 2009. A Notice of Completion was published in the Northern News on February 3, 2010 and provided for a 30-day review period. The only questions related to the Notice of Completion were questions from the Ministry of Natural Resources. These questions were addressed in the attached addendum (Attachment A). As such, we are satisfied that due process has been followed by the proponent under the requirements of the *Electricity Projects Regulation*.

AMEC Earth & Environmental,  
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Should you have any queries or comments regarding the project, or require further information, please do not hesitate to contact the undersigned (905) 568-2929.

Yours very truly,  
**AMEC Earth & Environmental,**  
**a Division of AMEC Americas Limited**  
**on behalf of Northgate Minerals Corporation**



Stephan Theben, Dipl.-Ing.  
Area Lead Environmental Permitting – Young-Davidson Project  
Senior Environmental Consultant

**Attached:**

Appendix G, Statement of Completion  
Attachment A, Responses Questions from the Ministry of Natural Resources on the ESR

**Distribution:**

Nancy Duquet-Harvey, Harold Bent, Andrew Cormier – Northgate Minerals Corporation  
Mike Mazzetti - MNR  
Nancy Daigle – MNR Parks  
Paula Allen – MOE  
David Simms, Tony Copland – AMEC



Northgate Minerals Corporation



Comment No.:	Comment:	Correction:
MNR 1	Page 21 (Section 6.1, 2nd paragraph) – reference to Hwy 566 as the "main highway access to the Reserve" is incorrect; this should be Hwy 66.	Page 21, Section 6.1, 2 <sup>nd</sup> paragraph should read: "In regards to socio-economics a broader study area is considered and has been expanded to consider the closest community to the transmission line, the Township of Matachewan, as well as the Matachewan First Nation (MFN) IR 72. The MFN membership may experience some effects given that construction activities will be carried out within their traditional territories and construction vehicles will be using Highway 66 which is the main highway access to the Reserve. Kirkland Lake as the closest community with a full range of services and may experience some benefits related to increases in demands for retail and accommodation services from the construction workforce."
MNR 2	Page 22 (Section 6.5, 2nd paragraph) – the first two references to Hwy 566 should be changed to Hwy 66. The third reference is correct.	Page 22, Section 6.5, 2 <sup>nd</sup> paragraph should read: "From Matachewan Junction the proposed transmission line alignment follows relatively flat topography along Highway 66 up to the point where it leaves Highway 66. From that point to the southwest, the line goes up to an elevation of approximately 340 masl before following a general downward slope toward the Montreal River. The terrain west of the Montreal River is characterized by rock cliff outcrops. The westernmost section of the alignment along Highway 566 follows a deep valley south up to the Young Davidson Project site."
MNR 3	Page 26 & 27 (Section 6.10) – newly listed Species at Risk (listed through Endangered Species Act) have been found within the Kirkland Lake District administrative area and should be documented as potentially present in this section. Olive-sided flycatcher – Provincial - special concern, Federal - threatened Common nighthawk – Provincial - special concern, Federal – threatened Whip-poor-will – Provincial – threatened, Federal – threatened Chimney swift – Provincial – threatened, Federal – threatened Habitat regulations for these species are not yet available, nor are there habitat descriptions available, but this report should mention that there is the possibility that they might dwell in this area, and should nesting birds be found legislation (Endangered Species Act) will be followed.	Page 27, the following paragraph before Section 6.11 should be added: "Newly listed Species at Risk (listed through Endangered Species Act) have been found within the Kirkland Lake District administrative area and could potentially be present in the study area. The species include: <ul style="list-style-type: none"> <li>■ Olive-sided flycatcher – Provincial – Special Concern, Federal – Threatened, Schedule 1;</li> <li>■ Common nighthawk – Provincial – Special Concern, Federal – Threatened, Schedule 1;</li> <li>■ Whip-poor-will – Provincial – Threatened, Federal – Threatened, Schedule status pending; and</li> <li>■ Chimney swift – Provincial – Threatened, Federal – Threatened, Schedule 1.</li> </ul> All provincially designated Threatened and Endangered species have general habitat protection. Under the ESA 2007 specific habitat regulations for these species will also be developed but at this point in time are not yet available. Thus, currently Whip-poor-will and Chimney Swift have general habitat protection and should these species be observed during construction MNR should be contacted."



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<b>MNR 4</b>	<p>Page 28 (Section 6.12.1) – first sentence should be revised to more accurately state that 'land use on Crown land is governed by the Crown Land Use Policy Atlas' as opposed to the Ontario's Living Legacy Land Use Strategy' which is but one source of direction (similar to the District Land Use Guidelines) incorporated (and replaced) by this atlas.</p>	<p>Page 28, Section 6.12.1, first sentence should read: "The Crown Land Use Policy Atlas governs land uses on Crown land in the region and shows that the area through which the transmission line would be established is mainly in the West Montreal and Montreal Rivers General Use Area (G1842), the Aggregate Areas General Use Area (G1846), and where it crosses the Montreal River the West Montreal River Provincial Waterway Park (P1715)."</p>
<b>MNR 5</b>	<p>Page 41 (Section 8.4) – states that "in the unlikely event that Hydro One does not assume ownership of the transmission line, it will be decommissioned according to the Young-Davidson Project Closure Plan." The final Closure Plan has yet to be issued for our review therefore it should be captured in this ESR that all improvements associated with the transmission line are to be removed from Crown land and the right of way rehabilitated to as before conditions when the line is no longer required.</p>	<p>Page 41, Section 8.4 should read as follows: "Once the Young-Davidson Project is decommissioned, it will likely no longer require power. Improvements associated with the transmission line are to be removed from Crown land and the right of way rehabilitated to as before conditions when the line is no longer required, in the case that Hydro One does not assume ownership of the transmission line."</p>
<b>MNR 6</b>	<p>Page 59 (Section 11.1.2) – wording of the 4<sup>th</sup> bullet item should be changed to "construction vehicles will not travel through surface waters; should crossings be necessary, work permit(s) will be obtained."</p>	<p>Page 59, Section 11.1.2, wording of the 4<sup>th</sup> bullet item should read: ▪ "Access to the transmission line right-of-way is generally good and primarily from the existing road network. Construction vehicles will not travel through surface waters; should crossings be necessary, appropriate work permit(s) will be obtained."</p>
<b>MNR 7 and MNR 8</b>	<p>Page 62 (Section 11.1.5) – comments for section 6.10 need to be incorporated here as well. The Rusty Blackbird is mentioned as a species at risk in this section. More detail should be given with this as the rusty blackbird is not listed provincially but federally. and Page 62 &amp; 63 - it is noted that the Canada Warbler is designated by COSEWIC as threatened – it should also be noted that they have recently been classified as a species of special concern in Ontario.</p>	<p>Page 62, Section 11.1.5, Effects on Rare, Threatened, or Endangered Species of Flora or Fauna or their Habitat, 1<sup>st</sup> paragraph should be changed to: "Field investigations to date have not identified any rare, threatened, or endangered fauna or flora within or in close proximity to the ROW. Three avian Species-at-Risk (SAR) were detected within the larger EA study area (Figure 4): ▪ Canada Warbler, federally designated as Threatened, Schedule 1 and provincially as Special Concern; ▪ Bald Eagle provincially designated as Special Concern; and; ▪ Rusty Blackbird, federally designated as Special Concern, Schedule 1.; and ▪ one additional SAR, Monarch Butterfly, federally and provincially designated as Special Concern was also recorded during baseline inventories." Page 63, after the 3<sup>rd</sup> paragraph, the following paragraph should be added:</p>



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	<p>"Additional Species at Risk not observed during the 2007 baseline inventories but occurring within the Kirkland Lake District (MNR correspondence and Cadman et. al, 2007) and potentially within the study area include;</p> <ul style="list-style-type: none"><li>▪ Olive-sided Flycatcher, federally designated as Threatened, Schedule 1 and provincially as Special Concern;</li><li>▪ Common Nighthawk, federally designated as Threatened, Schedule 1 and provincially designated as Special Concern;</li><li>▪ Whip-poor-will, federally designated as Threatened, Schedule 1 and provincially designated as Threatened; and</li><li>▪ Chimney Swift, federally designated as Threatened, Schedule 1 and provincially designated as Threatened."</li><li>▪ Yellow Rail, federally designated as Special Concern, Schedule 1 and provincially designated as Special Concern;</li><li>▪ Peregrine Falcon, federally designated as Threatened, Schedule 1 and provincially as Threatened</li><li>▪ Black Tern, provincially designated as Special Concern.</li></ul> <p>Both the federal <i>Species at Risk Act (SARA)</i> 2002 and provincial <i>Endangered Species Act (ESA)</i> 2007 prohibit destroying critical or essential habitat for threatened and endangered Species at Risk (SAR). The federal government has responsibility for federal lands, aquatic species and migratory birds covered by the <i>Migratory Birds Convention Act (MBCA 1994)</i>. The provincial <i>ESA (2007)</i> is similar, however, it applies to private and provincial lands and new provisions in this Act will have a habitat regulation for each endangered and threatened species (MNR 2010).</p> <p>Most bird species are also protected by the federal <i>Migratory Birds Convention Act (MBCA 1994)</i> and the provincial <i>Fish and Wildlife Conservation Act (FWCA 1997)</i>. <i>MBCA (1994)</i> prohibits the killing, harming, or collecting of adults, young and eggs of migratory birds. Under the <i>FWCA 1997</i>, one cannot hunt, trap, buy or sell the "specially protected wildlife" listed in the Act.</p> <p>Peregrine Falcon occur in the Kirkland Lake District and their habitat is currently regulated under <i>ESA 2007</i>. However they are not known to occur within the study area (MNR pers comm April 2010) and Project related impacts are not anticipated for this species."</p>
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		Other provincially designated Threatened SAR including Whip-poor-will and Chimney Swift have general habitat protection.
<b>MNR 9</b>	The issue of habitat fragmentation in regards to small mammals, reptiles and amphibians, and planned mitigation for the fragmentation should be addressed in the "Natural Environment" portion of the report (especially in regards to continued vegetation maintenance of the transmission lines). Example: the use of best management practices during continued maintenance of the lines - such as removing only those species of plants which have potential to interfere with the lines themselves by growing into the "safety buffer", while leaving a cover of short shrubs and herbaceous plants on the ground in which small wildlife species can hide.	No impacts to avian SAR are expected during construction, particularly as construction is planned outside the breeding bird season. However should these birds be observed within the area of undertaking during construction, MNR must be contacted.  Page 62, Section 11.1.5, 1 <sup>st</sup> paragraph: The following bullet should be added to the list of mitigation measures: "To avoid habitat fragmentation in regards to small mammals, reptiles and amphibians best management practices will be applied during continued maintenance of the transmission line, including removal of only those species of plants which have potential to interfere with the lines themselves by growing into the "safety buffer", while leaving a cover of short shrubs and herbaceous plants on the ground in which small wildlife species can hide."
<b>MNR 10</b>	The proposed line crosses two Cool water bodies (Montreal River and the stream between Knot Lake and the Montreal River). All other water bodies that the line crosses are identified as Cold water.	Page 24, Section 6.8, 1 <sup>st</sup> paragraph: The following sentence should be added after the first sentence: "The proposed line crosses two Cool water bodies (Montreal River and the stream between Knot Lake and the Montreal River). All other water bodies that the line crosses are identified as Cold water."
<b>MNR 11</b>	The proposed line appears to be within an area of high cultural heritage model when it crosses the Montreal River	A detailed archaeological investigation will be carried out in advance of the transmission line construction activities. Should this investigation identify any cultural heritage or archaeological finding the transmission line would be constructed such as to avoid these locations.
<b>MNR 12</b>	The proposed line crosses the local OFSC trail C106A in a few places. The Timiskaming-Abitibi Trails Association (TATA) should be contacted if and when this project commences for safety issues.	The Timiskaming-Abitibi Trails Association (TATA) will be contacted in advance of construction activities to discuss and avoid safety issues with the use of local OFSC trail C106A.

## STATUS OF OTHER REQUIRED APPROVALS

### Interrogatory 8

#### Reference:

8.(1) Exh. B/Tab 6/Sch. 1/p. 2

#### Questions/Requests:

- (i) At Reference 8.(1), please provide a status update where relevant to any or all of the four items listed under "Provincial Environmental Approvals".

#### RESPONSE

Permit/Licence Required	Timeline
Forest Resource Licence	Licence application to be submitted in June 2010. Anticipated Ministry approval and issuance time is approximately 6 to 8 weeks.
Work Permit	Permit application to be submitted in June 2010. Anticipated Ministry approval and issuance time is approximately 6 to 8 weeks.
Land Use Permit	Permit application to be submitted in June 2010. Anticipated Ministry approval and issuance time is approximately 6 to 8 weeks.
Encroachment Permits	Permit applications to be submitted in June 2010. Anticipated Ministry approval and issuance time is approximately 6 to 8 weeks.