

May 10, 2014

A. J. White, P. Eng.
Commissioner of Engineering and Public Works
The District Municipality of Muskoka, Engineering and Public Works Department
70 Pine Street
Bracebridge, ON P1L 1N3
Telephone: 705 645-6764
E-mail: PublicWorks@muskoka.on.ca

Hello Mr. White:

Re: Applications for Driveway Entrance and Roadway Occupancy Permits for the construction of a proposed hydro-electric generating station in Bala

I understand that your department is currently considering Applications for Driveway Entrance and Roadway Occupancy Permits for the construction of a proposed hydro-electric generating station in Bala.

We have examined the information made available and have many concerns about public safety, risk to public infrastructure, and increased liability and costs to the District Municipality of Muskoka, which we detail below.

- 1) Risk to District Road 169 Bridge over the Bala North Channel
 - a) As the proponent's drawing NBC-04 shows, the intake excavation would include blasting and excavating directly adjacent to and between the support piers for the District Road 169 bridge over the Bala north channel.
 - As exploratory drilling and core samples have not been taken at this location, it is not known whether such excavation would risk shifting or damaging the support piers for the bridge.
 - b) Furthermore, as drawing NBC-03 shows and the proponent has confirmed verbally at a May 2, 2014 Township of Muskoka Lakes Council meeting, excavated rock would be trucked up the north channel, below the bridge and between these bridge support piers. Repeatedly driving such heavy construction equipment, over the just-excavated and therefore rocky bed of the north channel and between these piers risks the truck making contact with the piers and with whatever would be supporting these piers after the proposed intake excavation.
 - Heavy construction activities so close to the bridge support piers risks them being damaged during construction.
 - c) The proponent is a Limited company, with no employees, no assets, no income, and no operations. While the proponent may hope that their Contractor's insurance would cover any possible damage, it may be difficult for the District to ensure payment, as there would be no direct business relationship between the District and the Contractor (or sub-Contractor, or independent trucker).
 - d) Because the excavation for the proposed generating station would be to a depth of approximately 40' below the Moon River water level, it would be necessary to pump any infiltrating water out of the excavation. This dewatering could cause settling and movement of the abutments and piers of the District Road 169 bridge over the north channel, thereby damaging the bridge.

- The proponent should be presenting a plan of advance exploratory drilling, including analysis of the results, on-going monitoring by surveyors during the proposed construction, and a protocol for communicating this information to the District's Engineering and Public Works department.

This same concern of foundation settling and movement could affect the also directly-adjacent MNR Bala north dam.

- Given the MNR's demonstrated over-eagerness to facilitate this project in any way and the MNR's lack of in-house engineering expertise for this type of work, the District should also be insisting that the advance investigation work include the Bala north dam area as well.

- e) In the past, the proponent has dismissed such concerns about excavation saying "they've done it before".

This over-confidence is exactly what is a concern:

- The substrate and groundwater conditions would be different.
- The age of the structures must be considered.
- The unusual situation of excavating at a site that both previously had an excavation and that would be below the directly-adjacent water bodies requires special care.
- The excavation being directly adjacent to two critical public infrastructure assets warrants much more advance planning and reporting than has been provided.

That is, the proponent must be required to provide much more evidence of due diligence than has been demonstrated.

2) Impact of Damage to District Road 169 Bridge over Bala North Channel

If the District Road 169 bridge over the Bala north channel was damaged, a 50 km detour would be required. This would have significant negative effects on emergency response vehicle travel times, area businesses, and the general public.

- The proponent should therefore be required to provide detail on the proposed intake blasting, excavation, and shoring methods, procedures, locations, and inspections before any work approvals are provided to them.
- For example, permission may be required from the Township of Muskoka Lakes for steel-rod anchors or tie-backs to be installed to the south of the proposed construction site. Such interactions with the Township need to be determined in advance.

3) On-going Bridge Inspections

Currently, the District's periodic inspections of the District Road 169 bridge over the Bala north channel is relatively easy and safe, with a low risk of sudden changes in bridge condition. However, the proposed intake excavation between the bridge support piers would result in:

- a) Much higher (on average), but also much more variable, water flows between the support piers.
- b) The support piers being taller and likely requiring some type of reinforcement or protection from the water. More frequent inspection would be required, and determining condition from such inspections would be more expensive or difficult.

- c) Furthermore, bridge maintenance and repair work would be more difficult and require more coordination.

Bridge inspection would be an on-going additional cost and risk to the District.

4) Infringement on District Property

The proponent's drawing NBC-04 shows that the east side of the proposed intake would infringe on District land. While in itself this may not be a major concern:

- a) This intake would be the most likely location for a serious accident or fatality at the proposed generating station. Therefore, the intake being partially on District property would expose the District to additional liability.
- b) The concrete forms for the construction of this proposed intake would need to further infringe onto District land and the required excavation would therefore need to be closer to the south abutment for the District Road 169 bridge over the Bala north channel. Such nearby blasting and excavation would create additional risk of damage to the bridge.

5) Obstructed Driveway

During operation, the driveway to the proposed generating station would have obstructed sight-lines to the north (due to the bridge railing) and an obstructed path to the south (due to the proposed road shoulder guide rail and retaining wall). The result is that use of this driveway would be difficult and dangerous. For example, if this driveway was to be used by vehicles backing-in to it (to facilitate subsequent vehicle exit), then:

- a) Vehicles backing-in to the driveway would be dangerous to pedestrians walking along the west side of District Road 169, as the vehicle driver would be focussed on any on-coming traffic and manoeuvring into this narrow driveway – and therefore not able to fully watch for children and other pedestrians approaching from either side.
 - Allowing a driveway in this known-undesirable location would expose the District to increased liability.
- b) Even if it is technically possible to back-in to the proposed driveway from the widened shoulder without one's car entering the vehicle roadway:
 - As we all know, it is often that additional manoeuvres are required to get one's vehicle aligned and turned as required. The resulting additional manoeuvres would cross into the District Road 169 (which has a 50 km/h speed limit), which would be unexpected to on-coming traffic.
 - For on-coming traffic southbound, suddenly (due to the view being obstructed by the bridge railing) seeing a vehicle backing-up beside, or entering the road would likely cause them to suddenly brake or swerve, which would lead to accidents.

The District should specify that a condition of both temporary (during proposed construction) and permanent (during proposed operation) driveway access is that all vehicular movements require a trained flag-person.

6) Impact on Traffic Capacity

- a) The proposed excavation work would require hauling away approximately 1,500 truckloads of excavated rock and soil, and there would be hundreds more

truckloads of concrete and other construction material delivery. These truck movements would slow and disrupt through traffic.

Note that it cannot be expected that through traffic would avoid the area by taking another route, as the detour around this is 50 km.

- b) District Road 169 passes through the proposed construction site, and there would be active work, material storage, and construction equipment on both sides of the road.

We all know that speed limits are always reduced through construction zones, for worker safety, to be prepared for debris on the road or to stop due to truck movements, and due to the driver distraction of the work.

- c) Blasting would be required for the excavation of the proposed intake, tailrace, and powerhouse, and this blasting would be as close as $\frac{1}{2}$ m from the support piers for the District Road 169 bridge over the Bala north channel and 3 m from the bridge's south abutment.

Traffic would need to be stopped both during blasting and afterwards during the subsequent inspections to confirm there is no damage to the bridge or its supports.

For all of these reasons, the traffic flow capacity through Bala would be reduced during the proposed construction, and this would result in travel delays.

A traffic study should be done to determine the delays to emergency vehicles and other traffic, and also that the queue lengths would be acceptable.

7) Guide Rail

The proponent's drawing NBC-04 shows a plan view of their proposed retaining wall and guide rail and their drawing NBC-05 Shoulder Widening, provides a cross-section view of this retaining wall and guide rail.

- a) The support posts for the guide rail are shown to be 200 mm from the retaining wall.

Ontario Provincial Standard Drawing OPSD 912.240 shows guide rail posts must be at least 600 mm from slopes up to 10H:1V which are adjacent to roadways. Therefore, this guide rail is shown too close to the edge of the proposed retaining wall.

But this particular situation is much more complex than is covered by that OPS drawing in that the "slope" is actually a vertical drop of approximately 2.5 m. Therefore much more distance from the posts to the edge of the retaining wall is required, both:

- So the posts are better anchored to resist being pushed over by an errant vehicle.
- To keep errant vehicles from going over the embankment even if the directly impacted guide rail posts break and the guide rail is deflected (as they are designed and expected to do). According to Ontario's *Roadside Safety Manual*, this deflection would be up to 0.9 m for Steel Beam Guide Rail.

Therefore, the retaining wall needs to be farther from the guide rail.

- b) To be effective, the north end of the guide rail should be anchored as it is not secured to the bridge railing. OPSD 913.102 shows such anchors are 1 m horizontally.

This may require the proposed generating station be farther from the road.

- c) The proponent's drawing NBC-05 Shoulder Widening shows the guide rail as having a height of 710 mm, as is required for guide rails.

However, as the height of the retaining wall is approximately 2.5 m, the Ontario Building Code requires a guard at least a 1,070 mm high and this must not have openings of more than 100 mm.

- d) As the north end of the proposed guide rail is angled towards oncoming traffic (both from District Road 168, but also from Bala Falls Road), an energy absorbing, eccentric loader or other terminal for the guide rail should be provided.

Given the need to not infringe on Township of Muskoka Lakes land, this terminal may narrow the available road shoulder width.

- e) The current gap in the guide rail on the west side of District Road 169 at the T-intersection with District Road 169 is narrow enough that errant vehicles from Bala Falls Road that do not turn or stop could be stopped.

However drawing NBC-04 shows there would be a 10 m wide opening at this location. This guide rail opening is unacceptable as it leads to both where people could be and a driveway with an 8 m drop to the Township land and to the Moon River. Bollards or some other protection is required at this location.

Therefore, protection must continue to be provided to ensure errant vehicles cannot pass through the opening in the guide rail.

In summary, the design for the guide rail needs much further work.

8) Retaining Wall

Upon impact by an errant vehicle, the guide rail posts would transfer most of the force to the vertical wall of the pre-engineered retaining wall system shown in drawing NBC-05 Shoulder Widening. Retaining walls are not typically designed for such forces, so it is likely this retaining wall would need to be much thicker to withstand this force.

- a) This would result in the retaining wall being closer to, and possibly crossing, the property line to the Township of Muskoka Lakes property to the west.
- b) The face of the retaining wall being farther to the west would result in the retaining wall being even higher (as the ground drops towards the west), possibly necessitating further safety measures both for vehicles and pedestrians.
- c) To not infringe on the Township of Muskoka Lakes property to the west may require the road shoulder to be narrowed at the north end of the proposed guard rail.

Required changes to the retaining wall would have many implications which would need to be resolved before any approvals are provided.

9) Pedestrian Sidewalk

The District Road 169 bridges over the Bala north and south channels have sidewalks on both sides, and indeed pedestrians frequently walk through Bala along both sides of the road. As there are currently no crosswalks or traffic lights in Bala to assist pedestrians crossing District Road 169, which has a 50 km/h speed limit, it is important that it continue to be safe for pedestrians to walk along either side of District Road 169 throughout the length of Bala. Therefore:

- a) The proposed widened shoulder needs to be wide enough that pedestrians could safely walk by vehicles parked on the shoulder. This may require the shoulder to be further widened, which could infringe on Township of Muskoka Lakes property.
- b) As noted above, the proposed retaining wall would be at least 2.5 m high. It is important that a tall enough fence (referred to as a guard in the Ontario Building Code) is provided for pedestrian safety, with the difficult requirements that this fence be both attractive and also not obstruct the view down the Moon River for pedestrians and passing vehicular traffic.

More planning and information is required to ensure the pedestrian sidewalk along the proposed widened road shoulder remains safe both during the proposed construction and afterwards.

10) Environmental Assessment

The proponent's drawing NBC-03 shows the proponent intends to drive trucks with excavated rock up the Bala north channel to the area beside Purk's Place. Therefore, a cofferdam would be required farther upstream of this location.

However, Figure 5.1 of the proponent's 2012 Alternative 1A Environmental Assessment Addendum shows that they received approval from the Ministry of the Environment for a cofferdam extending eastwards only to the east side of the District Road 169 bridge over the Bala north channel. While Figure 5.2 of the proponent's 2009 Option 2 Environmental Assessment did show a cofferdam at this location near Purk's Place, this earlier proposed cofferdam did not extend west past the District Road 169 bridge over the Bala north channel, as the proponent's current proposed Alternative 1A would require.

That is, the proponent is requesting driveway access for which they do not have environmental approval from the Ontario Ministry of the Environment. Therefore driveway access at this location should be denied until the proponent has the required approvals.

Summary

In summary we are concerned that:

- 1) The proposed construction could damage the District Road 169 bridge over the Bala north channel; through the excavation directly adjacent to the support piers, through damage to the support piers, and due to settling due to lowering the ground water table as the proposed excavation is pumped-out.

Damage to the bridge would have significant impacts to emergency vehicle response times, area businesses, and the general public. As the proponent has no employees, no assets, no income, and no operations, the District could end up having to deal with a difficult legal situation, a justifiably-angry public, and even a sub-Contractor's insurance company.

Also, the proponent's method of excavation and bridge support pier reinforcement may result in on-going higher inspection and maintenance costs to the District.

- 2) The drawings provided show infringement onto District property and this could expose the District to increased liability in the event of an accident or fatality.

- 3) The use of the driveway to the proposed generating station would be dangerous to both pedestrians and passing vehicles.
- 4) There would be more than 1,500 truckloads, construction on both sides of District Road 169, blasting, and subsequent inspections required. Therefore traffic delays and queuing would result. Study is required to determine whether these would be acceptable.
- 5) The proposed guide rail and retaining wall for the shoulder widening is inadequate for both vehicle and pedestrian safety. Resolving this could result in the both the shoulder being narrower than required and infringement onto Township property. Therefore, this needs to be resolved before approvals are provided.
- 6) The proponent is requesting driveway access at a location for which they do not have environmental approval. Approvals should therefore not be provided until the proponent has the required approvals from the Ministry of the Environment.

Conclusion

With so many unaddressed issues of concern to the public it would be irresponsible to enable this proposed project to proceed and incur additional costs until it can be assured that the proposed construction work and subsequent operation would be safe for the public, would not unduly risk damage to public infrastructure, and would not result in additional costs or liability to the District Municipality of Muskoka.

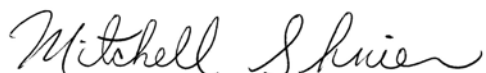
While the proponent has received environmental approval for some aspects of the proposed work, this has not examined public safety (nor risk to public infrastructure, nor liability to others). Indeed, it has recently become clear that the only way the proposed station could be operated safely would be to fence off the nearby Margaret Burgess Park. That is, the proponent has never been forthcoming concerning negative impacts, leaving it to the public to determine these. It is therefore incumbent on the District to ensure these are fully explored in advance.

We request that the District Municipality of Muskoka require that before any Driveway Access or Roadway Occupancy Permits are approved:

- The proponent provide updated information that addresses the above concerns.
- The public have an opportunity to review and comment on this new information.

Thank you for your consideration of these issues, and please contact me anytime for additional detail on the above.

Sincerely,



Mitchell Shnier, on behalf of SaveTheBalaFalls.com

Cc: Chris Wray, Chief Administrative Officer, Township of Muskoka Lakes, CWray@muskokalakes.ca