

Appendix M

Transportation Plan



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November 17, 2008

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**Re: Ostrander Point Wind Farm
Preliminary Wind Turbine Transportation Plan
Project No. 07-10135**

Dear Mr. Sorensen:

We are pleased to submit our Preliminary Transportation Plan for the Ostrander Point Wind Farm in Prince Edward County, Ontario. Enclosed are the results of our site visit and subsequent review of the potential access routes from Highway 401 to the site at Ostrander Point as well as our concerns and recommendations relative to the preferred route(s).

Please do not hesitate to contact the undersigned should you have any questions or concerns regarding the enclosed report.

Respectfully submitted,
D. M. Wills Associates Ltd.

Bruce T. Bonner, P. Eng.

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/ljw

cc: Dave Wills, D.M. Wills



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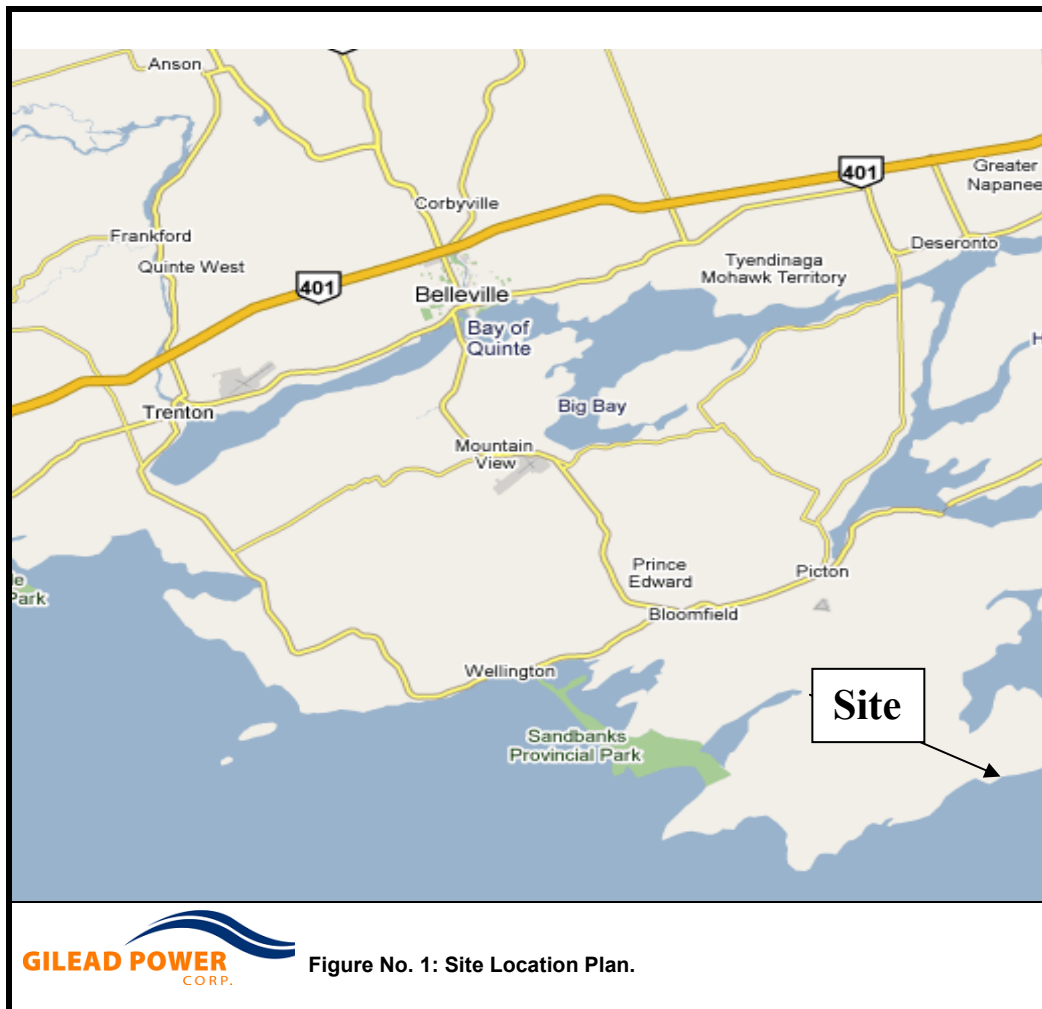
1. Introduction and Background

Ostrander Point (Site) in Prince Edward County is the proposed location of a new wind power farm in Ontario. A site plan has been included in Figure No. 1.

D.M. Wills was retained by Gilead Power Corp. to investigate alternative routes from Highway 401 to the site and to recommend the preferred route.

It is our understanding that the wind turbine equipment will be transported to a selected site on Lake Ontario via transport along Highway 401 (Hwy 401) and that an access route must be determined from Hwy 401, through Prince Edward County, to the Site. It has not been determined at this point which direction the equipment will be originating from and therefore, in order to accommodate either situation, we have considered several routes to the Site. The following parameters will be examined for each of the proposed routes: safety; road construction; bridges; overhead utilities; intersection geometrics; community disruption; seasonal weather; and, traffic volumes.

Discussions with the County of Prince Edward Roads Department representatives were of assistance with our study to determine the optimum route.



2. Transportation Requirements

At this time, the type and weight of the transport vehicles is unknown; however, we have summarized the shipping weights of the wind turbine equipment and provided the road restrictions as stated in *Weights, Dimensions and Transport Guidelines V82-II* provided by Vestas Wind Systems.

2.1 Equipment Weights

It is our understanding that the equipment will be shipped on trucks as indicated in Table 2-1.

Table No. 2-1: Equipment Specifications

Item	Height (m)	Length (m)	Width (m)	Weight (ton)
Nacelle	3.5	7.5	3.0	51.0
Cooling Unit	2.28	2.35	1.5	1.10
Rotor Hub	4.43	3.58	4.13	20.7
Blade	-	40	3.2	7.5
Tower (bottom)	3.98	22.416	3.98	46.0
Tower (middle)	3.669	10.08	3.669	17.0
Tower (middle)	3.666	22.4	3.666	29.0
Tower (top)	3.662	23.334	3.662	21.0

Note:

1. Specifications are based on Vestas Wind Systems' *Weights, Dimensions and Transport Guidelines V82-1.65MW*.
2. Rotor hub height is based on the hub including spinner, with nose cone and including transport frame (maximum).
3. Blade width and weight are based on the blade max chord (AL) value.
4. Tower specifications are based on the maximum tower hub height of 80m.

2.2 Road Restrictions

According to the *Weights, Dimensions and Transport Guidelines V82-II* provided by Vestas Wind Systems, the equipment requires access roads to have longitudinal slopes of less than 10% grade. The road width must be a minimum of 4.9m and suitable for a rubber tire crane. The clearance required on both sides of the road is required to be 2.5m and suitable for the use of a crawler chain.

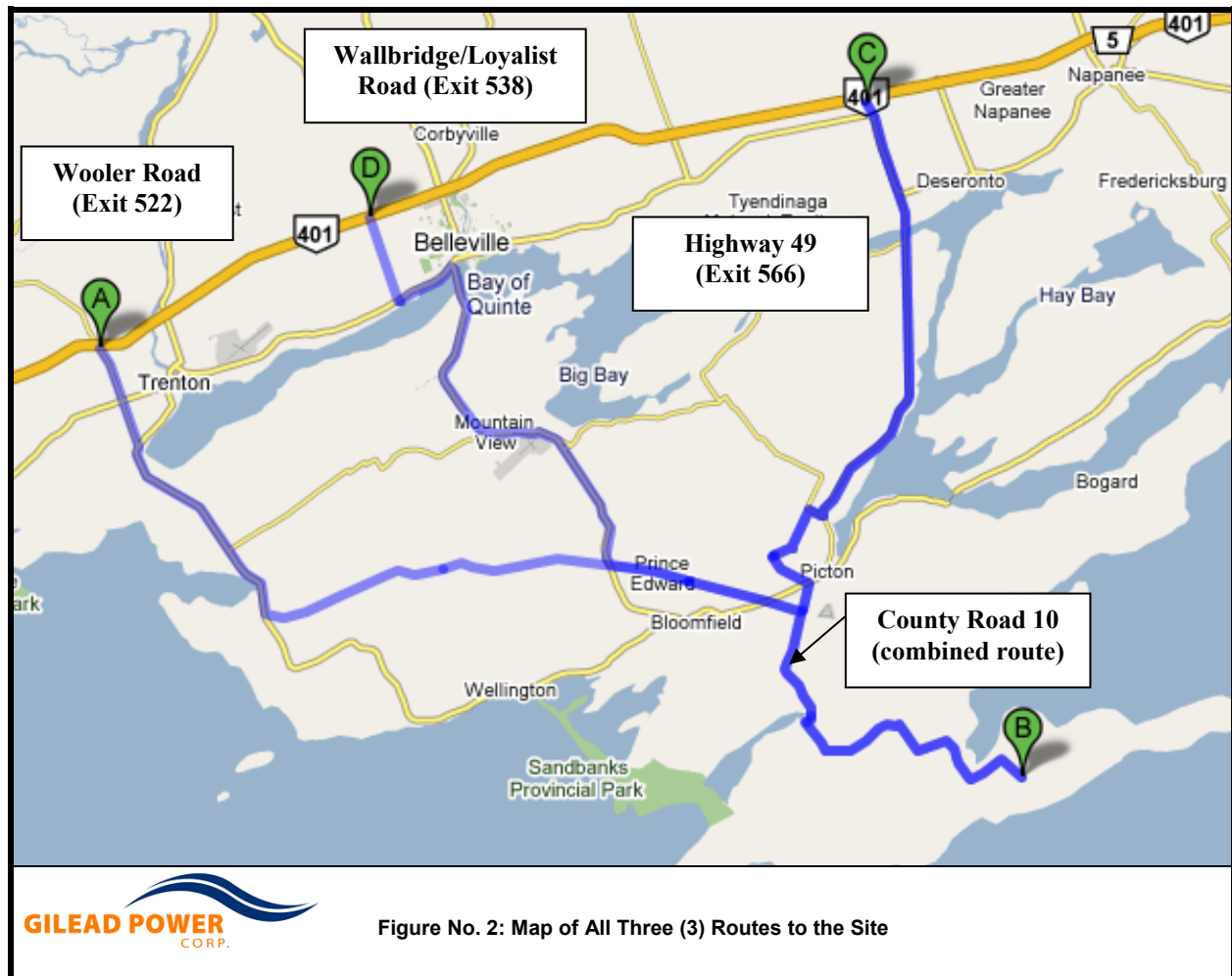
3. Proposed Transportation Routes

During our site visits conducted on October 30th and November 6th, 2008 it was determined that there were three (3) potential access routes from Hwy 401 to the Site. The three access routes are as follows:

- County Road 33 (CR33) at Wooler Road (Exit 522)
- Wallbridge/Loyalist Road (Exit 538)
- Highway 49 (Hwy 49) at Deseronto (Exit 566)

All of the proposed access routes converge to a common route at CR10 south of the Town of Picton. The combined route will be discussed in Section 3.4. Figure No. 2 displays all three (3) routes and the location where they converge on CR10.

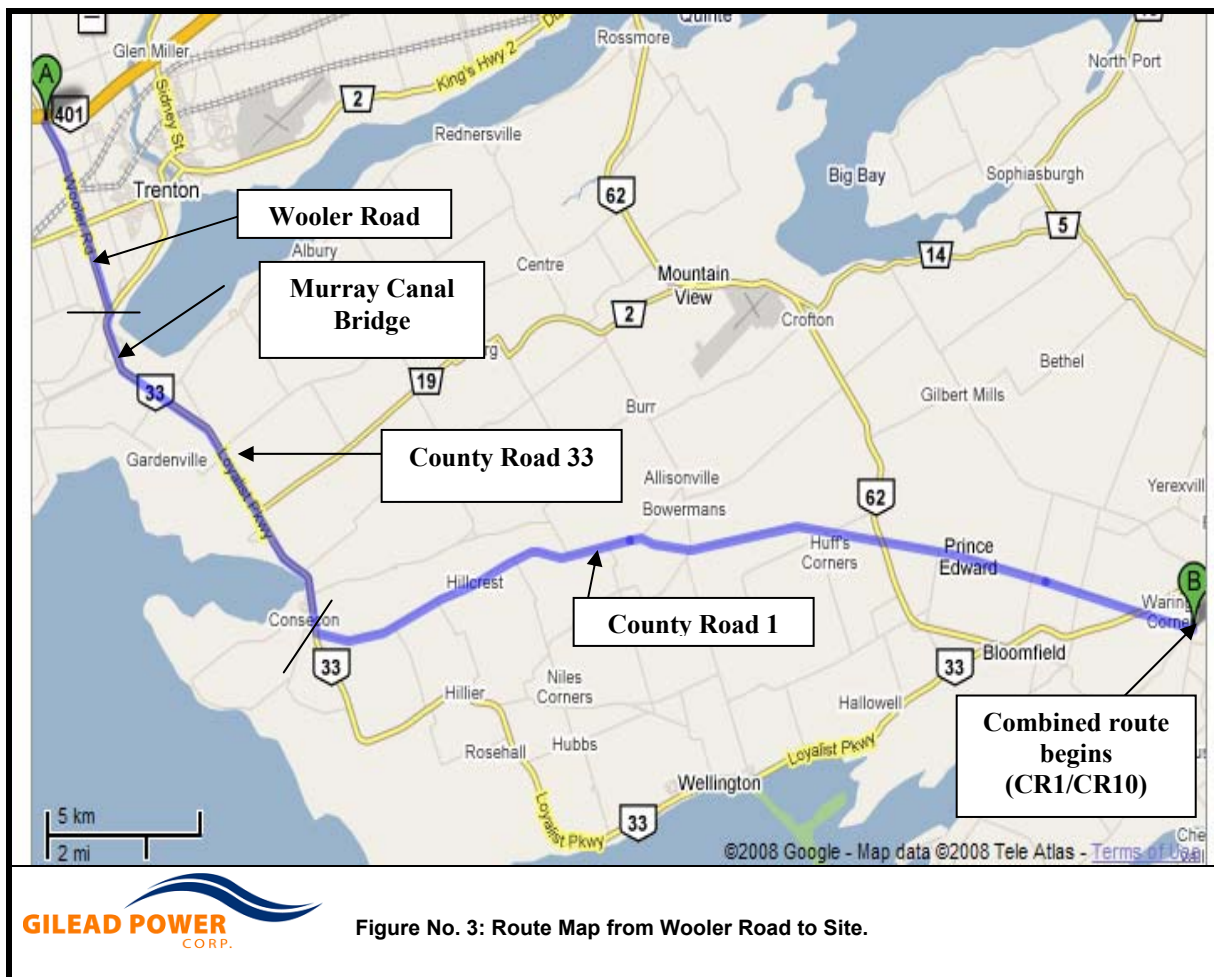
Each of the access routes had multiple county road options approaching CR10 each of which will be discussed in detail as to acceptability of each.



3.1 County Road 33 Wooler Road

The most accessible route from the west is Exit 522 at Wooler Road near Trenton, Ontario. A route map has been included in Figure No. 3. The route is as follows:

- Hwy 401
- Exit 522 (Wooler Road)
- County Road 33
- County Road 1
- County Road 10
- County Road 13
- Babylon Road
- Ostrander Point Road
- Site



The distance from Hwy 401 to the intersection at Babylon and Helmer Road is 71 kilometers.

Wooler Road provides access to the communities of Trenton, Wellington, Bloomfield, and Picton by way of CR33, all of which have greater populations during the summer season. By choosing CR1 (Schoharie Road) off of CR33, trucks will bypass all of these communities.

Road Construction

The roads along this route are asphalt or surface treated, two lane highways that experience moderate traffic volume but increased traffic volumes during the summer tourism season. All connecting roads along the route are in good condition.

Obstacles

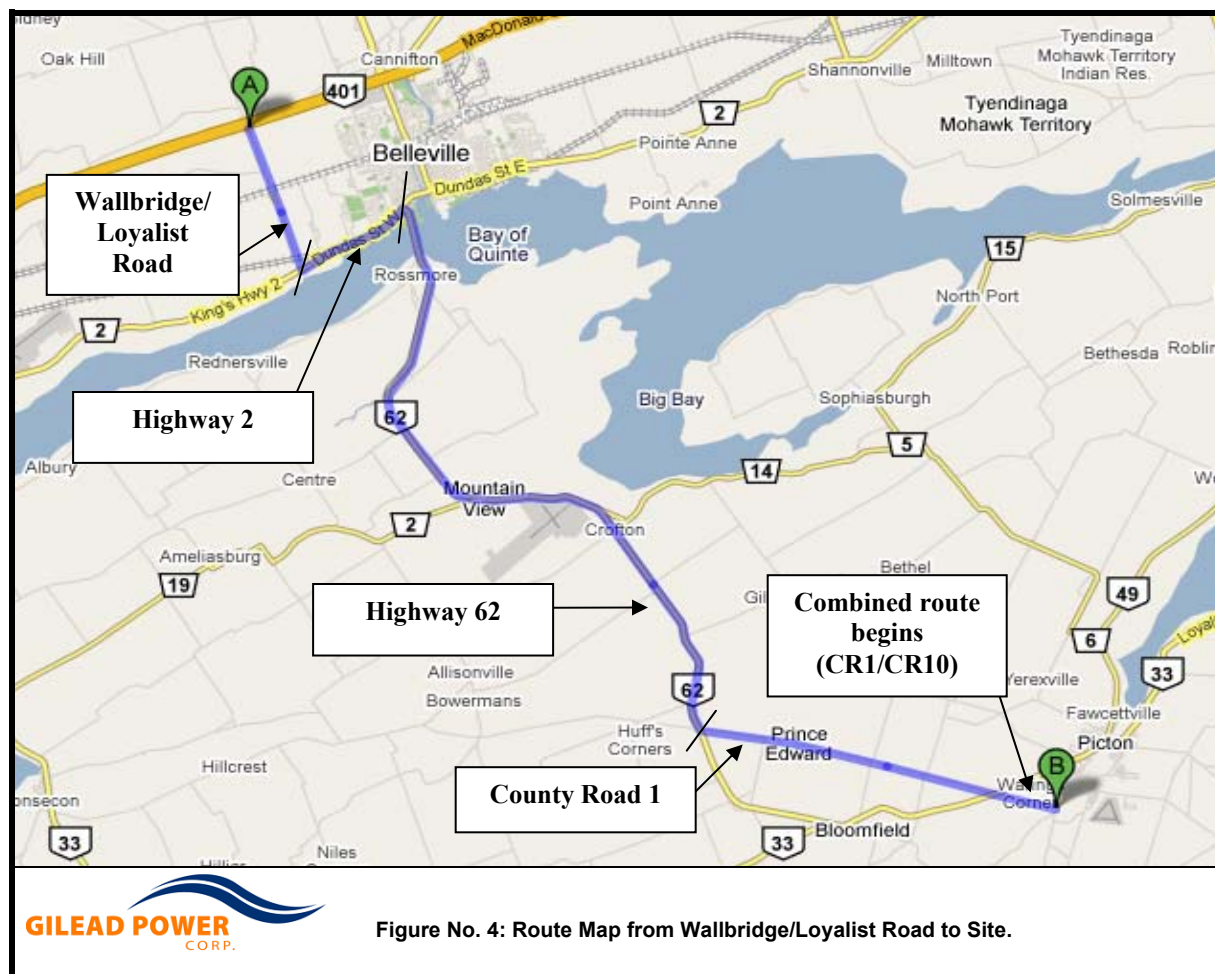
The greatest obstacle recognized for this route is the Murray Canal Bridge. The location of the bridge is indicated in Figure No. 3 above and the bridge itself is shown in Photo No. 1 below. The Murray Canal Bridge has a capacity of 59 tonnes. This route would offer ideal access to the site from Hwy 401 west (ie. from eastbound Hwy 401).



3.2 Wallbridge/Loyalist Road

An optional access route from Hwy 401 would be Exit 538 at Wallbridge/Loyalist Road near Belleville, Ontario. A route map has been included in Figure No. 4. The route is as follows:

- Hwy 401
- Wallbridge/Loyalist Road, Exit 538
- Highway 2
- Highway 62
- County Road 1
- County Road 10
- County Road 13
- Babylon Road
- Ostrander Point Road
- Site



The entire route from Hwy 401 to the intersection at Babylon and Helmer Road is 64 kilometers.

Although Hwy 62 would appear to be the more obvious route, it passes directly through the City of Belleville. We selected Wallbridge/Loyalist Road as an alternative since it bypasses Belleville. Wallbridge/Loyalist Road is less traveled and has fewer signaled intersections.

Road Construction

Wallbridge/Loyalist Road is an asphalt and/or surface treated, two lane highway which likely experiences moderate traffic volume and increased traffic volume during tourism season. It would however experience less tourism traffic than the Wooler Road route. All connecting roads along the route are in good condition.

Obstacles

A potential problem intersection along this route occurs at the Hwy 401 exit onto Wallbridge/Loyalist Road. As indicated in Photo No. 2, the southbound turn may require traffic control in order for the trucks to make wide turns. Since the intersection is at Hwy 401 there may be traffic congestion issues at certain times of the day.



Although Wallbridge/Loyalist Road bypasses the majority of the City of Belleville, it does pass by Loyalist College. The student population at Loyalist College is approximately 2,800 which may also pose some traffic congestion at certain times during the day.

The main obstacle recognized for this route is the southbound turn from Hwy 2 onto Bay Bridge Road (Hwy 62). This intersection exhibits two (2) lanes of traffic in each direction, is congested at times and would likely require traffic control. From this intersection, traffic passes onto a small bridge north of the larger Norris Whitney Bridge which spans the Bay of Quinte. The location of this intersection and the smaller bridge, have been indicated in Figure No. 5.

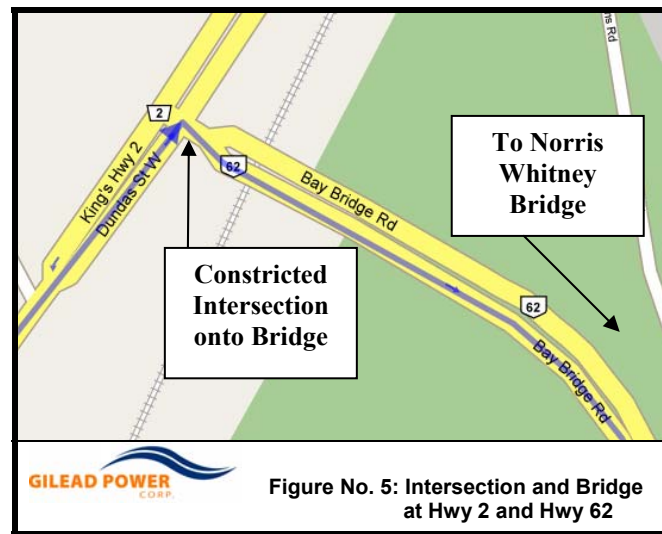


Figure No. 5: Intersection and Bridge
at Hwy 2 and Hwy 62

Both bridges have two (2) lanes of traffic in each direction and appear to be in good structural condition. The Norris Whitney Bridge would appear to have adequate load capacity, although all bridge loading capacities in all routes would need to be confirmed adequate for the subject loading.

3.3 Highway 49 Deseronto

The closest access route from the east is Exit 566 at Hwy 49 in Deseronto. Hwy 49 becomes County Road 49 south of the Skyway Bridge. A route map has been included in Figure No. 6.

The entire route from Hwy 401 to the intersection at Babylon and Helmer Road is 56 kilometers and the route is as follows:

- Hwy 401
- Highway 49
- County Road 6
- County Road 5
- County Road 34
- County Road 4
- County Road 10
- County Road 13
- Babylon Road
- Ostrander Point Road
- Site



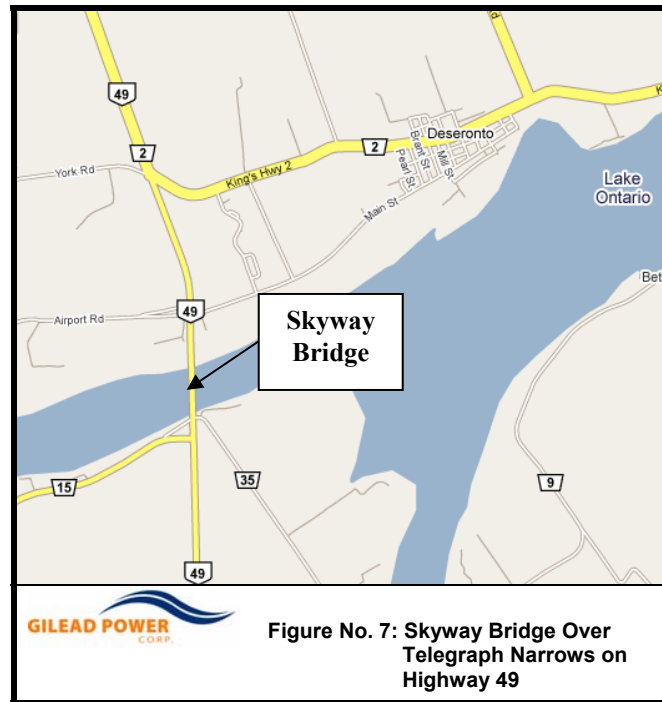
Road Construction

The roads traveled along this route from Hwy 401 to Picton are concrete, asphalt or surface treated, two lane highways that likely experience moderate traffic volumes and increased traffic volumes during tourism season although not to the same degree as Wooler Road. All connecting roads along the route are in good condition.

Hwy 49 is an access route for Essroc, a cement and chemical admixture factory. Heavy truck loads travel frequently to and from this site indicating the strong structural composition of Hwy 49.

Obstacles

The main obstacle recognized for this route is the Skyway Bridge over Telegraph Narrows. The location of the bridge is identified in Figure No. 7. The Skyway Bridge has what appears to be adequate capacity for the intended use.



This route exhibits a number of turning movements and is not as direct to the Site as the other proposed routes. However, the turns are all located in remote areas on County roads that would likely not require traffic control due to their lower traffic volumes. A typical police escort would suffice for this route. This route would offer ideal access to the Site from Hwy 401 east (ie. from westbound Hwy 401).

3.4 Combined Transportation Route

After transport vehicles have reached CR10, the route will be consistent for the remainder of the route to the Site. Figure No. 8 displays the route from the intersection of CR1 and CR10 where the three proposed routes converge, to the Site.



Construction Activities

CR 33 becomes Highway 33 east of Bloomfield and is expected to be under construction at CR1 for the installation of a round-about intersection. Project completion is expected for summer 2009. Depending on delivery dates this could pose a scheduling conflict as there will be a detour during the construction period between the spring and summer of 2009.

Cherry Valley

Traveling along CR10, transport vehicles will approach a “T” intersection at Cherry Valley as shown in Photo No. 3. Trucks will turn southbound up a hill at this intersection to continue on CR10.



The “T” intersection at Cherry Valley should not pose a problem as it exhibits very low traffic volumes and the intersection geometrics are generous and unconstrained.

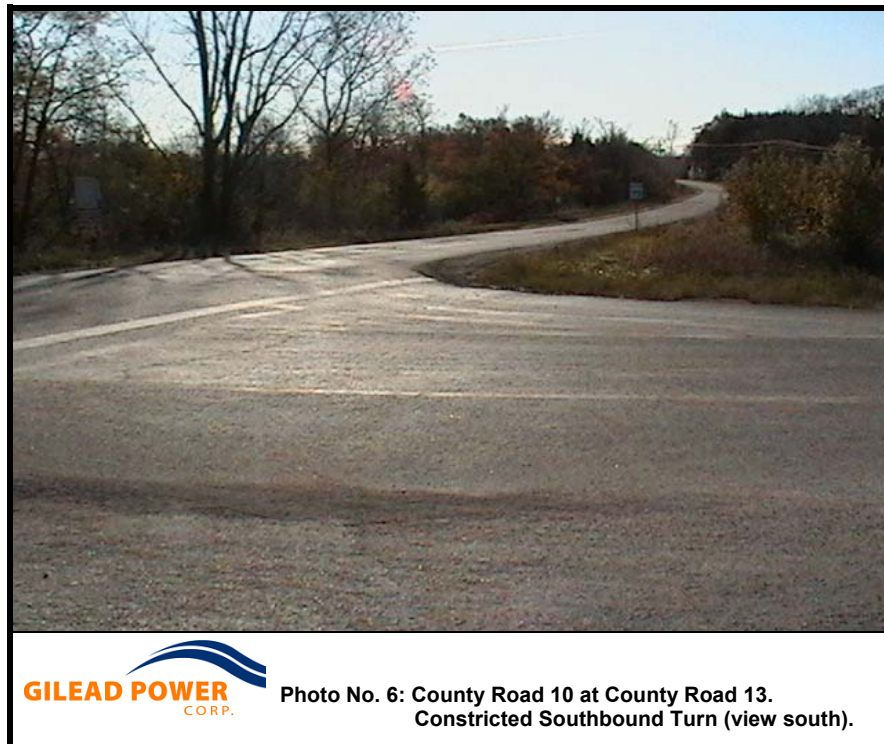
Milford

Transport vehicles will then approach Milford. In order to follow CR10 through Milford the trucks must pass under two (2) low overhead wires as indicated in Photo No. 4 and 5.

Photo No. 5 also identifies a more constrained intersection in Milford that may pose a tight turning movement onto CR10. The intersection has minimal traffic.



CR10 turns south onto CR13 at South Bay. This intersection is very remote, however, somewhat constraining (see Photo No. 6).



CR13 is of narrower width than CR10 and is not to as good a standard, however given the remoteness of the area and lower traffic volumes, this should not be a major issue.

Site Access Roads

Currently there are only two (2) access roads that lead directly to the Site off of Babylon Road. The access roads are Petticoat Point Road and Ostrander Point Road. Petticoat Point Road is only accessible via Helmer Road and each are seasonal roads that are not up to standard for the intended use.

Babylon Road is a low profile, narrow, poorly drained, two (2) lane road (See Photo No. 7). Helmer Road is a seasonal road that is has a low, flat profile. It is a narrow, single lane, gravel road (See Photo No. 8).

Ostrander Point Road is a single lane road which has been marginally built up with crushed stone. It provides better access to the site than at Helmer/Petticoat Point Road (See Photo No. 9); however, the road is narrow, poorly drained and is not up to proper standard. Ostrander Point Road is, in our opinion, the best access road option for vehicular access since it may not require a significant upgrade other than widening and improved granular base to accommodate its intended use.

Currently there is a 90 degree turn from Babylon Road onto Ostrander Point Road. This turn would be constricted for the large trucks in question and therefore Ostrander Point Road would need to be widened to accommodate the required wide turn from Babylon Road onto Ostrander Point Road.



Photo No. 7: Babylon Road (view east).



Photo No. 8: Helmer Road (view south).



4. Conclusion

This report has been developed as a preliminary transportation plan on behalf of Gilead Power Corp. to determine the best possible route for oversized vehicles to travel from Hwy 401 to Ostrander Point. At this time, measurements have not been taken for overhead utilities, bridges or overpasses nor have calculations been conducted for intersection geometrics or point loads for the shipping vehicles.

Considerations have been made for the following parameters: safety; road construction; bridges; overhead utilities; intersection geometrics; community interferences; seasonal weather; and, traffic considerations.

The following decision matrix demonstrates the degree of constraint for each of the parameters encountered along each route. These parameters determine the relative suitability of each route to accommodate traffic to the Site. The summary only addresses the portion of the route from Hwy 401 to the CR1/CR10 intersection. Parameters have been assigned values between 0 and 10 with 0 being the best score. The route with the lowest score is the most preferred route.

Table No. 4-1: Preferred Route Decision Matrix

Route	Intersection Geometrics	Overhead Utilities	Bridges	Municipalities	Other	Total
Wooler Road (CR33/CR1)	0	2	10	0	2	14
Wallbridge/Loyalist Road	8	2	5	7	3	25
Deseronto (Hwy49)	5	2	3	3	0	13

As can be seen in Table 4-1, the preferred route is Hwy 49 as this route exhibits no major concerns. The intersections that are of minimal concern are in very remote locations where wide turns can be made easily with traffic control assistance in place. This route bypasses Picton at the west end of the town. It passes through a wide intersection at CR4 and Main Street where the only concern is overhead traffic signals.

The second preferred route is Wooler Road provided the Murray Canal Bridge can accommodate the load and width of the subject vehicles. This route is the most direct particularly from a westerly access with the least number of turns/intersections provided the delivery dates for the equipment falls before or after the construction at the Hwy 33 and CR1 intersection (summer 2009 completion).

The third route via Wallbridge/Loyalist Road scored poorly as the route passes a very busy and constricted intersection in Belleville and encounters two other active intersections and two bridges.

Other routes that were considered from Hwy 401 were Wooler Road to CR33 through Wellington and Bloomfield, and Hwy 49 through Picton at Bridge Street, both of which pass through built up communities (Wellington, Bloomfield, and a difficult intersection at Hwy 49 and Bridge Street in Picton).

5. Recommendations

At this time, it is unknown as to what direction equipment will be arriving from in which case, based on our visual appraisal of the proposed routes from Hwy 401 to the Site, we have chosen acceptable routes from the east and from the west to accommodate the wind turbine equipment arriving from either direction.

West Approach

Provided the Murray Canal Bridge on CR33 has an acceptable load capacity and width tolerance, we recommend this route from Exit 522 at Wooler Road. The proposed Wooler Road route which eventually follows CR1 (Schoharie Road), does not experience high volumes of traffic and does not pass through large built up areas. The roads along this route are of high standard and are in a good state of repair.

Table 5-1 summarizes the concerns exhibited along the western proposed route:

Table No. 5-1: Wooler Road Route Characteristics

Item	Location	Concern	Recommendation
Murray Canal	Carrying Place	Bridge Capacity and Width	Compare point load of actual shipping package.
Construction	CR33 at CR1	Detour	Coordinate delivery dates with construction period or use alternate route.

East Approach

Should the wind turbine equipment be arriving from the east or if the Murray Canal bridge does not have sufficient load capacity, we recommend the Exit 566 route at Deseronto to Hwy 49. Although it appears that this route may be more complex (several turning movements), it presents fewer constraints (lower traffic volumes, smaller bridge crossings or poor geometrics). This route is less traveled and more remote than the Wallbridge/Loyalist Road or Wooler Road routes.

Table 5-2 summarizes the concerns exhibited along the eastern proposed route:

Table No. 5-2: Deseronto Route Characteristics

Item	Location	Concern	Recommendation
Skyway Bridge	Hwy 49 south of 401	Bridge slope.	Slope is less than 10%.
Poor Geometrics	Hwy 49/CR6, CR6/CR5, CR5/CR4	Some intersections may not accommodate long trucks.	Verify turning radius of trucks to compare against existing intersection radii.
Low Overhanging Utilities	CR4 at Main Street in Picton	Overhead utilities and traffic signal vertical clearance concern.	Verify height of traffic signals and utilities to compare against maximum equipment height.

The distance between the two preferred routes along Hwy 401 (Exit 522 to Exit 566) is approximately 44kms.

Combined Transportation Route

Table 5-3 summarizes the concerns exhibited along the combined proposed route from the intersection of CR1 and CR10:

Table No. 5-3: Combined Transportation Route Characteristics

Item	Location	Concern	Recommendation
Overhead Utilities	Milford and throughout route	Wires may not clear vertical height of equipment	Verify actual shipping heights and compare against all overhead utilities and overpasses.
Road Geometrics (at intersections)	Cherry Valley, Milford, CR10/CR13, CR13/Babylon, Babylon/Ostrander Point Rd.	Intersections may be too tight to accommodate truck turning movements	Verify actual truck turning radii and compare against existing road geometrics radius. Widen Babylon/ Ostrander Point Road intersection to accommodate a wide, turning movement.
Low Lying Areas	Access Roads (Babylon Rd., Helmer Rd., Ostrander Point Rd., Site.)	Access roads to the site are extremely low and poorly drained. May not be suitable for heavy loads in this current state.	Chosen access road should be rehabilitated to accommodate the equipment and truck loads. On site infrastructure will be required for truck access/egress.

The final access routes along Babylon and Ostrander Road will require upgrading to accommodate the proposed traffic.

We recommend that further studies be conducted along the chosen route(s) to determine if all intersections have the minimum required geometrics and if all overhead wires and overpasses meet the minimum clearances for the intended use. If the two recommended routes meet requirements for the transport of this equipment and bridge loading capacities are acceptable, then both routes may be utilized for transportation purposes.