

Fairview Wind Project

Analysis of Economic Impacts on Collingwood Regional Airport

November 9, 2015

Response to the MOECC's letter of October 6, 2015

Introduction

On October 6, 2015 MOECC asked wpd Canada to conduct an Economic Impact Analysis of the Fairview Wind Project (FWP) proposal on the aerodrome operations at Collingwood Regional Airport (CRA), including how the changes in operations may impact planned airport expansion outlined in the Town of Collingwood Economic Development Action Plan (May 2015).

The basis for the request - Transport Canada's letter to the MOECC

In November 2014, Transport Canada responded to a request from the MOECC for clarification of FWP in relation to aerodromes. The letter made statement such as (these changes) "may" result in a decrease in the usability of the aerodrome, the effectiveness of the instrument approach and the operational impact of the aerodrome in poor weather conditions. These statements were not quantified, other than to quote comments by Charles Cormier, a consultant hired by CRA. Mr. Cormier positioned that raising the minimum limits in R13 LNAV "would likely" have an impact on aerodrome operation, and that the raised minima for R31 LNAV "would result in a significant penalty". Neither of these statements are quantified and "penalty" in this sense is a qualitative expression, not an aviation term. Mr. Cormier did not quantify the statements but did suggest that impacts to raising the circling limits for RWY13 and RWY31 could be reduced by limiting the circling to one side of the aerodrome [the side opposite from the location of the turbines]. He further stated that impacts to raised limits for the VOR/DME approach (VHF Omni-Directional Radio-Range/Distance-Measuring Equipment – a non-precision approach) could also be reduced by limiting the circling to one side of the aerodrome.

In its most basic premise, the letter clearly stated that CRA was an aerodrome, not a certified airport, and as such the 4 km obstacle limitation surface (OLS) that limits the penetration of tall objects within this radius did not apply. According to Transport Canada, the OLS should be measured from the aerodrome reference point which is at or near the geometric centre of the aerodrome.

For illustrative purposes, we have depicted our closest turbines in relation to the aerodrome.



Figure 1. Distances of turbines as measured from the geometric centre of the aerodrome.

The letter clarified that aviation safety had been addressed by using the standard mitigation measures, i.e. measures that aviation uses around the world to address developments in the vicinity of airports.

Additionally, Transport Canada makes it clear that an evaluation of the impacts of obstacles and instrument approaches is the responsibility and purview of NAV CANADA. In its March 19, 2015 letter, NAV CANADA did not require the 20' and 120' alterations of the minima [for Category A and B flights] on RWY13 and RWY31 that the Cormier report states. Rather, NAV CANADA specified changes only on the circling approaches for Category C and D flights, which, as they note, can be mitigated by circling to the north; and as NAV CANADA's 2013 letter to wpd had previously clarified, circling to the north would reduce the need to raise the minima.

NAV CANADA has no objection to the project

Instrument Flight Rules (IFR)

Past Evaluations

wpd has previously submitted reports to MOECC that analyzed the potential effect of the FWP turbines on instrument flight approaches at CRA.

In March 2011, a Preliminary Aviation Analysis was conducted by an aviation specialist to assess whether FWP meets obstruction clearance rules related to aviation safety, and whether the wind

project would affect the instrument approaches at CRA. The assessment (*Fairview Wind Farm Preliminary Aviation Analysis* – see Appendix 1) clarified the following:

- CRA is a registered aerodrome and not a certified airport, therefore TP312 Aerodrome Standards and Recommended Practices do not apply. Neither the aerodrome operator, nor Transport Canada has grounds to restrict construction of FWP based on standards outlined in TP312.
- The distance of the closest turbine is sufficient to protect aircraft operating from either runway 31/13 or runway 01/19 from turbulence generated by wind turbines.
- Due to the orientation of the runways and the [instrument] approaches to the airport, flights can maintain a safe distance from the turbines if they are appropriately lit (NOTE: Transport Canada has approved wpd's lighting proposal; see Appendix 4 - Transport Canada correspondence).
- Although the preliminary assessment determined that FWP should not have an effect on aviation safety, additional mitigation was proposed. This assessment was later verified by NAV CANADA (see Appendix 5 – NAV CANADA correspondence). The impact of these mitigation measures is addressed in *The Economic Impacts of the Fairview Wind Project on Collingwood Regional Airport*, under the section 'Impact on Aerodrome Operations' (see Appendix 6).

In April 2011, wpd's aviation expert supplemented the aforementioned study with a second analysis to determine the impact of FWP on flight related navigational aids. The assessment (*Fairview Wind Farm Technical Analysis of Ground-Based Navigation Aids* – see Appendix 2) concluded:

- FWP did not appear to violate any known standard or proposed guidelines for the protection of aviation navigational aid facilities or RADAR.
- FWP should not generate concern for the NAV CANADA Land Use Group with regard to those facilities.
- NAV CANADA validated (letter 2015) that it did not have any objections to the proposed wind project, but that it would require publication of certain amendments to the procedures for CRA.

In July 2012, wpd examined the effect of changes to the instrument approaches on the operations of CRA. This report (*Potential Effects of the Fairview Wind Project on IFR Aircraft Accessing Collingwood Regional Airport* – see Appendix 3) was in response to a summary report by the CRA. Officials with the airport had publicly asserted that the FWP turbines would significantly impact access to their airport, and based their claim on the projected technical impact on the instrument approaches (i.e., the raising of certain minima). Given that no data was provided, nor was there a study conducted to determine the effects the raised minima would have on flight operations at the airport, wpd commissioned its own study. The study was peer-reviewed by two aviation professionals (see "Biographic Information" in Appendix 3): the first, experienced in the regulation and operation of aerodromes and air traffic services; the second, experienced in the regulation and operation of business and commercial aircraft operations. The analysis looked at flights operating under instrument flight rules (IFR); i.e. flights that would be using the instrument approaches, and concluded:

- Most aircraft flying at CRA are operating under visual flight rules (VFR – approx. 97%) and therefore will not be affected by changes to (IFR) instrument procedures. (NOTE: VFR flights are discussed later in this document).
- The minima for the runways and approaches that will most often be used during inclement weather (RNY13) will not be raised (or raised very slightly) because of the turbines.
- It was estimated to be from zero to three (0-3) flights annually that would be diverted or have a delayed landing as a result of the changes due to the turbines. [NOTE: flights are diverted or delayed for a host of other reasons such as snow, heavy crosswinds or icy runways, as well as medical emergencies, mechanical issues, natural disasters, customs issues, terror threats, etc.]

Validation of past IFR reports to present conditions

Given that the SMS Aviation Safety assessments were conducted in 2011 and 2012, wpd requested the author to re-assess the reports and determine whether the assessed impacts and conclusions remain valid. The aviation expert's observations included (see Appendix 7 for analysis, and Appendix 3 for qualifications/biographical information):

- The findings and conclusions of the two 2011 reports were validated by subsequent NAV CANADA and Transport Canada assessments.
- The methodology employed for the 2012 assessment was valid.
- Although the 2012 assessment appears to have underestimated the actual number of aircraft movements in 2011 and 2102, the difference does not impact the findings as the study anticipated and accommodated such potential changes in the data.

The author essentially reached the same conclusion:

- it is likely that none – and not likely more than three – will need to divert to an alternate airport, or be delayed in landing as a result of conducting a missed approach or entering the holding pattern before successfully landing at Collingwood Regional Airport

Assessment of VOR/DME concerns

The original 2012 assessment had examined the VOR/DME A approach; however, Transport Canada's November 2014 letter included concerns raised by the design specialist about the VOR/DME A approach. These concerns are critiqued in the context of NAV CANADA'S assessment in March 2015, with the following observations (see Appendix 7 – observation #4 and Addendum):

- VOR/DME A approach is not aligned with any of the runways and is a non-precision approach; therefore the pilot must identify the aerodrome environment visually .
- When flight visibilities are reduced, pilots would employ precision approaches which would enable them to land straight ahead from an altitude lower than a non-precision approach.

- NAV CANADA noted that “these impacts can be limited by sectoring the circling for CAT C & D to the north of [runways] 13-31”.
- Most IFR-equipped aircraft have more up-to-date GNS equipment, therefore approx. 5% of IFR flights into Collingwood (i.e. 2) would use the VOR/DME approach.

The author concluded:

- when the increase of 80 feet to the CAT A and B VOR/DME approach minima was applied to the weather and aircraft movement data, it was forecast that from zero to two GA IFR flights might be impacted by the raised minima.

Conclusion #1:

From zero to three (0-3) IFR flights annually would be diverted or have a delayed landing due to the presence of turbines vs. diversions or delays due to a host of other factors

Visual Flight Rules (VFR)

The 2012 assessment looked at the effects of changes to instrument flight approaches on IFR landings. In a review exercise undertaken by the author of that report, wpd asked him to consider the potential effects that the presence of the FWP turbines would have on VFR flights accessing CRA. He observed the following (see Appendix 7):

- The Fairview turbines would be lit, and their locations would be indicated in charts, published and communicated to pilots.
- Approx. 97% of aircraft movements at Collingwood Regional Airport are VFR.
- VFR-governed pilots are restricted by regulations to operate in weather conditions that enable them to visually detect and avoid the turbines by a **lateral and vertical** distance of no less than 500 feet while remaining clear of cloud {emphasis added}.
- The same regulatory weather minima will apply whether the FWP turbines are constructed or not.

The author concluded:

- The proposed wind energy turbines are not likely to impact VFR operations at Collingwood Regional Airport.

Conclusion #2:

The proposed wind energy turbines are not likely to impact VFR operations

In the recent Environmental Review Tribunal dismissal for the Gunn Hill Wind Project, Michael Lucking was qualified by the Tribunal as an expert in civil aviation safety, with special expertise in aerodromes and air navigation. He testified with respect to the impacts of the project on aviation safety.

Mr. Lucking stated that there are many aerodromes in Canada where obstacles, including wind farms, are located in close proximity, and that these obstacles are assessed to determine if they are a hazard to air navigation and if they require marking and lighting in accordance with the Canadian Aviation Regulations. (see paragraphs 53 & 54 of case no. 15-028 available at <http://elto.gov.on.ca/ert/decisions-orders/>)

Economic analysis

Current activity

wpd retained the services of Maury Hill to evaluate the potential economic impact to CRA from FWP. Mr. Hill has extensive experience in aviation safety and consultation services. His 15+ years as an independent consultant (Maury Hill and Associates, Inc.), as well as his 15 years with the Transportation Safety Board of Canada, have allowed him to focus his career in the fields of strategic planning, evaluation of organizational design, development of management systems, safety management and safety investigations. Because the perceived economic impacts to CRA would be the result of measures enacted to ensure continued aviation safety, his training and work experience uniquely position him to perform an informed evaluation.

Key elements of the review include (see Appendix 6 - *The Economic Impacts of the Fairview Wind Project on Collingwood Regional Airport*):

- The analysis leveraged the results of the safety and operational analyses previously mentioned, and would seek to express the findings in economic impact terms.
- It additionally addressed whether or not VFR flights would be impacted, as the 2011 and 2012 SMS reports had focused solely on IFR flights. It clarified that VFR pilots are responsible for seeing and avoiding obstacles, and for that reason are restricted from flying in poor weather. Turbines and other man-made objects are documented and lit conspicuously so that VFR pilots can see them in both daytime and nighttime conditions. Given that VFR operations can continue as specified for VFR, there should be no operational impact, and therefore no economic impact related to the installation of FWP for flights that utilize visual flight rules.
- It reviewed the Collingwood Economic Development Action Plan, as available on the Town of Collingwood's website. The plan to date is a support for the assessment and investigation of economic development opportunities at the airport and to develop the business case for them.

Through the course of the analysis, it was determined that the magnitude of the impacts is estimated to be very low, and therefore below the threshold of meaningful quantitative analysis; as such, a qualitative approach was utilized. The report concluded that the impact on aerodrome operations must be considered to be negligible to minimal and therefore the result is too minimal to quantify an economic impact.

“Having considered impacts on safety, and operational impacts on both VFR and IFR flights, there is nothing to indicate that there will be a detriment to the overall viability of the Collingwood Regional Airport.”

Future plans

The review also considered the impact that FWP could have on possible expansion plans for CRA. Key elements of the review include:

- The Town of Collingwood Economic Development Action Plan, as contained on the town’s website, does not detail concrete plans for future expansion; but simply refers to investigating development opportunities.
- Future activity could include the process of certifying the airport.
- Transport Canada has recently authorized operations at Chatham Kent, a certified airport, with 8 turbines within the 4km radius of the airport.
- A business park adjacent to the airport is being discussed.

The report concluded that there is nothing to indicate that changes to the surrounding infrastructure and facilities, i.e a business park, or attempts to change the regulatory status of the airfield would be negatively impacted by FWP.

“The impact on aviation activity is too small to have any significant impact on any anticipated expansion of facilities, and the wind turbines are unlikely to impact future plans to certify the airfield.”

Consultation undertaken for Economic Analysis

NAV CANADA’s Reconfirmation

wpd has consulted with NAV CANADA for any new or additional input. NAV CANADA maintains their position as stated in the March 19th, 2015 letter. They state what procedures need to be modified, but do not object to the project, provided that wpd submits to them a 10 day notification of turbine installation. This notification will allow them to publish the stated changes in a “Notice to Airmen” (NOTAM). NAV CANADA’s evaluation of FWP is based on impacts to the procedures that they maintain. NOTE: All of the procedures related to CRA that were discussed in the Transport Canada letter to the MOECC (see Appendix 8) are procedures maintained by NAV CANADA.

Consultation with Collingwood Regional Airport

The MOECC request for an economic impact analysis expected input from, and engagement with the Collingwood Regional Airport. Throughout the entire process of developing the FWP proposal, and after submission of the REA application to the MOECC, wpd has requested multiple times to meet with representatives of the Airport Services Board. wpd has written to the board on at least nine separate

occasions requesting a meeting. The last official response from the Airport Services Board was received November 22, 2013 in which the Chair stated:

“Clearly I have failed in my efforts to explain to you why we have no interest in meeting with you, to hear how we must alter our approach and departure procedures at the Collingwood Regional Airport . . .”

An open invitation to meet was left with the board, and wpd had not reiterated its request since the very direct refusal to meet.

However, in respect of the MOECC request, wpd initially reached out by phone to CRA on October 21st, 2015 with the intention of contacting Pierre Lajoie, the aerodrome manager. wpd was informed by staff at the airport that he was not at work, and was the only person who could speak to the MOECC letter. Further attempts to call him were made on October 22nd and October 23rd, 2015 without success. An email was sent to Mr. Lajoie the afternoon of October 23rd, 2015 with a request for documents and an invitation to meet.

wpd received an email reply from Mr. Lajoie on October 26th, 2015 indicating that wpd should contact Brian MacDonald, the Director of Public Works at the Town of Collingwood. Subsequently, a voice message was left for Mr. MacDonald that afternoon. This was followed up by an email to Mr. MacDonald the morning of October 27th, 2015. That afternoon, Mr. MacDonald replied by email, confirming they had received wpd’s request but would not be able to meet the deadline suggested in wpd’s email to send relevant documents by October 28th, 2015. He also inquired as to what kind of documents wpd was looking for and what the purpose of the meeting would be.

A reply email October 27th, 2015 indicating that wpd was looking for documents relating to the Town’s Economic Development Action Plan as indicated in the MOECC letter of October 6th, 2015. wpd also indicated that the document submission deadline would be extended to Monday November 2, 2015 but required documents by then in order to have an opportunity to review prior to completing the assessment. wpd also suggested a teleconference meeting with the municipality for November 2nd or 3rd, 2015 once documents were received.

Not having received a reply by noon on November 2nd, 2015 wpd emailed Mr. MacDonald on November 4th, 2015 (an additional 48 hours) that indicated our submission to the MOECC would be finalized with the information on hand (see Appendix 9 – consultation with Airport Services Board and Town of Collingwood). wpd also indicated to Maury Hill (the author of the economic impact analysis) to proceed in finalising his report.

One final thought on airport expansion

There is little public information on planned airport expansion outside of general references to runway expansion. However, if runway expansion was pursued, the FWP turbines would still be further from the expanded runway than the Erieau Wind Project turbines are from the Chatham-Kent runway. If the Collingwood Airport Services Board decides to move forward with expansion, the Erieau project could serve as an example of how to co-exist with turbines in close proximity to the airport. Consider:

- Chatham Kent Municipal Airport (CMKA). This is a certified airport. Potential risks from the Erieau Wind Farm were mitigated by NAV CANADA; Instrument approaches procedures were amended to address safety issues. Even with the required 4km outer limitation surface, the airport operates safely and successfully with 8 turbines from the Erieau Wind Farm within the 4km zone. Fifteen (15) additional turbines are within 5km of the airport, and many more within 10km of the airport in almost all directions. Comparatively speaking, FWP has 2 turbines within a 4m radius and 2 additional turbines within 5 km of the runway.

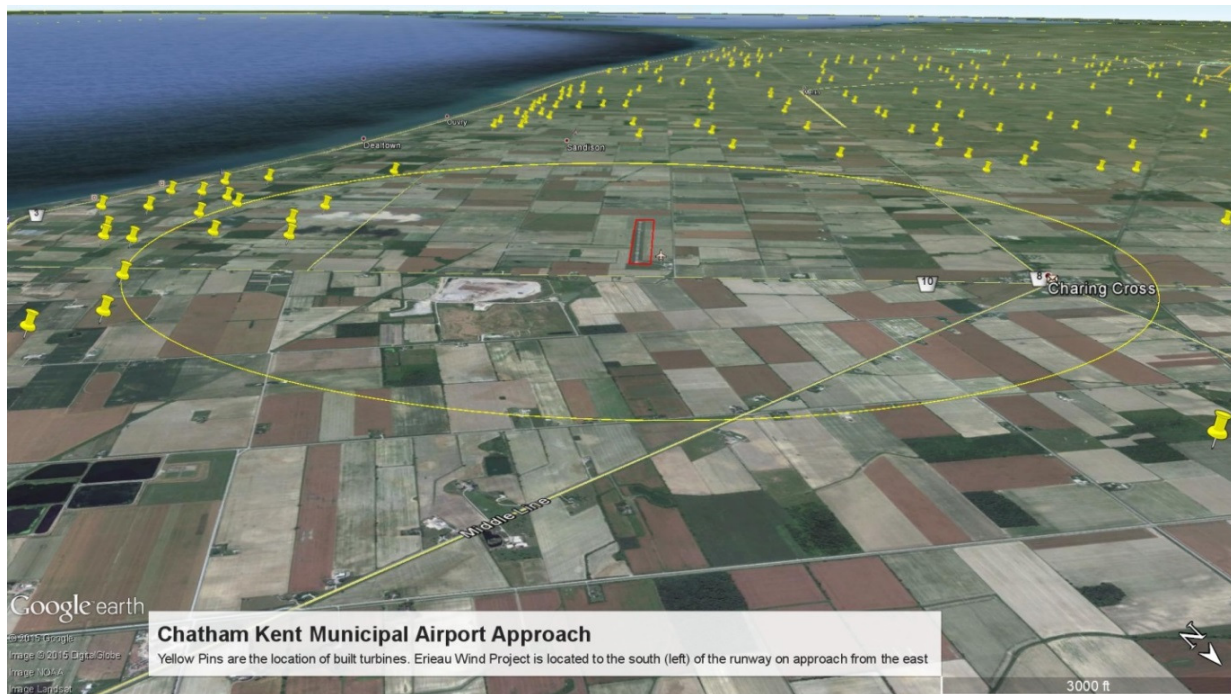


Figure 2. Presence of turbines in the 4 km zone and peripheries of the Chatham Kent Municipal Airport

Although the 4km radius does not apply to the Collingwood aerodrome, a 4 km radius has been drawn below for comparative purposes.

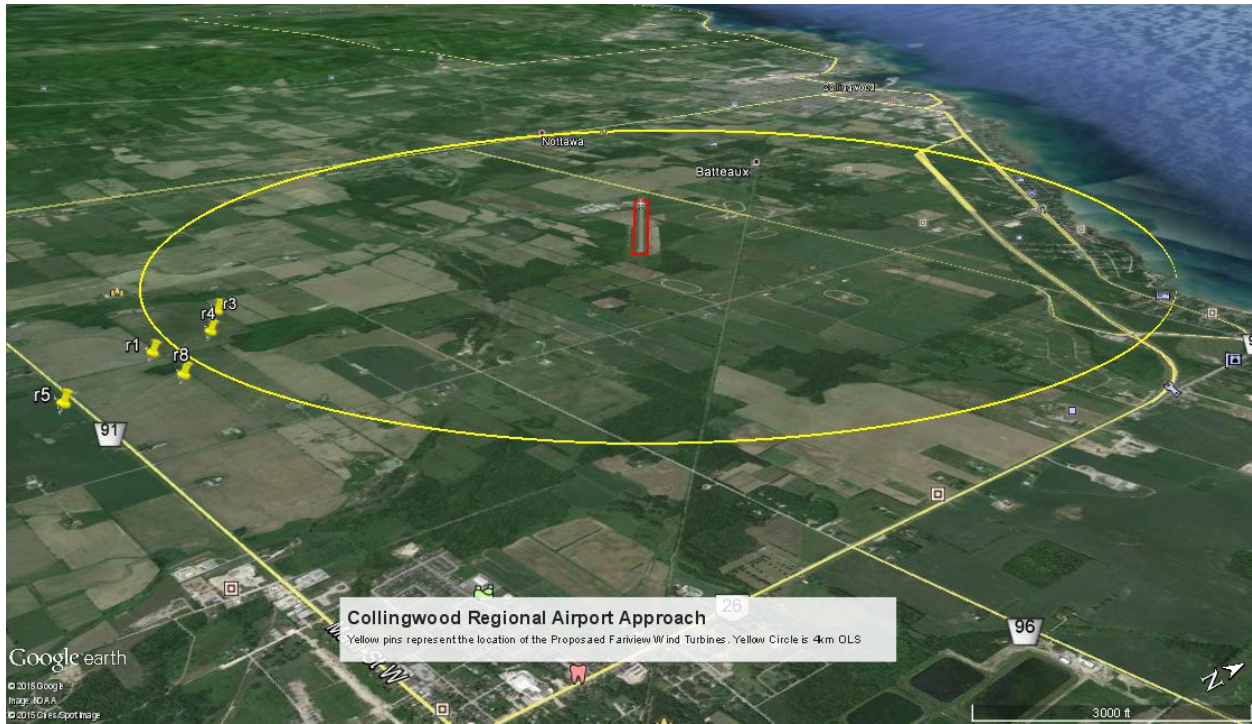


Figure 3. Pictorial of the 6 nearest (of 8 turbines) in relation to the CRA proposed for the Fairview Wind Project

Conclusion

**Aviation standards have been put in place to assure aviation safety.
If safety at CRA is assured, then planes can continue to fly in, out and around CRA.
With such a low number of aircraft potentially affected by these changes,
and with the likelihood that no aircraft are affected,
an economic impact on the airport or related expansion opportunities cannot be discerned.**

Appendix 1

Fairview Wind Farm Preliminary Aviation Analysis

SMS Aviation Safety, Inc.

March 6, 2011



Fairview Wind Farm Preliminary Aviation Analysis

Introduction

wpd Canada is considering the feasibility of a wind energy generation facility known internally as the Fairview Wind Project. SMS Aviation Safety Inc. was contracted by wpd Canada to assess the proposal and identify whether it meets obstruction clearance rules related to aviation safety, and whether the wind farm will affect the instrument approaches at the Collingwood Airport.

The proposed wind farm is centered on land roughly 3 km west of the town of Stayner, Ontario. The project calls for eight wind turbines, each with a total height of approximately 150 m.

Lighting

Transport Canada uses two approaches to manage aviation safety risks related to tall obstacles. The first is by specifying lighting standards that are recommended for tall structures. Lighting standards – outlined in the Canadian Aviation Regulations Part VI (621.19) – recommend that any wind turbine taller than 90 m be lit.

Because 621.19.12 is currently under review, it would be advisable for wpd to follow the updated 621.19 (available through CanWEA) for lighting their wind farm. This will result in lighting that surpasses the existing standard, and that will remain current as standards change in the future.

Obstacle Limitation Surfaces

The second approach Transport Canada takes to manage aviation safety risks posed by obstacles is by restricting the construction of tall structures near certified airports.

The northern edge of the Fairview project area is approximately 3.5 km of the Collingwood Airport, which is a registered aerodrome with two runways. The main runway has a paved surface approximately 5000 ft. (1524 m) long. It is oriented 310°/130° magnetic. The other is a grass-surfaced runway that is 2450 ft. long, and is oriented 010°/190° magnetic.

Transport Canada's TP312: Aerodrome Standards and Recommended Practices applies to all airports certified in accordance with the Canadian Aviation Regulations (CARs), Part III. TP312 places several

restrictions on construction near certified airports in the interest of aviation safety. For instance, it restricts the construction of objects taller than 45 m within a 4 km radius of the runway's center point¹.

Because the Collingwood Airport is a registered aerodrome and not a certified airport, TP312 does not apply. Therefore, neither the aerodrome operator nor Transport Canada has grounds to restrict construction of the Fairview Wind Farm based on the standards outlined in TP312.

Nevertheless, this preliminary assessment looked beyond the criteria of TP 312 and examined the potential safety-risks associated with the turbines as obstacles. Two turbines (identifiers r3b and r4b) are within 4 km of the mid-point of runway 31/13. One is approximately 3.5 km away and the other approximately 3.75 km. It was determined that because of the orientation of the runways and the approaches to the airport (described in greater detail in the next section), pilots flying in and out of the Collingwood should have little difficulty maintaining a safe distance from the proposed wind turbines, particularly if they are appropriately lighted. . Furthermore, 3.5 km is a sufficient distance to protect aircraft that are operating from either runway 31/13 or runway 01/19 from the turbulence generated by the wind turbines.

For these reasons, this preliminary assessment determined that the safety impact of the proposed Fairview Wind Farm on aviation operations at Collingwood Airport should be minimal. If further mitigation is desired, the following strategies could be considered:

- A non-standard circuit could be published in the Canada Flight Supplement, advising pilots using runway 31 to fly right-hand circuits that would position their aircraft on the opposite side of the airport from the wind turbines; or
- A non-standard circuit height could be published in the Canada Flight Supplement that would provide increased vertical clearance from the turbines.

Instrument Approaches

There are two published instrument approaches at Collingwood Airport. One is a Very High Frequency Omni-Directional Range / Distance Measuring Equipment (VOR/DME) non-precision instrument approach; and the other is an Area Navigation (RNAV) approach that employs GPS satellites². These instrument approaches provide pre-specified routes and elevations that pilots can use to position their aircraft for landing, particularly during conditions of low ceilings or reduced visibility.

As presently designed, pilots using these instrument approaches at Collingwood conduct all flight manoeuvres to the north of the aerodrome, on the opposite side of the runway from the proposed wind farm. The inbound radial (254°) of the VOR/DME non-precision approach tracks the aircraft from the east-north-east of the aerodrome, with the missed approach point (MAP) approximately 5 km north of

¹ This is known as an obstacle limitation surface.

² Canada Air Pilot, NAV CANADA, Effective 0901Z 13 Jan 2011 to 0901Z 10 Mar 2011.

the northern-most turbine. The inbound radial (143°) of the RNAV approach tracks the aircraft from the northwest, with the MAP also approximately 5 km from the closest of the proposed turbines. The missed approach procedure for both approaches directs pilots to climb and turn to a track that takes the aircraft away from the proposed wind farm.

For these reasons, this preliminary assessment determined that the proposed wind farm will not expose aircraft flying the existing instrument approaches to additional hazards caused by the proposed wind farm. A more comprehensive, technical analysis using instrument design approach standards would be required to determine whether some aspects of the current instrument approaches might need amendment to remain within the specifications. Such an analysis might determine the need to modify the approach or missed approach tracks, or minimum manoeuvring altitudes published for the approaches. Such modifications to instrument approaches at Canadian airports are routinely conducted, at very little expense.

Low-level Airways

Low-level airways are routes between ground-based air navigation aids that guide pilots flying under IFR³. Low level airway V332, which guides aircraft from the Midland VOR towards London, passes over the location of the proposed wind farm⁴. The minimum en-route altitude (MEA) on this airway is 4200 ft. (1280 m) ASL⁵, and the minimum obstacle clearance altitude (MOCA) is 3100 ft. (944 m) ASL⁶. The height of the wind turbine (with the blade extended vertically) at the highest elevation (identifier r7b) will extend 419.9 m ASL, fully 664 m (2178 ft.) below the current MOCA.

For these reasons, this preliminary assessment determined that that the Fairview Wind Farm will not affect the MOCA or the MEA of V332.

Conclusion

This preliminary assessment determined that the proposed Fairview Wind Farm should not have an adverse impact on aviation safety. The proposal will be scrutinized by Transport Canada and by NAV CANADA.

NAV CANADA's Land Use Program is expected to generate the more rigorous review, as they will wish to verify that the project will not interfere with their communication, navigation and/or surveillance facilities. In order to proactively evaluate the likelihood of NAV CANADA's approval of the project, SMS Aviation Safety Inc. recommends that a technical assessment of the proposed Fairview Wind Farm on the Mansfield VOR and the Midland VOR be conducted. Additionally, more detailed technical analysis of

³ Instrument Flight Rules.

⁴ En route Low Altitude map LO6, NAV CANADA, July 29, 2010.

⁵ Above mean sea level.

⁶ There are two tall towers near the Collingwood airport depicted in the Canada Air Pilot (CAP), each reaching approximately 2000 ft. ASL. This is likely the reason the MOCA has been established at 3100 ft. ASL.

the instrument approaches at Collingwood Airport would determine whether there will be need to modify the current approaches, and if so, the likely impact to airport services.

Appendix 2

Fairview Wind Farm Technical Analysis of Ground-Based Navigation Aids

SMS Aviation Safety, Inc.

April 8, 2011



Fairview Wind Farm Technical Analysis of Ground-Based Navigation Aids

Introduction

Before pursuing the development of a wind energy generation facility known internally as the Fairview Wind Project, wpd Canada wanted to address concerns that the construction of this proposed wind farm near Stayner, Ontario might affect NAVCANADA facilities. This led to a review of navigational aids located in the surrounding area. The project was also assessed against NAVCANADA's zoning restrictions for such facilities.

This technical analysis supplements the Preliminary Aviation Analysis conducted by SMS Aviation Safety Inc., dated March 6, 2011.

Table 1 outlines the categories used in the assessment.

Table 1 - Impact Categories

Indicator	Category	Description
Red	Major	Would not meet one or more regulated standards Wind turbines will not be permitted*
Yellow	Significant	Meets regulations, will likely require extensive discussion and possibly mitigation
White	Minor	Meets regulations, some impact to services expected, may require minor mitigation
Green	Insignificant	Little to no impact expected

*Note: May be permitted but will require extensive consultation.

Facilities

A review of the aeronautical charts and facility listings in the CFS (Canadian Flight Supplement) as well as a NAVCANADA database led to the identification of the installations displayed in Table 2.

Table 2 – Navigation Aids Near the Fairview Project

ID	Facility	P	Type	Lat N	Long W	Dist (km)
S7	Hanover	ON	NDB	44.1617	81.0600	77
YMS	Mans	ON	DVOR/DME	44.1433	80.1467	24.3
YEE	Midland	ON	VOR/DME*	44.5817	79.7933	34
VV	Wiarnton	ON	NDB	44.6983	81.1800	89
	Toronto TSR	ON	RADAR	43.6719	79.6561	89.2

NOTE: the * denotes a reduced coverage volume for the Midland VOR

Of these, the facilities of particular interest are the two VOR's (Very High Frequency Omnidirectional Ranges) and the Toronto Terminal Services RADAR, since they have the most restrictive zoning requirements, and are the most likely to be adversely affected by Wind Turbines.

Zoning Requirements

Several documents were considered when establishing the zoning requirements for wind farms in Ontario, including: ICAO Annex 10, ICAO Doc 8071, the forthcoming ICAO Euro Doc 15, and Transport Canada TP 1247. Of these, the ICAO Euro Doc 15 contained the most stringent requirements.

While ICAO Euro Doc 15 does not have the authority of a Civil Aviation Regulation (CAR) – the regulations that govern aviation in Canada - it represents the current thinking of the international community, specifically ICAO – the International Civil Aviation Organization - regarding the analysis necessary for determining potential interference to various navaid facilities. The following table was extracted from the draft of an upcoming standard and represents the most recent guidance available.

Table 3 – Summary of ICAO Euro Doc 15 Standards

Type of navigation facilities	Radius (Cylinder- <i>m</i>)	Alpha (α – cone) (°)	Radius (R-Cone) (<i>m</i>)	Radius (<i>j</i> – Cylinder- <i>m</i>) Wind turbine(s)	Height of cylinder <i>j</i> (<i>h</i> -height) (<i>m</i>) Wind turbine(s)
VOR	600	1.0	3000	15,000	52
NDB	200	5.0	1000	N/A	N/A

MANS DVOR

Insignificant	
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The MANS DVOR is 24.3 km from the proposed wind farm. The guidance material provided above suggests that an assessment of any proposed WT development exceeding 52 m in height be undertaken if that development is within 15 km of the VOR facility. As the WPD Fairview project is further away than that, NAVCANADA is not expected to object. There are, however, a number of other wind farm developments in the area of the VOR, and NAVCANADA may become concerned about the collective effect that they all might have on the facility performance. A mitigating factor in favour of the Fairview project is that the MANS facility is a Doppler VOR, which is inherently less susceptible to interference caused by reflections than is a standard VOR.

Midland VOR

Insignificant	
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The Midland VOR is 34 km from the development and because of that distance, should not be affected by the installation of the wind turbines. As mentioned in the MANS summary, there is the possibility that NAVCANADA may become concerned by the collective effect of a number of similar installations, but the fact that it is more than twice the limit proposed by the European Guidelines for assessment should mean that NAVCANADA will not need to further assess the proposed installations.

Warton and Hanover NDBs

Insignificant	
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The NDBs were identified as they were within the 90 km zone examined for NAVCANADA facilities. Their remoteness from the proposed development (89 and 77 km respectively) means that they will not experience any effects from the wind turbines whatsoever (the zoning restrictions for NDB's only extends to 1 km from the NDB).

Toronto Terminal Surveillance Radar

Insignificant	
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Wind turbines can create clutter on air traffic control radar displays if the wind turbines are visible to air traffic control radar. A brief examination of the proposed wind farm was undertaken to estimate whether the turbines would be visible from the nearest RADAR – the Toronto Terminal Surveillance Radar (TSR).

This review was based on the information available from Google Earth. To complete the required calculations, a height of 150 m was added to ground level in the project area to account for the wind turbines themselves. The approximate ground elevations for the extremities of the development are: NW-249 m, NE-244 m, SE-256 m and SW-277 m, resulting in maximum rotor tip heights of 399 m, 394 m, 406 m and 533 m respectively.

A path was drawn from the extreme furthest point of the development (at the rotor tip elevation) to the TSR (elevation 167 m + 25 m antenna = 192 m total) antenna elevation. The curvature of the earth was not taken into consideration, yielding a conservative result. An examination of the path revealed that the terrain heights at the escarpment in the vicinity of Caledon would provide shielding from the signal for low elevation coverage.

The turbines in the wind farm area will be below the Toronto TSR's line of sight by between 21 m (70 ft.) in the SW corner and 81 m (265 ft.) in the NE corner, due to the shielding provided by the escarpment in the vicinity of Celadon. This means that the turbines are not expected to be picked up by the Toronto TSR. The exception might be during periods of temperature inversions (anomalous propagation).

Conclusion

The proposed WPD Fairview wind farm development does not appear to violate any known standard or proposed guidelines for the protection of aviation navigational aid facilities or RADAR, and therefore should not generate concern for the NAVCANADA Land Use Group with regard to those facilities.

Appendix 3

Potential Effects of the Fairview Wind Project on IFR Aircraft Accessing Collingwood Regional Airport

SMS Aviation Safety, Inc.

July, 2012

**Potential Effects of the
Fairview Wind Project on IFR Aircraft Accessing
Collingwood Regional Airport**

Produced by

**SMS Aviation Safety
470 Somerset Street, West
Ottawa, Ontario, Canada
K1R 5J8**

Tel: 613.238.3232 sms@magma.ca

July 2012

Introduction

Representatives of the Collingwood Regional Airport have expressed concern that the proposed Fairview wind project will restrict the number of aircraft that will operate into Collingwood Regional Airport. To illustrate the concern, the Chair of the Airport Services Board forwarded a summary report to wpd Canada that described the adverse effect the wind turbines might have on newly designed IFR (Instrument Flight Rules) approaches for the Collingwood airport.¹

Consequently, wpd Canada commissioned a study to examine the potential reduction of IFR-operated aircraft to Collingwood Regional Airport as the result of the Fairview wind project. The analysis was conducted by SMS Aviation Safety, and the Summary Report was peer-reviewed by two independent individuals. One has experience in the regulation and operation of aerodromes and Air Traffic Services; and the other in the regulation and operation of commercial and business aircraft operations. A brief summary of their experience is contained in the appendix.

Objective

The objective was to estimate the degree to which the Fairview wind project might restrict IFR-governed aircraft from landing at Collingwood Regional Airport.

Scope

The study only examined Collingwood Regional Airport. The analysis examined the effects of the turbines on each of the IFR procedures discussed in the 2011 Cormier report. At the time of writing, these proposed instrument approach procedures were not in effect, and awaited approval by NAV CANADA.

Background

This section frames the study. Underlying the analysis is the fact that a turbine is only a potential hazard when the aircraft is flying close to the turbine.

1. Pilots are required to operate their aircraft using one of two sets of flight rules. 'VFR pilots' depend on visual references to the surface of the earth to operate their aircraft. They are responsible for seeing and avoiding obstacles, and for that reason, are restricted from flying in poor weather. 'IFR pilots' rely on information from navigational equipment and flight instruments in their aircraft. As a result, they can operate in weather conditions that would prohibit VFR pilots from flying. IFR pilots fly to a three-dimensional point near the runway from which – if they can see the runway and it is safe to continue the descent – they proceed for the landing. IFR pilots require considerable training and experience to attain and maintain the skills required to fly with sole reference to their flight instruments – skills which are perishable.

¹ Charles Cormier, *Review of Probable Effects on Instrument Approaches at Collingwood Airport: Fairview Wind Project*, November 15, 2011.

2. Turbines and other man-made obstacles are marked and lit conspicuously so that VFR pilots can see and avoid them. The changes to IFR procedures cited in the Cormier report will have no negative impact on VFR pilots because they will not fly in weather that requires IFR procedures. Nor are they trained or competent to use the instrument approaches. Therefore, the study excluded VFR-operated aircraft from the analysis, and focussed solely on IFR-operated aircraft.
3. IFR pilots have no need to see outside the aircraft until just before landing because the specially-designed procedures provide assurance they will avoid obstacles – including turbines – which they cannot see when the clouds and forward flight visibility is low.
4. As the Cormier Report indicated, the construction of turbines will result in changes to the IFR procedures for the runways at the Collingwood airport. The newly-designed procedures will assure pilots that they remain a safe distance from the turbines. If the tracks² for the instrument procedures remain the same, then the lowest altitudes (the minima) that a pilot can descend to for some procedures will be raised. The turbines will affect each procedure for each runway differently. The Cormier report stated that some approaches will see no change in minimum altitudes, and others will see the minima raised by as much as 360 feet.
5. Although instrument approach procedures enable IFR pilots to descend to a minimum altitude solely with reference to their instruments, they can usually see the runway earlier in the approach from a higher altitude. The weather information obtained from Environment Canada indicated that approximately 95% of the time, the cloud ceiling at Collingwood airport will be sufficiently high that IFR pilots will see the runway environment prior to descending to the IFR minimum altitude. In these cases, they will be able to proceed to land. In approximately 2% of the time, the weather data indicated that cloud ceilings will be so low that IFR pilots will not see the runway environment for any of the approach minima cited in the Cormier Report whether the turbines exist or not.
6. Therefore, the study focussed on estimating the approximate times an IFR-governed flight, flying in IMC (instrument meteorological conditions), would not be able to land at Collingwood because the new approach minima were higher than the minima prior to the construction of the turbines. It was assumed that in such cases, when the pilots did not have visual reference to the runway environment, they would conduct a missed approach and divert to another airport. In other words: the pilots would not access Collingwood airport because of the raised minimum altitudes. However, it was recognized that there would be occasions when the pilot or pilots would conduct another – this time successful – approach and land at Collingwood.
7. To make this determination, it was necessary to:
 - a. examine the frequency that cloud ceilings lay between the new approach minima and the old³;

² A track is the path over the earth that is specified in the IFR procedure and which pilots fly (when using their instruments) so they remain clear of all obstacles.

³ The lower minima if no turbines exist; the raised minima for some of the approaches if the turbines are constructed.

- b. estimate the number of flights that were IFR-governed⁴, and of these, the number that were flown in such poor weather conditions that the pilots needed to descend to the approach minima to determine whether they could land or needed to conduct a missed approach;
- c. estimate the distribution of these IFR approaches flown to minima, categorizing them by the runway and the type of instrument approach that would be used⁵;
- d. estimate the number of aircraft that would more likely conduct an IFR 'circling approach' rather than a 'straight-in approach'⁶; and
- e. determine the estimated number of IFR flights per year that would not land at Collingwood because of the revised approach minima – minima that had been raised because of the turbines.

A more detailed presentation of the analysis is found in a document titled '*Technical Reference Document for Potential Effects of the Fairview Wind Project on IFR Aircraft Accessing Collingwood Regional Airport*', which is available on request.

System Description

The Fairview wind project is centered on land roughly 3 km west of the town of Stayner, Ontario. The project calls for eight wind turbines, each with a total height of approximately 150 m. The northern edge of the project area is approximately 3.5 km from the Collingwood Regional Airport.

Collingwood airport is a registered aerodrome with two runways. The main runway has a paved asphalt surface approximately 5000 ft. long. It is oriented 310°/130° magnetic⁷. The other runway has a grass surface that is approximately 2450 ft. long, and is oriented 010°/190° magnetic. There are three types of instrument approaches to the Collingwood Airport: LNAV, LPV and VOR/DME approaches. As noted earlier, the wind turbines will have different effects on each of these approaches. The differences are summarised in Table 1.

⁴ And only IFR-governed, because, as noted earlier, VFR-pilots are not permitted to fly when the weather conditions are so poor that IFR procedures are required..

⁵ Because each procedure to each runway has different minima, the turbines have a different effect on each minimum altitude.

⁶ Because the minima for circling approaches are the most adversely affected of all approach types. fast-flying aircraft are potentially most affected.

⁷ Runway orientation is employed to describe the direction that aircraft land or take-off. For instance, an aircraft landing or taking off in a northwesterly direction uses runway 31, while one operating in a south easterly direction uses runway 13. Wind direction is the chief determinant of the runway that a pilot will use.

Table 1 – Summary of Potential Effects on Instrument Approaches

	RWY 13 LPV	RWY 13 LNAV	RWY 31 LPV	RWY 31 LNAV	Circling from LPV & LNAV	VOR/DME A
Current Height ⁸ (ASL)	1010'	1060'	1030'	1180'	1240' to 1340'	1340' to 1360'
Post-Turbine Height (ASL)	1030'	1080'	1030'	1300'	1240' to 1600'	1400' to 1600'
Difference	+20'	+20'	no difference	+120'	Range from no difference to +260'	Range: +60' to +240'

Because there will be LPV and LNAV approaches for each of runways 31 and 13, there will normally be no need for a pilot to conduct a circling approach from an LPV or LNAV approach⁹: IFR pilots with appropriate GNS equipment and IFR training will always be able to conduct an LPV or LNAV approach and land straight ahead “into-wind” on a paved surface. Consequently, the information in Table 1, column 5 was eliminated from the analysis. Pilots conducting a VOR/DME A approach at Collingwood – now and in the future – will need to circle to land. This is because the inbound track does not align with any of the runways. In effect, the VOR/DME A approach allows an IFR-qualified pilot who flies an aircraft with VOR/DME equipment but without IFR-certified GNS equipment, to conduct a cloud-breaking manoeuvre over the airport and then circle visually to land on the into-wind runway.

According to Stats Canada, the average annual number of aircraft movements at the Collingwood Airport in 2010 and 2011 was 8,002. Stats Canada records a take-off and landing as two movements, so it was assumed that the average number of landings for each of these years was 4001. Stats Canada’s categorization of these movements is presented in Table 2. As Table 3 illustrates, a significant portion of these movements were flown either by private-licensed pilots, most of whom operate VFR-only, or in commercial operations that require VFR weather conditions.

⁸ The minima specified in this row under the title “current minima” are those depicted in the newly-designed instrument approaches that have been submitted to NAV CANADA for approval.

⁹ Aircraft land “into wind”. Consequently, at some locations other than Collingwood, IFR pilots need from time-to-time to fly the instrument approach to one end of the runway, then “circle” around to land into wind on the other runway. This circling maneuver must be conducted clear of cloud and with constant reference to the end of the runway on which the pilot plans to land. A circling maneuver can introduce significant risk, particularly when the cloud ceiling is ragged or variable; visibility is restricted; there are strong winds; or the aircraft is being operated single-pilot.

Table 2 – Summary of Aircraft Movements at Collingwood

Year	Total Itinerant Movements	Piston Powered A/C Movements	Jet	Turbo	Helicopter
2011	8,501	7,603	100	271	477
2010	7,502	6,721	132	283	323

Table 3 – Summary of Aircraft Movements by Type of Operation (2010 – 2011 Average)

Airport	Carrier ¹⁰	Other Commercial ¹¹	Private
Collingwood	804	563	6598

Of those classified by Stats Canada as ‘Carrier’ movements (Table 3), some were jet or turbo-prop powered aircraft, and most of the rest were likely piston-powered aircraft.

In Ontario, the prevailing winds tend to be light in summer and generally flow from the southwest. In the winter, the prevailing winds are from the northwest. The winds over Georgian Bay are generally from the northwest, so runway 31 is the most commonly used.

In the winter, the upslope areas (i.e., inland from the south end of Georgian Bay between Meaford and Collingwood through Midland to Parry Sound) are subject to strong lake effect snowfalls, low ceilings and poor visibility under a northwest flow. Fog is at its worst in late summer and early winter, and is usually associated with frontal precipitation or radiation cooling. When visibility is restricted to less than half a mile because of blowing snow or fog, IFR pilots are not permitted to land on any of the runways at Collingwood airport.

Discussion

The Cormier report projected that the turbines from the Fairview wind project will have no effect on some instrument approaches, and on others, will raise the approach minima by between 20’ and 360’, depending on the type of the approach. The Cormier report did not project the actual impact on IFR-governed aircraft being able to access Collingwood Regional Airport. Hence, wpd Canada commissioned a study to estimate this effect.

¹⁰ Carrier means “aircraft operators, licensed by the Canadian Transportation Agency to transport persons, mail and/or goods by air.” (Statistics Canada)

¹¹ Statistics Canada defines ‘Other Commercial’ as: “Flights performed by Commercial aircraft operators not included in the Air carrier categories. Flying schools, agricultural sprayers, water-bombers, aerial photography and survey, etc.”

The conclusion of the analysis undertaken for wpd Canada is that the impact of the proposed turbines in Fairview wind project will be very small – estimated to be from zero to three aircraft, annually. An explanation follows.

Only a very small number of the average 4,001 landings at Collingwood¹² would be affected by the changes in the instrument approach procedures caused by the turbines. The only flights that would be affected are those where the pilot(s) arrive at the new (raised) approach minima and do not have visual reference to the runway environment, when they otherwise would have if they had been able to descend to the previous (pre-turbine) approach minima.

- It is estimated that between 90 and 216 of the 4,001 landings would involve aircraft using IFR flight plans. A description of how the estimated number of IFR-governed aircraft was determined is found in the addendum to the appendix.
- Of the 90 to 216 arrivals using IFR flight plans, approximately 95% (or between 85 and 206) would be flown in weather conditions that would enable pilots to visually identify the runway environment before descending to the approach minima, and continue using visual references to the landing.
- Of the remaining five to ten IFR-governed flights, approximately 2% (or from two to four)¹³ would occur when the weather was so poor that the pilots could not land using any of the IFR procedures, even if they were flown to the IFR minima that existed before the turbines.
- Of the remaining three to six aircraft, the majority (at least three, and perhaps as many as five) would be able to land because the approach minima for the LPV approaches to runways 13 and 31 (the approach procedures that would most frequently be flown), and for the LNAV approach to runway 13 will not be significantly raised¹⁴ because of the turbines. Table 1 refers.
- Of the remaining (zero to three) aircraft that *could* be affected by the raised minima per year, there is a very high likelihood that all would be able to land at Collingwood airport. This is because the hourly weather data is taken at a “moment-in-time”, and does not necessarily reflect the varying conditions that are experienced during the complete hour. The pilots may take approximately ten minutes to fly the instrument approach procedure, but the decision to proceed to land or conduct a missed approach occurs in less than a “moment-in-time”. It is highly likely that during the estimated three IFR approaches each year that could be adversely affected by the raised approach minima, the cloud ceiling will be at or slightly higher than the

¹² Using 2010 and 2011 data provided by Stats Canada. The number of landings were determined by dividing the total movements (take-offs and landings) by two.

¹³ The proportion of 2% (two to four flights) is taken from the total estimated IFR arrivals - 90 to 216, which constitutes 100%.

¹⁴ In other words, the minimum is not raised at all, or is only raised twenty feet.

minimum, enabling the pilots to see the runway environment when they reach the raised minimum altitude, and proceed to landing.

Conclusion

The Fairview Wind Project is expected to have very little and possibly no effect on IFR-governed aircraft landing at Collingwood Regional Airport. Of the estimated 90 to 216 aircraft expected to conduct an IFR approach annually, it is likely that none – and not likely more than three – will be prevented from or delayed in landing because of the raised approach minima. The main reasons are:

- Most aircraft flying to Collingwood are operated VFR, and will not be affected by changes to IFR procedures;
- The pilots of almost all IFR-operated aircraft arriving at Collingwood will be clear of cloud before arriving at the approach minima, and have visual reference to the runway, and land; and
- The minima for the runways and approaches that will most often be used during inclement weather will not be raised (or raised very slightly) because of the turbines. Consequently, if the turbines are constructed and pilots are unable to see the runway, they will conduct a missed approach from exactly the same altitude they would if the turbines are not constructed.

References

- Charles Cormier, *Review of Probable Effects on Instrument Approaches at Collingwood Airport: Fairview Wind Project*, November 15, 2011.
- SMS Aviation Safety Inc., *Technical Reference Document for Potential Effects of the Fairview Wind Project on IFR Aircraft Accessing Collingwood Regional Airport*, July 2012.
- Transport Canada, *Category of Operation & RVR*, <http://www.tc.gc.ca/eng/civilaviation/publications/tp1490-general-6180.htm>, Accessed on June 14, 2012.
- Statistics Canada, *Aircraft Movement Statistics, Airports Without Air Traffic Control Towers, Annual Report – TP 577*, 2010 and 2011.
- Philip Gladstone, *METAR/Synop Information for CYBN (71534) in Borden, Ont., Canada*, <http://weather.gladstonefamily.net/site/CYBN>, Accessed on June 12, 2012.
- Aircraft Approach Category*, Wikipedia, Accessed on June 14, 2012.
- Collingwood Regional Airport*, http://www.collingwood.ca/regional_airport, Accessed on Jun 14, 2012.
- Itinerant movements by I.F.R. (Instrument flight rules) and V.F.R. (Visual flight rules) and runway 88 movements — NAV CANADA towers*. <http://www.statcan.gc.ca/pub/51-007-x/2012004/t004-eng.htm>, Accessed on June 22, 2012.

Appendix - Biographic Information

Principal Analyst & Author

Terry Kelly is the Managing Director of SMS Aviation Safety Inc. He has acquired over 5,000 flying hours in single- and multi-engine piston, turbo-prop and jet aircraft. Past positions include Chief, Safety Studies in the Transportation Safety Board of Canada; Director of Safety Standards & Studies in Transport Canada Civil Aviation; and Manager, Safety Policy in NAV CANADA's Office of Safety & Quality, which reported directly to the CEO of NAV CANADA.

Terry has led and conducted over thirty operational safety-risk assessments, often of sensitive policy issues with safety ramifications. He has a reputation throughout the Canadian aviation industry for providing sound, independent analysis and reports on complex safety issues.

Peer Reviewers

Frank DeCarlo has extensive experience in managing all aspects of complex ATC operations within Canada's Air Navigation Services. Past positions include General Manager, Airport Operations Eastern Region, NAV CANADA, in which he was responsible for the daily assessment of operations from a service delivery and safety aspect; and Regional Director, Air Traffic Services Ontario, Transport Canada and NAV CANADA.

Trevor Owen has acquired over 5000 flying hours as a pilot of a variety of aircraft. He held a number of management positions in Transport Canada relating to the commercial operation of small aircraft. At the time of his retirement, he held the position of Program Manager, Flight Technical Operations in the Commercial & Business Aviation Branch of Transport Canada.

Appendix 4

Transport Canada correspondence

RDIMS 5460864
copy 5457309

2009-272

AERONAUTICAL OBSTRUCTION CLEARANCE FORM

FORMULAIRE D'AUTORISATION D'OBSTACLE AÉRIEN

TO BE COMPLETED BY APPLICANT - À REMPLIR PAR LE REQUÉRANT

Operator's Name - Nom de l'opérateur
wpd Canada Corporation

Operator's Address - Adresse de l'opérateur
405 Britannia Rd. E, Suite 214, Mississauga, ON, L4Z 3E6

Operator's Contact - Agent de liaison de l'opérateur
Khlaire Parre

Contact's Telephone No. - N° de téléphone de liaison
905-712-2400 x112

Contact's FAX No. - N° de télécopieur de liaison
905-712-9565

Contact's Email Address - Adresse électronique de liaison
Khlaire@wpd-canada.ca

Applicant's Name - Nom du requérant
wpd Canada Corporation

Address - Adresse
405 Britannia Rd E, Suite 214

City - Ville
Mississauga

Province/Territory - Province/Territoire
ON

Postal - Code - postal
L4Z 3E6

Applicant's Telephone No. - N° de téléphone du requérant
905-712-2400 x112

Applicant's FAX No. - N° de télécopieur du requérant
905-712-9565

Applicant's Email Address - Adresse électronique du requérant
Khlaire@wpd-canada.ca

Nearest city / town to proposed facility
 Ville la plus proche de la structure proposée
Stayner

Geographic coordinates of structure - coordonnées géographiques de la structure

44	24	03.63	N Latitude Latitude N	80	08	50.40	W Longitude Longitude O
----	----	-------	--------------------------	----	----	-------	----------------------------

NAD27 NAD83 WGS84

TOWERS / ANTENNAS TOURS / ANTENNES	BUILDING OR OTHER STRUCTURE BÂTIMENT OU AUTRE STRUCTURE	Feet - Pieds	Meters - Mètres
		A Height above ground Hauteur au-dessus du sol 457.02	139.3
		B Building height Hauteur du bâtiment N/A	N/A
		C Ground elevation above sea level Hauteur du sol au-dessus du niveau de la mer 880.25	268.3

List any tall adjacent buildings and structures which may shield the proposed structure (Attach sketch)
1337.27'

Faire une liste indiquant les structures et bâtiments avoisinants plus haut que le bâtiment projeté (inclure un diagramme)

New struc. - Nouv. struc.
 Yes / Oui No / Non

Add. to exist. struc. incl. total hght. - Ajout à un bâti. exis. incl. hauteur total
N/A

Proposed Construction - Date - de construction proposée
June, 2012

TYPE OF STRUCTURE (narrative description and function) - GENRE DE STRUCTURE (description narrative et fonction)

A wind turbine with a hub height of 98.3m, and a rotor diameter of 82m. There are 9 turbines in all, however we have selected the one that is closest to Collingwood Airport for the purposes of this application.

Signature (of applicant) (du requérant)

Date (Y/A-M-D/J)
2009/12/11

TRANSPORT CANADA USE ONLY - À L'USAGE DE TRANSPORTS CANADA
 AERONAUTICAL ASSESSMENT - ÉVALUATION AÉRONAUTIQUE

Site acceptable - Emplacement acceptable

Yes / Oui No / Non (if no, reason) **NA**

This form does not constitute authority for construction.

Lighting as per (TP382) required - Balisage lumineux tel que demandé au (TP382)

Yes / Oui No / Non or **AS PER LIGHTING PROPOSAL**

Painting as per (TP382) required - Balisage peint tel que demandé au (TP382)

Yes / Oui No / Non or

Temporary lighting required - Nécessité d'un balisage lumineux temporaire

Yes / Oui No / Non (if yes, type)

Advise Transport Canada in writing 90 days before construction
 Avertir Transports Canada par écrit 90 jours avant la construction

when construction starts / au commencement de la construction and on completion / et à la fin des travaux valid to / valide jusqu'au

Civil Aviation Inspector (as required) - Inspecteur Aviation Civile (si nécessaire)

Comments - Commentaires

(Y/A-M-D/J)
2009-12-22

Regional Manager Aerodrome Safety
 Gestionnaire Régional Sécurité des aérodomes

Date (Y/A-M-D/J)



ac

RDMS: # 6785405



Transport Canada / Transports Canada

APPENDIX C TO CAR 621.19 - ANNEXE C RAC 621.19

TC File No./Ref No. - TC n° du dossier/N° de réf.

2011-459

AERONAUTICAL OBSTRUCTION CLEARANCE FORM

FORMULAIRE D'AUTORISATION D'OBSTACLE AÉRIEN

TO BE COMPLETED BY APPLICANT - À REMPLIR PAR LE REQUÉRANT

Operator's Name - Nom de l'opérateur: wpd Canada
Operator's Address - Adresse de l'opérateur: 2233 Argentia Rd, Mississauga, ON L5N 2X7
Operator's Contact - Agent de liaison de l'opérateur: Khlaire Parre
Contact's Telephone No. - N° de téléphone de liaison: 905-813-8400
Contact's FAX No. - N° de télécopieur de liaison: 905-813-7487
Contact's Email Address - Adresse électronique de liaison: khlaire@wpd-canada.ca
Applicant's Name - Nom du requérant: Khlaire Parre
Address - Adresse: 2233 Argentia Rd
City - Ville: Mississauga
Province/Territory - Province/Territoire: ON
Postal - Code - postal: L5N 2X7
Applicant's Telephone No. - N° de téléphone du requérant: 905-813-8400
Applicant's FAX No. - N° de télécopieur du requérant: 905-813-7487
Applicant's Email Address - Adresse électronique du requérant: khlaire@wpd-canada.ca

Nearest city / town to proposed facility: Township of Stayner - Simcoe County
Geographic coordinates of structure - coordonnées géographiques de la structure: N Latitude, W Longitude, NAD27, NAD83, WGS84

TOWERS / ANTENNAS TOURS / ANTENNES and BUILDING OR OTHER STRUCTURE BÂTIMENT OU AUTRE STRUCTURE
A Height above ground, B Building height, C Ground elevation above sea level
List any tall adjacent buildings and structures which may shield the proposed structure (Attach sketch)
Faire une liste indiquant les structures et bâtiments avoisinants plus haut que le bâtiment projeté (Inclure un diagramme)

New struc. - Nouv. struc. Yes/No, Add. to exist. struc. incl. total hght. - Ajout à un bâti. exis. incl. hauteur total, Proposed Construction - Date - de construction proposée

TYPE OF STRUCTURE (narrative description and function) - GENRE DE STRUCTURE (description narrative et fonction)
The Fairview Wind Project is comprised of 8 wind turbines. The project was previously submitted and approved in December of 2009. This form pertains to an updated siting of the project. Information on each turbine may be found on the attached spreadsheet.

Signature (of applicant) and Date (Y/A-M-D/J): 2011/JUN/09

TRANSPORT CANADA USE ONLY - À L'USAGE DE TRANSPORTS CANADA

AERONAUTICAL ASSESSMENT - ÉVALUATION AÉRONAUTIQUE

Site acceptable - Emplacement acceptable: Yes/No (if no, reason)
This form does not constitute authority for construction.

Lighting as per (TP382) required - Balisage lumineux tel que demandé au (TP382): Yes/No or Non ou
PLEASE LIGHT TURBINE #6 IN ADDITION TO LIGHTING REDOSEDAL SUBMITTED

Painting as per (TP382) required - Balisage peint tel que demandé au (TP382): Yes/No or Non ou

Temporary lighting required - Nécessité d'un balisage lumineux temporaire: Yes/No (if yes, type) Non (si oui, de quel genre)

Advise Transport Canada in writing 90 days before construction - Avertir Transports Canada par écrit 90 jours avant la construction: when construction starts, and on completion, Valid to

Civil Aviation Inspector (as required) - Inspecteur Aviation Civile (si nécessaire)
Comments - Commentaires
Signature and Date (Y/A-M-D/J): 2011-06-28

Regional Manager Aerodrome Safety - Gestionnaire Régional Sécurité des aérodomes
Signature and Date (Y/A-M-D/J)



de



AERONAUTICAL ASSESSMENT FORM FOR OBSTRUCTION MARKING AND LIGHTING
FORMULAIRE D'ÉVALUATION AÉRONAUTIQUE POUR LE BALISAGE ET L'ÉCLAIRAGE D'UN OBSTACLE

TC File No/Ref No / N° du Dossier/No de réf. ATS-13-14-00020734
Applicant File No/Ref No / N° du dossier/No de réf.

General Information
Renseignements personnels

1.	Owner's Name / Nom du propriétaire wpd Fairview Wind Inc.		Contact Person / Personne ressource Khlaire Parré	
	Address / Adresse 2233 Argentia Road, Suite 102			
	City / Ville Mississauga		Prov Ontario	Postal Code / Code postal L5N 2X7
	Telephone No. / N° de téléphone 905-813-8400		Fax No. / N° de télécopieur 905-813-7487	
	Email Address / Courriel Khlaire@wpd-canada.ca			
2.	Applicant's Name / Nom du requérant wpd Canada Corporation		Contact Person / Personne ressource Khlaire Parré	
	Address / Adresse 2233 Argentia Road, Suite 102			
	City / Ville Mississauga		Prov Ontario	Postal Code / Code postal L5N 2X7
	Telephone No. / N° de téléphone 905-813-8400		Fax No. / N° de télécopieur 905-813-7487	
	Email Address / Courriel Khlaire@wpd-canada.ca			
3.	Description of Proposal (or as attached) / Description de la proposition (ou pièce jointe) Resubmission for Fairview Wind Project (see file 2011-459) Coordinates below for R1			
4.	Geographic Coordinates / Coordonnées géographiques <input checked="" type="checkbox"/> NAD83 <input type="checkbox"/> NAD27 <input type="checkbox"/> WGS84			
	N Latitude Latitude N		W Latitude Latitude O	
	deg 44 min 24 sec 46.63		deg -80 min 08 sec 42.04	
5.	Nearest / Plus proche Community / Collectivité Clearview Township, Simcoe County		Province Ontario	
6.	Nearest Aerodrome / Plus proche aéroport Stayner (Clearview Field) ON			
7.	Have you contacted the aerodrome? / Avez-vous contacté l'aéroport? <input checked="" type="checkbox"/> Yes / Oui <input type="checkbox"/> No / Non			
8.	Notice of / Avis de <input checked="" type="checkbox"/> New Construction / Nouvelle construction <input type="checkbox"/> Change to existing structure / modification à une structure existante			
9.	Duration / Durée <input checked="" type="checkbox"/> Permanent / Permanente <input type="checkbox"/> Temporary / Temporaire			
10.	Proposed Construction Date Beginning (yyyy-mm-dd) / Date de construction proposée à partir de (aaaa-mm-jj) 2014-10-01			
11.	Temporary Structure / Structure temporaire		From (yyyy-mm-dd) / Du (aaaa-mm-jj) _____ To (yyyy-mm-dd) / Au (aaaa-mm-jj) _____	

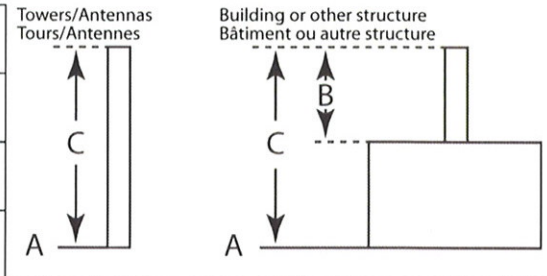
12. Marking and Lighting Proposed (refer to Standard 621) / Balisage et éclairage proposés (voir Norme 621)

- | | | |
|---|--|---|
| <input checked="" type="checkbox"/> Red lights and paint
Feux et peinture rouges | <input type="checkbox"/> Red and M.I. white lights
Feux rouges et blancs à M.I. | <input type="checkbox"/> White M.I. lights
Feux blancs à M.I. |
| <input type="checkbox"/> Red and H.I. white lights
Feux rouges et blancs à H.I. | <input type="checkbox"/> White H.I. lights
Feux blancs à H.I. | <input checked="" type="checkbox"/> No painting
Aucun peinture |
| <input type="checkbox"/> No lighting
Aucun éclairage | <input type="checkbox"/> Paint marking only
Balisage peint seulement | <input type="checkbox"/> Other (provide description)
Autre (fournir une description) |

13. Catenary/Cable Crossing / Fils/câbles caténares

- | | | |
|--|--|--|
| <input type="checkbox"/> Paint supporting structures
Structure portante peinte | <input type="checkbox"/> Cable marker spheres
Balises sphériques de fils/câbles | <input type="checkbox"/> Shore markers
Balises côtières |
| <input type="checkbox"/> Support structure lighting
Structure portante éclairée | <input type="checkbox"/> Cable marker lights
Balises lumineuses de fils/câbles | |

14. A	Ground Elevation (AMSL) Hauteur du sol (AMSL)	Feet / Pieds 803.5169	Metres / Mètres
15. B	Height of an addition to an existing structure Hauteur d'un ajout à une structure existante	N/A	
16. C	Total structure height including #15 (AGL) Hauteur totale de la structure y compris n°15 (AGL)	479.026	
17.	Overall height (#14 plus #16) (AMSL) Hauteur hors tout (n°14 plus n°16) (AMSL)	1282.5429	



18. Does the proposal comply with Airport Zoning Regulations?
La proposition est-elle conforme aux Règlements de zonage aux aéroports?
- Yes / Oui No / Non N/A / S/O

I hereby certify that all the above statements made by me are true, complete and correct to the best of my knowledge. Also, I agree to mark and/or light and maintain the structure with established marking and lighting standards as necessary.

J'atteste par la présente que tous les renseignements que j'ai fournis ci-dessus sont exhaustifs et exacts au meilleure de mes connaissances. De plus, j'accepte de baliser et/ou d'éclairer la structure et de l'entretenir conformément aux normes de balisage et d'éclairage, au besoin.

Date (yyyy-mm-dd) Date (aaaa-mm-jj) 2013-09-05	Name of person filing notice Nom de la personne qui dépose l'avis Jennifer Ng	Signature
--	---	---------------

Transport Canada Assessment / Evaluation de Transports Canada

Marking and lighting required (as per Standard 621) / Balisage et éclairage requis (conf. à la Norme 621)

- | | | | |
|---|--|--|---|
| <input checked="" type="checkbox"/> Lighting Required
Balisage lumineux requis | <input type="checkbox"/> Paint Required
Balisage peint requis | <input checked="" type="checkbox"/> Temporary Lighting Required
Balisage lumineux temporaire requis | <input type="checkbox"/> No Lighting or Painting required
Aucun éclairage ou peinture requis |
|---|--|--|---|

Comments (Transport Canada use Only) / Commentaires (à l'usage de Transports Canada)

In addition to lighting proposal please light turbine r6.

Civil Aviation Inspector / Inspecteur de l'Aviation civile Michael Lucking	Signature	Date (yyyy-mm-dd) / Date (aaaa-mm-jj) 2013-11-22
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Note 1: This assessment is only valid for one year from the date of assessment and applicable to the proposal as submitted. Remarque 1 : Cette évaluation n'est valide que pour une année seulement à compter de la date de l'évaluation, et ne s'applique qu'à la proposition telle qu'elle a été soumise.

Note 2: If there is a change to the intended installation, a new submittal is required. Remarque 2 : En cas de changement, il faut présenter une nouvelle demande.



AERONAUTICAL ASSESSMENT FORM FOR OBSTRUCTION MARKING AND LIGHTING

TC File No/Ref No ATS-14-15-00046544
Applicant File No/Ref No Fairview Wind Project

General Information

1.	Owner's Name wpd Fairview Wind Inc.	Contact Person Jonathan Clifford
	Address 2233 Argentia Road, Suite 102	
	City Mississauga	Province Ontario
	Postal Code L5N 2X7	
	Telephone No. 905-813-8400	Fax No. 905-813-7487
	Email Address jonathan@wpd-canada.ca	
2.	Applicant's Name wpd Canada Corporation	Contact Person Jonathan Clifford
	Address 2233 Argentia Rd, Suite 102	
	City Mississauga	Province Ontario
	Postal Code L5N 2X7	
	Telephone No. 905-813-8400	Fax No. 905-813-7487
	Email Address jonathan@wpd-canada.ca	
3.	Description of Proposal (or as attached) Resubmission for Fairview Wind Project (see file ATS 13-14-0020734) Coordinates below for R1. Coordinates for all turbines are attached.	
4.	Geographic Coordinates <input checked="" type="checkbox"/> NAD83 <input type="checkbox"/> NAD27 <input type="checkbox"/> WGS84	
	N Latitude deg <u>44</u> min <u>24</u> sec <u>46.63</u> W Latitude deg <u>-80</u> min <u>08</u> sec <u>42.04</u>	
5.	Nearest Community Clearview Township, Simcoe County	Province Ontario
6.	Nearest Aerodrome Stayner (Clearview Field) On	
7.	Have you contacted the aerodrome? <input checked="" type="radio"/> Yes <input type="radio"/> No	
8.	Notice of <input checked="" type="radio"/> New Construction <input type="radio"/> Change to existing structure	
9.	Duration <input checked="" type="radio"/> Permanent <input type="radio"/> Temporary	
10.	Proposed Construction Date Beginning (yyyy-mm-dd) 2015-07-01	
11.	Temporary Structure From (yyyy-mm-dd) _____ To (yyyy-mm-dd) _____	

12. Marking and Lighting Proposed (refer to Standard 621)

Red lights and paint
 Red and M.I. white lights
 White M.I. lights
 Red and H.I. white lights
 White H.I. lights
 No painting
 No lighting
 Paint marking only
 Other (provide description)

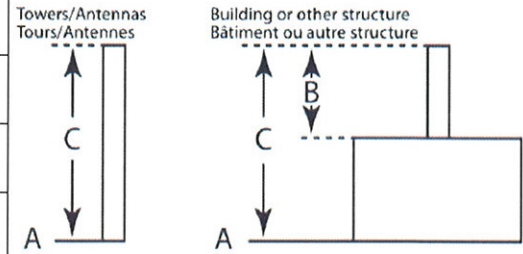
13. Monitoring to Standard 621, article 4.7

Visual Inspection per 24 hours
 Automatic remote monitoring

14. Catenary/Cable Crossing

Paint supporting structures
 Cable marker spheres
 Shore markers
 Support structure lighting
 Cable marker lights

15.	A Ground Elevation (AMSL)	Feet 803.52	Metres 244.912
16.	B Height of an addition to an existing structure	n/a	n/a
17.	C Total structure height including #16 (AGL)	479.026	146
18.	Overall height (#15 plus #17) (AMSL)	1282.54	390.92



19. Does the proposal comply with Airport Zoning Regulations?

Yes
 No
 N/A

I hereby certify that all the above statements made by me are true, complete and correct to the best of my knowledge. Also, I agree to mark and/or light and maintain the structure with established marking and lighting standards as necessary.

Date (yyyy-mm-dd)	Name of person filing notice	Signature
2014-11-14	Jonathan Clifford	

Transport Canada Assessment

Marking and lighting required (as per Standard 621)

Lighting Required
 Paint Required
 Temporary Lighting Required
 No Lighting or Painting required

Comments (Transport Canada use Only)

This assessment supersedes ATS-13-14-00020743.

Civil Aviation Inspector	Signature	Date (yyyy-mm-dd)
Michael Lucking		2014-12-31

Note 1: This assessment is only valid for one year from the date of assessment and applicable to the proposal as submitted.

Note 2: If there is a change to the intended installation, a new submittal is required.

Appendix 5

NAV CANADA correspondence



December 18, 2009

Your file
1457 Fairgrounds Rd S., Stayner, ON
Our file
09-2270

Ms. Khlaire Parre
WPD Canada Corporation
405 Britannia Rd. E.
Mississauga, ON
L4Z 3E6

RE: Wind Farm: 8 turbines (N44° 23' 38.74" W80° 07' 32.19") - Stayner, ON

Dear Ms. Parre,

We have evaluated the captioned proposal and NAV CANADA has no objection to the project as submitted. Let me emphasize however that our assessment is limited to the impact of the proposed physical structure on the air navigation system and installations. Industry Canada addresses any spectrum management issues that may arise from your proposal and consults with NAV CANADA engineering as deemed necessary.

In the interest of aviation safety, it is incumbent on NAV CANADA to maintain up-to-date aeronautical publications and issue NOTAM as required. To assist us in that end, we ask that you notify us at least 10 business days prior to the start of construction. This notification requirement can be satisfactorily met by returning a completed, signed copy of the attached form and spreadsheet to us by e-mail at landuse@navcanada.ca or fax at 613-248-4094. In the event that you should decide not to proceed with this project or if the structure is dismantled, please advise us accordingly so that we may formally close the file.

In the event that you should decide not to proceed with this project or if the structure is dismantled, please advise us accordingly so that we may formally close the file. If you have any questions, contact the Land Use Department by telephone at 1-866-577-0247 or e-mail at landuse@navcanada.ca.

NAV CANADA's land use evaluation is valid for a period of 12 months. It neither constitutes nor replaces any approvals or permits required by Transport Canada, Industry Canada, other Federal Government departments, Provincial or Municipal land use authorities or any other agency from which approval is required.

Yours truly,

A handwritten signature in black ink that reads "Chris Csatos".

Christopher Csatos
for
Tom Hollinger
Manager, Data Collection
Aeronautical Information Services

cc ONTR-Ontario Region, Transport Canada
CNY3-COLLINGWOOD



September 23, 2011

Your file
Fairview Wind Project
1457 Fairground Rd, S. L0M 1S0, Stayner

Our file
11-2058

Ms. Khlaire Parre
WPD Canada Corporation
2233 Argentia Road, Suite 102
Mississauga, ON
L5N 2X7

RE: Wind Farm: 8-turbine wind farm - Stayner, ON
(N44° 24' 08.900" W80° 7' 57.925" / 479.0260' AGL / 1397.3779' AMSL)

Ms. Parre,

We have evaluated the captioned proposal and NAV CANADA has the following observations:

- While the Stayner (Clearview Field) aerodrome (CLV2) is not served by instrument procedures, there are a number of proposed turbines in close proximity. You may want to consult with the operators of this aerodrome regarding potential impacts.
- Turbines R1, R3, R4, R5, and R8 are located within the lateral confines of airspace known as 'circling areas' protected for aircraft conducting a circling approach to the Collingwood, ON (CNY3) airport. The height of the proposed turbines at those specific locations results in a penetration of the circling areas for the "RNAV (GNSS) RWY 13" and "VOR/DME A" instrument approach procedures.
- These penetrations would require mitigation through an increase to the circling MDA (minimum decent altitude) for both instrument approach procedures. The increase is 120' for the VOR/DME A and 220' for the RNAV (GNSS) runway 13 circling minima. This increase would require redesign of both instrument procedures at your cost.
- As well, any increase to the circling MDA may adversely affect the accessibility of the aerodrome during periods of inclement weather, especially for aircraft dependant on circling minima such as those without RNAV (GNSS) capability.
- Finally, the design of a straight-in RNAV (GNSS) runway 31 procedure would reduce the requirement for circling.

In the event that you should decide not to proceed with this project, or you wish to proceed with design/re-design of the instrument procedures, please advise us accordingly. If you have any questions, contact the Land Use Department by telephone at 1-866-577-0247 or e-mail at landuse@navcanada.ca.

NAV CANADA's land use evaluation is valid for a period of 12 months. Our assessment is limited to the impact of the proposed physical structure on the air navigation system and installations; it neither constitutes nor replaces any approvals or permits required by Transport Canada, Industry Canada, other Federal Government departments, Provincial or Municipal land use authorities or any other agencies (airport authorities and owners) from which approval is required. Industry Canada addresses any spectrum management issues that may arise from your proposal and consults with NAV CANADA Engineering as deemed necessary.



Yours truly,

A handwritten signature in black ink that reads "Chris Csatlos". The signature is written in a cursive, flowing style.

Christopher Csatlos
for
David Legault
Manager, Data Collection
Aeronautical Information Services

cc Aerodromes and Air Navigation – Ontario Region, Transport Canada
 David Legault, Manager – AIS Assembly, Data Collection and NOTAM Office, NAV CANADA
 Jeff MacDonald, Director – Operations Planning and Programs, NAV CANADA
 Michelle Bishop, Manager – Government and Public Affairs, NAV CANADA
 Pierre Lajoie, Collingwood Airport – CNY3
 Kevin Elwood, Stayner (Clearview Field) – CLV2



March 19, 2013

Fairview Wind Project (1457 Fairgrounds Rd. S.) Stayner
Your file
Our file
12-3994

Mr. Jonathan Clifford
WPD Canada Corporation
2233 Argentia Road, Suite 102
Mississauga, ON
L5N 2X7

**RE: Wind Farm: 8-turbine wind farm - Stayner, ON
(Evaluated as per attached spreadsheet)**

Mr. Clifford,

NAV CANADA has evaluated the captioned proposal and come to the following conclusions:

- Turbine R3 is within the circling area for Category 'C' aircraft conducting the 'RNAV (GNSS) RWY 13' or 'VOR/DME A' instrument approaches to Collingwood, ON (CNY3) airport;
- Turbines R1, R3, R4, R5, and R8 are within the circling area for Category 'D' aircraft conducting the 'RNAV (GNSS) RWY 13' or 'VOR/DME A' instrument approaches to Collingwood, ON (CNY3) airport; and
- Implementation of a 'Circling Restriction' prohibiting aircraft from conducting a circling approach south of runway 13/31 would allow the currently-published circling minimum decent altitudes (MDA) to remain unaffected.

As part of the Land Use Proposal assessment process, NAV CANADA distributes proposed obstacle data to external instrument procedure design organizations so that they may determine if the proposed obstacles affect their interests and instrument procedures. During the course of this review, NAV CANADA received comments from two external organizations regarding impacts to their instrument procedures pending publication:

- For Collingwood, ON (CNY3) airport: the proposed wind farm will impact the circling areas for Category 'C' and 'D' aircraft conducting the 'RNAV (GNSS) RWY 13' and 'RNAV (GNSS) RWY 13' approaches, precluding circling between the threshold of runway 31 clock-wise to the threshold of runway 01.
- For Stayner (Cleaview Field), ON (CLV2) airport: The proposed wind farm will cause the following adverse effects:
 - The 'RNAV (GNSS) RWY 16' approach would suffer a rise in straight-in minima of 200 feet;
 - The Circling minima for this approach and the VOR/DME A minima would require an increase of 240 and 220 feet for Category A and B respectively; and
 - Departures from both Runways 16 and 34 can be conducted in ½ mile visibility, conditional with a modest climb gradient or no left turn until 1500 feet ASL, respectively. After the turbines are erected, the only IFR departure option would require a visual climb until 1700 feet ASL or 823 feet above aerodrome, before proceeding on course.



NAV CANADA's evaluation and conclusions are based only on the impacts to procedures we maintain; therefore, we do not object to the proposal as submitted provided our construction notification requirements (detailed below) are met.

With respect to impacts to instrument procedures maintained by external organizations, we encourage you to consult directly with all affected aerodromes and external instrument procedure design organizations to avoid adversely affecting airport operations.

This proposal is not expected to cause electronic interference to NAV CANADA ground-based navigation aids, including RADAR; however, interference to certain navigation aids from wind turbines is cumulative and depends on the location, configuration, number, and size of turbines. All turbines must be considered together for analysis and while initial turbines may be approved, continued development may not always be possible.

In the interest of aviation safety, it is incumbent on NAV CANADA to maintain up-to-date aeronautical publications and issue NOTAM as required. In order to ensure the required amendments are published prior to the erection of any wind turbines, we require notifications 150 calendar days and 10 business days prior to the start of construction. These notification requirements can be satisfactorily met by returning completed, signed copies of the attached forms by e-mail at landuse@navcanada.ca or fax at 613-248-4094.

If you have any questions, contact the Land Use Department by telephone at 1-866-577-0247 or e-mail at landuse@navcanada.ca.

NAV CANADA's land use evaluation is valid for a period of 12 months. Our assessment is limited to the impact of the proposed physical structure on the air navigation system and installations; it neither constitutes nor replaces any approvals or permits required by Transport Canada, Industry Canada, other Federal Government departments, Provincial or Municipal land use authorities or any other agency from which approval is required. Industry Canada addresses any spectrum management issues that may arise from your proposal and consults with NAV CANADA engineering as deemed necessary.

Yours truly,

A handwritten signature in black ink that reads "Chris Csatlos".

Christopher Csatlos
for
David Legault
Manager, Data Collection
Aeronautical Information Services

cc ONTR – Ontario Region, Transport Canada
Marcel Pinon, Manager – Level of Service and Aeronautical Studies, NAV CANADA
Michelle Bishop, Director – Government and Public Affairs, NAV CANADA
Pierre Lajoie, Manager – Collingwood, ON (CNY3)
Kevin Elwood, Owner – Stayner (Clearview Field), ON (CLV2)
Narren Santos, Senior Program Support Coordinator – Ontario Ministry of the Environment



April 16, 2014

Fairview Wind Project (1457 Fairgrounds Rd. S.)
Your file
Stayner
Our file
14-0151

Ms. Khlaire Parre
WPD Fairview Wind Inc.
2233 Argentia Road
Mississauga, ON
L5N 2X7

RE: Wind Farm: 8 Wind Turbines - Stayner, ON
(N44° 24' 08.90" W80° 7' 58.19" / 476.3780' AGL / 1394.7299' AMSL)

Ms. Parre,

NAV CANADA has evaluated the captioned proposal and come to the following conclusions regarding instrument procedures at the Collingwood, ON (CNY3) airport:

- 'RNAV (GNSS) RWY 13' and 'RNAV (GNSS) RWY 31' approaches:
 - Turbine R3 is within the circling area for Category 'C' aircraft and turbines R1, R3, R4, R5, and R8 are within the circling area for Category 'D' aircraft.
 - Category C & D circling minimum decent altitude (MDA) to be increased to 1600 feet above sea level (870 feet above ground level); however, the impact could be negated by restricting circling for Category C & D aircraft to north of runway 13/31.
- VOR/DME A' instrument approach:
 - Turbine R3 is within the missed approach segment.
 - Category A & B minimum decent altitude (MDA) to increase by 80 feet (to read: 1320ft above sea level, 590ft above ground level). *This impact is due to the MDA being lowered significantly since our previous evaluation in 2012; the new MDA would remain 160 feet lower than 2012-levels.*
 - Category C circling minimum decent altitude (MDA) to be increased to 1600 feet above sea level (870 feet above ground level); however, the impact could be negated by restricting circling for Category C aircraft to north of runway 13/31.

As part of the Land Use Proposal assessment process, NAV CANADA distributes proposed obstacle data to external instrument procedure design organizations so that they may determine if the proposed obstacles affect their interests and instrument procedures. During the course of this review, NAV CANADA received comments regarding impacts to instrument procedures at Stayner (Clearview Field), ON (CLV2) airport; these comments are summarized below and a copy of their report is attached as Appendix A to this document.

- Four turbines will be contained in the final segment of the RNAV (GNSS) RWY 16 approach and would cause the limits to be raised to 693 feet above touchdown, a penalty of 180 feet.
- The VOR/DME A approach has 7 of 8 turbines captured in the final segment, and the last would be immediately in the missed approach, causing the approach limits to rise to 843 feet above aerodrome elevation. This will be a significant increase of 240 and 220 feet to CAT A & B minima.
- The Circling option to any approach would be affected by the turbines, raising the CAT A & B minima by 240 and 220 feet.
- Two turbines would penetrate the critical zone 1 of the departure procedures and would require a visual climb to 1700 feet ASL before proceeding on course as the only option. This would necessitate moderately good weather conditions, and departures in marginal weather otherwise allowed, would not be permitted.

NAV CANADA's evaluation and conclusions are based only on the impacts to procedures we maintain; therefore, we do not object to the proposal as submitted provided our construction notification requirements (detailed below) are met.



With respect to impacts to instrument procedures maintained by external organizations, we encourage you to consult directly with external instrument procedure design organizations and both affected aerodromes to avoid adversely affecting airport operations.

The nature and magnitude of electronic interference to NAV CANADA ground-based navigation aids, including RADAR, due to wind turbines depends on the location, configuration, number, and size of turbines; all turbines must be considered together for analysis. The interference of wind turbines to certain navigation aids is cumulative and while initial turbines may be approved, continued development may not always be possible.

In the interest of aviation safety, it is incumbent on NAV CANADA to maintain up-to-date aeronautical publications and issue NOTAM as required. In order to ensure the required amendments are published prior to the erection of any wind turbines, we require notifications 150 calendar days and 10 business days prior to the start of construction. These notification requirements can be satisfactorily met by returning completed, signed copies of the attached forms by e-mail at landuse@navcanada.ca or fax at 613-248-4094.

NAV CANADA's land use evaluation is valid for a period of 12 months. Our assessment is limited to the impact of the proposed physical structure on the air navigation system and installations; it neither constitutes nor replaces any approvals or permits required by Transport Canada, Industry Canada, other Federal Government departments, Provincial or Municipal land use authorities or any other agency from which approval is required. Industry Canada addresses any spectrum management issues that may arise from your proposal and consults with NAV CANADA engineering as deemed necessary.

Yours truly,

David Legault
Manager, Data Collection
Aeronautical Information Services

cc ONTR - Ontario Region, Transport Canada (ATS-13-14-00020734)
CLV2 - STAYNER (CLEARVIEW FIELD)
CNY3 - COLLINGWOOD



March 19, 2015

Fairview Wind Project (1457 Fairgrounds Rd. S.)
Your file Stayner
Our file 15-0581

Mr. Jonathan Clifford
WPD Fairview Wind Inc.
2233 Argentia Road Suite 102
Mississauga, ON
L5N 2X7

RE: Wind Farm: 8 Wind Turbines - Stayner, ON
(See attached spreadsheet)

Mr. Clifford,

We have evaluated the captioned proposal and NAV CANADA has no objection to the project as submitted. Be advised that the locations and heights of the proposed turbines will require the following publication amendments to the procedures for Collingwood Airport (CNY3):

RNAV 13 and RNAV31: CIRCLING CAT C&D TO READ 1600(870) 2 3/4 (+360', +260' RESPECTIVELY)
VOR/DME A: CAT A+B TO READ 1320(590) 1 3/4 (+80'), CAT C TO READ 1600(870) 2 3/4 (+360')
These impacts can be limited by sectoring the circling for CAT C and D to the North of 13-31.
DEP 13 (IN PROCESS): MIGHT NEED TO BE REDESIGNED- PRESENT PUBLISHED DEP OK.

NAV CANADA's evaluation and conclusions are based only on the impacts to procedures we maintain; therefore, we do not object to the proposal as submitted provided our construction notification requirements (detailed below) are met.

With respect to impacts to instrument procedures maintained by external organizations, we encourage you to consult directly with all affected aerodromes and external instrument procedure design organizations. As procedures to Stayner (Clearview Field) Airport (CLV2) are also impacted by the project we recommend you contact the design firm for those procedures to discuss mitigations. The appropriate contact is Chas Cormier who can be reached at 819-717-9555 or chascorm@rogers.com.

Any changes to the locations and heights of the turbines will require a new land use submission and review.

The nature and magnitude of electronic interference to NAV CANADA ground-based navigation aids, including RADAR, due to wind turbines depends on the location, configuration, number, and size of turbines; all turbines must be considered together for analysis. The interference of wind turbines to certain navigation aids is cumulative and while initial turbines may be approved, continued development may not always be possible.

In the interest of aviation safety, it is incumbent on NAV CANADA to maintain up-to-date aeronautical publications and issue NOTAM as required. To assist us in that end, we ask that you notify us at least 10 business days prior to the erection of the turbines. This notification requirement can be satisfactorily met by returning a completed, signed copy of the attached form by e-mail at landuse@navcanada.ca or fax at 613-248-4094. In the event that you should decide not to proceed with this project or if the structure is dismantled, please advise us accordingly so that we may formally close the file.

If you have any questions, contact the Land Use Department by telephone at 1-866-577-0247 or e-mail at landuse@navcanada.ca.



NAV CANADA's land use evaluation is valid for a period of 12 months. Our assessment is limited to the impact of the proposed physical structure on the air navigation system and installations; it neither constitutes nor replaces any approvals or permits required by Transport Canada, Industry Canada, other Federal Government departments, Provincial or Municipal land use authorities or any other agency from which approval is required. Industry Canada addresses any spectrum management issues that may arise from your proposal and consults with NAV CANADA engineering as deemed necessary.

Yours truly,

A handwritten signature in black ink, appearing to be "DL" or similar initials, written in a cursive style.

David Legault
Manager, Data Collection
Aeronautical Information Services

cc ONTR - Ontario Region, Transport Canada
CLV2 - STAYNER (CLEARVIEW FIELD)
CNY3 - COLLINGWOOD
Chas Cormier – Aeronautical Information Consultant (CLV2)

Appendix 6

The Economic Impacts of the Fairview Wind Project on Collingwood Regional Airport

Maury Hill and Associates, Inc.

November 9, 2015

wpd Canada

**The Economic Impacts of the Fairview Wind
Project on Collingwood Regional Airport**

Prepared by

**Maury Hill and Associates, Inc
2060 Richardson Side Rd.,
Carp, Ontario
Maury.w.hill@gmail.com**

November 9, 2015

INTRODUCTION

wpd Canada is in the process of developing a number of wind farm projects throughout Canada, including a wind energy generation facility known internally as the Fairview Wind Project near the Collingwood Regional Airport.

Staff at the Ministry of the Environment and Climate Change (MOECC) continue to undertake the technical review of the Fairview Wind Project application for a Renewable Energy Approval (REA). As part of this review, the MOECC has recently expressed concern about the project's potential economic impacts on the Airport resulting from the operational impacts that Transport Canada has indicated will occur at the Airport.

The MOECC has subsequently directed wpd Canada to complete an analysis of the economic impact of the project on the aerodrome operations at the airport, including how the changes in operations may impact planned airport expansion outlined in the Collingwood Economic Development Action Plan (May 2015). MOECC had expected that the economic impact analysis would involve input from, and engagement with, Collingwood Regional Airport.

To this end, wpd Canada commissioned an examination of the economic impact analysis to meet the needs of the MOECC directive.

SCOPE and SCALE

The analysis of economic impact considered the following two areas:

- the economic impact of the project on current aerodrome operations at the Collingwood Regional Airport, and
- the economic impact of changes in operations as they impact any planned or anticipated aerodrome expansion outlined in the Collingwood Economic Development Action Plan

METHODOLOGY

In general, economic impact analyses provide a quantitative method to estimate the economic benefits or detriments that a particular project or industry brings to the economies of surrounding communities where the specific project is located. Typically, economic impact studies use financial and economic data to generate estimates of output, GDP, employment and tax revenues associated with changes in the level of economic activity resulting from the project or industry being analyzed. In general, economic impacts can be estimated at the direct, indirect and induced levels.

Where financial or economic data are not available, or where the magnitude of the impacts are relatively low, then a qualitative approach to the economic impact analysis is appropriate.

The approach for this analysis proposed three phases:

1. At its core, the analysis would leverage the results of the safety and operational analyses previously conducted on behalf of wpd Canada, by Transport Canada, by NAV CANADA, and by Charles Cormier on behalf of the Collingwood Regional Airport. In essence, the analysis would seek to express the identified safety issues in economic impact terms.
2. The Collingwood Economic Development Action Plan and aerodrome expansion plans (if any) would be examined to assess potential economic impacts of a pre-existing wind farm in the area on those plans.
3. Input from the Collingwood Regional Airport would be sought through the engagement of local representatives in order to better inform the economic impact analysis. The engagement would take the form of in-situ discussions or telephone interviews.

In essence, the analysis was based on the principle that any negative economic impact would be the adverse effect of a significant impact of the Fairview Wind Project on operations at the Collingwood Regional Airport, which in turn would be the adverse effect of a significant impact on safe aerodrome operations caused by the project. The foundational assumption was that without such adverse effects, there could be no negative economic impact related to the installation of the related windmills.

RESULTS OF PREVIOUS STUDIES

Prior to employing any of the available analyses, i.e. those conducted by Terry Kelly of SMS Aviation Inc. on behalf of wpd Canada (*Fairview Wind Farm Preliminary Analysis*, March 2011; *Fairview Wind Farm Technical Analysis of Ground-Based Navigation Aids*, April 2011; *Potential Effects of the Fairview Wind Project on IFR Aircraft Accessing Collingwood Regional Airport*, July 2012), by Transport Canada, by NAV CANADA and by Charles Cormier on behalf of Collingwood Regional Airport, each was critically examined with respect to the methodology employed, and the appropriateness of the conclusions expressed. Having reviewed all documents, it is my professional judgment that the SMS Aviation Safety reports and NAV CANADA analysis were not found wanting in this regard – the methodological approach and conclusions are concurred with for the purpose of this report. However, the methods used in the Cormier report and the conclusions drawn contained some factual errors: for example, the number of wind turbines that would be within the 4 kilometer Outer Surface Limit (OLS) is 2 rather than 4, and in applying the OLS to the Collingwood aerodrome (as a non-certified aerodrome, the 4 kilometer radius/limit does not apply). Transport Canada's

subsequent reference to the Cormier report did not address this. Further, it is noted that NAV CANADA, as the national authority for air traffic services as well as the agency responsible for the instrument approaches, did not echo the minimum limit conclusions of the Cormier report with respect to changes to instrument approach procedures for RWY 13 and 31. Rather, NAV CANADA only requires changes on these approaches for Category C and D flights, which, as they note, can be mitigated by circling to the north.

Impact on Safety

While Transport Canada has acknowledged that the installation of the wind turbines associated with the Fairview Wind Project would create changes to the aviation environment around the Collingwood Regional Airport, Transport Canada also has indicated that any risks to safety will be addressed through a number of resulting actions, such as marking, lighting, publications, and operating procedures.

NAV CANADA evaluated the Fairview Wind Project proposal and had no objection to the project as submitted. NAV CANADA did advise that the locations and heights of the proposed turbines will require publication amendments to the procedures for Collingwood Regional Airport related to circling.

Impact on Aerodrome Operations

According to the *Canadian Aviation Regulations*, pilots are required to operate their aircraft using one of two sets of flight rules – visual flight rules (VFR) or instruments flight rules (IFR). “VFR” pilots must ensure they maintain visual references to the surface of the earth at all times while flying. They are responsible for seeing and avoiding obstacles, and for that reason, are restricted from flying in poor weather.

Turbines and other man-made obstacles are documented, and marked and lit conspicuously so that VFR pilots can see and avoid them in both daytime and nighttime conditions. While the wind turbines would represent yet another obstacle in the aviation environment to be avoided, avoiding them would not be unduly challenging in VFR conditions, and well within the skill level of any licensed pilot flying into Collingwood Regional Airport. The proposed changes to IFR procedures (as cited in the Cormier report) will have no negative impact on VFR operations, because VFR pilots will not fly in weather that requires IFR procedures. Therefore, this analysis concludes that the installation of the wind turbines will have no impact on VFR operations at the aerodrome.

On the other hand, “IFR” pilots rely on information from navigational equipment and flight instruments in their aircraft. As a result, they can operate in weather conditions that would prohibit VFR pilots from flying.

Studies completed in 2011 and 2012 by SMS Aviation Safety concluded that, of the estimated 90 to 216 aircraft expected to conduct an IFR approach annually (based on activity levels at that time), it was likely that none – and not likely more than three – would need to divert to an alternate airport, or be delayed in landing as a result of conducting a missed approach or entering the holding pattern before successfully landing at Collingwood due to low ceilings or reduced visibility.

It should be noted that there are a variety of reasons why an aircraft might be required to divert, apart from low ceilings or reduced visibility. There may be other weather concerns such as accumulated snow, heavy crosswinds or icy runways, as well as medical emergencies, mechanical issues, natural disasters, customs issues, terror threats, etc.

The main reasons the number of aircraft needing to divert for reasons related to the new minima is so low relative to the total activity level (approximately 8000 movements per year) are as follows:

- Most aircraft flying to Collingwood are operated VFR, and will not be affected by changes to IFR procedures;
- The pilots of almost all IFR-operated aircraft arriving at Collingwood will be clear of cloud before arriving at the approach minima, and have visual reference to the runway, and land; and
- The minima for the runway and approach that will most often be used during inclement weather (013) will not be raised (or raised very slightly) because of the turbines. Consequently, if the turbines are constructed and pilots are unable to see the runway, they will conduct a missed approach from exactly the same altitude they would if the turbines are not constructed.

A recent review (October 2015) of the SMS Aviation Safety studies was conducted to determine whether the conclusions arrived at were still valid. The review determined that, if anything, the earlier studies had overestimated the actual number of IFR approaches conducted in instrument meteorological conditions (IMC). Nevertheless, for the purpose of this analysis, the earlier conclusions of 0 to 3 aircraft being impacted will be used.

For clarity, it is noted that the only flights that would be affected are those where the pilot(s) arrive at the new (raised) approach minima and do not have visual reference to the runway environment, when they otherwise would have if they had been able to descend to the previous (pre-turbine) approach minima.

Should the predicted weather be such that the altitude at which the runway is predicted to be visible is lower than the “new” minima, the pilots of the impacted aircraft would have two main options:

ANALYSIS OF ECONOMIC IMPACTS

- divert to an alternate airport with the attendant delays in completing the trip to Collingwood – if that was the objective, or
- fly the approach, anticipating that the actual condition would be better than that predicted. Should a missed approach be required, there would be a delay in landing as a result of entering the holding pattern before successfully landing at Collingwood, or deciding to divert to an alternate airport.

Given the number of flights that might be affected by the installation of the wind turbines relative to the total number of aircraft movements, and the nature of the consequences, the impact on aerodrome operations must be considered to be negligible to minimal and therefore the result is too minimal to quantify an economic impact.

Having considered impacts on safety, and operational impacts on both VFR and IFR flights, there is nothing to indicate that there will be a detriment to the overall viability of the Collingwood Regional Airport.

ANTICIPATED FUTURE AERODROME ACTIVITIES

In a publicly available document entitled “Town of Collingwood Economic Development Action Plan Final Report”, dated May 2015, the Town of Collingwood has made two references to the Collingwood aerodrome:

Section 2.5

Support assessment and investigation of economic development opportunities at the airport by working with municipal funding partners and private investment partners to develop a strategy and business case for future of the airport.

Section 8.4

Continue assessing economic development opportunities at the airport by working with municipal funding partners and private investment partners to develop a strategy and business case for future development of the airport.

It is not known if any substantive progress has been made on these sections of the Development Action Plan.

Attempts to obtain information on the future airport expansion plans from the management of Collingwood Regional Airport have been unsuccessful to date. Information in the public domain seems to indicate that there is an interest in expanding facilities, such as a proposed business park, in the area surrounding the aerodrome.

While there is no information available indicating so, it could be anticipated that future plans might include getting the aerodrome certified as an airport. Should this be the case, Transport Canada has made it clear in both word and action that the wind

turbines in question will not be a significant impediment. That is, Transport Canada has made it clear that “any safety issue will be addressed through a number of resulting actions, such as marking, lighting, publications, and operating procedures”. Further, Transport Canada has recently authorized operations at the Chatham Kent Airport with 8 wind turbines within a 4 KM radius of the airport (vs. 2 for Fairview) and with at least one in closer proximity (at 2.86km) than is being proposed for the Fairview Wind Project, (the closest at 3.66km).

ECONOMIC IMPACTS

As noted above, this analysis was based on the principle that any negative economic impact would be the result of negative impacts on safety related to the Fairview Wind Project, and the resultant adverse effects on operations at the Collingwood Regional Airport. In short, no such significant impacts were found based on the analysis of source documents.

In terms of methodological approach, a qualitative approach to the economic impact analysis was deemed to be appropriate, primarily because the magnitude of the impacts was estimated to be very low, and therefore below the threshold of meaningful quantitative analysis.

It should be noted that attempts to seek input from the Collingwood Regional Airport through the engagement of local representatives has proved unsuccessful to date.

Current Aerodrome Operations

Notwithstanding that VFR flights represent the majority of the activity at the Collingwood Regional Airport, it is the considered opinion of this author that there would be no VFR-related economic impacts related to the installation of the Fairview Wind Project, as there would be little or no VFR-related operational impact. That is, VFR flights would continue to fly when the weather allowed for the appropriate see and avoid mode of flying.

Given that the VFR flights are not likely to be impacted and the number of IFR aircraft that would be impacted by the installation of the wind turbines is in the order of 0 – 3 flights per annum, it is the considered judgment of this author that the result is too minimal to quantify an economic impact.

Anticipated Future Aerodrome Activities

While the nature of future aerodrome activities cannot be stated with authority, in this author's professional opinion there is nothing to indicate that changes to the surrounding infrastructure and facilities, i.e. a business park, or attempts to change the regulatory status of the airfield would be negatively impacted by the Fairview Wind Project. The impact on aviation activity is too small to have any significant impact on any anticipated expansion of facilities, and the wind turbines are unlikely to impact future plans to certify the airfield.

SUBMITTED BY

Maury Hill

Maury Hill and Associates, Inc.

Appendix 7

Update to 2011 and 2012 assessments

Terry Kelly

November 3, 2015

On October 22, 2015, I was tasked by wpd Canada to review three documents prepared by *SMS Aviation Safety Inc.* in 2011 and 2012. The objective was to assess the reports and determine whether the findings remain valid in light of developments at Collingwood Regional Airport in the intervening three to four years (i.e., in 2015).

Please find below a summary of the activities undertaken, and the results of the review.

Please don't hesitate to contact me if you have any questions regarding this submission.

Terry Kelly
613.730.0652

Introduction

The following reports (which wpd Canada provided MOECC) were examined:

- 'Fairview Wind Farm - Preliminary Aviation Analysis' (March 6, 2011)
- 'Fairview Wind Farm Technical Analysis of Ground-Based Navigation Aids' (April 8, 2011)
- 'Potential Effects of the Fairview Wind Project on IFR Aircraft Accessing Collingwood Regional Airport' (July 2012)

Assessments of the proposed Fairview project received from Transport Canada, NAV CANADA and the Collingwood Regional Airport between 2011 and 2015 were also reviewed.

Additionally, various sources of information regarding aviation operations at the Collingwood Regional Airport in 2015 were consulted. These included several NAV CANADA publications [e.g., the 'Canada Flight Supplement' (CFS) and 'Canada Air Pilot' (CAP)], and web-based documents containing aircraft movement data and operational information.

Observations regarding the accuracy and appropriateness of the analyses and reports

1. The findings and conclusions of the two reports completed in 2011 were validated by the subsequent assessments that NAV CANADA and Transport Canada conducted of the proposed wind energy project.
 - a. NAV CANADA: the September 23, 2011 assessment indicated that changes would need to be made to instrument flight approaches to increase minimum altitudes for circling. The March 19, 2013 assessment included previous suggestions, and also indicated that if aircraft were restricted from circling to the south of Collingwood Airport, the impact on minimum altitudes would be minimal. Subsequent assessments (April 16, 2014; March 19, 2015) contained similar observations. All assessments indicate that NAV CANADA had no objection to the project. A more detailed assessment of NAV CANADA's correspondence of March 19, 2015 is contained in the addendum to the current summary report.
 - b. Transport Canada: The June 28, 2011 assessment required that one turbine be lit in addition to those that had been proposed by wpd. No additional comments were made. Subsequent assessments (November 22, 2013; December 31, 2014) contained similar results.

2. The remainder of the observations pertain to the 2012 study of the potential impact of the proposed Fairview project on IFR operations at the Collingwood Airport. The study had been commissioned because Collingwood Airport had asserted that the turbines would significantly impact access to the airport. Although the airport had studied the projected 'technical' impact of the proposed turbines on the newly designed instrument approach procedures, they had not studied the actual effects the raised minima might have on future IFR operations at the airport. In other words: their claim of a significant impact on airport operations was unsubstantiated. The objective and scope of the wpd study was purposely framed to examine this unstudied area.
3. The impact of the proposed turbines on *VFR* operations at Collingwood was outside the scope of the 2011 and 2012 assessments. An assessment of VFR operations using 2014 and 2015 data is summarized in paragraphs 12 to 15, below.
4. The methodology employed in the 2012 assessment of IFR operations was critically examined, and was determined to be valid. The data and information concerning the newly designed IFR approach procedures came directly from the instrument approach design specialist who created the procedures. Concerns raised by the design specialist about the VOR/DME A approach are critiqued in the context of NAV CANADA'S assessment in March 2015. The short summary is appended.
5. There were a number of limitations in the data at the time of the 2012 study (relating to weather, aircraft movements, and the number of IFR approaches, categorized by approach and aircraft type). The methodological assumptions and techniques that were used to compensate for these limitations were examined, and determined to be valid. The findings almost certainly overestimated the number of IFR approaches and landings that might possibly be affected by the wind energy project.
6. In 2012, no weather data were kept for Collingwood. Therefore, the analysts consulted a number of Canadian and American weather specialists for their advice on the best proxy data to employ. During the analysis, the weather data were consistently adjusted to provide worst case situations for IFR operations at the airport. This was done to compensate for potentially non-representative or incomplete weather data, and resulted in the operational impacts (missed approaches or diversions) being over-stated in the study.
7. Current aircraft movement data for Collingwood Regional Airport are now available at http://www.collingwood.ca/files/2015-07-30_AirportServicesBoardAgendapkg.pdf. The data are reported by month and general category of operation, and are valid to June 2015. They do not contain data specific to IFR operations.
8. The 2012 report appears to have underestimated the actual number of aircraft movements in 2010 and 2011. However, the difference does not impact the findings, in large part because the methodology anticipated and accommodated such weaknesses in the data. In fact, the data suggest that the 2012 study overestimated the actual number of IFR approaches conducted in instrument meteorological conditions (IMC).
9. The wording in the conclusion of the 2012 report is imprecise. Revised wording is recommended later in this e-mail.

Observations regarding the impact on IFR operations in 2015 on the findings of the three reports

10. An automated weather observation system (AWOS) has been installed at Collingwood, and new instrument approach procedures instituted. The 2012 assessment anticipated these changes in the analyses, and do not affect the findings.
11. There are no published data on the nature of IFR operations at Collingwood (i.e., frequency, type of instrument approach, type of aircraft). However, aviation operations do not appear to have substantially changed between 2012 and 2015.

Observations regarding the potential impacts of the turbines on VFR operations at Collingwood Regional Airport

12. The studies conducted by *SMS Aviation Safety Inc.* in 2011 and 2012 focussed on IFR operations because the analysts knew that:
 - a. Transport Canada (TC) would require wpd Canada to light the turbines in the wind energy project so they would be visible to VFR pilots;
 - b. NAV CANADA would publish advisory information for VFR pilots (*inter alia*) in the Canada Flight Supplement (CFS), VFR aeronautical navigation charts, and notice to airmen (NOTAMs);
 - c. If wanted, the aerodrome operator could change VFR procedures (e.g., to include VFR circuits to the north of runways 13/31) as has become increasingly common place at aerodromes near wind energy projects; and, importantly
 - d. VFR-governed pilots would be restricted by regulations to operate their aircraft in weather conditions that enable them to visually detect and avoid the turbines by a lateral and vertical distance of no less than 500', while remaining clear of cloud.
13. An estimated 97% of aircraft movements at Collingwood Regional Airport in 2014 were VFR. Based on data for the first six months of 2015¹, this proportion is expected to remain constant in 2015.
14. Almost all VFR aircraft movements are conducted by "itinerant" pilots, local (mainly recreational) pilots, and pilots operating aircraft owned by flight schools.
 - a. Itinerant pilots will normally conduct a landing when arriving, and a take-off on departure (i.e., an itinerant flight will normally account for just two aircraft movements at Collingwood Regional Airport);
 - b. Local pilots, in addition to a take-off and landing at the start and end of the flight, may conduct several practice take-offs and landings from the "circuit" during a flight (i.e., a single flight might account for at least four and perhaps as many as 10 aircraft movements); and
 - c. Pilots operating flight school aircraft will often conduct multiple take-offs and landings (i.e., a single flight will normally account for numerous aircraft movements).
15. Given that the same regulatory weather minima will apply whether the turbines are constructed or not, and that all VFR pilots (including itinerant, local and flight school pilots) will benefit from

¹ http://www.collingwood.ca/files/2015-07-30_AirportServicesBoardAgendapkg.pdf.

the mitigation described in paragraph 12, the proposed Fairview wind energy project should have no effect on VFR operations at Collingwood Regional Airport.

Conclusions and Recommendations

1. The findings and conclusions of the two 2011 reports were validated by the subsequent assessments conducted by Transport Canada and NAV CANADA.
2. The 2012 assessment of the possible impact of Fairview on IFR operations at Collingwood appears to have overestimated the number of IFR approaches conducted at Collingwood Regional Airport, and the number of approaches conducted in IMC. Therefore, the number of annual landings from IFR approaches that could be potentially impacted by the turbines is more likely in the bottom range of the estimated zero to three, documented in the 2012 report.
3. It is recommended that the wording of the conclusion on page 7 of the 2012 report on IFR operations be amended to read (the amended words are in italics):

“... it is likely that none – and not likely more than three – will need to divert to an alternate airport, or be delayed in landing as a result of conducting a missed approach or entering the holding pattern before successfully landing at Collingwood.”

4. The proposed wind energy turbines are not likely to impact VFR operations at Collingwood Regional Airport.

ADDENDUM

NAV CANADA provided an updated assessment of the proposed Fairview project in March 2015. They concluded that:

- The circling minima for CAT C & D aircraft conducting RNAV 13 and 31 approaches would be raised by 360 and 260 feet, respectively;
- The minima for CAT C aircraft conducting the VOR/DME approach would be raised by 360 feet; and
- The minima for CAT A & B aircraft conducting the VOR/DME approach would be raised by 80 feet.

NAV CANADA noted that “these impacts can be limited by sectoring the circling for CAT C & D to the north of [runways] 13-31”.

The assessment is consistent with the findings of the 2012 study conducted by SMS Aviation Study.

- It was recognized in the 2012 study that in the future, when IMC (instrument meteorological conditions) prevail, almost all pilots will use the LPV (localizer performance with vertical guidance) approaches to runways 13 and 31. The LPV approach minima for a straight-in landing to these runways are much lower than the non-precision, circling minima. Furthermore, one LPV approach services runway 13, and another, runway 31. Therefore, the 2012 study determined that there would be no reason for an IFR pilot to circle during inclement weather. Pilots

operating in IMC would land from LPV approaches to runway 13 or 31 – approaches that had not been impacted by turbines

- It was also known that the effect on CAT C & D aircraft on circling could be mitigated by amending the procedures so that circling aircraft would remain north of runways 13 and 31, well away from the turbines. This was confirmed by NAV CANADA's 2015 assessment.
- The same mitigation (i.e., maneuvering north of runways 13/31) could be applied for CAT A, B and C aircraft conducting the VOR/DME A approach. This is reiterated by NAV CANADA. An explanation is provided below.

The VOR/DME A approach is a non-precision instrument approach. The approach radial is not aligned with any of the runways. Therefore, the pilot must in all cases (i.e., before or after the construction of the proposed turbines), complete the approach, identify the aerodrome environment visually, then maneuver the aircraft visually to land on the into-wind runway. In effect, the pilot conducts a maneuver that is similar to circling. As noted by NAV CANADA, by remaining north of runways 13/31, future pilots would stay clear of the turbines.

The 2012 study forecast that the turbines would only raise the minima for CAT A & B aircraft conducting the VOR/DME A approach by 60 feet, not 80 feet - as subsequently determined by NAV CANADA.

Therefore, the impact of the 80 foot increase has been reassessed.

As noted above, during the study in 2012, it was assumed that when cloud ceilings were low and flight visibilities reduced, pilots would employ precision approaches that would enable them to land straight ahead and into wind on the approach runway from an altitude lower than a non-precision approach.

Therefore, the study assumed that no more than 5% of all IFR flights to Collingwood that were conducted in IMC would use the VOR/DME A approach. This almost certainly over-stated the number, as only a very few IFR-equipped aircraft are not equipped with GNS equipment (i.e., aircraft that are only equipped with legacy VOR/DME equipment). Corporate or commercially-operated aircraft, and military or air ambulance helicopters would be equipped with GNS equipment, and would not conduct a VOR/DME approach in IMC.

Consequently, when the increase of 80 feet to the CAT A and B VOR/DME approach minima was applied to the weather and aircraft movement data, it was forecast that from zero to two GA IFR flights might be impacted by the raised minima.

Appendix 8

Transport Canada letter to the Ministry of Environment and Climate Change

November 17, 2014



4900 Yonge Street, 4th Floor
Toronto, Ontario
M2N 6A5

UNCLASSIFIED

Your file Votre référence

Our file Notre référence

RDIMS #10115796

November 17, 2014

Hayley Berlin
Manager - Service Integration
Environmental Approvals Access and Service Integration Branch
Ministry of the Environment and Climate Change
2 St. Clair Avenue West
Floor 12A
Toronto ON M4V 1L5

Subject: Fairview Wind Farm - Aerodromes

Dear Ms. Berlin:

The following comments are provided in response to your request dated October 10, 2014.

The terms “aerodrome” and “airport” are often used interchangeably in general parlance, and in some Transport Canada publications. However, the *Aeronautics Act* definitions are crucial to understanding the application of regulations and standards.

Aerodrome

An “aerodrome” means any area of land, water (including the frozen surface thereof) or other supporting surface used, designed, prepared, equipped or set apart for use either in whole or in part for the arrival, departure, movement or servicing of aircraft and includes any buildings, installations and equipment situated thereon or associated therewith.

Aerodromes must comply with the *Canadian Aviation Regulations* (CARS) Part III, Subpart 1.

Airport

An “airport” means an aerodrome in respect of which a Canadian aviation document is in force, and is referred to as “certified”. Airport operators must comply with the *Canadian Aviation Regulations* and the associated standards which include obstacle limitation surfaces (OLS) that must not be penetrated. Wind turbines that penetrate the OLS will affect the airport certification, requiring the airport operator to take action to maintain the standards e.g. displace the runway threshold so there is a shorter runway to land on.

Airports must comply with the *Canadian Aviation Regulations (CARS) Part III, Subpart 2* and the *TP312 - Aerodrome Standards and Recommended Practices* standards document.

Collingwood and Stayner are “aerodromes” not “airports”.

Canada Flight Supplement

The *Canada Flight Supplement* is an aeronautical information publication published by NAV CANADA which contains an Aerodrome Directory including data and sketches of Canadian aerodromes and airports.

Aerodrome operators may request their aerodrome information be registered in the *Canada Flight Supplement* in accordance with the *Canadian Aviation Regulations (CARS) Part III – Subpart 1*.

CAR 301.03(2) states: “*The Minister may refuse to register an aerodrome where the operator of the aerodrome does not meet the requirements of sections 301.05 to 301.09 or where using the aerodrome is likely to be hazardous to aviation safety and, in such a case, shall not publish information with respect to that aerodrome.*”

TP1247

TP1247E - “Aviation - Land Use in the Vicinity of Aerodromes” is a guidance document published by Transport Canada. It is designed to assist planners and legislators at all levels of government in becoming familiar with issues related to land use in the vicinity of aerodromes and how land used around an aerodrome will have an impact on its operations.

TP1247 was recently updated to include the following Note:

“ Note: It is of the utmost importance to be aware that the proximity of obstacles, for example, wind turbines, telecommunications towers, antennae, smoke stacks, etc., may potentially have an impact on the current and future usability of an aerodrome. Therefore, it is critical that planning and coordination of the siting of obstacles should be conducted in conjunction with an aerodrome operator at the earliest possible opportunity.”

Obstacle limitation surfaces are established to ensure the required level of safety. TP1247 identifies three types of surfaces at an aerodrome that should be protected to avoid penetration by objects or structures.

The three types of surfaces are:

- 1) Outer Surface
- 2) Take-off/Approach slope surface
- 3) Transitional Surface

Where the aerodrome is not an airport, penetration of these surfaces may affect the operations at the aerodrome. The standards in TP312 - *Aerodrome Standards and Recommended Practices* can be used but are not enforceable; however, the operational integrity of the aerodrome is enhanced if the designation of the use of land adjacent to the facility is done in line with technical portions of the standards.

At an airport, objects penetrating any of these surfaces would violate the certification standards in TP312 - *Aerodrome Standards and Recommended Practices* and would require some action to bring the airport back into compliance. Depending on the location of the penetrating obstacle, action could be things like a runway threshold displacement, changes to aeronautical information publications, restrictions to operations, and others.

Airports that have an Airport Zoning Regulation have these surfaces protected by law and these zoning regulations apply to land that is located outside the property boundary of the airport. Since aerodromes are not eligible for Airport Zoning Regulations, Transport Canada publishes TP1247 to make provincial/municipal land use authorities aware of development that may be incompatible with an aerodrome or airport.

TP1247 also refers to the requirement for marking and lighting of obstacles in accordance with Transport Canada's Standard 621 – Obstruction Marking and Lighting. The purpose of Standard 621 is to provide an effective means of indicating the presence of objects likely to present a hazard to aviation safety.

TP1247 can be found at the following link:

<http://www.tc.gc.ca/eng/civilaviation/publications/tp1247-menu-1418.htm>.

Transport Canada Land Use Role

As stated in TP1247E - Aviation - Land Use in the Vicinity of Aerodromes: “From a regulatory perspective, the authority for the designation of and control of the use of lands located outside of aerodrome property rests with provincial/municipal levels of government. The only exception to this fact, in the aviation case, occurs where an airport zoning regulation, made pursuant to the Aeronautics Act, is in force.”

The Minister of Transport may exercise authority only over lands that are included in an Airport Zoning Regulation made pursuant to the Act. An Airport Zoning Regulation contains restrictive clauses that describe the activities and uses that are restricted or prohibited and contains a legal description of the lands to which it applies.

Restrictions and or prohibitions contained in an Airport Zoning Regulation may range from limiting the height of structures to prohibiting specified land uses or to prohibiting facilities that may interfere with signals or communications to/from aircraft.

Airport Zoning Regulations can only be enacted for airports.

Therefore, since Collingwood and Stayner are not airports, there are no Airport Zoning Regulations.

TP312

Transport Canada Publication - TP312 E - *Aerodrome Standards and Recommended Practices* contains the standards applicable to land airports which are certified pursuant to the *Canadian Aviation Regulations* - Part III, Subpart 2.

TP312 serves as the authoritative document for airport specifications, including physical characteristics, obstacle limitation surfaces, lighting, markers, marking and signs.

Obstacle limitation surfaces in this document define the airspace to be maintained free from obstacles in order to minimize the dangers presented by obstacles to an aircraft, either during an entirely visual approach or during the visual segment of an instrument approach; and prevent the airport from becoming unusable by the growth of obstacles around the airport.

Since Collingwood and Stayner are not airports, they are not required by regulation to comply with the standards in TP312.

TP308

Section 803.02 of the *Canadian Aviation Regulations* (CARs) regulates the development of civil instrument procedures in Canada through the standards manual entitled *Criteria for the Development of Instrument Procedures*, known as TP 308. Paragraph 120(a) of this document requires that specific aerodrome standards be met before an Instrument Approach Procedure (IAP) is authorized.

The rationale for linking the standards in TP312 and TP 308 is to ensure that a specific obstacle-free environment is provided in the vicinity of the aerodrome to support the visual segment of an IAP.

In accordance with Transport Canada Advisory Circular (AC) No. 301-001, an aerodrome attestation form is required to support a public IAP at an aerodrome. The criteria used are based on TP312, except there are no outer surface criteria. A copy of the aerodrome attestation form can be found at:

<http://www.tc.gc.ca/media/documents/ca-opssvs/301-001.pdf>

NAV CANADA is the responsible agency for reviewing, publishing and amending Instrument Approach Procedures.

Canada Air Pilot

The *Canada Air Pilot* (CAP) is an aeronautical information publication published by NAV CANADA containing instrument approach procedures for aerodromes and airports across Canada.

The following is in response to your specific questions:

1. Question: Overall, does the Project meet the Transport Canada guidelines for aviation safety (i.e. TP 1247, TP 312, TP 308), including obstacle restrictions and obstacle limitation surfaces with respect to the two proximal aerodromes?

Answer: Transport Canada has not conducted an assessment of the obstacle restrictions or the obstacle limitation surfaces for compliance with TP1247, TP312 or TP308. However, we offer the following general comments:

- a) TP1247 –The Fairview Wind Project proposal was submitted to Transport Canada and was assessed for marking and lighting requirements. With respect to the obstacle limitation surfaces, refer to c) below. With respect to airport radar, navigation aids, communication systems and weather radar, NAV CANADA would have to make this assessment.
- b) TP308 - An evaluation of the impact of obstacles on TP308 and the instrument approaches at Collingwood and Stayner is the responsibility of NAV CANADA or the sponsor of the instrument approach. NAV CANADA is also responsible to amend all aeronautical information publications to advise pilots of the obstacles and make changes to the instrument approach procedures.

For aircraft operating under Instrument Flight Rules (IFR), aviation safety is maintained by raising the limits of the instrument approach procedures to avoid the obstacles. While aviation safety has been addressed, it may result in a decrease in the usability of the aerodrome, the effectiveness of the instrument approach and the operational impact of the aerodrome in poor weather conditions.

The assessment conducted by Charles Cormier on January 20, 2014 for the Collingwood aerodrome and on January 23, 2014 for the Stayner aerodrome indicates that the proposed wind turbines would have an impact on both aerodromes as follows:

Collingwood:

There are presently three instrument approaches published in the *Canada Air Pilot*.

- i) RNAV(GNSS) RWY 13 LNAV: Mr. Cormier's assessment indicates the minimum limits would have to be raised by 20'. This would likely have an impact on the aerodrome operation.
- ii) RNAV(GNSS) RWY 31 LNAV: Mr. Cormier's assessment indicates the minimum limits would have to be raised by 120'. This is a fairly significant penalty, which would reduce the effectiveness of the instrument approach.

- iii) Circling limits for RWY 13 and 31: Mr. Cormier's assessment indicates the circling limits for category C and D aircraft would increase significantly by 360' and 260' respectively. This is a significant penalty on the existing circling limits. However, the impact may be reduced if it is possible to limit circling to one side of the aerodrome (as is done at other aerodromes and airports).
- iv) VOR/DME A: Mr. Cormier's assessment indicates the minimum limits would have to be raised 60' for category A & B aircraft, which would likely have an impact on the aerodrome operation, and the minimum limits for category C would have to be raised by 240'. This is a significant penalty, which would reduce the effectiveness of the existing instrument approach. However, the impact may be reduced if it is possible to limit circling to one side of the aerodrome.

Stayner:

There are currently two instrument approaches which are approved for "restricted" use and a special Transport Canada approval is required to use these approaches. It appears wpd Canada may not have considered the impact on these two instrument approaches.

- i) RNAV(GNSS) RWY 16: Mr. Cormier's assessment indicates the straight-in minimum limits would have to be raised by 180' and that the circling limits would have to be raised by as much as 240'. These are significant penalties, which would reduce the effectiveness of the existing instrument approach. However, the impact may be reduced if it is possible to limit circling to one side of the aerodrome.
 - ii) VOR/DME A: Mr. Cormier's assessment indicates the minimum limits would have to be raised by 240' and 220' for category A & B aircraft respectively. This is a significant penalty, which would reduce the effectiveness of the existing instrument approach. However, the impact may be reduced if it is possible to limit circling to one side of the aerodrome.
- c) TP312 – The obstacle limitation surfaces identified in TP312 (and TP1247) are established to protect an aircraft either during an entirely visual approach or during the visual segment of an instrument approach. Although an aerodrome does not have to comply with these surfaces, the operational integrity is enhanced if the designation of the use of land adjacent to the facility is done in line with technical portions of the standards.

The assessment conducted by Charles Cormier on January 20, 2014 for the Collingwood aerodrome and on January 23, 2014 for the Stayner aerodrome indicates that the proposed wind turbines would have an impact on both aerodromes as follows:

Collingwood:

- i) Mr. Cormier's assessment indicates that the "Outer Surface" (which is normally a 4000m radius around the aerodrome) would be penetrated by 4 turbines by as much as 416'.
- ii) The outer surface for airports is established to protect aircraft manoeuvring near the runway and in the "circuit pattern". There is no requirement for an outer surface at an aerodrome. However, the proximity and height of the wind turbines could potentially pose a hazard to aircraft operating in the "circuit pattern".
- iii) There are ways to mitigate obstacles that lie within the "circuit pattern". The aerodrome operator could request a right hand circuit pattern be published for runways 19 and 31 to avoid the obstacles. Such procedures would have to be approved by Transport Canada.

Stayner:

- i) RWY 34 - Mr. Cormier's assessment indicates Turbine #7 is approximately 7000' south of the runway and would violate the take-off/approach surface by 214'. If Stayner were an airport, appropriate mitigations would be required in order for the airport to remain certified, such as displacing the runway or establishing an offset approach. The impact at an airport would be a displacement of approximately 4280'. Since the runway is only 1920' long, this obstacle would effectively close the runway.
As an aerodrome, Stayner does not have to comply with the take-off/approach surface. However, in its proposed location and without special procedures in place to avoid the obstacle, the turbine is a significant obstacle and could potentially pose a hazard to aircraft on final approach to this runway.
- ii) RWY 16 - Mr. Cormier's assessment indicates Turbine #3 would penetrate the transitional surface by 138'. If Stayner were an airport, appropriate mitigations would be required in order for the airport to remain certified, such as displacing the runway or establishing an offset approach for aircraft landing on runway 16, and implementing special departure procedures for aircraft taking off on runway 34. Transport Canada is not able to determine the exact impact on the runway displacement; however the obstacle could potentially close the runway, similar to runway 34.
As an aerodrome, Stayner does not have to comply with the transitional surface. However, in its proposed location and without special procedures in place to avoid the obstacle, the turbine is a significant obstacle and could potentially pose a hazard to aircraft on final approach to runway 16 or when overshooting runway 34.
- iii) Mr. Cormier also noted that all turbines would penetrate the outer surface. The same general comments apply as outlined in ii) and iii) under Collingwood above.

2. If the turbines are erected where they are proposed:

- a. Question: Do they have the potential to infringe/cause an obstruction in the outer surface and transitional surface around the Stayner (Clearview Field) Aerodrome or Collingwood Regional Airport?

Answer: Refer to response under Question 1. above.

- b. Question: Could they cause turbulence (e.g. potential cross-wind and roll-hazards) for any type of aircraft that will impair their safe operation when approaching the aerodromes?

Answer: As you may be aware, there are numerous articles and studies available regarding the effects of turbulence caused by wind turbines. In February 2011, Transport Canada participated in the “Aviation Safety-risk Assessment of The Effect of Wind Turbines on General Aviation Aircraft”, which was included within one of your attachments. The Summary 3.4 concluded: “The safety-risks associated with GA aircraft operating in very close proximity to wind turbines – in particular, light and ultra-light aircraft – during take-off and landings from aerodromes, are assessed to be from low to moderate significance. The remainder of the safety-risks to GA aircraft are assessed to be very low.” Several strategies to mitigate the hazards and risks were discussed in this document.

- c. Question: Will they impact a pilot’s descent to low altitudes with reduced forward visibility in white sky line conditions?

Answer: Pilots must fly under Visual Flight Rules (VFR) or Instrument Flight Rules (IFR) according to the *Canadian Aviation Regulations*. When operating under VFR, significant obstacles would be seen and avoided as they are marked and lighted, and published in the aeronautical information publications. Pilots operating under IFR would be protected from obstacles by following published instrument procedures.

- d. Question: Could they have an impact on the safe operation of low level Griffith helicopters flying into the aerodromes?

Answer: The impact on the safe operation of the low level Griffith helicopters would have to be answered by DND.

- e. Question: Do they have the potential to create a safety hazard for aircraft using the surrounding airspace during nighttime?

Answer: Any obstacle has the potential to create a safety hazard for aircraft if the pilot does not see the obstacle and the aircraft is flying in close proximity

to that obstacle. Significant obstacles are lighted for night time, and are published in the aeronautical information publications.

3. Question: If yes to any of the above, would Transport Canada or NAV CANADA support the implementation of mitigation measures by the proponent to ensure aviation safety? Are the mitigation measures proposed by the proponent adequate to address potential impacts?

Answer: Transport Canada is not aware of any specific mitigation measures proposed by the proponent. Transport Canada has assessed the obstacles for marking and lighting. The aerodrome operator has an ongoing responsibility to advise NAV CANADA of any change or modification to the information submitted in the Aerodrome Attestation Form. NAV CANADA is responsible for reviewing, publishing and amending instrument approaches and for updating the aeronautical information publications to address the new obstacles. Proposed procedural changes such as a revised circuit pattern would have to be submitted by the aerodrome operator and then reviewed and approved by Transport Canada.

4. Question: Is the meteorological test tower, with a height of 60 meters AGL, stationed approximately 2.5 metres southeast of the Stayner (Clearview Field) Aerodrome creating an aviation safety concern?

Answer: Transport Canada is not aware of a 60m meteorological test tower located 2.5m SE of the aerodrome. This obstacle is not published in the *Canada Flight Supplement*. If such an obstacle existed, it would constitute a hazard to aircraft taking off and landing from the aerodrome.

5. Question: The Operator of Stayner (Clearview Field) Aerodrome provided information and procedures for pilots operating from the aerodrome, as published by the Federal Government, in its Canada Flight Supplement, Restricted Canada Air Pilot (see original comment from Operator) – would these procedures need to be revised as a result of the proposed turbines?

Answer: The aeronautical information publications would have to be amended by NAV CANADA to reflect the new obstacles. The impact on the aerodrome and the procedures was discussed in 1. above. In addition, the request for a right hand circuit pattern would have to be approved by Transport Canada.

6. Question: Is Transport Canada able to identify any limitations to the future expansion of the Stayner (Clearview Field) aerodrome, as a result of the proposed turbine locations? If the Stayner (Clearview Field) Aerodrome further developed its existing operation (i.e. extended its runway and added aircraft hangars) would the turbines infringe/cause an obstruction in the outer surface and transitional surface around the airfield, such that it would pose a threat to the aerodrome's operational safety?

Answer: Transport Canada is not aware of the proposed expansion plans by Stayner aerodrome and therefore cannot identify any limitations to future expansion. However, if there is an operational impact on the aerodrome today, there will likely be an operational impact on the aerodrome in the future if the aerodrome is further developed. A qualified aviation consultant would have to make that assessment once they have been made aware of the aerodrome operator's intentions. Safety is addressed through a number of resulting actions, such as marking, lighting, publications, and operating procedures.

7. Question: If the Project was established as proposed, would it trigger the need for displacement of the runway at the Stayner aerodrome?

Answer: Since Stayner is not an airport, there is no legal requirement for a runway displacement. However, according to the analysis conducted by Charles Cormier on January 23, 2014, theoretically, a penetration of the takeoff and approach surface and transition surface at an airport would require a runway displacement or other mitigative measures. In its proposed location and without special procedures in place to avoid the obstacle, the turbine could potentially pose a hazard to aircraft on final approach to runway 16 or when overshooting runway 34.

8. Question: If the Project was established as proposed, would it complicate visual flights rules and/ or instrument flight rules for either aerodrome?

Answer: There will be an operational impact at both aerodromes as outlined in 1. above. Aeronautical information publications would be amended by NAV CANADA to account for the new obstacles.

9. Question: Is Transport Canada able to identify any limitations to the future expansion of the Collingwood Regional Airport (CRA), as a result of the proposed turbine locations? If CRA extended its runway to 7,500 feet, would the proposed turbines infringe/cause an obstruction in the outer surface and transitional surface around the aerodrome, such that it would pose a threat to the airport's operational safety?

Answer: Transport Canada is not aware of the proposed expansion plans by Collingwood aerodrome and therefore cannot identify any limitations to future expansion. However, if there is an operational impact on the aerodrome today, there will likely be an operational impact on the aerodrome in the future if the aerodrome is further developed. Safety is addressed through a number of resulting actions, such as marking, lighting, publications, and operating procedures.

10. Question: If the Project was established, would it trigger the need for displacement of the runways at CRA?

Answer: Since Collingwood is not an airport, there is no legal requirement to displace a runway. According to the analysis conducted by Charles Cormier on Jan 20, 2014, there was no indication that a displacement would be required.

11. Question: The MOECC received from the CRA a document with “Effects to Collingwood Regional Airport” from the Fairview Wind Project, prepared by Charles (Chas) Cormier, Aeronautical Information Consultant and dated January 20, 2014 (see attachment). Based on the review of this report and using Transport Canada’s expertise, is there a potential threat to CRA’s operational safety?

Answer: According to Mr. Cormier’s assessment dated January 20, 2014, there will be an operational impact on the aerodrome. See response under Question 1. above. Safety is addressed through a number of resulting actions, such as marking, lighting, publications, and operating procedures.

In conclusion, based on the information reviewed, it appears there would likely be an operational impact on both the Collingwood and Stayner aerodromes. There are aerodromes in Canada where obstacles are located in proximity to runways, and depending on their location, have continued operation with the establishment of specific procedures, and the marking, lighting and publication of these obstacles. However, it should be noted that such mitigation can result in a decrease in the usability of the Collingwood and Stayner aerodromes. The Department also wishes to emphasize that it is critical that planning and coordination of the siting of obstacles be conducted in conjunction with an aerodrome operator at the earliest possible opportunity.

Yours truly,

Joseph M. Szwalek
Regional Director Civil Aviation
Ontario Region

Cc: Agatha Garcia-Wright, Director, EAB, MOECC
Sarah Paul, Director, EAASIB, MOECC

The logo for the Government of Canada, featuring the word "Canada" in a serif font with a small Canadian flag icon above the letter 'a'.

Appendix 9

Consultation with the Airport Services Board and Town of Collingwood

From: Jonathan Clifford
Sent: November 4, 2015 1:29 PM
To: bmacdonald@collingwood.ca
Cc: fairviewproject; Ian MacRae; Khlaire Parré
Subject: FW: Fairview Wind Project and Collingwood Airport Ministry Letter

Hello Brian,

I wanted to let you know that, not having received the requested documentation, wpd has proceeded to finalize our submission to the Ministry of Environment and Climate Change.

Sincerely,

Jonathan Clifford

Renewable Energy Approvals and Research Specialist



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From: Jonathan Clifford
Sent: Tuesday, October 27, 2015 8:36 PM
To: 'Brian Macdonald'

Cc: fairviewproject; Khlaire Parré; Ian MacRae

Subject: RE: Fairview Wind Project and Collingwood Airport Ministry Letter

Hello Brian,

Thank you for your response.

The ministry has given us instructions to review potential economic impacts of the Fairview Wind Farm to the Collingwood Regional Airport, as well as to the planned airport expansion as outlined in the Collingwood Economic Development Action Plan. As such, wpd is requesting this documentation and any other information you currently possess which may help inform the final report.

Given our initial request to Mr. Lajoie for documents by tomorrow (Oct. 28th) and your response that you needed additional time, we can defer completing the report until early next week, but ask that the municipality forward any relevant documents to us to review by noon on Monday, November 2nd.

Following receipt of your documentation, we would be interesting in meeting with you. Given the tight timelines imposed by MOECC, a meeting either Monday or Tuesday via teleconference would be preferable.

Thank you,

Jonathan Clifford

Renewable Energy Approvals and Research Specialist



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From: Brian Macdonald [<mailto:bmacdonald@collingwood.ca>]
Sent: Tuesday, October 27, 2015 2:32 PM
To: Jonathan Clifford
Cc: fairviewproject; Khlaire Parré
Subject: RE: Fairview Wind Project and Collingwood Airport Ministry Letter

Jonathan

Thank you for the email. We will need a little time to put this together and unfortunately we will not be able to meet your deadline of this week. We fully appreciate the timeline put on you by the MOECC and we will do what we can to provide the relevant information as soon as we possibly can.

Regarding the meeting request is it possible that you can provide a proposed agenda. I think we need a little more information than "a discussion of the same topics". Do you have a terms of reference for your study. Are there specific items regarding the proposed economic impact study you wish to discuss. Do you have a consultant for this study and will they be part of the meeting. I think it would be most helpful for us all to have a little more information on the intent of the proposed meeting so that it may be productive for all.

We will work on putting together the information requested and if you could get back to us on the proposed meeting.

Sincerely,

Brian

From: Jonathan Clifford [<mailto:jonathan@wpd-canada.ca>]
Sent: Tuesday, October 27, 2015 8:50 AM
To: Brian Macdonald
Cc: fairviewproject; Khlaire Parré
Subject: FW: Fairview Wind Project and Collingwood Airport Ministry Letter

Hello Brian,

I am following up my voice message from yesterday.

I am contacting you from wpd Canada. Pierre Lajoie directed me to reach out to you regarding our inquiry for documents and a meeting related to Collingwood Airport. If you have not been forwarded the email we sent to Pierre, the contents are below.

I look forward to hearing back from you.

Thank you for your time,

Jonathan Clifford
Renewable Energy Approvals and Research Specialist



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From: Collingwood Regional Airport [<mailto:clgwdairport@simcoemail.com>]

Sent: Monday, October 26, 2015 2:30 PM

To: Jonathan Clifford

Subject: RE: Fairview Wind Project and Collingwood Airport Ministry Letter

Good afternoon Jonathan,

I have been instructed to inform you to contact Brian Macdonald Director of Public Works and Engineering for all Airport business inquiries. See below contact info.

Brian Macdonald

Email: bmacdonald@collingwood.ca

Telephone: 705-445-1292 Ext: 4201

Fax: 705-445-1286

Thanks

Pierre Lajoie APM

From: Jonathan Clifford [<mailto:jonathan@wpd-canada.ca>]

Sent: Friday, October 23, 2015 1:19 PM

To: clgwdairport@simcoemail.com

Cc: fairviewproject; Ian MacRae; Khlaire Parré; mgal@collingwood.ca

Subject: Fairview Wind Project and Collingwood Airport Ministry Letter

Hello Pierre,

My name is Jonathan Clifford.

I am contacting you on behalf of wpd Canada regarding the Fairview Wind Project and Collingwood Airport. I have tried several times this week to call you but I understand from your staff that you are under the weather, I hope you feel better soon.

The reason for my emails is that it is our understanding that the Airport received a copy of a letter that the Ministry of Environment and Climate Change (MOECC) sent to wpd Canada dated October 6, 2015.

The letter requested that wpd complete an analysis of the economic impact of the Project on aerodrome operations. The letter from the Ministry has also asked that the economic impact analysis involve input and engagement from Collingwood Airport.

With that in mind, we kindly request that the Airport expediently forward us any documents related to the Airport's business plans. Documents that may be useful could include proposals for future expansion, documents relating to the current status of the airport, and municipal presentation materials that may have been used to discuss aerodrome development.

We would also request a meeting with the aerodrome to discuss these same topics. We suggest meeting October 30, 2015 or earlier.

As indicated in the letter, time is of the essence and we request that the airport please provide a response as quickly as possible. Receiving documents by Tuesday or Wednesday (Oct 27 or 28) next week would be appreciated.

Thanks you for your immediate attention.

Sincerely,

Jonathan Clifford

Renewable Energy Approvals and Research Specialist



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Collingwood Airport Summary Table

The following table represents all consultation activities that have taken place with Collingwood Airport from November 2009 to present.

In summary:

- wpd initially contacted Collingwood Airport prior to receiving a REA contract in 2009 to informally begin consultation should a project be approved.
- A meeting was tentatively booked with the Airport in June, 2011 around the time the modified Project layout was published.
- The Airport canceled the meeting and has refused to meet with wpd since.
- A total of 11 invitations have been sent during this period.
- No direct contact has been made with the Airport since November 2013 when the Airport made it clear that they had no intention of meeting with wpd.

#	Name of Correspondent	Date Received	Collingwood Airport Services Board Correspondence	Date Replied	wpd's Response
1.1	First Contact: Pierre Lajoie (Collingwood Airport Management)	November 10, 2009	<ul style="list-style-type: none"> • Email discussion with Collingwood Airport - discussing the airport layout following a phone conversation earlier that day. • Purpose of the correspondence was to check with the Airport to ensure the project does not affect navigation services in the nearby area. • Noted there are no setback requirements from aerodromes but that project developers are required to contact Transport Canada to determine whether there are any applicable federal government regulations around aerodromes and to contact the airport operator to discuss zoning regulations. • Inquired specifically about the effects on radar at the airport (of which early indication suggested there were none) and any other zoning bylaws that wpd should be made aware of. • Coordinates of the Project area closest to the airport was provided. • No turbine locations were specifically discussed. 	November 24, 2009	<ul style="list-style-type: none"> • Email • Collingwood Airport forwarded information from their instrument approach analyst. • The analyst commented that the locations of the turbines need to be analyzed to examine their effect on the Obstacle Limitation Surfaces (OLS) and the Instrument procedures. The purpose would be to identify where the turbines cannot go, and where they can be placed safely. • The design specialist provided information on how long a study would take and the cost of the analysis.
1.2	Pierre Lajoie (Collingwood Airport)	November 27, 2009	<ul style="list-style-type: none"> • wpd phoned the Airport Manager and followed up with an email to assure the Collingwood Airport that wpd will do what is necessary to 		

Collingwood Airport Summary Table

	Management)		<p>ensure aviation safety, and to be compliant with any regulations related to this goal.</p> <ul style="list-style-type: none"> Also stated that if wpd received a contract from the OPA, wpd would proceed with submitting applications to Transport Canada, NAV Canada and will check with DND as well. Assured him that we would check back with him to see if additional analysis was required. 		
2	Pierre LaJoie	May 24, 2011	<ul style="list-style-type: none"> Email wpd had been in contact with Collingwood Airport Management concerning a meeting to discuss any impacts that the Project might have on the airport. Email was sent to the Airport Manager to confirm the meeting time and date as June 13, 2011 at 1:00pm. 		
2.1	Pierre Lajoie (Collingwood Airport Management)	May 25, 2011	<ul style="list-style-type: none"> An email was sent to Collingwood Airport Management to inform them about the meeting objectives: As the Fairview Wind Project is located in the nearby region of Collingwood Airport, wpd would like to meet to discuss the Project to: <ol style="list-style-type: none"> 1) establish the channels of communication; 2) provide a direct link for the Airport to contact wpd, should they have any questions or concerns; 3) Discuss the aviation safety parameters that wpd has had assessed to ensure safety at the Collingwood Airport. wpd's aviation safety expert was also invited and confirmed attendance for the scheduled meeting. Called the Airport later that day to confirm the meeting wpd extended an invitation to Collingwood Airport's instrument design expert to attend the meeting. 	May 26, 2011	<ul style="list-style-type: none"> Email The Airport responded and confirmed the meeting for June 13, 2011.
2.2	Pierre Lajoie (Collingwood Airport Management)	June 8, 2011	<ul style="list-style-type: none"> Email Turbine Locations along with a Draft Project Description Report were sent to the Collingwood Airport Manager 		
2.3	Pierre Lajoie (Collingwood Airport)	June 9, 2011	<ul style="list-style-type: none"> Email The Airport Manager canceled the meeting for June 13th. He explained that they needed 		

Collingwood Airport Summary Table

	Management)		more time to consult with an independent expert on the new Project location.		
2.4	Pierre Lajoie (Collingwood Airport Management)	June 14, 2011	<ul style="list-style-type: none"> Email The Collingwood Airport Manager requested the height of the turbines. 	June 15, 2011	<ul style="list-style-type: none"> Email wpd responded confirming the hub height and the height to blade tip.
N/A	Pierre Lajoie (Collingwood Airport Management)	June – July, 2011	<ul style="list-style-type: none"> Numerous phone calls were made to Collingwood Airport in an attempt to book a meeting prior to the first public meeting, but either no contact was made or the Collingwood Airport was non-committal. 		
3.1	Charles Tatham Chair of Collingwood Airport Services Board	July 27, 2011	<ul style="list-style-type: none"> Letter Received letter from Collingwood Airport Service Board in response to wpd's new Notice of Draft Site Plan and Public Meeting that was mailed several weeks prior The letter indicated it was surprised by wpd's decision to relocate the turbines closer to the airport. Indicated that they had engaged the services of a company to design instrument approach procedures for the airport. The placement of the turbines would impact these instrument approaches according to the Airport's hired expert. Stated that there were specific safety concerns that they had about the Project The Airport Board concluded that they strenuously object to the proposed Project. The letter was accompanied with an analysis that identified the impacts the Project would have on the Airport's instrument approaches. For details of this report please see the attached documents. 	November 9, 2011	<ul style="list-style-type: none"> Indicated that wpd is close to completing drafts of the regulatory studies Currently wpd is planning a final public consultation meeting which is tentatively planned for Winter 2012 with an REA submission for Spring 2012. Indicated that wpd was looking forward to meeting with representatives of the airport to provide more detailed information regarding our plans and to begin to address any concerns or questions they might have.
3.2	Charles Tatham Chair of Collingwood Airport Services Board	December 15, 2011	<ul style="list-style-type: none"> Letter Indicated that since their last correspondence, Collingwood Airport had completed the design of their new precision approaches for the airport. They had been flight tested and submitted to NAVCAN for publication. Indicated that the instrument approach designer had found some of the turbines push the minimum approach level up 	January 31, 2012	<ul style="list-style-type: none"> Letter Explained that wpd Canada commissioned a number of independent studies to identify and assess any potential impact on the proposed turbines on local aviation before commencing the Fairview Wind Project. The first report examined lighting requirements, safety regulations regarding obstacles, instrument approach procedures and en route navigational airways

Collingwood Airport Summary Table

			<p>120 feet, and may reduce the effectiveness of the airport.</p> <ul style="list-style-type: none"> • Indicated that the Airport faces weather challenges in the winter because of snow streamers off Georgian Bay. • Felt wpd's references to consultation was "an affront to [their] sensibilities" • "Your proposal to erect wind turbines over 500 feet in the air in the immediate vicinity of the airport is asinine, unjustified and dangerous" • An updated technical report from the Airport instrument designer was attached with the letter. • The letter explained the specific changes that would be required of the Airport's instrument approaches and noted that it may impact the effectiveness of the airport. 		<ul style="list-style-type: none"> • The report concluded that the Fairview Wind Project should not have adverse impacts on local aviation safety. • The follow-up technical analysis concluded that the Project did not violate safety standards and aviation navigation aids. • wpd stated that they were confident that the procedures and regulations put in place by Transport Canada and NAV Canada will ensure aviation safety in and around Collingwood Airport. • Both NAV Canada and Transport Canada have been notified of the turbine locations. wpd will continue to work with both agencies to address any concerns, responsibilities and obligations of wpd Canada. • In order to ensure wpd is assessing and responding to all safety questions and concerns raised by the community to the fullest extent possible, the Airport's Dec 5, 2011 letter was passed onto aviation safety consultants • The response from the consultants was attached to wpd's response to the Airport. • Reiterated that wpd would be happy to meet with Airport representatives to discuss these matters further. • The consultation report concluded that Collingwood Airport could continue to function safely as it had in the past. • It noted the different aviation safety requirements that were required of a registered aerodrome (Collingwood Airport) versus a Certified Airport.
3.3	Charles Tatham Chair of Collingwood Airport Services Board	February 27, 2012	<ul style="list-style-type: none"> • Letter • Thanked wpd for the aviation safety report. • Acknowledged that the Project could not proceed without being compliant with all applicable laws and regulations. • However, noted that there are no real regulations to be met as NAV Canada has no authority to stop a project and neither does Transport Canada (unless an airport has zoning protection). • Felt that the safety impact was excruciatingly obvious because the instrument approach minimums will have to be raised. • Felt that it was obvious that 	April 20, 2012	<ul style="list-style-type: none"> • Letter • Interim response sent March 16, 2012 acknowledging the Airport Board's Feb 27, 2012 letter and indicated that wpd was developing a formal response. • Full response sent Apr 20, 2012 • Reiterated that wpd's understanding from the aviation consultants is that safety standards have been put in place to assure aviation safety. • Checks and balances are designed to ensure aviation activities acknowledge new situations and properly respond to them. A process has been put in place to evaluate changing circumstances and regulatory bodies are responsible for ensuring the system works. Airport facilities and authorities throughout the world have followed

Collingwood Airport Summary Table

			<p>the increased minima will reduce the effectiveness of the airport in poor weather.</p> <ul style="list-style-type: none"> • Stated that “your proposed placement of wind turbines (obstacles) beside the airport will inevitably lead to damages and losses and could cause injury and death.” • Reiterated their complete opposition to the Project. 		<p>these well-established processes to provide safe aviation services.</p> <ul style="list-style-type: none"> • The Fairview Project presents a changing circumstance in aviation for the Collingwood Airport. The responsible organizations have fulfilled their duties to assure aviation safety, and wpd understands modifications to the instrument approaches have been suggested to accommodate the project. • Reiterated that wpd was interested in meeting with Collingwood Airport to look at ways to implement these changes.
3.4	Charles Tatham Chair of Collingwood Airport Services Board	April 26, 2012	<ul style="list-style-type: none"> • Letter • Indicated they remain gravely concerned with wpd’s observations and specifically the company’s “inane assertion” that the Project will not be dangerous. • The Airport Board acknowledged that arrival and departure procedures can be amended to reflect the presence of the turbine towers like traffic signs on the road but the presence of them increased the potential for accidents. • Claimed again that the Project will reduce the viability of the airport in adverse weather and negatively impact the airport. Claimed it will inevitably lead to damages and losses including injury and death. • Asked that wpd conduct a search for an alternative location. 	May 28, 2012	<ul style="list-style-type: none"> • Letter • Explained that given the assurances from their aviation safety consultants, wpd was of the position that it was fulfilling their duties to ensure aviation safety. • Explained that the final open house will be held in the next several months and it will be followed soon after by the REA submission to the MOE. • Noted that the Collingwood Airport Services Board’s position to date has been to oppose the Project moving forward. • Expressed concerns that the airport had not begun to develop contingency plans should the project be approved. • Noted that the project may receive approval as early as spring 2013 with construction starting soon after that. • Noted that the NAV Canada letter suggested several modifications to the instrument approach procedures which could take some time to develop (up to a year) • Asked that the Airport enter discussion with wpd to look at ways of implementing these changes.
3.5	Charles Tatham Chair of Collingwood Airport Services Board	June 27, 2012	<ul style="list-style-type: none"> • Letter • Took exception to wpd suggesting that placing 50 story structures near the airport would ensure aviation safety • Also took exception to wpd’s statement: “Thus far, the Collingwood Airport Services Board’s position has been to oppose our project moving forward” • Stated that wpd misstated the facts and that the Airport does not oppose the Project but to the portion of the Project what 	August 2, 2012	<ul style="list-style-type: none"> • Letter • Explained that wpd continues to move forward with the project with the assurance from their aviation consultants that the project can safely operate within the vicinity of Collingwood Airport. • Reiterated once again wpd’s offer to meet with the Airport Board with the purpose of looking at ways to implement changes to the instrument procedures should the project move forward. • In wpd’s view, these discussions should commence shortly to ensure the new procedures are in place to

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			<p>was revised at the 11th hour (reference to the revised layout announced in June 2011)</p> <ul style="list-style-type: none"> • Took exception with the fact that wpd was suggesting that the Airport was inattentive and negligent in not preparing contingency plans. • Found it arrogant that wpd thought the Airport should prepare contingency plans before the public consultation process was over. • Acknowledged that should the proposed turbine project be approved, it will negatively impact the airport and introduce the potential for collisions and that the airport will need to amend the approach and departure procedures at no cost to the airport. 		<p>coincide with the potential construction phase of the Project.</p>
3.6	Charles Tatham Chair of Collingwood Airport Services Board	September 19, 2012	<ul style="list-style-type: none"> • Indicated that they have reviewed the consultant's report that wpd provided. • Stated that the narrow terms of reference meant the report was virtually of no use in identifying potential impacts • Indicated that no planning around the airport instrument approaches should take place prior to MOE approvals being put in place. • The Airport Board believes that if Transport Canada guidelines for land use around airports is followed there will be no approval 	October 12, 2012	<ul style="list-style-type: none"> • Responded to propose meeting dates with the Collingwood Airport Board. • Explained that it was wpd's understanding that the development of instrument approaches can take upwards of a year to develop. Waiting for an REA approval could provide a gap between the time of commercial operation date and publication of new flight approaches. • Acknowledged that continued service and safety at Collingwood Airport is a shared responsibility and wpd was prepared to meet with the airport to see how they can be of assistance. • wpd suggested some dates in late October and asked that they be contacted with suggested dates. • An interim response from the Town of Collingwood indicating that the Chair of the Airport Board was away but he would be reviewing his calendar and will be contacting wpd to review meeting dates. • However, no response regarding this request was received.
3.7	wpd to Charles Tatham Chair of Collingwood Airport Services Board	March, 19, 2013	<ul style="list-style-type: none"> • Email to Chair of the Airport Board. • Purpose of correspondence was to inform the Chair that NAV Canada has recently completed another land use evaluation of the project that had again encouraged the Airport and developer to consult with each other. 		<ul style="list-style-type: none"> • No Response from Airport Board.

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			<ul style="list-style-type: none"> • wpd restated their hope that the airport would meet with wpd to discuss instrument approach changes. 		
3.8	wpd to Charles Tatham Chair of Collingwood Airport Services Board	September 27, 2013	<ul style="list-style-type: none"> • Wpd extended another invitation to meet and discuss the Project and the airport. • wpd does not assume that the project will be approved but explained that holding early conversations regarding instrument approach changes would be beneficial to both parties should the project be approved. • wpd recognized that safety is a shared responsibility. 	October 18, 2013	<ul style="list-style-type: none"> • Acknowledged instrument approaches would need to be changed should the project be approved. • The Airport argued the modifications would significantly increase the complexity of landing at the airport and increase risk. • Placement of the turbines would increase risk or arriving and departing VFR traffic. • They argued that a better alternative was to simply move the turbines. • Indicated they have no interest in becoming part of a proposal that would degrade safety and increase chances of accidents.
3.9		November 15, 2013	<ul style="list-style-type: none"> • Expressed disappointment that the Airport would not meet with wpd. • Indicated that wpd did not agree with the airport's assessment of safety issues. • Acknowledged the normal costs associated with making instrument approach changes would be paid for by wpd. • wpd is confident that all appropriate due diligence has been followed and wpd will continue to consult with all responsible agencies and aviation safety consultants. 	November 22, 2013	<ul style="list-style-type: none"> • In reply, the Airport Chair explained that he has failed in his efforts to explain to wpd why the airport has ". . .no interest in meeting with you, to hear how we must alter our approach and departure procedures at the Collingwood Regional Airport . . ." • Assumed that wpd is seeking a meeting in response to fulfilling O.Reg 359/09 requirements. • The Airport feels that wpd has never meaningfully discussed the negative repercussions of the project in an informed and open consultation. • Stated that the Airport's consultant feels that wpd's consultant's report is of little value. • Argued wpd was breaching Transport Canada guidelines.