

APPENDIX G: ELECTROMAGNETIC INTERFERENCE STUDY



Electromagnetic Interference (EMI) Study

Prepared for:

Pokeshaw Black Rock Wind Project (PBRWP)



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1.0 Introduction

This study was completed in order to determine if the proposed wind farm in Pokeshaw, New Brunswick may impact existing radio, telecommunication or radar systems. It follows the guidelines identified by the *Radio Advisory Board of Canada and Canadian Wind Energy Association Technical Information and Coordination Process Between Wind Turbines and Radiocommunication and Radar Systems* (RABC, CanWEA, September 12, 2018). These guidelines help to apply a consistent approach to critical stakeholder consultations.

To ensure that there will be no negative impacts on existing CBC/Radio signals, spatial analysis and mapping are also included in this report to meet the specific requirements made by CBC/Radio Canada. These requirements are specified in *CBC/Radio Canada Involvement and Requirements Concerning Wind Energy Projects* (CBCIR).

The proposed Pokeshaw Black Rock Wind Project is located approximately 35 km NE of Bathurst, NB and 12 km W of Bertrand, NB. The project will consist of 5 wind turbine generators (WTGs) with a maximum hub height of 135 m and a maximum rotor diameter of 149 m. The total maximum height of the turbines is 200 m. Within this report the above listed turbine settings can be seen as worst-case scenario, as they represent the highest turbine with the largest rotor diameter. Every lower hub height and smaller rotor diameter will have less impact on radio communication infrastructure.

Table 1: Turbine Coordinates - November 2018 Layout

	NAD 1983 CSRS New Brunswick Stereographic		WGS 1984 UTM Zone 20N		Geogr. Coord.	
	X	Y	East	North	Lon	Lat
1	2595332	7642010	333057	5293192	-65.2282	47.7705
2	2595650	7642430	333393	5293597	-65.2238	47.7742
3	2595814	7642857	333576	5294016	-65.2216	47.7780
4	2596247	7642721	334003	5293861	-65.2158	47.7767
5	2595938	7643543	333731	5294696	-65.2197	47.7842

Table 2: Turbine Elevations - November 2018 Layout

	Elevation (DEM 1m)		Elevation		Total Height WTG	Total Height WTG	Total Height Above Sea Level	Total Height Above Sea Level		
	[m]	[feet]	[max m]	[max feet]	[m]	[feet]				
1	37	121.6	200.0	656.2	237	778				
2	32	104.9	200.0	656.2	232	761				
3	26	85.1	200.0	656.2	226	741				
4	24	*26	79.0	*85.6	200.0	656.2	224	*226	735	*742
5	23	*23	74.1	*74.1	200.0	656.2	223	*223	730	*730

*Values represent elevation data for June 2019 Layout

Note: Since the completion of the EMI study, the locations of turbine sites four (4) and five (5) have changed. The difference between the two layouts can be found in the table below.

Table 3: Layout Version Coordinate Comparison

	EMI report Nov. 12, 2018		Current, June 03, 2019		Distances	Differences	
	X	Y	X	Y		X [m]	Y [m]
1	2595332	7642010	2595332	7642010	no changes	0	0
2	2595650	7642430	2595650	7642430	no changes	0	0
3	2595814	7642857	2595814	7642857	no changes	0	0
4	2596247	7642721	2596114	7642559	210m to SW	-133	-162
5	2595938	7643543	2596009	7643700	172m to NNE	71	157

A map depicting the changes between layout versions is found in the figure below. It is understood that further changes to the layout may occur throughout the EIA review process, and all stakeholders will be notified and consulted with information regarding layout changes.

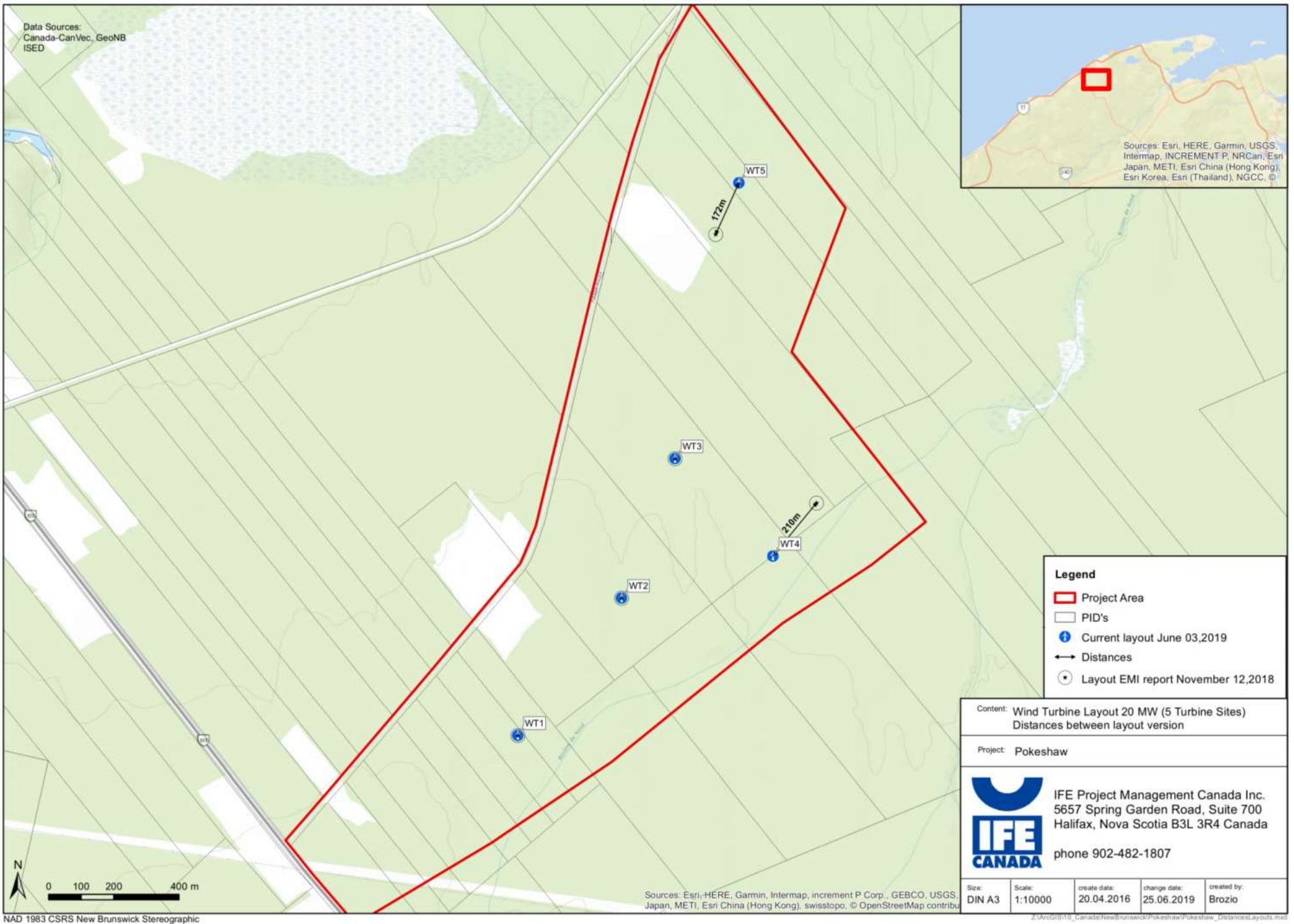


Figure 1: Changes in Layout Versions

2.0 Point-to-Point Systems above 890 MHz

As detailed in the RABC guidelines, existing point-to-point (PtP) transmitters and receivers above 890 MHz have a consultation zone of 1 km. The consultation zone for the path between radio links is a variable of the distance between the transmitter and receiver and the frequency of the license. RABC gives the following formula to calculate the variable consultation zone along the line of sight between transmitter and receiver.

$$LC = R + 52 \sqrt{D/F}$$

Where:

R = Rotor diameter in meters

D = Path length in kilometers

F = Frequency in gigahertz

LC = Diameter of the cylinder in meters

The table below summarizes the PtP systems above 890 MHz with antennas or links near the project.

Table 4: Point-to-Point radio links above 890 MHz

Frequency (MHz)	License Number	Latitude	Longitude	Location	Closest Distance (km)	Licensee
4957.5	010045169-001	47.769722	-65.155583	Saint-Léolin	5	NB DTI
		47.76806	-65.15456	Saint-Léolin (corrected)		
		47.806389	-65.749722	Petit-Roche		
6093.45 6345.49	010045791-001	47.799722	-65.134722	Dugas	6.1	Rogers Communications Canada Inc.
		47.687222	-65.430833	Janeville		
4977.5	010045165-001	47.769722	-65.155833	Saint-Léolin	5	NB DTI
		47.775	-64.93833	Caraquet		
11020 11510	010045789-001	47.775	-65.134722	Dugas	6.1	Rogers Communications Canada Inc.
		47.766389	-64.978889	Caraquet		

There is one point-to-point radio link above 890 MHz that passes through the project area. Using the formula above, it was determined that the closest wind turbine is outside of the variable consultation area, and no interference issues are expected.

It was found that the coordinates for the Saint-Léolin radio tower obtained from the *Spectrum Management System data base* did not match the coordinates obtained through visual inspection of satellite photos. The Department of Transportation and Infrastructure (DTI) was consulted on this matter. The DTI confirmed a new set of coordinates for the Saint-Léolin tower and agreed to the proposed turbine layout. The corrected coordinates are found in Table 4 **Error! Reference source not found.** above.

A radio link belonging to Rogers Communications Canada Inc. passes adjacent to the wind farm outside of the consultation area. Rogers was contacted and provided with wind farm layout information.

There are two PtP links above 890 MHz that pass near the project area. Both links are outside of the variable width consultation area calculated using the RABC formula. No interference is expected.

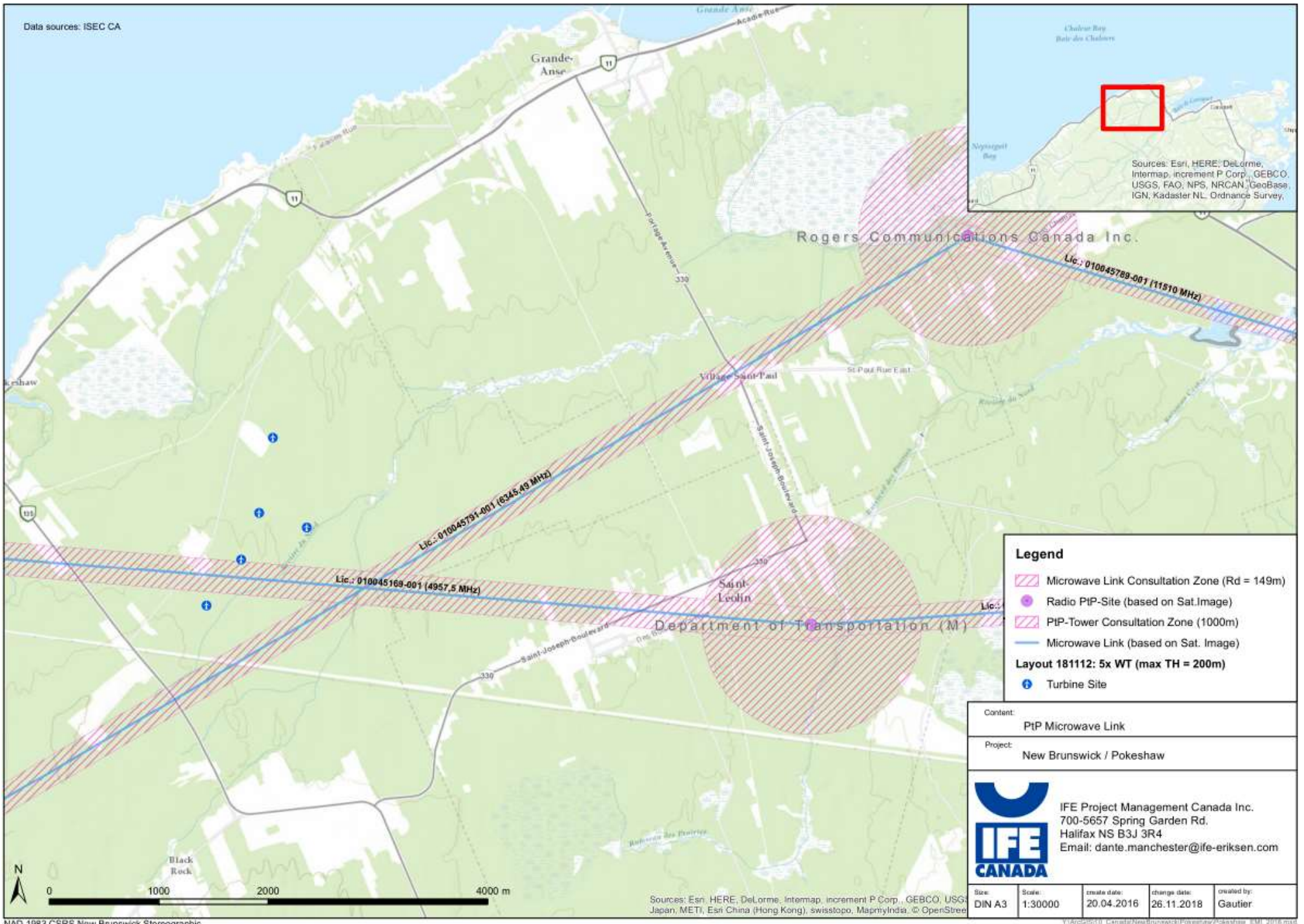


Figure 2 - Point-to-Point Links at Pokeshaw Black Rock Wind Farm

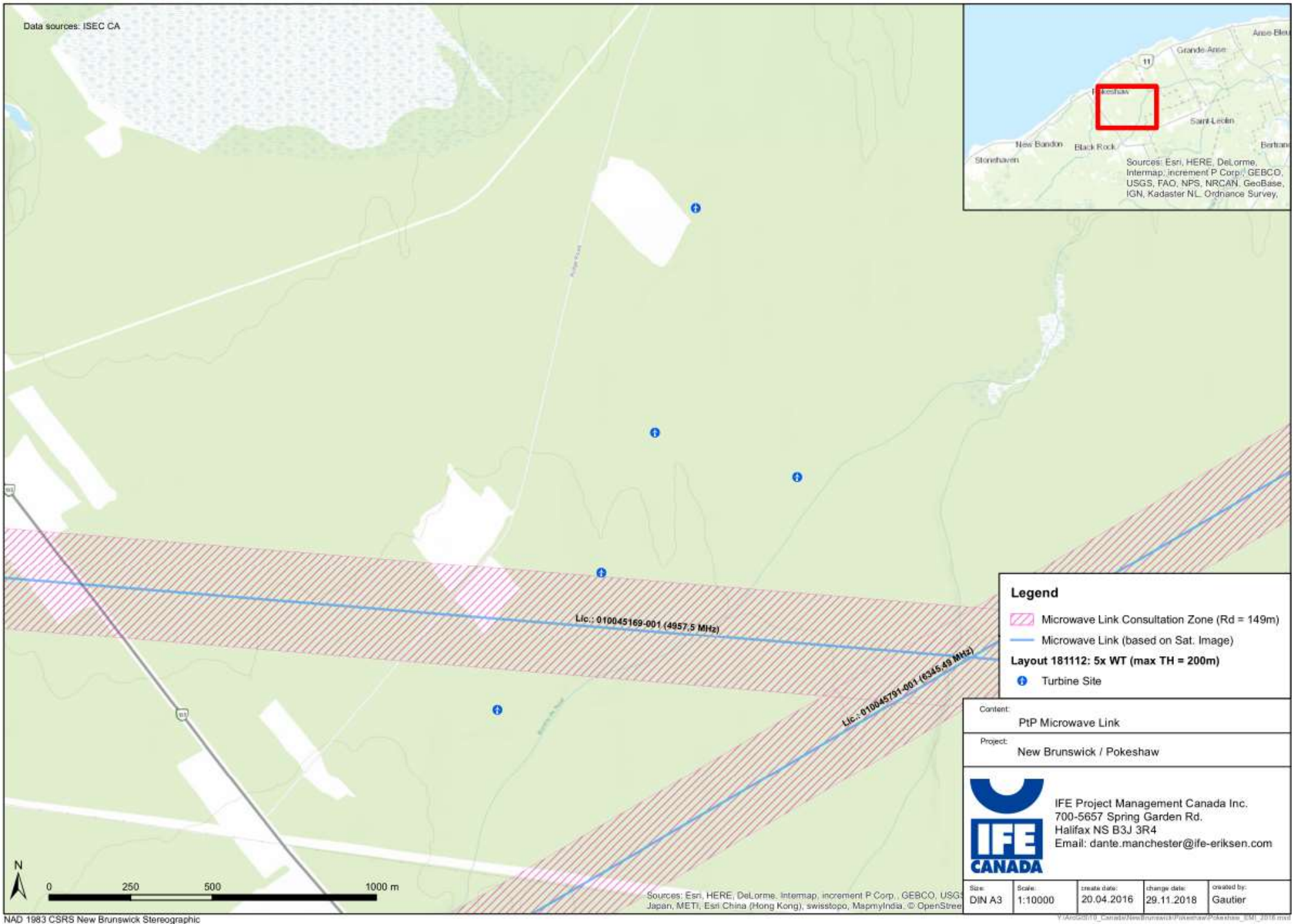


Figure 3 - Point-to-Point links at Pokeshaw Black Rock Wind Farm

3.0 Broadcast Transmitters

3.1 TV Transmitters

The RABC recommended consultation zone for TV Transmitters is 2 km. The closest TV transmitter is located in Tracadie approximately 35.5 km from the proposed wind farm. The second closest TV transmitter is located approximately 42.1 km from the proposed wind farm, in Port-Daniel.

Table 5 summarizes the closest TV Transmitters to the proposed wind farm.

Table 5: Closest TV transmitters to proposed Pokeshaw Black Rock Wind Farm

Channel	Call Sign	Authorization #	Latitude	Longitude	Distance (km)
D9	CHAU-DT-10	010300813-001	47,5075	-64,94	35.5
D10	CHAU-DT-3	010300765-001	48,138889	-64,985278	42.1

There are no TV Transmitters located within the RABC recommended 2 km consultation zone.

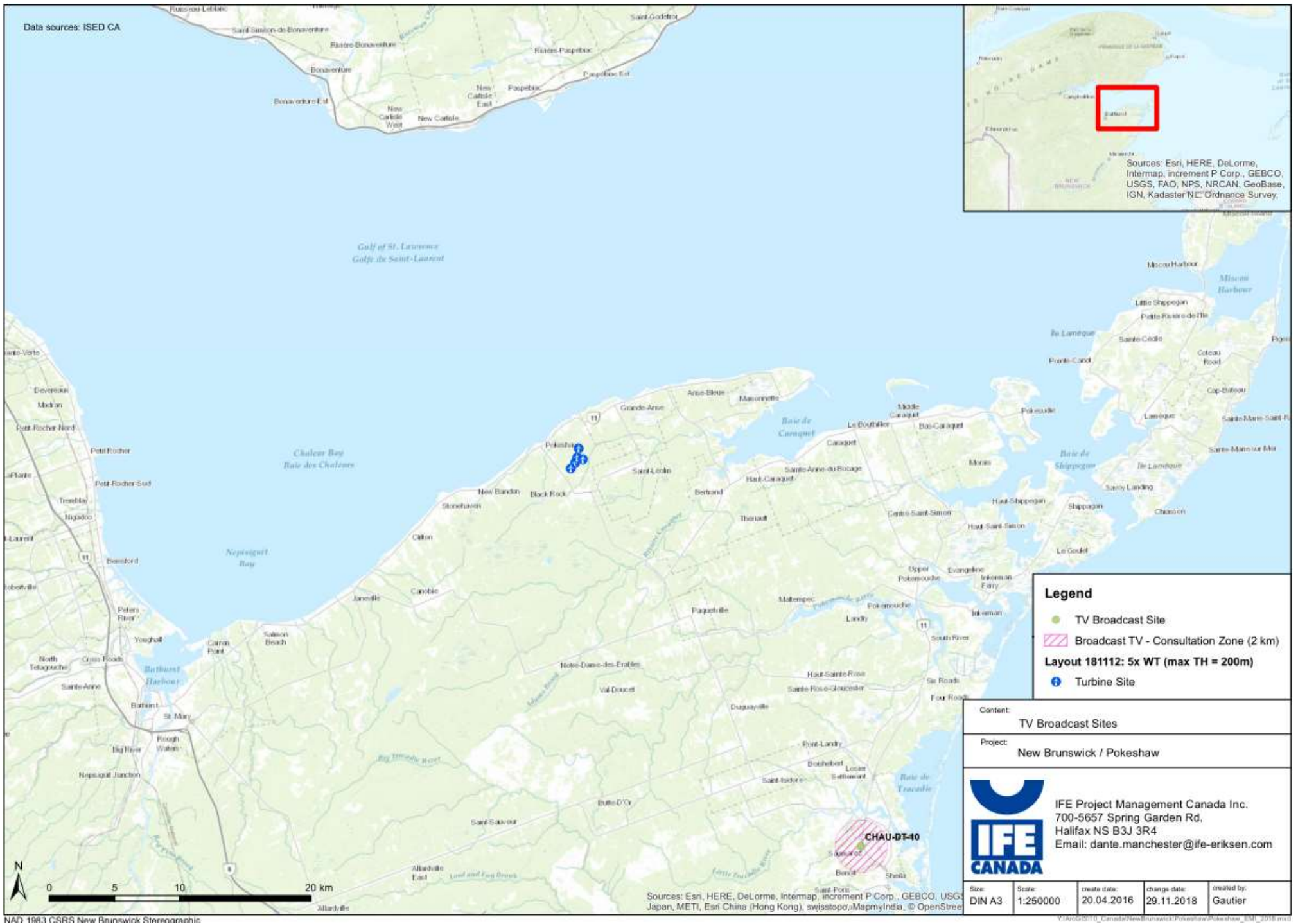


Figure 4 - TV broadcast sites

3.2 AM Transmitters

For AM radio transmitters utilizing multiple tower antenna systems the RABC recommends a 15 km consultation zone. A 5 km consultation zone is recommended for single tower systems.

The closest AM Transmitter is located in Campbellton, NB, approximately 104.7 km from the proposed wind farm.

Table 6 summarizes the closest AM Transmitters to the proposed wind farm.

Table 6: Closest AM Transmitters to proposed wind farm

Frequency (kHz)	Call Sign	Authorization number	Latitude	Longitude	Licensee	Distance (km)
810	CKNB	010298550-001	48.015	-66.585	Maritime Broadcasting Systems Limited	104.7

There are no AM transmitters within the 5 or 15 km consultation zones recommended by the RABC.

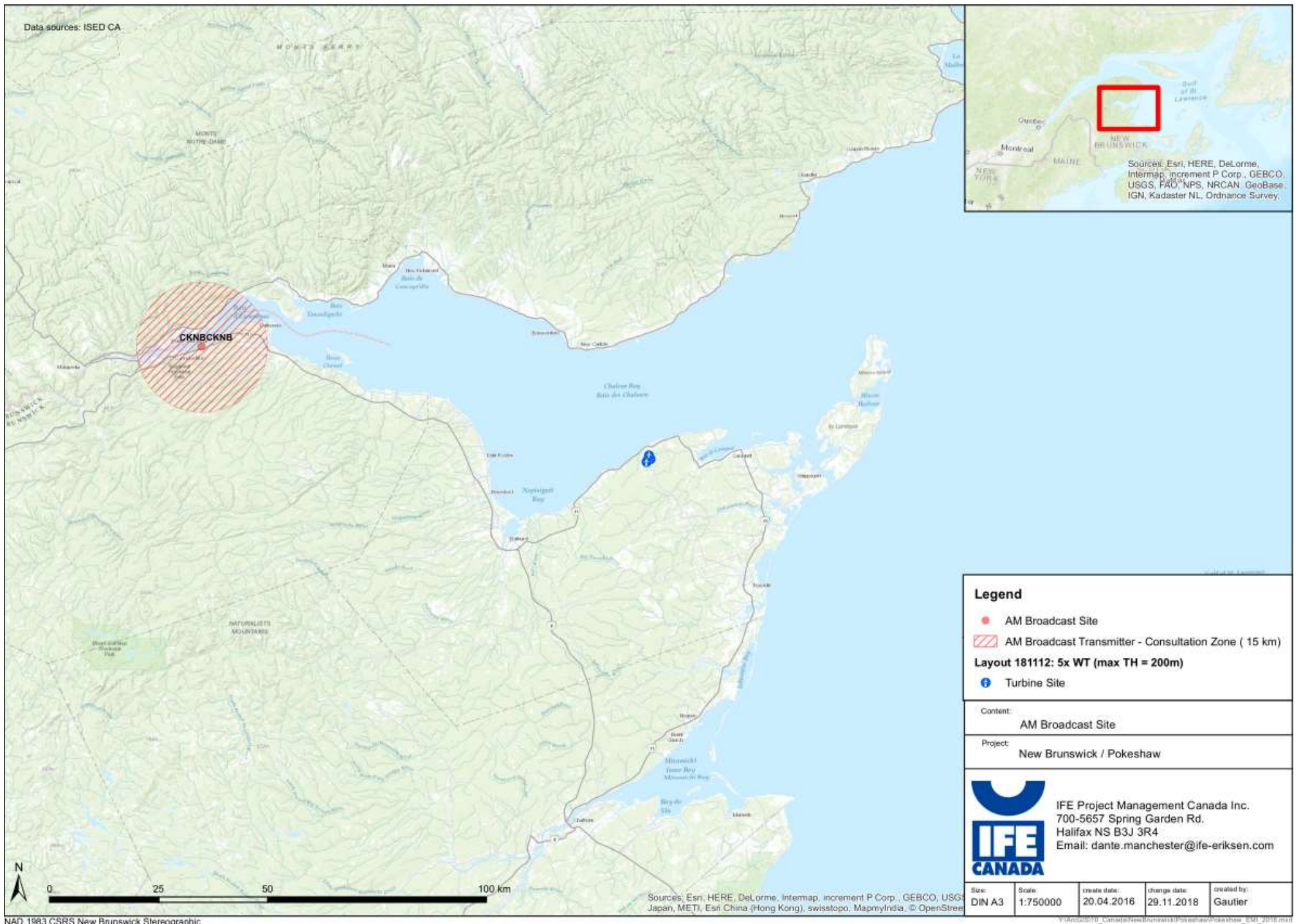


Figure 5 - AM broadcast site

3.3 FM Transmitters

For FM transmitters, the RABC recommends a consultation zone of 2 km and the CBCIR recommends a consultation zone of 5 km. There is no FM transmitter within the CBCIR or RABC consultation zones for the proposed project. The closest FM transmitter is approximately 5.9 km from the proposed wind farm and is located in Grand-Anse/ Caraquet. This transmitter is operated by Radio Acadie Ltée. The second closest FM transmitter is approximately 25 km from the proposed wind farm, and is located in New-Carlisle, QC.

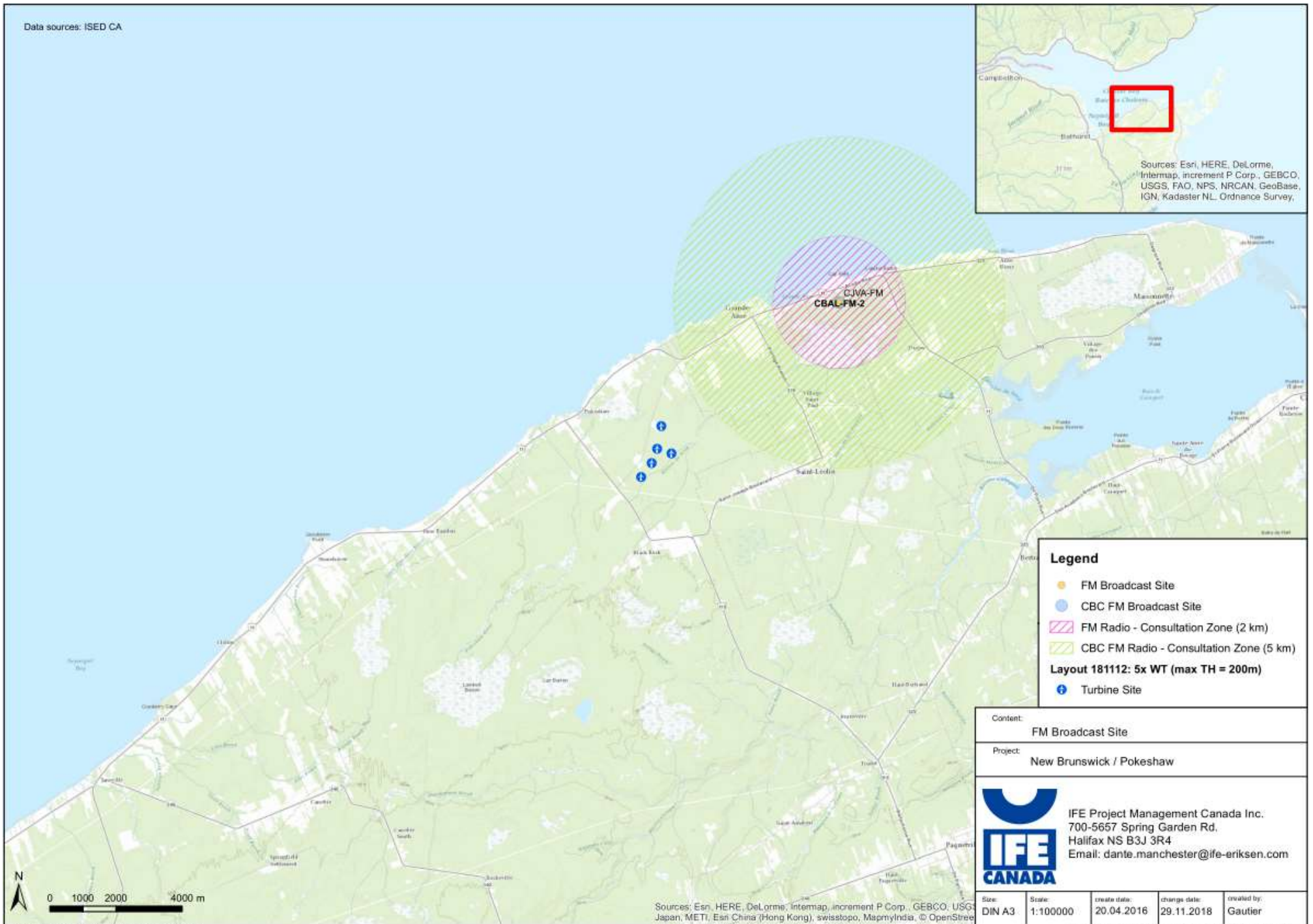
Table 7 summarizes the closest FM Transmitters to the proposed Wind Farm.

Table 7: Closest FM Transmitters to proposed Pokeshaw Wind Farm

Frequency (MHz)	Call Sign	Latitude	Longitude	Licensee	Distance (km)
94.1	CJVA-FM	47.816944	-65.147222	Radio Acadie Ltée	5.9
107.1	CHNC-FM-AX1	48.009722	-65.332222	La Coopérative des Travailleurs CHNC	25

There are no FM transmitters within the 2 km RABC consultation zone or the 5 km CBCIR consultation zone.

Data sources: ISED CA



NAD 1983 CSRS New Brunswick Stereographic

Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreet

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Figure 6 - FM broadcast sites

3.4 CBC/Radio-Canada Radio Transmitters

The consultation zone identified by CBCIR for CBC AM radio transmitters is 15 km. For FM radio transmitters the consultation zone is 5 km. There are no CBC AM or FM radio transmitters within the recommended consultation zones of 15 or 5 km, respectively. The two closest FM CBC radio transmitters are situated in Grand-Anse approximately 5.9 km from the proposed wind farm.

Table 8: Distance and Location of closest CBC Radio Transmitters

Frequency (MHz)	Call Sign	Latitude	Longitude	Type	Distance to wind Project (km)
90.3	CBAF-FM-18	47.816944	-65.147222	FM	5.9
88.3	CBAL-FM-2	47.816944	-65.147222	FM	5.9
98.7	CBGA-FM	48.008889	-65.324722	FM	25
101.5	CBVN-FM	48.008889	-65.324722	FM	25

There are no AM or FM CBC radio transmitters within the CBCIR recommended consultation zones. CBC was contacted by IFE Project Management and has no specific comments regarding the project.

3.5 CBC Television Transmitters

CBCIR recommends that all CBC television transmitters located within 100 km of the site must be identified. There are no CBC television transmitters within the 100 km consultation zone. The closest CBC television transmitter is 181 km from the proposed wind farm.

There are no CBC Television Transmitters within the CBCIR 100 km consultation zone.

4.0 Over-the-Air Television Reception

In the proximity of the proposed wind project, digital signals can potentially be used to receive TV Over-the-Air. Analog signals were phased out in New Brunswick in 2012. There is a suggested consultation zone of 10 km for digital signals. The 10 km consultation zone includes the following communities:

- Grand Anse
- Saint-Léolin
- Dugas
- Village-Sainte-Paul
- Black Rock
- Burnsville
- New Brandon
- Pokeshaw
- Stonehaven

Inside the recommended 10 km consultation zone, there are 9 communities. Residents within these consultation zones will be informed during an open house meeting about potential for Over-the-Air digital TV reception interference.

Complaints will be handled during the operation of the wind farm and will be resolved by engineers / consultants. In case of confirmed deterioration of the TV reception signal, appropriate mitigation strategies, such as installation of alternate reception equipment will be applied.

Data sources: Openstreetmap



Legend

Over the Air TV Reception

- Digital TV (10km)

Places

- Island
- Locality
- Town
- Village

Layout 181112: 5x WT (max TH = 200m)

- Turbine Site

Content: Over the Air TV Reception

Project: New Brunswick / Pokeshaw

IFE Project Management Canada Inc.
 700-5657 Spring Garden Rd.
 Halifax NS B3J 3R4
 Email: dante.manchester@ife-eriksen.com

State: DIN A3	Scale: 1:150000	create date: 20.04.2016	change date: 11.12.2018	created by: Gautier
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NAD 1983 CSRS New Brunswick Stereographic

Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

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Figure 7 - Consultation zones for over-the-air television

5.0 Cellular Type Networks

The RABC recommends a 1 km consultation zone for cellular networks. There are no cellular networks located within the 1 km consultation zone. The two closest cellular towers are located in Dugas, NB, approximately 6.1 km from the proposed wind farm.

Table 9 below lists the three closest cellular towers.

Table 9: Closest Cellular Towers to proposed Wind Project

Location	Latitude	Longitude	Licensee	Distance to Wind Project (km)
J0748-274 CHEMIN DUGAS	47.7986	-65.1342	Bell Mobility Inc.	6.1
J0377-8064 ROUTE 11	47.7561	-65.3394	Bell Mobility Inc.	8.3
A0440-CH. DUGAS, DUGAS OFFICE	47.7997	-65.1347	Rogers Communication Canada Inc.	6.1

There are no cellular towers within the 1 km RABC recommended consultation zone.

Data sources: ISED CA

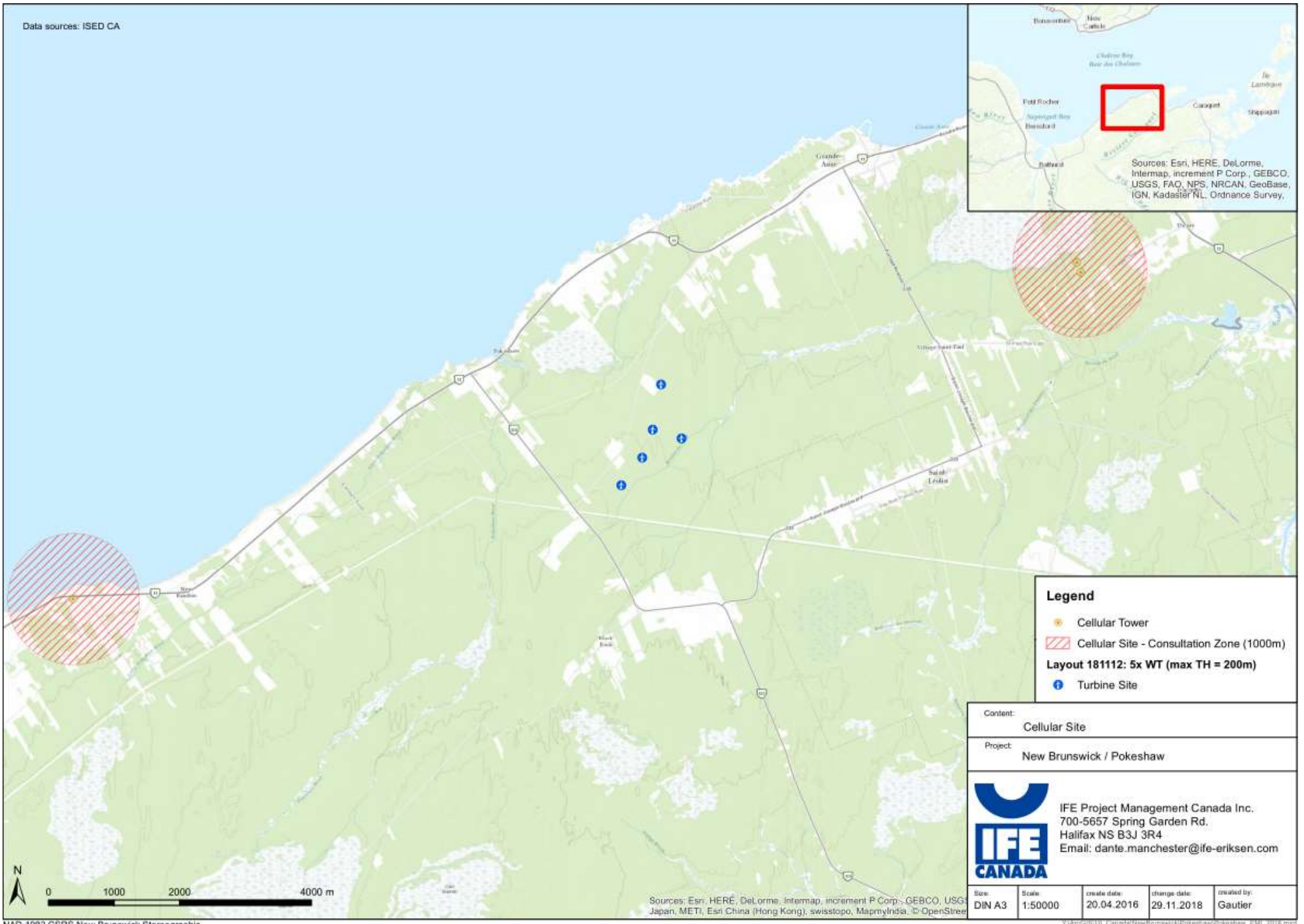


Figure 8 - Cellular towers near Pokeshaw Black Rock Wind Project

6.0 Land Mobile Radio Networks and Point-to-Point Systems below 890 MHz

6.1 Land Mobile Radio Networks

For Land Mobile Radio Networks, the RABC suggests a consultation zone of 1 km. There are no towers located within the 1 km consultation zone. Within a radius of 10 km there are 11 tower sites containing radio licenses listed in **Error! Reference source not found.** below. The closest radio tower is 2.8 km from the proposed site.

A map of all radio links within 10 km of the proposed project site was mapped and can be seen in Figure 9.

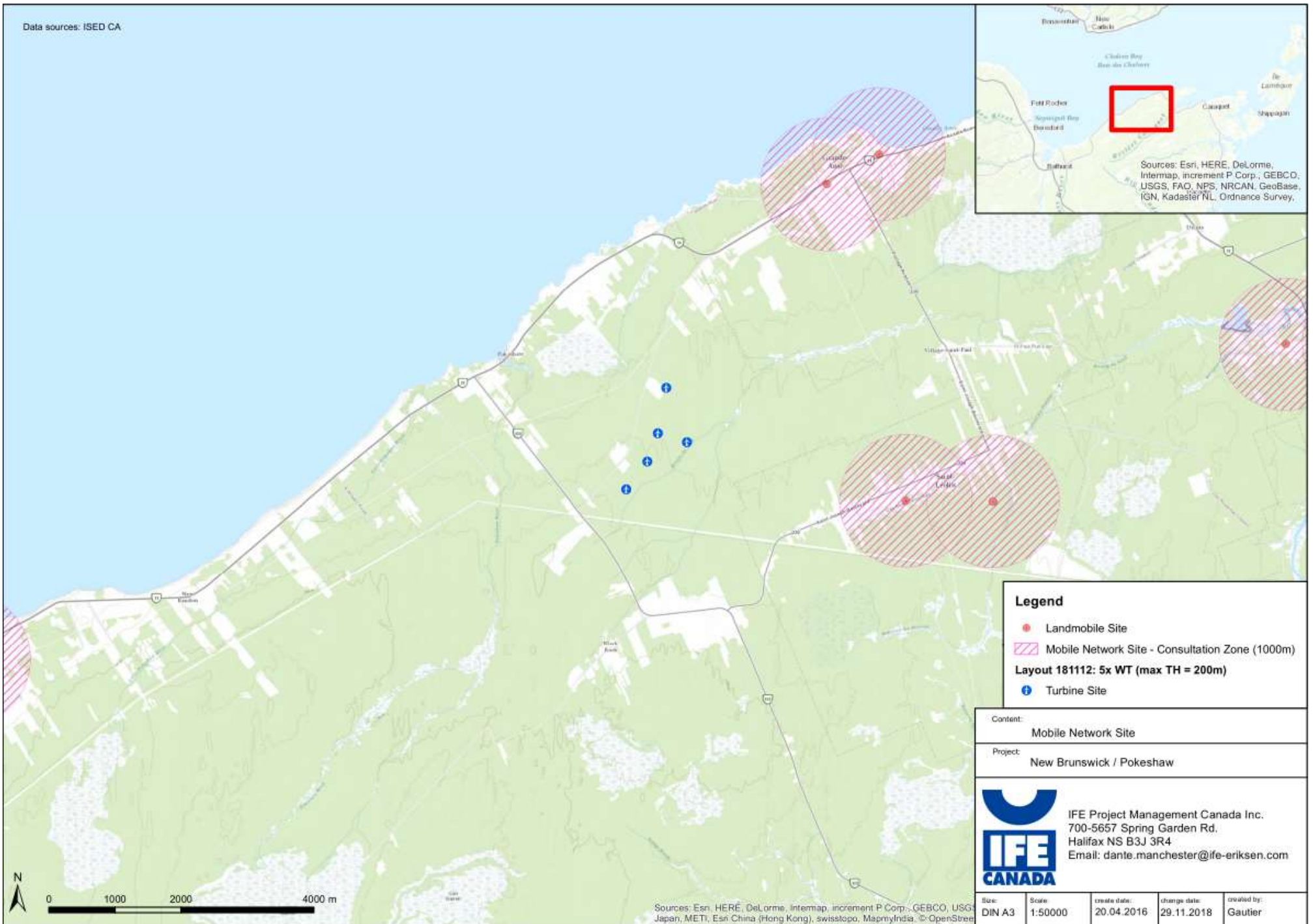
Table 10: Licensed mobile radio links close to proposed Wind Farm

License Number	Licensee	Distance to Wind Project (km)
010507457-001	Ville de Caraquet Pompier	2.8
010507525-001	Village of Grand Anse	2.8
010525543-001	Village of Grand Anse	2.8
010376647-001	École Leandre-Legresley	3.1
010360157-001	Village of Grand Anse	4.1
010562425-001	Village of Grand Anse	4.1
010424167-001	Village de Saint-Léolin	3.8
010525565-001	Village de Bertrand Service Incendie	3.8
010525619-001	Village de Saint-Léolin	3.8
010459291-001	Department of Public Safety Regional Fire Dispatch c/o DOT	5.1
010355715-002	NB DTI Radiocommunications NBTMR Project	5.1

There are no Land Mobile Radio Networks located within the RABC recommended 1 km consultation zone.

There are no towers used by the NB Trunked Mobile Radio (NBTMR) network within the consultation zone. NB DTI, who operate the NBTMR system were notified of the project and approved the turbine layout. A map of NBTMR sites is found in Figure 10 below.

Data sources: ISED CA



NAD 1983 CSRS New Brunswick Stereographic

Y:\Arctos\210_Canada\New Brunswick\Pokeshaw\Pokeshaw_BMI_2018.mxd

Figure 9 - Land Mobile Radio Network sites

6.2 Point-to-Point systems below 890 MHz

The RABC recommends a 1 km consultation zone for point-to-point systems below 890 MHz. There are no systems below 890 MHz within 1 km of the proposed wind project.

There are no point-to-point systems below 890 MHz within the RABC 1 km consultation zone.

7.0 Satellite Systems

7.1 Satellite Ground Stations

The RABC recommended consultation zone for satellite ground stations is 500 m. There are no satellite ground stations located within the 500 m consultation zone.

There are no satellite ground stations within the RABC recommended 500 m consultation zone.

7.2 DTH Receivers

An analysis based on the turbines dimensions has been made and a preliminary review of DTH Satellite receivers has also been completed.

The maximum ‘worst case scenario’ dimensions of the wind turbine and tower are:

Hub Height: 135 m
Turbine Height: 200m
Rotor Diameter: 149 m

The following formula recommended by RABC has been applied to calculate the size of the cone:

$$Lc(m) = R + 104 \sqrt{D/F}$$

where: Lc = Diameter of the cylinder (m)
 D = Distance from the nearest possible ground satellite receiver (1.7km)
 F = Frequency (4 GHz)
 R = Rotor Diameter (149 m)

$$Lc (1.7 \text{ km}) = 217\text{m}$$

Table 11: Direct-to-Home Geostationary Satellite Parameters

Service Provider	Satellite ID	Geostationary Satellite Orbit (Lat, Long)	Local Inclination
Bell Direct	Nimiq 2	0° N, 28° W	14.4°
	Nimiq 4	0° N, 82° W	32.9°
	Nimiq 6	0° N, 91.1° W	29.7°
Shaw Direct	Anik F1 Anik F1R	0° N, 107.3° W	21.9°
	Anik F2	0° N, 111.1° W	19.8°
	Anik F3	0° N, 118.7° W	15.3°

Based on the minimum ‘Local Inclination’ of the satellite data in **Error! Reference source not found.** and the maximum Turbine Height of the wind turbine, a worst case vertical shadow zone (781m) was calculated. Furthermore a cone was calculated based on a frequency of 4 GHz and the lowest possible distance between a DTH-receiver and a wind turbine. The addition of both values result in a maximum satellite shadow of 998m.

In addition to the maximum vertical shadow zone a horizontal zone was calculated. The calculation of the horizontal zone was based on the positions of the geostationary satellites and the calculated cone.

The result of the intersection of horizontal and vertical zone is the consultation zone highlighted in Figure 11.

There are no DTH receivers inside the calculated consultation zone that was based on a worst case scenario and the RABC formula above.

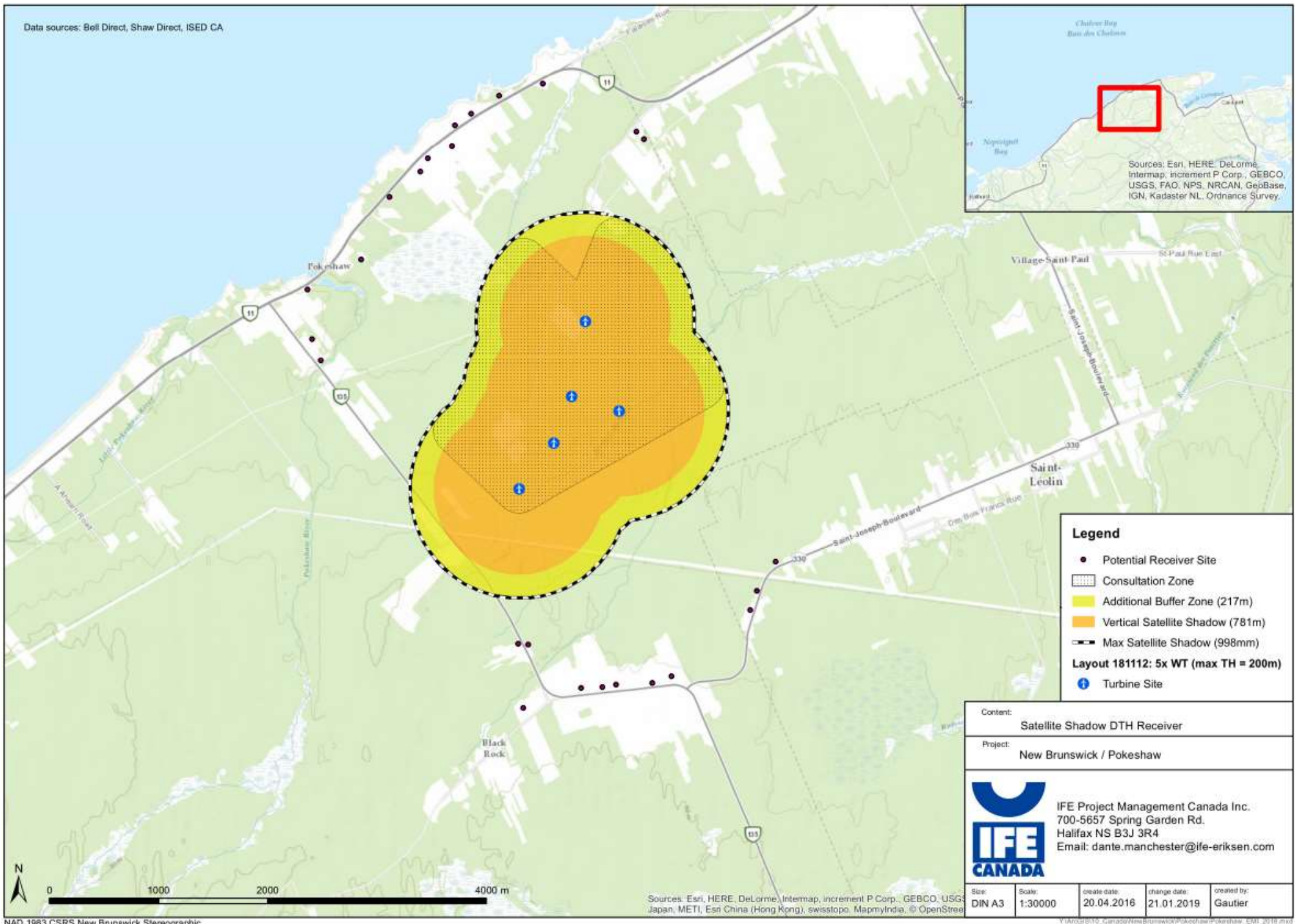


Figure 11 - DTH-receiver Satellite Shadow

8.0 Mandatory contacts

All mandatory contacts specified by the RABC guidelines were contacted and notified about the project. Relevant communications can be found at the end of the report in Appendix A: Correspondence.

8.1 Non-Disclosed Radio Operators - RCMP

RCMP was contacted November 30th, 2018 to determine if there are any issues regarding the proposed wind site.

Confirmation that no issues are expected was received on December 28th, 2018.

8.2 Canadian Coast Guard- Vessel Traffic Radar

Vessel Traffic is monitored by the Canadian Coast Guard through radar installations. The RABC's recommended consultation zone is 60 km around existing stations.

The Canadian Coast Guard was contacted November 30th, 2018 to determine if the proposed wind farm may interfere with their operations.

Confirmation that no issues are expected was received on December 3rd, 2018.

8.3 Department of National Defense- Air Defense Radar

DND was contacted November 30th, 2018 to investigate if the proposed wind farm could impact existing radar stations.

Confirmation that no issues are expected was received on December 4th, 2018.

8.4 Department of National Defense-Air Traffic Control Radars

Air Traffic Control Primary Surveillance Radars (PSR) are critical to ensure aircraft safety. RABC recommends an 80 km consultation zone for PSRs, and a 10 km consultation zone for Secondary Surveillance Radars (SSRs). For major civilian or military airfields RABC recommends a consultation zone of 10 km.

There is no PSR site inside the suggested consultation zone by RABC. The closest PSR site is located in Moncton approximately 213 km from the proposed wind site. The second closest PSR site is in Halifax, approximately 345 km from the proposed wind site. There is no SSR site located within the recommended 80 km consultation zone.

Table 12: Closest Air Traffic Control Radars

ID	Latitude	Longitude	Distance to wind project (km)
Moncton (PSR)	45.8550694	-64.79225833	213
Halifax (PSR)	44.9105139	-63.42904167	345
Moncton (SSR)	45.85506944	-64.79225833	213
Halifax (SSR)	44.91051389	-63.42904167	345
Digby (SSR)	44.71514444	-65,25811111	339
Sydney (SSR)	46.09322222	-60,43791111	408

There is no SSR or PSR site inside the 80 km consultation zone recommended by the RABC.

For major civilian airports and military airfields the RABC recommends a 10 km consultation zone. There are no major civilian airports or military airfields within the consultation zone. The closest airport is Pokemouche Airport, 25 km from the proposed wind farm. The second closest airport is in Bathurst, approximately 40 km from the proposed wind farm.

Table 13: Closest Airports to proposed wind farm

Airport	ID	Scheduled Services	Latitude	Longitude	Distance (km)
Pokemouche Airport	CDA4	No	47.6297	-65.738899	25
Bathurst Airport	CZBF	Yes	47.7164	-64.8825	40

There are no major civilian airports or military airfields within the RABC recommended 10 km consultation zone.

Confirmation that no issues are expected was received from the DND on December 4th, 2018.

Pokemouche and Bathurst airports have been notified of the project and have confirmed that they do not have any objection to the project.

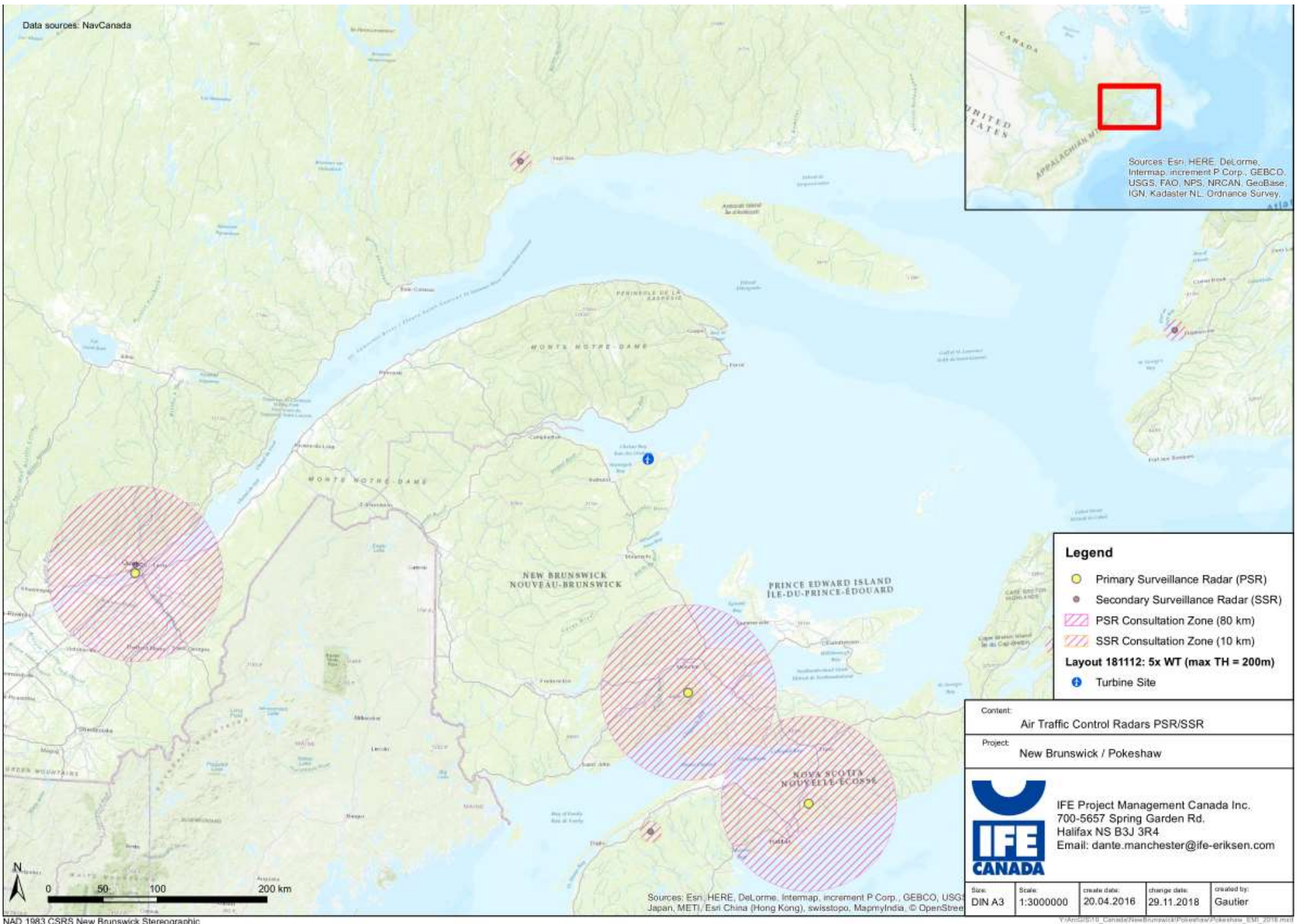


Figure 12 - Air Traffic Control Radar PSR / SSR

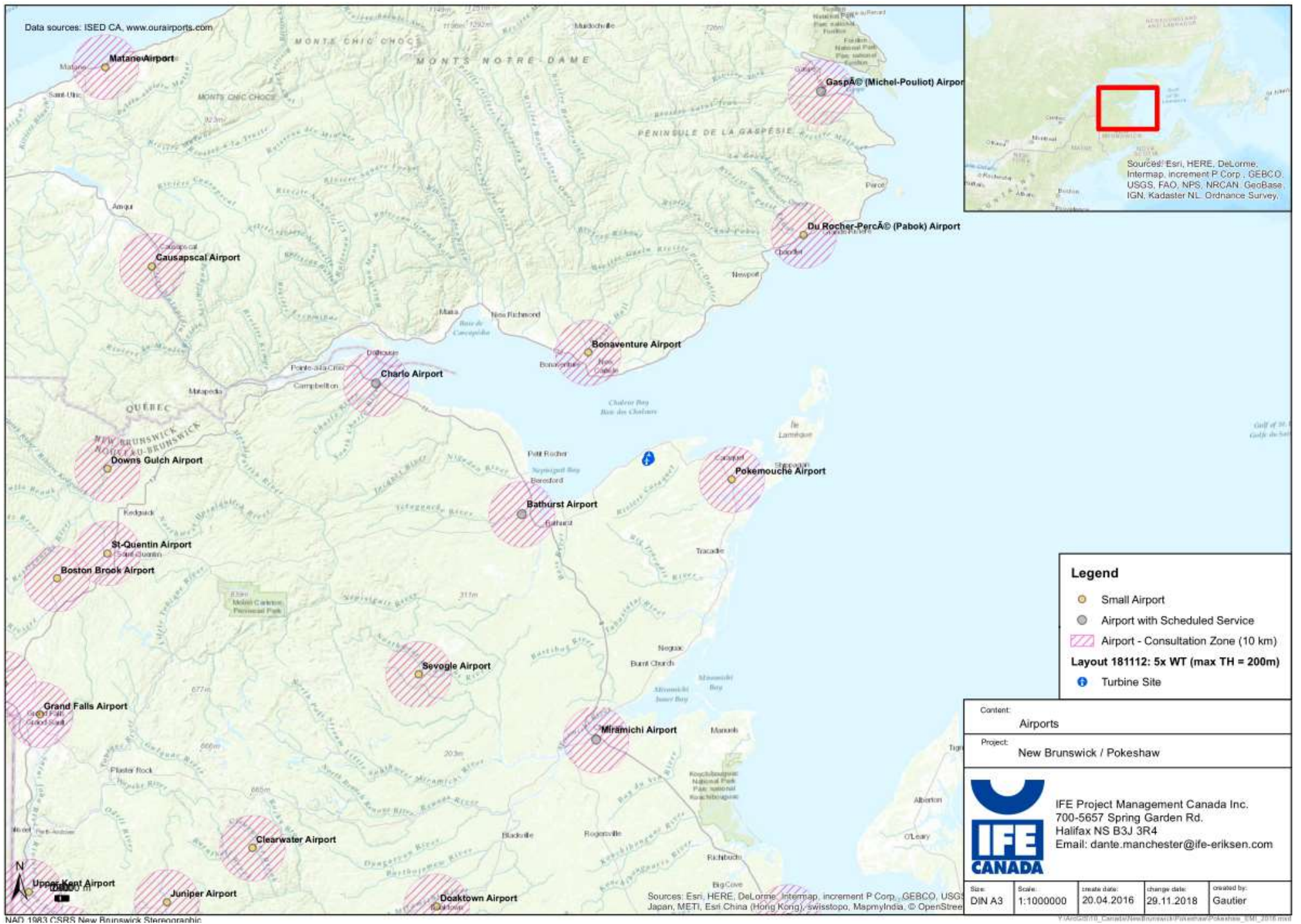


Figure 13 - Airports in the vicinity of the wind farm

8.5 Environment Canada- Weather Radar

The Canadian Weather Radars are used for meteorological forecasting and detecting severe weather events as they occur. The consultation zone for weather stations recommended by the RABC is 50 km.

There are no weather radars within the 50 km consultation zone. The closest weather radar is in Chipman, New Brunswick, approximately 175 km from the proposed site. The second closest weather radar is in Val d'Irène Quebec, approximately 192 km from the proposed wind farm. Environment Canada was contacted on November 30th, 2018, and provided with project maps and information.

Confirmation that no issues are expected was received on January 16th, 2019.

Table 14: Weather Radar Sites

ID and Location	Latitude	Longitude	Distance to Wind Project (km)
CXNC, Chipman (NB)	46.22222	-65.69861	175
CXAM, Val d'Irene (QC)	48.48028	-67.60111	192

There are no weather radars within the RABC recommended 50 km consultation zone.

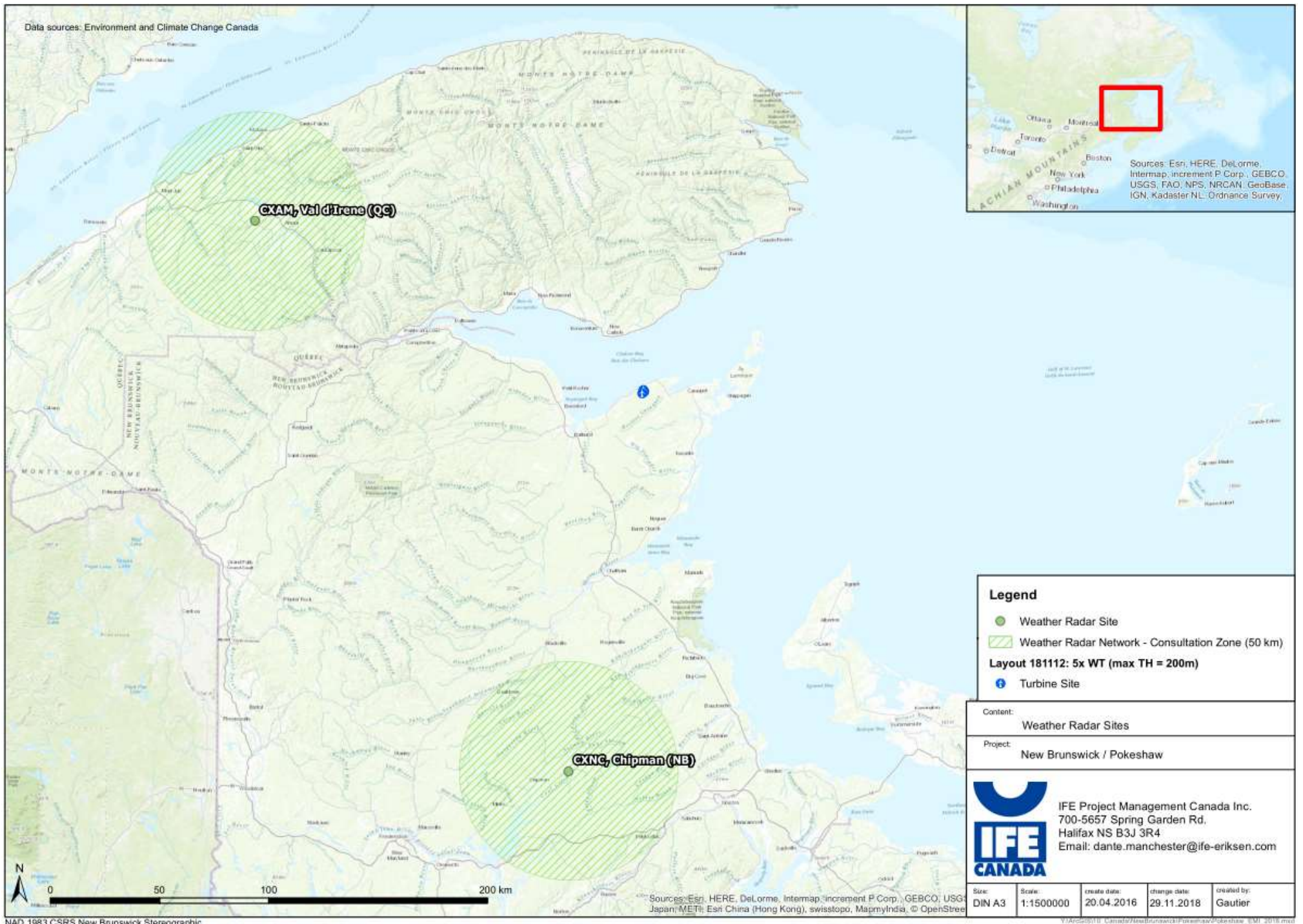


Figure 14 - Weather Radar Sites

8.6 CBC

CBC was contacted December 12th, 2018 and informed about the proposed wind farm. Confirmation was received January 17th, 2019 that CBC does not have any specific comments regarding the project.

9.0 VHF Omnidirectional Range (VOR)

VHF Omnidirectional systems give pilots 360 degree directional information to or from a station using short distance navigation aids. The frequency range is 108.1 to 117.956 MHz. RABC recommends a consultation zone of 15 km for VOR sites.

There is no VOR site located within the recommended 15 km consultation zone. The closest VOR site is located in Gaspé, QC, approximately 120 km from the proposed site. The second closest site is Moncton VOR and is located 178 km away.

Table 15: VOR sites

Site	Type	Latitude	Longitude	Distance to Wind Project (km)
Gaspe	VOR-DME	48.7631	-64.404701	120
Moncton	VORTAC	46.188999	-64.570702	178
Charlottetown	VOR-DME	46.297501	-63.119701	225
Fredericton	VORTAC	45.895302	-66.4189	226
Saint John	VOR-DME	45.4072	-65.870796	264

There are no VOR sites located within the RABC recommended 15 km consultation zone.

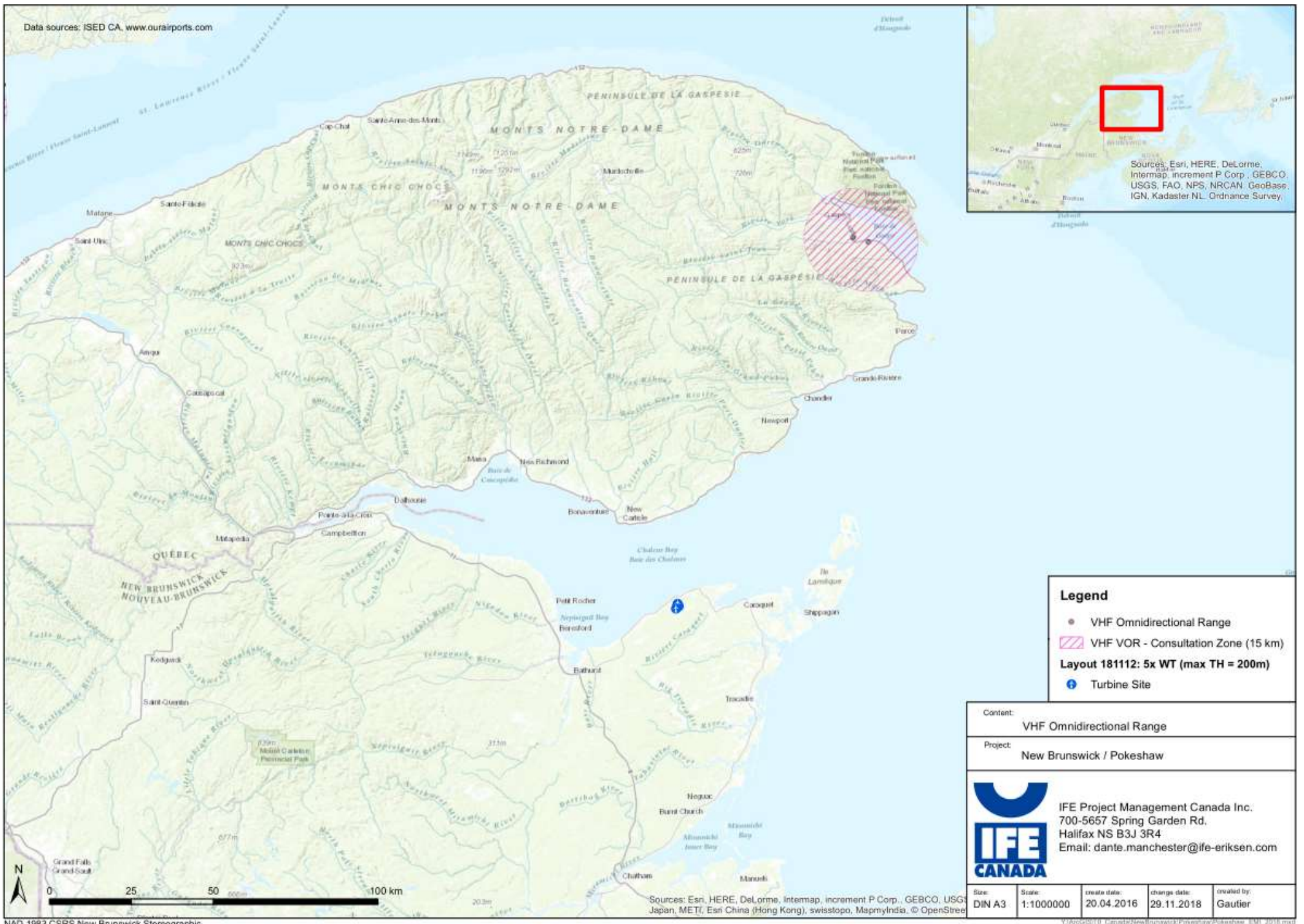


Figure 15 - VHF Omnidirectional Range (VOR) Sites

10.0 Summary

System	Consultation Requirement by RABC	Result
Point-to-Point Systems above 890 MHz	1 km consultation zone for transmitters and receivers Consultation cylinder based on link parameters	There are two point-to-point radio links above 890 MHz. The Department of Transportation and Rogers Communications Canada were contacted. The Department of Transportation approved the Nov. 2018 layout and will be issued an updated layout for approval. Rogers was contacted and project maps and information were shared. Rogers did not provide any comment on the project.
Broadcast Transmitters	Consultation zone for: <ul style="list-style-type: none"> • TV: 2km • AM Stations: Omnidirectional: 5 km Directional: 15 km • FM: 2km 	TV: There are no TV transmitters within the 2 km suggested consultation zone. AM: There is no AM transmitter within the 5 km suggested consultation zone. There no AM transmitter within the 15 km recommended consultation zone. FM: There is no FM transmitter within either consultation zone: 2 km (RABC) or 5 km (CBCIR)
Over-the-Air reception	Digital Transmitters: 10 km Analogue Transmitters: 15 km	Residents with over-the-air TV reception will be informed and appropriate mitigation strategies will be assessed and applied.
Cellular Type Networks	1 km consultation zone of Cell Towers	There are no cellular towers within the consultation zone.
Land Mobile Radio Networks and Point-to-Point Systems below 890 MHz	1 km consultation zone	There are no Land Mobile Radio Networks located within the 1 km consultation zone.
Satellite Systems	0.5 km around satellite transmit/receive locations Consultation cone based on turbine and satellite locations	There are no satellite ground stations within the consultation zone. There are no DTH receivers inside the consultation zone of 500 m.
Non Disclosed Radio Operators	Mandatory Contact	RCMP was contacted and informed about the project
Mandatory Contacts: DND	DND Air Defender radar: 100 km	DND was contacted
Mandatory Contacts: DND	Air Traffic Control Primary Surveillance Radar 80 km	There is no PSR site located within the recommended 80 km consultation zone. DND was contacted.
Mandatory Contacts: DND	Air Traffic Control Secondary Surveillance Radar 10 km	There is no SSR site located within the recommended 10 km consultation zone.

		DND was contacted.
Mandatory Contacts: DND	DND Precision Approach radar: 40 km	DND was contacted.
Mandatory Contacts: Canadian Coast Guard	Canadian Coast Guard Vessel Traffic radar: 60 km	The Canadian Coast Guard was contacted
Mandatory Contacts: Environment Canada	Environment Canada Weather Radar: 50 km	There are no weather radars within the suggested 50 km consultation zone.
Mandatory contacts: CBC	AM Transmitters: 15 km FM Transmitters: 5 km TV Transmitters: 100 km	CBC was contacted to inform about the project
VOR	VOR Beacon: 15 km	There are no VOR sites within the recommended consultation zone.

11.0 References

- [1] Radio Advisory Board of Canada and Canadian Wind Energy Association (CanWEA), Technical Information and Coordination Process Between Wind Turbines and Radiocommunication and Radar Systems, December, 2010
- [2] CBC/Radio-Canada Involvement and Requirements Concerning Wind Energy Projects, CBC, 1400 Rene-Levesque Blvd. East, Montreal, Quebec. H2L 2M2.
- [3] Spectrum Management System data base, Industry Canada, <<https://sms-sgs.ic.gc.ca/eic/site/sms-sgs-prod.nsf/eng/home>>, Accessed April 2017.
- [4] Ourairports
www.ourairports.com
- [5] Canadian Weather Radar, Government of Canada
http://weather.gc.ca/radar/index_e.html

Appendix A: Correspondence

From: Windfarm_Coordinator Windfarm_Coordinator <windfarm_coordinator@rcmp-grc.gc.ca>
Sent: Friday, December 28, 2018 3:28 PM
To: Manchester, Dante
Subject: RE: Wind Farm Consultation - Pokeshaw, NB

Dear Mr. Manchester,

This email will service the purpose to advise you that RCMP's National Radio Services has no issues with the Wind Farm Consultation with the information you have provided.

Best regards,

Jules Lefrançois
RCMP National Radio Services
Spectrum Unit Co-ordinator

Figure 16: Correspondence from RCMP

From: CCG Wind Farm Coordinator / Coordinateur Parcs Eoliens GCC (DFO/MPO) <WindfarmCoordinator.XNCR@dfo-mpo.gc.ca>
Sent: Monday, December 3, 2018 11:06 AM
To: Manchester, Dante
Subject: RE: Wind Farm Consultation - CCG Radiocommunications & Radar Systems

Hello,

There is no CCG communication or radar site in the vicinity of the proposed wind farm (Pokeshaw). Therefore no interference issues are anticipated.

Regards / Salutations,

Martin Grégoire, P. Eng
Canadian Coast Guard

Figure 17: Correspondence from Canadian Coast Guard (CCG)

From: MARIO.LAVOIE2@forces.gc.ca
Sent: Tuesday, December 4, 2018 10:57 AM
To: Manchester, Dante
Subject: FW: Pokeshaw Wind Project New Brunswick
Attachments: Pokeshaw_20MW_overview_50k.pdf; 181130 EMI_Consult_DND.pdf; 181129_Pokeshaw_EMI_Airports.pdf; 181129_Pokeshaw_EMI_Airtraffic.pdf

Hello **Dante Manchester**,

Thank you for your patience on this matter and for considering DND radar, airport facilities, and radiocommunication systems in your project

development process. We have completed the detailed analysis of your proposed site, **Pokeshaw Wind Farm Project**. The results of the

detailed analysis and subsequent technical and operational impact assessments have confirmed there is likely to be minimal or no interference

with DND radar, flight operations, and radiocommunication systems. Therefore, as a result of these findings we have no objections with your

project as submitted (attached). If however, the layout were to change/move, please re-submit that proposal for another assessment. The

concurrence for this site is valid for 24 months from date of this correspondence. If the project should be cancelled or delayed during this timeframe

please advise my point of contact. It should be noted that each submission is assessed on a case by case basis and as such, concurrence on this

submission in no way constitutes a concurrence for similar projects in the same area, nor does it indicate that similar concurrence might be offered in

another region. The issuance of this Letter of Non-Objection shall not constitute a waiver or alienation of any existing or future legal rights of the DND/CF

nor shall it be construed to create any exemptions, indemnification, approvals, rights, acceptances in favour **IFE Project Management Canada**.

. The DND/CF expressly reserves its rights to take legal action or seek remedy for any and all liability, loss, harm, degradation of services or equipment, litigation costs, damages, judgements or expenses that arise from the adverse effects, whether incidental, indirect or causal, of the **Pokeshaw Wind Farm Project** upon the DND/CF radars, equipment and its provision of Air Traffic Services.

*At present DND is working with Transport Canada to make obstruction lighting mandatorily NVG compliant. (Night Vision Goggles) At present DND cannot stipulate that proponents of wind turbine farms utilize NVG compliant lighting. However, as you can imagine, the safety of our aircrews is a top priority, and as such, we ask that you consider lighting your turbines with NVG compliant lighting so that they are visible to pilots during NVG operations.

I trust that you will find this satisfactory. If you have any technical questions or concerns regarding any aspect of this investigation, please contact the undersigned.

Sincerely,

Mario Lavoie

Department of National Defence (DND) Canada
DND Frequency Spectrum Management (DND FSM)
Spectrum Engineering (DND FSM ENG 2)
101 Colonel By Drive
Ottawa Ontario Canada
K1A 0K2
Mario.lavoie2@forces.gc.ca
343-291-3822 (work)
613-697-7925 (Cell)

Figure 18: Correspondence from Department of National Defence (DND)

From: Radars Météo / Weather Radars (EC) <ec.radarsmeteo-weatheradars.ec@canada.ca>
Sent: Wednesday, January 16, 2019 4:06 PM
To: Manchester, Dante
Cc: Radars Météo / Weather Radars (EC)
Subject: RE: Wind Turbine Consultation

Dante

Thank you for contacting the Meteorological Service of Canada, a branch of Environment and Climate Change Canada, regarding your wind energy intentions.

Our preliminary assessment of the updated information provided to us via e-mail on 30 November 2018 indicates that any potential interference that may be created by the Pokeshaw wind farm, located approximately 3 km east of Pokeshaw, NB will not be severe. Although we would prefer our radar view to be interference free, this is not always reasonable. As a consequence, we do not have strong objections to the current proposal.

If your plans are modified in any manner (e.g. number of turbines, height, placement or materials) this analysis would no longer be valid. An updated analysis must be conducted.

Please contact us at: ec.radarsmeteo-weatheradars.ec@canada.ca

Thank you for your ongoing cooperation and we wish you success.

Best Regards,

Troy Beechinor

Planner, Meteorological Service of Canada
Environment & Climate Change Canada / Government of Canada
Troy.Beechinor@canada.ca / Tel: +1-416-739-4814

Figure 19: Correspondence with Environment Canada

From: Julie Bergeron <julie.bergeron@radio-canada.ca>
Sent: Thursday, January 17, 2019 11:29 AM
To: Manchester, Dante
Cc: Charles Rousseau; CBC/RC Spectre
Subject: Re: Wind Farm Consultation - CBC/Radio-Canada Radio Transmitters
Attachments: Guidelines for a Technical Engineering Report on the Impacts of Wind Turbines on CBC-Radio-Canada Services v4.pdf; CBC Radio-Canada Involvement and Requirements Concerning Wind Energy Projects.pdf; RABC CANWEA Guidelines (EN).pdf

Hello Mr. Manchester,

Thanks for providing the information regarding the proposed wind energy project and also for having performed the necessary analysis regarding the potential impact on our broadcasting infrastructure.

Note that CBC/Radio-Canada had no specific comments regarding this project.

You'll find enclosed CBC/Radio-Canada standard documentation package for wind energy projects.

Best regards,

 **Radio-Canada**

Julie Bergeron, ing., M. Ing.

Première ingénieure | Senior Engineer
Spectre | Spectrum
Systèmes centraux, Solutions d'ingénierie | Core Systems, Engineering Solutions
CBC/Radio-Canada
Tel: [\(514\) 597-3894](tel:5145973894)
Cell: [\(514\) 214-7633](tel:5142147633)
julie.bergeron@radio-canada.ca

Figure 20: Correspondence from CBC/Radio-Canada

From: Jennifer Henry <jennifer.henry@airbathurst.com>
Sent: Monday, January 28, 2019 1:31 PM
To: MacLean, Bill; Manchester, Dante
Subject: FW: Pokeshaw Black Rock Wind Farm

Good afternoon Mr. MacLean and Mr. Manchester

The proposed windmills are well outside of the Bathurst Airport Airspace.

Thank you for reaching out.

Regards,
Jennifer

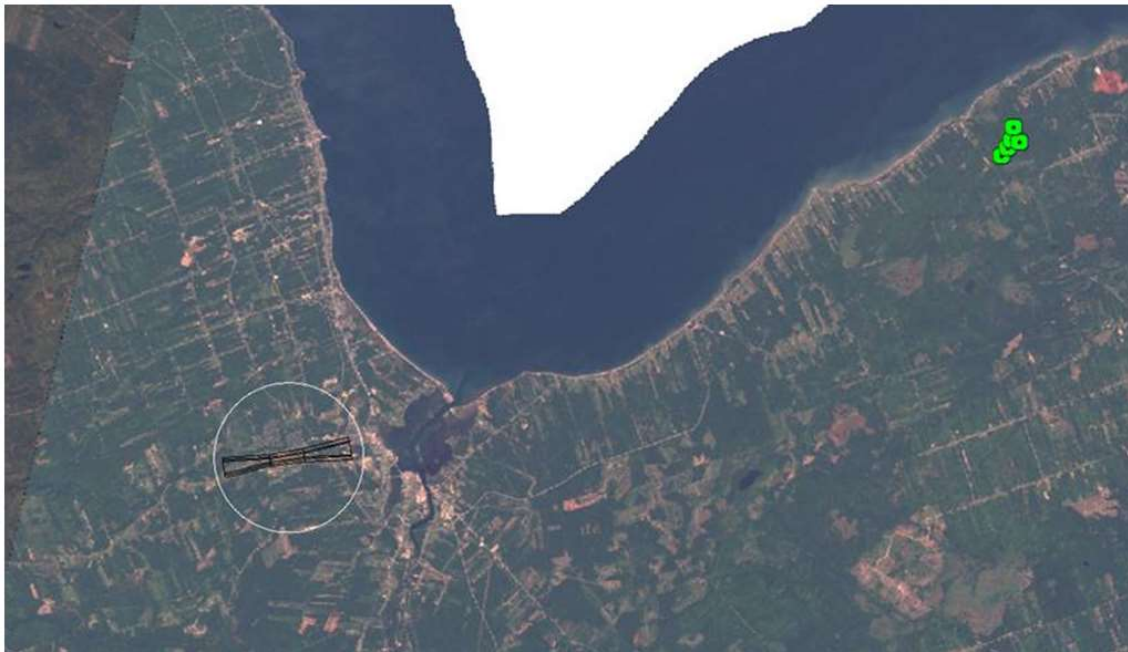


Figure 21: Correspondence from Bathurst Airport

From: Charles-Éric Landry <charlesericlandry@csrpa.ca>
Sent: Monday, February 4, 2019 10:30 AM
To: Hr. MacLean
Subject: Informations concerning Pokemouche Airport

Hello M. MacLean,

Here is, as discussed, the information I received from our engineer concerning the Pokemouche Airport (in French) :

« Pour ce qui est des obstacles, autre les surfaces d'approches (L = 2500m de chaque extrémité de la piste) et de transitions (L = 265m de chaque côté du centre ligne) qui doivent être exempts de tout obstacle physique, une identification des obstacles (OIS, Obstacle Identification Surface) doit être fait sur un rayon de 4000m (4km) basé sur le TP312 5th édition. Le parc éolien proposé à Pokeshaw se situe à environ 25km de l'aéroport donc au niveau de vérification et d'identification d'obstacle il n'y aura pas d'impact.

Le promoteur devra par contre s'assurer de vérifier que la signalisation lumineuse des structures du parc éolien respectent les normes qui s'appliquent. »

If you have any other enquiries, you can contact me.

Have a good day!

Charles-Éric Landry
Urbaniste
COMMISSION DE SERVICES RÉGIONAUX PÉNINSULE ACADIENNE
Téléphone: [506\) 727-7979](tel:5067277979) poste: 214
Télécopieur: [506\) 727-7990](tel:5067277990)
www.csrpa.ca | facebook.com/csr4pa



Toute correspondance créée, reçue ou envoyée par les employés, agents et administrateurs de la Commission de services régionaux Péninsule acadienne pourrait être divulguée conformément aux dispositions de la Loi sur le droit à l'information et la protection de la vie privée de la province du Nouveau-Brunswick. Ce courriel contient des renseignements privilégiés ou confidentiels et seul le destinataire peut le recevoir, le lire ou le reproduire. Si vous avez reçu ce message par erreur, veuillez nous aviser immédiatement et éliminer ce message, ainsi que les pièces jointes, de votre système informatique et de vos dossiers.

Figure 22: Correspondence from CSR Péninsule Acadienne RE: Pokemouche Airport



Serving a world in motion
navcanada.ca

January 17, 2019

Your file
Pokeshaw Wind Farm, Ridge Road
Our file
18-4347

Mr. Dante Manchester
IFE Renewable Energy Construcion
5657 Spring Garden Road, Suite 700, Box 167
Halifax, NS
B3J 3R4

**RE: Wind Farm: 5 Wind Turbines - Pokeshaw, NB
(See attached spreadsheet)**

Mr. Manchester,

NAV CANADA has evaluated the captioned proposal and has no objection to the project as submitted.

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 start of construction. 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, other Federal Government departments, Provincial or Municipal land use authorities or any other agency from which approval is required. Innovation, Science and Economic Development Canada addresses any spectrum management issues that may arise from your proposal and consults with NAV CANADA engineering as deemed necessary.

This document contains information proprietary to NAV CANADA. Any disclosure or use of this information or any reproduction of this document for other than the specific purpose for which it is intended is expressly prohibited except as NAV CANADA may otherwise agree in writing.

A handwritten signature in black ink, appearing to read 'Olivier Meier'.

Olivier Meier | NAV CANADA
Manager - Land Use and NOTAM Office

cc ATLR - Atlantic Region, Transport Canada (2018-177 to 2018-181)