

# Technical Report Supporting a Minor Modification of a Licensed Facility Construction Permit Application

Pursuant to 47 C.F.R. Section 73:

for

*WHBP(FM).L – Harbor Springs, MI  
(Facility ID: 172716)*

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*Change to a New Site Location  
and Decrease to Class C3 Status*

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*as a  
Class C3, NCE-FM Facility on  
CH211C3 (90.1 MHz)*

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**EXPLANATION OF PROPOSAL:** This Minor Modification of a Licensed Facility Construction Permit Application and accompanying Technical Report supports a minor change for NCE-FM Station WHBP(FM).L – Harbor Springs, MI (Facility ID: 172716). This FCC Schedule 340-NCE-FM filing requests a change to a new site location and decrease to Class C3 status. Continued operation on the present NCE-FM channel but decrease in class to CH211C3 (90.1 MHz) with 1.2 kW ERP (Circular Polarization) is requested. From the new site, operation with an antenna COR height of 533.4 meters AMSL, 158.5 meters AGL (300.3 meters HAAT) is requested. The facility will employ a directional antenna. The facility will continue specifying service to the community of Harbor Springs, MI.

**FACILITY COMPLIANCE SHOWINGS:** A map of the proposed 60 dBμ service contour in relation to the present 60 dBμ service contour has been included in ***Exhibit 1***. The minor change proposed service area will overlap a portion of the present service area as noted in the exhibit. In addition, this exhibit demonstrates NCE-FM grade service of 1.0 mV/m, or 60 dBμ F(50:50), to visually more than 50% of the community of license, as allowed per 47 C.F.R. Section 73.515. In this instance, 100% community coverage will be attained.

A Longley-Rice coverage map of the proposed operation has been plotted in ***Exhibit 2***. The applicant acknowledges this map has been provided for illustrative purposes only.

The proposed facility will be located on the tower bearing Antenna Structure Registration Number 1000703. In support of this filing, a copy of the current ASRN has been included in ***Exhibit 3***. A depiction of the tower and antenna configuration has been included in ***Exhibit 4***. Further notification to the FAA or ASR governing authorities is not required as this proposal will not increase the overall tower height.

The applicant would like to note use of the NEC 03 second terrain database for all allocation, contour and HAAT showings contained herein. A copy of the proposed HAAT calculation has been included in ***Exhibit 5***. In addition, the requested Class C3 power of 1.2 kW ERP has been verified accurate for the proposed 300.3 meter HAAT value also as noted in ***Exhibit 5***.

**ALLOCATION COMPLIANCE SHOWINGS:** The proposed full service NCE-FM site will meet all class contour protection requirements of 47 C.F.R. Section 73.509 toward each allocation protection. A tabulation of the proposed NCE-FM allocation is found in **Exhibit 6**. There are three (3) allocation concerns deemed close enough to require further study. Therefore, maps and/or tabulations of the relevant protected and interference contours toward these concerns have been supplied in **Exhibit(s) 7(a-c)**. The applicant would further like to note a request for processing under 47 C.F.R. Section 73.509(e) toward WLJN-FM - Traverse City, MI. Contour overlap over Lake Michigan exists, therefore the provisions of this section concerning prohibited overlap will not apply where the area of such overlap lies entirely over water. Documentation concerning WLJN-FM contour overlap over Lake Michigan has been provided in **Exhibit(s) 7a & 7a(i)**. It is believed sufficient clearance exists precluding the need for further study. However, additional tabulations or maps will be supplied upon request.

The transmitter site is located within 320 km from the common border of the United States and Canada. Full protection will be afforded all Canadian concerns as noted in the **Exhibit 6** allocation study.

The transmitter site is not located within the affected radius of any TV6 facility. Therefore, full protection will be afforded all TV6 concerns as noted in **Exhibit 6**.

The remainder of the information in this report is responsive to the Rules of the Commission, and provides the data for the FCC's online master LMS (Licensing and Management System) Form 2100 - Schedule 340-FM.

**ENVIRONMENTAL COMPLIANCE SHOWINGS:** The proposed facility complies with the maximum permissible radiofrequency electromagnetic exposure limits for controlled and uncontrolled environments as set forth under §1.1310 and/or §1.1307(b)(3) of the Commission's rules and the guidelines for RF radiation protection as set forth in OET Bulletin No. 65 (Edition 97-01), and the accompanying Supplement A, (Edition 97-01). Compliance has been demonstrated in the attached **RF Appendix 1** of this filing. The facility is, or will be, properly marked with signs. Entry is, or will be, restricted by means of fencing with locked doors or gates. In addition, coordination with other users of the site will be secured to reduce power or cease operation as necessary to protect persons having access to the site, tower or antenna from radiofrequency electromagnetic fields in excess of FCC guidelines.

Regarding compliance with the NEPA, Nationwide Programmatic Agreement and NHPA Section 106 for tower co-location, compliance with the Agreement is not required where no new tower construction is being proposed and the tower is not being substantially altered. Specifically, compliance is not necessary where only an antenna and feedline are being added to an existing structure. However, should the Commission determine compliance is necessary, upon notification to the applicant, the applicant will file FCC Form 621.

**CERTIFICATION OF TECHNICAL CONSULTANT:** *I declare, under penalty of perjury, that the contents of this report are true and accurate to the best of my knowledge and belief. I further certify I have over twenty-four years of experience as a broadcast technical consultant before the Federal Communications Commission ("the FCC"); and am familiar with the Code of Federal Regulations Title 47 ("the Rules") as pertaining to this report and its contents herein. The underlying data utilized in this report was taken directly from FCC databases or indirectly through third party software vendors securing data directly from FCC databases. This firm cannot be held liable for errors or omissions resulting from the underlying data. The information contained herein is believed accurate to the date reported below.*



Justin W. Asher  
Technical Consultant  
January 29, 2024

NED 03 SEC Terrain Database  
US Census 2020 PL Database  
NAD 1983 Coordinate Datum

# ***Exhibit 1***

## ***Service Contour Study: Present vs Proposed Operations***

*Present 60 dBμ F(50:50) Contour*

*Proposed 60 dBμ F(50:50) Contour*

**WHBP.L**  
Harbor Springs, MI  
Facility ID: 172716  
BLED20171005AAD  
Channel: 211C2 (90.1 MHz)  
Latitude: 45-34-07 N  
Longitude: 085-02-35.20 W  
AMSL Height: 486.0 m  
ERP: 8.50 kW  
Pattern: Directional

60 dBμ F(50:50) Contour  
Total Population: 37,800  
Total Area: 4,594.5 sq. km

**WHBP.P**  
Harbor Springs, MI  
Facility ID: 172716  
Proposed Operation  
Channel: 211C3 (90.1 MHz)  
Latitude: 45-30-05.20 N  
Longitude: 085-01-48.90 W  
AMSL Height: 533.4 m  
ERP: 1.20 kW  
Pattern: Directional

60 dBμ F(50:50) Contour  
Total Population: 21,731  
Total Area: 2,245.5 sq. km

**Asher Broadcast Consulting LLC**  
justinasher@consultant.com  
1 (202) 875-2986

Terrain  
166 470 m

Scale 1:475,000  
0 8 16 24 km

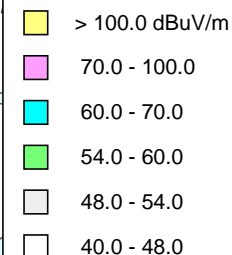
V-Soft Communications LLC ©

non-FCC-sanctioned coverage map  
for illustrative purposes only

NED 03 SEC Terrain Database  
US Census 2020 PL Database  
NAD 1983 Coordinate Datum

## Exhibit 2

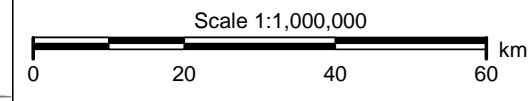
### Service Contour Study: Proposed Longley-Rice Method



**WHBP.P**  
Harbor Springs, MI  
Facility ID: 172716  
Proposed Operation  
Channel: 211C3 (90.1 MHz)  
Latitude: 45-30-05.20 N  
Longitude: 085-01-48.90 W  
AMSL Height: 533.4 m  
ERP: 1.20 kW  
Pattern: Directional  
Prop Model: Longley-Rice  
Climate: Cont temperate  
Conductivity: 0.0050  
Dielec Const: 15.0  
Refractivity: 311.0  
Receiver Ht AG: 9.1 m  
Receiver Gain: 0 dB  
Time Variability: 50.0%  
Sit. Variability: 50.0%  
ITM Mode: Broadcast

60 dBμ F(50:50) Contour  
Total Population: 52,923

Asher Broadcast Consulting LLC  
justinasher@consultant.com  
1 (202) 875-2986



V-Soft Communications LLC ©

# Exhibit 3

## Copy of Existing Antenna Structure Registration

(public record copy)

**Registration Detail**

Reg Number	1000703	Status	Constructed
File Number	A0748906	Constructed	01/01/1987
EMI	No	Dismantled	
NEPA	No		

**Antenna Structure**

Structure Type TOWER - Free standing or Guyed Structure used for Commu

**Location** (in NAD83 Coordinates)

Lat/Long	45-30-05.2 N 085-01-48.9 W	Address	3399 WRESSEL RD
City, State	HARBOR SPRINGS , MI		
Zip	49740	County	EMMET

Center of AM Array

Position of Tower in Array

**Heights (meters)**

Elevation of Site Above Mean Sea Level

Overall Height Above Ground (AGL)

374.9

201.2

Overall Height Above Mean Sea Level

Overall Height Above Ground w/o Appurtenances

576.1

200.3

**Painting and Lighting Specifications**

FAA Chapters 3, 4, 5, 9

Paint and Light in Accordance with FAA Circular Number 70/7460-1G

**FAA Notification**

FAA Study	2011-AGL-6373-OE	FAA Issue Date	12/14/2011
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**Owner & Contact Information**

FRN	0008157232	Owner Entity Type	
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**Owner**

Northern Star Broadcasting, LLC

P: (231)922-4981

Attention To: Del Reynolds

F:

3250 Racquet Club Drive

E: reynolds@upnorth.net

Traverse City , MI 49684

**Contact**

P:

F:

E:

**Last Action Status**

Status	Constructed	Received	01/25/2012
Purpose	Notification	Entered	01/25/2012
Mode	Interactive		

**Related Applications**

01/25/2012	A0748906 - Notification (NT)
01/24/2012	A0748807 - Change Owner (OC)
01/24/2012	A0748808 - Modification (MD)

Related applications (5)

**Comments****Comments**

01/25/2012	APPLICATION RESUBMITTED WITH COORDS, GROUND ELEV AND SUPPORT & OVERALL STRUCTURE HEIGHTS CORRECTED FROM 45-30-05N 085-01-50W, 376.4, 201.4, 202.7. ADDED CONSTRUCTION DATE AND ADDED FAA CLEARANCE DATA BASED ON CLEARANCE COPY PROVIDED BY APPLICANT.
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**History**

Date	Event
01/26/2012	Registration Printed
01/25/2012	Construction Notification Received
01/25/2012	Modification Received
All History (10)	

**Pleadings**

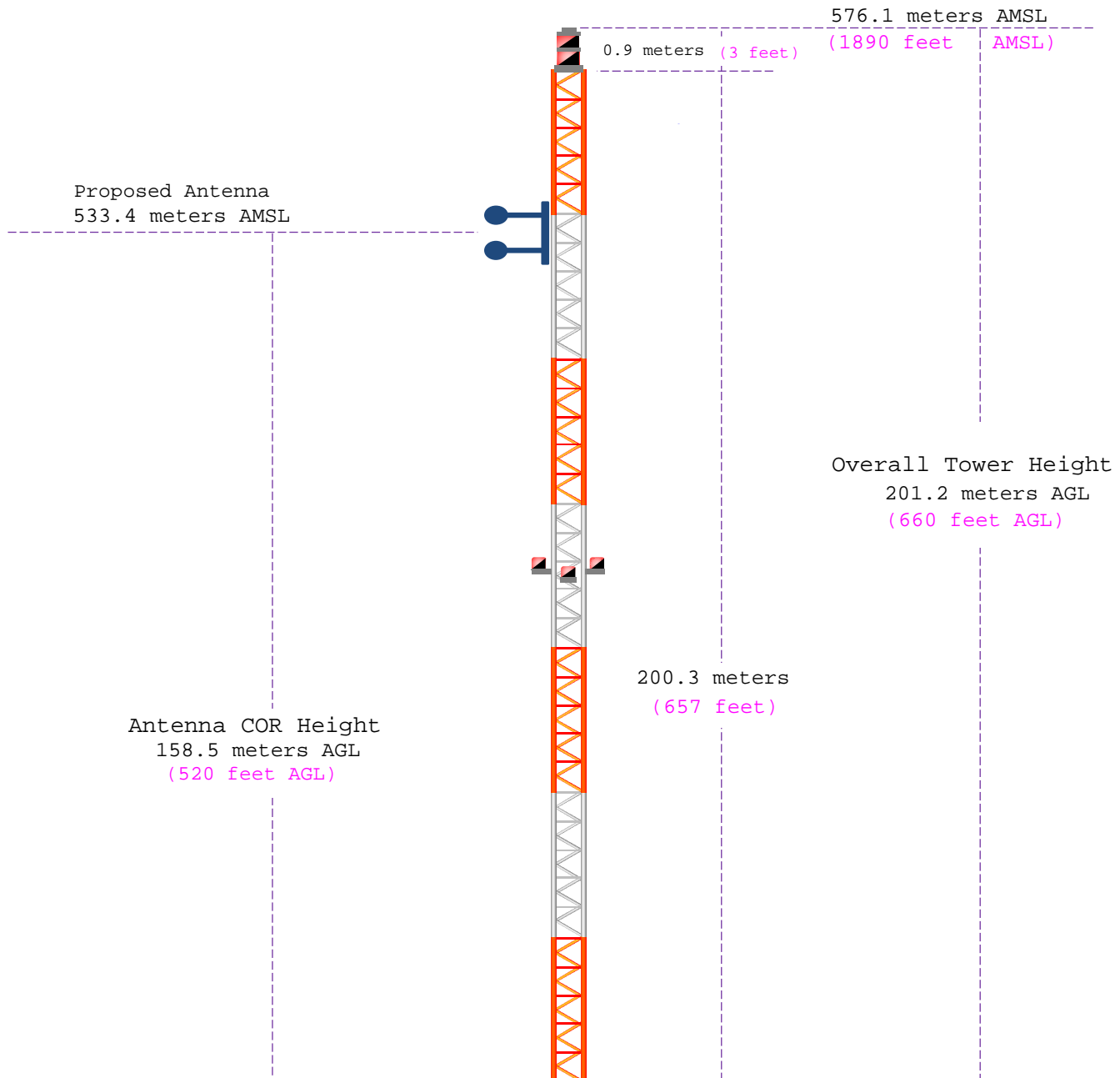
Pleading Type	Filer Name	Description	Date Entered
None			

**Automated Letters**

01/25/2012	Ownership Change, Reference 705755
04/07/2003	Ownership Change, Reference 279515
04/07/2003	Authorization, Reference 279583

# Exhibit 4

## Vertical Plan of Antenna System and Support Tower



Ground Elevation: 374.9 meters AMSL (1230 feet AMSL)		
Address: 3399 WRESSEL RD		
City: HARBOR SPRINGS	Latitude (D M S) Longitude (D M S)	
County: EMMET	--- (NAD 1927)	
State: MICHIGAN	Lat/Long: 45-30-05.2 N 085-01-48.9 (NAD 1983)	
Antenna Structure Registration 1000703	Drawing Is Not To Scale	Asher Broadcast Consulting, LLC justinasher@consultant.com 1(202)875-2986

## ***Exhibit 5***

### **HAAT and Miscellaneous Coordinate Information**

#### **HAAT Calculation (NAD 1983):**

N. Lat. = 453005.2    W. Lng. = 850148.9  
 HAAT and Distance to Contour,  
 FCC, FM 2-10 Mi, 51 pts Method - NED 03 SEC

Azi.	AV EL	HAAT	ERP kW	dBk	Field	60-F5
000	282.8	250.6	1.2000	0.79	1.000	29.86
045	253.8	279.6	1.2000	0.79	1.000	31.50
090	281.4	252.0	1.1856	0.74	0.994	29.85
135	229.8	303.6	0.1512	-8.20	0.355	20.10
180	210.8	322.6	0.0384	-14.15	0.179	14.60
225	186.2	347.2	0.0954	-10.20	0.282	19.13
270	189.2	344.2	0.7489	-1.26	0.790	31.33
315	231.1	302.3	1.2000	0.79	1.000	32.75

Ave El= 233.13 M    HAAT= 300.27 M    AMSL= 533.4

#### **NAD 1983 to NAD 1927 Conversion:**

#### **Various Coordinate Conversion Calculations (NAD 1983):**

<b>Position Type</b>	Lat Lon
<b>Degrees Lat Long</b>	45.5014444°, -085.0302500°
<b>Degrees Minutes</b>	45°30.08667', -085°01.81500'
<b>Degrees Minutes Seconds</b>	45°30'05.2000", -085°01'48.9000"
<b>UTM</b>	16T 653885mE 5040544mN
<b>UTM centimeter</b>	16T 653885.84mE 5040544.07mN
<b>MGRS</b>	16TFR5388540544
<b>Grid North</b>	1.4°
<b>GARS</b>	190MH49
<b>Maidenhead</b>	EN75LM60II83
<b>GEOREF</b>	GKEA58183008
<b>Plus Code</b>	86QPGX29+HW
<b>Plus Code Extended</b>	86QPGX29+HWCJRC6
<b>what3words</b>	occur.negotiated.templates

# Exhibit 6

## Tabulation of Proposed Allocation

Blue Text indicates contour protection studies toward select stations as included in **Exhibit(s) 7(a-c)**.

Processing under 47 C.F.R. Section 73.509(e) is requested toward WLJN-FM - Traverse City, MI. The provisions of this section concerning prohibited overlap will not apply where the area of such overlap lies entirely over water as documented in **Exhibit(s) 7a & 7a(i)**.

REFERENCE		CH#	211C3 - 90.1 MHz, Pwr= 1.2 kW DA, HAAT= 300.3 M, COR= 533.4 M							DISPLAY DATES	
45 30 05.20 N.			Average Protected F(50-50)= 32.65 km							DATA 01-26-24	
85 01 48.90 W.			Standard Directional							SEARCH 01-26-24	
CH	CALL	TYPE	ANT	AZI	DIST	LAT	PWR (kW)	INT (km)	PRO (km)	*IN*	*OUT*
CITY		STATE		<--	FILE #	LNG	HAAT (M)	COR (M)	LICENSEE	(Overlap in km)	
211C2	WHBP	LIC DCN		352.4	7.53	45 34 07.00	8.500		---	Reference---	
Harbor Springs		MI		172.4	BLEDD20171005AAD	85 02 35.20	254	486	Interlochen Center For The		
210C1	WLJN-FM	LIC DCN		211.8	94.59	44 46 36.00	100.000	86.1	57.1	-10.5	9.1
Traverse City		MI		31.4	BLEDD20130730ANS	85 39 43.30	169	402	Northern Christian Radio,		
213C	WPHN	LIC CN		120.5	78.97	45 08 17.00	100.000	10.3	72.9	44.7	4.7
Gaylord		MI		301.1	BMLDD20150410ABJ	84 09 44.00	305	579	Northern Christian Radio		
210A	WHWG	LIC CN		4.8	76.61	46 11 17.00	1.000	30.8	20.8	16.0	10.9
Trout Lake		MI		184.9	BLEDD20090831ACU	84 56 46.20	119	369	Gospel Opportunities, Inc.		
265C3	WQHN«	LIC ZCN		188.5	36.37	45 10 40.00	11.500	61.6	17.3	13.5R	22.9M
East Jordan		MI		8.5	BLEDD20190912AAA	85 05 57.20	149	375	Northern Christian Radio		
211C1	WNMU-FM	LIC CN		294.4	238.00	46 21 09.80	100.000	171.7	72.2	31.9	74.0
Marquette		MI		112.4	BLEDD20131113BSN	87 51 15.50	283	730	Board Of Trustees, Norther		
210AA	AL06801«	ALO		57.8	162.73	46 16 00.10	6.000	47.7	38.0	119.0R	43.7M
Iron Bridge		ON		239.1		83 14 32.90	100	313			
210A	AL6754«	VAC		57.8	162.73	46 16 00.08	6.000	47.7	38.0	119.0R	43.7M
Iron Bridge		ON		239.1		83 14 32.94	100	313	From CDBS		
212A	WGTM	CP CN		298.4	109.58	45 57 50.90	0.500	15.9	11.1	59.5	47.2
Manistique		MI		117.5	0000167562	86 16 37.50	35	228	West Central Michigan Medi		
208B	R18288«	ADD		25.1	134.68	46 35 44.47	50.000	7.4	65.0	71.0R	63.7M
Sault Ste Marie		ON		205.7		84 16 54.92	150	433	From CDBS		
208B	CBSMFM«	LIC CN		25.1	134.85	46 35 50.10	46.000	6.7	69.9	71.0R	63.9M
Sault Ste Marie		ON		205.6		84 16 53.10	117	400			
214A	WNMC-FM	LIC CN		212.7	95.50	44 46 36.00	0.600	1.5	23.6	74.6	71.4
Traverse City		MI		32.2	BLEDD19971126KCC	85 41 02.30	164	395	Northwestern Michigan Coll		
212B1	R18286«	ADD		61.3	211.24	46 23 16.79	25.000	60.2	51.0	131.0R	80.2M
Elliot Lake		ON		243.0		82 37 11.55	100	100	From CDBS		
212A	AL9320«	DEL		61.2	211.41	46 23 21.09	6.000	43.7	38.0	119.0R	92.4M
Elliot Lake		ON		243.0		82 37 05.84	100	100	From CDBS		
212AA	AL00669«	ALO		61.2	211.41	46 23 21.10	6.000	43.7	38.0	119.0R	92.4M
Elliot Lake		ON		243.0		82 37 05.80	100	100			
211C2	WUCX-FM	LIC CN		153.4	241.28	43 33 10.10	30.000	126.5	47.7	95.7	138.8
Bay City		MI		334.3	BLEDD19891010KCB	83 41 23.90	146	328	Central Michigan Universit		
209C2	WJOJ	LIC EN		126.4	147.79	44 42 12.00	31.000	5.1	45.3	119.6	100.0
Rust Township		MI		307.4	BLEDD20130920AEB	83 31 26.90	143	395	Northland Community Broadc		

Terrain database is NED 03 SEC , R= 73.215 qualifying spacings or FCC minimum Spacings in KM, M= Margin in KM  
 In & Out distances between contours are shown at closest points. Reference zone= - ZN2, Co to 3rd adjacent.  
 All separation margins (if shown) include rounding. Call signs with strikeout need not be protected.  
 Ant Column: (D= DA Standard, Z= DA 73.215, N= Not DA 73.215, \_= Omni), Polarization (C,H,V,E), Beamtilt(Y,N,X)  
 "\*"affixed to 'IN' or 'OUT' values = site inside restricted contour.  
 « = Station meets FCC minimum distance spacing for its class.  
 Reference station has protected zone issue: Canada

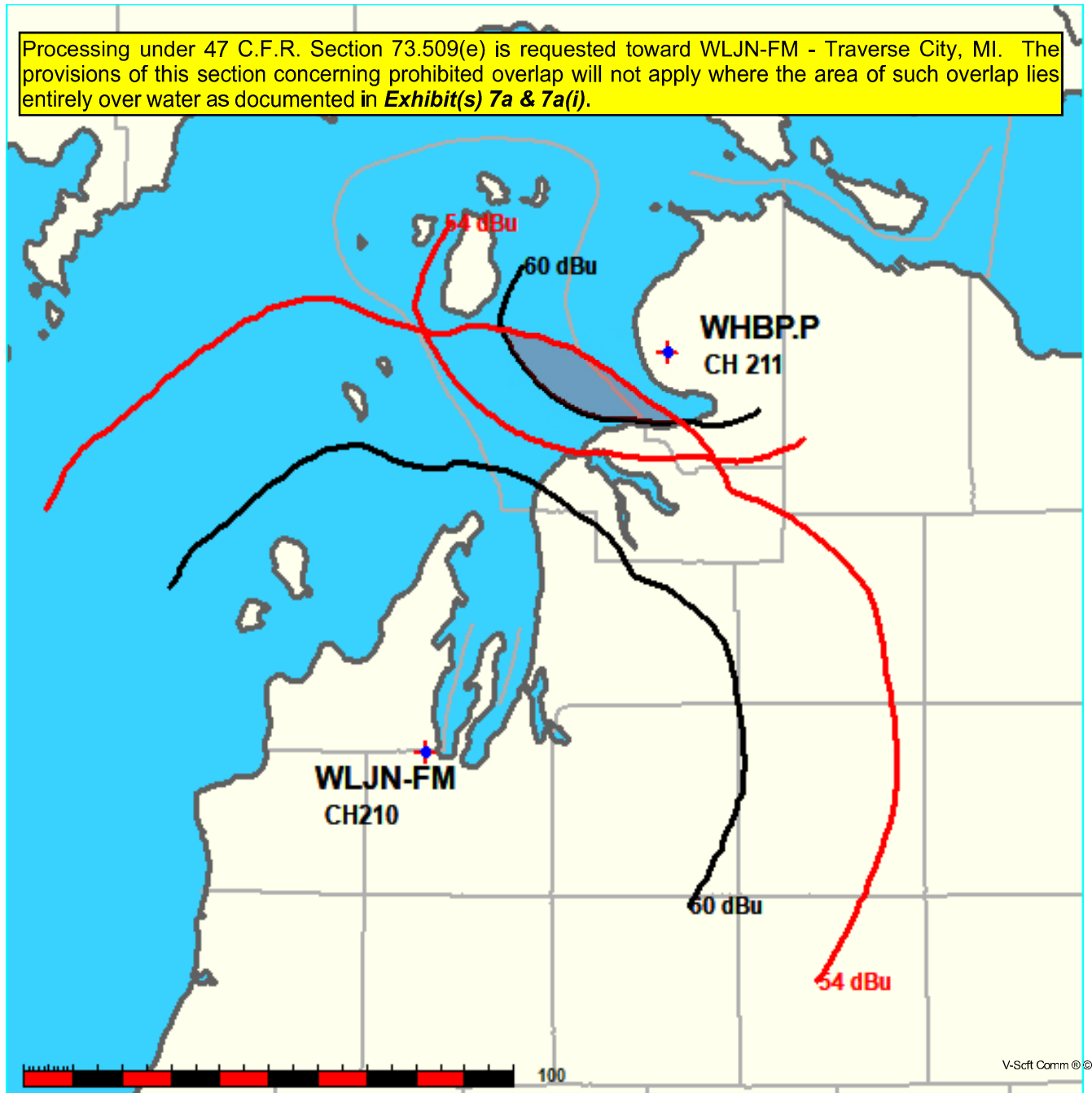
## Exhibit 7a

### Contour Protection Studies Toward Select Allocation Concern(s)

FMCommander Single Allocation Study - 01-26-2024 - NED 03 SEC  
WHBP.P's Overlaps (In= -10.53 km, Out= 9.13 km)

WHBP.P CH 211 C3 DA  
Lat= 45 30 05.20, Lng= 85 01 48.90  
1.2 kW 300.3 m HAAT, 533.4 m COR  
Prot.= 60 dBu, Intef.= 54 dBu

WLJN-FM CH 210 C1 DA BLED20130730ANS  
Lat= 44 46 36.00, Lng= 85 39 43.30  
100.0 kW 169 m HAAT, 402 m COR  
Prot.= 60 dBu, Intef.= 54 dBu



# ***Exhibit 7a***

## **Contour Protection Studies Toward Select Allocation Concern(s)**

01-26-2024

Terrain Data: NED 03 SEC

FMOver Analysis

WHBP.P

WLJN-FM BLED20130730ANS

Channel = 211C3  
 Max ERP = 1.2 kW  
 RCAMSL = 533.4 m  
 N. Lat. 45 30 05.20  
 W. Lng. 85 01 48.90  
 Protected  
 60 dBu

Channel = 210C1  
 Max ERP = 100 kW  
 RCAMSL = 402 m  
 N. Lat. 44 46 36.00  
 W. Lng. 85 39 43.30  
 Interfering  
 54 dBu

Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Actual (dBu)	IX (km)
170.0	000.0384	0317.2	014.5	037.9	038.9376	0224.9	084.4	54.00	
171.0	000.0384	0319.5	014.5	037.8	038.9376	0224.9	084.1	54.07*	0.21
172.0	000.0384	0317.4	014.5	037.7	038.9376	0224.9	084.0	54.12*	0.36
173.0	000.0384	0316.0	014.4	037.6	038.9376	0224.9	083.8	54.17*	0.52
174.0	000.0384	0316.4	014.5	037.4	038.9376	0224.9	083.6	54.22*	0.70
175.0	000.0384	0317.4	014.5	037.3	038.9376	0224.8	083.5	54.29*	0.89
176.0	000.0384	0318.2	014.5	037.2	038.9376	0224.8	083.3	54.34*	1.07
177.0	000.0384	0320.6	014.5	037.1	038.9376	0224.8	083.1	54.41*	1.28
178.0	000.0384	0322.4	014.6	037.0	038.9376	0224.8	082.9	54.47*	1.48
179.0	000.0384	0322.8	014.6	036.9	038.9376	0224.8	082.7	54.53*	1.64
180.0	000.0384	0322.6	014.6	036.7	038.9376	0224.8	082.6	54.58*	1.79
181.0	000.0384	0323.2	014.6	036.6	038.9376	0224.8	082.4	54.63*	1.96
182.0	000.0384	0323.5	014.6	036.4	038.9376	0224.8	082.2	54.68*	2.11
183.0	000.0384	0324.3	014.6	036.3	038.9376	0224.8	082.1	54.73*	2.27
184.0	000.0384	0324.2	014.6	036.1	038.9376	0224.8	081.9	54.77*	2.40
185.0	000.0384	0324.4	014.6	036.0	038.9376	0224.7	081.8	54.81*	2.54
186.0	000.0384	0324.9	014.6	035.8	038.9376	0224.7	081.7	54.86*	2.68
187.0	000.0384	0325.8	014.7	035.7	038.9376	0224.7	081.5	54.90*	2.82
188.0	000.0384	0326.2	014.7	035.5	038.9376	0224.7	081.4	54.95*	2.94
189.0	000.0384	0326.6	014.7	035.4	038.9376	0224.6	081.3	54.98*	3.07
190.0	000.0384	0327.5	014.7	035.2	038.9376	0224.5	081.1	55.02*	3.19
191.0	000.0389	0327.8	014.8	035.1	038.9376	0224.5	081.0	55.07*	3.33
192.0	000.0393	0327.8	014.8	034.9	038.9376	0224.3	080.8	55.11*	3.46
193.0	000.0393	0328.1	014.8	034.8	038.9376	0224.2	080.7	55.14*	3.55
194.0	000.0397	0328.5	014.9	034.6	038.9376	0224.1	080.6	55.18*	3.68
195.0	000.0402	0329.6	014.9	034.4	038.9376	0223.9	080.4	55.22*	3.81
196.0	000.0406	0330.3	015.0	034.3	038.9376	0223.5	080.3	55.26*	3.91
197.0	000.0411	0331.4	015.0	034.1	038.9376	0223.1	080.1	55.29*	4.00
198.0	000.0411	0332.4	015.1	033.9	038.9376	0222.6	080.0	55.30*	4.04
199.0	000.0415	0333.4	015.1	033.8	038.9376	0222.1	079.9	55.33*	4.12
200.0	000.0420	0334.4	015.2	033.6	038.9376	0221.6	079.8	55.35*	4.19
201.0	000.0424	0335.3	015.3	033.4	038.9376	0221.2	079.7	55.38*	4.27
202.0	000.0429	0336.0	015.3	033.2	038.9376	0220.9	079.5	55.40*	4.35

## ***Exhibit 7a***

### ***Contour Protection Studies Toward Select Allocation Concern(s)***

Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Actual (dBu)	
203.0	000.0433	0336.5	015.4	033.1	038.9376	0220.9	079.4	55.43*	4.45
204.0	000.0438	0337.1	015.4	032.9	038.9376	0221.1	079.3	55.47*	4.57
205.0	000.0442	0337.9	015.5	032.7	038.9376	0221.5	079.2	55.52*	4.72
206.0	000.0452	0338.7	015.6	032.5	038.9376	0222.2	079.1	55.59*	4.94
207.0	000.0456	0339.4	015.6	032.3	038.9376	0222.8	079.0	55.64*	5.10
208.0	000.0461	0340.3	015.7	032.1	038.9376	0223.2	078.9	55.68*	5.23
209.0	000.0466	0341.6	015.8	031.9	038.9376	0223.3	078.8	55.72*	5.34
210.0	000.0470	0341.7	015.8	031.7	038.9376	0223.4	078.8	55.74*	5.40
211.0	000.0495	0342.1	016.0	031.5	038.9376	0223.5	078.6	55.82*	5.64
212.0	000.0519	0342.1	016.2	031.3	038.9376	0223.7	078.3	55.89*	5.87
213.0	000.0550	0343.0	016.5	031.1	038.9376	0223.9	078.1	55.99*	6.15
214.0	000.0576	0343.7	016.7	030.9	038.9376	0224.1	077.9	56.06*	6.38
215.0	000.0602	0344.3	016.9	030.7	038.9376	0224.2	077.7	56.13*	6.60
216.0	000.0629	0345.1	017.2	030.4	038.9376	0224.4	077.5	56.20*	6.81
217.0	000.0657	0345.6	017.4	030.2	038.9376	0224.6	077.3	56.26*	7.01
218.0	000.0691	0346.4	017.6	030.0	038.9701	0224.7	077.1	56.34*	7.23
219.0	000.0720	0347.0	017.8	029.7	039.1383	0224.7	077.0	56.41*	7.45
220.0	000.0750	0347.7	018.0	029.4	039.3105	0224.7	076.8	56.47*	7.65
221.0	000.0786	0348.3	018.3	029.2	039.4899	0224.6	076.6	56.55*	7.88
222.0	000.0830	0348.3	018.5	028.9	039.6760	0224.6	076.5	56.62*	8.12
223.0	000.0868	0348.0	018.7	028.6	039.8614	0224.6	076.3	56.69*	8.31
224.0	000.0914	0347.5	018.9	028.4	040.0541	0224.6	076.2	56.75*	8.51
225.0	000.0954	0347.2	019.1	028.1	040.2465	0224.6	076.1	56.81*	8.68
226.0	000.0995	0347.1	019.3	027.8	040.4423	0224.7	076.0	56.86*	8.84
227.0	000.1044	0347.0	019.6	027.5	040.6472	0224.7	075.9	56.92*	9.02
228.0	000.1087	0347.0	019.8	027.2	040.8502	0224.7	075.8	56.96*	9.16
229.0	000.1138	0347.0	020.0	026.9	041.0614	0224.7	075.7	57.01*	9.31
230.0	000.1183	0346.9	020.2	026.6	041.2688	0224.7	075.7	57.05*	9.42
231.0	000.1244	0346.7	020.4	026.3	041.4914	0224.7	075.6	57.10*	9.58
232.0	000.1307	0346.1	020.6	025.9	041.7148	0224.7	075.5	57.14*	9.71
233.0	000.1379	0346.0	020.9	025.6	041.9507	0224.7	075.5	57.19*	9.87
234.0	000.1445	0345.7	021.2	025.3	042.1811	0224.7	075.4	57.23*	9.98
235.0	000.1512	0345.6	021.4	025.0	042.4148	0224.6	075.4	57.26*	10.08
236.0	000.1581	0345.5	021.6	024.6	042.6502	0224.6	075.4	57.28*	10.16
237.0	000.1652	0345.7	021.9	024.3	042.8897	0224.5	075.4	57.31*	10.23
238.0	000.1733	0345.5	022.1	023.9	043.1359	0224.5	075.4	57.33*	10.31
239.0	000.1807	0345.7	022.3	023.6	043.3787	0224.5	075.4	57.35*	10.36
240.0	000.1882	0345.5	022.5	023.3	043.6183	0224.5	075.5	57.35*	10.38
241.0	000.1978	0345.5	022.8	022.9	043.8797	0224.5	075.5	57.37*	10.44
242.0	000.2077	0345.8	023.1	022.5	044.1436	0224.5	075.5	57.39*	10.49
243.0	000.2188	0345.6	023.4	022.1	044.4134	0224.5	075.6	57.40*	10.53
244.0	000.2292	0345.1	023.6	021.8	044.6699	0224.5	075.7	57.40*	10.52
245.0	000.2398	0345.1	023.9	021.4	044.9332	0224.5	075.7	57.39*	10.51
246.0	000.2506	0345.3	024.1	021.1	045.1982	0224.4	075.8	57.38*	10.49
247.0	000.2617	0345.1	024.4	020.7	045.4576	0224.3	076.0	57.36*	10.43

# ***Exhibit 7a***

## **Contour Protection Studies Toward Select Allocation Concern(s)**

01-26-2024      Terrain Data: NED 03 SEC      FMOver Analysis

WLJN-FM    BLED20130730ANS

WHBP.P

Channel = 210C1  
 Max ERP = 100 kW  
 RCAMSL = 402 m  
 N. Lat. 44 46 36.00  
 W. Lng. 85 39 43.30  
 Protected  
 60 dBu

Channel = 211C3  
 Max ERP = 1.2 kW  
 RCAMSL = 533.4 m  
 N. Lat. 45 30 05.20  
 W. Lng. 85 01 48.90  
 Interfering  
 54 dBu

Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Actual (dBu)	IX (km)
346.0	096.4324	0198.4	063.3	253.8	000.3589	0345.4	067.4	43.37	
347.0	095.8441	0196.4	063.0	253.5	000.3543	0345.4	066.3	43.71	
348.0	095.2576	0194.3	062.8	253.2	000.3492	0345.3	065.2	44.03	
349.0	094.6729	0188.8	062.2	252.6	000.3391	0345.2	064.2	44.27	
350.0	094.0900	0180.4	061.4	251.7	000.3247	0345.1	063.2	44.42	
351.0	090.4401	0176.5	060.6	250.9	000.3112	0345.0	062.3	44.57	
352.0	086.8624	0174.2	060.0	250.1	000.2995	0345.1	061.4	44.74	
353.0	083.3569	0170.8	059.3	249.2	000.2884	0345.0	060.6	44.88	
354.0	079.9236	0168.8	058.7	248.4	000.2791	0344.8	059.7	45.05	
355.0	076.5625	0167.6	058.2	247.6	000.2698	0345.0	058.9	45.21	
356.0	073.2736	0169.4	058.0	247.1	000.2635	0345.1	058.0	45.45	
357.0	070.0569	0171.0	057.7	246.6	000.2570	0345.2	057.1	45.67	
358.0	066.9124	0172.0	057.4	245.9	000.2498	0345.3	056.3	45.86	
359.0	063.8401	0173.8	057.2	245.3	000.2429	0345.2	055.5	46.05	
000.0	060.8400	0174.1	056.8	244.5	000.2341	0345.0	054.8	46.16	
001.0	059.2592	0176.9	056.8	244.0	000.2296	0345.0	053.9	46.42	
002.0	057.6992	0178.9	056.8	243.5	000.2239	0345.3	053.0	46.64	
003.0	056.1600	0183.1	056.9	243.1	000.2197	0345.6	052.1	46.92	
004.0	054.6417	0187.5	057.1	242.7	000.2149	0345.6	051.2	47.18	
005.0	053.1441	0198.2	057.7	242.7	000.2155	0345.6	049.9	47.66	
006.0	051.6673	0206.7	058.2	242.5	000.2136	0345.6	048.8	48.05	
007.0	050.2114	0211.6	058.4	242.0	000.2078	0345.8	047.9	48.30	
008.0	048.7763	0215.4	058.5	241.3	000.2012	0345.7	047.0	48.49	
009.0	047.3619	0220.3	058.6	240.7	000.1951	0345.4	046.1	48.70	
010.0	045.9684	0222.0	058.5	239.8	000.1864	0345.7	045.4	48.80	
011.0	045.9684	0222.2	058.5	238.9	000.1801	0345.6	044.7	48.96	
012.0	045.9684	0222.8	058.5	238.1	000.1737	0345.5	043.9	49.12	
013.0	045.9684	0223.0	058.6	237.1	000.1662	0345.7	043.2	49.24	
014.0	045.9684	0223.4	058.6	236.1	000.1592	0345.5	042.4	49.36	

***Exhibit 7a***  
**Contour Protection Studies Toward Select Allocation Concern(s)**

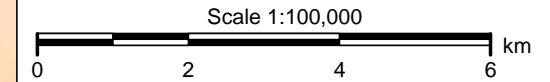
Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Actual (dBu)
015.0	045.9684	0223.5	058.6	235.1	000.1519	0345.6	041.8	49.45
016.0	045.9684	0223.8	058.6	234.0	000.1446	0345.7	041.1	49.52
017.0	045.9684	0223.9	058.6	232.9	000.1369	0346.0	040.5	49.56
018.0	045.9684	0224.0	058.7	231.7	000.1286	0346.3	039.9	49.55
019.0	045.9684	0224.1	058.7	230.4	000.1209	0346.8	039.4	49.54
020.0	045.9684	0224.2	058.7	229.1	000.1144	0347.0	038.8	49.54
021.0	045.2391	0224.4	058.5	227.7	000.1074	0347.0	038.5	49.43
022.0	044.5156	0224.5	058.4	226.2	000.1006	0347.0	038.2	49.28
023.0	043.7979	0224.5	058.2	224.7	000.0943	0347.3	037.9	49.12
024.0	043.0861	0224.5	058.1	223.2	000.0877	0347.9	037.7	48.92
025.0	042.3801	0224.6	058.0	221.7	000.0815	0348.5	037.6	48.69
026.0	041.6799	0224.7	057.8	220.1	000.0754	0347.8	037.4	48.39
027.0	040.9856	0224.7	057.6	218.5	000.0707	0346.8	037.4	48.11
028.0	040.2971	0224.6	057.5	217.0	000.0657	0345.6	037.4	47.76
029.0	039.6144	0224.6	057.3	215.4	000.0614	0344.7	037.4	47.43
030.0	038.9376	0224.7	057.2	213.9	000.0573	0343.7	037.5	47.07
031.0	038.9376	0224.0	057.1	212.4	000.0530	0342.5	037.5	46.69
032.0	038.9376	0223.3	057.1	210.8	000.0491	0342.1	037.5	46.31
033.0	038.9376	0220.9	056.9	209.3	000.0467	0341.7	037.8	45.98
034.0	038.9376	0222.7	057.0	207.8	000.0460	0340.0	037.7	45.89
035.0	038.9376	0224.4	057.1	206.3	000.0453	0339.0	037.7	45.79
036.0	038.9376	0224.7	057.2	204.8	000.0441	0337.8	037.9	45.57
037.0	038.9376	0224.8	057.2	203.3	000.0435	0336.8	038.1	45.38
038.0	038.9376	0224.9	057.2	201.9	000.0428	0336.0	038.4	45.17
039.0	038.9376	0224.9	057.2	200.5	000.0422	0334.7	038.7	44.93
040.0	038.9376	0224.9	057.2	199.1	000.0416	0333.4	039.0	44.67
041.0	038.9376	0224.8	057.2	197.7	000.0411	0332.2	039.4	44.41
042.0	038.9376	0223.9	057.1	196.5	000.0408	0330.6	039.9	44.12
043.0	038.9376	0222.7	057.0	195.3	000.0403	0329.9	040.4	43.81
044.0	038.9376	0219.7	056.8	194.2	000.0399	0328.7	041.1	43.41
045.0	038.9376	0214.8	056.3	193.4	000.0395	0328.4	042.0	42.98
046.0	038.9376	0212.1	056.1	192.4	000.0393	0327.8	042.7	42.63
047.0	038.9376	0209.9	055.9	191.5	000.0391	0327.5	043.4	42.30
048.0	038.9376	0206.7	055.7	190.7	000.0387	0327.9	044.2	41.93
049.0	038.9376	0202.7	055.3	190.0	000.0384	0327.5	045.1	41.53
050.0	038.9376	0202.4	055.3	189.1	000.0384	0326.6	045.8	41.23
051.0	040.9088	0203.2	055.8	187.8	000.0384	0326.1	046.0	41.11
052.0	042.9287	0204.4	056.3	186.4	000.0384	0325.2	046.3	40.96
053.0	044.9973	0207.4	057.0	185.0	000.0384	0324.4	046.6	40.83
054.0	047.1145	0210.0	057.7	183.6	000.0384	0324.3	046.9	40.68
055.0	049.2804	0211.4	058.2	182.3	000.0384	0323.9	047.4	40.49
056.0	051.4950	0214.7	058.9	180.9	000.0384	0323.1	047.8	40.29
057.0	053.7582	0218.0	059.6	179.6	000.0384	0322.8	048.3	40.09
058.0	056.0701	0218.7	060.0	178.5	000.0384	0322.8	049.0	39.83
059.0	058.4307	0219.1	060.5	177.5	000.0384	0321.5	049.7	39.51

**Exhibit 7a(i)**  
**§73.509(e) Contour Study:**  
**Expanded View Map**

47 C.F.R. Section 73.509(e)

The provisions of this section concerning prohibited overlap will not apply where the area of such overlap lies entirely over water.

WHBP.P



NED 03 SEC Terrain Database  
US Census 2010 PL Database  
NED 1983 Coordinate Datum

**WHBP.P**  
Harbor Springs, MI  
Proposed Operation  
Facility ID: 172716  
Latitude: 45-30-05.20 N  
Longitude: 085-01-48.90 W  
ERP: 1.20 kW  
Channel: 211C3 (90.1 MHz)  
AMSL Height: 533.4 m  
Horiz. Pattern: Directional

**WLJN-FM.L**  
Traverse City, MI  
BLED20130730ANS  
Facility ID: 24607  
Latitude: 44-46-36 N  
Longitude: 085-39-43.30 W  
ERP: 100.00 kW  
Channel: 210C1 (89.9 MHz)  
AMSL Height: 402.0 m  
Horiz. Pattern: Directional

*WLJN-FM.L - 54 dBμ F(50:10) Contour*

*WHBP.P - 60 dBμ F(50:50) Contour*

Asher Broadcast Consulting LLC  
justinasher@consultant.com  
1 (202) 875-2986

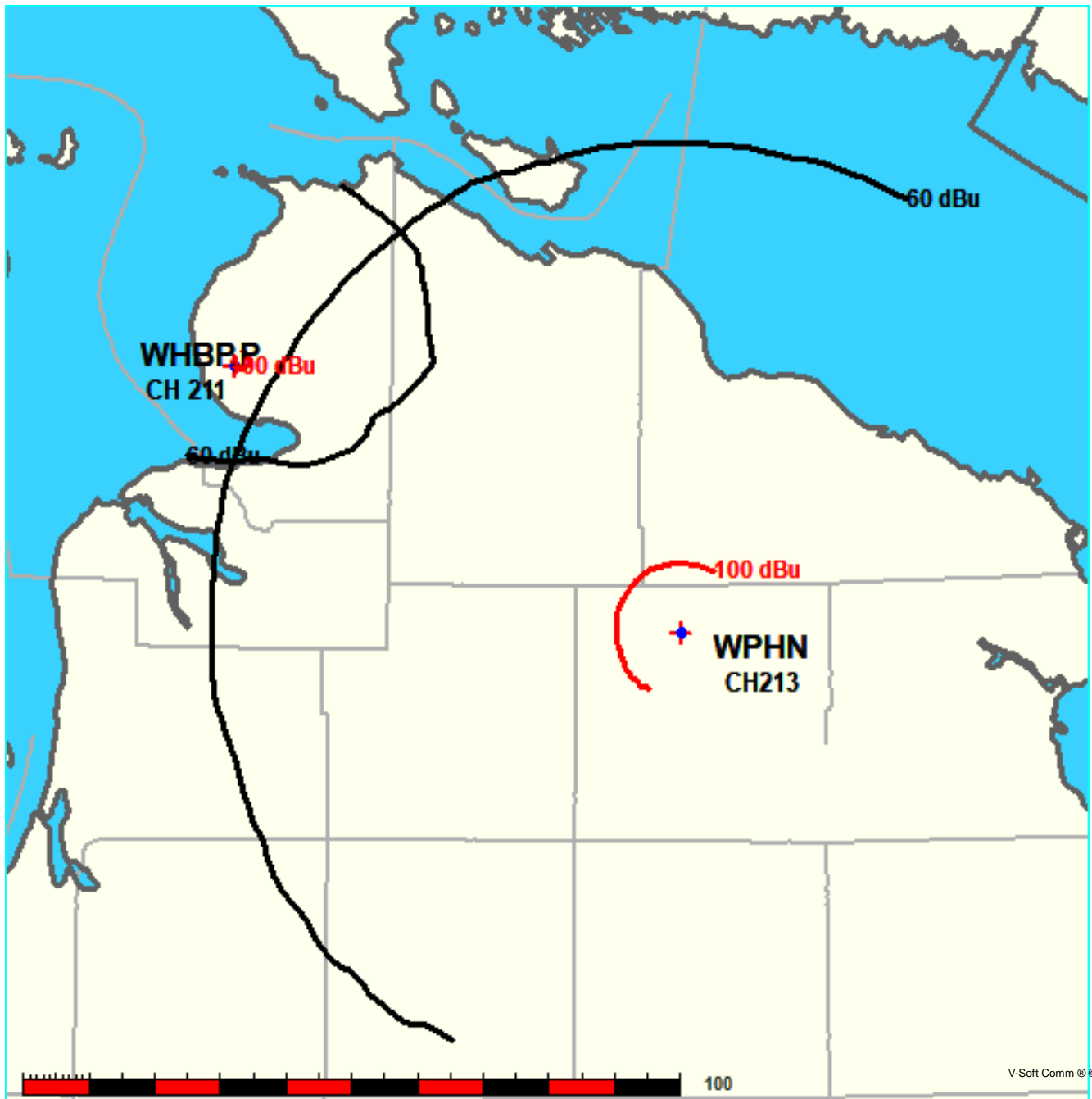
V-Soft Communications LLC ©

***Exhibit 7b***  
***Contour Protection Studies Toward Select Allocation Concern(s)***

FMCommander Single Allocation Study - 01-26-2024 - NED 03 SEC  
WHBP.P's Overlaps (In= 44.69 km, Out= 4.68 km)

WHBP.P CH 211 C3 DA  
Lat= 45 30 05.20, Lng= 85 01 48.90  
1.2 kW 300.3 m HAAT, 533.4 m COR  
Prot.= 60 dBu, Intef.= 100 dBu

WPHN CH 213 C BMLED20150410ABJ  
Lat= 45 08 17.00, Lng= 84 09 44.00  
100.0 kW 305 m HAAT, 579 m COR  
Prot.= 60 dBu, Intef.= 100 dBu



## Exhibit 7b

### Contour Protection Studies Toward Select Allocation Concern(s)

01-26-2024

Terrain Data: NED 03 SEC

FMOver Analysis

WHBP.P

WPHN BMLED20150410ABJ

Channel = 211C3  
Max ERP = 1.2 kW  
RCAMSL = 533.4 m  
N. Lat. 45 30 05.20  
W. Lng. 85 01 48.90  
Protected  
60 dBu

Channel = 213C  
Max ERP = 100 kW  
RCAMSL = 579 m  
N. Lat. 45 08 17.00  
W. Lng. 84 09 44.00  
Interfering  
100 dBu

Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Actual (dBu)	IX (km)
080.0	001.2000	0245.4	029.6	319.8	100.0000	0318.1	059.6	69.71	
081.0	001.1976	0246.9	029.6	319.6	100.0000	0318.1	059.2	69.88	
082.0	001.1976	0247.7	029.7	319.4	100.0000	0317.9	058.7	70.06	
083.0	001.1952	0249.1	029.7	319.2	100.0000	0317.7	058.2	70.23	
084.0	001.1952	0248.9	029.7	318.9	100.0000	0317.6	057.8	70.38	
085.0	001.1928	0251.4	029.9	318.7	100.0000	0317.6	057.3	70.57	
086.0	001.1904	0252.5	029.9	318.4	100.0000	0317.7	056.9	70.75	
087.0	001.1904	0252.3	029.9	318.0	100.0000	0317.5	056.5	70.89	
088.0	001.1880	0254.3	030.0	317.8	100.0000	0317.2	056.0	71.06	
089.0	001.1880	0254.6	030.0	317.4	100.0000	0317.1	055.6	71.21	
090.0	001.1856	0252.0	029.9	316.9	100.0000	0317.2	055.4	71.32	
091.0	001.1384	0249.3	029.4	316.3	100.0000	0316.5	055.3	71.33	
092.0	001.0899	0247.7	029.0	315.6	100.0000	0315.4	055.2	71.32	
093.0	001.0446	0246.9	028.7	315.0	100.0000	0314.9	055.1	71.34	
094.0	000.9981	0244.6	028.3	314.3	100.0000	0314.1	055.1	71.31	
095.0	000.9548	0243.7	027.9	313.7	100.0000	0313.2	055.1	71.30	
096.0	000.9125	0242.8	027.6	313.1	100.0000	0312.6	055.0	71.29	
097.0	000.8690	0242.6	027.3	312.5	100.0000	0312.2	055.0	71.29	
098.0	000.8287	0242.8	027.0	311.9	100.0000	0311.8	055.0	71.28	
099.0	000.7873	0241.5	026.6	311.3	100.0000	0312.1	055.1	71.27	
100.0	000.7489	0240.5	026.3	310.7	100.0000	0313.1	055.1	71.27	
101.0	000.7189	0240.4	026.0	310.1	100.0000	0313.9	055.1	71.30	
102.0	000.6877	0238.9	025.7	309.5	100.0000	0314.0	055.2	71.27	
103.0	000.6589	0236.9	025.3	309.0	100.0000	0313.5	055.3	71.21	
104.0	000.6308	0235.8	025.0	308.4	100.0000	0312.5	055.4	71.13	
105.0	000.6032	0233.4	024.6	307.9	100.0000	0311.5	055.6	71.03	
106.0	000.5746	0230.8	024.2	307.3	100.0000	0310.3	055.8	70.91	
107.0	000.5484	0227.6	023.8	306.7	100.0000	0309.0	056.1	70.76	
108.0	000.5227	0225.1	023.4	306.2	100.0000	0307.8	056.3	70.63	
109.0	000.4961	0222.1	023.0	305.7	100.0000	0307.6	056.6	70.51	
110.0	000.4718	0221.7	022.7	305.2	100.0000	0307.4	056.8	70.44	

***Exhibit 7b***  
**Contour Protection Studies Toward Select Allocation Concern(s)**

Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Actual (dBu)
111.0	000.4524	0221.2	022.5	304.8	100.0000	0307.3	056.9	70.38
112.0	000.4334	0227.8	022.6	304.4	100.0000	0307.0	056.8	70.44
113.0	000.4149	0233.8	022.6	304.0	100.0000	0306.9	056.6	70.48
114.0	000.3967	0237.7	022.5	303.6	100.0000	0306.5	056.6	70.47
115.0	000.3790	0241.9	022.5	303.2	100.0000	0306.4	056.6	70.47
116.0	000.3630	0248.8	022.6	302.9	100.0000	0306.6	056.5	70.52
117.0	000.3460	0253.8	022.5	302.5	100.0000	0306.7	056.5	70.52
118.0	000.3295	0259.0	022.5	302.1	100.0000	0306.6	056.5	70.51
119.0	000.3133	0262.5	022.3	301.7	100.0000	0306.3	056.6	70.46
120.0	000.2976	0268.1	022.3	301.3	100.0000	0306.3	056.7	70.44
121.0	000.2858	0273.2	022.3	300.9	100.0000	0306.4	056.7	70.44
122.0	000.2742	0279.6	022.3	300.5	100.0000	0306.0	056.7	70.43
123.0	000.2617	0284.4	022.2	300.1	100.0000	0306.0	056.8	70.40
124.0	000.2506	0287.9	022.1	299.7	100.0000	0305.6	056.9	70.33
125.0	000.2398	0290.0	022.0	299.3	100.0000	0305.7	057.1	70.26
126.0	000.2292	0291.6	021.8	299.0	100.0000	0306.3	057.3	70.20
127.0	000.2188	0292.8	021.6	298.6	100.0000	0306.3	057.6	70.10
128.0	000.2077	0293.5	021.4	298.3	100.0000	0306.2	057.9	69.98
129.0	000.1978	0293.9	021.1	298.0	100.0000	0306.0	058.2	69.86
130.0	000.1882	0294.5	020.9	297.7	100.0000	0305.9	058.5	69.74
131.0	000.1807	0296.2	020.7	297.4	100.0000	0305.8	058.7	69.64
132.0	000.1733	0298.3	020.6	297.1	100.0000	0305.5	058.9	69.55
133.0	000.1652	0300.0	020.4	296.8	100.0000	0305.4	059.2	69.44
134.0	000.1581	0302.0	020.3	296.5	100.0000	0305.5	059.5	69.35
135.0	000.1512	0303.6	020.1	296.2	100.0000	0305.8	059.7	69.26
136.0	000.1445	0306.6	020.0	296.0	100.0000	0306.5	060.0	69.19
137.0	000.1379	0309.5	019.8	295.7	100.0000	0307.3	060.2	69.12
138.0	000.1307	0311.8	019.7	295.5	100.0000	0307.7	060.5	69.02
139.0	000.1244	0312.2	019.4	295.3	100.0000	0307.8	060.9	68.89
140.0	000.1183	0313.7	019.2	295.0	100.0000	0307.8	061.2	68.77
141.0	000.1138	0314.7	019.1	294.8	100.0000	0307.6	061.5	68.66
142.0	000.1087	0316.4	018.9	294.6	100.0000	0307.4	061.8	68.54
143.0	000.1044	0318.8	018.8	294.4	100.0000	0307.3	062.0	68.44
144.0	000.0995	0319.8	018.6	294.2	100.0000	0307.3	062.4	68.31
145.0	000.0954	0320.5	018.4	294.1	100.0000	0307.4	062.7	68.20
146.0	000.0914	0320.9	018.2	293.9	100.0000	0307.5	063.0	68.08
147.0	000.0868	0321.6	018.0	293.8	100.0000	0307.6	063.4	67.95
148.0	000.0830	0322.2	017.8	293.6	100.0000	0307.6	063.7	67.83
149.0	000.0786	0322.1	017.6	293.6	100.0000	0307.5	064.1	67.69
150.0	000.0750	0322.6	017.4	293.4	100.0000	0307.4	064.4	67.57
151.0	000.0720	0322.6	017.2	293.3	100.0000	0307.3	064.8	67.44
152.0	000.0691	0322.4	017.0	293.2	100.0000	0307.1	065.1	67.32
153.0	000.0657	0323.2	016.8	293.1	100.0000	0307.0	065.5	67.19

# ***Exhibit 7b***

## **Contour Protection Studies Toward Select Allocation Concern(s)**

01-26-2024      Terrain Data: NED 03 SEC      FMOver Analysis

WPHN    BMLD20150410ABJ

WHBP.P

Channel = 213C  
 Max ERP = 100 kW  
 RCAMSL = 579 m  
 N. Lat. 45 08 17.00  
 W. Lng. 84 09 44.00  
 Protected  
     60 dBu

Channel = 211C3  
 Max ERP = 1.2 kW  
 RCAMSL = 533.4 m  
 N. Lat. 45 30 05.20  
 W. Lng. 85 01 48.90  
 Interfering  
     100 dBu

Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Actual (dBu)	IX (km)
256.0	100.0000	0278.8	070.7	180.3	000.0384	0322.5	057.9	36.38	
257.0	100.0000	0280.8	070.8	180.8	000.0384	0322.8	056.7	36.83	
258.0	100.0000	0283.0	071.0	181.3	000.0384	0323.3	055.6	37.29	
259.0	100.0000	0284.0	071.1	181.6	000.0384	0323.3	054.4	37.75	
260.0	100.0000	0285.4	071.2	182.1	000.0384	0323.6	053.2	38.22	
261.0	100.0000	0288.1	071.4	182.6	000.0384	0324.2	052.0	38.69	
262.0	100.0000	0290.6	071.6	183.1	000.0384	0324.3	050.8	39.16	
263.0	100.0000	0291.9	071.7	183.5	000.0384	0324.3	049.6	39.63	
264.0	100.0000	0292.4	071.8	183.8	000.0384	0324.3	048.4	40.10	
265.0	100.0000	0292.1	071.8	184.1	000.0384	0324.2	047.2	40.59	
266.0	100.0000	0291.1	071.7	184.2	000.0384	0324.2	045.9	41.09	
267.0	100.0000	0290.3	071.6	184.4	000.0384	0324.1	044.7	41.60	
268.0	100.0000	0289.7	071.6	184.5	000.0384	0324.1	043.4	42.12	
269.0	100.0000	0288.9	071.5	184.6	000.0384	0324.1	042.2	42.66	
270.0	100.0000	0289.9	071.6	184.9	000.0384	0324.3	041.0	43.20	
271.0	100.0000	0290.4	071.6	185.1	000.0384	0324.6	039.7	43.76	
272.0	100.0000	0290.1	071.6	185.2	000.0384	0324.7	038.5	44.33	
273.0	100.0000	0290.9	071.7	185.4	000.0384	0324.7	037.2	44.90	
274.0	100.0000	0292.3	071.8	185.7	000.0384	0324.8	036.0	45.49	
275.0	100.0000	0292.3	071.8	185.8	000.0384	0324.8	034.7	46.08	
276.0	100.0000	0292.9	071.8	185.9	000.0384	0324.9	033.5	46.69	
277.0	100.0000	0292.9	071.8	185.9	000.0384	0324.9	032.2	47.30	
278.0	100.0000	0293.3	071.9	185.9	000.0384	0324.9	031.0	47.95	
279.0	100.0000	0293.9	071.9	185.9	000.0384	0324.9	029.7	48.65	
280.0	100.0000	0295.7	072.0	186.1	000.0384	0325.0	028.4	49.41	
281.0	100.0000	0297.8	072.2	186.2	000.0384	0325.0	027.2	50.21	
282.0	100.0000	0299.1	072.3	186.2	000.0384	0325.0	025.9	51.06	
283.0	100.0000	0299.6	072.3	186.0	000.0384	0324.9	024.7	51.94	
284.0	100.0000	0300.6	072.4	185.9	000.0384	0324.9	023.4	52.85	
285.0	100.0000	0301.5	072.5	185.6	000.0384	0324.7	022.1	53.80	
286.0	100.0000	0302.8	072.6	185.3	000.0384	0324.7	020.9	54.78	
287.0	100.0000	0303.9	072.7	184.8	000.0384	0324.3	019.6	55.77	
288.0	100.0000	0305.2	072.8	184.3	000.0384	0324.2	018.3	56.78	

***Exhibit 7b***  
**Contour Protection Studies Toward Select Allocation Concern(s)**

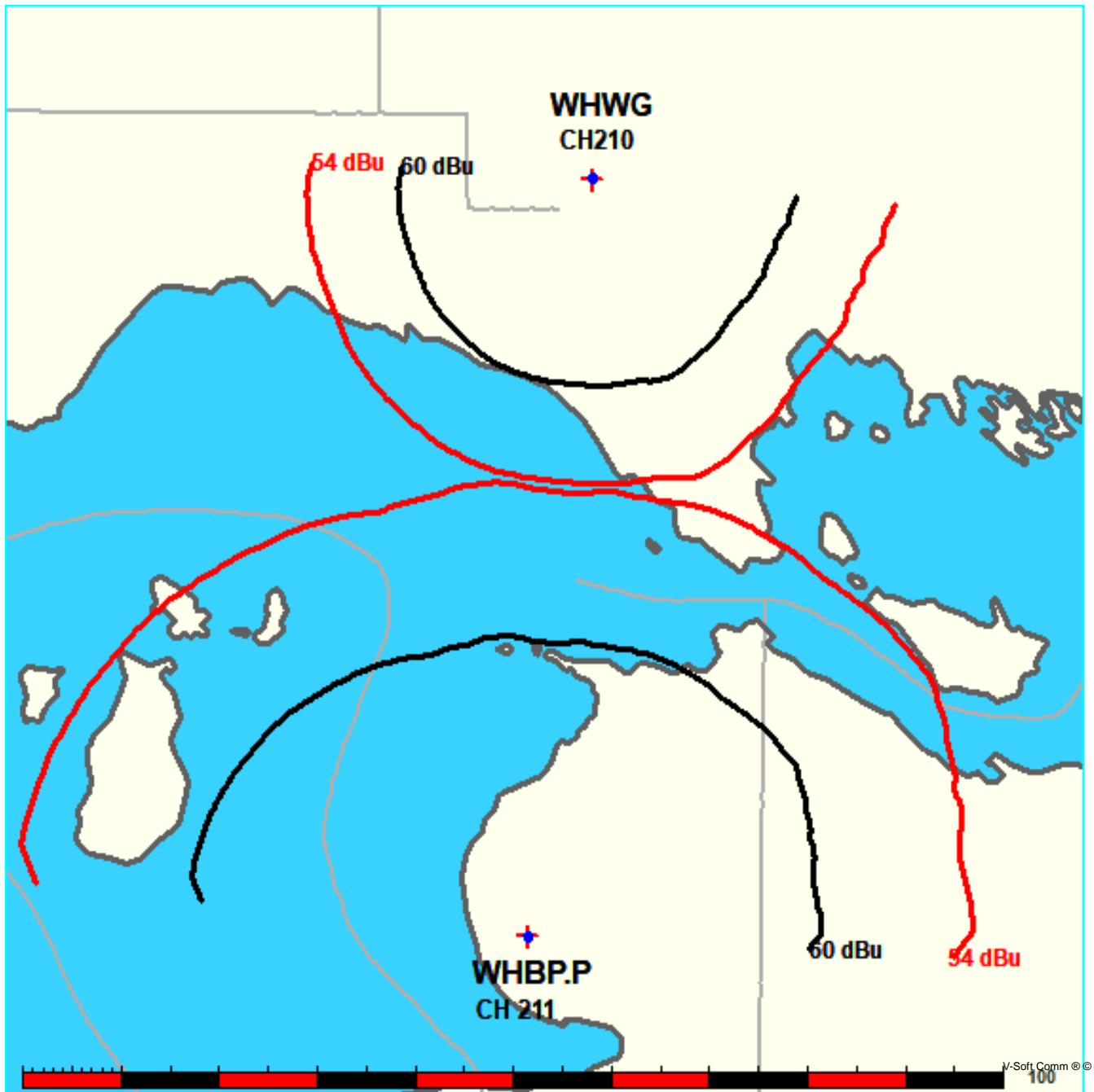
Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Actual (dBu)
289.0	100.0000	0307.9	073.0	184.0	000.0384	0324.3	017.1	57.84
290.0	100.0000	0307.7	073.0	182.7	000.0384	0324.2	015.8	58.86
291.0	100.0000	0308.1	073.0	181.4	000.0384	0323.3	014.6	59.99
292.0	100.0000	0308.4	073.0	179.6	000.0384	0322.7	013.4	61.51
293.0	100.0000	0306.8	072.9	176.9	000.0384	0320.2	012.3	63.00
294.0	100.0000	0307.4	072.9	174.2	000.0384	0316.4	011.1	64.64
295.0	100.0000	0307.7	073.0	170.7	000.0384	0319.1	010.0	66.46
296.0	100.0000	0306.3	072.9	165.7	000.0423	0315.0	009.1	68.38
297.0	100.0000	0305.5	072.8	159.6	000.0480	0321.0	008.2	70.58
298.0	100.0000	0306.0	072.8	152.5	000.0674	0323.3	007.4	73.57
299.0	100.0000	0306.2	072.9	143.6	000.1013	0319.6	006.7	76.53
300.0	100.0000	0305.9	072.8	133.0	000.1653	0300.0	006.3	79.18
301.0	100.0000	0306.5	072.9	121.4	000.2814	0275.7	006.1	81.46
302.0	100.0000	0306.5	072.9	109.6	000.4820	0222.2	006.2	82.09
303.0	100.0000	0306.6	072.9	098.7	000.7986	0241.8	006.6	83.98
304.0	100.0000	0306.9	072.9	089.4	001.1871	0254.0	007.2	84.75
305.0	100.0000	0307.2	072.9	081.7	001.1976	0247.6	008.0	83.04
306.0	100.0000	0307.6	073.0	075.6	001.2000	0256.7	008.9	81.68
307.0	100.0000	0309.6	073.1	070.2	001.2000	0265.0	009.8	80.29
308.0	100.0000	0311.8	073.3	065.7	001.2000	0273.3	010.8	78.86
309.0	100.0000	0313.6	073.4	062.3	001.2000	0283.5	011.9	77.47
310.0	100.0000	0314.0	073.4	059.9	001.2000	0288.2	013.1	75.91
311.0	100.0000	0312.5	073.3	058.6	001.2000	0292.5	014.3	74.41
312.0	100.0000	0311.9	073.3	057.3	001.2000	0294.0	015.6	73.25
313.0	100.0000	0312.6	073.3	056.0	001.2000	0292.1	016.8	72.17
314.0	100.0000	0313.5	073.4	054.8	001.2000	0290.9	018.0	71.11
315.0	100.0000	0314.9	073.5	053.8	001.2000	0289.5	019.3	70.05
316.0	100.0000	0316.0	073.6	053.0	001.2000	0289.0	020.5	69.03
317.0	100.0000	0317.2	073.7	052.4	001.2000	0288.7	021.8	68.03
318.0	100.0000	0317.4	073.7	052.0	001.2000	0288.6	023.1	67.05
319.0	100.0000	0317.6	073.7	051.8	001.2000	0288.5	024.3	66.09
320.0	100.0000	0317.9	073.7	051.6	001.2000	0288.5	025.6	65.18
321.0	100.0000	0317.8	073.7	051.5	001.2000	0288.5	026.9	64.30
322.0	100.0000	0317.5	073.7	051.5	001.2000	0288.5	028.2	63.47
323.0	100.0000	0318.1	073.7	051.5	001.2000	0288.5	029.5	62.68
324.0	100.0000	0320.0	073.9	051.3	001.2000	0288.3	030.8	61.94
325.0	100.0000	0320.2	073.9	051.3	001.2000	0288.4	032.1	61.27
326.0	100.0000	0321.1	074.0	051.4	001.2000	0288.4	033.4	60.63
327.0	100.0000	0323.4	074.1	051.2	001.2000	0288.3	034.7	59.99
328.0	100.0000	0324.0	074.2	051.4	001.2000	0288.4	036.0	59.37
329.0	100.0000	0324.3	074.2	051.6	001.2000	0288.5	037.2	58.76
330.0	100.0000	0324.9	074.2	051.8	001.2000	0288.5	038.5	58.16
331.0	100.0000	0324.2	074.2	052.1	001.2000	0288.6	039.8	57.58
332.0	100.0000	0326.5	074.4	052.1	001.2000	0288.6	041.1	57.00

***Exhibit 7c***  
**Contour Protection Studies Toward Select Allocation Concern(s)**

FMCommander Single Allocation Study - 01-26-2024 - NED 03 SEC  
WHBP.P's Overlaps (In= 15.99 km, Out= 10.87 km)

WHBP.P CH 211 C3 DA  
Lat= 45 30 05.20, Lng= 85 01 48.90  
1.2 kW 300.3 m HAAT, 533.4 m COR  
Prot.= 60 dBu, Intef.= 54 dBu

WHWG CH 210 A BLED20090831ACU  
Lat= 46 11 17.00, Lng= 84 56 46.20  
1.0 kW 119 m HAAT, 369 m COR  
Prot.= 60 dBu, Intef.= 54 dBu



# ***Exhibit 7c***

## **Contour Protection Studies Toward Select Allocation Concern(s)**

01-26-2024

Terrain Data: NED 03 SEC

FMOver Analysis

WHBP.P

WHWG BLED20090831ACU

Channel = 211C3  
 Max ERP = 1.2 kW  
 RCAMSL = 533.4 m  
 N. Lat. 45 30 05.20  
 W. Lng. 85 01 48.90  
 Protected  
 60 dBu

Channel = 210A  
 Max ERP = 1 kW  
 RCAMSL = 369 m  
 N. Lat. 46 11 17.00  
 W. Lng. 84 56 46.20  
 Interfering  
 54 dBu

Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Actual (dBu)	IX (km)
325.0	001.2000	0282.6	031.7	206.1	001.0000	0128.2	056.1	43.20	
326.0	001.2000	0281.5	031.6	205.8	001.0000	0128.3	055.7	43.38	
327.0	001.2000	0279.9	031.5	205.4	001.0000	0128.4	055.2	43.54	
328.0	001.2000	0278.5	031.4	205.0	001.0000	0128.4	054.8	43.71	
329.0	001.2000	0277.1	031.4	204.6	001.0000	0128.3	054.4	43.86	
330.0	001.2000	0275.5	031.3	204.2	001.0000	0128.3	054.0	44.02	
331.0	001.2000	0273.9	031.2	203.8	001.0000	0128.3	053.6	44.16	
332.0	001.2000	0271.5	031.0	203.3	001.0000	0128.3	053.3	44.30	
333.0	001.2000	0269.4	030.9	202.9	001.0000	0128.4	052.9	44.44	
334.0	001.2000	0267.5	030.8	202.4	001.0000	0128.3	052.6	44.56	
335.0	001.2000	0265.7	030.7	201.9	001.0000	0128.3	052.3	44.69	
336.0	001.2000	0263.6	030.6	201.4	001.0000	0128.2	052.0	44.80	
337.0	001.2000	0262.1	030.5	200.9	001.0000	0128.0	051.6	44.92	
338.0	001.2000	0258.0	030.3	200.3	001.0000	0128.0	051.5	44.99	
339.0	001.2000	0254.6	030.1	199.7	001.0000	0127.9	051.2	45.06	
340.0	001.2000	0252.4	030.0	199.2	001.0000	0128.0	051.0	45.16	
341.0	001.2000	0251.3	029.9	198.7	001.0000	0128.1	050.7	45.28	
342.0	001.2000	0252.0	029.9	198.2	001.0000	0128.3	050.4	45.42	
343.0	001.2000	0253.5	030.0	197.8	001.0000	0128.2	050.0	45.56	
344.0	001.2000	0253.3	030.0	197.3	001.0000	0128.3	049.7	45.68	
345.0	001.2000	0252.7	030.0	196.8	001.0000	0128.2	049.5	45.77	
346.0	001.2000	0252.6	030.0	196.3	001.0000	0127.9	049.2	45.86	
347.0	001.2000	0252.1	029.9	195.7	001.0000	0127.7	049.0	45.94	
348.0	001.2000	0252.5	030.0	195.2	001.0000	0127.5	048.7	46.03	
349.0	001.2000	0254.1	030.1	194.7	001.0000	0127.5	048.4	46.15	
350.0	001.2000	0255.9	030.2	194.2	001.0000	0127.3	048.1	46.26	
351.0	001.2000	0257.5	030.2	193.6	001.0000	0127.3	047.8	46.37	
352.0	001.2000	0257.8	030.3	193.0	001.0000	0127.2	047.6	46.45	
353.0	001.2000	0256.5	030.2	192.4	001.0000	0127.0	047.5	46.49	
354.0	001.2000	0256.9	030.2	191.8	001.0000	0126.9	047.3	46.56	
355.0	001.2000	0257.6	030.3	191.2	001.0000	0126.6	047.1	46.62	

***Exhibit 7c***  
**Contour Protection Studies Toward Select Allocation Concern(s)**

Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Actual (dBu)
356.0	001.2000	0257.6	030.3	190.6	001.0000	0126.5	047.0	46.67
357.0	001.2000	0256.5	030.2	189.9	001.0000	0126.2	046.9	46.68
358.0	001.2000	0255.1	030.1	189.3	001.0000	0125.9	046.9	46.68
359.0	001.2000	0252.7	030.0	188.6	001.0000	0126.0	046.9	46.67
000.0	001.2000	0250.6	029.9	188.0	001.0000	0125.8	046.9	46.63
001.0	001.2000	0247.6	029.7	187.3	001.0000	0125.6	047.0	46.59
002.0	001.2000	0246.9	029.7	186.7	001.0000	0125.5	047.0	46.58
003.0	001.2000	0246.3	029.6	186.1	001.0000	0125.5	047.0	46.58
004.0	001.2000	0245.7	029.6	185.4	001.0000	0125.6	047.0	46.58
005.0	001.2000	0244.7	029.5	184.8	001.0000	0125.7	047.1	46.57
006.0	001.2000	0244.8	029.5	184.2	001.0000	0125.7	047.1	46.57
007.0	001.2000	0245.9	029.6	183.6	001.0000	0126.2	047.1	46.61
008.0	001.2000	0248.5	029.7	182.9	001.0000	0126.1	046.9	46.65
009.0	001.2000	0252.2	029.9	182.2	001.0000	0125.9	046.8	46.70
010.0	001.2000	0253.7	030.0	181.6	001.0000	0126.1	046.8	46.71
011.0	001.2000	0255.1	030.1	181.0	001.0000	0126.2	046.8	46.72
012.0	001.2000	0255.0	030.1	180.3	001.0000	0126.4	046.9	46.68
013.0	001.2000	0254.8	030.1	179.7	001.0000	0126.5	047.0	46.64
014.0	001.2000	0255.5	030.1	179.1	001.0000	0126.4	047.1	46.60
015.0	001.2000	0256.8	030.2	178.4	001.0000	0126.5	047.2	46.57
016.0	001.2000	0257.6	030.3	177.8	001.0000	0126.6	047.3	46.53
017.0	001.2000	0258.6	030.3	177.2	001.0000	0126.7	047.4	46.50
018.0	001.2000	0260.3	030.4	176.5	001.0000	0127.1	047.5	46.47
019.0	001.2000	0262.3	030.5	175.9	001.0000	0127.1	047.6	46.44
020.0	001.2000	0264.3	030.6	175.2	001.0000	0127.1	047.7	46.39
021.0	001.2000	0265.7	030.7	174.6	001.0000	0127.3	047.9	46.34
022.0	001.2000	0266.8	030.8	174.0	001.0000	0127.5	048.1	46.28
023.0	001.2000	0268.7	030.9	173.4	001.0000	0127.4	048.2	46.21
024.0	001.2000	0270.5	031.0	172.8	001.0000	0127.2	048.4	46.13
025.0	001.2000	0270.6	031.0	172.2	001.0000	0127.3	048.7	46.02
026.0	001.2000	0271.4	031.0	171.7	001.0000	0127.4	049.0	45.93
027.0	001.2000	0272.2	031.1	171.1	001.0000	0127.3	049.2	45.81
028.0	001.2000	0273.3	031.1	170.6	001.0000	0127.4	049.5	45.71
029.0	001.2000	0274.0	031.2	170.1	001.0000	0127.5	049.8	45.60
030.0	001.2000	0273.4	031.1	169.6	001.0000	0127.5	050.2	45.45
031.0	001.2000	0272.9	031.1	169.2	001.0000	0127.2	050.6	45.29
032.0	001.2000	0273.6	031.2	168.7	001.0000	0127.2	050.9	45.15
033.0	001.2000	0274.2	031.2	168.2	001.0000	0127.4	051.3	45.03
034.0	001.2000	0274.3	031.2	167.8	001.0000	0127.4	051.7	44.88
035.0	001.2000	0274.9	031.2	167.4	001.0000	0127.6	052.0	44.74
036.0	001.2000	0274.9	031.2	167.0	001.0000	0128.0	052.4	44.60
037.0	001.2000	0275.6	031.3	166.5	001.0000	0128.3	052.8	44.47
038.0	001.2000	0273.9	031.2	166.3	001.0000	0128.6	053.3	44.30

# ***Exhibit 7c***

## **Contour Protection Studies Toward Select Allocation Concern(s)**

01-26-2024

Terrain Data: NED 03 SEC

FMOver Analysis

WHWG BLED20090831ACU

WHBP.P

Channel = 210A

Max ERP = 1 kW

RCAMSL = 369 m

N. Lat. 46 11 17.00

W. Lng. 84 56 46.20

Protected

60 dBu

Channel = 211C3

Max ERP = 1.2 kW

RCAMSL = 533.4 m

N. Lat. 45 30 05.20

W. Lng. 85 01 48.90

Interfering

54 dBu

Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Actual (dBu)	IX (km)
140.0	001.0000	0119.8	020.4	017.9	001.2000	0260.0	063.8	46.95	
141.0	001.0000	0121.1	020.5	017.8	001.2000	0259.8	063.5	47.07	
142.0	001.0000	0122.6	020.6	017.7	001.2000	0259.5	063.1	47.19	
143.0	001.0000	0123.8	020.7	017.6	001.2000	0259.1	062.8	47.31	
144.0	001.0000	0124.3	020.7	017.4	001.2000	0258.9	062.4	47.41	
145.0	001.0000	0124.2	020.7	017.2	001.2000	0258.9	062.2	47.52	
146.0	001.0000	0124.5	020.7	017.0	001.2000	0258.7	061.9	47.62	
147.0	001.0000	0125.2	020.8	016.8	001.2000	0258.6	061.5	47.73	
148.0	001.0000	0125.7	020.8	016.6	001.2000	0258.5	061.2	47.84	
149.0	001.0000	0126.6	020.9	016.5	001.2000	0258.3	060.9	47.95	
150.0	001.0000	0127.6	021.0	016.3	001.2000	0258.0	060.6	48.06	
151.0	001.0000	0128.7	021.1	016.1	001.2000	0257.7	060.3	48.18	
152.0	001.0000	0129.7	021.1	015.9	001.2000	0257.4	060.0	48.28	
153.0	001.0000	0131.8	021.3	015.7	001.2000	0257.3	059.6	48.42	
154.0	001.0000	0133.0	021.4	015.5	001.2000	0257.2	059.3	48.54	
155.0	001.0000	0133.5	021.4	015.3	001.2000	0257.0	059.0	48.64	
156.0	001.0000	0134.0	021.4	015.0	001.2000	0256.8	058.8	48.73	
157.0	001.0000	0134.7	021.5	014.8	001.2000	0256.4	058.5	48.83	
158.0	001.0000	0135.3	021.5	014.5	001.2000	0256.1	058.2	48.92	
159.0	001.0000	0135.5	021.6	014.2	001.2000	0255.8	058.0	49.00	
160.0	001.0000	0135.3	021.5	013.9	001.2000	0255.4	057.8	49.06	
161.0	001.0000	0134.9	021.5	013.6	001.2000	0255.3	057.6	49.13	
162.0	001.0000	0134.0	021.4	013.2	001.2000	0255.1	057.5	49.18	
163.0	001.0000	0133.3	021.4	012.9	001.2000	0254.6	057.3	49.22	
164.0	001.0000	0132.0	021.3	012.5	001.2000	0254.7	057.2	49.26	
165.0	001.0000	0130.5	021.2	012.1	001.2000	0254.9	057.1	49.30	
166.0	001.0000	0129.0	021.1	011.7	001.2000	0255.1	057.1	49.33	
167.0	001.0000	0127.9	021.0	011.3	001.2000	0255.1	057.0	49.36	
168.0	001.0000	0127.4	021.0	011.0	001.2000	0255.1	056.9	49.41	
169.0	001.0000	0127.2	020.9	010.7	001.2000	0254.7	056.8	49.45	
170.0	001.0000	0127.5	021.0	010.3	001.2000	0254.3	056.6	49.49	
171.0	001.0000	0127.4	021.0	010.0	001.2000	0253.7	056.5	49.52	
172.0	001.0000	0127.3	021.0	009.6	001.2000	0253.3	056.4	49.55	

***Exhibit 7c***  
**Contour Protection Studies Toward Select Allocation Concern(s)**

Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Actual (dBu)
173.0	001.0000	0127.3	021.0	009.3	001.2000	0253.0	056.3	49.58
174.0	001.0000	0127.4	021.0	008.9	001.2000	0251.8	056.2	49.58
175.0	001.0000	0127.2	020.9	008.5	001.2000	0250.4	056.1	49.56
176.0	001.0000	0127.1	020.9	008.2	001.2000	0249.1	056.0	49.54
177.0	001.0000	0126.8	020.9	007.8	001.2000	0247.8	056.0	49.52
178.0	001.0000	0126.6	020.9	007.4	001.2000	0246.7	055.9	49.50
179.0	001.0000	0126.4	020.9	007.0	001.2000	0246.0	055.9	49.49
180.0	001.0000	0126.4	020.9	006.7	001.2000	0245.2	055.8	49.48
181.0	001.0000	0126.2	020.9	006.3	001.2000	0244.8	055.8	49.48
182.0	001.0000	0125.9	020.8	005.9	001.2000	0244.8	055.8	49.48
183.0	001.0000	0126.1	020.9	005.6	001.2000	0244.6	055.8	49.48
184.0	001.0000	0125.8	020.8	005.2	001.2000	0244.5	055.8	49.48
185.0	001.0000	0125.6	020.8	004.8	001.2000	0245.0	055.8	49.49
186.0	001.0000	0125.5	020.8	004.4	001.2000	0245.6	055.8	49.50
187.0	001.0000	0125.7	020.8	004.1	001.2000	0245.7	055.8	49.51
188.0	001.0000	0125.8	020.8	003.7	001.2000	0245.7	055.8	49.50
189.0	001.0000	0126.0	020.9	003.3	001.2000	0246.0	055.8	49.51
190.0	001.0000	0126.3	020.9	002.9	001.2000	0246.4	055.9	49.52
191.0	001.0000	0126.6	020.9	002.6	001.2000	0246.7	055.9	49.51
192.0	001.0000	0127.0	020.9	002.2	001.2000	0246.7	055.9	49.50
193.0	001.0000	0127.2	020.9	001.8	001.2000	0247.0	056.0	49.49
194.0	001.0000	0127.3	021.0	001.5	001.2000	0246.8	056.0	49.46
195.0	001.0000	0127.5	021.0	001.1	001.2000	0247.3	056.1	49.45
196.0	001.0000	0127.8	021.0	000.7	001.2000	0248.5	056.2	49.47
197.0	001.0000	0128.3	021.0	000.4	001.2000	0249.6	056.2	49.48
198.0	001.0000	0128.3	021.0	360.0	001.2000	0250.6	056.3	49.47
199.0	001.0000	0128.1	021.0	359.6	001.2000	0251.5	056.5	49.45
200.0	001.0000	0127.9	021.0	359.3	001.2000	0252.1	056.6	49.42
201.0	001.0000	0128.1	021.0	359.0	001.2000	0252.8	056.7	49.39
202.0	001.0000	0128.3	021.0	358.6	001.2000	0253.7	056.9	49.37
203.0	001.0000	0128.4	021.0	358.3	001.2000	0254.6	057.0	49.35
204.0	001.0000	0128.3	021.0	357.9	001.2000	0255.2	057.2	49.31
205.0	001.0000	0128.4	021.0	357.6	001.2000	0255.8	057.3	49.26
206.0	001.0000	0128.2	021.0	357.3	001.2000	0256.2	057.5	49.20
207.0	001.0000	0128.0	021.0	357.0	001.2000	0256.6	057.7	49.14
208.0	001.0000	0127.8	021.0	356.7	001.2000	0257.0	057.9	49.08
209.0	001.0000	0127.4	021.0	356.4	001.2000	0257.4	058.1	49.01
210.0	001.0000	0127.3	021.0	356.1	001.2000	0257.6	058.3	48.93
211.0	001.0000	0127.2	020.9	355.8	001.2000	0257.7	058.5	48.85
212.0	001.0000	0127.0	020.9	355.5	001.2000	0257.6	058.8	48.76
213.0	001.0000	0126.5	020.9	355.2	001.2000	0257.7	059.0	48.67
214.0	001.0000	0125.8	020.8	355.0	001.2000	0257.6	059.3	48.56
215.0	001.0000	0125.3	020.8	354.8	001.2000	0257.4	059.5	48.46
216.0	001.0000	0125.1	020.8	354.5	001.2000	0257.2	059.8	48.35

# ***Exhibit 8***

## ***Tabulation of Proposed Directional Antenna Pattern***

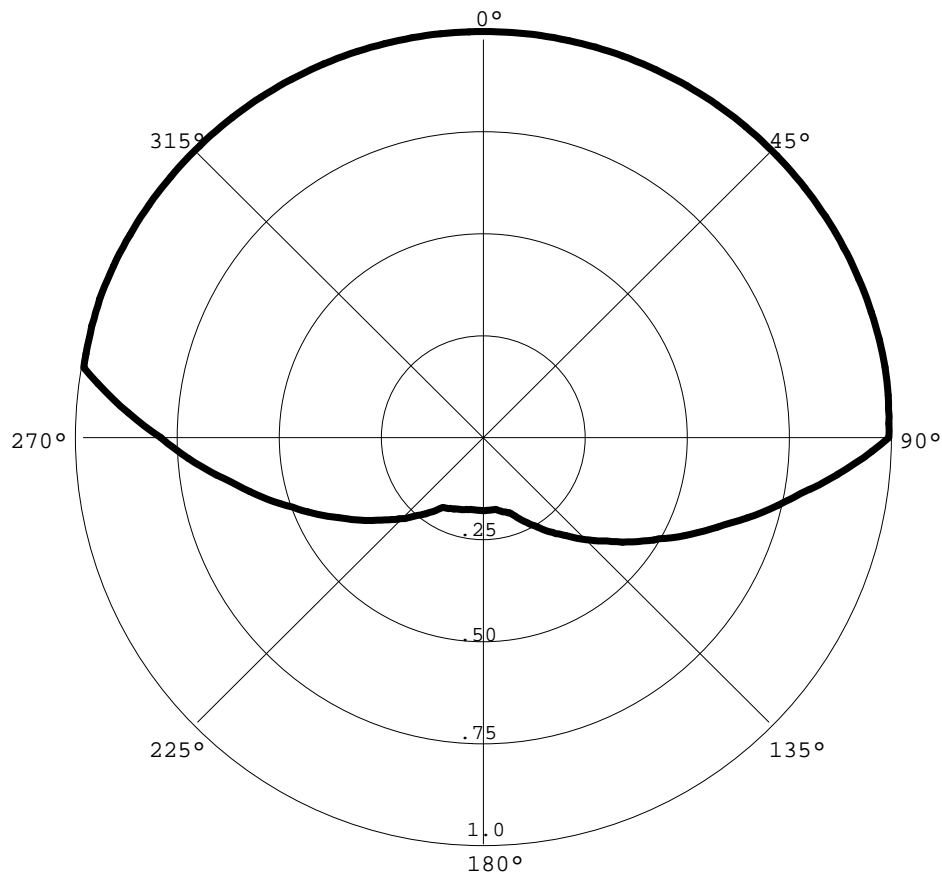
WHBP.P

01-26-2024

RMS(V)= .769

Graph is Relative Field

Azi	Field	dBk	kW
000	1.000	00.792	1.200
010	1.000	00.792	1.200
020	1.000	00.792	1.200
030	1.000	00.792	1.200
040	1.000	00.792	1.200
050	1.000	00.792	1.200
060	1.000	00.792	1.200
070	1.000	00.792	1.200
080	1.000	00.792	1.200
090	0.994	00.740	1.186
100	0.790	-01.256	0.749
110	0.627	-03.263	0.472
120	0.498	-05.264	0.298
130	0.396	-07.254	0.188
140	0.314	-09.270	0.118
150	0.250	-11.249	0.075
160	0.198	-13.275	0.047
170	0.179	-14.151	0.038
180	0.179	-14.151	0.038
190	0.179	-14.151	0.038
200	0.187	-13.771	0.042
210	0.198	-13.275	0.047
220	0.250	-11.249	0.075
230	0.314	-09.270	0.118
240	0.396	-07.254	0.188
250	0.498	-05.264	0.298
260	0.627	-03.263	0.472
270	0.790	-01.256	0.749
280	0.994	00.740	1.186
290	1.000	00.792	1.200
300	1.000	00.792	1.200
310	1.000	00.792	1.200
320	1.000	00.792	1.200
330	1.000	00.792	1.200
340	1.000	00.792	1.200
350	1.000	00.792	1.200



The antenna proposed in this application will be mounted in accordance with specific instructions provided by the antenna manufacturer. The antenna will be tested by the manufacturer using the type of mounting which will be employed in the field.

No other antennas of any type are or will be mounted on the same tower level as the directional antenna nor will any antenna be mounted within any vertical or horizontal distance specified by the antenna manufacturer as being necessary for proper operation of the directional antenna. The antenna will be assembled under the supervision of a qualified engineer, who will provide the required certification. This statement will certify that the antenna has been installed pursuant to the manufacturer's instructions. Also upon completion of antenna construction, a statement from a licensed surveyor will be submitted with the application for license certifying the antenna has been installed in the proper orientation.

The antenna pattern will be measured by the manufacturer on the test range, and the measurement results will be supplied to the Commission at the time Form 302-FM is filed covering the construction.