



Comprehensive Engineering Statement

7/9/2020

State of Wisconsin - Educational Communications Board

This minor-change application for permit to construct requests a channel change and power increase authorization for translator W215AQ. This proposal will continue to be for a fill-in facility. The coordinates and antenna height will not change.

New channel proposed: CH 213, 90.5 MHz

New ERP: 250 watts, 0.25 kW

Coordinates (NAD 83): 43-03-21.00 N. Lat, 89-32-06.40 W. Long

Antenna C.O.R. height above ground, 125 m

Elevation at the site, 343 m

Antenna C.O.R. AMSL, 468 m

Tower height above ground, 433.7 m, tower ID= 1033919

Page #2 of this statement is a contour-to-contour study of the proposed channel. This shows that, except for WORT, the proposed facility causes no contour overlap.

Protection to 3rd adjacent WORT:

The proposed 250-watt facility is located 3.94 km from WORT. The proposed translator antenna is 175 meters above the ground. At this antenna height and distance from WORT, the WORT signal strength at the translator is 95.08 dBu. Based on the U-to-D ratio, the translator can be 40 dB above the WORT signal at the translator, therefore the translator must be 135.08 dBu before it causes interference. The 135.08 dBu signal of the translator¹ travels only 19.54 meters and therefore never reaches the ground.

Pages #3 through #14, compose an allocation study that shows that all the Commission's rules under section 74.1204, regarding protection to other stations and translators, have been followed. Note that the GLOBE terrain database was used throughout this application.

Page #15 is a coverage map showing the 60 dBu of the proposed facility and that of the existing facility. Note that the proposed 60 dBu coverage contour is entirely contained within the existing 60 dBu coverage. Since the translator is not to be physically moved, this map shows that the proposed 60 dBu contour overlaps with the existing 60 dBu contour, as is required under the rules. The map is followed by a distance-to-contour table for the proposed and existing facilities.

Due to the low power radiated and the relatively high antenna height, provided by the existing tower, using OET formulas, we see that this translator produces a mere 0.040 $\mu\text{W}/\text{cm}^2$ at head height. No further analysis of the emissions impact to the public or workers was deemed necessary.

¹ Without considering the impact of the vertical elevation field, the antenna can be considered worst case

Doug Vernier, Telecommunication Consultants
V-Soft Communications

W215AQ Contour-to-Contour Channel Study - outgoing only
State Of Wisconsin - Educational Communications Board
CH# 213D - 90.5 MHz, Pwr= 0.25 kW, HAAT= 165.9 M, COR= 468 M
Average Protected F(50-50)= 16.88 km
Omni-directional

DISPLAY DATES
DATA 07-09-20
SEARCH 07-09-20

REFERENCE
43 03 21.00 N.
89 32 06.40 W.

CH CITY	CALL	TYPE ANT STATE	AZI <--	DIST FILE #	LAT LNG	PWR(kW) HAAT(M)	INT(km) COR(M)	PRO(km) LICENSEE	*OUT* (Overlap in km)
210B1 WORT Madison		LIC ___ WI	98.1 278.1	3.94 BLED19990208KB	43 03 03.00 89 29 13.40	2.000 286	2.6 582	33.4 Back Porch Radio Broadcast	-30.6* < **
215D W215AQ Madison		LIC ___ WI	0.0 0.0	0.00 BLFT20140710ADB	43 03 21.00 89 32 06.40	0.026	468	---Reference--- State Of Wisconsin - Educa	
212B1 WJWD Marshall		LIC D___ WI	47.4 227.7	47.50 BLED20030213AAJ	43 20 40.00 89 06 10.40	9.900 95	25.7 380	17.4 Calvary Radio Network, Inc	2.8
214B WHAD Delefield		LIC ___ WI	91.5 272.3	92.90 BLED20030129AIT	43 01 42.00 88 23 32.30	72.000 208	92.5 487	62.7 State Of Wisconsin - Educa	3.6
216D W216BL McFarland		LIC ___ WI	91.7 271.9	20.56 BLFT20020114AAS	43 03 00.00 89 16 55.40	0.120 30	0.8 305	5.9 Vcy America, Inc.	13.6
213A WSUP Platteville		LIC ___ WI	245.4 64.8	85.38 BLED19910227KA	42 43 56.90 90 29 09.40	1.000 45	35.6 337	10.2 Board Of Regents, Universi	24.1
213B WNIU Rockford		LIC D___ IL	159.1 339.5	123.65 BLED19910411KA	42 00 55.10 89 00 07.30	50.000 112	92.4 364	32.4 Northern Illinois Universi	39.5
06 -- WDXN-LD« Dixon		CP ___N IL	166.9 347.1	120.92 BNPDVL-20090825B0Q	42 18 58.90 91 51 31.61	0.300	6.8 453	18.0 24.8R	96.1M

Terrain database is GLOBE 30 Sec, R= 73.215 qualifying spacings or FCC minimum Spacings in KM, M= Margin in KM
Contour distances are on direct line to and from reference station. Reference zone= East Zone, Co to 3rd adjacent.
Ant Column: (D= DA Standard, Z= DA 73.215, N= Not DA 73.215, _= Omni), Polarization (C,H,V,E), Beamtilt(Y,N,X)
Incoming contour overlap is ignored.

***affixed to 'IN' or 'OUT' values = site inside restricted contour.

< ** Please see page #1, the comprehensive engineering statement for how WORT is protected from interference.

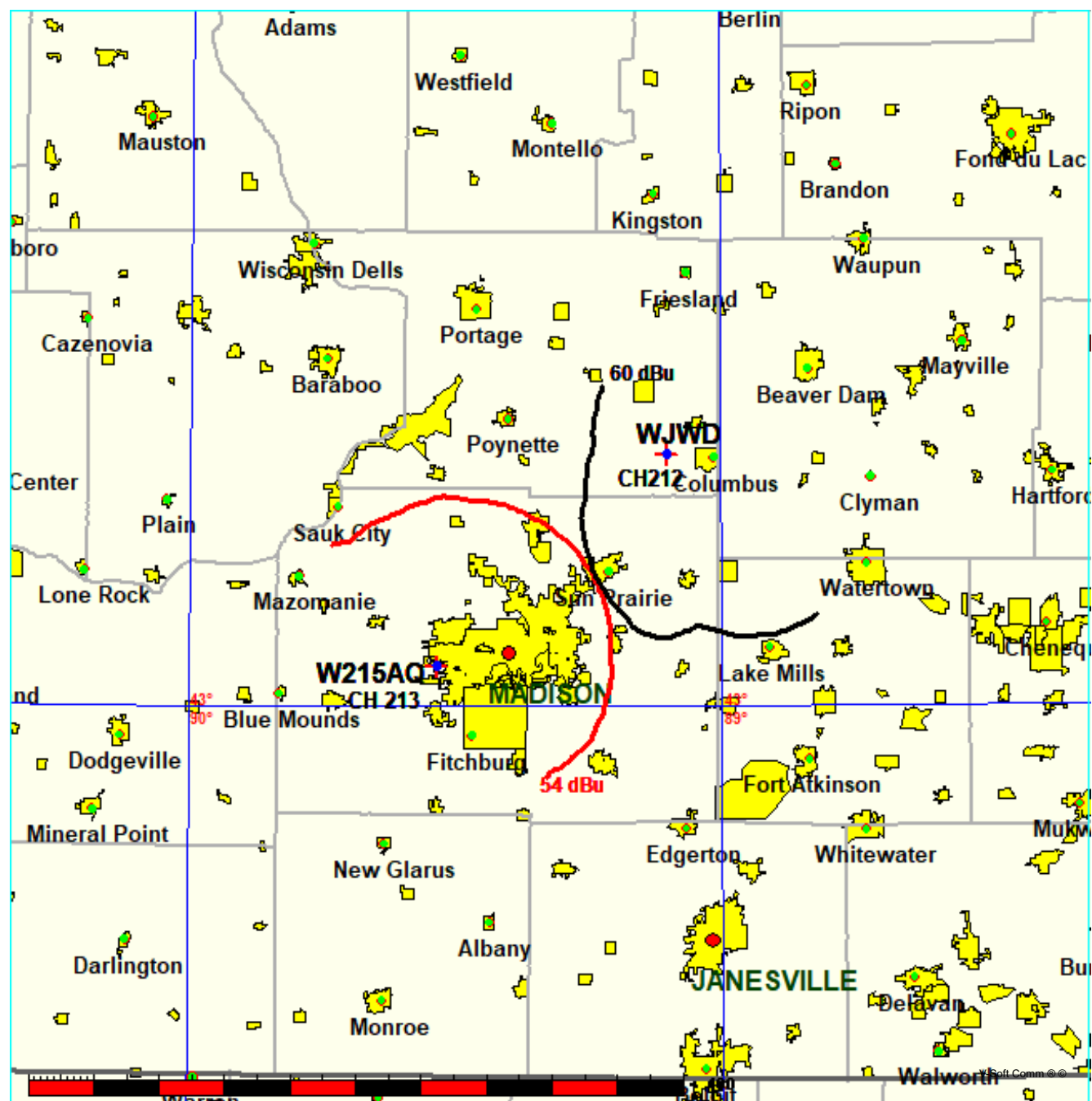
FMCommander Single Allocation Study - 07-09-2020 - GLOBE 30 Sec
W215AQ's Overlaps (In= 1.41 km, Out= 0.22 km)

W215AQ CH 213 D

Lat= 43 03 21.00, Lng= 89 32 06.40
0.25 kW 165.9 m HAAT, 468 m COR
Prot.= 60 dBu, Intef.= 54 dBu

WJWD CH 212 B1 DA BLED20030213AAJ

Lat= 43 20 40.00, Lng= 89 06 10.40
9.9 kW 95 m HAAT, 380 m COR
Prot.= 60 dBu, Intef.= 54 dBu



WJWD BLED20030213AAJ

W215AQ

Channel = 212B1
 Max ERP = 9.9 kW
 RCAMSL = 380 m
 N. Lat. 43 20 40.00
 W. Lng. 89 06 10.40
 Protected F-(50-50)
 60 dBu

Channel = 213D
 Max ERP = 0.25 kW
 RCAMSL = 468 m
 N. Lat. 43 03 21.00
 W. Lng. 89 32 06.40
 Interfering F(50-10)
 54 dBu

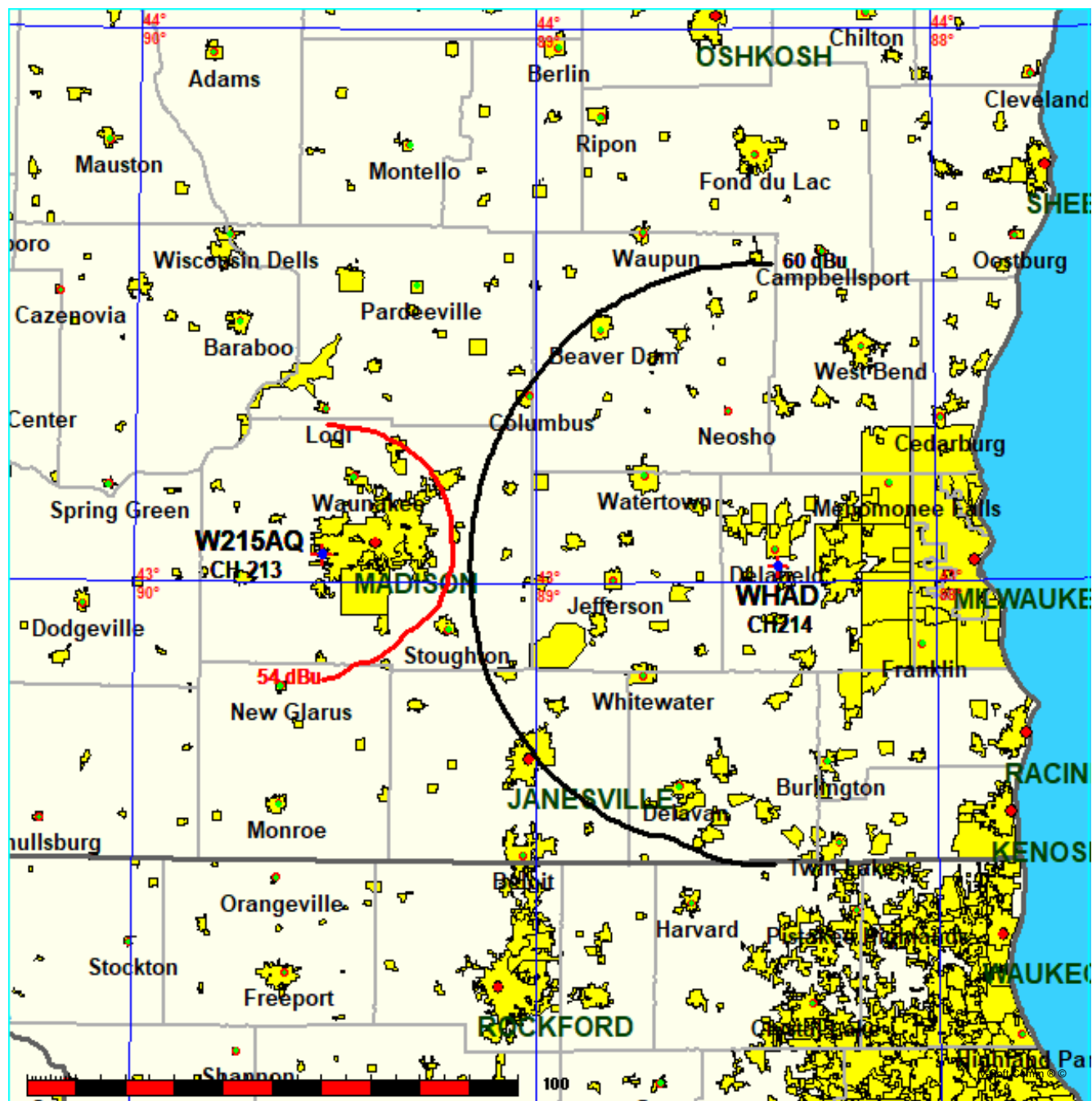
Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Actual (dBu)	IX (km)
168.0	006.1131	0089.4	026.9	081.8	000.2500	0185.2	041.1	46.14	
169.0	005.8150	0090.1	026.7	081.6	000.2500	0185.5	040.6	46.37	
170.0	005.5243	0090.7	026.5	081.3	000.2500	0185.9	040.2	46.61	
171.0	005.6000	0091.4	026.7	081.5	000.2500	0185.5	039.7	46.81	
172.0	005.6762	0091.9	026.9	081.8	000.2500	0185.2	039.2	47.02	
173.0	005.7529	0092.4	027.0	082.0	000.2500	0185.0	038.8	47.23	
174.0	005.8301	0092.7	027.1	082.2	000.2500	0184.8	038.3	47.46	
175.0	005.9079	0092.9	027.2	082.3	000.2500	0184.7	037.8	47.68	
176.0	005.9862	0093.5	027.4	082.5	000.2500	0184.6	037.3	47.91	
177.0	006.0649	0094.1	027.6	082.7	000.2500	0184.4	036.8	48.15	
178.0	006.1442	0094.7	027.7	082.9	000.2500	0184.3	036.3	48.39	
179.0	006.2240	0094.9	027.8	083.0	000.2500	0184.3	035.8	48.64	
180.0	006.3044	0095.2	028.0	083.1	000.2500	0184.2	035.3	48.89	
181.0	006.2791	0095.4	028.0	083.0	000.2500	0184.3	034.9	49.14	
182.0	006.2539	0095.3	027.9	082.9	000.2500	0184.4	034.4	49.39	
183.0	006.2287	0095.2	027.9	082.7	000.2500	0184.5	033.9	49.64	
184.0	006.2036	0094.7	027.8	082.4	000.2500	0184.7	033.4	49.89	
185.0	006.1786	0094.1	027.7	082.0	000.2500	0185.0	033.0	50.14	
186.0	006.1536	0093.5	027.6	081.6	000.2500	0185.5	032.6	50.40	
187.0	006.1286	0093.0	027.5	081.2	000.2500	0186.0	032.1	50.66	
188.0	006.1037	0092.4	027.4	080.8	000.2500	0186.7	031.7	50.92	
189.0	006.0789	0091.4	027.2	080.3	000.2500	0187.6	031.3	51.18	
190.0	006.0541	0090.6	027.1	079.7	000.2500	0188.5	030.9	51.45	
191.0	005.8074	0090.0	026.7	078.8	000.2500	0189.9	030.6	51.69	
192.0	005.5658	0089.3	026.4	077.9	000.2500	0191.2	030.3	51.92	
193.0	005.3293	0088.5	026.0	076.9	000.2500	0192.1	030.0	52.11	
194.0	005.0980	0087.5	025.6	075.8	000.2500	0192.6	029.8	52.27	
195.0	004.8718	0086.7	025.2	074.8	000.2500	0192.9	029.6	52.41	
196.0	004.6508	0086.8	025.0	073.9	000.2500	0193.1	029.3	52.57	
197.0	004.4348	0087.3	024.8	073.1	000.2500	0193.3	029.1	52.74	
198.0	004.2240	0087.9	024.6	072.3	000.2500	0193.5	028.8	52.90	
199.0	004.0184	0088.3	024.4	071.5	000.2500	0193.8	028.6	53.04	
200.0	003.8178	0088.5	024.1	070.6	000.2500	0194.3	028.4	53.18	
201.0	003.6621	0088.3	023.9	069.6	000.2500	0194.9	028.3	53.30	

Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Actual (dBu)
202.0	003.5096	0087.7	023.6	068.6	000.2500	0195.6	028.2	53.40
203.0	003.3603	0087.2	023.3	067.6	000.2500	0196.0	028.1	53.47
204.0	003.2143	0087.0	023.0	066.6	000.2500	0196.1	028.0	53.54
205.0	003.0715	0086.9	022.7	065.7	000.2500	0196.2	027.9	53.59
206.0	002.9319	0086.8	022.5	064.7	000.2500	0196.4	027.9	53.63
207.0	002.7956	0086.8	022.2	063.8	000.2500	0196.8	027.8	53.68
208.0	002.6626	0087.1	022.0	062.8	000.2500	0197.4	027.8	53.74
209.0	002.5328	0087.4	021.8	061.9	000.2500	0197.9	027.7	53.79
210.0	002.4062	0087.9	021.6	061.1	000.2500	0198.3	027.7	53.82
211.0	002.3086	0088.2	021.4	060.2	000.2500	0198.4	027.7	53.86
212.0	002.2130	0088.1	021.2	059.3	000.2500	0198.4	027.7	53.84
213.0	002.1195	0087.6	020.9	058.4	000.2500	0198.2	027.8	53.77
214.0	002.0280	0086.6	020.6	057.4	000.2500	0197.6	027.9	53.65
215.0	001.9385	0085.8	020.3	056.5	000.2500	0197.1	028.1	53.52
216.0	001.8510	0085.1	020.0	055.6	000.2500	0196.9	028.3	53.41
217.0	001.7655	0084.8	019.7	054.7	000.2500	0197.2	028.4	53.32
218.0	001.6821	0084.6	019.4	053.9	000.2500	0197.6	028.5	53.25
219.0	001.6007	0084.8	019.2	053.1	000.2500	0198.1	028.7	53.19
220.0	001.5213	0085.2	019.0	052.4	000.2500	0198.6	028.8	53.14
221.0	001.4416	0085.8	018.8	051.7	000.2500	0199.0	028.9	53.08
222.0	001.3641	0086.2	018.6	051.0	000.2500	0199.1	029.1	52.99
223.0	001.2887	0086.4	018.3	050.3	000.2500	0199.1	029.3	52.87
224.0	001.2155	0086.7	018.1	049.6	000.2500	0198.6	029.5	52.72
225.0	001.1444	0086.9	017.8	049.0	000.2500	0198.0	029.7	52.55
226.0	001.1057	0087.1	017.7	048.3	000.2500	0197.4	029.8	52.45
227.0	001.0677	0087.1	017.5	047.7	000.2500	0196.7	030.0	52.33
228.0	001.0303	0087.0	017.3	047.2	000.2500	0196.2	030.2	52.19
229.0	000.9936	0086.9	017.1	046.6	000.2500	0195.7	030.4	52.06
230.0	000.9575	0086.8	017.0	046.1	000.2500	0195.2	030.6	51.93
231.0	000.9185	0086.9	016.8	045.5	000.2500	0194.7	030.8	51.78
232.0	000.8803	0086.9	016.6	045.0	000.2500	0194.2	031.0	51.63
233.0	000.8430	0086.8	016.4	044.6	000.2500	0193.8	031.2	51.47
234.0	000.8064	0086.7	016.1	044.1	000.2500	0193.4	031.5	51.31
235.0	000.7706	0086.5	015.9	043.7	000.2500	0193.1	031.8	51.14
236.0	000.7357	0086.1	015.7	043.3	000.2500	0192.8	032.1	50.97
237.0	000.7015	0085.3	015.4	042.9	000.2500	0192.5	032.4	50.78
238.0	000.6682	0084.1	015.1	042.6	000.2500	0192.3	032.8	50.58
239.0	000.6357	0082.9	014.8	042.3	000.2500	0192.2	033.2	50.38
240.0	000.6040	0081.8	014.5	042.1	000.2500	0192.0	033.5	50.18
241.0	000.5967	0080.7	014.3	041.7	000.2500	0191.8	033.7	50.06
242.0	000.5894	0079.5	014.2	041.4	000.2500	0191.7	034.0	49.94
243.0	000.5822	0078.3	014.0	041.1	000.2500	0191.6	034.2	49.82
244.0	000.5750	0077.3	013.9	040.8	000.2500	0191.5	034.4	49.71
245.0	000.5679	0076.6	013.8	040.5	000.2500	0191.4	034.6	49.60
246.0	000.5608	0076.1	013.7	040.2	000.2500	0191.4	034.8	49.51
247.0	000.5537	0075.4	013.6	040.0	000.2500	0191.3	035.0	49.41
248.0	000.5467	0074.4	013.5	039.7	000.2500	0191.3	035.2	49.29
249.0	000.5398	0073.2	013.3	039.5	000.2500	0191.4	035.4	49.18
250.0	000.5329	0072.0	013.2	039.3	000.2500	0191.4	035.7	49.05
251.0	000.5192	0071.0	013.0	039.1	000.2500	0191.4	035.9	48.93
252.0	000.5057	0070.6	012.9	038.9	000.2500	0191.4	036.1	48.82

Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Actual (dBu)
253.0	000.4923	0070.5	012.8	038.7	000.2500	0191.4	036.3	48.72
254.0	000.4792	0070.6	012.8	038.4	000.2500	0191.3	036.5	48.62
255.0	000.4662	0070.9	012.7	038.2	000.2500	0191.3	036.7	48.53
256.0	000.4534	0071.2	012.6	038.0	000.2500	0191.2	036.9	48.44
257.0	000.4408	0071.4	012.6	037.8	000.2500	0191.1	037.1	48.34
258.0	000.4283	0071.6	012.5	037.6	000.2500	0191.0	037.3	48.24
259.0	000.4160	0071.8	012.4	037.4	000.2500	0190.9	037.5	48.14
260.0	000.4040	0072.0	012.4	037.2	000.2500	0190.8	037.6	48.03
261.0	000.3940	0072.2	012.3	037.1	000.2500	0190.6	037.8	47.93
262.0	000.3842	0072.3	012.2	036.9	000.2500	0190.4	038.0	47.83
263.0	000.3745	0072.1	012.2	036.8	000.2500	0190.3	038.2	47.72
264.0	000.3650	0071.9	012.1	036.7	000.2500	0190.2	038.5	47.61
265.0	000.3555	0071.5	012.0	036.6	000.2500	0190.1	038.7	47.50
266.0	000.3462	0070.9	011.8	036.5	000.2500	0190.0	038.9	47.38
267.0	000.3370	0070.1	011.7	036.4	000.2500	0189.9	039.2	47.27
268.0	000.3279	0069.7	011.6	036.4	000.2500	0189.9	039.4	47.16
269.0	000.3190	0069.4	011.5	036.3	000.2500	0189.8	039.6	47.05
270.0	000.3102	0069.1	011.4	036.2	000.2500	0189.7	039.8	46.94
271.0	000.3102	0068.6	011.4	036.1	000.2500	0189.6	040.0	46.85
272.0	000.3102	0068.2	011.3	036.0	000.2500	0189.4	040.2	46.76
273.0	000.3102	0067.9	011.3	035.9	000.2500	0189.2	040.4	46.67
274.0	000.3102	0067.6	011.3	035.7	000.2500	0189.0	040.5	46.57
275.0	000.3102	0067.2	011.3	035.6	000.2500	0188.9	040.7	46.48
276.0	000.3102	0067.0	011.2	035.5	000.2500	0188.7	040.9	46.39
277.0	000.3102	0067.0	011.3	035.4	000.2500	0188.5	041.1	46.30
278.0	000.3102	0067.4	011.3	035.2	000.2500	0188.3	041.2	46.22
279.0	000.3102	0068.0	011.3	035.0	000.2500	0188.0	041.4	46.14
280.0	000.3102	0068.6	011.4	034.9	000.2500	0187.8	041.5	46.05
281.0	000.3154	0068.9	011.4	034.7	000.2500	0187.4	041.7	45.97
282.0	000.3208	0069.2	011.5	034.5	000.2500	0187.1	041.9	45.88
283.0	000.3261	0069.3	011.6	034.3	000.2500	0186.8	042.0	45.79
284.0	000.3315	0069.4	011.6	034.1	000.2500	0186.5	042.2	45.70
285.0	000.3370	0069.5	011.7	034.0	000.2500	0186.2	042.4	45.61
286.0	000.3425	0069.6	011.7	033.8	000.2500	0185.9	042.5	45.52
287.0	000.3480	0069.5	011.8	033.7	000.2500	0185.7	042.7	45.42

W215AQ CH 213 D
Lat= 43 03 21.00, Lng= 89 32 06.40
0.25 kW 165.9 m HAAT, 468 m COR
Prot.= 60 dBu, Intef.= 54 dBu

WHAD CH 214 B BLED20030129AIT
Lat= 43 01 42.00, Lng= 88 23 32.30
72.0 kW 208 m HAAT, 487 m COR
Prot.= 60 dBu, Intef.= 54 dBu



WHAD BLED20030129AIT

W215AQ

Channel = 214B

Max ERP = 72 kW

RCAMSL = 487 m

N. Lat. 43 01 42.00

W. Lng. 88 23 32.30

Protected F(50-50)

60 dBu

Channel = 213D

Max ERP = 0.25 kW

RCAMSL = 468 m

N. Lat. 43 03 21.00

W. Lng. 89 32 06.40

Interfering F(50-10)

54 dBu

Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Actual (dBu)	IX (km)
212.0	072.0000	0199.6	060.7	131.5	000.2500	0149.8	082.0	29.79	
213.0	072.0000	0201.5	060.8	131.7	000.2500	0149.3	081.0	30.08	
214.0	072.0000	0203.3	061.0	132.0	000.2500	0149.0	080.0	30.38	
215.0	072.0000	0204.6	061.1	132.2	000.2500	0148.7	078.9	30.68	
216.0	072.0000	0204.8	061.1	132.3	000.2500	0148.6	077.9	31.00	
217.0	072.0000	0204.6	061.1	132.3	000.2500	0148.5	076.8	31.33	
218.0	072.0000	0204.4	061.1	132.4	000.2500	0148.4	075.7	31.65	
219.0	072.0000	0204.9	061.1	132.5	000.2500	0148.3	074.7	31.98	
220.0	072.0000	0206.1	061.3	132.7	000.2500	0148.2	073.6	32.31	
221.0	072.0000	0207.8	061.4	132.8	000.2500	0148.0	072.6	32.64	
222.0	072.0000	0209.5	061.6	133.0	000.2500	0148.0	071.5	32.97	
223.0	072.0000	0210.9	061.7	133.1	000.2500	0147.9	070.4	33.31	
224.0	072.0000	0211.8	061.8	133.2	000.2500	0147.9	069.3	33.66	
225.0	072.0000	0212.5	061.8	133.2	000.2500	0147.9	068.3	34.00	
226.0	072.0000	0213.4	061.9	133.3	000.2500	0147.8	067.2	34.36	
227.0	072.0000	0214.4	062.0	133.3	000.2500	0147.8	066.1	34.71	
228.0	072.0000	0215.4	062.1	133.3	000.2500	0147.8	065.0	35.07	
229.0	072.0000	0216.3	062.2	133.3	000.2500	0147.8	063.9	35.43	
230.0	072.0000	0216.9	062.2	133.3	000.2500	0147.8	062.8	35.80	
231.0	072.0000	0217.3	062.3	133.2	000.2500	0147.9	061.8	36.17	
232.0	072.0000	0217.5	062.3	133.1	000.2500	0147.9	060.7	36.56	
233.0	072.0000	0217.6	062.3	132.9	000.2500	0148.0	059.6	36.95	
234.0	072.0000	0217.5	062.3	132.7	000.2500	0148.1	058.5	37.35	
235.0	072.0000	0217.3	062.3	132.5	000.2500	0148.3	057.5	37.75	
236.0	072.0000	0217.3	062.3	132.3	000.2500	0148.6	056.4	38.16	
237.0	072.0000	0217.4	062.3	132.0	000.2500	0148.9	055.3	38.58	
238.0	072.0000	0217.8	062.3	131.8	000.2500	0149.3	054.3	39.00	
239.0	072.0000	0218.6	062.4	131.5	000.2500	0149.7	053.2	39.44	
240.0	072.0000	0219.7	062.5	131.3	000.2500	0150.1	052.1	39.87	
241.0	072.0000	0221.0	062.6	131.0	000.2500	0150.6	051.1	40.31	
242.0	072.0000	0222.1	062.7	130.7	000.2500	0151.3	050.0	40.76	
243.0	072.0000	0222.8	062.8	130.3	000.2500	0152.2	049.0	41.21	
244.0	072.0000	0223.1	062.8	129.8	000.2500	0153.3	048.0	41.66	
245.0	072.0000	0223.2	062.8	129.3	000.2500	0154.4	047.0	42.11	

Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Actual (dBu)
246.0	072.0000	0223.5	062.8	128.7	000.2500	0155.5	046.0	42.57
247.0	072.0000	0224.0	062.9	128.2	000.2500	0156.4	045.0	43.04
248.0	072.0000	0224.6	062.9	127.5	000.2500	0157.2	044.0	43.50
249.0	072.0000	0225.2	063.0	126.9	000.2500	0157.9	043.0	43.96
250.0	072.0000	0225.5	063.0	126.1	000.2500	0159.0	042.1	44.43
251.0	072.0000	0225.3	063.0	125.2	000.2500	0160.3	041.2	44.91
252.0	072.0000	0224.9	062.9	124.3	000.2500	0161.9	040.3	45.39
253.0	072.0000	0224.9	062.9	123.3	000.2500	0163.4	039.4	45.88
254.0	072.0000	0225.4	063.0	122.3	000.2500	0165.0	038.5	46.38
255.0	072.0000	0225.3	063.0	121.2	000.2500	0166.8	037.7	46.86
256.0	072.0000	0224.9	062.9	120.0	000.2500	0168.8	037.0	47.34
257.0	072.0000	0223.9	062.9	118.7	000.2500	0171.4	036.3	47.82
258.0	072.0000	0223.2	062.8	117.3	000.2500	0174.2	035.6	48.29
259.0	072.0000	0222.8	062.8	115.9	000.2500	0176.2	034.9	48.73
260.0	072.0000	0222.8	062.8	114.4	000.2500	0177.1	034.3	49.11
261.0	072.0000	0222.7	062.7	112.9	000.2500	0177.1	033.7	49.42
262.0	072.0000	0222.4	062.7	111.2	000.2500	0176.6	033.1	49.69
263.0	072.0000	0222.4	062.7	109.6	000.2500	0176.8	032.6	49.97
264.0	072.0000	0222.0	062.7	107.8	000.2500	0179.0	032.2	50.31
265.0	072.0000	0221.5	062.6	106.0	000.2500	0181.5	031.8	50.64
266.0	072.0000	0221.0	062.6	104.1	000.2500	0181.1	031.4	50.81
267.0	072.0000	0221.0	062.6	102.2	000.2500	0179.6	031.1	50.92
268.0	072.0000	0221.4	062.6	100.2	000.2500	0181.0	030.8	51.16
269.0	072.0000	0221.8	062.7	098.2	000.2500	0183.7	030.6	51.43
270.0	072.0000	0222.2	062.7	096.2	000.2500	0185.8	030.4	51.64
271.0	072.0000	0222.2	062.7	094.1	000.2500	0186.2	030.2	51.71
272.0	072.0000	0221.9	062.7	092.1	000.2500	0185.6	030.2	51.70
273.0	072.0000	0221.7	062.7	090.0	000.2500	0185.3	030.3	51.66
274.0	072.0000	0221.4	062.6	087.9	000.2500	0184.7	030.4	51.58
275.0	072.0000	0221.5	062.6	085.9	000.2500	0183.9	030.5	51.48
276.0	072.0000	0221.9	062.7	083.9	000.2500	0183.9	030.6	51.39
277.0	072.0000	0222.4	062.7	081.9	000.2500	0185.2	030.8	51.33
278.0	072.0000	0222.7	062.7	079.9	000.2500	0188.2	031.1	51.31
279.0	072.0000	0222.6	062.7	078.0	000.2500	0191.1	031.5	51.23
280.0	072.0000	0222.6	062.7	076.2	000.2500	0192.5	031.9	51.07
281.0	072.0000	0222.5	062.7	074.4	000.2500	0193.0	032.3	50.85
282.0	072.0000	0222.5	062.7	072.7	000.2500	0193.4	032.8	50.60
283.0	072.0000	0222.4	062.7	071.0	000.2500	0194.0	033.4	50.34
284.0	072.0000	0222.3	062.7	069.5	000.2500	0195.0	034.0	50.08
285.0	072.0000	0222.1	062.7	068.0	000.2500	0195.8	034.6	49.78
286.0	072.0000	0221.7	062.7	066.6	000.2500	0196.2	035.3	49.44
287.0	072.0000	0221.4	062.6	065.3	000.2500	0196.2	036.0	49.08
288.0	072.0000	0221.3	062.6	064.0	000.2500	0196.7	036.8	48.74
289.0	072.0000	0221.6	062.7	062.8	000.2500	0197.4	037.5	48.40
290.0	072.0000	0221.8	062.7	061.6	000.2500	0198.0	038.3	48.06
291.0	072.0000	0221.8	062.7	060.5	000.2500	0198.4	039.1	47.68
292.0	072.0000	0221.6	062.7	059.6	000.2500	0198.5	040.0	47.28
293.0	072.0000	0221.2	062.6	058.7	000.2500	0198.3	040.9	46.86
294.0	072.0000	0220.8	062.6	057.8	000.2500	0197.9	041.8	46.42
295.0	072.0000	0220.5	062.6	057.0	000.2500	0197.4	042.7	45.99
296.0	072.0000	0220.5	062.6	056.3	000.2500	0197.1	043.6	45.56

Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Actual (dBu)
297.0	072.0000	0220.7	062.6	055.5	000.2500	0196.9	044.6	45.15
298.0	072.0000	0221.1	062.6	054.8	000.2500	0197.1	045.5	44.77
299.0	072.0000	0221.5	062.6	054.2	000.2500	0197.4	046.5	44.38
300.0	072.0000	0221.7	062.7	053.6	000.2500	0197.8	047.5	44.01
301.0	072.0000	0221.7	062.7	053.1	000.2500	0198.2	048.5	43.63
302.0	072.0000	0221.7	062.7	052.6	000.2500	0198.5	049.5	43.24
303.0	072.0000	0221.4	062.6	052.2	000.2500	0198.7	050.5	42.85
304.0	072.0000	0220.9	062.6	051.8	000.2500	0198.9	051.5	42.45
305.0	072.0000	0220.2	062.5	051.5	000.2500	0199.0	052.6	42.04
306.0	072.0000	0219.7	062.5	051.2	000.2500	0199.1	053.7	41.63
307.0	072.0000	0219.4	062.5	050.9	000.2500	0199.1	054.7	41.22
308.0	072.0000	0219.3	062.4	050.7	000.2500	0199.1	055.8	40.81
309.0	072.0000	0219.1	062.4	050.4	000.2500	0199.1	056.8	40.40
310.0	072.0000	0218.8	062.4	050.2	000.2500	0199.0	057.9	39.99
311.0	072.0000	0218.8	062.4	050.1	000.2500	0199.0	059.0	39.59
312.0	072.0000	0218.8	062.4	049.9	000.2500	0198.9	060.1	39.18
313.0	072.0000	0219.2	062.4	049.7	000.2500	0198.7	061.1	38.78
314.0	072.0000	0220.0	062.5	049.5	000.2500	0198.6	062.2	38.39
315.0	072.0000	0220.9	062.6	049.4	000.2500	0198.4	063.3	38.01
316.0	072.0000	0221.4	062.6	049.2	000.2500	0198.3	064.4	37.63
317.0	072.0000	0221.4	062.6	049.2	000.2500	0198.3	065.5	37.25
318.0	072.0000	0221.2	062.6	049.1	000.2500	0198.2	066.6	36.88
319.0	072.0000	0220.8	062.6	049.2	000.2500	0198.2	067.7	36.51
320.0	072.0000	0220.5	062.6	049.2	000.2500	0198.3	068.7	36.15
321.0	072.0000	0220.5	062.6	049.2	000.2500	0198.3	069.8	35.78
322.0	072.0000	0220.8	062.6	049.2	000.2500	0198.3	070.9	35.42
323.0	072.0000	0221.2	062.6	049.2	000.2500	0198.3	072.0	35.06
324.0	072.0000	0221.4	062.6	049.2	000.2500	0198.3	073.1	34.70
325.0	072.0000	0221.3	062.6	049.3	000.2500	0198.4	074.2	34.34
326.0	072.0000	0220.7	062.6	049.4	000.2500	0198.5	075.3	33.99
327.0	072.0000	0219.8	062.5	049.6	000.2500	0198.6	076.4	33.65
328.0	072.0000	0219.0	062.4	049.7	000.2500	0198.7	077.4	33.30
329.0	072.0000	0218.6	062.4	049.9	000.2500	0198.8	078.5	32.96
330.0	072.0000	0218.6	062.4	050.0	000.2500	0198.9	079.6	32.61
331.0	072.0000	0218.3	062.4	050.1	000.2500	0199.0	080.7	32.27

W215AQ vs W216BL - Contour-to-Contour Map
 State Of Wisconsin - Educational Communications Board

FMCommander Single Allocation Study - 07-09-2020 - GLOBE 30 Sec
 W215AQ's Overlaps (In= 1.92 km, Out= 12.87 km)

W215AQ CH 213 D

Lat= 43 03 21.00, Lng= 89 32 06.40

0.25 kW 165.9 m HAAT, 468 m COR

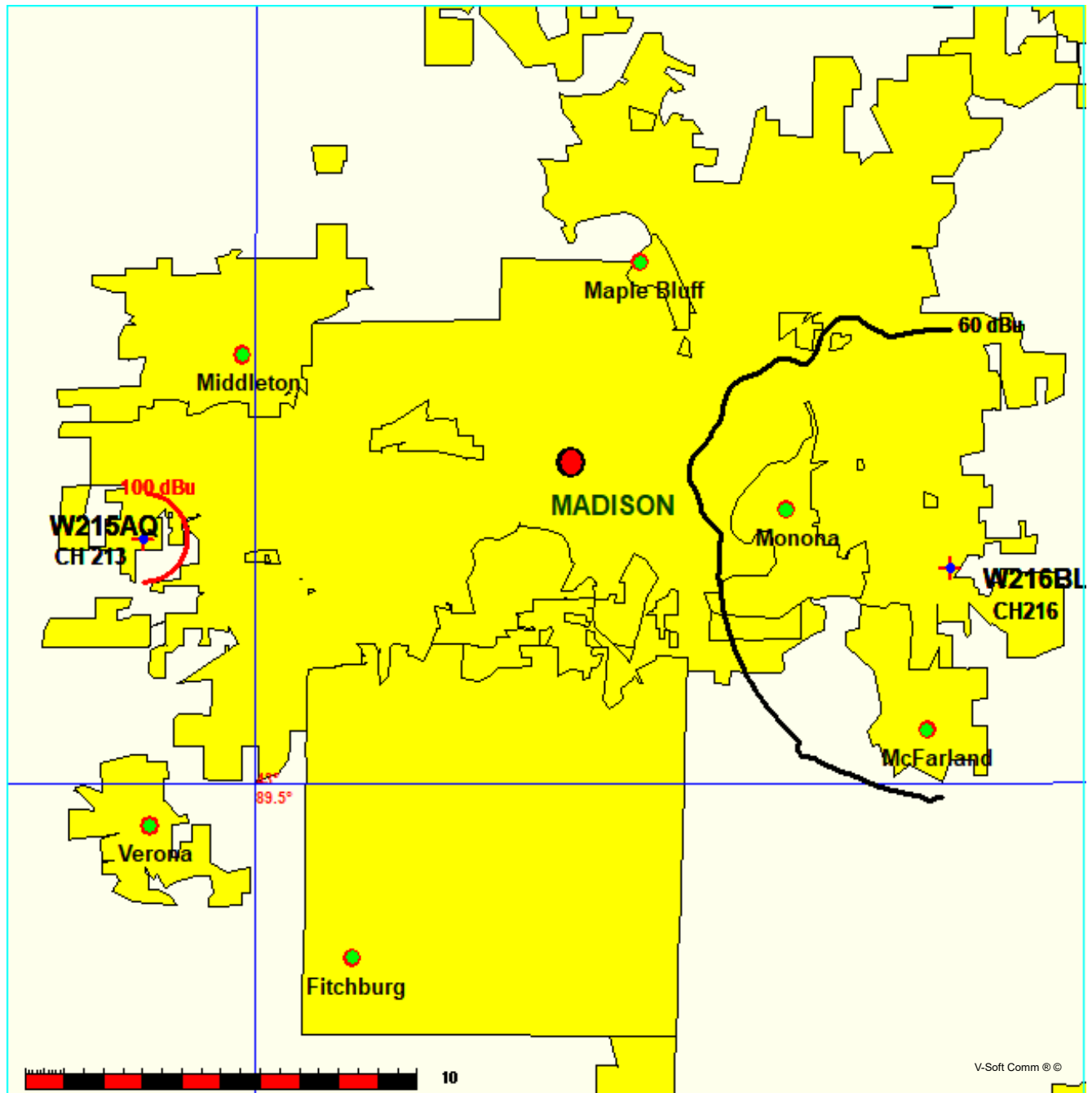
Prot.= 60 dBu, Intef.= 100 dBu

W216BL CH 216 D BLFT20020114AAS

Lat= 43 03 00.00, Lng= 89 16 55.40

0.12 kW 30 m HAAT, 305 m COR

Prot.= 60 dBu, Intef.= 100 dBu



W216BL BLFT20020114AAS

W215AQ

Channel = 216D

Max ERP = 0.12 kW

RCAMSL = 305 m

N. Lat. 43 03 00.00

W. Lng. 89 16 55.40

Protected F(50-50)

60 dBu

Channel = 213D

Max ERP = 0.25 kW

RCAMSL = 468 m

N. Lat. 43 03 21.00

W. Lng. 89 32 06.40

Interfering F(50-10)

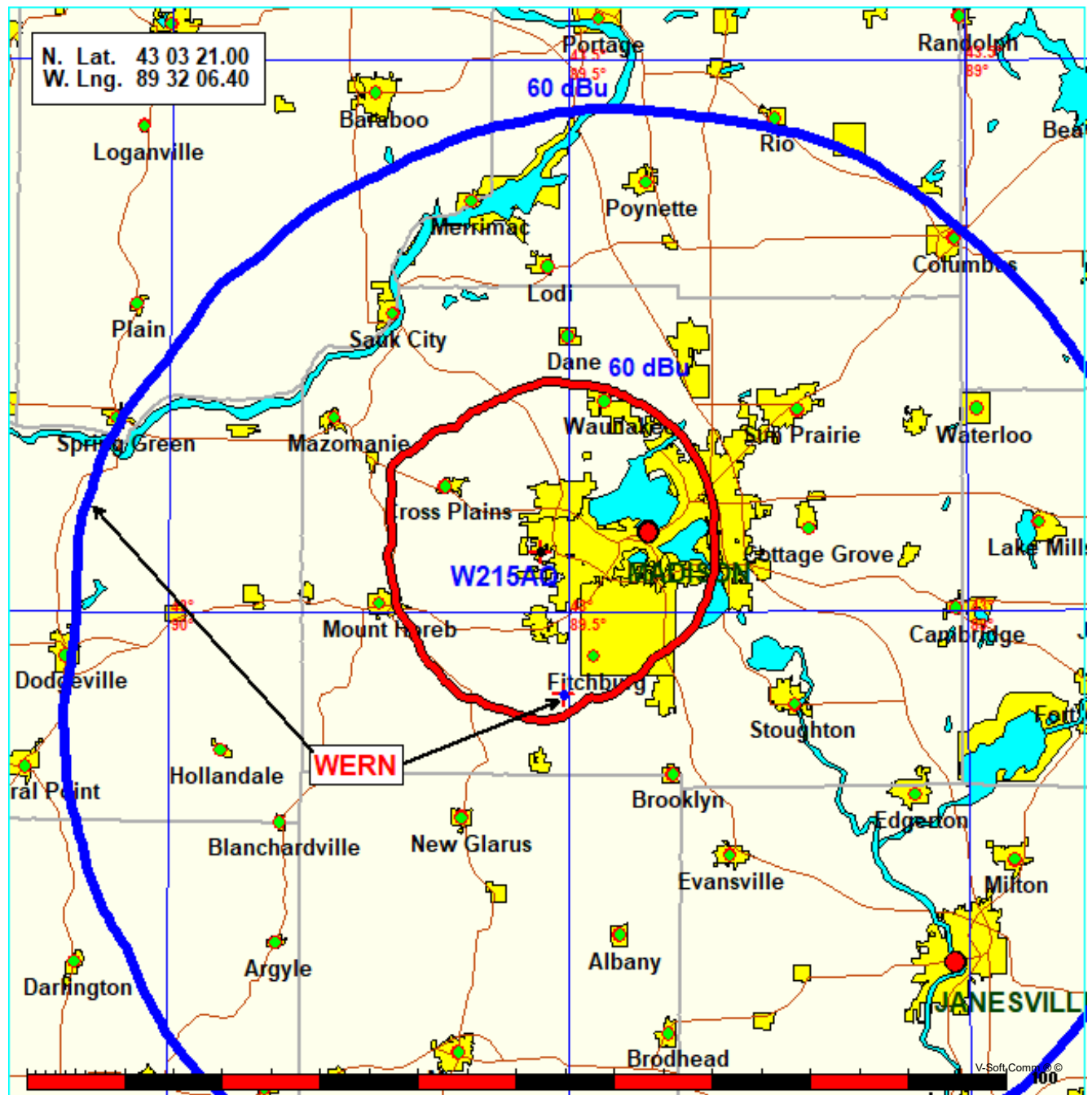
100 dBu

Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Actual (dBu)	IX (km)
212.0	000.1200	0030.9	006.0	108.1	000.2500	0178.5	018.3	59.93	
213.0	000.1200	0031.0	006.0	108.1	000.2500	0178.6	018.2	60.02	
214.0	000.1200	0031.1	006.0	108.0	000.2500	0178.7	018.1	60.11	
215.0	000.1200	0031.2	006.0	107.9	000.2500	0178.8	018.0	60.20	
216.0	000.1200	0031.5	006.0	107.9	000.2500	0178.8	017.9	60.29	
217.0	000.1200	0032.1	006.1	107.9	000.2500	0178.7	017.8	60.38	
218.0	000.1200	0032.8	006.1	108.0	000.2500	0178.6	017.7	60.47	
219.0	000.1200	0032.9	006.1	107.9	000.2500	0178.8	017.6	60.57	
220.0	000.1200	0031.9	006.1	107.5	000.2500	0179.4	017.5	60.65	
221.0	000.1200	0030.0	005.9	106.9	000.2500	0180.4	017.5	60.73	
222.0	000.1200	0028.0	005.9	106.8	000.2500	0180.6	017.4	60.81	
223.0	000.1200	0026.5	005.9	106.6	000.2500	0180.8	017.3	60.90	
224.0	000.1200	0025.3	005.9	106.5	000.2500	0181.0	017.2	60.98	
225.0	000.1200	0024.5	005.9	106.3	000.2500	0181.2	017.1	61.07	
226.0	000.1200	0024.2	005.9	106.1	000.2500	0181.4	017.0	61.15	
227.0	000.1200	0024.3	005.9	106.0	000.2500	0181.5	016.9	61.23	
228.0	000.1200	0024.6	005.9	105.8	000.2500	0181.6	016.8	61.31	
229.0	000.1200	0024.7	005.9	105.6	000.2500	0181.7	016.7	61.39	
230.0	000.1200	0024.3	005.9	105.4	000.2500	0181.8	016.7	61.46	
231.0	000.1200	0023.1	005.9	105.2	000.2500	0181.8	016.6	61.53	
232.0	000.1200	0020.9	005.9	105.0	000.2500	0181.7	016.5	61.60	
233.0	000.1200	0018.2	005.9	104.8	000.2500	0181.6	016.4	61.66	
234.0	000.1200	0016.0	005.9	104.5	000.2500	0181.5	016.3	61.72	
235.0	000.1200	0014.8	005.9	104.3	000.2500	0181.3	016.2	61.78	
236.0	000.1200	0014.5	005.9	104.1	000.2500	0181.1	016.2	61.84	
237.0	000.1200	0014.9	005.9	103.8	000.2500	0180.9	016.1	61.89	
238.0	000.1200	0015.6	005.9	103.6	000.2500	0180.7	016.0	61.94	
239.0	000.1200	0016.8	005.9	103.3	000.2500	0180.5	015.9	61.99	
240.0	000.1200	0018.6	005.9	103.0	000.2500	0180.2	015.9	62.04	
241.0	000.1200	0020.8	005.9	102.8	000.2500	0180.0	015.8	62.09	
242.0	000.1200	0023.1	005.9	102.5	000.2500	0179.8	015.7	62.14	
243.0	000.1200	0024.9	005.9	102.2	000.2500	0179.6	015.7	62.19	
244.0	000.1200	0026.4	005.9	101.9	000.2500	0179.6	015.6	62.24	
245.0	000.1200	0027.5	005.9	101.6	000.2500	0179.8	015.5	62.30	

Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Actual (dBu)
246.0	000.1200	0028.4	005.9	101.3	000.2500	0180.0	015.5	62.36
247.0	000.1200	0028.9	005.9	101.0	000.2500	0180.3	015.4	62.43
248.0	000.1200	0028.6	005.9	100.7	000.2500	0180.6	015.4	62.49
249.0	000.1200	0027.3	005.9	100.3	000.2500	0180.9	015.3	62.55
250.0	000.1200	0025.9	005.9	100.0	000.2500	0181.2	015.3	62.61
251.0	000.1200	0024.8	005.9	099.7	000.2500	0181.6	015.2	62.67
252.0	000.1200	0024.4	005.9	099.3	000.2500	0182.0	015.2	62.73
253.0	000.1200	0024.6	005.9	099.0	000.2500	0182.5	015.1	62.80
254.0	000.1200	0025.4	005.9	098.6	000.2500	0183.1	015.1	62.86
255.0	000.1200	0025.7	005.9	098.3	000.2500	0183.7	015.0	62.92
256.0	000.1200	0025.8	005.9	097.9	000.2500	0184.2	015.0	62.79
257.0	000.1200	0025.4	005.9	097.5	000.2500	0184.6	014.9	62.85
258.0	000.1200	0024.9	005.9	097.2	000.2500	0185.0	014.9	62.91
259.0	000.1200	0024.3	005.9	096.8	000.2500	0185.4	014.9	62.96
260.0	000.1200	0024.1	005.9	096.4	000.2500	0185.6	014.8	63.00
261.0	000.1200	0024.6	005.9	096.0	000.2500	0185.9	014.8	63.05
262.0	000.1200	0025.9	005.9	095.6	000.2500	0186.1	014.8	63.08
263.0	000.1200	0027.5	005.9	095.3	000.2500	0186.2	014.8	63.12
264.0	000.1200	0029.1	005.9	094.9	000.2500	0186.3	014.7	63.14
265.0	000.1200	0030.0	005.9	094.5	000.2500	0186.3	014.7	63.17
266.0	000.1200	0030.3	005.9	094.1	000.2500	0186.2	014.7	63.21
267.0	000.1200	0030.5	005.9	093.7	000.2500	0186.1	014.7	63.24
268.0	000.1200	0030.2	005.9	093.3	000.2500	0185.9	014.7	63.22
269.0	000.1200	0029.6	005.9	092.9	000.2500	0185.8	014.7	63.20
270.0	000.1200	0029.1	005.9	092.5	000.2500	0185.7	014.7	63.20
271.0	000.1200	0028.6	005.9	092.1	000.2500	0185.6	014.7	63.20
272.0	000.1200	0028.4	005.9	091.7	000.2500	0185.6	014.7	63.20
273.0	000.1200	0028.6	005.9	091.3	000.2500	0185.6	014.7	63.20
274.0	000.1200	0028.7	005.9	090.9	000.2500	0185.6	014.7	63.20
275.0	000.1200	0028.8	005.9	090.5	000.2500	0185.5	014.7	63.18
276.0	000.1200	0028.6	005.9	090.1	000.2500	0185.3	014.7	63.17
277.0	000.1200	0029.1	005.9	089.7	000.2500	0185.2	014.7	63.15
278.0	000.1200	0030.6	005.9	089.2	000.2500	0185.1	014.7	63.19
279.0	000.1200	0032.5	006.1	088.7	000.2500	0184.9	014.5	63.34
280.0	000.1200	0034.5	006.3	088.2	000.2500	0184.8	014.4	63.52
281.0	000.1200	0035.9	006.4	087.7	000.2500	0184.6	014.3	63.63
282.0	000.1200	0036.9	006.5	087.1	000.2500	0184.5	014.2	63.68
283.0	000.1200	0037.5	006.5	086.6	000.2500	0184.3	014.2	63.70
284.0	000.1200	0038.1	006.6	086.1	000.2500	0184.0	014.2	63.70
285.0	000.1200	0039.3	006.7	085.6	000.2500	0183.6	014.1	63.76
286.0	000.1200	0040.6	006.8	085.0	000.2500	0183.5	014.1	63.84
287.0	000.1200	0041.8	006.9	084.3	000.2500	0183.7	014.0	63.91
288.0	000.1200	0043.0	007.0	083.7	000.2500	0183.9	014.0	63.97
289.0	000.1200	0043.5	007.0	083.2	000.2500	0184.2	014.0	63.97
290.0	000.1200	0043.8	007.1	082.7	000.2500	0184.4	014.0	63.94
291.0	000.1200	0044.0	007.1	082.2	000.2500	0184.8	014.1	63.90
292.0	000.1200	0044.1	007.1	081.8	000.2500	0185.3	014.1	63.86
293.0	000.1200	0043.9	007.1	081.4	000.2500	0185.8	014.2	63.78
294.0	000.1200	0043.3	007.0	081.1	000.2500	0186.2	014.3	63.67
295.0	000.1200	0042.6	007.0	080.8	000.2500	0186.7	014.4	63.55
296.0	000.1200	0042.1	006.9	080.5	000.2500	0187.2	014.5	63.44

Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Actual (dBu)
297.0	000.1200	0041.9	006.9	080.1	000.2500	0187.8	014.6	63.37
298.0	000.1200	0041.9	006.9	079.8	000.2500	0188.4	014.7	63.31
299.0	000.1200	0041.8	006.9	079.4	000.2500	0189.0	014.8	63.24
300.0	000.1200	0041.6	006.9	079.1	000.2500	0189.5	014.9	63.16
301.0	000.1200	0041.6	006.9	078.8	000.2500	0190.0	014.9	63.09
302.0	000.1200	0041.9	006.9	078.4	000.2500	0190.6	015.0	63.04
303.0	000.1200	0042.3	006.9	077.9	000.2500	0191.1	015.1	63.23
304.0	000.1200	0042.7	007.0	077.5	000.2500	0191.6	015.1	63.20
305.0	000.1200	0043.3	007.0	077.1	000.2500	0191.9	015.2	63.17
306.0	000.1200	0043.9	007.1	076.6	000.2500	0192.2	015.2	63.13
307.0	000.1200	0044.3	007.1	076.2	000.2500	0192.5	015.3	63.08
308.0	000.1200	0044.6	007.1	075.9	000.2500	0192.6	015.4	63.02
309.0	000.1200	0044.5	007.1	075.6	000.2500	0192.7	015.5	62.94
310.0	000.1200	0044.3	007.1	075.4	000.2500	0192.8	015.6	62.85
311.0	000.1200	0043.9	007.1	075.2	000.2500	0192.8	015.7	62.74
312.0	000.1200	0043.2	007.0	075.2	000.2500	0192.8	015.9	62.63
313.0	000.1200	0042.3	006.9	075.1	000.2500	0192.8	016.0	62.51
314.0	000.1200	0041.5	006.9	075.1	000.2500	0192.8	016.1	62.39
315.0	000.1200	0040.9	006.8	075.1	000.2500	0192.8	016.3	62.29
316.0	000.1200	0040.6	006.8	074.9	000.2500	0192.9	016.4	62.19
317.0	000.1200	0040.5	006.8	074.8	000.2500	0192.9	016.5	62.10
318.0	000.1200	0040.5	006.8	074.6	000.2500	0193.0	016.6	62.02
319.0	000.1200	0040.3	006.8	074.4	000.2500	0193.0	016.7	61.92
320.0	000.1200	0039.7	006.7	074.4	000.2500	0193.0	016.8	61.82
321.0	000.1200	0038.5	006.6	074.6	000.2500	0193.0	017.0	61.69
322.0	000.1200	0036.7	006.5	074.9	000.2500	0192.9	017.2	61.55
323.0	000.1200	0034.7	006.3	075.3	000.2500	0192.8	017.3	61.41
324.0	000.1200	0033.7	006.2	075.4	000.2500	0192.8	017.5	61.29
325.0	000.1200	0033.8	006.2	075.3	000.2500	0192.8	017.6	61.21
326.0	000.1200	0034.2	006.3	075.0	000.2500	0192.9	017.6	61.14
327.0	000.1200	0034.6	006.3	074.8	000.2500	0192.9	017.7	61.07
328.0	000.1200	0035.4	006.4	074.5	000.2500	0193.0	017.8	61.00
329.0	000.1200	0036.7	006.5	074.1	000.2500	0193.1	017.9	60.94
330.0	000.1200	0037.9	006.6	073.7	000.2500	0193.2	018.0	60.88
331.0	000.1200	0038.7	006.6	073.4	000.2500	0193.2	018.1	60.80

Coverage Study - GLOBE 30 Sec
07-09-2020



N. Lat. = 43 03 21.0 W. Lng. = 89 32 06.4
 HAAT and Distance to Contour,
 FCC, FM 2-10 Mi, 51 pts Method - GLOBE 30 SEC

Existing Distance to Contour - W215AQ

Azi.	AV EL	HAAT	ERP kW	dBk	Field	60-F5
000	300.6	167.4	0.0260	-15.85	1.000	9.62
030	284.6	183.4	0.0260	-15.85	1.000	10.08
060	269.6	198.4	0.0260	-15.85	1.000	10.47
090	282.7	185.3	0.0260	-15.85	1.000	10.13
120	299.2	168.8	0.0260	-15.85	1.000	9.66
150	314.0	154.0	0.0260	-15.85	1.000	9.19
180	298.3	169.7	0.0260	-15.85	1.000	9.69
210	306.7	161.3	0.0260	-15.85	1.000	9.43
240	327.7	140.3	0.0260	-15.85	1.000	8.73
270	323.6	144.4	0.0260	-15.85	1.000	8.86
300	293.2	174.8	0.0260	-15.85	1.000	9.84
330	324.6	143.4	0.0260	-15.85	1.000	8.83

Ave El= 302.06 M HAAT= 165.94 M AMSL= 468.0

N. Lat. = 43 03 21.0 W. Lng. = 89 32 06.4
 HAAT and Distance to Contour,
 FCC, FM 2-10 Mi, 51 pts Method - GLOBE 30 SEC

Proposed Distance to Contour - W215AQ

Azi.	AV EL	HAAT	ERP kW	dBk	Field	60-F5
000	300.6	167.4	0.2500	-6.02	1.000	16.97
030	284.6	183.4	0.2500	-6.02	1.000	17.78
060	269.6	198.4	0.2500	-6.02	1.000	18.46
090	282.7	185.3	0.2500	-6.02	1.000	17.87
120	299.2	168.8	0.2500	-6.02	1.000	17.05
150	314.0	154.0	0.2500	-6.02	1.000	16.16
180	298.3	169.7	0.2500	-6.02	1.000	17.10
210	306.7	161.3	0.2500	-6.02	1.000	16.61
240	327.7	140.3	0.2500	-6.02	1.000	15.28
270	323.6	144.4	0.2500	-6.02	1.000	15.53
300	293.2	174.8	0.2500	-6.02	1.000	17.37
330	324.6	143.4	0.2500	-6.02	1.000	15.47

Ave El= 302.06 M HAAT= 165.94 M AMSL= 468.0