

Technical Report W269CV Minor Modification

This technical report is submitted for a minor modification to W269CV, FCC file no. BLFT-20150501AJN. A move to channel 280 and new tower site within the allowed 250 mile radius is submitted. The translator is to serve as a fill-in facility to rebroadcast KDAL(AM) 610 kHz at Duluth, MN, FCC facility I.D. no. 60230.

W269CV Modification Analysis:

An overlap study in exhibit E-1 shows the W269CV modification to channel 280 is within the KUMD-FM 277C1 third-adjacent and KZIO(FM) 282C2 second-adjacent protected contours. A tabulation of the +40 dBu F(50-10) contour to the facilities (exhibits E-2 and E-3) using the vertical elevation pattern of the Bext TFC2K two bay, full wavelength-spaced antenna (exhibit E-4) shows the lowest point above the site elevation = 84.9 and 18.7 meters, respectively, which will not reach any population, roads or buildings (exhibit E-5). The 60 dBu F(50-50) contour is contained within the primary KDAL(AM) 2.0 mV/m daytime contour (exhibit E-6). The modification is located within 250 miles of the current facility (exhibit E-7) and is within 200 miles (320 km) of the Canadian border. Therefore, a plot of the 34 dBu F(50-10) contour is included as exhibit E-8.

Antenna System:

The W269CV modification will be relocated to the existing tower, ASR 1024122, at coordinates:

46 47 21N 92 07 09W NAD 27.

A Bext TFC2K two bay, full wavelength-spaced, nondirectional antenna will be mounted at a COR AGL of 85 meters, 466 meters AMSL and operate at 0.250 kW ERP.

RF Exposure Calculation:

The RF contribution was calculated using the formula from the OET Bulletin 65:

$$S \text{ (RF in microwatts/cm}^2\text{)} = \frac{33.4 \times F^2 \times (H \text{ ERP} + V \text{ ERP in watts})}{R^2 \text{ (height of radiation center in meters -2m)}}$$

Using a worst case vertical (F) factor of 1.0, the RF is calculated to be 2.42 $\mu\text{W/cm}^2$ to the ground, which is well below 5% of the 200 $\mu\text{W/cm}^2$ maximum permissible for general public exposure allowing exclusion from consideration.

Conclusion:

It is concluded that the W269CV modification complies with all Commission rules and policies.



Christopher Anderson July 20, 2016
andersce@bham.rr.com
© 2016 Anderson Associates

E-1 W269CV Mod. to Ch. 280 Overlap Study

REFERENCE		CH# 280D - 103.9 MHz, Pwr= 0.25 kW, HAAT= 169.0 M, COR= 466 M								DISPLAY DATES	
46 47 21.0 N.		Average Protected F(50-50)= 17.06 km								DATA 07-19-16	
92 07 09.0 W.		Omni-directional								SEARCH 07-19-16	
CH CITY	CALL	TYPE STATE	ANT	AZI <--	DIST FILE #	LAT LNG	PWR(kW) HAAT(M)	INT(km) COR(M)	PRO(km) LICENSEE	*IN* (Overlap in km)	*OUT*
277C1 Duluth	KUMD-FM	LIC _CX MN		320.6 140.6	0.40 BMLED20080826AAE	46 47 31.0 92 07 21.0	95.000 250	11.2 565	78.1 Regents Of University Of M	-19.0*	-78.8*
282C2 Two Harbors	KZIO	LIC NCN MN		31.5 211.6	19.82 BLH19960321KD	46 56 28.0 91 58 58.0	50.000 121	4.8 470	44.0 Red Rock Radio Corp.	-1.9	-25.2* (1)
280D Sandstone	W280DF	LIC _C_ MN		218.1 37.6	92.54 BMLFT20021209ABJ	46 07 54.0 92 51 37.0	0.038 46	14.0 375	4.4 Refuge Media Group	57.3	24.6 (new Bo
280D Silver Bay	W280AA	LIC DHN MN		48.1 228.7	83.77 BLFT249	47 17 21.0 91 17 31.0	0.117 18	4.5 323	1.6 K & M Broadcasting, Inc.	58.3	24.8
280D Hoyt Lakes	K280AW	LIC DHN MN		359.3 179.3	79.25 BLFT19781002JU	47 30 07.0 92 07 55.0	0.110 24	4.4 481	1.6 Heartland Christian Broadc	64.1	46.0
Terrain database is FCC NGDC 30 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= East Zone, Co to 3rd adjacent. All separation margins (if shown) include rounding. 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. Reference station has protected zone issue: Canada											

- 1) The 115.4 and 174.7 +40 dBu F(50-10) contours within the KUMD-FM 277C1 and KZIO(FM) 282C2 protected contours, respectively, do not reach the ground to any population, roads or buildings, as shown in the vertical elevation tabulations in exhibits E-2 and E-3.

E-2 W269CV Mod. +40 dBu Tabulation Within KUMD-FM 277C1

W269CV Duluth, MN

74.1204(d) Showing

Translator or LPFM Maximum Licensed ERP = 0.25

Translator or LPFM Antenna Height AG = 85 Meters

w269cv Antenna Model = BEXT-TFC-2K-2FULL

Protected Station's Contour = 134.6631 dBu

Translator's or LPFM's full Interference contour 174.6631

Review Azimuth = 0 Degrees True

Relative Field on the horizon at Review Azimuth = 1.000

Translator/LPFM ERP on the horizon at Review Azimuth = 0.25 kW

Distance between stations = 0.4 km

Protected Station= KUMD-FM, 95 kW, 565 M Meters COR AMSL

Depression Angle From Horizon(Deg)	Vertical Relative Field	Horizontal Relative Field	ERP (kw)	Dist to IX Contour Along Dep. Angle(m)	Dist to IX Contour From Tower Base(m)	Height IX Above Ground (m)
00.00	1.000	1.0	0.2500	000.2050	000.2050	085.000
01.00	0.995	1.0	0.2473	000.2039	000.2039	084.996
02.00	0.989	1.0	0.2445	000.2028	000.2027	084.993
03.00	0.975	1.0	0.2374	000.1998	000.1995	084.990
04.00	0.960	1.0	0.2304	000.1968	000.1963	084.986
05.00	0.940	1.0	0.2207	000.1926	000.1919	084.983
06.00	0.919	1.0	0.2111	000.1884	000.1874	084.980
07.00	0.892	1.0	0.1989	000.1829	000.1815	084.978
08.00	0.865	1.0	0.1871	000.1773	000.1756	084.975
09.00	0.834	1.0	0.1739	000.1710	000.1689	084.973
10.00	0.803	1.0	0.1612	000.1646	000.1621	084.971
11.00	0.770	1.0	0.1480	000.1578	000.1549	084.970
12.00	0.736	1.0	0.1354	000.1509	000.1476	084.969
13.00	0.700	1.0	0.1225	000.1435	000.1398	084.968
14.00	0.664	1.0	0.1102	000.1361	000.1321	084.967
15.00	0.628	1.0	0.0984	000.1287	000.1243	084.967
16.00	0.591	1.0	0.0873	000.1212	000.1165	084.967
17.00	0.554	1.0	0.0767	000.1136	000.1086	084.967
18.00	0.517	1.0	0.0668	000.1060	000.1008	084.967
19.00	0.479	1.0	0.0572	000.0981	000.0928	084.968
20.00	0.440	1.0	0.0484	000.0902	000.0848	084.969
21.00	0.401	1.0	0.0402	000.0822	000.0768	084.971
22.00	0.362	1.0	0.0328	000.0742	000.0688	084.972
23.00	0.322	1.0	0.0258	000.0659	000.0607	084.974
24.00	0.281	1.0	0.0197	000.0576	000.0526	084.977
25.00	0.240	1.0	0.0143	000.0491	000.0445	084.979
26.00	0.198	1.0	0.0098	000.0406	000.0365	084.982
27.00	0.156	1.0	0.0061	000.0320	000.0285	084.985
28.00	0.114	1.0	0.0032	000.0234	000.0206	084.989
29.00	0.072	1.0	0.0013	000.0147	000.0128	084.993
30.00	0.029	1.0	0.0002	000.0059	000.0051	084.997
31.00	0.042	1.0	0.0004	000.0086	000.0074	084.996
32.00	0.055	1.0	0.0008	000.0113	000.0096	084.994
33.00	0.096	1.0	0.0023	000.0196	000.0164	084.989
34.00	0.136	1.0	0.0046	000.0279	000.0231	084.984
35.00	0.174	1.0	0.0075	000.0356	000.0291	084.980
36.00	0.211	1.0	0.0111	000.0433	000.0350	084.975
37.00	0.245	1.0	0.0149	000.0501	000.0400	084.970
38.00	0.278	1.0	0.0193	000.0570	000.0449	084.965
39.00	0.307	1.0	0.0235	000.0628	000.0488	084.960
40.00	0.335	1.0	0.0281	000.0687	000.0526	084.956
41.00	0.358	1.0	0.0320	000.0734	000.0554	084.952

E-2 W269CV Mod. +40 dBu Tabulation Within KUMD-FM 277C1

Depression Angle From Horizon(Deg)	Vertical Relative Field	Horizontal Relative Field	ERP (kw)	Dist to IX Contour Along Dep. Angle(m)	Dist to IX Contour From Tower Base(m)	Height IX Above Ground (m)
42.00	0.381	1.0	0.0363	000.0781	000.0581	084.948
43.00	0.399	1.0	0.0397	000.0817	000.0598	084.944
44.00	0.416	1.0	0.0433	000.0853	000.0614	084.941
45.00	0.428	1.0	0.0457	000.0876	000.0620	084.938
46.00	0.439	1.0	0.0482	000.0900	000.0625	084.935
47.00	0.446	1.0	0.0496	000.0913	000.0623	084.933
48.00	0.452	1.0	0.0511	000.0927	000.0620	084.931
49.00	0.453	1.0	0.0513	000.0929	000.0609	084.930
50.00	0.454	1.0	0.0515	000.0931	000.0598	084.929
51.00	0.452	1.0	0.0510	000.0926	000.0583	084.928
52.00	0.449	1.0	0.0504	000.0921	000.0567	084.927
53.00	0.443	1.0	0.0491	000.0908	000.0547	084.927(1)
54.00	0.437	1.0	0.0477	000.0896	000.0527	084.928
55.00	0.428	1.0	0.0458	000.0878	000.0503	084.928
56.00	0.419	1.0	0.0439	000.0859	000.0480	084.929
57.00	0.409	1.0	0.0417	000.0838	000.0456	084.930
58.00	0.398	1.0	0.0396	000.0816	000.0432	084.931
59.00	0.387	1.0	0.0373	000.0792	000.0408	084.932
60.00	0.375	1.0	0.0352	000.0769	000.0384	084.933
61.00	0.363	1.0	0.0329	000.0744	000.0361	084.935
62.00	0.351	1.0	0.0308	000.0720	000.0338	084.936
63.00	0.339	1.0	0.0286	000.0694	000.0315	084.938
64.00	0.326	1.0	0.0266	000.0668	000.0293	084.940
65.00	0.314	1.0	0.0246	000.0643	000.0272	084.942
66.00	0.301	1.0	0.0227	000.0617	000.0251	084.944
67.00	0.289	1.0	0.0208	000.0592	000.0231	084.946
68.00	0.276	1.0	0.0190	000.0566	000.0212	084.948
69.00	0.264	1.0	0.0174	000.0541	000.0194	084.949
70.00	0.252	1.0	0.0159	000.0517	000.0177	084.951
71.00	0.240	1.0	0.0144	000.0492	000.0160	084.953
72.00	0.228	1.0	0.0130	000.0467	000.0144	084.956
73.00	0.216	1.0	0.0117	000.0443	000.0129	084.958
74.00	0.204	1.0	0.0104	000.0418	000.0115	084.960
75.00	0.192	1.0	0.0092	000.0394	000.0102	084.962
76.00	0.180	1.0	0.0081	000.0369	000.0089	084.964
77.00	0.169	1.0	0.0071	000.0345	000.0078	084.966
78.00	0.157	1.0	0.0062	000.0322	000.0067	084.969
79.00	0.145	1.0	0.0053	000.0297	000.0057	084.971
80.00	0.133	1.0	0.0044	000.0273	000.0047	084.973
81.00	0.121	1.0	0.0036	000.0247	000.0039	084.976
82.00	0.108	1.0	0.0029	000.0221	000.0031	084.978
83.00	0.096	1.0	0.0023	000.0197	000.0024	084.980
84.00	0.084	1.0	0.0018	000.0172	000.0018	084.983
85.00	0.073	1.0	0.0013	000.0150	000.0013	084.985
86.00	0.062	1.0	0.0010	000.0127	000.0009	084.987
87.00	0.053	1.0	0.0007	000.0108	000.0006	084.989
88.00	0.043	1.0	0.0005	000.0088	000.0003	084.991
89.00	0.040	1.0	0.0004	000.0081	000.0001	084.992
90.00	0.036	1.0	0.0003	000.0074	000.0000	084.993

(1) The +40 174.7 dBu F(50-10) contour lowest point within the KZIO(FM) 282C2 third-adjacent protected contour = 84.9 meters, which will not reach any population, roads or buildings.

E-3 W269CV Mod. +40 dBu Tabulation Within KZIO(FM) 282C2

W269CV Duluth, MN

74.1204(d) Showing

Translator or LPFM Maximum Licensed ERP = 0.25

Translator or LPFM Antenna Height AG = 85 Meters

w269cv Antenna Model = BEXT-TFC-2K-2FULL

Protected Station's Contour = 75.44345 dBu

Translator's or LPFM's full Interference contour 115.44345

Review Azimuth = 0 Degrees True

Relative Field on the horizon at Review Azimuth = 1.000

Translator/LPFM ERP on the horizon at Review Azimuth = 0.25 kW

Distance between stations = 19.8 km

Protected Station= KZIO, 50 kW, 470 M Meters COR AMSL

Depression Angle From Horizon(Deg)	Vertical Relative Field	Horizontal Relative Field	ERP (kw)	Dist to IX Contour Along Dep. Angle(m)	Dist to IX Contour From Tower Base(m)	Height IX Above Ground (m)
00.00	1.000	1.0	0.2500	187.4120	187.4120	085.000
01.00	0.995	1.0	0.2473	186.3813	186.3529	081.747
02.00	0.989	1.0	0.2445	185.3505	185.2376	078.531
03.00	0.975	1.0	0.2374	182.6330	182.3827	075.442
04.00	0.960	1.0	0.2304	179.9156	179.4773	072.450
05.00	0.940	1.0	0.2207	176.0736	175.4036	069.654
06.00	0.919	1.0	0.2111	172.2317	171.2882	066.997
07.00	0.892	1.0	0.1989	167.1715	165.9255	064.627
08.00	0.865	1.0	0.1871	162.1114	160.5338	062.438
09.00	0.834	1.0	0.1739	156.3016	154.3773	060.549
10.00	0.803	1.0	0.1612	150.4919	148.2056	058.867
11.00	0.770	1.0	0.1480	144.2136	141.5640	057.483
12.00	0.736	1.0	0.1354	137.9353	134.9211	056.322
13.00	0.700	1.0	0.1225	131.1884	127.8261	055.489
14.00	0.664	1.0	0.1102	124.4416	120.7451	054.895
15.00	0.628	1.0	0.0984	117.6011	113.5939	054.563
16.00	0.591	1.0	0.0873	110.7605	106.4698	054.470
17.00	0.554	1.0	0.0767	103.8263	099.2896	054.644
18.00	0.517	1.0	0.0668	096.8920	092.1498	055.059
19.00	0.479	1.0	0.0572	089.6767	084.7910	055.804
20.00	0.440	1.0	0.0484	082.4613	077.4883	056.797
21.00	0.401	1.0	0.0402	075.1522	070.1607	058.068
22.00	0.362	1.0	0.0328	067.8432	062.9031	059.586
23.00	0.322	1.0	0.0258	060.2530	055.4632	061.457
24.00	0.281	1.0	0.0197	052.6628	048.1098	063.580
25.00	0.240	1.0	0.0143	044.8852	040.6798	066.031
26.00	0.198	1.0	0.0098	037.1076	033.3521	068.733
27.00	0.156	1.0	0.0061	029.2363	026.0497	071.727
28.00	0.114	1.0	0.0032	021.3650	018.8642	074.970
29.00	0.072	1.0	0.0013	013.4000	011.7199	078.504
30.00	0.029	1.0	0.0002	005.4349	004.7068	082.283
31.00	0.042	1.0	0.0004	007.8713	006.7470	080.946
32.00	0.055	1.0	0.0008	010.3077	008.7414	079.538
33.00	0.096	1.0	0.0023	017.8979	015.0104	075.252
34.00	0.136	1.0	0.0046	025.4880	021.1305	070.747
35.00	0.174	1.0	0.0075	032.5160	026.6355	066.350
36.00	0.211	1.0	0.0111	039.5439	031.9917	061.757
37.00	0.245	1.0	0.0149	045.8222	036.5953	057.423
38.00	0.278	1.0	0.0193	052.1005	041.0558	052.924
39.00	0.307	1.0	0.0235	057.4418	044.6407	048.851
40.00	0.335	1.0	0.0281	062.7830	048.0946	044.644
41.00	0.358	1.0	0.0320	067.0935	050.6361	040.983

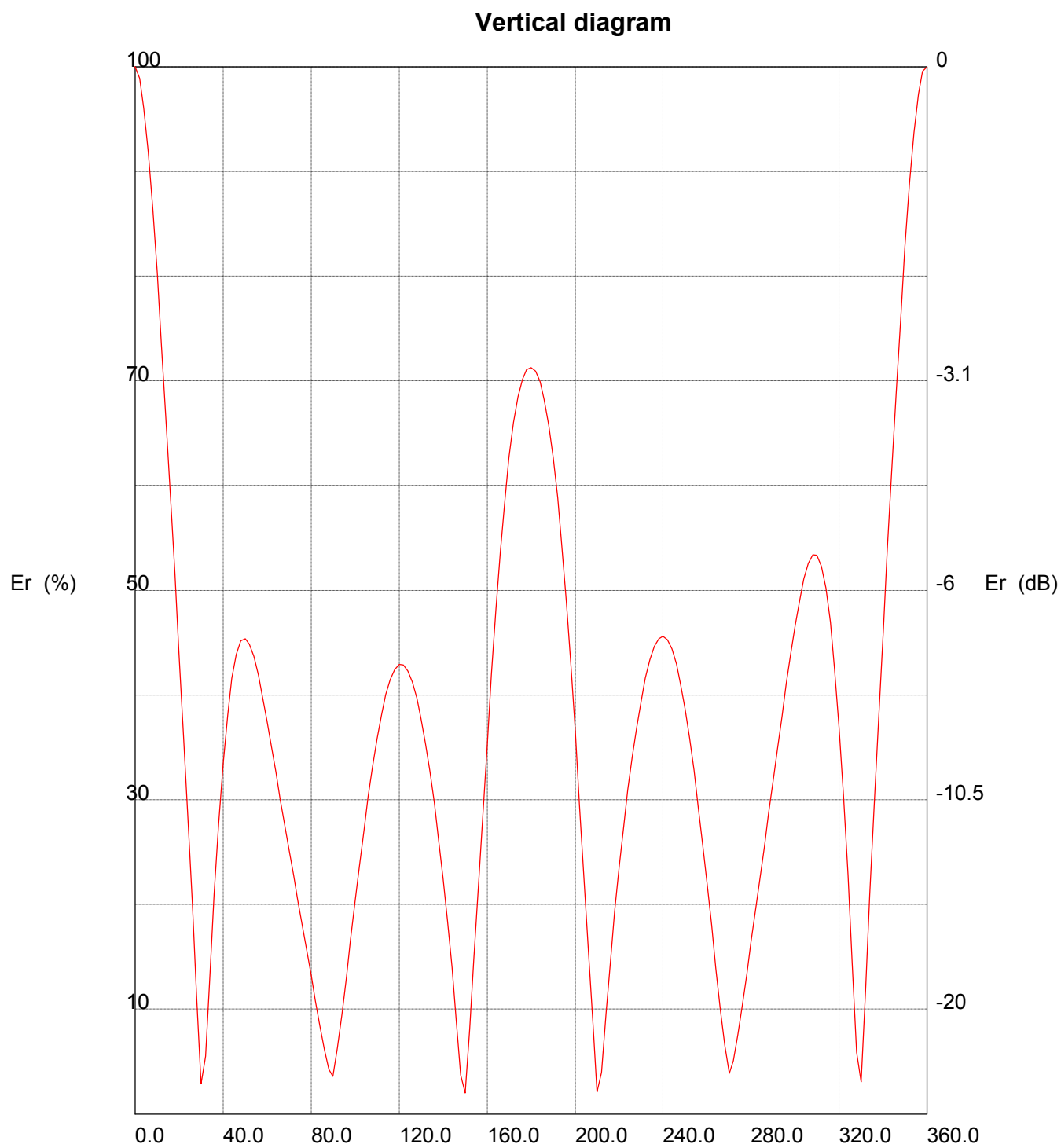
E-3 W269CV Mod. +40 dBu Tabulation Within KZIO(FM) 282C2

Depression Angle From Horizon(Deg)	Vertical Relative Field	Horizontal Relative Field	ERP (kw)	Dist to IX Contour Along Dep. Angle(m)	Dist to IX Contour From Tower Base(m)	Height IX Above Ground (m)
42.00	0.381	1.0	0.0363	071.4040	053.0635	037.221
43.00	0.399	1.0	0.0397	074.6837	054.6202	034.066
44.00	0.416	1.0	0.0433	077.9634	056.0822	030.842
45.00	0.428	1.0	0.0457	080.1187	056.6524	028.348
46.00	0.439	1.0	0.0482	082.2739	057.1522	025.817
47.00	0.446	1.0	0.0496	083.4921	056.9415	023.938
48.00	0.452	1.0	0.0511	084.7102	056.6822	022.048
49.00	0.453	1.0	0.0513	084.8977	055.6979	020.927
50.00	0.454	1.0	0.0515	085.0851	054.6916	019.821
51.00	0.452	1.0	0.0510	084.6165	053.2509	019.241
52.00	0.449	1.0	0.0504	084.1480	051.8067	018.690(1)
53.00	0.443	1.0	0.0491	083.0235	049.9648	018.694
54.00	0.437	1.0	0.0477	081.8991	048.1391	018.742
55.00	0.428	1.0	0.0458	080.2124	046.0079	019.294
56.00	0.419	1.0	0.0439	078.5256	043.9110	019.899
57.00	0.409	1.0	0.0417	076.5578	041.6964	020.793
58.00	0.398	1.0	0.0396	074.5900	039.5267	021.744
59.00	0.387	1.0	0.0373	072.4348	037.3067	022.911
60.00	0.375	1.0	0.0352	070.2795	035.1398	024.136
61.00	0.363	1.0	0.0329	068.0306	032.9819	025.499
62.00	0.351	1.0	0.0308	065.7816	030.8826	026.918
63.00	0.339	1.0	0.0286	063.4390	028.8007	028.475
64.00	0.326	1.0	0.0266	061.0963	026.7829	030.087
65.00	0.314	1.0	0.0246	058.7537	024.8304	031.751
66.00	0.301	1.0	0.0227	056.4110	022.9444	033.466
67.00	0.289	1.0	0.0208	054.0684	021.1262	035.230
68.00	0.276	1.0	0.0190	051.7257	019.3768	037.041
69.00	0.264	1.0	0.0174	049.4768	017.7309	038.809
70.00	0.252	1.0	0.0159	047.2278	016.1529	040.620
71.00	0.240	1.0	0.0144	044.9789	014.6437	042.472
72.00	0.228	1.0	0.0130	042.7299	013.2043	044.361
73.00	0.216	1.0	0.0117	040.4810	011.8355	046.288
74.00	0.204	1.0	0.0104	038.2321	010.5382	048.249
75.00	0.192	1.0	0.0092	035.9831	009.3131	050.243
76.00	0.180	1.0	0.0081	033.7342	008.1610	052.268
77.00	0.169	1.0	0.0071	031.5789	007.1037	054.230
78.00	0.157	1.0	0.0062	029.4237	006.1175	056.219
79.00	0.145	1.0	0.0053	027.1747	005.1852	058.325
80.00	0.133	1.0	0.0044	024.9258	004.3283	060.453
81.00	0.121	1.0	0.0036	022.5832	003.5328	062.695
82.00	0.108	1.0	0.0029	020.2405	002.8169	064.956
83.00	0.096	1.0	0.0023	017.9916	002.1926	067.143
84.00	0.084	1.0	0.0018	015.7426	001.6456	069.344
85.00	0.073	1.0	0.0013	013.6811	001.1924	071.371
86.00	0.062	1.0	0.0010	011.6195	000.8105	073.409
87.00	0.053	1.0	0.0007	009.8391	000.5149	075.174
88.00	0.043	1.0	0.0005	008.0587	000.2812	076.946
89.00	0.040	1.0	0.0004	007.4028	000.1292	077.598
90.00	0.036	1.0	0.0003	006.7468	000.0000	078.253

(1) The +40 115.4 dBu F(50-10) contour lowest point within the KZIO(FM) 282C2 second-adjacent protected contour = 18.7 meters, which will not reach any population, roads or buildings.

E-4 Bext TFC2K-2 Fullwave Antenna Vertical Elevation Pattern and Tabulation

Frequency: 98.00 MHz



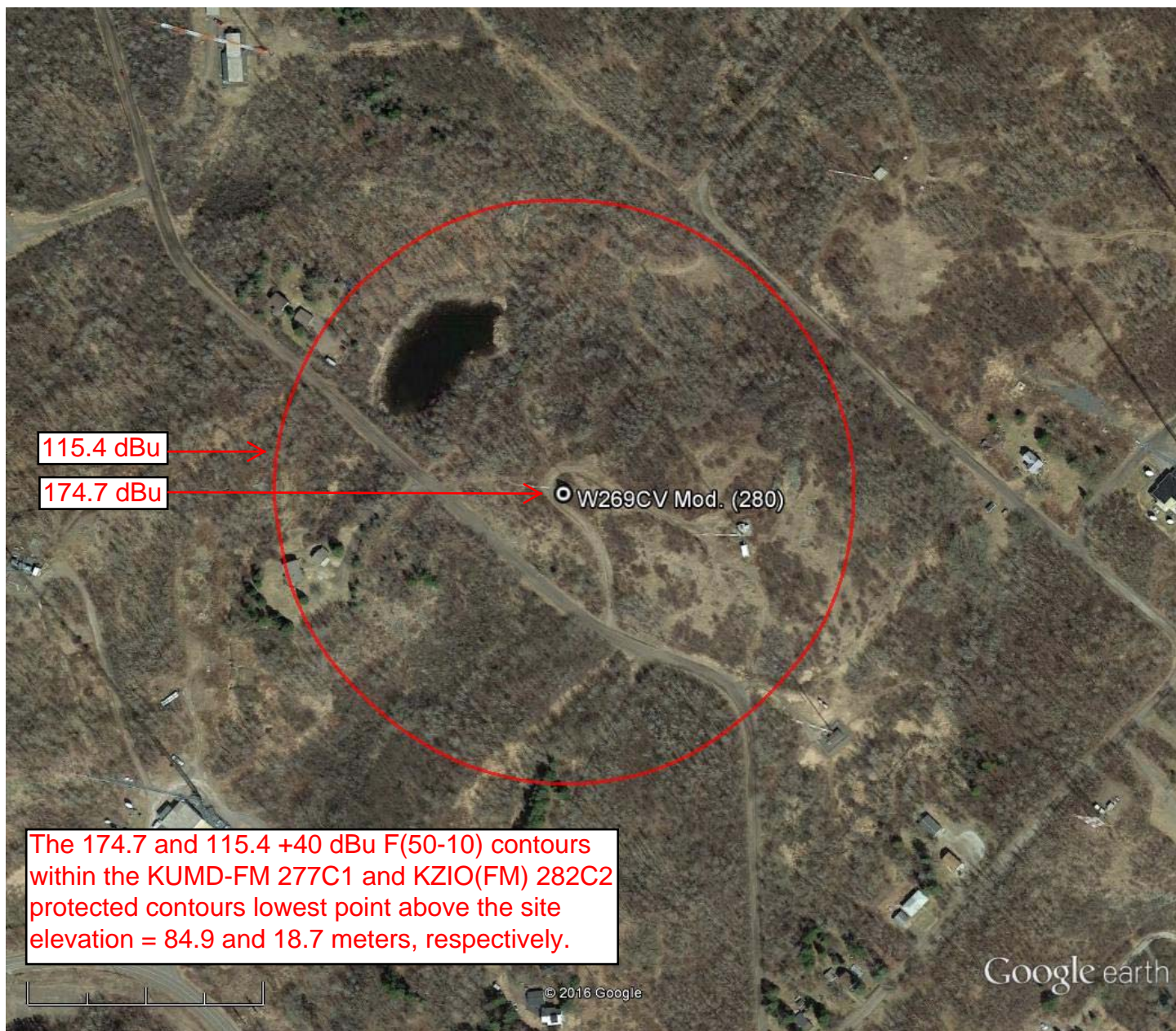
E-4 Bext TFC2K-2 Fullwave Antenna Vertical Elevation Pattern and Tabulation

Frequency: 98.00 MHz

Vertical diagram at an azimuth of 0°

Dep (°)	Er (%)	ERP (W)	Dep (°)	Er (%)	ERP (W)	Dep (°)	Er (%)	ERP (W)
0.0	100.0	0.9	120.0	42.9	0.2	240.0	45.6	0.2
2.0	98.9	0.9	122.0	42.9	0.2	242.0	45.3	0.2
4.0	96.0	0.8	124.0	42.3	0.2	244.0	44.4	0.2
6.0	91.9	0.8	126.0	41.2	0.2	246.0	43.0	0.2
8.0	86.5	0.7	128.0	39.7	0.1	248.0	41.0	0.2
10.0	80.3	0.6	130.0	37.8	0.1	250.0	38.7	0.1
12.0	73.6	0.5	132.0	35.4	0.1	252.0	35.9	0.1
14.0	66.4	0.4	134.0	32.7	0.1	254.0	32.8	0.1
16.0	59.1	0.3	136.0	29.6	0.1	256.0	29.4	0.1
18.0	51.7	0.2	138.0	26.2	0.1	258.0	25.7	0.1
20.0	44.0	0.2	140.0	22.5	0.0	260.0	21.9	0.0
22.0	36.2	0.1	142.0	18.4	0.0	262.0	18.0	0.0
24.0	28.1	0.1	144.0	13.9	0.0	264.0	14.0	0.0
26.0	19.8	0.0	146.0	9.1	0.0	266.0	10.0	0.0
28.0	11.4	0.0	148.0	3.8	0.0	268.0	6.6	0.0
30.0	2.9	0.0	150.0	2.0	0.0	270.0	3.9	0.0
32.0	5.5	0.0	152.0	8.2	0.0	272.0	5.1	0.0
34.0	13.6	0.0	154.0	14.7	0.0	274.0	7.6	0.0
36.0	21.1	0.0	156.0	21.5	0.0	276.0	10.4	0.0
38.0	27.8	0.1	158.0	28.4	0.1	278.0	13.4	0.0
40.0	33.5	0.1	160.0	35.3	0.1	280.0	16.4	0.0
42.0	38.1	0.1	162.0	41.9	0.2	282.0	19.4	0.0
44.0	41.6	0.2	164.0	48.1	0.2	284.0	22.5	0.0
46.0	43.9	0.2	166.0	53.7	0.3	286.0	25.6	0.1
48.0	45.2	0.2	168.0	58.6	0.3	288.0	28.7	0.1
50.0	45.4	0.2	170.0	62.7	0.4	290.0	31.8	0.1
52.0	44.9	0.2	172.0	66.0	0.4	292.0	34.9	0.1
54.0	43.7	0.2	174.0	68.5	0.4	294.0	38.0	0.1
56.0	41.9	0.2	176.0	70.1	0.4	296.0	41.1	0.2
58.0	39.8	0.1	178.0	71.0	0.5	298.0	43.9	0.2
60.0	37.5	0.1	180.0	71.2	0.5	300.0	46.7	0.2
62.0	35.1	0.1	182.0	70.9	0.5	302.0	49.1	0.2
64.0	32.6	0.1	184.0	69.9	0.4	304.0	51.1	0.2
66.0	30.1	0.1	186.0	68.2	0.4	306.0	52.6	0.2
68.0	27.6	0.1	188.0	65.8	0.4	308.0	53.4	0.3
70.0	25.2	0.1	190.0	62.7	0.4	310.0	53.3	0.3
72.0	22.8	0.0	192.0	58.8	0.3	312.0	52.3	0.2
74.0	20.4	0.0	194.0	54.2	0.3	314.0	50.2	0.2
76.0	18.0	0.0	196.0	49.0	0.2	316.0	47.0	0.2
78.0	15.7	0.0	198.0	43.0	0.2	318.0	42.5	0.2
80.0	13.3	0.0	200.0	36.5	0.1	320.0	37.0	0.1
82.0	10.8	0.0	202.0	29.6	0.1	322.0	30.3	0.1
84.0	8.4	0.0	204.0	22.5	0.0	324.0	22.8	0.0
86.0	6.2	0.0	206.0	15.5	0.0	326.0	14.6	0.0
88.0	4.3	0.0	208.0	8.6	0.0	328.0	5.9	0.0
90.0	3.6	0.0	210.0	2.1	0.0	330.0	3.0	0.0
92.0	6.3	0.0	212.0	4.0	0.0	332.0	12.0	0.0
94.0	9.5	0.0	214.0	9.6	0.0	334.0	20.9	0.0
96.0	13.0	0.0	216.0	14.7	0.0	336.0	29.5	0.1
98.0	16.6	0.0	218.0	19.4	0.0	338.0	37.9	0.1
100.0	20.2	0.0	220.0	23.6	0.0	340.0	46.0	0.2
102.0	23.7	0.1	222.0	27.4	0.1	342.0	53.9	0.3
104.0	27.1	0.1	224.0	30.9	0.1	344.0	61.6	0.3
106.0	30.3	0.1	226.0	34.1	0.1	346.0	69.1	0.4
108.0	33.2	0.1	228.0	36.9	0.1	348.0	76.2	0.5
110.0	35.8	0.1	230.0	39.5	0.1	350.0	82.8	0.6
112.0	38.2	0.1	232.0	41.6	0.2	352.0	88.8	0.7
114.0	40.0	0.1	234.0	43.4	0.2	354.0	93.7	0.8
116.0	41.5	0.2	236.0	44.6	0.2	356.0	97.4	0.9
118.0	42.4	0.2	238.0	45.4	0.2	358.0	99.5	0.9

E-5 W269CV Mod. +40 dBu Contour Aerial Photo

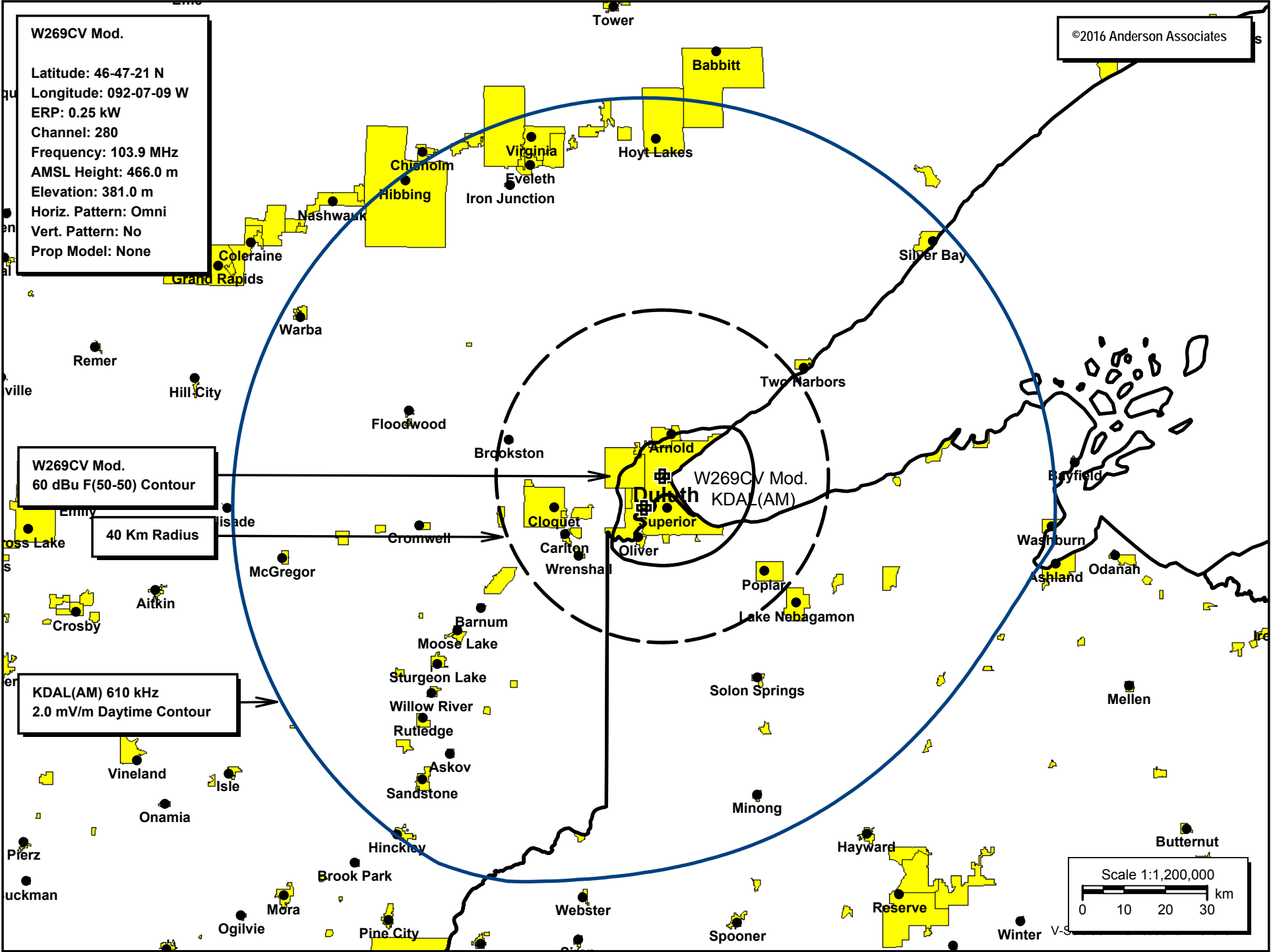


Google earth

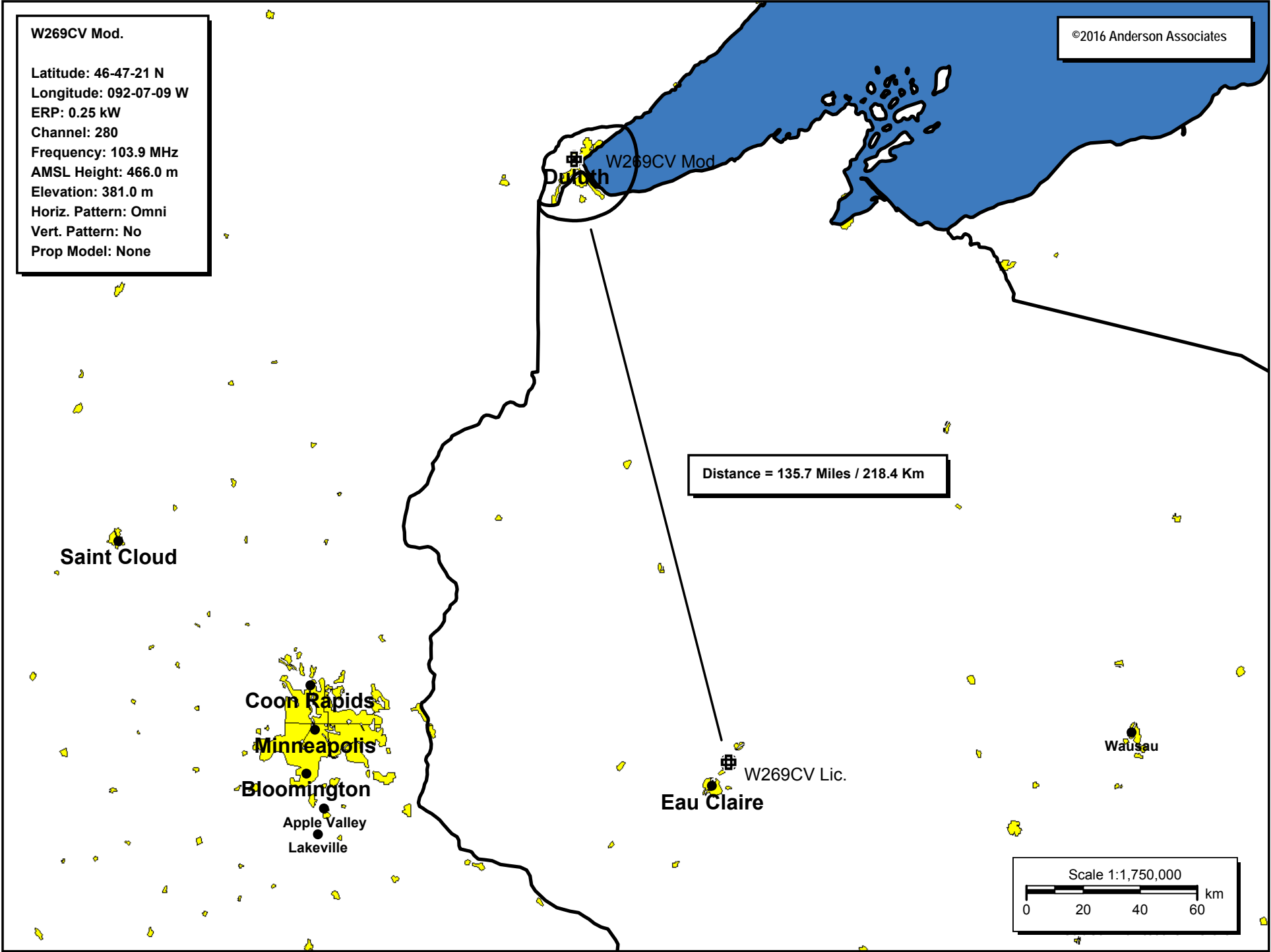
feet
meters



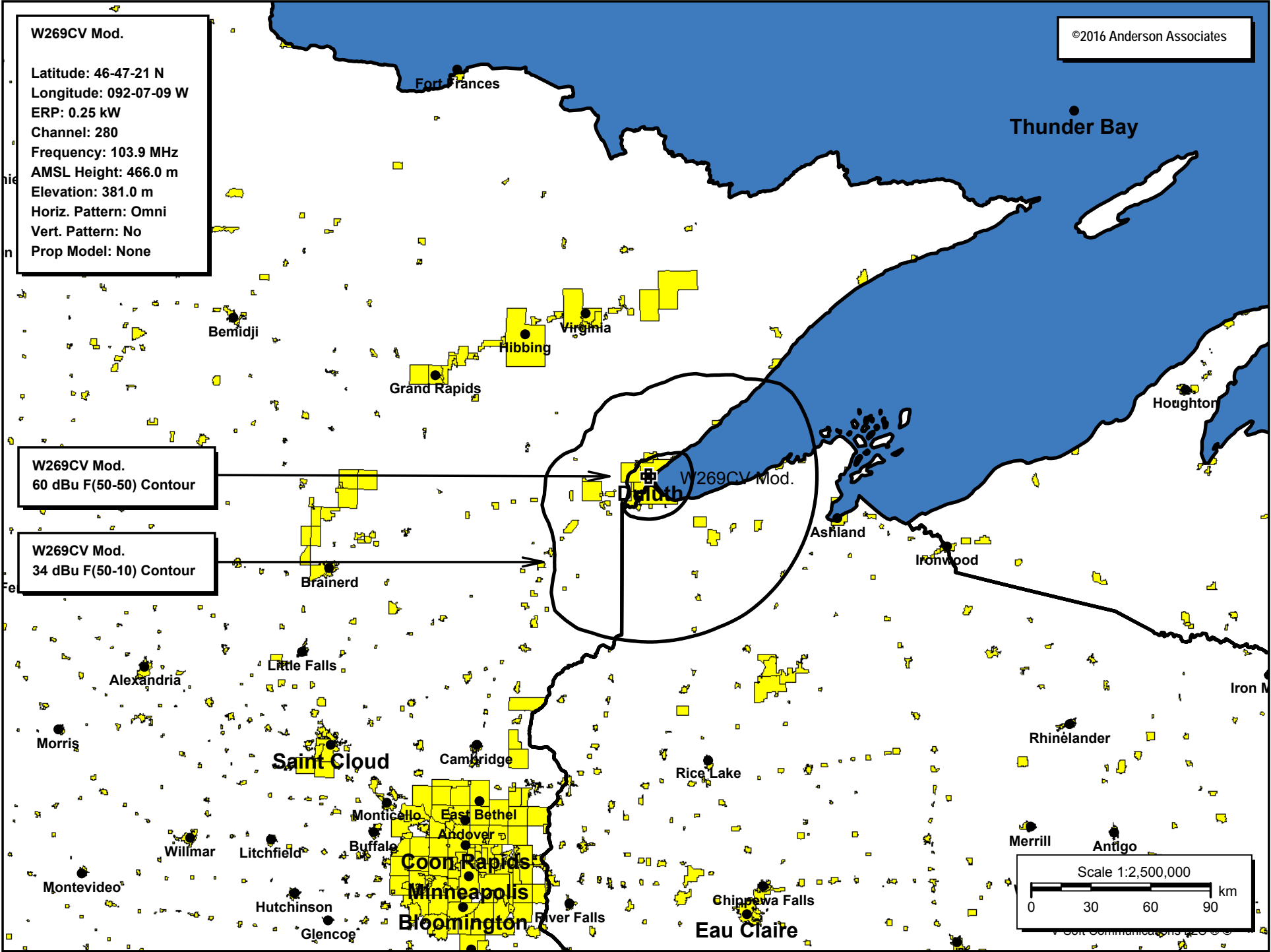
E-6 W269CV Mod. 60 dBu Contour Plot



E-7 W269CV Mod. 250 Mile Distance Plot



E-8 W269CV Mod. 34 dBu Contour Plot



Registration 1024122



Registration Detail

Reg Number	1024122	Status	Constructed
File Number	A0909229	Constructed	11/01/1978
EMI	No	Dismantled	
NEPA	No		

Antenna Structure

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

Location (in NAD83 Coordinates)

Lat/Long	46-47-21.0 N 092-07-10.0 W	Address	13TH & HIGHLAND STS
City, State	DULUTH , MN		
Zip	55806	County	ST. LOUIS
Center of AM Array		Position of Tower in Array	

Heights (meters)

Elevation of Site Above Mean Sea Level	Overall Height Above Ground (AGL)
381.0	121.9
Overall Height Above Mean Sea Level	Overall Height Above Ground w/o Appurtenances
502.9	120.7

Painting and Lighting Specifications

FCC Paragraphs 1, 3, 12, 21

FAA Notification

FAA Study	78-AGL-1855-OE	FAA Issue Date	12/19/1978
-----------	----------------	----------------	------------

Owner & Contact Information

FRN	0002711737	Owner Entity	Corporation
		Type	

Owner

Midwest Communications, Inc.
Attention To: Mr. Paul Rahmlow
904 Grand Avenue
Wausau , WI 54403

P: (715)842-1437
F:
E: paul.rahmlow@mwcradio.com

Contact

Rahmlow , Paul
904 Grand Avenue
Wausau , WI 54403

P: (715)842-1437
F:
E: paul.rahmlow@mwcradio.com

Last Action Status

Status	Constructed	Received	07/14/2014
Purpose	Admin Update	Entered	07/14/2014