

ENGINEERING REPORT

**FM Translator
Minor Modification to CP
Application**

for

**W280FW
Facility ID: 203241**

as an AM Fill-In Translator for
WCVG(AM) – Covington, KY

November 2021

MUNN-REESE

Broadcast Engineering Consultants
Coldwater, MI 49036

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Discussion

This firm has been retained to prepare the required engineering report in support of a Minor Modification to Construction Permit Application for an FM Translator W280FW. The existing construction permit parameters were an AMSL of 217 meters AMSL and an ERP of 0.250 kW. The applicant is not able to install the antenna on the tower as proposed due to structural issues with the tower. This proposal requests an AMSL of 237 meters AMSL and an ERP of 0.099 kW.

The Fill-In Translator will rebroadcast Class D Primary Station WCVG(AM) – Covington, KY (1320 kHz); Facility ID No. 56220.

The Translator as proposed will be mounted on a tower which does not bear an Antenna Structure Registration Number.

The proposed 60 dB μ contour of the Fill-In Translator lies wholly inside the greater of the AM primary daytime 2.0 mV/m contour and a 25 mile radius around the AM site. A map of the proposed service area in relation to the primary station service contour has been included in **Exhibit 1.0**.

It has been determined the Translator may be used in the area without interference to any existing FM broadcast station or facility. General allocation details are found in **Exhibit 2.0**. It is believed sufficient clearance exists precluding the need for additional contour protection showings.

The applicant would like to note the existence of a §74.1204(d) Second/Third Adjacent Channel Given Interference Waiver Request toward WGRR(FM) – Hamilton, OH (CH278B) and WNLT(FM) – Delhi Hills, OH (CH282A) as noted in **Exhibit 2.1**. Protection has been based on the worst case calculated 130.3 dB μ F(50:10) Interference Contour, corresponding to the worst case 90.3 dB μ F(50:50) Protected Contour. Protection has been demonstrated through a downward vertical radiation study. Full protection will be afforded the facility as the interference area that reaches the ground is contained within the property where the antenna will be installed and does not reach any houses or main roads.

The applicant certifies the proposed translator 34 dBu F(50:10) Interference contour does not enter Canadian territory. Documentation of the proposed 34 dBu F(50:10) Interference contour will be supplied upon request.

This translator is not within the affected distance of any TV Channel 6 stations.

The applicant would like to note use of the NED 03 second terrain database for terrain-based showings contained here-in.

Discussion (continued)

RADIATION PROTECTION: The Commission requires an engineering study regarding compliance with the guidelines for human protection from radiofrequency radiation. This report section is in response to that provision of the Rules. The current Federal Communications Commission guidelines for RF radiation protection are set forth in OET Bulletin No. 65 (Edition 97-01), and the accompanying Supplement A, (Edition 97-01).

The FM Broadcast facility proposed in this application will not produce human exposure to radiofrequency radiation in excess of the applicable safety standards specified in §1.1307 of the Commission's rules concerning RF contributors. **Exhibit 3.0** provides the details of the study that was made to demonstrate compliance. The facility is properly marked with signs, and entry is restricted by means of fencing with locked doors and/or gates. Any other means as may be required to protect employees and the general public will be employed.

In the event work would be required in proximity to the antenna such that the person or persons working in the area would be potentially exposed to fields in excess of the guidelines set forth in OET Bulletin No. 65 (Edition 97-01), the transmitter power will be reduced or the station will cease operation during the critical period.

Exhibit 1.0 - W280FW Present and Proposed with WCVG(AM) Contours

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W280FW.P
 BNPFT20180424AAS
 Latitude: 39-07-12.09 N
 Longitude: 084-30-08.01 W
 Frequency: 1320 kHz

W280FW.C
 BNPFT20180424AAS
 Latitude: 39-02-43 N
 Longitude: 084-30-30 W
 ERP: 0.25 kW
 Channel: 280
 Frequency: 103.9 MHz
 AMSL Height: 217.0 m
 Elevation: 162.0 m
 Horiz. Pattern: Omni
 Vert. Pattern: No
 Prop Model: None

W280FW.P
 BNPFT20180424AAS
 Latitude: 39-07-12.09 N
 Longitude: 084-30-08.01 W
 ERP: 0.099 kW
 Channel: 280
 Frequency: 103.9 MHz
 AMSL Height: 237.0 m
 Elevation: 225.0 m
 Horiz. Pattern: Omni
 Vert. Pattern: No
 Prop Model: None

- WCVG.L
- W280FW.P (280)
- W280FW.C (280)

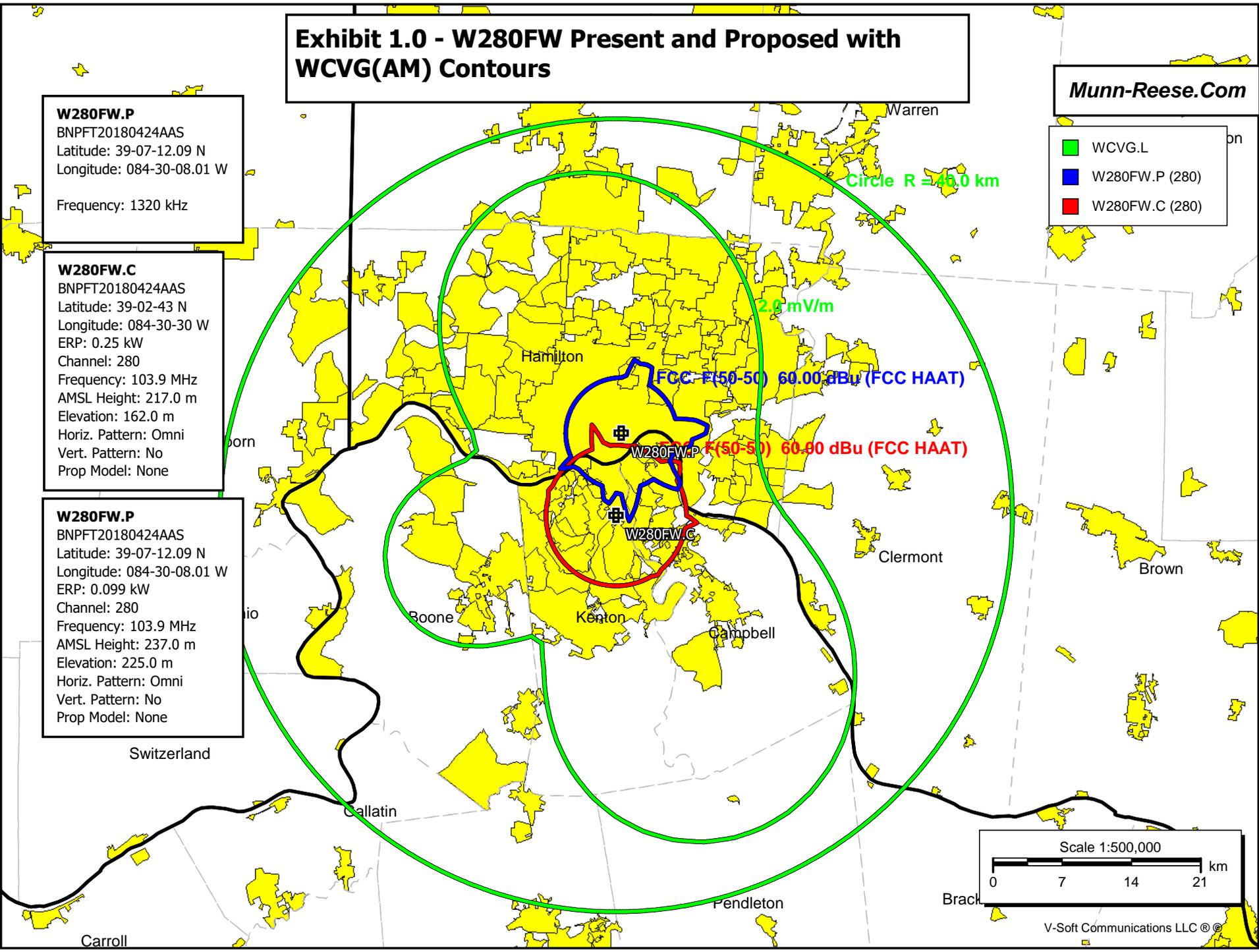


Exhibit 2.0
Reign Enterprizes, LLC

REFERENCE CH# 280D - 103.9 MHZ, Pwr= 0.099 kW, HAAT= 20.9 M, COR= 237 M DISPLAY DATES
39 07 12.30 N. DATA 11-15-21
84 30 07.80 W. Average Protected F(50-50)= 5.62 km SEARCH 11-19-21
Omni-directional

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)
278B	WGRR	LIC ZCN		348.8	9.09	39 12 01.20	11.000	4.9	64.4	-1.4*<	-56.7*<
Hamilton	OH			168.8	BLH19940718KB	84 31 21.70	316	536	Radio License Holding Src		
282A	WNL	LIC NCN		250.5	5.00	39 06 18.20	2.000	2.4	28.7	-3.0*<	-24.4*<
Delhi Hills	OH			70.5	0000145880	84 33 24.80	175	395	Educational Media Foundati		
280D	W280FW	CP _CN		183.6	8.32	39 02 43.20	0.250		---	Reference---	
Covington	KY			3.6	BNPFT20180424AAS	84 30 29.70		217	Reign Enterprizes, LLC		
280A	WRBI	LIC _CN		280.3	65.99	39 13 25.20	2.650	75.1	24.2	-14.7*<	23.3
Batesville	IN			99.8	BLH20151021AHW	85 15 21.90	108	402	Leeson Media, LLC		
280A	WZDA	LIC ZCN		20.5	71.49	39 43 19.20	2.900	75.4	25.4	-11.3*<	21.4
Beavercreek	OH			200.7	BMLH20120315ADM	84 12 32.80	146	413	Ihm Licenses, LLC		
281C0	WPK	LIC ZCN		110.2	137.71	38 41 00.30	100.000	107.6	73.1	24.5	56.7
Portsmouth	OH			291.1	BLED20181011AAC	83 00 45.60	450	676	Educational Media Foundati		
279A	WFRT-FM	LIC _CN		199.8	106.12	38 13 17.30	2.500	41.6	27.5	58.9	70.7
Frankfort	KY			19.6	BLH19910422KA	84 54 51.80	109	336	Southern Belle, LLC		
281B	WLBC-FM	LIC _CN		327.3	137.95	40 09 40.20	41.000	70.8	59.0	61.5	67.6
Muncie	IN			146.8	BMLH20041020AAB	85 22 43.90	140	438	Woof Boom Radio Muncie Lic		
280A	WRKA	LIC _CN		229.0	145.26	38 15 22.30	1.350	75.1	25.3	64.6	101.4
Louisville	KY			48.2	BMLH20011227AAH	85 45 28.90	149	304	Sm-wrka, LLC		
283C2	WLKT	LIC NCN		171.9	117.99	38 04 09.30	50.000	5.9	52.0	104.2	65.3
Lexington-Fayette	KY			352.0	BLH20000217ABS	84 18 43.80	142	430	Ihm Licenses, LLC		
280D	W280DO	LIC _CN		177.4	122.97	38 00 54.30	0.250	48.4	14.4	68.0	86.7
Lexington	KY			357.4	BLFT20070622ADR	84 26 17.80	128	418	Educational Media Foundati		
282D	W282CD	LIC _CN		21.0	84.07	39 49 32.30	0.250	1.1	13.1	75.5	70.3
Dayton	OH			201.2	BLFT20160613ABK	84 08 59.20		336	L & D Broadcasters, Inc.,		
282D	W282AZ	LIC _CN		286.3	88.05	39 20 18.20	0.027	0.4	5.2	82.1	82.2
Greensburg	IN			105.7	BLFT20071105ADN	85 29 05.90	75	351	Two Black Cadillacs		
278D	W278BB	LIC _CN		286.3	88.05	39 20 18.20	0.027	0.4	5.2	82.1	82.2
Greensburg	IN			105.7	BLFT20071105ADP	85 29 05.90	75	351	Two Black Cadillacs Inc		
280A	WJKR	LIC ZCN		51.3	152.16	39 58 00.20	6.000	60.4	17.6	86.2	116.0
Worthington	OH			232.2	BLH20130816ACY	83 06 27.70	99	350	North American Broadcastin		
277A	WXZZ	LIC _CN		179.3	117.24	38 03 56.30	6.000	2.9	30.0	108.0	86.5
Georgetown	KY			359.4	BLH19980929KB	84 29 12.80	100	387	Cumulus Licensing LLC		
279B	WFIU	LIC _CN		271.4	171.90	39 08 31.20	29.000	78.9	66.4	87.3	94.2
Bloomington	IN			90.2	BLED20021223ABE	86 29 43.00	197	413	Trustees Of Indiana Univer		
277D	W277AO	LIC DCN		30.2	99.56	39 53 34.20	0.250	0.5	7.8	93.4	91.1
Enon	OH			210.5	0000112572	83 54 55.80		361			
281L1	WYDX-LP	LIC _CN		198.3	106.13	38 12 48.20	0.064			92.0	92.2
Frankfort	KY			18.1	BLL20180108AAE	84 53 04.50	38	259	Woods And Waters Land Trus		
279D	W279BR	LIC _CN		353.8	108.60	40 05 28.20	0.120	8.4	5.9	94.6	94.7
Greenville	OH			173.7	BLFT20190924ABP	84 38 23.80		351	Educational Media Foundati		
283B	WJJK	LIC _CN		299.7	164.45	39 50 25.20	50.000	5.9	64.3	153.0	98.7
Noblesville	IN			118.6	BMLH20030828AYT	86 10 34.00	150	390	Radio License Holding Src		
283B	AL9217	RSV-A		299.7	164.45	39 50 25.15	50.000	5.8	64.2	153.0	98.8
Noblesville	IN			118.6	RM10153	86 10 33.95	150	389	Eastern Airwaves, Llc		

Terrain database is NED 03 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.
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.
< = Contour Overlap

Exhibit 2.1 - W280FW Proposed with WGRR and WNLT signal strength at W280FW Site in support of a 74.1204(d) Waiver Request

W280FW.P
 BNPFT20180424AAS
 Latitude: 39-07-12.09 N
 Longitude: 084-30-08.01 W
 Frequency: 1320 kHz

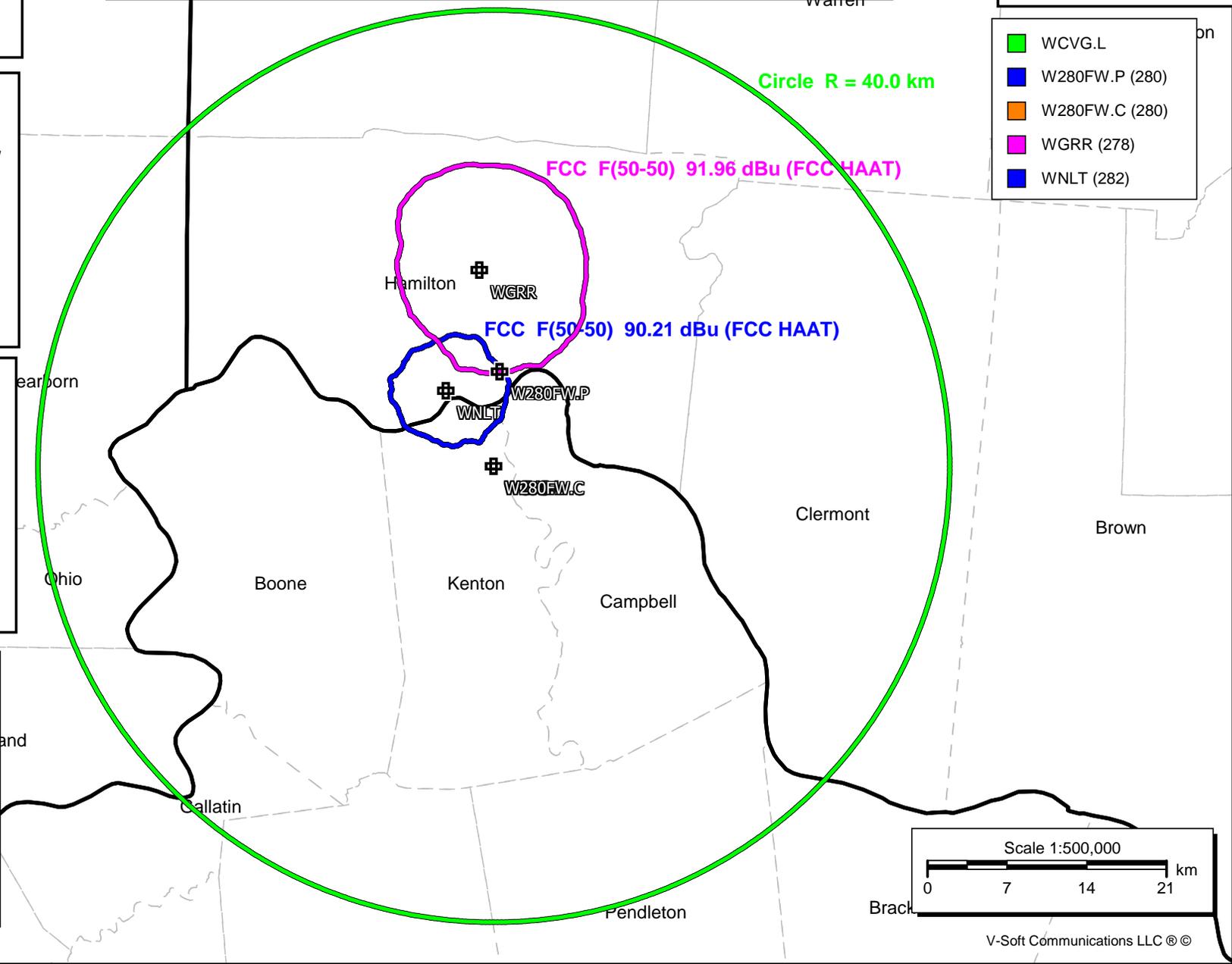
W280FW.P
 BNPFT20180424AAS
 Latitude: 39-07-12.09 N
 Longitude: 084-30-08.01 W
 ERP: 0.099 kW
 Channel: 280
 Frequency: 103.9 MHz
 AMSL Height: 237.0 m
 Elevation: 225.0 m
 Horiz. Pattern: Omni
 Vert. Pattern: No
 Prop Model: None

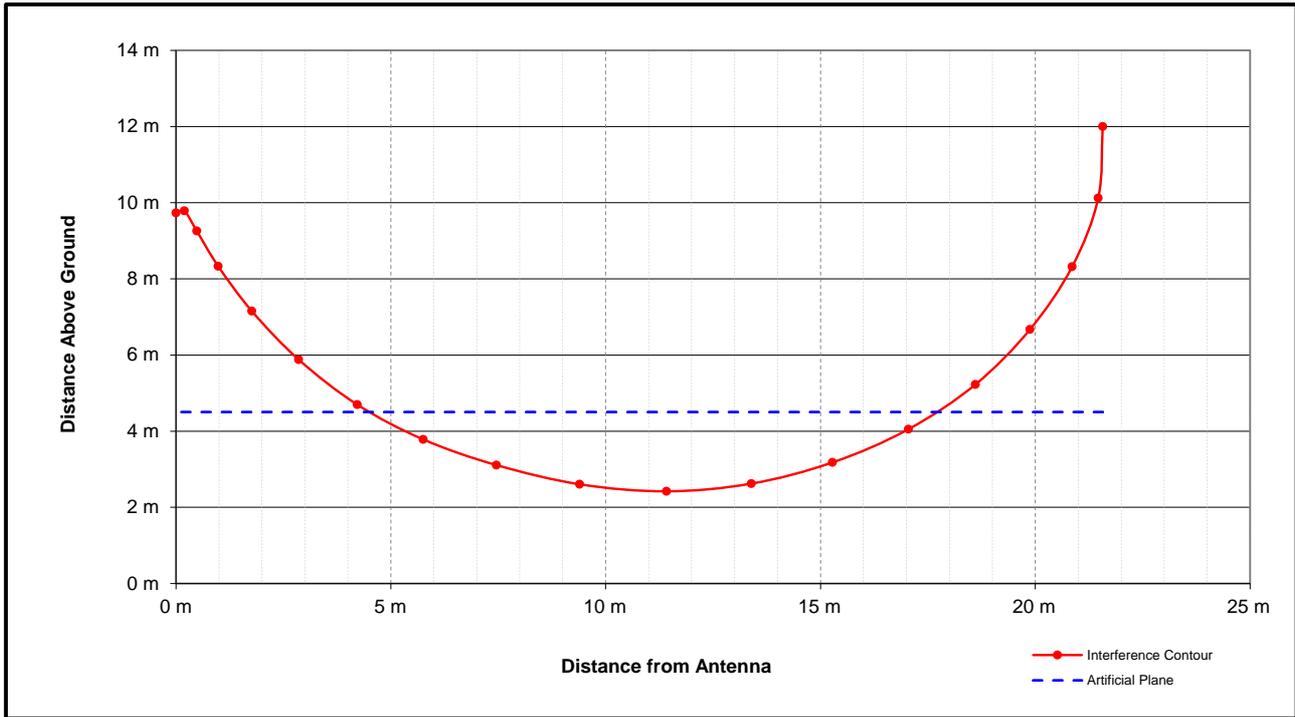
WGRR
 BLH19940718KB
 Latitude: 39-12-00.99 N
 Longitude: 084-31-21.90 W
 ERP: 11.00 kW
 Channel: 278
 Frequency: 103.5 MHz
 AMSL Height: 536.0 m
 Elevation: 273.0 m
 Horiz. Pattern: Directional
 Vert. Pattern: No
 Prop Model: None

WNLT
 0000145880
 Latitude: 39-06-17.99 N
 Longitude: 084-33-25 W
 ERP: 2.00 kW
 Channel: 282
 Frequency: 104.3 MHz
 AMSL Height: 395.0 m
 Elevation: 259.0 m
 Horiz. Pattern: Omni
 Vert. Pattern: No
 Prop Model: None

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- WCVG.L
- W280FW.P (280)
- W280FW.C (280)
- WGRR (278)
- WNLT (282)





Proposed Antenna: Opposed V Dipole
Proposed Power: 0.099 kW
Antenna Height AGL: 12 meters
Interference Contour: 130.2 dBu f(50:10)
Artificial Ground Plane Height: 5 meters
Distance (Free Space) Equation: $= (10^{((106.92 - [\text{desired dBu}] + [\text{ERP in dBk}]/20))} * 1000)$
Field Strength (dBu) Equation: $= 106.92 - (20 * (\text{LOG}_{10}[\text{DistMeters}/1000])) + [\text{ERP in dBk}]$

Depression Angle Below Horizon	Antenna Relative Field	ERP in kW	ERP in dBk	Distance from Ant. to Interference Contour	Distance from Ant. to Artificial Plane	Field Strength in dBu @ Artificial Plane	Distance from Ant. to Ground Level	Field Strength in dBu @ Ground Level
0°	1.000	0.099	-10.04	21.57 m	infinite	---	---	---
-5°	0.999	0.099	-10.05	21.55 m	86.05 m	118.17 dBu	137.68 m	114.09 dBu
-10°	0.982	0.095	-10.20	21.18 m	43.19 m	124.01 dBu	69.11 m	119.93 dBu
-15°	0.954	0.090	-10.45	20.58 m	28.98 m	127.23 dBu	46.36 m	123.14 dBu
-20°	0.918	0.083	-10.79	19.80 m	21.93 m	129.31 dBu	35.09 m	125.23 dBu
-25°	0.872	0.075	-11.23	18.81 m	17.75 m	130.70 dBu	28.39 m	126.62 dBu
-30°	0.818	0.066	-11.79	17.64 m	15.00 m	131.61 dBu	24.00 m	127.53 dBu
-35°	0.758	0.057	-12.45	16.35 m	13.08 m	132.14 dBu	20.92 m	128.06 dBu
-40°	0.691	0.047	-13.25	14.90 m	11.67 m	132.33 dBu	18.67 m	128.24 dBu
-45°	0.616	0.038	-14.25	13.29 m	10.61 m	132.16 dBu	16.97 m	128.07 dBu
-50°	0.538	0.029	-15.43	11.60 m	9.79 m	131.68 dBu	15.66 m	127.59 dBu
-55°	0.465	0.021	-16.69	10.03 m	9.16 m	130.99 dBu	14.65 m	126.91 dBu
-60°	0.391	0.015	-18.20	8.43 m	8.66 m	129.97 dBu	13.86 m	125.89 dBu
-65°	0.313	0.010	-20.13	6.75 m	8.28 m	128.43 dBu	13.24 m	124.35 dBu
-70°	0.239	0.006	-22.48	5.15 m	7.98 m	126.40 dBu	12.77 m	122.32 dBu
-75°	0.176	0.003	-25.13	3.80 m	7.76 m	123.98 dBu	12.42 m	119.90 dBu
-80°	0.129	0.002	-27.83	2.78 m	7.62 m	121.45 dBu	12.19 m	117.37 dBu
-85°	0.103	0.001	-29.79	2.22 m	7.53 m	119.60 dBu	12.05 m	115.52 dBu
-90°	0.105	0.001	-29.62	2.26 m	7.50 m	119.80 dBu	12.00 m	#NAME?

Exhibit 3.0 Compliance with Radiofrequency Radiation Guidelines

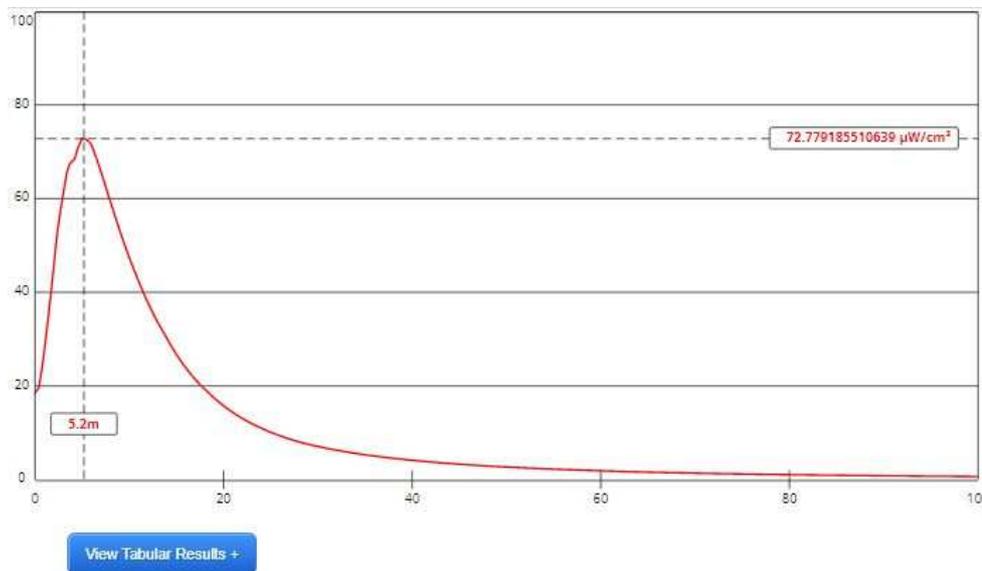
The RF Compliance Study has been evaluated for human exposure to non-ionizing radiofrequency radiation at the transmitter site. The site is intended to house multiple transmitters. The potential for human exposure to non-ionizing radiofrequency radiation at the proposed transmitter site has therefore been evaluated with regards to the §1.1307(b)(3), five percent (5%) contribution rule, for multiple transmitter sites.

The proposed operation will broadcast from an antenna COR mounted 12 meters above ground level (AGL) atop a pole on building rooftop. The minimum distance between the antenna and any people below the antenna is at least 7 meters. The facility will operate with a one bay antenna employing EPA Type 2 elements as defined by *FM Model - Appendix B* issued March 31, 2016¹. This facility will not operate with HD/IBOC facilities at this time.

To evaluate the total exposure to non-ionizing radio-frequency radiation with regards to the single source contribution rules, the individual contribution may be expressed directly in $\mu\text{W}/\text{cm}^2$ units relative to the maximum permissible uncontrolled environment limit of $200 \mu\text{W}/\text{cm}^2$. If the resulting contribution is less than or equal to $200 \mu\text{W}/\text{cm}^2$, the exposure is concluded to be within the guidelines of OET Bulletin No. 65 (Edition 97-01) and §1.1310 for the more restrictive uncontrolled limit. Protection of the uncontrolled limit ($200 \mu\text{W}/\text{cm}^2$) implies protection of the controlled limit ($1000 \mu\text{W}/\text{cm}^2$).

Inspection of the graph below shows the maximum contribution for the uncontrolled environment to be less than $200 \mu\text{W}/\text{cm}^2$ as set forth by §1.1310. Therefore, the facility is in compliance with FCC guidelines. In addition to the protection afforded by the proposed antenna height above ground, the facility is or will be properly marked with signs, and/or entry to the facility will be restricted by means of fencing with locked doors and/or gates if required. Any other means that may be required to protect employees and the general public will also be employed.

In the event work is required in proximity to the antenna(s) such that the person or persons working in the area will be potentially exposed to fields in excess of the current guidelines, an agreement signed by all broadcast parties at the site will be in effect for the offending transmitter(s) to reduce power, or cease operation during the critical period.



¹ The current *FM Model* web-based software application employs the standards as detailed in OET Bulletin No. 65 (Edition 97-01). FM radiofrequency radiation levels have been predicted using both the array pattern, the calculations of which are based on the number of bays in the antenna and wavelength spacing between the bays, and the element pattern. The element pattern has been determined by using measured element data prepared by the EPA and published in "An Engineering Assessment of the Potential Impact of Federal Radiation Protection Guidance on the AM, FM and TV Services," by Paul C. Gailey and Richard Tell - April 1985, U.S. Environmental Protection Agency. The results of the evaluation for the FM station have been shown at the end of this RF compliance discussion. To ensure complete protection, the maximum FM contribution has been assumed without regard to any restricted access fencing distance.

Channel Selection:	Channel 280 (103.9 MHz)		
Antenna Type +	EPA Type 2: Opposed V Dipole		
Height (m)	7	Distance (m)	100
ERP-H (W)	99	ERP-V (W)	99
Num of Elements	1	Element Spacing (λ)	1
Num of Points	500	Apply	

