



**ENGINEERING EXHIBIT FOR A MINOR
CHANGE APPLICATION FOR A
TRANSLATOR K292HI
SUBARCTIC MEDIA, LLC
BMPFT-20180419AAG
FACILITY ID# 202097
CHANNEL 292D 106.3 MHZ**

CHANNEL 292D 0.25 KW (H&V) 31 METERS HAAT

May 4, 2021



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ENGINEERING STATEMENT

This engineering exhibit, of which this Statement is a part, was prepared in accordance with the Rules and Regulations of the Federal Communications Commission and pursuant to the provisions of Section III-B of FCC Form 349 on behalf of Subarctic Media, LLC (Hereafter "Subarctic") in support of an application for authority to modify an existing FM Translator Construction permit (BNPFT-20180419AAG). The purpose of this application is to modify the site location using a power output of 250 watts ERP and 31 meters HAAT and provide coverage for KFSP-AM. This power/height combination is an allowable Class D facility permitted under the current rules and regulations. The station was to be co-located at an KTOE AM tower. However, the location will now be on an existing tower on the property that is not part of the AM antenna array.

"Subarctic" proposes to operate from a site uniquely described by the geographic coordinates:

**NAD 83
N 44° 10" 2.3."
W 93° 54' 37"**

Engineering Figure 1 is a portion of the Mankato East, MN 7.5-minute USGS map that shows the exact location of the antenna. Figure 2 is an aerial view of the site. The applicant is aware of the provisions of §74.1203 of the FCC's Rules and the requirement for satisfying all complaints of interference that are received.

ALLOCATION CONSIDERATIONS

A review of allotments and assignments on channel 292, on the three immediately upper adjacent, the three immediately lower adjacent channels show that the site proposed has no short-spaced conditions and fully complies with the Rules. The results of the allocation study are shown in Figure 3.

COVERAGE CONTOURS

The three-to-sixteen-kilometer average terrain elevations were derived from the NGDC 30 - second terrain database.

The effective antenna radiation center height for each of the twelve standard 30-degree spaced radials was used in conjunction with the F (50, 50) metric curves of Figure 1 of §73.333 of the Rules to determine the distances to the 60 dBuV coverage contour.

DISTANCES TO CONTOURS (Kilometers):

Antenna COR elevation (AMSL): 329 meters Average HAAT: 31 meters
Frequency: 106.3000 MHz
Coordinates: N 44° 10' 2.30" W 93° 54' 37.00"
F(50,50) Curves Number of Contours: 1

AZ (degs)	HAAT (m)	ERPd (kW)	CONTOUR LEVELS (dBuV): 60.0
0.0	25	0.2500	7.1
30.0	20	0.2500	7.1
60.0	11	0.2500	7.1
90.0	11	0.2500	7.1
120.0	14	0.2500	7.1
150.0	25	0.2500	7.1
180.0	24	0.2500	7.1
210.0	39	0.2500	8.0
240.0	33	0.2500	7.5
270.0	60	0.2500	10.1
300.0	51	0.2500	9.2
330.0	55	0.2500	9.6

Figure 4 shows the present licensed KFSP-AM 2 mv/m contour and the proposed 60 dBuV coverage contour. As can be seen, the proposed contour is contained within the KFSP-AM contour and shows all of Mankato, Minnesota is covered by it.

ANSI Power Density Calculations

The power density at the base of the tower was calculated using the following formula from OST Bulletin Number 65, August, 1997:

$$S = \frac{0.64 \times 1.64 \times ERP \times 1000}{\pi(R^2)}$$

Where:

S = power density in milliwatts per square centimeter
ERP = effective radiated power in watts
R = distance to radiation source in centimeters
pi = 3.14



The site is considered to be a controlled site since access to the tower area is restricted.

Using:

$$\begin{aligned} \text{ERP} &= 0.50 \text{ KW} \quad (0.25 \text{ KW Vertical \& 0.25 KW Horizontal}) \\ R &= 2,130 \text{ cm.} \end{aligned}$$

Using this formula and the values shown below, a power density of $1.37 \mu\text{W}/\text{cm}^2$ is found to exist at the base of the tower. This predicted value is 0.1% of the Controlled exposure limit of $1,000 \mu\text{W}/\text{cm}^2$.

Access to RF circuitry is restricted since the antenna is mounted on a fenced tower that restricts public access. Signs are posted warning of the potential danger. When persons require access to the site, tower or antenna for maintenance purposes, the transmitter power will be reduced or completely eliminated to comply with ANSI guidelines. Hence, the conditions of §1.1306(b)(3) would not be involved.

ENVIRONMENTAL IMPACT STATEMENT

The instant proposal is categorically excluded from environmental processing since none of the conditions of §1.1306(b)(2) and (3) would be involved for the following reasons:

- 1) The site proposed is not in or near any location referenced in §1.1306(b)(1) as being of environmental interest.
- 2) The provisions of §1.1306(b)(2) relating to the use of high intensity strobe lighting do not apply since this tower is not utilizing this type of lighting.
- 3) Compliance to §1.1306(b)(3) regarding human exposure to RF radiation.

CONCLUSIONS

Based on the engineering studies provided, the proposal is in complete conformance with all technical rules of the Federal Communications Commission.

Garrett G. Lysiak, P.E.
May 5, 2020

(NORTH STAR)

093° 55' 59.0953" W
044° 11' 26.1083" N

(ST PETER)

MANKATO EAST QUADRANGLE
MINNESOTA
TOPOGRAPHIC SERIES (CLEVELAND)

093° 53' 14.1718" W
044° 11' 26.1083" N

(MANKATO WEST)

(MADISON LAKE)

044° 08' 38.5221" N
093° 55' 59.0953" W

044° 08' 38.5221" N
093° 53' 14.1718" W

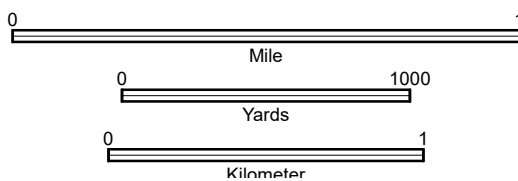
(GOOD THUNDER)

(ST CLAIR)

Declination

GN 0° 38' W
MN 0° 39' E

(BEAUFORD)
SCALE 1:24000



CONTOUR INTERVAL 10 FT
[BASE MAP VERTICAL DATUM]

MANKATO EAST, MN
JAN 1, 1993



FIGURE 2 - AERIAL SITE VIEW

FIGURE 3 - ALLOCATION STUDY

Subarctic Media, LLC											
REFERENCE		CH#	292D - 106.3 MHz, Pwr= 0.25 kW, HAAT= 29.9 M, COR= 329.8 M							DISPLAY DATES	
44 10 02.30 N.			Average Protected F(50-50)= 7.09 km							DATA 05-03-21	
93 54 37.00 W.			Omni-directional							SEARCH 05-06-21	
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)	
292D	K292HI	CP	_CN	47.8	0.06	44 10 03.60	0.250		---	Reference---	
Mankato		MN		227.8	0000122419	93 54 35.00		357	Subarctic Media, LLC		
293C1	KFMC-FM	LIC	_CN	217.7	75.46	43 37 44.80	100.000	85.3	55.8	-17.8*	8.3
Fairmont		MN		37.3	BLH19850225LM	94 29 00.89	113	478	City Of Lakes Media, Inc.		
292D	K292GU	LIC	_CN	107.7	44.23	44 02 43.90	0.250	50.7	15.4	-13.6*	5.1
Waseca		MN		288.0	BLFT20160728ADD	93 23 02.79		493	Main Street Broadcasting,		
290C3	KRRW	LIC	_CN	307.6	56.20	44 28 24.90	23.000	4.1	38.8	41.7	16.0
Winthrop		MN		127.2	BLH20080708AKE	94 28 15.90	105	413	Subarctic Media, LLC		
239A	KMKO-FM	LIC	ZCN	247.7	33.74	44 03 05.90	6.000	23995370	00000000000000.0		
									1528398000000000000000.0		
									10.0R	23.7M	
Lake Crystal		MN		67.4	BLH20050914AAE	94 17 59.90	100	407	Alpha 3e Licensee LLC Debt		
292A	WEVR-FM	LIC	NCN	50.8	128.22	44 53 18.90	6.000	91.3	31.7	29.9	72.6
River Falls		WI		231.7	BLH19981112KK	92 39 02.70	100	393	Hanten Broadcasting Compan		
294D	K294DF	CP	_CN	38.2	41.65	44 27 39.90	0.250	1.1	9.9	33.5	30.4
New Prague		MN		218.4	BNPFT20171205ACC	93 35 08.80		381	Ingstad Brothers Broadcast		
238A	KCHK-FM	LIC	NCN	38.2	41.66	44 27 39.90	6.000	23995370	00000000000000.0		
									1528398000000000000000.0		
									10.0R	31.7M	
New Prague		MN		218.4	BLH20051103ABJ	93 35 08.80	100	418	Ingstad Brothers Broadcast		
291C1	KLSS-FM	LIC	_CN	150.3	130.86	43 08 30.91	100.000	78.6	49.0	45.2	71.0
Mason City		IA		330.9	BMLH20171113AAO	93 06 40.70	96	442	Alpha 3e Licensee LLC Debt		
293D	K293BA	LIC	_CN	47.2	66.52	44 34 18.80	0.196	12.9	9.2	46.5	47.0
Elko		MN		227.6	BLFT20061228AAR	93 17 41.69	83	394	Minn-Iowa Christian Broadc		
289D	K289AE	LIC	DCN	97.8	62.21	44 05 18.91	0.170	0.8	11.8	54.3	49.0
Owatonna		MN		278.4	BLFT19990804TE	93 08 25.70	103	475	Minnesota Public Radio		
295D	K295BD	LIC	_CN	250.7	63.28	43 58 38.80	0.085	0.6	10.0	52.6	52.1
St. James		MN		70.2	BLFT20070906AFR	94 39 18.90	90	425	Minnesota Public Radio		
291C3	KLCI	LIC	_CN	8.3	120.35	45 14 19.90	9.100	57.2	38.4	55.5	71.8
Elk River		MN		188.5	BLH20010710AAW	93 41 14.89	164	453	Milestone Radio LLC		

Terrain database is USGS 03 SEC

