

TECHNICAL SUMMARY  
APPLICATION FOR MODIFICATION OF CONSTRUCTION PERMIT  
FCC FILE NO. BNPFT-20171219ACN  
FM TRANSLATOR STATION K281CX  
BOZEMAN, MONTANA  
CHANNEL 281 (104.1 MHZ) 0.25 KW (ND)

1. Application Purpose: It is proposed to modify the construction permit for K281CX (FCC File No. BNPFT-20171219ACN, Facility ID 201662) to change the transmitter site and modify its facilities.

2. Fill-in Translator Coverage & Minor Change Compliance: Station K281CX is a fill-in translator for AM station KYWL on 1490 kHz at Bozeman, MT (Facility ID 161553). Figure 1 is a map demonstrating that the proposed 60 dBu contour is within a 25 mile circle from the KYWL transmitter site as required for fill-in compliance. In addition, the proposal complies with the FCC's minor change rules as there will be overlap of the licensed and proposed 60 dBu contours.

3. Section 74.1204 compliance: Figure 2 is an allocation study for channel 281 based on Section 74.1204. Figure 2 lists the results of a numerical analysis of the potential for contour overlap to all nearby co-channel, first, second and third-adjacent channel facilities as well as IF related stations. For the purposes of the numerical study, the maximum HAAT (340 meters) and ERP (0.25 kW) values were used in determining the maximum distance in any direction to the predicted coverage and interfering contours. Figure 3 demonstrates that the proposal complies with the contour overlap provisions of Section 73.1204 of the FCC rules, except with respect to stations KZMY and KBZM discussed below.

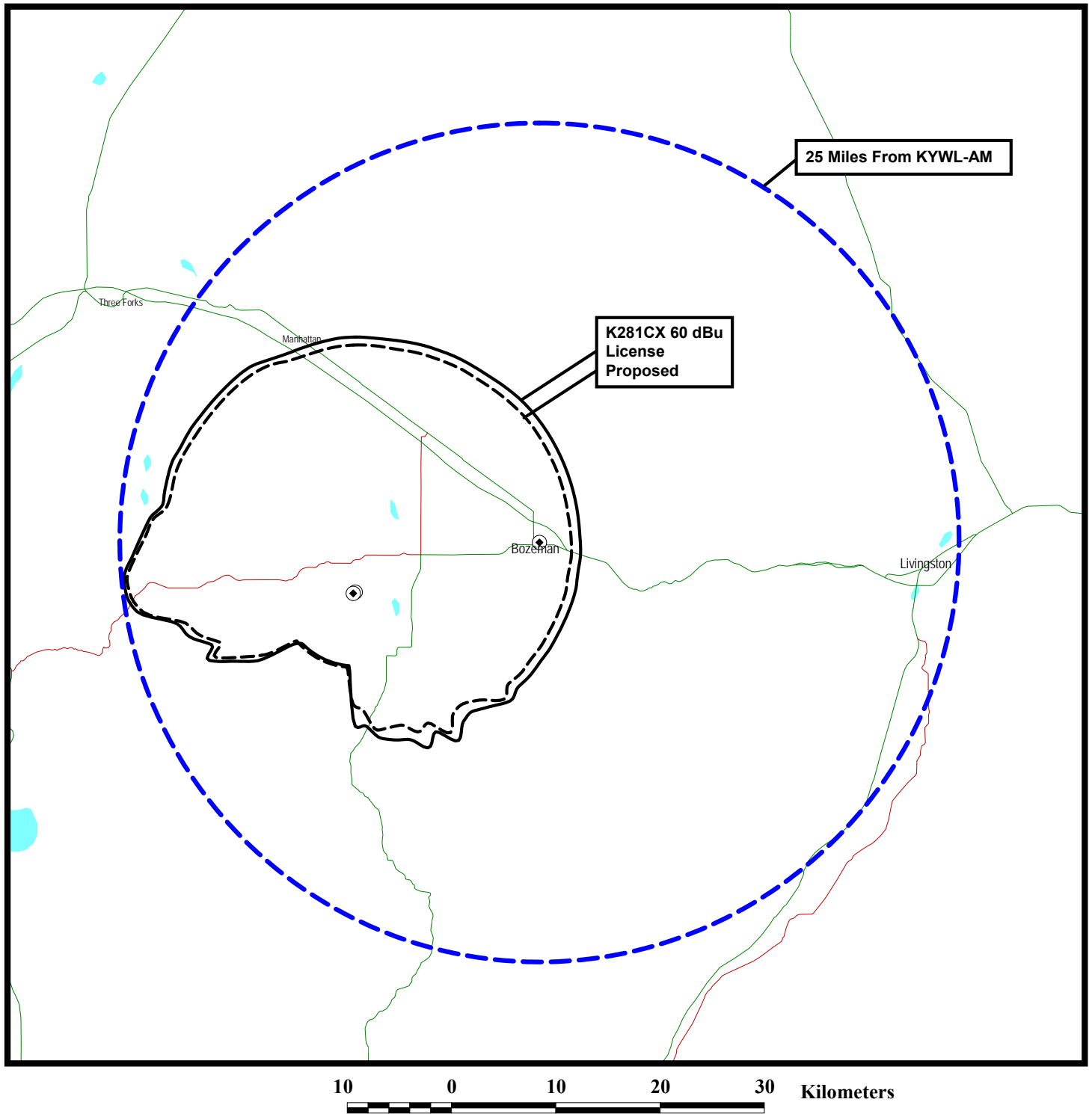
Specifically, the proposal does not comply with the contour overlap provisions of Section 73.1204 of the FCC rules with respect to third lower adjacent channel station KZMY (Ch. 278C1/103.5 MHz, Bozeman, MT) and third upper adjacent channel station KBZM (Ch. 284C1/104.7 MHz, Big Sky, MT). However, based on the undesired-to-desired (U/D) signal strength interference ratio methodology, which is permitted by the FCC (per Living Way Ministries, Inc., 17 FCC Rcd 17054, 17056, 2002), it has been determined that no actual interference would occur due to lack of population under Section 74.1204(d). Specifically, the calculated KZMY f(50,50) field strength at the proposed site is 79.8 dBu. Using the 40 dB U/D ratio contained in Section 74.1204 of the FCC rules, the proposed f(50,10) interfering signal is 119.8 dBu. Similarly, the calculated KBZM f(50,50) field strength at the proposed site is 71.6 dBu. Using the 40 dB U/D ratio contained in Section 74.1204 of the FCC rules, the proposed f(50,10) interfering signal is 111.6 dBu. As the 111.6 dBu interfering signal to KBZM is the lowest it is the most critical. Figure 4 is Google Earth map depicting the interfering 111.6 dBu contour. As indicated on Figure 4, there are no occupied buildings or

major roads within the interfering 111.6 dBu contour. Therefore, the proposal complies with the lack of population criteria under Section 74.1204(d).

4. RFR Compliance: The proposed facilities were evaluated in terms of potential radiofrequency radiation (RFR) exposure at ground level to workers and the general public. The radiation center for the proposed Nicom BKG77, 1-bay nondirectional antenna will be located 34 meters above ground level. The total ERP is 0.500 kW (horizontal and vertical polarization). Figure 5 depicts the output of the FCC's FM Model program. As indicated, a maximum power density of  $4.5 \text{ uw/cm}^2$  will occur at a point located 32.8 meters from the tower. This is only 2.25% of the FCC's recommended limit of  $200 \text{ uw/cm}^2$  for FM frequencies for an uncontrolled environment and only 0.45% of the FCC's recommended limit of  $1000 \text{ uw/cm}^2$  for FM frequencies for a controlled environment. Therefore, it is believed that the proposed operation is in full compliance with the FCC's requirements with regard to RFR exposure.

The transmitting site will be appropriately marked with RFR warning signs. Furthermore, as this is a multi-user site, a formal RFR protection protocol will be in effect in the event that workers or other authorized personnel enter the restricted area or climb the tower to ensure that appropriate measure will be taken to assure worker safety with respect to RFR exposure. Such measures include limiting the exposure time, wearing protective clothing, reducing power to an acceptable level or termination of transmitter output power all together until workers leave the restricted area.

Figure 1



### **AM FILL-IN COMPLIANCE MAP**

FM TRANSLATOR STATION K281CX  
BOZEMAN, MONTANA  
CH 281 (104.1 MHZ) 0.250 KW (ND)

du Treil, Lundin & Rackley, Inc. Sarasota, Florida

# FM Contour Study

du Treil, Lundin, &amp; Rackley, Inc., Sarasota, Florida



Channel: 281 Coordinates: 045-38-15.6 111-16-07.8 (NAD 83) ERP: 0.25 kW Max. HAAT: 340 m Considering Only Interference Caused

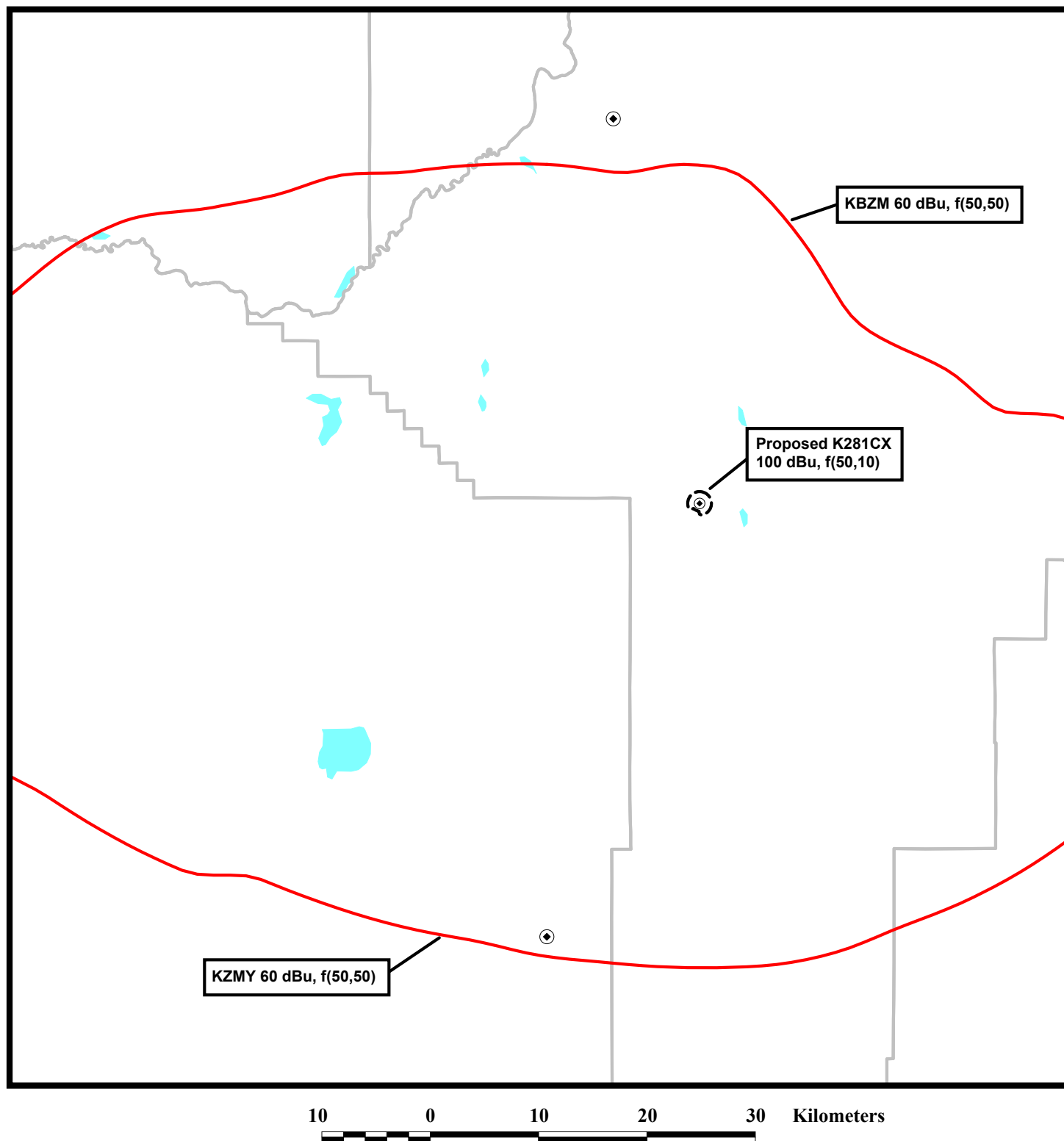
Comment: Proposed K281CX

Callsign	Chan.	Service	Status	Freq.	City	State	Co.	Rec.	Latitude	Dist. (km)	Sep. (km)	Spac. (km)
Facility ID	ARN			Class	DA	73.215	ERP (kW)	HAAT (m)	Longitude	Bear. (deg)	Comment	
KZMY	278	FM	LIC	103.5	BOZEMAN	MT	US	C	45-57-24.9	36.36	85.31	-48.95
72722	BMLH	20150825AAF	C1	N	N		100	289	111-22-13.5	347.43	SHORT	/1
KZMY 60.0 dBu desired distance: 84.2 km				Proposed 100.0 dBu undesired distance: 1.1 km								
K281CX	281	FX	CP	104.1	BOZEMAN	MT	US	C	45-38-20	0.23	96.48	-96.25
201662	BNPFT	20171219ACN	D	N	N		0.25		111-15-56	56.53	SHORT	/2
K281CX 60.0 dBu desired distance: 24.6 km				Proposed 40.0 dBu undesired distance: 71.9 km								
KJPZ	281	FM	LIC	104.1	EAST HELENA	MT	US	C	46-46-06	138.51	119.98	18.53
49724	BMLD	20170522ABB	C3	N	N		5	207	112-01-21.6	335.48	CLEAR	
KJPZ 60.0 dBu desired distance: 48.1 km				Proposed 40.0 dBu undesired distance: 71.9 km								
KBZM	284	FM	LIC	104.7	BIG SKY	MT	US	C	45-16-41	42.41	79.13	-36.72
81679	BLH	20040728AMQ	C1	N	N		5	1017	111-26-57	199.52	SHORT	/1
KBZM 60.0 dBu desired distance: 78.0 km				Proposed 100.0 dBu undesired distance: 1.1 km								

/1 There will be overlap normally prohibited by Section 74.1204. However, based on the U/D signal strength ratio method which is permitted by the FCC per Living Way Ministries, Inc., it has been determined that no actual interference will occur due to lack of population under Section 74.1204(d). See Technical Narrative and Figure 4.

/2 Authorized (CP) K284CX operation.

Figure 3

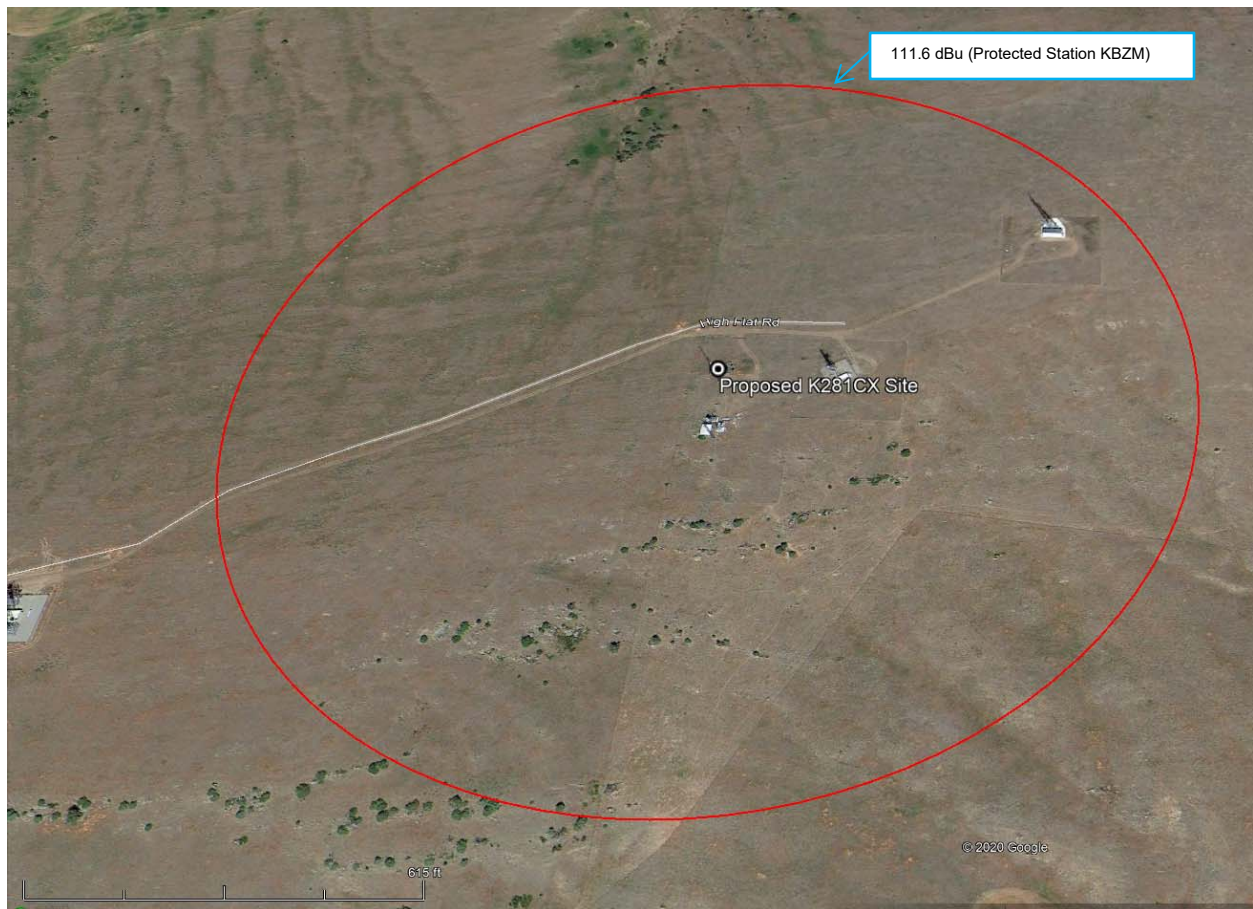


**COMPLIANCE WITH SECTION 74.1204**

FM TRANSLATOR STATION K281CX  
BOZEMAN, MONTANA  
CH 281 (104.1 MHz) 0.250 KW (ND)

du Treil, Lundin & Rackley, Inc. Sarasota, Florida

Figure 4



**UNDESIRE-TO-DESIRED (U/D) SIGNAL STRENGTH INTERFERENCE RATIO ANALYSIS**

FM TRANSLATOR STATION K281CX

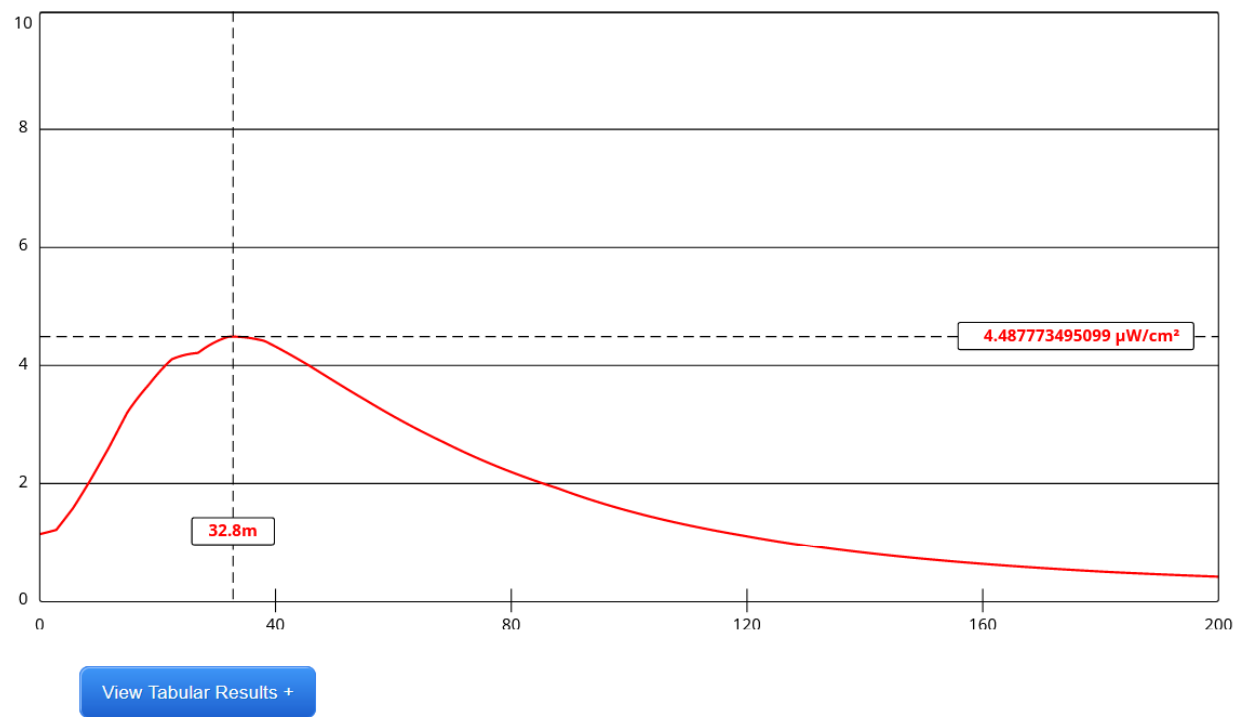
BOZEMAN, MONTANA

CH 281 (104.1 MHZ) 0.25 KW (ND)

*du Treil, Lundin & Rackley, Inc. Sarasota, Florida*

Figure 5

Output of FCC's FM Model Program:



Channel Selection	Channel 281 (104.1 MHz) ▾		
Antenna Type +	EPA Type 2: Opposed V Dipole ▾		
Height (m)	<input type="text" value="34"/>	Distance (m)	<input type="text" value="200"/>
ERP-H (W)	<input type="text" value="250"/>	ERP-V (W)	<input type="text" value="250"/>
Num of Elements	<input type="text" value="1"/>	Element Spacing (λ)	<input type="text" value="1"/>
Num of Points	<input type="text" value="500"/>	<input type="button" value="Apply"/>	