

July 2021
FM Translator K239AU
Driggs, Idaho Channel 239D
Allocation Study

Background and Allocation Study

The instant application, filed as an amendment to 0000152154, proposes a minor modification of FM translator K239AU, including a site change, antenna change, and power increase.

The attached spacing study shows the spacing between the proposed translator site and the location of cochannel and adjacent channel stations and proposals. This study was made with the Commission's Class A spacing requirements, and individual situations were examined to determine the lack of prohibited contour overlap per the requirements of §74.1204 of the Rules. The attached allocation study maps demonstrate compliance with the Commission's Rules for protection of FM broadcast stations and FM translators as outlined in §74.1204.

The 100 dBu F(50,10) contour will overlap the 60 dBu contour of second-adjacent channel station KZJH 237C Jackson. Since KZJH is the parent station for this translator, no further analysis is necessary. However it can also be noted that the entire 100 dBu F(50,10) contour area falls over National Forest lands and is unpopulated.

Protection to K240EK Jackson

The proposed 54 dBu F(50,10) contour, as calculated using the standard contour prediction methodology described in §73.313 of the Commission's Rules, overlaps the 60 dBu protected contour of first-adjacent channel station K240EK on Channel 240D at Jackson. However, there is a significant mountain ridge located between the proposed transmitter site and Jackson, which effectively blocks the proposed facility's signal from causing interference within the K240EK service area. It is therefore believed that a supplemental showing using alternative contour prediction methodology is justified in this instance.

An alternative prediction methodology has been employed to verify that the K240EK 60 dBu protected contour will not receive overlap from the proposed facility's 54 dBu interfering signal. All calculations were made using the 3-arc second database in conjunction with the height and ERP specified herein.

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Study has been made of the predicted 54 dBu F(50,10) contour in the direction of K240EK, using the Longley-Rice v1.2.2 methodology. This study has been conducted using the software program SIGNAL™ from EDX Wireless.

A sample calculation has been made to a location along the K240EK 60 dBu contour in order to verify that the proposed facility places less than 40 dBu at that location, using the formula:

$$\text{Field Strength} = \text{Free Space} - \text{Diffraction Loss} - \text{Clutter}$$
$$\text{Where Free Space} = 106.9 + \text{power in dBk} - 20\log(\text{distance in km to point of interest})$$

For the path studied (-6.82 dBk at this azimuth, over a 46.47 km path), the result of this calculation is:

Radial	Free Space Field	Minus Diffraction Loss	Yields
123.5 deg	66.74 dBu	50.39 dB	16.35 dBu

Attached is a plot of the terrain path from the transmitter site to the sample location along the K240EK 60 dBu contour. The attached terrain path plot includes a list of the Longley-Rice study parameters, and also depicts the significant intervening mountains.

The location of the Longley-Rice 54 dBu F(50,10) contour in the direction of the K240EK 60 dBu F(50,50) contour has been determined for radials at 2-degree increments. These calculations include a 3 dB local clutter loss factor at receive locations. These results are shown in the attached table.

The attached first-adjacent channel study map exhibit depicts the results of this analysis as a Longley-Rice 54 dBu F(50,10) contour over the span of 106 to 136 degrees, and clearly demonstrates that this contour does not overlap the K240EK 60 dBu protected contour.

Section 74.1204(d) of the Commission's Rules states that "The provisions of this section concerning prohibited overlap will not apply where the area of such overlap lies entirely over water. In addition, an application otherwise precluded by this section will be accepted if it can be demonstrated that no actual interference will occur due to intervening terrain, lack of population, or such other factors as may be applicable." (Emphasis added) The preceding analysis has demonstrated that intervening terrain prevents the creation of any actual interference to K240EK.

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If required, waiver of §74.1204 is respectfully requested to the extent necessary to permit the use of Longley-Rice propagation techniques to demonstrate that the proposed K239AU facility will provide protection to K240EK.¹

¹ A similar showing was previously accepted in BPFT-20091210ABU to allow FM translator K232ED Wenatchee to demonstrate interference protection to K232CV Ellensburg; in BPFT-20120808ABL to allow FM translator K241AK Reno to demonstrate interference protection to K240CA Crystal Bay; and in BPFT-20140623ACP to allow FM translator K294AS Ashland to demonstrate interference protection to KCGP-LP Grants Pass; in addition to other such applications prepared by this firm.

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SEARCH PARAMETERS FM Database Date: 20210719

Channel: 239A 95.7 MHz Page 1

Latitude: 43 43 53.3 (NAD83)

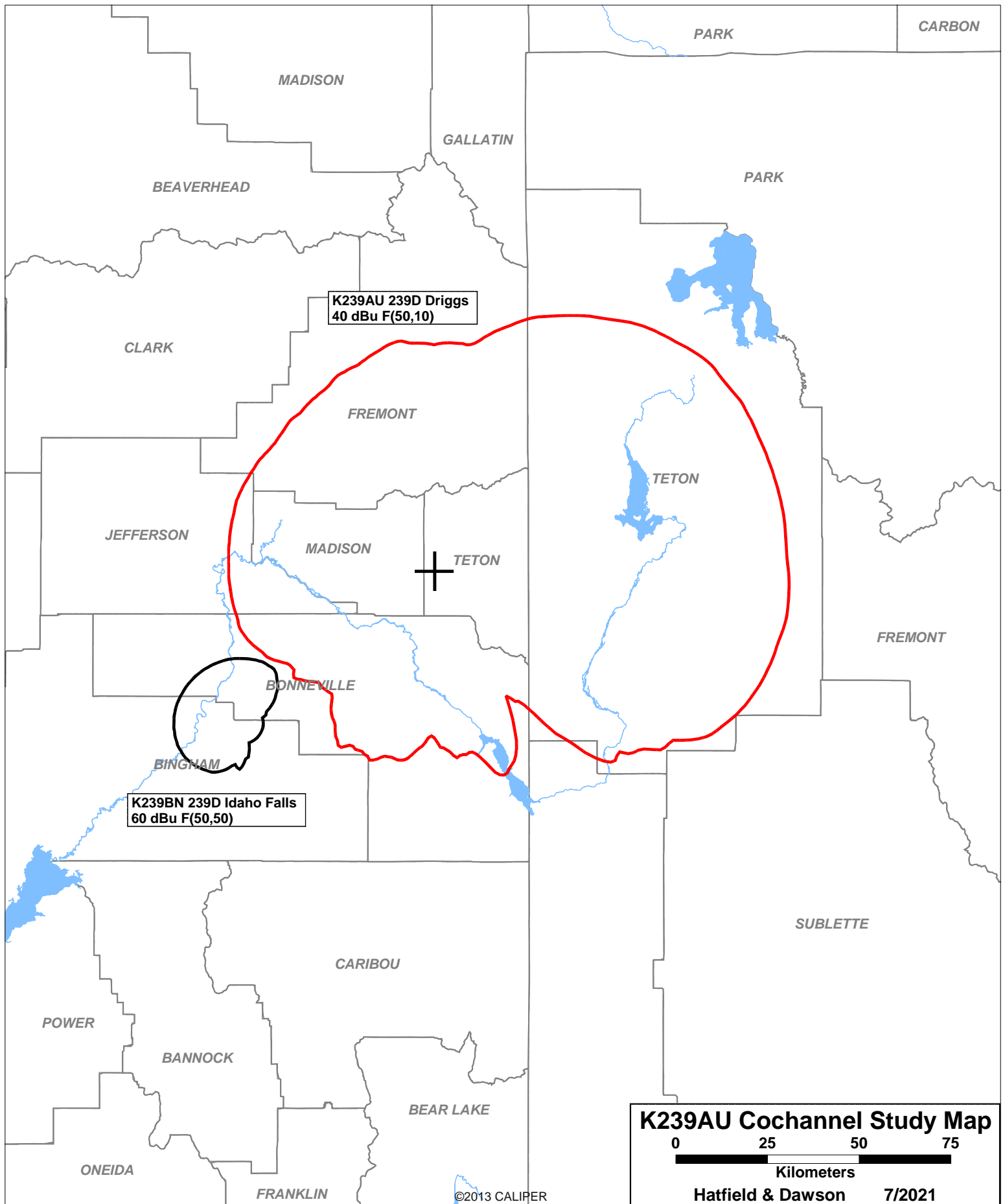
Longitude: 111 21 54.7

Safety Zone: 50 km

Job Title: K239AU DRIGGS

Call Status	City St	FCC File No.	Channel Freq.	ERP(kW) HAAT(m)	Latitude Longitude	Bearing deg-True	Dist (km)	Req (km)
KZJH LIC	JACKSON WY	BLH-19890714KA	237C 95.3	100.000 322.0	43 27 39.7 110 45 11.7	121.2	57.83 -37.17	95 SHORT
KZJH APP	JACKSON WY	0000152309	237C1 95.3	12.600 305.2	43 27 42.3 110 45 12.7	121.1	57.77 -17.23	75 SHORT
K239BN LIC	IDAHO FALLS ID	BLFT-20171010AEB	239D 95.7	0.102 0.0	DA 43 21 5.6 112 0 31.8	231.1	66.99 0.00	0 TRANS
K239AU APP	DRIGGS ID	0000152154	239D 95.7	0.250 0.0	DA 43 42 41.6 111 20 59.8	151.0	2.53 0.00	0 TRANS
K239AY LIC	MONTPELIER ID	BLFT-20080305AEV	239D 95.7	0.115 0.0	42 19 14.7 111 17 14.7	177.7	156.85 0.00	0 TRANS
K239BR LIC	POCATELLO ID	BLFT-20160425AAL	239D 95.7	0.010 0.0	42 51 56.7 112 30 46.9	224.4	133.89 0.00	0 TRANS
K239AU LIC	DRIGGS ID	BLFT-20070822ADX	239D 95.7	0.100 0.0	DA 43 42 41.6 111 20 59.8	151.0	2.53 0.00	0 TRANS
K240EK LIC	JACKSON WY	BLFT-20161228AAK	240D 95.9	0.013 0.0	43 27 44.7 110 45 5.7	121.0	57.87 0.00	0 TRANS
KWFI-FM LIC	ABERDEEN ID	BLH-20170202AAC	241C 96.1	100.000 458.0	43 29 50.6 112 39 52.9	256.5	108.08 13.08	95 CLEAR
K242BU LIC	JACKSON WY	BLFT-20090128AEW	242D 96.3	0.014 0.0	DA 43 27 41.7 110 45 12.7	121.1	57.78 0.00	0 TRANS
K242BU CP	JACKSON WY	0000086910	242D 96.3	0.250 0.0	43 27 42.0 110 45 13.0	121.1	57.77 0.00	0 TRANS
KIDJ LIC	SUGAR CITY ID	BLH-20160804ADM	292C1 106.3	100.000 194.0	43 32 33.6 111 53 9.8	243.6 SS	46.98 24.98	22 CLEAR

===== END OF FM SPACING STUDY FOR CHANNEL 239 =====



K239AU 239D Driggs
FCC 54 dBu F(50,10)
L-R 54 dBu F(50,10)

FREMONT

MADISON

TETON

TETON

106 deg

136 deg

BONNEVILLE

K240EK 240D Jackson
60 dBu F(50,50)

SIBLETTE

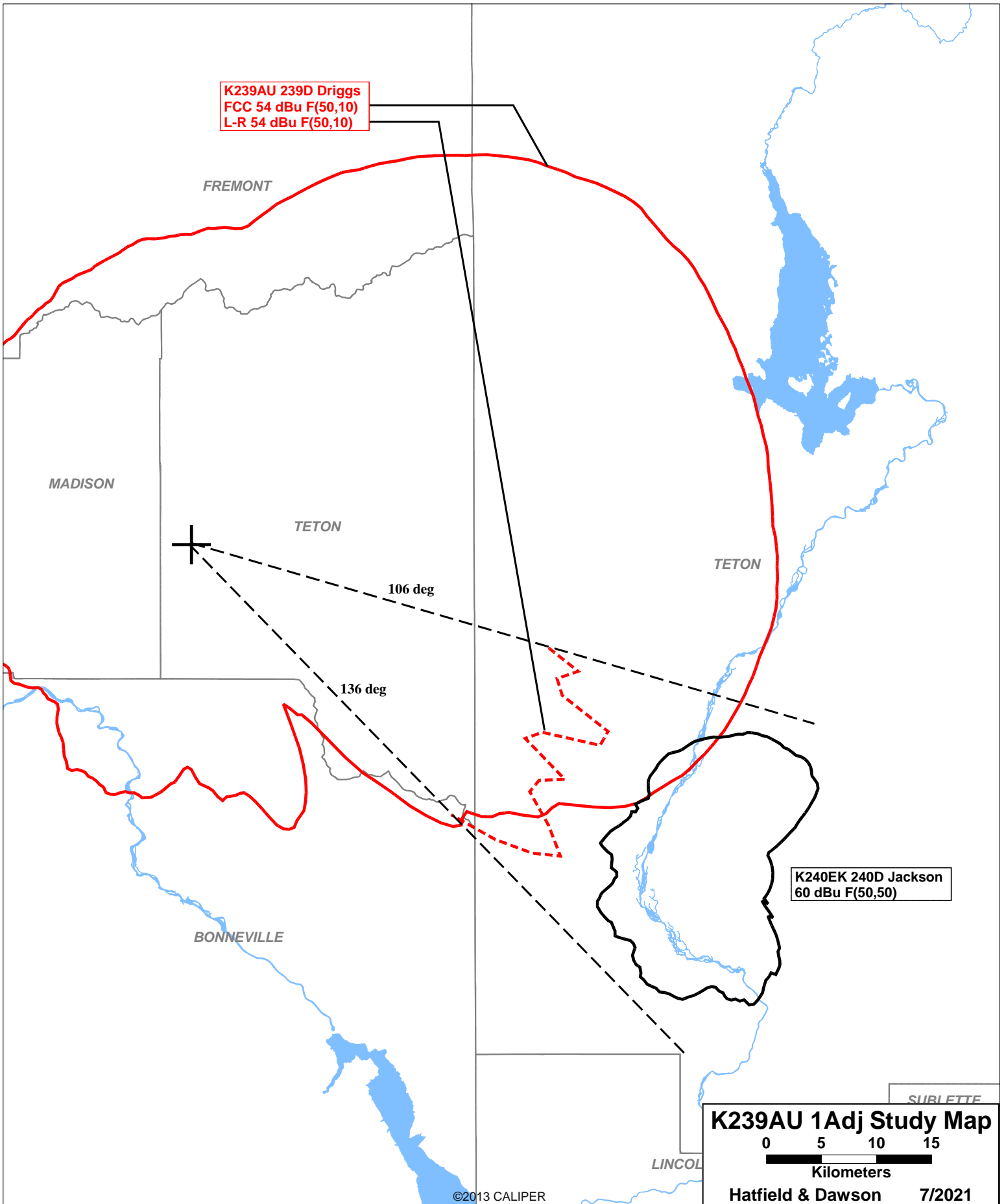
K239AU 1Adj Study Map

0 5 10 15
Kilometers

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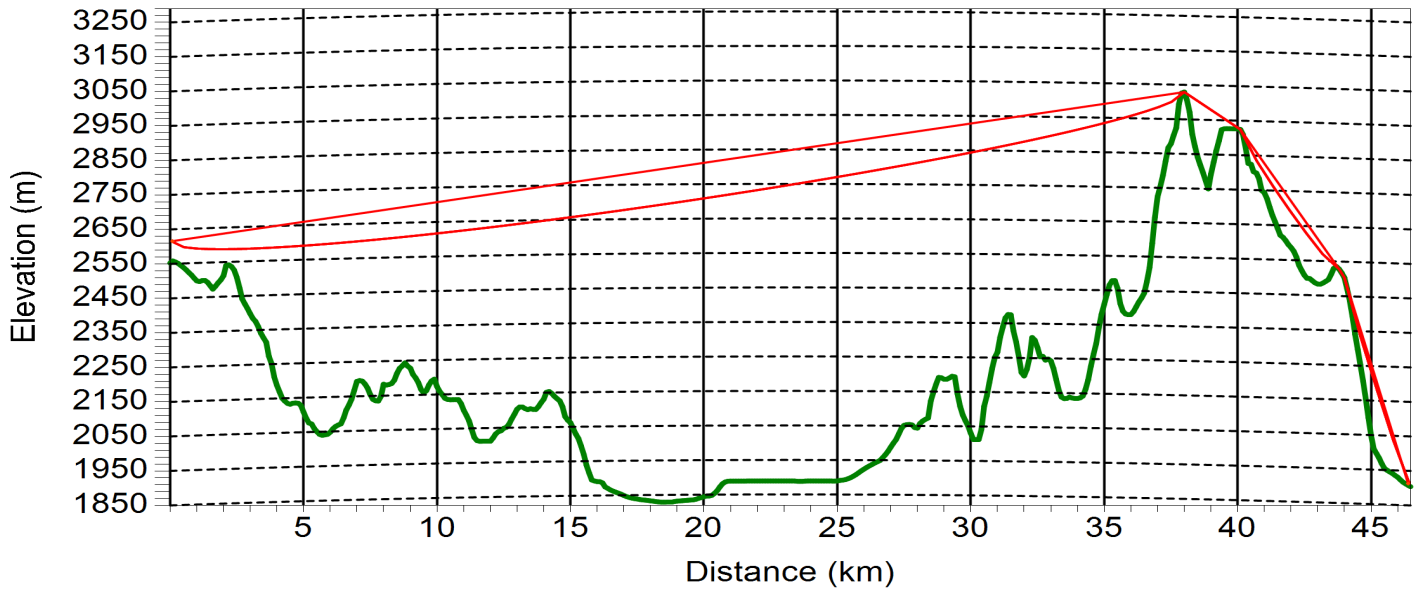
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LINCOLN



Sample Path

Link: Tx001 -> Rx001



Transmitter	
Description	Data
Link end 1 ID	Tx001
Site name	K239AU
Latitude	N43°43'53.30"
Longitude	W111°21'54.70"
Transmitter Frequency	95.7 MHz
Polarization	horizontal
Antenna Height (AGL)	25.00 m
Antenna elevation (AMSL)	2616.00 m
Point az. to link end 2	123.50°
ERPd toward link end 2	-6.82 dBkW

Receiver	
Description	Data
Link end 2 ID	Rx001
Site name	Sample Point on K240EK 60 dBu
Latitude	N43°29'58.92"
Longitude	W110°53'04.67"
Received signal level	-98.31 dBmW
Antenna Height (AGL)	9.10 m
Antenna elevation (AMSL)	1913.41 m
Point az. to link end 1	303.84°

Link Statistics	
Description	Data
Path	Tx001 -> Rx001
Length	46.4749 km
Number of obstacles	4
Excess pathloss	50.39 dB
K factor	1.333

**Longley-Rice 54 dBu F(50,10)
Distances to Contour**

Radial in degrees	FCC 54 dBu F(50,10) distance in km	L-R 54 dBu F(50,10) distance in km	L-R falls short of F(50,10) by
106	51.8	33.7	-35%
108	51.4	36.9	-28%
110	50.9	35.3	-31%
112	50.3	36.3	-28%
114	49.6	41.4	-17%
116	48.6	41.3	-15%
118	47.6	36.1	-24%
120	46.7	35.0	-25%
122	44.8	40.0	-11%
124	42.1	38.1	-10%
126	40.5	38.0	-6%
128	40.0	41.2	3%
130	37.7	43.8	16%
132	36.8	41.7	13%
134	34.8	38.4	10%
136	35.3	34.0	-4%

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RF Exposure Study

Facilities Proposed

The proposed operation will be on Channel 239D (95.7 MHz) with a maximum lobe effective radiated power of 250 watts. Operation is proposed with an antenna which will be mounted on an existing tower on Relay Ridge. The antenna is shared by K239AU and K281BH.

The proposed antenna support structure does not exceed 60.96 meters (200 feet) above ground and does not require notification to the Federal Aviation Administration. Therefore, this structure does not require an Antenna Structure Registration Number.

DETERMINATION Results	
Structure does not require registration. There are no airports within 8 kilometers (5 miles) of the coordinates you provided.	
Your Specifications	
NAD83 Coordinates	
Latitude	43-43-53.3 north
Longitude	111-21-54.7 west
Measurements (Meters)	
Overall Structure Height (AGL)	47.2
Support Structure Height (AGL)	47.2
Site Elevation (AMSL)	2591
Structure Type	
LTOWER - Lattice Tower	

RF Exposure Calculations

The power density calculations shown below were made using the techniques outlined in OET Bulletin No. 65. "Ground level" calculations in this report have been made at a reference height of 2 meters above ground to provide a worst-case estimate of exposure for persons standing on the ground in the vicinity of the tower. The equation shown below was used to calculate the ground level power density figures from each antenna.

$$S(\mu W / cm^2) = \frac{33.40981 \times AdjERP(Watts)}{D^2}$$

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Where: $AdjERP(Watts)$ is the maximum lobe effective radiated power times the element pattern factor times the array pattern factor.

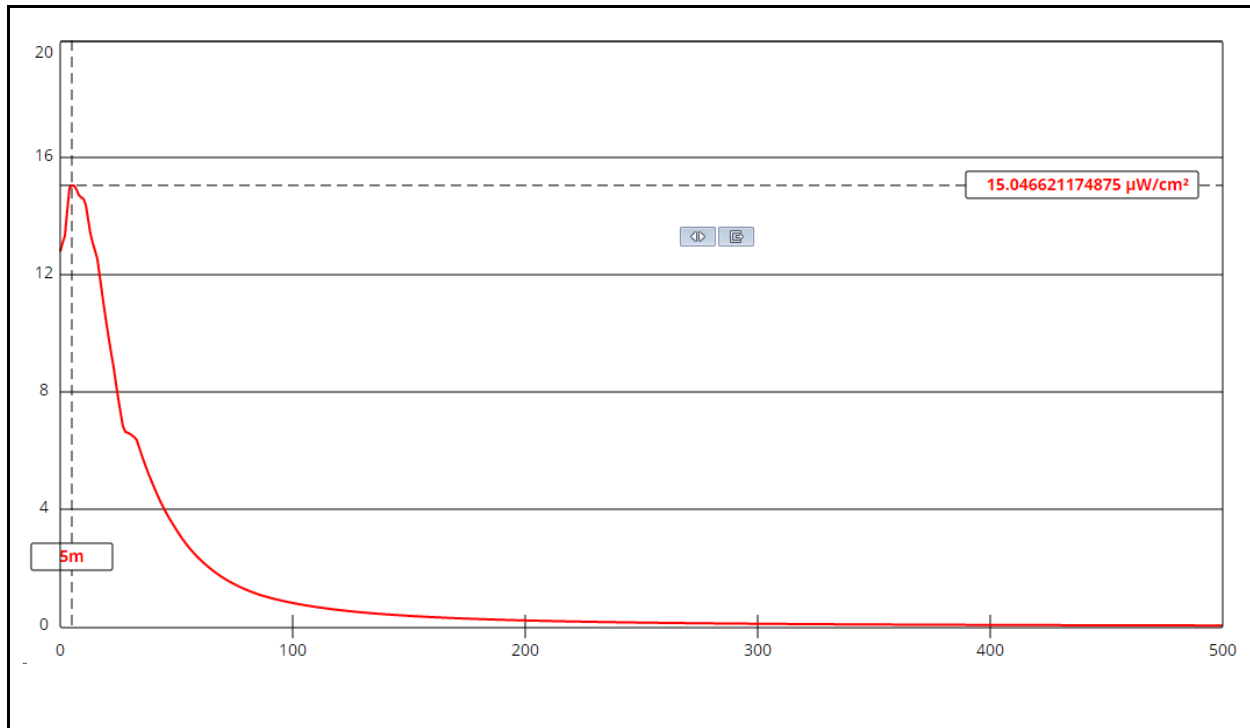
D is the distance in meters from the center of radiation to the calculation point.

Ground level power densities have been calculated for locations extending from the base of the tower to a distance of 500 meters. Values past this point are increasingly negligible.

Calculations of the power density produced by the proposed antenna system assume a Type 1 element pattern, which is the “worst case” element pattern used in the FMModel software. The highest calculated ground level power density occurs at a distance of 5 meters from the base of the antenna support structure. At this point the power density is calculated to be $15.0 \mu W/cm^2$, which is 7.5% of the FCC standard for uncontrolled areas.

Three full-power FM stations are also located on this tower (KWFO-FM 271C1, KUPY 260C3, and KYSK 204C). Summation of the FMModel-calculated ground-level power densities from each of these stations at incremental distances of the tower would produce a maximum result which exceeds the FCC standard for uncontrolled areas. The licensee will perform post-construction ground-level power density measurements should the Commission so require.

The permittee/licensee in coordination with other users of the site must reduce power or cease operation as necessary to protect persons having access to the site, tower or antenna from radiofrequency exposure in excess of FCC guidelines.



Ground-Level RF Exposure

OET FMModel

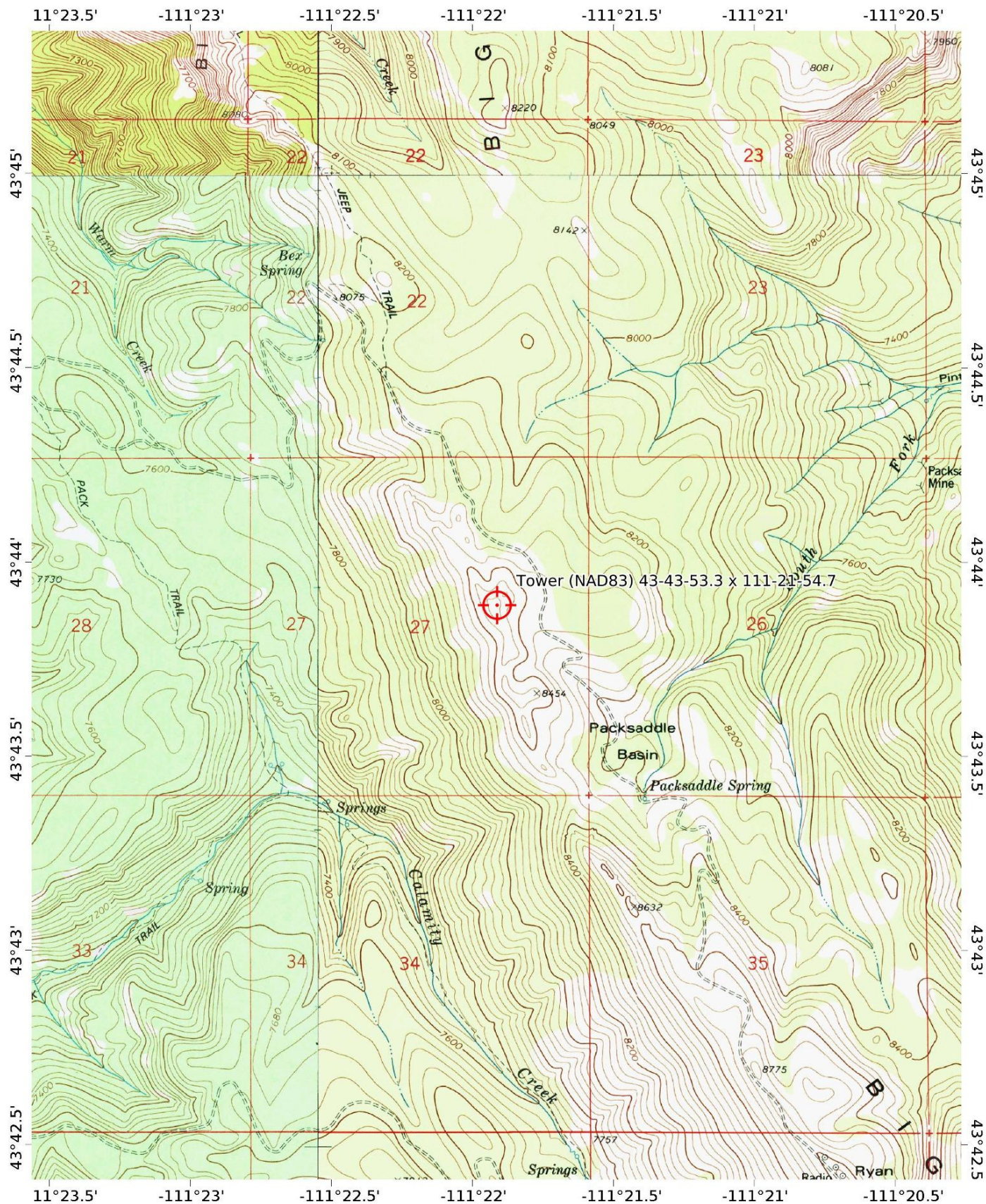
K239AU Driggs

Antenna Type: Nicom BKY3P (Type 1)
No. of Elements: 1
Element Spacing: 1 wavelength

Distance: 500 meters
Horizontal ERP: zero W
Vertical ERP: 250 W

Antenna Height: 25 meters AGL

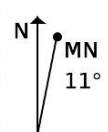
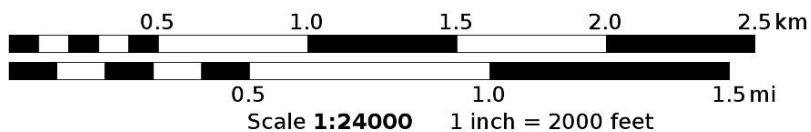
Maximum Calculated Power Density is 15.0 $\mu\text{W}/\text{cm}^2$ at 5 meters from the antenna structure.



Mercator Projection

WG584

USNG Zone 12TVP



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