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**Engineering Statement  
Minor Modification Displacement of K11MU-D  
Channel 22 at McDermitt, NV  
September 2019**

This Engineering Statement has been prepared on behalf of Humboldt County, licensee of digital TV translator station K11MU-D. This material has been prepared in connection with an application for displacement to UHF Channel 22.

**I. Background and Waiver Request**

Humboldt County proposes to relocate the translator transmitter site, with a change from VHF Channel 11 to UHF Channel 22. Humboldt County requests a waiver of §74.787(b) which specifies the requirements for minor change and “displacement” applications. The instant application does not satisfy the traditional qualifications for a displacement application, as the licensed K11MU-D facility neither causes nor receives interference from other stations on Channels 10 through 12.

Nevertheless, Humboldt County believes that displacement of this VHF translator (or in the alternative, treatment as a minor change application) is warranted. Humboldt County and Quinn River TV Maintenance District (“QRTV”) cooperatively operate a system of TV translator stations throughout rural Humboldt County, Nevada, paid for by revenues from the taxpayers of Humboldt County. Humboldt County holds licenses for 21 digital TV translator stations, while QRTV holds licenses for another 10 stations. Of these, the only VHF licenses in the county are Humboldt County’s K11MU-D, and QRTV’s analog K13EN (which will be transitioning to UHF Channel 27 under digital companion channel authorization K27MF-D).

Indeed, apart from K11MU-D and the to-be-discontinued K13EN, there is not a single VHF transmission facility in the entirety of Humboldt County. No other VHF low-power facilities, and no

VHF full-power facilities. There are not even any VHF facilities originating from outside Humboldt County which can be reliably received at residential locations, which are limited to the valley floors of this mountainous county.

Humboldt County is a largely rural county encompassing 9,658 square miles in northern Nevada, with an estimated 2018 population of just 16,786 persons and a population density of just 1.7 persons per square mile. The largest city in the county is Winnemucca, which has a population of 7,763 persons, and which itself is served only by low-power television translator facilities.

The translator in question is situated to serve small rural communities and isolated ranches. There are no full-power television stations in Humboldt County; the nearest full-power television station to the proposed transmitter site is located 185 kilometers away in Elko (KENV-DT, affiliated with Comet-TV), while the nearest major network stations (ABC, CBS, NBC, Fox, etc) are located over 250 kilometers away in Boise and Reno. These stations are not receivable in Humboldt County, and thus low-powered TV translators provide the only over-the-air television service to viewers in the county.

Grant of the waiver and relief requested herein will allow Humboldt County and QRTV to operate all of their digital TV translator stations as UHF facilities. There are several public interest benefits accruing this request:

- 1) Humboldt County, a public government entity, will be able to standardize its equipment and spare parts inventory, saving taxpayer funds. This will also facilitate a reduction in time and expenses for training in maintaining both the UHF and VHF transmission equipment in the county.
- 2) This translator will become part of a combined UHF antenna system with five other UHF translators which are planned to be relocated to the same tower site proposed in this application.
- 3) The current VHF Yagi antenna is more susceptible to damage from weather (wind, ice) in the harsh winters, then is a UHF panel antenna contained within a radome.

- 3) County viewers will be able to receive all channels in the county using UHF receiving antennas; no viewers will have to alternate between receiving some channels in UHF, and this one channel in VHF.

Waiver of §74.787(b) is therefore respectfully requested, to allow this application to be treated as either a displacement application or as a minor change application. As is required for minor change and displacement applications, there is overlap of the licensed and proposed F(50,90) coverage contours as depicted on the attached map exhibit.

## II. Interference Study

Study has been made of all cochannel and adjacent-channel facilities in the vicinity of the proposed operation, including a detailed Longley-Rice interference study to demonstrate that the proposed operation will not cause interference to any authorized or pending proposed facilities. This study was performed using the Commission's TVStudy software.

The results of this study indicate that the proposed facility is predicted to cause zero additional interference to any of the listed stations. Based on the foregoing interference study, it is believed that the proposed facility can operate without risk of interference to other stations.

Study created: 2019.09.10 15:33:54

Study build station data: LMS TV 2019-09-09

Proposal: K11MU-D D22 LD APP MCDERMITT, NV  
 File number: EAGLE22X  
 Facility ID: 54305  
 Station data: User record  
 Record ID: 917  
 Country: U.S.

Build options:  
 Protect pre-transition records not on baseline channel

Stations potentially affected by proposal:

IX	Call	Chan	Svc	Status	City, State	File Number	Distance
No	KAID	D21	DD	LIC	BOISE, ID	BLEDT20120719ABH	271.5 km
No	K43MM-D	D21	LD	CP	BEOVAWE, NV	BLANK0000054890	137.9
No	K21FO-D	D21	LD	CP	WINNEMUCCA, NV	BLANK0000059880	69.1
No	K21FO-D	D21	LD	LIC	WINNEMUCCA, NV	BLDIT20090505ABS	69.1
No	K22LE-D	D22	LD	LIC	CEDARVILLE, CA	BLDIT20120730AKH	195.2
No	KRID-LD	D22	LD	LIC	BOISE, ID	BLANK0000001109	271.4
No	KIPT	D22	DD	LIC	TWIN FALLS, ID	BLEDT20120808ABN	299.8
No	K22GM-D	D22	LD	LIC	BATTLE MOUNTAIN, NV	BLDIT20120514ADF	143.1
No	K48LM	D22	LD	CP	CARLIN, NV	BLANK0000054862	159.7
No	K22KB-D	D22	LD	LIC	ELY, ETC., NV	BLDIT20140717ABY	356.7
No	K51GR-D	D22	LD	CP	EUREKA, NV	BLANK0000054891	283.8
No	K51BW	D22	LD	CP	GOLCONDA, NV	BLANK0000054081	57.7
No	K22FH-D	D22	LD	LIC	HAWTHORNE, NV	BLDIT20100630BZY	363.5
Yes	K22LH-D	D22	LD	CP	IMLAY, NV	BNPDTL20100512AHF	109.7
No	KNPB	D22	LD	LIC	RENO, NV	BLANK0000063431	317.1
No	K22JC-D	D22	LD	LIC	SILVER SPRINGS, NV	BLDIT20121204ACN	272.2
No	K22GW-D	D22	LD	LIC	WELLS, NV	BLDIT20090709AOQ	238.2
No	K22LY-D	D22	LD	LIC	BAKER VALLEY, OR	BLANK0000067879	329.8

No	K22KP-D	D22	LD	LIC	WENDOVER, UT	BLDTT20110928ADB	325.3
No	K23FR-D	D23	LD	LIC	WINNEMUCCA, NV	BLDTT20070404AAM	69.1
No	K23FR-D	D23	LD	CP	WINNEMUCCA, NV	BLANK0000059881	69.1

No non-directional AM stations found within 0.8 km

No directional AM stations found within 3.2 km

Record parameters as studied:

Channel: D22  
Mask: Stringent  
Latitude: 41 37 56.60 N (NAD83)  
Longitude: 117 44 30.40 W  
Height AMSL: 1707.6 m  
HAAT: 0.0 m  
Peak ERP: 0.150 kW  
Antenna: KAT-75-25SPLIT 20.0 deg  
Elev Pattn: Generic

49.6 dBu contour:

Azimuth	ERP	HAAT	Distance
0.0 deg	0.106 kW	303.8 m	30.4 km
45.0	0.101	-153.2	10.3
90.0	0.007	-363.8	5.3
135.0	0.002	-371.9	4.0
180.0	0.018	39.1	7.6
225.0	0.050	403.4	29.1
270.0	0.014	419.7	23.0
315.0	0.011	396.6	21.3

Database HAAT does not agree with computed HAAT  
Database HAAT: 0 m Computed HAAT: 84 m

Distance to Canadian border: 819.0 km

Distance to Mexican border: 1005.4 km

Conditions at FCC monitoring station: Livermore CA  
Bearing: 219.6 degrees Distance: 553.4 km

Proposal is not within the West Virginia quiet zone area

Conditions at Table Mountain receiving zone:  
Bearing: 94.8 degrees Distance: 1061.1 km

Study cell size: 1.00 km  
Profile point spacing: 1.00 km

Maximum new IX to full-service and Class A: 0.50%  
Maximum new IX to LPTV: 2.00%

**No IX check failures found.**

### III. Antenna Structure Registration Not Required

The proposed antenna will be installed on a 60 foot tower at the Eagle Creek communications site. The tower will be less than 200 feet tall and there are no airports within 5 miles of the site coordinates. Therefore this structure is exempted from FCC Antenna Structure Registration.

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	41-37-56.6 north
Longitude	117-44-30.4 west
Measurements (Meters)	
Overall Structure Height (AGL)	18.3
Support Structure Height (AGL)	18.3
Site Elevation (AMSL)	1694.0
Structure Type	
LTOWER - Lattice Tower	

### IV. RF Exposure Study

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.

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

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.

Power density levels produced by the proposed facility were calculated for an elevation of 2 meters above ground (10.6 meters below the antenna radiation center). The worst case power density levels occur at depression angles between 45 and 90 degrees below the horizontal. The calculations in this report assume a worst-case relative field value of 0.200 at these angles, based on the manufacturer's vertical plane pattern for the horizontally-polarized Kathrein broadband panel

antenna proposed in this application. This relative field value yields a worst-case adjusted average effective radiated power of 6 watts at depression angles between 45 and 90 degrees below the horizontal. Assuming this power and the shortest distance between the antenna radiation center and 2 meters above ground level (i.e. straight down), the highest calculated power density from the proposed antenna alone occurs at the base of the antenna support structure. At this point the power density from the proposed facility is calculated to be  $1.8 \mu\text{W}/\text{cm}^2$ , which is 0.5% of  $345.3 \mu\text{W}/\text{cm}^2$  (the FCC maximum for uncontrolled environments at the Channel 22 frequency).

These calculations show that the maximum calculated power density produced at two meters above ground level by the proposed operation alone is less than 5% of the applicable FCC exposure limit at all locations between 1 and 500 meters from the base of the antenna support structure. Section 1.1307(b)(3) of the Commission's Rules excludes applications for new facilities or modifications to existing facilities from the requirement of preparing an environmental assessment when the calculated emissions from the applicant's proposed facility are predicted to be less than 5% of the applicable FCC exposure limit. Therefore, the proposed facility is in compliance with Section 1.1301 *et seq* and no further analysis of RF exposure at this site is required in this application.

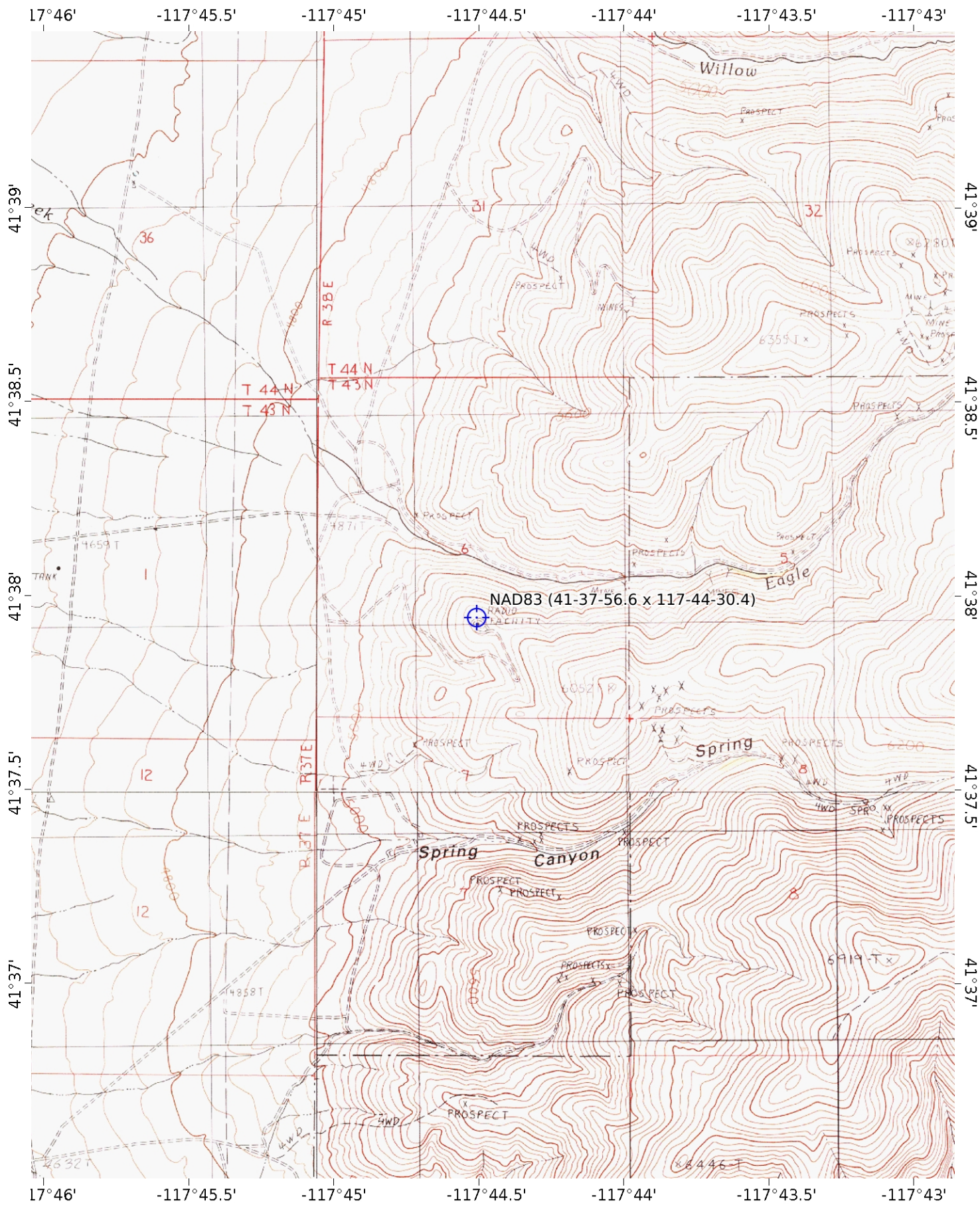
Pursuant to OET Bulletin No. 65, all station personnel and contractors are required to follow appropriate safety procedures before any work is commenced on the antenna tower, including reduction in power or discontinuance of operation before any maintenance work is undertaken. The permittee/licensee 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.

September 10, 2019

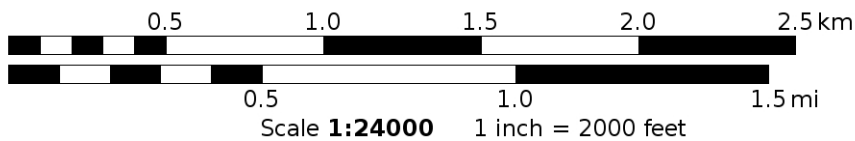
Erik C. Swanson, P.E.

Hatfield & Dawson Consulting Engineers





Mercator Projection  
WGS84  
USNG Zone 11TMG  
CalTopo



HARNEY

MALHEUR

MCDERMITT

FORT MCDERMITT

Proposed Ch22  
49.6 dBu

Licensed Ch11  
48.0 dBu

95

ORO VADA

HUMBOLDT

PARADISE VALLEY

290

95

### Ch22 McDermitt Contour Map

0 10 20 30  
Kilometers

Hatfield & Dawson 9/2019