

THOMAS M. ECKELS, PE
STEPHEN S. LOCKWOOD, PE
DAVID J. PINION, PE
ERIK C. SWANSON, PE

THOMAS S. GORTON, PE

JAMES B. HATFIELD, PE
BENJAMIN F. DAWSON III, PE
CONSULTANTS

HATFIELD & DAWSON
CONSULTING ELECTRICAL ENGINEERS
9500 GREENWOOD AVE. N.
SEATTLE, WASHINGTON 98103

TELEPHONE (206) 783-9151
FACSIMILE (206) 789-9834
E-MAIL hatdaw@hatdaw.com

MAURY L. HATFIELD, PE
(1942-2009)
PAUL W. LEONARD, PE
(1925-2011)

**Engineering Statement
Minor Modification of K20NT-D
Channel 20 at McDermitt, NV
May 2019**

This Engineering Statement has been prepared on behalf of Quinn River TV Maintenance District ("QRTV"), licensee of digital TV translator station K20NT-D at McDermitt, NV. This material has been prepared in connection with an application for minor modification.

I. Background

QRTV proposes to relocate the transmitter site. This application qualifies as "minor" since there is overlap of the licensed and proposed F(50,90) coverage contours.

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.

Hatfield & Dawson Consulting Engineers

Study created: 2019.05.24 10:41:40

Study build station data: LMS TV 2019-05-20

Proposal: K20NT-D D20 LD APP MCDERMITT, NV
File number: MCD20
Facility ID: 54299
Station data: User record
Record ID: 859
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	K19IU-D	D19	LD	LIC	BATTLE MOUNTAIN, NV	BLDTT20110902ACD	175.6 km
No	K19EU-D	D19	LD	CP	WINNEMUCCA, NV	BLANK0000059879	109.6
No	K19EU-D	D19	LD	LIC	WINNEMUCCA, NV	BLDTT20110701ACI	109.6
No	K20DE-D	D20	LD	LIC	ALTURAS/LIKELY, CA	BLDTT20080826AAS	254.4
No	KNVN	D20	DT	CP	CHICO, CA	BLANK0000034865	413.8
No	KCVU	D20	DT	LIC	PARADISE, CA	BLCDT20081222AAV	404.2
No	KZTN-LD	D20	LD	LIC	BOISE, ID	BLANK0000005170	229.1
No	KZTN-LD	D20	LD	CP	BOISE, ID	BLANK0000031961	233.2
No	K49EB-D	D20	LD	CP	GARDEN VALLEY, ID	BLANK0000052582	273.4
No	KTFT-LD	D20	LD	LIC	TWIN FALLS, ID	BLDTL20080813AAO	282.9
No	K20HX	N20	TX	LIC	BEOWAWE, NV	BLTTL20051006ADR	175.3
No	K46KH	D20	LD	CP	CARLIN, NV	BLANK0000054861	186.4
No	K20LW-D	D20	LD	CP	IMLAY, NV	BNPDTL20100512AAH	148.5
No	KAME-TV	D20	DT	LIC	RENO, NV	BLANK0000001059	320.1
No	KAME-TV	D20	DT	APP	RENO, NV	BLANK0000035790	320.1
No	K39IR-D	D20	LD	CP	VALMY, NV	BLANK0000054082	120.6
No	K20JQ-D	D20	LD	LIC	WELLS, NV	BLDTT20090709AOP	247.2
No	K20IV-D	D20	LD	LIC	BAKER CITY, ETC., OR	BLDTT20120418AAB	289.4
No	KQRE-LD	D20	LD	LIC	BEND, OR	BLDTL20120523ACJ	377.3
No	K20ES	N20z	TX	LIC	PENDLETON, ETC., OR	BLTTL19960301JC	379.4
No	K20LF-D	D20	LD	LIC	WENDOVER, UT	BLDTT20110928ADD	337.2
No	KAID	D21	DD	LIC	BOISE, ID	BLEDT20120719ABH	235.9
No	K43MM-D	D21	LD	CP	BEOWAWE, NV	BLANK0000054890	171.4
No	K21FO-D	D21	LD	CP	WINNEMUCCA, NV	BLANK0000059880	109.6
No	K21FO-D	D21	LD	LIC	WINNEMUCCA, NV	BLDTT20090505ABS	109.6

No non-directional AM stations found within 0.8 km

No directional AM stations found within 3.2 km

Record parameters as studied:

Channel: D20
Mask: Stringent
Latitude: 41 59 44.50 N (NAD83)
Longitude: 117 43 5.30 W
Height AMSL: 1361.0 m (Adjusted based on actual ground elevation calculation)
HAAT: 0.0 m
Peak ERP: 0.200 kW
Antenna: SCA-K723147 (ID 106376) 180.0 deg
Elev Pattn: Generic

49.4 dBu contour:

Azimuth	ERP	HAAT	Distance
0.0 deg	0.002 kW	-80.7 m	4.0 km
45.0	0.000	-274.0	2.4
90.0	0.000	-206.3	2.2
135.0	0.044	-135.9	8.5
180.0	0.200	24.2	12.3
225.0	0.044	-46.9	8.5
270.0	0.000	-76.9	2.2
315.0	0.000	-13.5	2.4

Database HAAT does not agree with computed HAAT
Database HAAT: 0 m Computed HAAT: -101 m

Distance to Canadian border: 778.6 km

Distance to Mexican border: 1045.7 km

Conditions at FCC monitoring station: Livermore CA
Bearing: 217.3 degrees Distance: 586.3 km

Proposal is not within the West Virginia quiet zone area

Hatfield & Dawson Consulting Engineers

Conditions at Table Mountain receiving zone:
Bearing: 96.9 degrees Distance: 1063.3 km

No land mobile station failures found

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 pipe mount which extends no more than 10 feet above the roof of an existing 20 foot building. Therefore this structure is exempted from FCC Antenna Structure Registration.

DETERMINATION Results	
Structure does not require registration. The structure meets the 6.10-meter (20-foot) Rule criteria.	
Your Specifications	
NAD83 Coordinates	
Latitude	41-59-44.5 north
Longitude	117-43-05.3 west
Measurements (Meters)	
Overall Structure Height (AGL)	9.1
Support Structure Height (AGL)	6.1
Site Elevation (AMSL)	1351
Structure Type	
BPIPE - Building with Pipe	

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.

Hatfield & Dawson Consulting Engineers

Power density levels produced by the proposed facility were calculated for an elevation of 2 meters above ground (7 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 8 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 $5.5 \mu\text{W}/\text{cm}^2$, which is 1.6% of $337.3 \mu\text{W}/\text{cm}^2$ (the FCC maximum for uncontrolled environments at the Channel 20 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.

May 28, 2019

Erik C. Swanson, P.E.

Hatfield & Dawson Consulting Engineers