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**Engineering Statement
Displacement of K50CZ-D
Channel 20 at McDermitt, NV
May 2018**

This Engineering Statement has been prepared on behalf of Quinn River TV Maintenance District ("QRTV"), licensee of digital TV translator station K50CZ-D at McDermitt, NV. This material has been prepared in connection with a displacement application.

I. Background

The translator currently operates on a channel above Channel 36, which will be the highest channel remaining for terrestrial television broadcasting per the results of the 2017 spectrum auction. Accordingly, QRTV is filing this displacement application during the Commission's Special Displacement Window, which is scheduled for April 10 through June 1, 2018.

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.

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Study created: 2018.05.04 10:28:02

Study build station data: LMS TV 2018-05-03 (122)

Proposal: K50CZ-D D20 LD APP MCDERMITT, NV
File number: HIGH20
Facility ID: 54299
Station data: User record
Record ID: 662
Country: U.S.

Build options:

Protect pre-transition records not on baseline channel

User records included:

632 K39IR-D D20 LD APP VALMY, NV GOLC20
655 K19EU-D D19 LD APP WINNEMUCCA, NV WINN19-WIDE-185W
656 K21FO-D D21 LD APP WINNEMUCCA, NV WINN21-WIDE-185W

Stations potentially affected by proposal:

IX	Call	Chan	Svc	Status	City, State	File Number	Distance
No	K19EU-D	D19	LD	LIC	WINNEMUCCA, NV	BLDTT20110701ACI	126.6 km
No	K19EU-D	D19	LD	APP	WINNEMUCCA, NV	WINN19-WIDE-185W	126.6
No	K20DE-D	D20	LD	LIC	ALTURAS/LIKELY, CA	BLDTT20080826AAS	262.4
No	KNVN	D20	DT	CP	CHICO, CA	BLANK0000034865	423.1
No	KCVU	D20	DT	LIC	PARADISE, CA	BLCDT20081222AAV	415.0
No	KZTN-LD	D20	LD	LIC	BOISE, ID	BLANK0000005170	214.1
No	KZTN-LD	D20	LD	CP	BOISE, ID	BLANK0000031961	218.3
No	K49EB-D	D20	LD	APP	GARDEN VALLEY, ID	BLANK0000052582	258.4
No	KTFT-LD	D20	LD	LIC	TWIN FALLS, ID	BLDTL20080813AAO	276.6
No	K20HX	N20	TX	LIC	BEOWAWE, NV	BLTTL20051006ADR	189.5
Yes	K20LW-D	D20	LD	CP	IMLAY, NV	BNPDTL20100512AHH	165.3
No	KAME-TV	D20	DT	LIC	RENO, NV	BLANK0000001059	335.2
No	KAME-TV	D20	DT	APP	RENO, NV	BLANK0000035790	335.2
No	K39IR-D	D20	LD	APP	VALMY, NV	GOLC20	136.8
No	K20JQ-D	D20	LD	LIC	WELLS, NV	BLDTT20090709AOP	252.0
No	K20IV-D	D20	LD	LIC	BAKER CITY, ETC., OR	BLDTT20120418AAB	272.5
No	KQRE-LD	D20	LD	LIC	BEND, OR	BLDTL20120523ACJ	366.3
No	K20ES	N20z	TX	LIC	PENDLETON, ETC., OR	BLTTL19960301JC	364.0
No	K20LF-D	D20	LD	LIC	WENDOVER, UT	BLDTT20110928ADD	342.7
No	KAID	D21	DD	LIC	BOISE, ID	BLDTT20120719ABH	221.0
No	K21FO-D	D21	LD	LIC	WINNEMUCCA, NV	BLDTT20090505ABS	126.6
No	K21FO-D	D21	LD	APP	WINNEMUCCA, NV	WINN21-WIDE-185W	126.6

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: 42 8 53.60 N (NAD83)
Longitude: 117 41 51.90 W
Height AMSL: 1976.0 m
HAAT: 0.0 m
Peak ERP: 0.040 kW
Antenna: SCA-K723147 (ID 106376) 190.0 deg
Elev Pattn: Generic

49.4 dBu contour:

Azimuth	ERP	HAAT	Distance
0.0 deg	0.000 kW	265.9 m	7.4 km
45.0	0.000	210.6	2.8
90.0	0.000	108.9	3.0
135.0	0.004	186.3	11.8
180.0	0.037	528.1	30.9
225.0	0.015	591.8	27.1
270.0	0.000	536.9	6.1
315.0	0.000	486.8	5.4

Database HAAT does not agree with computed HAAT

Database HAAT: 0 m Computed HAAT: 364 m

Distance to Canadian border: 761.6 km

Distance to Mexican border: 1062.6 km

Conditions at FCC monitoring station: Livermore CA
Bearing: 216.4 degrees Distance: 600.9 km

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Proposal is not within the West Virginia quiet zone area

Conditions at Table Mountain receiving zone:
Bearing: 97.9 degrees Distance: 1063.8 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. 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 (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 1.6 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 1.1 $\mu W/cm^2$, which is 0.3% of 337.3 $\mu W/cm^2$ (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 4, 2018

Erik C. Swanson, P.E.