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**Engineering Statement  
Displacement of K39IR-D  
Channel 20 at Valmy, NV  
May 2018**

This Engineering Statement has been prepared on behalf of Humboldt County ("HC"), licensee of digital TV translator station K39IR-D at Valmy, 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, HC 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 12:54:52

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

Proposal: K39IR-D D20 LD APP VALMY, NV  
File number: GOLC20  
Facility ID: 167437  
Station data: User record  
Record ID: 632  
Country: U.S.

Build options:

Protect pre-transition records not on baseline channel

User records included:

655 K19EU-D D19 LD APP WINNEMUCCA, NV WINN19-WIDE-185W  
656 K21FO-D D21 LD APP WINNEMUCCA, NV WINN21-WIDE-185W  
662 K50CZ-D D20 LD APP MCDERMITT, NV HIGH20

Stations potentially affected by proposal:

IX	Call	Chan	Svc	Status	City, State	File Number	Distance
No	K18GW	N18	TX	LIC	BEOWAWE, NV	BLTTL20051006ADO	69.1 km
No	K19IU-D	D19	LD	LIC	BATTLE MOUNTAIN, NV	BLDTT20110902ACD	69.1
No	K19FZ-D	D19	LD	LIC	ELKO, NV	BLDTT20111219ABE	128.1
Yes	K19EU-D	D19	LD	LIC	WINNEMUCCA, NV	BLDTT20110701ACI	32.4
Yes	K19EU-D	D19	LD	APP	WINNEMUCCA, NV	WINN19-WIDE-185W	32.4
No	K20DE-D	D20	LD	LIC	ALTURAS/LIKELY, CA	BLDTT20080826AAS	266.8
No	KVME-TV	D20	DT	LIC	BISHOP, CA	BLANK0000001562	397.9
No	KNVN	D20	DT	CP	CHICO, CA	BLANK00000034865	403.4
No	KCVU	D20	DT	LIC	PARADISE, CA	BLCDT20081222AAV	381.0
No	K20JX-D	D20	DC	CP	SACRAMENTO, CA	BLANK00000036141	404.8
No	KZTN-LD	D20	LD	LIC	BOISE, ID	BLANK00000005170	324.5
No	KZTN-LD	D20	LD	CP	BOISE, ID	BLANK00000031961	328.2
No	K49EB-D	D20	LD	APP	GARDEN VALLEY, ID	BLANK00000052582	366.8
No	KTFT-LD	D20	LD	LIC	TWIN FALLS, ID	BLDTL20080813AAO	316.7
Yes	K20HX	N20	TX	LIC	BEOWAWE, NV	BLTTL20051006ADR	69.1
No	K20LD-D	D20	LD	LIC	ELY, NV	BLDTT20120119AEH	308.1
No	K20FR-D	D20	LD	CP	HAWTHORNE, NV	BMPDTT20090521ADK	299.3
No	K20FR-D	D20	LD	LIC	HAWTHORNE, NV	BLDTT20090914ACI	299.3
No	K20LW-D	D20	LD	CP	IMLAY, NV	BNPDTL20100512AAH	74.5
No	K50CZ-D	D20	LD	APP	MCDERMITT, NV	HIGH20	136.8
No	KAME-TV	D20	DT	LIC	RENO, NV	BLANK00000001059	253.5
No	KAME-TV	D20	DT	APP	RENO, NV	BLANK00000035790	253.5
No	K20JQ-D	D20	LD	LIC	WELLS, NV	BLDTT20090709AOP	207.2
No	KTMW	D20	DT	LIC	SALT LAKE CITY, UT	BLCDT20140529AJC	437.9
No	K20LF-D	D20	LD	LIC	WENDOVER, UT	BLDTT20110928ADD	283.1
No	K21MJ-D	D21	LD	CP	SPRING CREEK, NV	BNPDTL20100512AHQ	143.0
Yes	K21FO-D	D21	LD	LIC	WINNEMUCCA, NV	BLDTT20090505ABS	31.9
Yes	K21FO-D	D21	LD	APP	WINNEMUCCA, NV	WINN21-WIDE-185W	32.4
No	K27DY	N27	TX	LIC	CARLIN, NV	BLTT19930413JE	110.6

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: 40 56 19.00 N (NAD83)  
Longitude: 117 23 38.00 W  
Height AMSL: 1669.6 m (Adjusted based on actual ground elevation calculation)  
HAAT: 0.0 m  
Peak ERP: 0.200 kW  
Antenna: SCA-723147 (ID 106556) 0.0 deg  
Elev Pattnr: Generic

49.4 dBu contour:

Azimuth	ERP	HAAT	Distance
0.0 deg	0.000 kW	131.8 m	6.4 km
45.0	0.010	318.1	19.0
90.0	0.151	280.1	31.7
135.0	0.126	256.6	29.8
180.0	0.005	194.1	12.4
225.0	0.000	125.1	6.2
270.0	0.000	194.4	7.0
315.0	0.000	294.2	7.3

Database HAAT does not agree with computed HAAT  
Database HAAT: 0 m Computed HAAT: 224 m

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Distance to Canadian border: 896.1 km  
Distance to Mexican border: 928.0 km  
Conditions at FCC monitoring station: Livermore CA  
Bearing: 227.8 degrees Distance: 517.7 km  
Proposal is not within the West Virginia quiet zone area  
Conditions at Table Mountain receiving zone:  
Bearing: 90.9 degrees Distance: 1028.3 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. 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 (5.6 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 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  $8.5 \mu\text{W}/\text{cm}^2$ , which is 2.5% 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 4, 2018

Erik C. Swanson, P.E.