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

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

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
Displacement of K51BW
Channel 22 at Golconda, NV
May 2018

This Engineering Statement has been prepared on behalf of Humboldt County ("HC"), licensee of TV translator station K51BW at Winnemucca, Nevada. This material has been prepared in connection with a digital displacement application at Golconda, Nevada.

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.

Study created: 2018.05.05 11:02:30

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

```
    Proposal: K51BW D22 LD APP GOLCONDA, NV
 File number: SAIPAN22
 Facility ID: 28089
Station data: User record
   Record ID: 649
     Country: U.S.
```

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

User records included:
656 K21FO-D D21 LD APP WINNEMUCCA, NV WINN21-WIDE-185W
657 K23FR-D D23 LD APP WINNEMUCCA, NV WINN23-WIDE-185W

Stations potentially affected by proposal:

IX	Call	Chan	Svc	Status	City, State	File Number	Distance
No	K18GW	N18	TX	LIC	BEOWAWE, NV	BLTTL20051006ADO	88.6 km
No	K20HX	N20	TX	LIC	BEOWAWE, NV	BLTTL20051006ADR	88.6
No	K21MJ-D	D21	LD	CP	SPRING CREEK, NV	BNPDTL20100512AHQ	153.4
No	K21FO-D	D21	LD	LIC	WINNEMUCCA, NV	BLDTT20090505ABS	29.2
No	K21FO-D	D21	LD	APP	WINNEMUCCA, NV	WINN21-WIDE-185W	29.6
No	K22LE-D	D22	LD	LIC	CEDARVILLE, CA	BLDTT20120730AKH	225.0
No	KRID-LD	D22	LD	LIC	BOISE, ID	BLANK0000001109	310.1
No	KIPT	D22	DD	LIC	TWIN FALLS, ID	BLEDT20120808ABN	307.3
Yes	K22GM-D	D22	LD	LIC	BATTLE MOUNTAIN, NV	BLDTT20120514ADF	88.7
No	K22KB-D	D22	LD	LIC	ELY, ETC., NV	BLDTT20140717ABY	303.3
No	K22FH-D	D22	LD	LIC	HAWTHORNE, NV	BLDTT20100630BZY	319.5
Yes	K22LH-D	D22	LD	CP	IMLAY, NV	BNPDTL20100512AHF	80.2
No	KNPB	D22	LD	APP	RENO, NV	BLANK0000052186	292.3
No	K22JC-D	D22	LD	LIC	SILVER SPRINGS, NV	BLDTT20121204ACN	241.4
No	K22GW-D	D22	LD	LIC	WELLS, NV	BLDTT20090709AOQ	211.5
No	K22KP-D	D22	LD	LIC	WENDOVER, UT	BLDTT20110928ADB	291.9
No	K23FC-D	D23	LD	LIC	ELKO, NV	BLDTT20111219ABF	141.1
No	K23FR-D	D23	LD	LIC	WINNEMUCCA, NV	BLDTT20070404AAM	29.2
No	K23FR-D	D23	LD	APP	WINNEMUCCA, NV	WINN23-WIDE-185W	29.6
No	K29JM	N29	TX	LIC	ELKO, NV	BLTT20111122EKF	141.1
No	K30HF	N30	TX	LIC	BEOWAWE, NV	BLTT20051006ADT	88.6

No non-directional AM stations found within 0.8 km

No directional AM stations found within 3.2 km

Record parameters as studied:

```
    Channel: D22
       Mask: Stringent
   Latitude:  41  9 17.70 N (NAD83)
  Longitude: 117 28 17.10 W
Height AMSL: 1942.8 m
       HAAT: 0.0 m
   Peak ERP: 0.040 kW
    Antenna: SCA-K723147 0.0 deg
Elev Pattrn: Generic
```

49.6 dBu contour:

Azimuth	ERP	HAAT	Distance
0.0 deg	0.032 kW	418.6 m	27.1 km
45.0	0.001	431.7	12.7
90.0	0.000	49.7	2.4
135.0	0.007	394.5	19.3
180.0	0.039	548.4	31.4
225.0	0.007	599.4	23.1
270.0	0.000	609.2	1.5
315.0	0.021	598.4	28.7

Database HAAT does not agree with computed HAAT
Database HAAT: 0 m Computed HAAT: 456 m

Distance to Canadian border: 872.0 km

Distance to Mexican border: 952.0 km

Conditions at FCC monitoring station: Livermore CA
Bearing: 225.3 degrees Distance: 529.5 km

Proposal is not within the West Virginia quiet zone area

```
Conditions at Table Mountain receiving zone:
Bearing: 92.2 degrees   Distance: 1035.4 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%


---- Below is IX received by proposal SAIPAN22 ----

Proposal receives 3.28% interference from scenario 1
Proposal receives 3.28% interference from scenario 2
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 (12 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 0.4 μW/cm², which is 0.1% of 345.3 μW/cm² (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.

May 6, 2018
Erik C. Swanson, P.E.