

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

THOMAS S. GORTON, PE  
MICHAEL H. MEHIGAN, 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  
Displacement of K47MW-D  
Channel 24 at Casper, WY  
January 2018**

This Engineering Statement has been prepared on behalf of Central Wyoming College ("CWC"), licensee of digital TV translator station K47MW-D at Casper, Wyoming. This material has been prepared in connection with a displacement application and request for Special Temporary Authority.

**I. Background and Waiver Request**

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. The translator licensee has received a 120-day notice from T-Mobile informing it that the translator station is likely to cause interference in areas where the wireless licensee intends to commence operations or FFA testing. Included with this Engineering Statement is a copy of that notice. Termination of operations would need to occur before the Special Displacement Window opens.

Under these circumstances, CWC respectfully requests a waiver of the Displacement Freeze, in accordance with the procedures announced by Public Notice on June 14, 2017. (See DA 17-584, *Incentive Auction Task Force and Media Bureau Set Forth Tools Available to LPTV/Translator Stations Displaced Prior to the Special Displacement Window*.) Grant of this waiver will allow the station to continue providing service to viewers with as little disruption as possible.

Accordingly, CWC is filing both a displacement application, and a request for Special Temporary Authority to begin operations on the requested channel.

## 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 facilities with which contour overlap exists. 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: 2018.01.10 14:33:29

Study build station data: LMS TV 2018-01-10 (91)

Proposal: K47MW-D D24 LD APP CASPER, WY  
File number: CASPER24  
Facility ID: 182697  
Station data: User record  
Record ID: 443  
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	K23LN-D	D23	LD	CP	MIDWEST, WY	BNPDTL20100510ACQ	86.1 km
No	K24HQ-D	D24	LD	LIC	BOULDER, CO	BLANK0000034173	323.5
No	KRDO-TV	D24	DT	LIC	COLORADO SPRINGS, CO	BLCDT20060329AAW	461.6
No	KMLN-LD	D24	LD	LIC	FORT COLLINS, CO	BLDTL20130709ABW	268.3
No	K24KM-D	D24	LD	LIC	COLSTRIP, ETC., MT	BLDTL20120608AAT	347.1
No	K24GD-D	D24	LD	LIC	HARDIN, MT	BLDTL20100907ACF	346.9
No	KKRA-LP	N24	TX	LIC	RAPID CITY, SD	BLTTL19980213JB	292.7
No	K24LL-D	D24	LD	CP	WASTA, SD	BNPDTL20100510AHK	352.6
No	K24DA	N24	TX	LIC	BIG PINEY, ETC., WY	BLTT19920825JD	290.9
Yes	K24KF-D	D24	LD	CP	GILLETTE, WY	BNPDTL20100505AIB	167.6
No	K24GT-D	D24	LD	LIC	KEMMERER, WY	BLDTT20061003ABS	355.1
No	KPAH-LP	N24z	TX	LIC	LARAMIE, WY	BLTTA20030519ACB	178.6
Yes	K40AQ-D	D24	LD	APP	SHOSHONI, WY	BLANK0000036127	153.8
Yes	K25ME-D	D25	LD	CP	CASPER, WY	BNPDTL20100510ACS	40.5
No	K25NC-D	D25	LD	CP	WHEATLAND, WY	BNPDTL20100510AEN	156.3
No	K25LI-D	D25	LD	LIC	WRIGHT, WY	BLDTT20100617AJX	115.9
No	K31HT	N31+	TX	LIC	CASPER, WY	BLTTL20070628ACN	0.2
No	K31HT	N31+	TX	CP	CASPER, WY	BPTTL20140513ABY	0.0

No non-directional AM stations found within 0.8 km

No directional AM stations found within 3.2 km

Record parameters as studied:

Channel: D24  
Mask: Stringent  
Latitude: 42 44 25.90 N (NAD83)  
Longitude: 106 21 38.10 W  
Height AMSL: 2469.0 m  
HAAT: 0.0 m  
Peak ERP: 1.00 kW  
Antenna: SCA-1X1KBBU (ID 20717) 0.0 deg  
Elev Pattn: Generic

49.8 dBu contour:

Azimuth	ERP	HAAT	Distance
0.0 deg	1.00 kW	810.4 m	55.7 km
45.0	0.221	725.1	44.6
90.0	0.000	219.8	8.3
135.0	0.001	116.5	6.7
180.0	0.010	391.8	20.5
225.0	0.001	665.3	14.7
270.0	0.000	580.9	12.7
315.0	0.221	767.6	45.3

Database HAAT does not agree with computed HAAT  
Database HAAT: 0 m    Computed HAAT: 535 m

Distance to Canadian border: 695.7 km

Distance to Mexican border: 1217.9 km

Conditions at FCC monitoring station: Grand Island NE  
Bearing: 104.4 degrees    Distance: 687.0 km

Proposal is not within the West Virginia quiet zone area

Conditions at Table Mountain receiving zone:  
Bearing: 161.9 degrees    Distance: 302.0 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. 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 (23 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 1X1KBBU antenna proposed in this application. This relative field value yields a worst-case adjusted average effective radiated power of 40 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 is calculated to be  $2.5 \mu\text{W}/\text{cm}^2$ , which is 0.7% of  $353.3 \mu\text{W}/\text{cm}^2$  (the FCC maximum for uncontrolled environments at the Channel 24 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 1000 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.

January 10, 2018

Erik C. Swanson, P.E.

Hatfield & Dawson Consulting Engineers