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**Engineering Statement  
Modification of K15HK-D  
Channel 15 at Sheridan, WY  
November 2017**

This Engineering Statement has been prepared on behalf of Central Wyoming College ("CWC"), licensee of digital TV translator station K15HK-D at Sheridan, Wyoming. This material has been prepared in connection with an application for minor modification, including a change in the transmitter site.

**I. 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: 2017.11.09 09:50:37

Study build station data: LMS TV 2017-11-08 (68)

Proposal: K15HK-D D15 LD APP SHERIDAN, WY  
File number: K15HK-MOD  
Facility ID: 167612  
Station data: User record  
Record ID: 318  
Country: U.S.

Build options:

Protect records not on baseline channel

Stations affected by proposal:

Call	Chan	Svc	Status	City, State	File Number	Distance
K14OT-D	D14	LD	CP	GILLETTE, WY	BNPDTL20100505AHZ	105.6 km
K15JL-D	D15	LD	CP	BILLINGS, MT	BNPDTL20100208ACF	164.5

No non-directional AM stations found within 0.8 km

No directional AM stations found within 3.2 km

Record parameters as studied:

Channel: D15  
Mask: Simple  
Latitude: 44 37 25.70 N (NAD83)  
Longitude: 107 7 5.10 W  
Height AMSL: 2355.6 m  
HAAT: 0.0 m  
Peak ERP: 2.80 kW  
Antenna: SCA-1X2KBBU (ID 1001952) 30.0 deg  
Elev Pattn: Generic

48.8 dBu contour:

Azimuth	ERP	HAAT	Distance
0.0 deg	1.85 kW	953.8 m	63.5 km
45.0	1.71	1005.0	63.8
90.0	2.43	873.3	64.1
135.0	0.188	209.2	30.2
180.0	0.038	-262.4	8.4
225.0	0.006	-153.2	5.4
270.0	0.048	-71.2	8.9
315.0	1.20	265.3	42.8

Database HAAT does not agree with computed HAAT  
Database HAAT: 0 m Computed HAAT: 352 m

Distance to Canadian border: 486.4 km

Distance to Mexican border: 1427.2 km

Conditions at FCC monitoring station: Grand Island NE  
Bearing: 117.1 degrees Distance: 819.0 km

Proposal is not within the West Virginia quiet zone area

Conditions at Table Mountain receiving zone:  
Bearing: 162.2 degrees Distance: 520.0 km

No land mobile station failures found

Proposal is not within the Offshore Radio Service protected area

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.

## II. Facilities Proposed

The proposed K15HK-D facility will operate from a tower site on Bosin Rock, with a horizontally-polarized Scala/Kathrein 1X2KBBU antenna array. The tower structure does not require FCC Antenna Structure Registration.

## 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 Scala/Kathrein 1X2KBBU antenna proposed in this application. This relative field value yields a worst-case adjusted average effective radiated power of 112 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 119.3  $\mu W/cm^2$ , which is 37.6% of 317.3  $\mu W/cm^2$  (the FCC maximum for uncontrolled environments at the Channel 15 frequency).

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.

November 9, 2017

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