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 K41KH-D Channel 16 at Teton Village, WY August 2017

This Engineering Statement has been prepared on behalf of Central Wyoming College ("CWC"), licensee of digital TV translator station K41KH-D at Teton Village, 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: 2017.08.10 11:55:26 Study build station data: LMS TV 2017-08-10 (25) Proposal: K41KH-D D16 LD LIC TETON VILLAGE, WY File number: TETON16 Facility ID: 167611 Station data: User record Record ID: 117 Country: U.S. Build options: Protect records not on baseline channel No protected stations found. No non-directional AM stations found within 0.8 km No directional AM stations found within 3.2 km Record parameters as studied: Channel: D16 Mask: Simple Latitude: 43 35 47.40 N (NAD83) Longitude: 110 52 10.40 W Height AMSL: 3160.2 m HAAT: 0.0 m Peak ERP: 0.500 kW Antenna: KAT-1X2KBBU (ID 39008) 120.0 deg Elev Pattrn: Generic 48.9 dBu contour: Azimuth ERP HAAT Distance 0.0 deg 0.008 kW 252.4 m 16.3 km 972.6 45.0 0.211 49.5 90.0 0.328 1192.2 55.3 0.300 1201.6 54.8 135.0 180.0 0.432 1149.8 56.5 225.0 0.033 464.1 29.1 270.0 0.006 612.8 23.0 315.0 0.001 449.1 12.4 Database HAAT does not agree with computed HAAT Database HAAT: 0 m Computed HAAT: 787 m Distance to Canadian border: 600.4 km Distance to Mexican border: 1254.6 km Conditions at FCC monitoring station: Grand Island NE Bearing: 101.9 degrees Distance: 1064.5 km Proposal is not within the West Virginia quiet zone area Conditions at Table Mountain receiving zone: Bearing: 127.6 degrees Distance: 601.9 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.

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 (3 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 1X2 Kathrein broadband panel antenna array proposed in this application. This relative field value yields a worst-case adjusted average effective radiated power of 20 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 74.2 μ W/cm², which is 23% of 321 μ W/cm² (the FCC maximum for uncontrolled environments at the Channel 16 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 applicants proposed facility are predicted to be less than 5% of the

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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.

August 10, 2017 Erik C. Swanson, P.E.