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Engineering Statement Minor Modification of K29IG-D Channel 29 at Sunlight Basin, WY October 2019

I. Background

This Engineering Statement has been prepared on behalf of Central Wyoming College ("CWC"), licensee of digital TV translator station K29IG-D. This material has been prepared in connection with an application for minor modification, to correct the station's transmitter site coordinates and elevation data.

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. This study was run with a grid spacing of 1.0 km, and a terrain increment of 1.0 km.

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Study created: 2019.10.07 12:51:32 Study build station data: LMS TV 2019-10-07 Proposal: K29IG-D D29 LD APP SUNLIGHT BASIN, WY File number: K29IG-FIX Facility ID: 167609 Station data: User record Record ID: 929 Country: U.S. Build options: Protect pre-transition records not on baseline channel Stations potentially affected by proposal: IΧ Call Chan Svc Status City, State KWYB-LD D28 LD CP BOZÉMAN, MT No BOZEMAN, MI BOZEMAN, MT BRIDGER, ETC., MT WEST YELLOWSTONE, MT RIVERTON, WY BLACKFOOT, ID IDAHO FALLS, ID MONTPELIER, ID DECETON, ID KWYB-LD D28 LD LIC No LD No K28LG-D D28 LTC TX APP No K28A7 N28 LD LTC K28HL-D D28 No K29KY-D D29 LD CP No CP No K29KG-D D29 LD K29BM-D D29 LD LIC No PRESTON, ID SALMON, ID K29EY-D D29 LIC No LD SALMON, ID SODA SPRINGS, ID K29LY-D D29 LIC No LD No K29LG-D D29 LD LIC Nο K29MM-D D29 LD LIC BILLINGS, MT BOZEMAN, MT LIC KDBZ-CD D29 DC No BUTTE, MT HELENA, MT HELENA, MT K29JT-D D29 LD No CP KUHM-TV D29 LIC DT No KUHM-TV D29 DT APP No LOMA, MT MILES CITY, MT K29LD-D No D29 LD CP K29KB-D D29 LD CP No K11BF D29 LD CP RANDOLPH, UT No No K29HG-D D29 LD LIC JACKSON, WY LA BARGE, ETC., WY K29HV-D No D29 LD LIC METEETSE, ETC., WY SHERIDAN, WY LD LIC Yes K29TH-D D29 D29 CP KSWY-LP No LD SHERIDAN, WY KSWY-LP N29 TX LIC No No K30MA-D D30 LD CP COLUMBUS, MT CODY, ETC, WY SHOSHONI, WY COLUMBUS, MT D30 LIC No K300U-D LD No K30GV-D D30 LD LIC No кззеа N33 ТΧ LIC No K36EZ N36 ТΧ LIC BILLINGS, MT No non-directional AM stations found within 0.8 km No directional AM stations found within 3.2 km Record parameters as studied: Channel: D29 Mask: Simple Latitude: 44 45 14.20 N (NAD83) Longitude: 109 22 30.00 W Height AMSL: 2630.0 m HAAT: 0.0 m Peak ERP: 0.600 kW Antenna: SCA-PR-450 /4DR4S ARRAY (ID 100900) 310.0 deg Elev Pattrn: Generic 50.2 dBu contour: HAAT Distance Azimuth ERP 0.0 deg 0.002 kW 8.1 km 16.4 0.001 45.0

138.5 m 886.7 957.1 90.0 0.000 15.1 135.0 0.000 731.2 10.5 180.0 0.001 -18.3 3.5 225.0 0.073 221.7 24.4 270.0 0.127 562.0 37.8 315.0 0.486 562.2 46.1 Database HAAT does not agree with computed HAAT Database HAAT: 0 m $\,$ Computed HAAT: 505 m $\,$ Distance to Canadian border: 472.0 km Distance to Mexican border: 1414.9 km Conditions at FCC monitoring station: Grand Island NE Bearing: 111.7 degrees Distance: 987.5 km

File Number

BLANK0000080859

BLDTL20121030AAV

BLDTT20110207ADQ

BLDTT20120807ABP

BLDTT20111116AYI

BLDTT20111116AIA

BLANK0000059727

BLANK0000059259

BLANK0000064137

BLANK0000075047

BLANK0000004580

BLANK0000035768

BNPDTL20100310ABV

BNPDTT20130325AHT

BNPDTL20100506AEP

BLANK0000052885

BLDTL20090224AAW BLDTT20070523ACE

BLDTT20120223ACF

BLANK0000071563

BLTTL20100422ADU

BLANK0000078411

BLTT19940902IF BLTTL20001227ABC

BLDTT20120807ABS

BNPDTL20100505AGS

BNPDTL20100609AHK

BMJADTL20100524ABH

BLTT19880426IB

Distance

177.8 km

155.3

144.0

172.1

294.2

241.2

308.7

350.6

367.1

300.4

142.3

155.3

284.4

292.5

292.5

364.4

314.6 375.5

175.4

298.7

193.9

194.0

172.1 99.1

133.6

99.0

45.2

72.8

68.5

Proposal is not within the West Virginia quiet zone area Conditions at Table Mountain receiving zone: Bearing: 145.1 degrees Distance: 612.8 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

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 (21 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 0.257 at these angles, based on the manufacturer's vertical plane pattern for the horizontally-polarized Scala PR-450/4DR-4S antenna array proposed in this application. This relative field value yields a worst-case adjusted average effective radiated power of 39.6 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 $3.0 \,\mu$ W/cm², which is 0.8% of 373.3 μ W/cm² (the FCC maximum for uncontrolled environments at the Channel 29 frequency).

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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.

October 7, 2019 Erik C. Swanson, P.E.