

STEPHEN S. LOCKWOOD, PE, PMP

THOMAS M. ECKELS, PE
ERIK C. SWANSON, PE, PMP
THOMAS S. GORTON, PE

JAMES B. HATFIELD, PE
BENJAMIN F. DAWSON III, PE
STEPHEN PUMPLE, M.Eng, MBA, PMP
CONSULTANTS

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

TELEPHONE (206) 783-9151

E-MAIL hatdaw@hatdaw.com

MAURY L. HATFIELD, PE
(1942-2009)
PAUL W. LEONARD, PE
(1925-2011)

**Engineering Statement
Minor Modification of K30MX-D
Channel 30 at Wyodak, WY
July 2023**

I. Background

This Engineering Statement has been prepared on behalf of VW License, LLC ("VW"), licensee of low-power digital station K30MX-D. This material has been prepared in connection with an application for minor modification.

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.

This study was conducted using a study cell size of 1.0 km and a terrain extraction increment of 1.0 km.

The results of this study indicate that the proposed facility is predicted to cause zero additional interference to any of the listed stations, beyond the allowed values of 0.5% to full-power and Class A stations, and 2.0% to low-power stations. Based on the foregoing interference study, it is believed that the proposed facility can operate without risk of interference to other stations.

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Study created: 2023.07.27 11:42:33

Study build station data: LMS TV 2023-07-25

Proposal: K30MX-D D30 LD APP WYODAK, WY
File number: K30MX-MOD-OMNI
Facility ID: 190277
Station data: User record
Record ID: 1300
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	K22AD-D	N22	TX	LIC	GILLETTE, WY	BLTTL19940224JS	8.4 km
No	K29OF-D	D29	LD	LIC	DEADWOOD, SD	BLANK0000179231	137.4
No	K29JO-D	D29	LD	LIC	DOUGLAS, WY	BLANK0000135895	177.0
No	DDKSWY-LP	D29	LD	APP	SHERIDAN, WY	BLANK0000071563	113.3
No	DDKSWY-LP	N29	TX	APP	SHERIDAN, WY	BLTTL20100422ADU	113.1
No	KGWN-TV	D30	DT	LIC	CHEYENNE, WY	BLCDT20070327AEQ	359.1
No	K30OU-D	D30	LD	LIC	CODY, ETC, WY	BLANK0000078411	262.7
No	K30GV-D	D30	LD	LIC	SHOSHONI, WY	BLDTT20120807ABS	230.7
No	K31QA-D	D31	LD	LIC	DEADWOOD, SD	BLANK0000179230	137.4
No	K31LF-D	D31	LD	LIC	CLARETON, WY	BLANK0000124578	62.8

No non-directional AM stations found within 0.8 km

No directional AM stations found within 3.2 km

Record parameters as studied:

Channel: D30
Mask: Simple
Latitude: 44 18 17.00 N (NAD83)
Longitude: 105 33 55.00 W
Height AMSL: 1511.0 m
HAAT: 0.0 m
Peak ERP: 1.20 kW
Antenna: Omnidirectional
Elev Pattn: Generic
Elec Tilt: 1.75

50.3 dBu contour:

Azimuth	ERP	HAAT	Distance
0.0 deg	1.20 kW	180.7 m	36.4 km
45.0	1.20	180.8	36.4
90.0	1.20	131.1	33.3
135.0	1.20	99.0	30.7
180.0	1.20	56.6	24.9
225.0	1.20	56.0	24.7
270.0	1.20	84.5	28.9
315.0	1.20	124.2	32.9

Database HAAT does not agree with computed HAAT
Database HAAT: 0 m Computed HAAT: 114 m

Distance to Canadian border: 521.8 km

Distance to Mexican border: 1394.2 km

Conditions at FCC monitoring station: Grand Island NE
Bearing: 120.3 degrees Distance: 693.9 km

Proposal is not within the West Virginia quiet zone area

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Conditions at Table Mountain receiving zone:
Bearing: 176.7 degrees Distance: 462.2 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.

$$S(\mu W / cm^2) = \frac{33.4 \times AdjERP(Watts)}{D^2}$$

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 (17.3 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 0.250 at these angles, based on the manufacturer's vertical plane pattern for the horizontally-polarized SL-8 antenna proposed in this application. This relative field value yields a worst-case adjusted average effective radiated power of 75 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 8.4 $\mu W/cm^2$, which is 2.2% of 377.3 $\mu W/cm^2$ (the FCC maximum for uncontrolled environments at the Channel 30 frequency).

These calculations show that the maximum calculated power density produced at two meters above ground level by the proposed operation of K30MX-D 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 of the Commission's Rules exempts 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.

July 27, 2023

Erik C. Swanson, P.E.

Hatfield & Dawson Consulting Engineers