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**Engineering Statement
Minor Modification Application for KPTW
Post-Transition Channel 6 at Casper, Wyoming
March 2008**

This Engineering Statement has been prepared on behalf of Central Wyoming College ("CWC"), licensee of television station KPTW at Casper, Wyoming. KPTW presently operates on analog Channel 6, with no paired digital channel. KPTW will be implementing digital operation on its present analog channel. This material has been prepared in connection with a minor modification application for the KPTW post-transition facilities on digital Channel 6.

The following table lists the KPTW post-transition facilities approved in Appendix B of the DTV Seventh Report and Order MO&O¹, as well as CWC's requested post-transition facilities as proposed herein:

	DTV Table Appendix B	Proposed Form 340
Channel	6	6
ERP	1.0 kW	0.62 kW
HAAT	536 meters	536 meters
Antenna	ID #74715 (FCC-created directional)	Kathrein K5234867 directional panel
Coordinates	42-44-26 106-21-34	42-44-26 106-21-34
DTV Population (thousand)	70	70

¹ See *Advanced Television Systems and their Impact Upon the Existing Television Broadcast Service*, MB Docket No. 87-268, Memorandum Opinion and Order on Reconsideration of the Seventh Report and Order and Eighth Further Notice of Proposed Rulemaking, FCC 08-72, Released March 6, 2008.

I. Waiver Request For Minor Expansion

In accordance with the policy announced in paragraphs 151-152 of the *Third DTV Periodic Review R&O*,² CWC respectfully requests a waiver to allow a minor expansion of the KPTW Appendix B facility. The proposed facility satisfies the waiver requirements that the minor expansion:

- (1) Would allow the station will use its analog antenna or a new antenna to avoid a significant reduction in post-transition service from its analog service area;
- (2) Would be no more than five miles larger in any direction than its authorized service area, as defined by the post-transition DTV Table Appendix B; and
- (3) Would not cause impermissible interference, i.e., more than 0.5 percent new interference, to other stations.

The waiver will allow KPTW to operate post-transition on its present analog channel, utilizing a new antenna.

The Appendix B facility contour has been compared to that of the proposed facility, and we have determined that the greatest extension of the service area is 8.0 kilometers (5 miles).

Results of an interference analysis to other stations are discussed below.

II. Allocation 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 impermissible interference (i.e. more than 0.5 percent new interference) to any stations beyond that level listed in the post-transition DTV Table Appendix B. This study was performed using the SunDTV program from V-Soft Communications and a 2 km grid spacing. The SunDTV program identically duplicates the FCC's OET-69 processing program.

² *Third Periodic Review of the Commission's Rules and Policies Affecting the Conversion to Digital Television*, MB Docket No. 07-91, Notice of Proposed Rulemaking, FCC 07-228, Released December 31, 2007.

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 this allocation and interference study, it is believed that the proposed facility can operate without risk of interference to other stations.

Summary Study

TV INTERFERENCE and SPACING ANALYSIS PROGRAM

Date: 03-07-2008 Time: 19:11:19

Record Selected for Analysis

KPTW USERRECORD-02 CASPER WY US
Channel 06 ERP 0.62 kW HAAT 567. m RCAMSL 02501 m
Latitude 042-44-26 Longitude 0106-21-34
Status APP Zone 2 Border
Dir Antenna Make usr Model USRPAT02 Beam tilt N Ref Azimuth 0.
Last update Cutoff date Docket
Comments
Applicant

Cell Size for Service Analysis 2.0 km/side

Distance Increments for Longley-Rice Analysis 1.00 km

Facility meets maximum height/power limits

Azimuth (Deg)	ERP (kW)	HAAT (m)	28.0 dBu F(50,90) (km)
0.0	0.620	850.1	109.8
45.0	0.270	759.9	97.0
90.0	0.022	254.2	52.2
135.0	0.006	140.9	33.3
180.0	0.016	421.2	58.3
225.0	0.006	690.5	61.8
270.0	0.022	610.9	71.2
315.0	0.270	809.1	98.7

Evaluation toward Class A Stations

No Spacing violations or contour overlap to Class A stations

Class A Evaluation Complete

SPACING VIOLATION FOUND BETWEEN STATION

KPTW 06 CASPER WY USERRECORD02

and station

SHORT TO: KPTW 06 CASPER WY BPET 19960624KT
042-44-26 0106-21-34
Req. separation 273.6 Actual separation 0.0 Short 273.6 km

Proposed facility OK to FCC Monitoring Stations

Proposed facility OK toward West Virginia quite zone
Proposed facility OK toward Table Mountain
Proposed facility is beyond the Canadian coordination distance
Proposed facility is beyond the Mexican coordination distance
Proposed station is OK toward AM broadcast stations

Start of Interference Analysis

Channel	Proposed Station Call	City/State	ARN
06	KPTW	CASPER WY	USERRECORD02

Stations Potentially Affected by Proposed Station

Chan	Call	City/State	Dist(km)	Status	Application Ref. No.
%%%					

Study of this proposal found the following interference problem(s):

NONE.

Furthermore, it has been verified that the proposed facility will not reduce the population served by KPTW digital facility by more than 5%, compared to the DTV population listed in Appendix B.

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Analysis of Interference to Affected Station 1

Analysis of current record

Channel	Call	City/State	Application Ref. No.
06	KPTW	CASPER WY	USERRECORD-02

Stations Potentially Affecting This Station

Chan	Call	City/State	Dist(km)	Status	Application Ref. No.
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Total scenarios = 1

Result key: 1
Scenario 1 Affected station 1
Before Analysis

Results for: 6A WY CASPER USERRECORD02 APP

HAAT 567.0 m, ATV ERP 0.6 kW	POPULATION	AREA (sq km)
within Noise Limited Contour	70609	18462.9
not affected by terrain losses	70552	18002.8
lost to NTSC IX	0	0.0
lost to additional IX by ATV	0	0.0
lost to ATV IX only	0	0.0
lost to all IX	0	0.0

Potential Interfering Stations Included in above Scenario 1

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III. NIER 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.

$$S(\text{mW} / \text{cm}^2) = \frac{33.40981 \times \text{AdjERP}(\text{Watts})}{D^2}$$

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.

Ground level power densities have been calculated for locations extending from the base of the tower to a distance of 1000 meters. Values past this point are increasingly negligible.

"Worst case" power density levels produced by the proposed facility were calculated for an elevation of 2 meters above ground (55 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 0.45 at these angles. This value occurs at a depression angle of 45 degrees below the horizontal, as shown on the manufacturer's vertical plane pattern for the horizontally-polarized Kathrein K5234867 panel antenna proposed in this application. This relative field value yields a worst-case adjusted effective radiated power of 126 Watts at depression angles between 45 and 90 degrees below the horizontal. Assuming this worst-case effective radiated 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 1.4 $\mu\text{W}/\text{cm}^2$, which is 0.7% of 200 $\mu\text{W}/\text{cm}^2$ (the FCC maximum for uncontrolled environments at the Channel 6 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 applicants 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 non-ionizing radiation at this site is required in this application.

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 radiation in excess of FCC guidelines.

March 7, 2008

Erik C. Swanson

