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

BENJAMIN F. DAWSON III, PE
THOMAS M. ECKELS, PE
STEPHEN S. LOCKWOOD, PE
DAVID J. PINION, PE

PAUL W. LEONARD, PE
ERIK C. SWANSON, PE
THOMAS S. GORTON, PE
MICHAEL H. MEHIGAN, EIT

TELEPHONE (206) 783-9151
FACSIMILE (206) 789-9834
E-MAIL hatdaw@hatdaw.com

JAMES B. HATFIELD, PE
CONSULTANT

MAURY L. HATFIELD, PE
CONSULTANT
OAKHURST, NSW
AUSTRALIA

Engineering Statement
Digital Flash Cut Application for K31HK
Channel 31 at Rainier, OR
August 2009

This Engineering Statement has been prepared on behalf of Rural Oregon Wireless TV, Inc., licensee of TV translator station K31HK at Rainier, Oregon. This material has been prepared in connection with an application for digital flash cut.

I. 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 interference to any facilities with which contour overlap exists. This study was performed using the SunDTV program from V-Soft Communications and a 1 km grid spacing. The SunDTV program identically duplicates the FCC's OET-69 processing program.

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

Summary Study

Census data selected: 2000

Post DTV Transition Database Selected

TV INTERFERENCE and SPACING ANALYSIS PROGRAM

Date: 08-07-2009 Time: 17:30:17

Record Selected for Analysis

K31HK USERRECORD-07 RAINIER OR US
Channel 31 ERP 0.20 kW HAAT 219. m RCAMSL 00399 m STRINGENT MASK
Latitude 046-09-46 Longitude 0122-51-05
Status APP Zone 2 Border
Dir Antenna Make usr Model USRPAT07 Beam tilt N Ref Azimuth 240.
Last update Cutoff date Docket
Comments
Applicant

Cell Size for Service Analysis 1.0 km/side

Distance Increments for Longley-Rice Analysis 1.00 km

Not full service station

Facility meets maximum power limit

Contour Overlap to Proposed Station

Station
K59BX 31 GRAYS RIVER WA BDISTT20060328AGL causes

Contour overlap to Digital LPTV station
K31HK 31 RAINIER OR USERRECORD07
Required D/U ratio: 2.0

Contour Overlap Evaluation to Proposed Station Complete

LANDMOBILE SPACING VIOLATIONS FOUND

NONE

Proposed facility OK to FCC Monitoring Stations

Proposed facility OK toward West Virginia quiet zone

Proposed facility OK toward Table Mountain

Proposed facility is within the Canadian coordination distance
Distance to border = 234.5km

Proposed facility is beyond the Mexican coordination distance

Proposed station is OK toward AM broadcast stations

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Start of Interference Analysis

	Proposed Station		
Channel	Call	City/State	ARN
31	K31HK	RAINIER OR	USERRECORD07

Stations Potentially Affected by Proposed Station

Chan	Call	City/State	Dist(km)	Status	Application Ref. No.
17	K17GV	RAINIER OR	0.0	LIC	BLTT -20070209ABT
28	K28IH	RAINIER OR	0.0	LIC	BLTT -20070502ABX
30	KUSE-LP	SEATTLE WA	165.3	CP	BPTTL -20030221AAF
30	KPDX	VANCOUVER WA	71.7	CP MOD	BMPCDT -20080619AGD
30	KUNW-LD	YAKIMA WA	184.3	CP	BDISDTL -20080804AFC
31	KLSR-TV	EUGENE OR	241.1	LIC	BLCDT -20070104ADQ
31	K31CR-D	PRINEVILLE, ETC. OR	263.2	LIC	BLDTT -20081016AEI
31	K31AE	SUTHERLIN OR	310.7	LIC	BLTT -19970513JB
31	K31HZ	THE DALLES, ETC. OR	143.2	CP	BDFCDTT -20081022AAP
31	K31HZ	THE DALLES, ETC. OR	143.2	LIC	BLTT -20070813ADC
31	K31AK	ELLENSBURG, ETC. WA	208.1	LIC	BLTT -19880615IE
31	KONG	EVERETT WA	167.7	LIC	BLCDT -20060627ADG
31	KONG	EVERETT WA	167.7	APP	BPCDT -20080617AEE
31	K59BX	GRAYS RIVER WA	63.0	CP	BDISTT -20060328AGL
31	K59BX	GRAYS RIVER WA	63.0	CP	BDFCDTT -20090213AAK
31	K31AH	OMAK, ETC. WA	368.6	LIC	BLTTL -19841015IA
31	K28FT	WALLA WALLA WA	344.4	APP	BDISDTA -20090318ADP
32	K32IG-D	ELLENSBURG, ETC. WA	201.1	LIC	BLDTT -20090506ACO
32	KUNW-LD	YAKIMA WA	184.3	CP MOD	BMPDTL -20070625ADS
33	K33CJ	WASCO/HEPPNER OR	182.4	LIC	BLTTL -19980903JE
34	K34DC	ASTORIA OR	81.6	LIC	BLTT -19920505IJ
34	K40AM	HOOD RIVER OR	108.9	CP	BDISTT -20070815ABG
34	K40AM	HOOD RIVER, ETC. OR	108.6	APP	BSTA -20070815ABP
34	K34HK	LONGVIEW WA	8.0	APP	BSTA -20061109ADS
34	K34HK	LONGVIEW WA	7.8	LIC	BLTTL -20080509AAL
35	K35HU	GRAYS RIVER, ETC. OR	63.0	LIC	BLTT -20061018ABS
35	K35CR	TILLAMOOK-LINCOLN CI OR	126.6	LIC	BLTTL -19940829IB
38	K53EI	HOOD RIVER OR	108.9	CP	BDISTT -20070822ABB
38	K38CZ	LINCOLN CITY/NEWPORT OR	182.0	LIC	BLTT -19940131JG
38	KKEI-CA	PORTLAND OR	71.6	LIC	BLTTA -20070831ADB
38	K38KU	SWEET HOME OR	172.4	CP	BNPTTL -20000829ANO
38	K38GS	GRAYS RIVER, LEBAM WA	63.0	LIC	BLTT -20040412ACX
39	K39ES	HEPPNER, ETC. OR	182.4	LIC	BLTT -19980803JH
39	K25KS	THE DALLES OR	143.2	CP	BDISTT -20071120AET
39	DK39DM	ELLENSBURG WA	201.1	APP	BSTA -20090724AEE
39	DK39DM	ELLENSBURG WA	201.1	CP	BPTTL -20060127ARI
39	K39FU	YAKIMA WA	185.3	LIC	BLTTL -20040616AAS

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

NONE.

II. NIER Study

OET Bulletin 65 Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields (Edition 97-01) states in part that:

> When performing an evaluation for compliance with the FCC's RF guidelines all significant contributors to the ambient RF environment should be considered. . .For purposes of such consideration, significance can be taken to mean any transmitter producing more than 5% of the applicable exposure limit (in terms of power density or the square of the electric or magnetic field strength) at accessible locations.

As will be demonstrated below, the proposed operation will produce less than 5% of the applicable exposure limit for both controlled and uncontrolled environments. Thus, the proposed facility is categorically excluded from the requirement of further study. Therefore, pursuant to §1.1307(b)(3) of the Commission's Rules no calculations are required for the other FM and TV facilities in the vicinity, and precise calculations are made only with regard to the levels from this proposal.

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 (13 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 1X1KBBU broadband

antenna array proposed in this application. This relative field value yields a worst-case adjusted average effective radiated power of 8 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 1.6 $\mu W/cm^2$, which is 0.4% of 383 $\mu W/cm^2$ (the FCC maximum for uncontrolled environments at the Channel 31 frequency).

These calculations show that the worst-case 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.

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 radiation in excess of FCC guidelines.

August 19, 2009
Erik C. Swanson, P.E.