

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

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](mailto:hatdaw@hatdaw.com)

JAMES B. HATFIELD, PE  
CONSULTANT

MAURY L. HATFIELD, PE  
CONSULTANT  
OAKHURST, NSW  
AUSTRALIA

**Engineering Statement  
Digital Displacement Application for K44HM  
Channel 48 at Rainier, OR  
October 2009**

This Engineering Statement has been prepared on behalf of Rural Oregon Wireless TV, Inc. ("ROWT"), licensee of TV translator station K44HM at Rainier, Oregon. This material has been prepared in connection with an application for digital displacement.

K44HM presently operates on analog Channel 44. ROWT is in the process of converting its several translators at Rainier to digital operation, and has already secured digital flash cut construction permits for K17GV (BDFCDTT-20090821ACQ), K28IH (BDFCDTT-20090821ACP), and K31HK (BDFCDTT-20090821ACO). (A digital flash cut application for K41IP remains pending as BDFCDTL-20090630AFJ.)

An interference study for digital flash cut for ROWT's K44HM, however, indicated that prohibited interference would be caused to KATU-DT Ch43 and KNMT-DT Ch45, such that the digital ERP for K44HM would have to be reduced by approximately 6 dB (when compared to the other ROWT Rainier translators authorized for 340 watts ERP) in order to eliminate that interference. In order to maintain signal parity for its Rainier translators, which relay the signals of the Portland, Oregon TV stations into Rainier, ROWT respectfully requests displacement relief for digital operation of K44HM on Channel 48.

**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: 09-30-2009 Time: 18:00:33

Record Selected for Analysis

K44HM USERRECORD-01 RAINIER OR US  
Channel 48 ERP 0.34 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 USRPAT01 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

Azimuth (Deg)	ERP (kW)	HAAT (m)	51.0 dBu F(50,90) (km)
0.0	0.001	180.6	7.1
45.0	0.002	58.1	5.1
90.0	0.000	171.2	2.4
135.0	0.001	105.2	5.1
180.0	0.025	287.5	20.7
225.0	0.282	300.1	33.8
270.0	0.167	334.9	32.0
315.0	0.003	311.5	12.0

# Contour Overlap to Proposed Station

Station  
K47JJ 47 RAINIER OR BMPPT20070227AEF

Station inside contour of Digital LPTV station  
K44HM 48 RAINIER OR USERRECORD01

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

Channel	Proposed Station Call City/State	ARN
48	K44HM RAINIER OR	USERRECORD01

## Stations Potentially Affected by Proposed Station

Chan	Call	City/State	Dist(km)	Status	Application	Ref. No.
41	K41IP	RAINIER OR	0.0	LIC	BLTT	-20070209ABP
47	KUNP-LP	PORTLAND OR	71.9	LIC	BLTTTL	-20060809ABC
47	K47JJ	RAINIER OR	0.0	CP MOD	BMPPT	-20070227AEF
47	K47CD	ROCKAWAY OR	96.1	LIC	BLTT	-20030610AAF
47	KCST-LP	HOQUIAM WA	137.6	LIC	BLTTTL	-20090330AIY
47	K47LG-D	POINT PULLEY, ETC. WA	144.2	LIC	BLDTT	-20090529AMN
47	K57HB	SEATTLE WA	167.7	APP	BPTTL	-20020807AAR
47	NEW	YAKIMA WA	186.3	APP	BNPDTL	-20090825AMK
47	NEW	YAKIMA WA	183.6	APP	BNPDTL	-20090825AMW
47	NEW	YAKIMA WA	178.8	APP	BNPDTL	-20090825BIM
48	K48KC-D	COTTAGE GROVE OR	265.6	CP	BDISTT	-20051122AGZ
48	K48KC-D	COTTAGE GROVE OR	265.5	LIC	BLDTT	-20090330AAO
48	K48GC	FLORENCE OR	263.4	APP	BDFCDTL	-20090818AAC
48	K48GC	FLORENCE OR	263.4	LIC	BLTTA	-20020701AAI
48	K48BS	GLENDALE, ETC. OR	383.9	LIC	BLTT	-19880527ID
48	K48DZ	HERMISTON OR	274.9	LIC	BLTTTL	-19980814JD
48	K48DZ	HERMISTON OR	274.9	CP	BDFCDTL	-20090806AAD
48	K48BL	TERREBONNE-BEND, ETC OR	237.4	LIC	BLTTA	-20010711ABF
48	K48BY	QUINCY WA	265.6	LIC	BLTT	-19870929ID
48	KING-TV	SEATTLE WA	167.7	LIC	BLCDT	-19981026KE
48	KING-TV	SEATTLE WA	167.7	CP	BPCDT	-20080617AED
48	NEW	YAKIMA WA	178.8	APP	BNPDTL	-20090825BIN
49	KWVT-LP	SALEM OR	71.6	CP	BDISDTL	-20090421AAC
49	NEW	WARM SPRINGS OR	186.2	APP	BNPTTL	-20000831BPV
49	K49EV	CLARKSTON WA	69.6	APP	BDFCDTL	-20090825BVD
49	KCST-LD	HOQUIAM WA	92.9	CP	BDCCDTL	-20061026AEB
49	K49IX-D	PUYALLUP WA	121.0	CP	BDISTTL	-20051221AJD

49	K49IX-D	PUYALLUP WA	121.0	LIC	BLDTT	-20090610ACB
49	K49GF	YAKIMA, ETC. WA	185.3	LIC	BLTTL	-20040616AAK
50	K42IR	ASTORIA OR	81.6	CP	BNPTTL	-20000829ARO
50	K50CE	HOOD RIVER OR	108.6	LIC	BLTT	-19880603IK
50	K50CE	HOOD RIVER OR	108.9	CP	BPTT	-20070822AAV
50	K50IK	LINCOLN CITY OR	182.0	LIC	BLTT	-20040402ACM
50	K50GG	SALEM OR	132.9	LIC	BLTTL	-20020916ABF
51	K51FK	NEHALEM, ROCKAWAY OR	96.1	LIC	BLTTL	-19990528JF
51	KOXO-CA	NEWBERG OR	71.6	LIC	BLTTA	-20070831ADA
51	K51EH	THE DALLES OR	143.2	LIC	BLTTL	-19931014JG
51	KHPN-LP	WARRENTON OR	81.6	LIC	BLTTL	-20090324ADI
51	KHPN-LP	WARRENTON OR	73.1	APP	BSTA	-20090427ADA
51	KHPN-LP	WARRENTON OR	73.1	CP	BPTTL	-20090427ACZ
51	K51BD	ELLENSBURG WA	201.1	LIC	BLTT	-19900327JE
51	K51JG-D	YAKIMA-TOPPENISH WA	188.2	CP MOD	BMPTTL	-20080411AEG
52	KXPD-LP	EOLA OR	129.8	LIC	BLTTL	-20080122ACK
52	K52CH	MAUPIN OR	177.1	LIC	BLTT	-19980427JD
52	KXPD-LP	SALEM OR	129.8	APP	BSTA	-20061116ADO
52	K52ET	TILLAMOOK OR	126.6	LIC	BLTT	-19970124JG
56	K56CD	MAUPIN OR	177.1	LIC	BLTT	-19980427JB

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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.

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

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  $1.6 \mu\text{W}/\text{cm}^2$ , which is 0.4% of  $451 \mu\text{W}/\text{cm}^2$  (the FCC maximum for uncontrolled environments at the Channel 48 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.

October 1, 2009

Erik C. Swanson, P.E.

Hatfield & Dawson Consulting Engineers