

THOMAS M. ECKELS, PE
STEPHEN S. LOCKWOOD, PE
DAVID J. PINION, PE
ERIK C. SWANSON, PE

THOMAS S. GORTON, PE

JAMES B. HATFIELD, PE
BENJAMIN F. DAWSON III, PE
CONSULTANTS

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

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

**Engineering Statement
Displacement of K47CD-D
Channel 23 at Rockaway Beach, OR
March 2018**

This Engineering Statement has been prepared on behalf of Rural Oregon Wireless Television, Inc. ("ROWT"), licensee of digital TV translator station K47CD-D at Rockaway Beach, Oregon. This material has been prepared in connection with a displacement application.

I. Background

The translator currently operates on a channel above Channel 36, which will be the highest channel remaining for terrestrial television broadcasting per the results of the 2017 spectrum auction. Accordingly, ROWT is filing this displacement application during the Commission's Special Displacement Window, which is scheduled for April 10 to May 15, 2018.

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 objectionable interference to other stations.

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Study created: 2018.03.30 13:02:32

Study build station data: LMS TV 2018-03-28 (108)

Proposal: K47CD-D D23 LD LIC ROCKAWAY BEACH, OR
File number: ROCK23
Facility ID: 49334
Station data: User record
Record ID: 543
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	KMCB	D22	DT	APP	COOS BAY, OR	BLANK0000035789	261.6 km
Yes	KPXG-TV	D22	DT	LIC	SALEM, OR	BLCDT20110715ACN	96.0
No	KHPN-LD	D22	LD	CP	WARRENTON, OR	BLANK0000011217	60.4
No	K44JF-D	D23	LD	APP	CRESCENT CITY, CA	BLANK0000035560	420.0
Yes	K23GK-D	D23	LD	LIC	ASTORIA, OR	BLDTT20100723AFZ	60.4
Yes	K23GK-D	D23	LD	CP	ASTORIA, OR	BPDIT20120202ABH	60.4
No	K23ME-D	D23	LD	LIC	CAMAS VALLEY, OR	BLDTT20120510ABB	305.1
No	K23KD-D	D23	LD	LIC	COOS BAY, ETC., OR	BLDTT20110524AGT	261.6
No	KEVU-CD	D23	DC	CP	EUGENE, OR	BLANK0000035736	204.4
No	KEVU-CD	D23	DC	LIC	EUGENE, OR	BLDTA20101029ACH	204.4
No	KEZI	D23	LD	LIC	EUGENE, OR	BLCDT20120620AAA	238.1
No	K23KS-D	D23	LD	CP	GRANTS PASS, OR	BNPDTL20090825BGN	352.8
No	K23CU-D	D23	LD	LIC	PRINEVILLE, OR	BLDTL20091014AAG	275.7
No	K50KK-D	D23	LD	APP	ELLENSBURG, WA	BLANK0000031967	297.1
No	K23JU-D	D23	LD	LIC	PROSSER, WA	BLDTL20100504ALB	327.1
No	K23KI-D	D23	LD	LIC	Seattle, WA	BLANK0000008201	235.5
No	K23KI-D	D23	LD	CP	Seattle, WA	BLANK0000024400	230.6
No	KIRO-TV	D23	DT	CP	SEATTLE, WA	BLANK0000034847	242.2
No	NEW	D23	LD	APP	YAKIMA, WA	BNPDTL20090825ANG	277.6
Yes	KATU	D24	DT	CP	PORTLAND, OR	BLANK0000033626	97.1
No	KPWC-LD	D24	LD	LIC	TILLAMOOK, OR	BLANK0000007284	95.1
No	KUNS-TV	D24	DT	CP	BELLEVEUE, WA	BLANK0000034610	242.3
No	K24IT-D	D24	LD	LIC	HOQUIAM, WA	BLANK0000001697	62.0
No	K26DB-D	N26-	TX	LIC	ASTORIA, OR	BLTT19911016IG	60.4

No non-directional AM stations found within 0.8 km

No directional AM stations found within 3.2 km

Record parameters as studied:

Channel: D23
Mask: Simple
Latitude: 45 44 37.30 N (NAD83)
Longitude: 123 56 27.40 W
Height AMSL: 493.0 m
HAAT: 0.0 m
Peak ERP: 0.975 kW
Antenna: SCA-2X1KBBU (ID 20724) 160.0 deg
Elev Pattn: Generic
Elec Tilt: 1.00

49.7 dBu contour:

Azimuth	ERP	HAAT	Distance
0.0 deg	0.004 kW	313.8 m	14.1 km
45.0	0.002	261.1	11.6
90.0	0.016	313.6	21.1
135.0	0.593	339.9	41.3
180.0	0.721	489.8	47.5
225.0	0.039	493.0	29.9
270.0	0.002	493.0	16.3
315.0	0.002	486.1	14.0

Database HAAT does not agree with computed HAAT
Database HAAT: 0 m Computed HAAT: 399 m

Proposal 24.66 dBu contour does not cross Canadian border
Distance to Canadian border: 277.4 km

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Distance to Mexican border: 1563.6 km

Conditions at FCC monitoring station: Ferndale WA
Bearing: 15.8 degrees Distance: 371.9 km

Proposal is not within the West Virginia quiet zone area

Conditions at Table Mountain receiving zone:
Bearing: 105.6 degrees Distance: 1637.5 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. Technical Facility

Continued operation is proposed at the current transmitter site on Neahkahnie Mountain, using a 2-level Kathrein broadband antenna array (2X1KBBU), with an ERP of 975 watts.

IV. 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 element pattern factor times the array pattern factor.

D is the distance in meters from the center of radiation to the calculation point.

ROWT owns six TV translators operating from this transmitter site, four of which are being displaced into the contracted TV band. Calculations of the power density produced by these facilities in their final configuration are summarized in the following table:

Call	ERP Antenna Model	Relative Field	Height AGL	Calculated Max Exposure	Gen Pop FCC Limit	% of Limit
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K20HT-D	0.975 kW avg KAT 2X1KBBU	0.125	5 m	56.6 $\mu\text{W}/\text{cm}^2$	337.3 $\mu\text{W}/\text{cm}^2$	16.8%
K36GU-D	0.975 kW avg KAT 2X1KBBU	0.125	5 m	56.6 $\mu\text{W}/\text{cm}^2$	401.3 $\mu\text{W}/\text{cm}^2$	14.1%
K41GG-D to Ch15	0.975 kW avg KAT 2X1KBBU	0.125	5 m	56.6 $\mu\text{W}/\text{cm}^2$	317.3 $\mu\text{W}/\text{cm}^2$	17.8%
K44AV-D to Ch17	0.975 kW avg KAT 2X1KBBU	0.125	5 m	56.6 $\mu\text{W}/\text{cm}^2$	325.3 $\mu\text{W}/\text{cm}^2$	17.4%
K47CD-D to Ch23	0.975 kW avg KAT 2X1KBBU	0.125	5 m	56.6 $\mu\text{W}/\text{cm}^2$	349.3 $\mu\text{W}/\text{cm}^2$	16.2%
K51FK-D to Ch29	0.975 kW avg KAT 2X1KBBU	0.125	5 m	56.6 $\mu\text{W}/\text{cm}^2$	373.3 $\mu\text{W}/\text{cm}^2$	15.2%

(For TV translators, the relative field value indicated is the maximum value which occurs at 45 degrees or more below the horizontal, based on the manufacturer's vertical plane pattern. The resulting adjusted ERP value is assumed to be radiated straight down to a point 2 meters above ground level at the base of the tower.)

These calculations show that the maximum calculated power density produced at two meters above ground level by the proposed digital flash cut facilities at this site (were their maxima to coincide) is 97.5% of the FCC standard for uncontrolled environments.

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.

March 30, 2018

Erik C. Swanson, P.E.