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**Engineering Statement
Digital Flash Cut Application for K50FX
Channel 50 at Milton-Freewater, OR
May 2009**

This Engineering Statement has been prepared on behalf of Oregon Public Broadcasting, licensee of TV translator station K50FX at Milton-Freewater, 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

1990 Census data selected
TV INTERFERENCE and SPACING ANALYSIS PROGRAM

Date: 05-08-2009 Time: 17:17:15

Record Selected for Analysis

K50FX USERRECORD-02 MILTON-FREEWATER OR US
Channel 50 ERP 1.2 kW HAAT 217. m RCAMSL 01034 m STRINGENT MASK
Latitude 045-49-54 Longitude 0118-15-38
Status APP Zone 2 Border
Dir Antenna Make usr Model USRPAT02 Beam tilt N Ref Azimuth 320.
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	1.094	442.1	46.6
45.0	0.301	73.0	19.3
90.0	0.010	78.3	8.5
135.0	0.004	33.0	4.4
180.0	0.005	33.0	4.7
225.0	0.168	134.0	22.5
270.0	1.200	413.8	46.4
315.0	0.947	530.1	48.6

Contour Overlap to Proposed Station

Station
K50CI 50 LA GRANDE OR BLTT19891120JI causes

Contour overlap to Digital LPTV station
K50FX 50 MILTON-FREEWATER OR USERRECORD02
Required D/U ratio: 2.0

Station
K51DF 51 MILTON, ETC. OR BLTT19891114JR

Station inside contour of Digital LPTV station
K50FX 50 MILTON-FREEWATER OR USERRECORD02

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 quite zone

Proposed facility OK toward Table Mountain

Proposed facility is within the Canadian coordination distance
Distance to border = 352.2km

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
50	K50FX	MILTON-FREEWATER OR	USERRECORD02

Stations Potentially Affected by Proposed Station

Chan	Call	City/State	Dist(km)	Status	Application	Ref. No.
35	K35BW	LEWISTON ID	116.1	LIC	BLTT	-19890203IC
35	KUID-TV	MOSCOW ID	137.0	APP	BPET	-20041019ABU
35	K35GA	LA GRANDE OR	71.1	LIC	BLTT	-20011212AAE
35	K35FO	MILTON-FREEWATER OR	2.2	LIC	BLTT	-20020724AAD
36	K36DP	PENDLETON, ETC. OR	105.9	LIC	BLTT	-19950512IH
36	K36HV	WALLOWA OR	83.1	LIC	BLTT	-20080902ABL
36	K36EW	COLLEGE PARK WA	24.8	LIC	BLTTTL	-19991018AAB
36	KBWU-LD	RICHLAND, ET AL WA	73.7	APP	BSTA	-20070516AAW
42	K42AI	BAKER OR	141.1	LIC	BLTT	-19820511IC
42	KVBI-LP	CLARKSTON WA	116.1	APP	BPTTA	-20060324AAQ
42	KVBI-LP	CLARKSTON WA	116.1	LIC	BLTTTL	-20010807AAP
43	K43CI	GRANGEVILLE, ETC. ID	141.2	LIC	BLTT	-19890705IJ
46	K46HX	GRANGEVILLE ID	141.2	LIC	BLTT	-20070103ACZ
46	K46AM	BAKER, ETC. OR	141.1	LIC	BLTT	-19810121LB
46	KPMT-LP	PULLMAN WA	129.0	LIC	BLTTTL	-20070220ABL
46	K46FL	WALLA WALLA WA	0.0	LIC	BLTT	-20020211AAA
47	K47BW	LEWISTON, ETC. ID	116.1	LIC	BLTTTL	-19880523IH
47	KWWO-LP	WALLA WALLA WA	9.2	LIC	BLTTTL	-19961015JF
48	K48DH	GRANGEVILLE, ETC. ID	141.2	LIC	BLTT	-19891220IA
48	K48DZ	HERMISTON OR	81.7	LIC	BLTTTL	-19980814JD
49	K49EV	CLARKSTON WA	116.1	LIC	BLTTTL	-20010501AAG
49	KRLB-LP	RICHLAND, ETC WA	93.4	CP	BDFCDTL	-20080922ADM
49	KRLB-LP	RICHLAND, ETC. WA	93.4	LIC	BLTTTL	-19890920IK
49	K49GF	YAKIMA, ETC. WA	188.8	LIC	BLTTTL	-20040616AAK
50	K50GL	BONNERS FERRY ID	343.9	CP	BDFCDTT	-20070821ABD
50	K50GL	BONNERS FERRY, ETC. ID	343.9	LIC	BLTT	-20040113ACC
50	K50DM	COEUR D'ALENE ID	241.2	LIC	BLTT	-19940525JK
50	K50KM-D	GLENN'S FERRY ID	396.9	CP	BDCCDTT	-20061027ACF
50	KSVT-LP	KETCHUM ID	390.1	APP	BMJPTTL	-20000823AAX
50	K50LB	POLSON MT	374.7	CP	BDFCDTT	-20090115BJX
50	K50LB	POLSON MT	374.7	LIC	BLTT	-20081217AAT
50	K50FD	BAKER OR	141.1	LIC	BLTT	-19970421JE
50	KUBN-LP	BEND OR	280.2	APP	BDFCDTL	-20060331BDR
50	K50CE	HOOD RIVER OR	257.4	CP	BPTT	-20070822AAV
50	K50CE	HOOD RIVER OR	257.5	LIC	BLTT	-19880603IK
50	K50CI	LA GRANDE OR	51.8	LIC	BLTT	-19891120JI
50	KUBN-LP	PRINEVILLE-REDMOND OR	280.2	LIC	BLTT	-19951019IC
50	K50GG	SALEM OR	392.3	LIC	BLTTTL	-20020916ABF
50	K50GG	SALEM OR	392.3	CP	BDFCDTL	-20060331BDH
50	KUNS-TV	BELLEVUE WA	338.4	LIC	BLCDT	-20060707ACF
50	KUNS-TV	BELLEVUE WA	370.4	APP	BPCDT	-20080620AGX
50	K50KK-D	ELLENSBURG WA	204.3	CP	BDCCDTT	-20061030AHL

50	K50BO	QUINCY WA	203.0	LIC	BLTT	-19870929IC
51	K51HY	LEWISTON ID	116.1	APP	BMPTT	-20041213AAS
51	K51HY	LEWISTON ID	116.1	CP	BDFCDTT	-20081022AAG
51	K51HY	LEWISTON ID	116.1	LIC	BLTT	-20050810ABK
51	K53EJ	BAKER OR	142.0	CP	BDISDTL	-20060330AGB
51	K51DF	MILTON, ETC. OR	2.2	LIC	BLTT	-19891114JR
51	K51BD	ELLENSBURG WA	204.6	LIC	BLTT	-19900327JE
51	K51BD	ELLENSBURG WA	198.4	CP	BMJPTT	-20000831CMJ
51	NEW	MEDICAL LAKE WA	198.0	LIC	BPRM	-20040510ACI
51	K58DL	YAKIMA-TOPPENISH WA	186.0	CP MOD	BMPTTL	-20080411AEG
52	K52DT	LA GRANDE OR	51.8	LIC	BLTT	-19920304IJ
53	K53GN	LEWISTON ID	116.1	LIC	BLTT	-20020131AAC
53	K53EJ	BAKER OR	141.1	LIC	BLTTL	-19920729IB
53	K53EK	MILTON-FREEWATER OR	0.0	LIC	BLTT	-19931101IE
54	K26FE	LA GRANDE OR	51.8	LIC	BLTT	-19890131IK
54	K54DU	RICHLAND WA	93.4	LIC	BLTTL	-19981021JD
58	K58AY	LA GRANDE OR	51.8	LIC	BLTT	-19800204IG

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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.

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

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.

Power density levels produced by the proposed facility were calculated for an elevation of 2 meters above ground (4 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 0.095 at these angles, based on the manufacturer's vertical plane pattern for the horizontally-polarized 4-level Kathrein broadband panel antenna array proposed in this application. This relative field value yields a worst-case adjusted average effective radiated power of 10.8 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 $22.6 \mu\text{W}/\text{cm}^2$, which is 4.9% of $459 \mu\text{W}/\text{cm}^2$ (the FCC maximum for uncontrolled environments at the Channel 50 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.

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.

May 11, 2009

Erik C. Swanson, P.E.