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**Engineering Statement
Minor Modification Application for KOPB-DT
Channel 10 at Portland, Oregon
May 2010**

This Engineering Statement has been prepared on behalf of Oregon Public Broadcasting ("OPB"), licensee of digital television station KOPB-DT at Portland, Oregon. This material has been prepared in connection with a minor modification application for the KOPB-DT post-transition facilities on digital Channel 10.

The following table lists the KOPB-DT post-transition facilities approved in Appendix B of the DTV Seventh Report and Order¹, as well as OPB's requested post-transition facilities as proposed herein:

	DTV Table Appendix B	Proposed Form 340
Channel	10	10
ERP	32 kW	77 kW
HAAT	509 meters	524 meters
Antenna	ID #75002 (FCC-created directional)	Dielectric TW-9B10-R omnidirectional
Coordinates	45-31-21 122-44-45	45-31-21 122-44-45

¹ See *Advanced Television Systems and their Impact Upon the Existing Television Broadcast Service*, MB Docket No. 87-268, Seventh Report and Order and Eighth Further Notice of Proposed Rulemaking, FCC 07-138, Released August 6, 2007.

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 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 **1 km grid spacing and a 0.1 km terrain increment**. 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

Percent allowed new interference: 0.500
Percent allowed new interference to Class A: 0.500
Census data selected 2000
Post Transition Data Base Selected ./data_files/pt_tvdb.sff

TV INTERFERENCE and SPACING ANALYSIS PROGRAM

Date: 04-30-2010 Time: 17:49:33

Record Selected for Analysis

KOPB-TV USERRECORD-01 PORTLAND OR US
Channel 10 ERP 77. kW HAAT 525. m RCAMSL 00615 m
Latitude 045-31-21 Longitude 0122-44-45
Status APP Zone 2 Border
Dir Antenna Make usr Model USRPAT01 Beam tilt N Ref Azimuth 0.
Last update Cutoff date Docket
Comments
Applicant

Cell Size for Service Analysis 1.0 km/side

Distance Increments for Longley-Rice Analysis 0.10 km

Facility does not meet maximum height/power limits
Channel 10 ERP = 77.00 HAAT = 525.

Azimuth (Deg)	ERP (kW)	HAAT (m)	36.0 dBu F(50,90) (km)
0.0	77.000	543.2	129.2
45.0	77.000	564.9	131.1
90.0	77.000	540.5	128.9
135.0	77.000	505.0	126.3
180.0	77.000	531.8	128.2
225.0	77.000	511.6	126.7
270.0	77.000	549.1	129.7
315.0	77.000	456.9	123.3

Evaluation toward Class A Stations

No Spacing violations or contour overlap to Class A stations

Class A Evaluation Complete

SPACING VIOLATION FOUND BETWEEN STATION

KOPB-TV 10 PORTLAND OR USERRECORD01

and station

SHORT TO: KOPB-TV 10 PORTLAND OR DTVPLN DTVP0275
45 -31-21 122 -44-45

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 quiet zone

Proposed facility OK toward Table Mountain

Proposed facility is within the Canadian coordination distance
Distance to border = 305.9km

Proposed facility is beyond the Mexican coordination distance

Proposed station is 1.31km from AM station
PORTLAND OR KUPL Status: L Antenna: DAN

Start of Interference Analysis

Channel	Proposed Station Call	City/State	ARN
10	KOPB-TV	PORTLAND OR	USERRECORD01

Stations Potentially Affected by Proposed Station

Chan	Call	City/State	Dist(km)	Status	Application	Ref. No.
09	KEZI	EUGENE OR	157.6	LIC	BLCDT	-20090225ADH
09	KEZI	EUGENE OR	157.6	PLN	DTVPLN	-DTVP0207
10	KTVL	MEDFORD OR	382.5	CP MOD	BMPCDT	-20081112AIS
10	KTVL	MEDFORD OR	382.4	PLN	DTVPLN	-DTVP0274
11	KOAB-TV	BEND OR	195.4	LIC	BLEDT	-20060823AAP
11	KOAB-TV	BEND OR	195.4	PLN	DTVPLN	-DTVP0328

%%%

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

NONE.

II. 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.

Power density levels produced by the proposed facility were calculated for an elevation of 2 meters above ground (271 meters below the antenna radiation center). The worst case power density levels occur at depression angles between 40 and 90 degrees below the horizontal. The calculations in this report assume a worst-case relative field value of 0.053 at these angles. This value occurs at a depression angle of 43 degrees below the horizontal, as shown on the manufacturer's vertical plane pattern for the horizontally-polarized Dielectric TW-9B10-R antenna proposed in this application. This relative field value yields a worst-case adjusted effective radiated power of 216 Watts at depression angles between 40 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 $0.1 \mu\text{W}/\text{cm}^2$, which is 0.05% of $200 \mu\text{W}/\text{cm}^2$ (the FCC maximum for uncontrolled environments at the Channel 10 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.

Public access to the transmitter site is restricted. 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 5, 2010

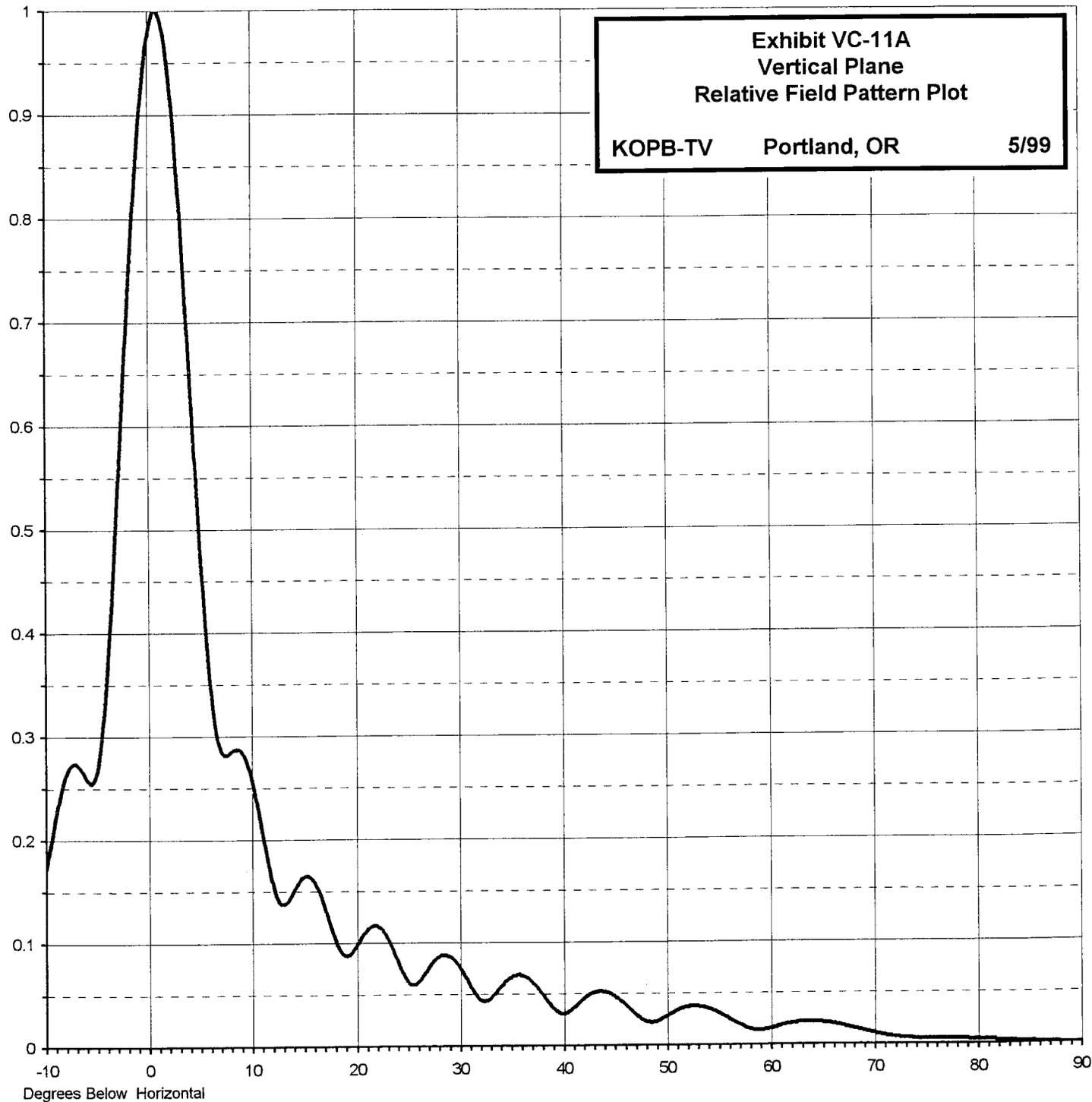
Erik C. Swanson



Proposal Number **DCA-8001**
Date **27-Jul-98**
Call Letters **KOPB** Channel **10**
Location **Portland, OR**
Customer **Oregon Public Broadcasting**
Antenna Type **TW-9B10-R**

ELEVATION PATTERN

RMS Gain at Main Lobe	9.00 (9.54 dB)	Beam Tilt	0.75 deg
RMS Gain at Horizontal	8.60 (9.34 dB)	Frequency	195.00 MHz
Calculated / Measured	Calculated	Drawing #	19W09007-90





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Exhibit VC-11B
Vertical Plane
Relative Field Pattern Plot

KOPB-TV **Portland, OR** **5/99**

ELEVATION PATTERN

Elevation Pattern Drawing #: **19W09007-90**

Angle	Field										
-10.0	0.173	2.4	0.900	10.6	0.232	30.5	0.068	51.0	0.034	71.5	0.008
-9.5	0.200	2.6	0.875	10.8	0.221	31.0	0.059	51.5	0.036	72.0	0.007
-9.0	0.226	2.8	0.847	11.0	0.210	31.5	0.051	52.0	0.037	72.5	0.006
-8.5	0.249	3.0	0.818	11.5	0.183	32.0	0.045	52.5	0.038	73.0	0.006
-8.0	0.265	3.2	0.787	12.0	0.159	32.5	0.044	53.0	0.038	73.5	0.006
-7.5	0.273	3.4	0.754	12.5	0.143	33.0	0.046	53.5	0.037	74.0	0.005
-7.0	0.273	3.6	0.721	13.0	0.138	33.5	0.051	54.0	0.035	74.5	0.005
-6.5	0.267	3.8	0.686	13.5	0.141	34.0	0.057	54.5	0.033	75.0	0.005
-6.0	0.258	4.0	0.651	14.0	0.150	34.5	0.063	55.0	0.031	75.5	0.005
-5.5	0.256	4.2	0.615	14.5	0.159	35.0	0.066	55.5	0.028	76.0	0.005
-5.0	0.270	4.4	0.580	15.0	0.164	35.5	0.068	56.0	0.025	76.5	0.005
-4.5	0.308	4.6	0.545	15.5	0.165	36.0	0.068	56.5	0.022	77.0	0.005
-4.0	0.369	4.8	0.510	16.0	0.160	36.5	0.066	57.0	0.020	77.5	0.005
-3.5	0.448	5.0	0.477	16.5	0.150	37.0	0.062	57.5	0.017	78.0	0.005
-3.0	0.536	5.2	0.445	17.0	0.136	37.5	0.057	58.0	0.015	78.5	0.005
-2.8	0.573	5.4	0.416	17.5	0.120	38.0	0.050	58.5	0.014	79.0	0.005
-2.6	0.610	5.6	0.388	18.0	0.105	38.5	0.043	59.0	0.014	79.5	0.004
-2.4	0.647	5.8	0.364	18.5	0.093	39.0	0.037	59.5	0.015	80.0	0.004
-2.2	0.684	6.0	0.343	19.0	0.088	39.5	0.033	60.0	0.016	80.5	0.004
-2.0	0.719	6.2	0.324	19.5	0.090	40.0	0.031	60.5	0.017	81.0	0.004
-1.8	0.754	6.4	0.310	20.0	0.097	40.5	0.033	61.0	0.018	81.5	0.004
-1.6	0.787	6.6	0.298	20.5	0.106	41.0	0.037	61.5	0.020	82.0	0.003
-1.4	0.819	6.8	0.291	21.0	0.112	41.5	0.041	62.0	0.021	82.5	0.003
-1.2	0.848	7.0	0.285	21.5	0.116	42.0	0.046	62.5	0.021	83.0	0.003
-1.0	0.876	7.2	0.283	22.0	0.117	42.5	0.049	63.0	0.022	83.5	0.003
-0.8	0.901	7.4	0.282	22.5	0.113	43.0	0.051	63.5	0.022	84.0	0.002
-0.6	0.924	7.6	0.282	23.0	0.105	43.5	0.053	64.0	0.022	84.5	0.002
-0.4	0.944	7.8	0.284	23.5	0.095	44.0	0.052	64.5	0.022	85.0	0.002
-0.2	0.961	8.0	0.285	24.0	0.083	44.5	0.051	65.0	0.021	85.5	0.002
0.0	0.975	8.2	0.287	24.5	0.072	45.0	0.048	65.5	0.021	86.0	0.001
0.2	0.986	8.4	0.287	25.0	0.063	45.5	0.044	66.0	0.020	86.5	0.001
0.4	0.994	8.6	0.287	25.5	0.060	46.0	0.040	66.5	0.019	87.0	0.001
0.6	0.999	8.8	0.287	26.0	0.062	46.5	0.035	67.0	0.018	87.5	0.001
0.8	1.000	9.0	0.284	26.5	0.068	47.0	0.030	67.5	0.017	88.0	0.000
1.0	0.998	9.2	0.281	27.0	0.075	47.5	0.026	68.0	0.015	88.5	0.000
1.2	0.993	9.4	0.277	27.5	0.082	48.0	0.023	68.5	0.014	89.0	0.000
1.4	0.985	9.6	0.271	28.0	0.086	48.5	0.022	69.0	0.013	89.5	0.000
1.6	0.974	9.8	0.268	28.5	0.088	49.0	0.023	69.5	0.012	90.0	0.000
1.8	0.959	10.0	0.260	29.0	0.087	49.5	0.026	70.0	0.011		
2.0	0.942	10.2	0.252	29.5	0.083	50.0	0.028	70.5	0.010		
2.2	0.922	10.4	0.242	30.0	0.076	50.5	0.031	71.0	0.009		