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

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

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

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

MAURY L. HATFIELD, PE
CONSULTANT
BOX 1326
ALICE SPRINGS, NT 5950
AUSTRALIA

Engineering Statement
Minor Modification Application for KOAC-DT
Post-Transition Channel 7 at Corvallis, Oregon
February 2008

This Engineering Statement has been prepared on behalf of Oregon Public Broadcasting ("OPB"), licensee of digital television station KOAC-DT at Corvallis, Oregon. KOAC-DT presently operates on digital Channel 39, paired with analog Channel 7. This material has been prepared in connection with a minor modification application for the KOAC-DT post-transition facilities on digital Channel 7.

The following table lists the KOAC-DT post-transition facilities approved in Appendix B of the DTV Seventh Report and Order[1], as well as OPB's requested post-transition facilities as proposed herein:

	DTV Table Appendix B	**Proposed Form 340**
Channel	7	7
ERP	10.1 kW	18.1 kW
HAAT	375 meters	357 meters
Antenna	ID #74546 (FCC-created directional)	Dielectric TW-9B7-R omnidirectional
Coordinates	44-38-25 123-16-25	44-38-25 123-16-25

[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. Waiver Request For Minor Expansion

In accordance with the policy announced in paragraphs 151-152 of the *Third DTV Periodic Review R&O*,[2] OPB respectfully requests a waiver to allow a minor expansion of the KOAC-DT Appendix B facility. The proposed facility satisfies the waiver requirements that the minor expansion:

(1) Would allow the station will use its analog antenna or a new antenna to avoid a significant reduction in post-transition service from its analog service area;

(2) Would be no more than five miles larger in any direction than its authorized service area, as defined by the post-transition DTV Table Appendix B; and

(3) Would not cause impermissible interference, i.e., more than 0.5 percent new interference, to other stations.

The waiver will allow KOAC-DT to operate post-transition utilizing the existing KOAC-TV analog Channel 7 antenna already installed on the tower. Grant of the waiver will provide benefits for the successful completion of the transition by reducing the demands on equipment suppliers and installation crews during a critical time as the transition date nears.

The Appendix B facility contour has been compared to that of the proposed facility, and we have determined that the greatest extension of the service area is 7.6 kilometers (4.7 miles).

Results of an interference analysis to other stations are discussed below.

II. 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. The SunDTV program identically duplicates the FCC's OET-69 processing program.

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[2] *Third Periodic Review of the Commission's Rules and Policies Affecting the Conversion to Digital Television*, MB Docket No. 07-91, Notice of Proposed Rulemaking, FCC 07-228, Released December 31, 2007.

The results of this study indicate that the proposed facility is predicted to cause zero additional interference to any of the listed stations. Specifically, the results indicate:

Post-transition DTV facility	**Interference Discussion**
KGW(TV) Ch8 Portland, OR	The proposed KOAC-DT facility causes no additional interference.

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

III. 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.

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

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.

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 (73 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 43.5 degrees below the horizontal, as shown on the manufacturer's vertical plane pattern for the horizontally-polarized Dielectric TW-9B7-R antenna proposed in this application. This relative field value yields a worst-case adjusted effective radiated power of 51 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 0.3 μW/cm², which is 0.15% of 200 μW/cm² (the FCC maximum for uncontrolled environments at the Channel 7 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.

February 12, 2008

Erik C. Swanson

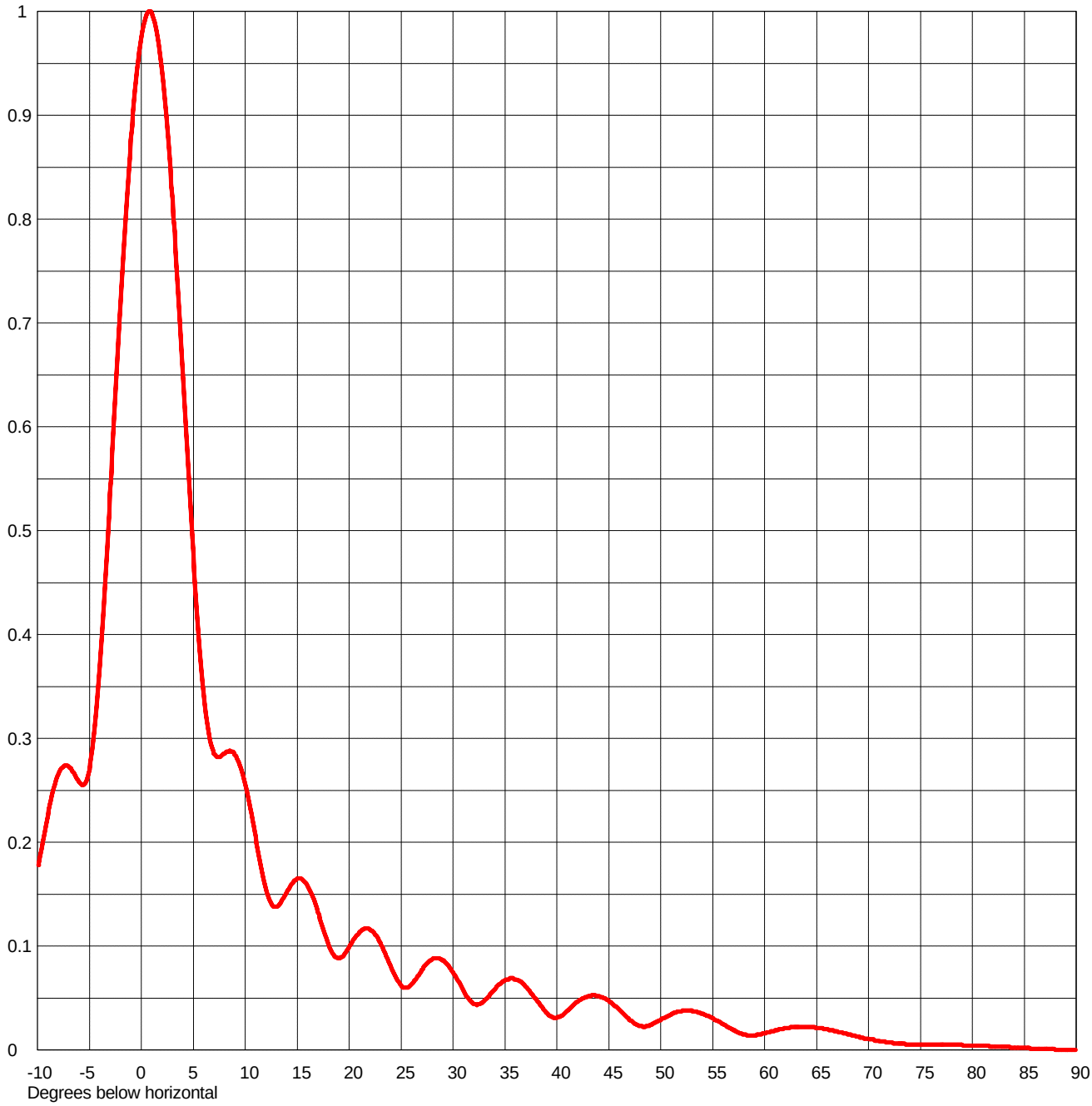
Exhibit No.

Dielectric

Date	**12 Feb 2008**		
Call Letters	**KOAC**	Channel	**7**
Location	**Corvallis, OR**		
Customer	**Oregon Public Broadcasting**		
Antenna Type	**TW-9B7**		

ELEVATION PATTERN

RMS Gain at Main Lobe	**9.0 (9.54 dB)**	Beam Tilt	**0.75 Degrees**
RMS Gain at Horizontal	**8.6 (9.34 dB)**	Frequency	**177.00 MHz**
Calculated / Measured	**Calculated**	Drawing #	**19W090075-90**



Remarks:

Exhibit No.

Dielectric

Date **12 Feb 2008**
Call Letters **KOAC** Channel **7**
Location **Corvallis, OR**
Customer **Oregon Public Broadcasting**
Antenna Type **TW-9B7**

TABULATION OF ELEVATION PATTERN

Elevation Pattern Drawing # **19W090075-90**

Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field
-10.0	0.173	2.4	0.900	10.6	0.227	30.5	0.066	51.0	0.034	71.5	0.008
-9.5	0.200	2.6	0.875	10.8	0.216	31.0	0.057	51.5	0.036	72.0	0.007
-9.0	0.226	2.8	0.847	11.0	0.205	31.5	0.050	52.0	0.037	72.5	0.006
-8.5	0.249	3.0	0.818	11.5	0.178	32.0	0.044	52.5	0.038	73.0	0.006
-8.0	0.265	3.2	0.787	12.0	0.155	32.5	0.044	53.0	0.038	73.5	0.006
-7.5	0.273	3.4	0.754	12.5	0.141	33.0	0.047	53.5	0.037	74.0	0.005
-7.0	0.273	3.6	0.721	13.0	0.138	33.5	0.052	54.0	0.035	74.5	0.005
-6.5	0.267	3.8	0.686	13.5	0.143	34.0	0.058	54.5	0.033	75.0	0.005
-6.0	0.258	4.0	0.651	14.0	0.152	34.5	0.063	55.0	0.031	75.5	0.005
-5.5	0.256	4.2	0.615	14.5	0.160	35.0	0.067	55.5	0.028	76.0	0.005
-5.0	0.270	4.4	0.580	15.0	0.165	35.5	0.069	56.0	0.025	76.5	0.005
-4.5	0.308	4.6	0.545	15.5	0.164	36.0	0.068	56.5	0.022	77.0	0.005
-4.0	0.369	4.8	0.510	16.0	0.158	36.5	0.066	57.0	0.019	77.5	0.005
-3.5	0.448	5.0	0.477	16.5	0.147	37.0	0.061	57.5	0.017	78.0	0.005
-3.0	0.536	5.2	0.445	17.0	0.133	37.5	0.055	58.0	0.015	78.5	0.005
-2.8	0.573	5.4	0.416	17.5	0.117	38.0	0.049	58.5	0.014	79.0	0.005
-2.6	0.610	5.6	0.388	18.0	0.102	38.5	0.042	59.0	0.014	79.5	0.004
-2.4	0.647	5.8	0.364	18.5	0.092	39.0	0.036	59.5	0.015	80.0	0.004
-2.2	0.684	6.0	0.343	19.0	0.088	39.5	0.032	60.0	0.016	80.5	0.004
-2.0	0.719	6.2	0.324	19.5	0.091	40.0	0.031	60.5	0.017	81.0	0.004
-1.8	0.754	6.4	0.310	20.0	0.099	40.5	0.033	61.0	0.019	81.5	0.004
-1.6	0.787	6.6	0.298	20.5	0.107	41.0	0.038	61.5	0.020	82.0	0.003
-1.4	0.819	6.8	0.291	21.0	0.114	41.5	0.042	62.0	0.021	82.5	0.003
-1.2	0.848	7.0	0.285	21.5	0.117	42.0	0.046	62.5	0.022	83.0	0.003
-1.0	0.876	7.2	0.283	22.0	0.116	42.5	0.050	63.0	0.022	83.5	0.003
-0.8	0.901	7.4	0.282	22.5	0.111	43.0	0.052	63.5	0.022	84.0	0.002
-0.6	0.924	7.6	0.282	23.0	0.103	43.5	0.053	64.0	0.022	84.5	0.002
-0.4	0.944	7.8	0.284	23.5	0.093	44.0	0.052	64.5	0.022	85.0	0.002
-0.2	0.961	8.0	0.285	24.0	0.081	44.5	0.050	65.0	0.021	85.5	0.002
0.0	0.975	8.2	0.287	24.5	0.070	45.0	0.047	65.5	0.021	86.0	0.001
0.2	0.986	8.4	0.287	25.0	0.062	45.5	0.043	66.0	0.020	86.5	0.001
0.4	0.994	8.6	0.287	25.5	0.060	46.0	0.039	66.5	0.019	87.0	0.001
0.6	0.999	8.8	0.287	26.0	0.063	46.5	0.034	67.0	0.018	87.5	0.001
0.8	1.000	9.0	0.284	26.5	0.069	47.0	0.029	67.5	0.017	88.0	0.000
1.0	0.998	9.2	0.281	27.0	0.077	47.5	0.025	68.0	0.015	88.5	0.000
1.2	0.993	9.4	0.277	27.5	0.083	48.0	0.023	68.5	0.014	89.0	0.000
1.4	0.985	9.6	0.271	28.0	0.087	48.5	0.022	69.0	0.013	89.5	0.000
1.6	0.974	9.8	0.264	28.5	0.088	49.0	0.024	69.5	0.012	90.0	0.000
1.8	0.959	10.0	0.256	29.0	0.086	49.5	0.026	70.0	0.011		
2.0	0.942	10.2	0.247	29.5	0.082	50.0	0.029	70.5	0.010		
2.2	0.922	10.4	0.237	30.0	0.075	50.5	0.032	71.0	0.009		

Remarks: