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**Engineering Statement
Amendment to Minor Modification Application for KOPB-TV
Channel 10 at Portland, Oregon
May 2012**

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

The following table lists the KOPB-TV 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, as amended
Channel	10	10
ERP	32 kW	46 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.

In application BPEDT-20100510ASK as originally filed, OPB requested operation with an omnidirectional ERP of 77 kW, accompanied by a waiver request to operate with an ERP value greater than that which would be permitted by routine application of the table in §73.622(f)(7) of the Commission's Rules.

OPB will shortly take delivery of a new transmitter which will allow KOPB-TV to increase power beyond the licensed 32.4 kW, and wishes to implement a power increase promptly. BPEDT-20100510ASK has been pending two years, and there is no indication when the Commission will take action on the waiver request. By this amendment, therefore, OPB amends BPEDT-20100510ASK to request operation at the maximum ERP permitted by §73.622(f)(7) of the Commission's Rules. Linear interpolation of the table allows for a Channel 10 digital ERP of 46 kW at 524 meters HAAT.

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.

II. 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.

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 129 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 $0.06 \mu\text{W}/\text{cm}^2$, which is 0.03% 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 RF exposure 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 exposure in excess of FCC guidelines.

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