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**Engineering Statement
Engineering STA for K24FH-D
Glide, OR
February 2020**

I. Background

This Engineering Statement has been prepared on behalf of Oregon Public Broadcasting ("OPB"), licensee of digital TV translator station K24FH-D. This material has been prepared in connection with an application for engineering STA, to operate with a single Kathrein broadband UHF panel at 5 meters above ground level, with 20 watts ERP.

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.

Power density levels produced by the proposed facility were calculated for an elevation of 2 meters above ground, using the manufacturer's vertical plane radiation pattern for the Kathrein broadband panel antenna used. The highest calculated power density from the proposed antenna alone occurs at a point 2 meters from the base of the antenna support structure. At this point the power

density from the proposed facility is calculated to be $3.4 \mu\text{W}/\text{cm}^2$, which is 1% of $353.3 \mu\text{W}/\text{cm}^2$ (the FCC maximum for uncontrolled environments at the Channel 24 frequency).

These calculations show that the maximum calculated power density produced at two meters above ground level by the proposed operation of the K24FH-D STA facility 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 applicant's 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.

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.

February 4, 2020

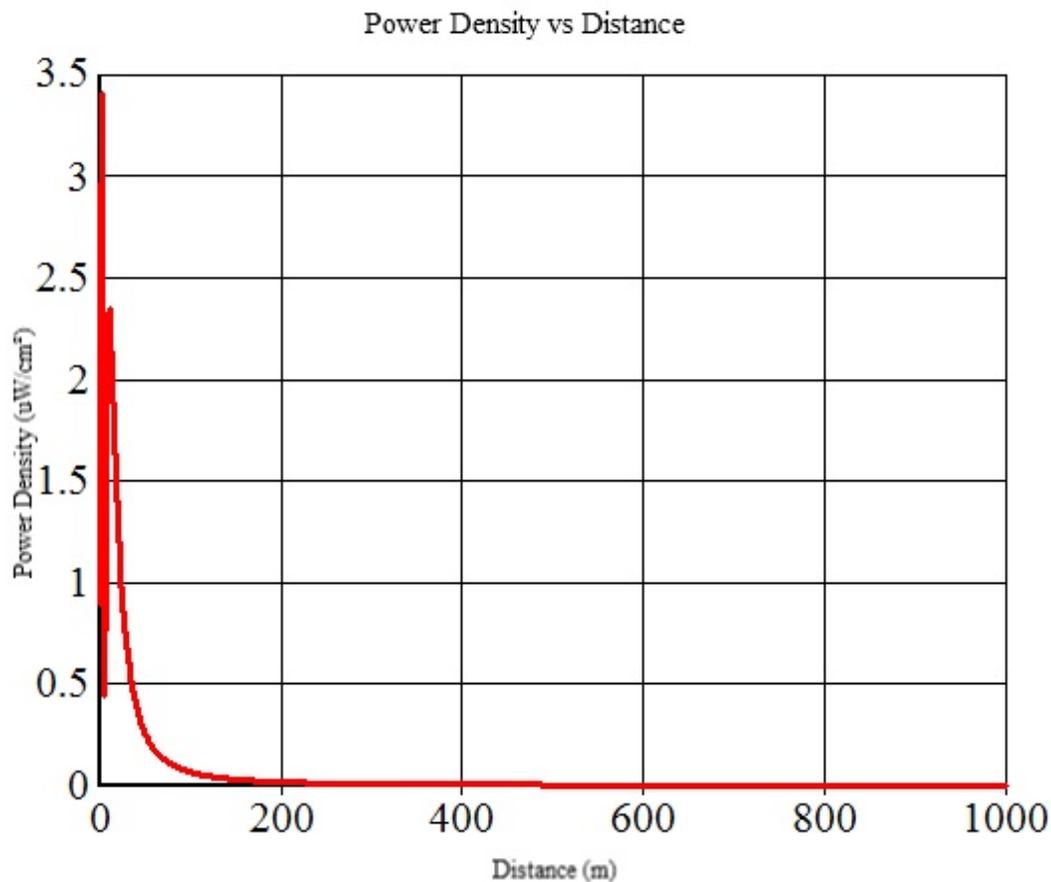
Erik C. Swanson, P.E.

K24FH-D Glide

Ground-Level Power Density Calculations

Using Manufacturer's Vertical Plane Pattern

Antenna K723147
 ERP 20 Watts H (avg)
 0 Watts V (avg)
 Antenna AGL 5 meters less 2m is 3 meters above the reference plane
 Calculated Maximum is 3.40 uW/cm² at 2 meters from the tower



Distance From Tower (meters)	Hypotenuse (meters)	Depression Angle (degrees)	Interp Rel Field	Adjusted ERP (watts)	Power Density uW/cm ²
0	3.00	90.00	0.110	0.2	0.90
1	3.16	71.57	0.194	0.8	2.51
2	3.61	56.31	0.257	1.3	3.40 MAX
3	4.24	45.00	0.200	0.8	1.48
4	5.00	36.87	0.129	0.3	0.44
5	5.83	30.96	0.150	0.5	0.44
6	6.71	26.57	0.270	1.5	1.08
7	7.62	23.20	0.385	3.0	1.71
8	8.54	20.56	0.480	4.6	2.11
9	9.49	18.43	0.556	6.2	2.30
10	10.44	16.70	0.619	7.7	2.35
11	11.40	15.26	0.671	9.0	2.31
12	12.37	14.04	0.711	10.1	2.21
13	13.34	12.99	0.744	11.1	2.08

14	14.32	12.09	0.773	11.9	1.95
15	15.30	11.31	0.798	12.7	1.82
16	16.28	10.62	0.820	13.5	1.70
17	17.26	10.01	0.840	14.1	1.58
18	18.25	9.46	0.853	14.5	1.46
19	19.24	8.97	0.865	15.0	1.35
20	20.22	8.53	0.875	15.3	1.25
21	21.21	8.13	0.885	15.7	1.16
22	22.20	7.77	0.894	16.0	1.08
23	23.19	7.43	0.902	16.3	1.01
24	24.19	7.13	0.909	16.5	0.94
25	25.18	6.84	0.916	16.8	0.88
26	26.17	6.58	0.922	17.0	0.83
27	27.17	6.34	0.928	17.2	0.78
28	28.16	6.12	0.933	17.4	0.73
29	29.15	5.91	0.938	17.6	0.69
30	30.15	5.71	0.943	17.8	0.65
31	31.14	5.53	0.948	18.0	0.62
32	32.14	5.36	0.952	18.1	0.59
33	33.14	5.19	0.956	18.3	0.56
34	34.13	5.04	0.960	18.4	0.53
35	35.13	4.90	0.962	18.5	0.50
36	36.12	4.76	0.963	18.6	0.48
37	37.12	4.64	0.965	18.6	0.45
38	38.12	4.51	0.966	18.7	0.43
39	39.12	4.40	0.967	18.7	0.41
40	40.11	4.29	0.968	18.7	0.39
41	41.11	4.18	0.969	18.8	0.37
42	42.11	4.09	0.970	18.8	0.35
43	43.10	3.99	0.971	18.9	0.34
44	44.10	3.90	0.972	18.9	0.32
45	45.10	3.81	0.972	18.9	0.31
46	46.10	3.73	0.973	18.9	0.30
47	47.10	3.65	0.974	19.0	0.29
48	48.09	3.58	0.974	19.0	0.27
49	49.09	3.50	0.975	19.0	0.26
50	50.09	3.43	0.976	19.0	0.25