

Compliance with Special Operating Conditions

The WDKL Construction Permit (File Number BPH-20160913AAY) contains several Special Operating Conditions summarized as follows:

1. 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 electromagnetic fields in excess of FCC guidelines.
2. BEFORE PROGRAM TESTS ARE AUTHORIZED, permittee shall submit the results of a complete proof-of-performance to establish the horizontal plane radiation patterns for both the horizontally and vertically polarized radiation components. This proof-of-performance may be accomplished using the complete full size antenna, or individual bays therefrom, mounted on a supporting structure of identical dimensions and configuration as the proposed structure, including all braces, ladders, conduits, coaxial lines, and other appurtenances; or using a carefully manufactured scale model of the entire antenna, or individual bays therefrom, mounted on an equally scaled model of the proposed supporting structure, including all appurtenances. Engineering exhibits should include a description of the antenna testing facilities and equipment employed, including appropriate photographs or sketches and a description of the testing procedures, including scale factor, measurements frequency, and equipment calibration.
3. BEFORE PROGRAM TESTS ARE AUTHORIZED, permittee must submit a certification executed by a licensed surveyor showing that the FM directional antenna system has been oriented at the azimuth(s) specified in the directional antenna proof of performance. This certification must include a description of the method used by the surveyor to determine the azimuth(s) of the installed directional antenna system and the accuracy of that determination.
4. BEFORE PROGRAM TESTS ARE AUTHORIZED, permittee/licensee shall submit an affidavit that the installation of the directional antenna system was overseen by a qualified engineer. This affidavit shall include a certification by the engineer that the antenna was installed pursuant to the manufacturer's instructions and list the qualifications of the certifying engineer.
5. BEFORE PROGRAM TESTS ARE AUTHORIZED, the permittee must submit an exhibit demonstrating that the measured directional antenna pattern complies with the appropriate community coverage provisions of 47 C.F.R. Sections 73.315 or 73.515 (See 47 C.F.R. Section 73.316(c)(2)(ix)(B)).
6. The relative field strength of neither the measured horizontally nor vertically polarized radiation component shall exceed at any azimuth the value indicated on the composite radiation pattern authorized by this construction permit. A relative field strength of 1.0 on the composite radiation pattern herein authorized corresponds to the following effective radiated power:
65 kilowatts
Principal minima and their associated field strength limits:
340 - 10 degrees True (clockwise): 2.35 kilowatts

7. THE AUTOMATIC PROGRAM TEST PROVISIONS OF 47 C.F.R. § 73.1620 DO NOT APPLY IN THIS CASE. A FORMAL REQUEST FOR PROGRAM TEST AUTHORITY MUST BE FILED WITH THE FCC FORM 302-FM, APPLICATION FOR LICENSE, BEFORE PROGRAM TESTS WILL BE AUTHORIZED. This request must contain documentation which demonstrates compliance with the following special operating condition:
8. The permittee/licensee must, upon completion of construction and during the equipment test period, make proper radiofrequency electromagnetic (RF) field strength measurements throughout the transmitter site area, to determine if there are any areas that exceed the FCC guidelines for human exposure to RF fields. If necessary, a fence must be erected at such distances and in such a manner as to prevent the exposure of humans to RF fields in excess of the FCC Guidelines (OET Bulletin No. 65, Edition 97-01, August 1997). The fence must be a type which will preclude casual or inadvertent access, and must include warning signs at appropriate intervals which describe the nature of the hazard. Any areas within the fence found to exceed the recommended guidelines must be clearly marked with appropriate visual warning signs.
9. Documentation demonstrating compliance with the preceding special operating condition shall be submitted at the time of filing of FCC Form 302-FM.
10. Educational Media Foundation requests waiver of 47 C.F.R. § 73.509 to allow Station KWAQ, as authorized herein, to receive contour overlap from the 100 dBu contour of second adjacent channel Station KNKX(FM), Tacoma, WA (Facility ID No. 51199) on Channel 201C. We have afforded this request the "hard look" called for under *WAIT Radio v. FCC*, 418 F.2d 1153 (D.C. Cir. 1969), and find that the facts and circumstances presented in the applicant's justification are sufficient to establish that grant of the requested waiver is in the public interest. Accordingly, waiver of 47 C.F.R. § 73.509 IS HEREBY GRANTED. Furthermore, further modifications of Station KNKX will not be construed as a "per se" modification of KWAQ's facility. (See *Educational Information Corporation*, 6 FCC Rcd 2207 (1991)).
11. PROGRAM TESTS FOR KWAQ (FACILITY ID NO. 121867) WILL NOT COMMENCE ON CHANNEL 201C WITH THE FACILITIES SPECIFIED HEREIN UNTIL PROGRAM TESTS FOR KLOY (FACILITY ID NO. 93999) COMMENCE ON CHANNEL 204C3 IN OCEAN PARK, WA WITH THE FACILITIES SPECIFIED IN BPED-20170213AAQ AND A LICENSE WILL NOT BE GRANTED FOR KWAQ ON CHANNEL 201C WITH THE FACILITIES SPECIFIED HEREIN UNTIL A LICENSE IS GRANTED FOR KLOY ON CHANNEL 204C3 IN OCEAN PARK, WA WITH THE FACILITIES SPECIFIED IN BPED-20170213AAQ.

EMF complies with, or agrees to, these conditions as follows:

1. EMF in coordination with other users of the site, agrees to reduce power or cease operation as necessary to protect persons having access to the site, tower, or antenna from radiofrequency electromagnetic fields in excess of FCC guidelines.
2. A complete Proof of Performance is contained in Exhibit 1-A
3. The directional antenna system has been oriented at the correct azimuth as certified in Exhibit 1-B
4. The installation of the directional antenna system was done under the supervision of a qualified engineer with the signed affidavit certification in Exhibit 1-C.

5. Community of License coverage using the measured directional pattern is seen in Exhibit 1-D.
6. The measured relative field strengths of the horizontal and vertical patterns are seen in Exhibit 1-A and abide by the principle minima values as listed.
7. A formal request for program test authority is hereby submitted in this Form 302-FM License Application
8. RF Measurements have been done to determine the RF Fields in and around the immediate area of the tower. Measurements were done before and after testing the newly installed antenna system. These measurements are seen in Exhibit 1-E.
9. As seen in Exhibit 1-E, the RF measurements determined that no areas open to the general public are over the exposure limits allowed for the general population.
10. Educational Media Foundation understands and accepts that KWAQ receives contour overlap from KNKX and further modifications of station KNKX will not be construed as a "per se" modification of KWAQ's facility. (See Educational Information Corporation, 6 FCC Rcd 2207 (1991)).
11. KLOY has indeed commenced operation on channel 204C3 and has been granted a license to operate on channel 204C3 serving the community of Ocean Park, WA. This fulfills the facilities as specified in FCC file number BPED-20170213AAQ which was subsequently licensed in file number BLED-20180830AAA.

Directional Antenna System for KWAQ, Vashon, Washington

September 15, 2020

Electronics Research Inc. is providing a custom fabricated antenna system that is specially designed to meet the FCC requirements and the general needs of radio station KWAQ.

The antenna is the ERI model MP-6E-DA-HW configuration. The circular polarized system consists of 6 half-wavelength spaced bays using one driven circular polarized radiating element per bay, one horizontal parasitic element per bay and two vertical parasitic elements interleaved between alternate bay pairs. The antenna was mounted on the North 139 degrees East tower face with bracketry to provide an antenna orientation of North 154 degrees East. The antenna was tested on a 48" face tower, which is the structure the station plans to use to support the array. All tests were performed on a frequency of 88.1 megahertz, which is the center of the FM broadcast channel assigned to KWAQ.

Pattern measurements were made on a sixty-acre antenna pattern range that is owned and operated by Electronics Research, Inc. The tests were performed under the direction of Thomas B. Silliman, president of Electronics Research, Inc. Mr. Silliman has the Bachelor of Electrical Engineering and the Master of Electrical Engineering degrees from Cornell University and is a registered professional engineer in the states of Indiana, Maryland and Minnesota.



Directional Antenna System for KWAQ, Vashon, Washington

(continued)

DESCRIPTION OF THE TEST PROCEDURE

The test antenna consisted of two bay levels of the circular polarized system with the associated horizontal and vertical parasitic elements. The elements and brackets that were used in this test are electrically equivalent to those that will be supplied with the antenna. A section of 3 1/8 inch o.d. rigid coaxial line was used to feed the test antenna, and a section of 3 1/8 inch o.d. rigid outer conductor only was attached above the test antenna. The lines were properly grounded during all tests.

The power distribution and phase relationship to the antenna elements was adjusted in order to achieve the directional radiation patterns for both horizontal and vertical polarization components.

The proof-of-performance was accomplished using a 48" face tower with identical dimension and configuration including all braces, ladders, conduits, coaxial lines and other appurtenances that are included in the actual aperture at which the antenna will be installed. The structure was erected vertically on a turntable mounted on a non-metallic building with the antenna centered vertically on the structure, making the center of radiation of the test approximately 30 feet above ground. The turntable is equipped with a motor drive and a US Digital angle position indicator. The resolution of this angle position indicator is one-hundredth of a degree.

The antenna under test was operated in the transmitting mode and fed from a HP8657D signal generator. The frequency of the signal source was set at 88.1 MHz and was constantly monitored by a Rohde & Schwarz ESVD measuring receiver.

A broadband horizontal and vertical dipole system, located approximately 628 feet from the test antenna, was used to receive the emitted test signals. The dipole system was mounted at the same height above terrain as the center of the antenna under test. The signals received by the dipole system were fed to the test building by way of two buried Heliax cables to a Rohde & Schwarz measuring receiver. This data was interfaced to a laser jet printer by means of a computer system. Relative field strength was plotted as a function of azimuth.

Directional Antenna System for KWAQ, Vashon, Washington

(continued)

The measurements were performed by rotating the test antenna in a counter-clockwise direction and plotting the received signal on polar co-ordinated graph paper in a clockwise direction. Both horizontal and vertical components were recorded separately.

CONCLUSIONS

The circular polarized system consists of 6 half-wavelength spaced bays using one driven circular polarized radiating element per bay, one horizontal parasitic element per bay and two vertical parasitic elements interleaved between alternate bay pairs. The power distribution and phase relationship will be fixed when the antenna is manufactured. Proper maintenance of the elements should be all that is required to maintain the pattern in adjustment.

The MP-6E-DA-HW array is to be mounted on the North 139 degrees East tower face of the 48" face tower at a bearing of North 154 degrees East. Blue prints provided with the antenna will show the proper antenna orientation alignment. The antenna alignment procedure should be directed by a licensed surveyor as prescribed by the FCC.

Figure #1 represents the measured individual horizontal and vertical components, the composite maximum of either the horizontal or vertical component at any azimuth and the FCC filed envelope pattern. The horizontal plane relative field list for the composite pattern and the individual H & V components are shown as Figure #1 & 1A respectively. The actual measured pattern does not exceed the authorized FCC composite pattern at any azimuth. A calculated vertical plane relative field pattern is shown on Figure #3 attached. The power in the maximum will reach 65 kilowatts (18.129 dBk).

The power at North 340-10 degrees East does not exceed 2.35 kilowatts (3.711 dBk).

The RMS of the vertically polarized horizontal plane component does not exceed the RMS of the horizontally polarized horizontal plane component.

The composite horizontal and vertical maximum relative field pattern obtained from the measured data as shown on Figure #1 has an RMS that is greater than 85% of the filed composite pattern.

***Directional Antenna System
for
KWAQ, Vashon, Washington***

(continued)

The clear vertical length of the structure required to support the antenna is 47 feet 9 inches.

The directional antenna should not be mounted on the top of an antenna tower that includes a top-mounted platform larger than the cross-sectional area of the tower in the horizontal plane. No obstructions other than those that are specified by the blue prints supplied with the antenna are to be mounted within 75 ft. horizontally of the system. The vertical distance to the nearest obstruction should be a minimum of 10 ft. from the directional antenna. Metallic guy wires should be a minimum distance of forty feet horizontally from the antenna.

ELECTRONICS RESEARCH, INC.

Robert Grossman

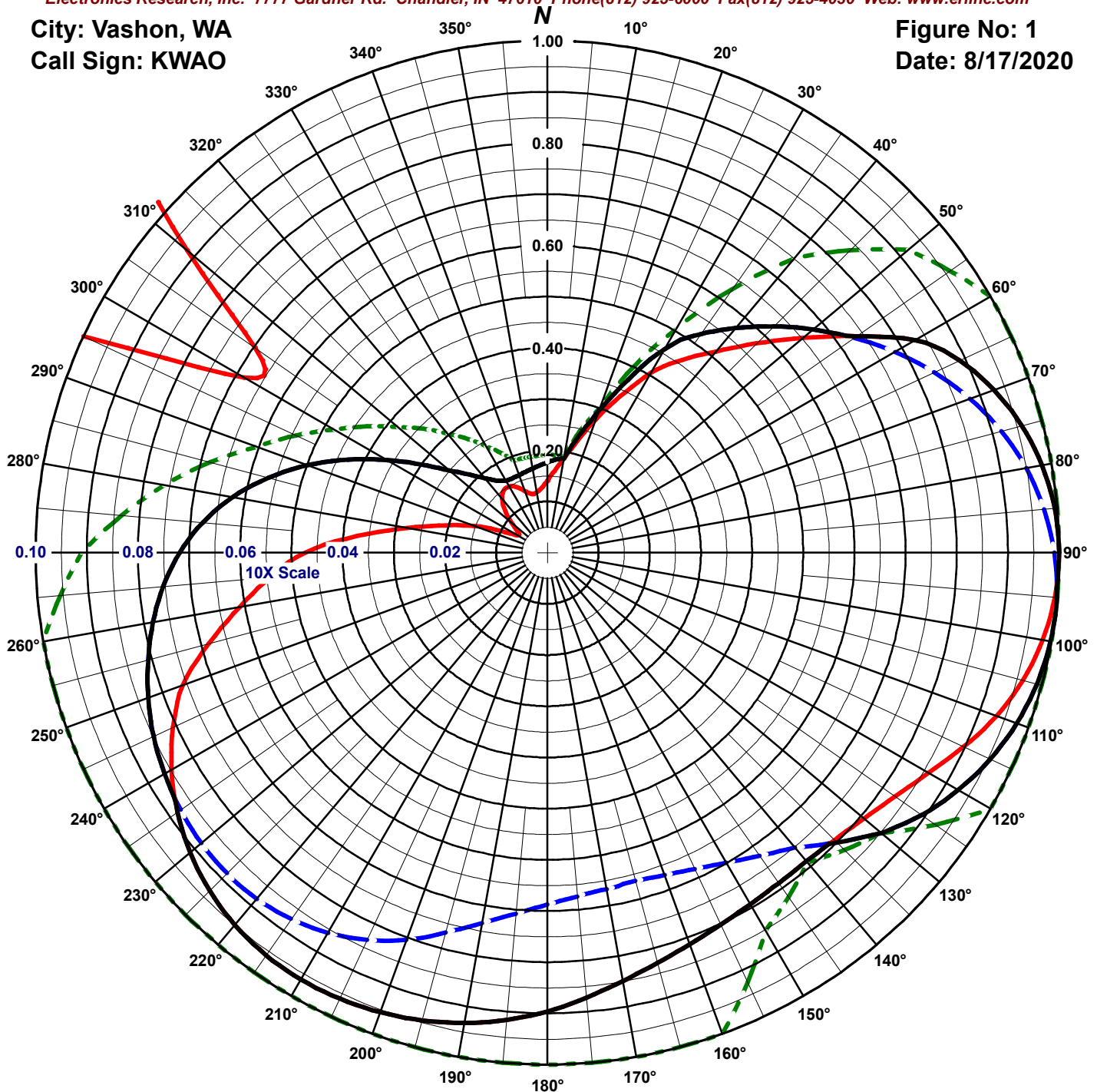
The Microsoft Word document on file electronically at Electronic Research, Inc. governs the specifications, scope, and configuration of the product described. All other representations whether verbal, printed, or electronic are subordinate to the master copy of this document on file at ERI.

ERI® Horizontal Plane Relative Field Pattern

Electronics Research, Inc. 7777 Gardner Rd. Chandler, IN 47610 Phone(812) 925-6000 Fax(812) 925-4030 Web: www.eriinc.com

City: Vashon, WA
Call Sign: KWAQ

Figure No: 1
Date: 8/17/2020



Antenna Orientation: 154° True

Frequency: 88.1 MHz

Antenna Type: MP-6E-DA-HW

Antenna Mounting: 26" Radome

Tower Type: 48" face tower

HORIZONTAL

RMS: .701

Maximum: 1 @ 90°

Minimum: .065 @ 302°

VERTICAL

RMS: .695

Maximum: 1 @ 97°

Minimum: .16 @ 333°

COMPOSITE

RMS: .737

Maximum: 1 @ 90°

Minimum: .16 @ 333°

FCC ENVELOPE

RMS: .82

Maximum: 1 @ 60°

Minimum: .19 @ 350°

Measured patterns of the horizontal and vertical components.

ERI[®] Horizontal Plane Relative Field Pattern

Electronics Research, Inc. 7777 Gardner Rd. Chandler, IN 47610 Phone(812) 925-6000 Fax(812) 925-4030 Web: www.eriinc.com

Figure# 1

Date: 8/17/2020

Station: KWAQ

Antenna: MP-6E-DA-HW

Location: Vashon, WA

Antenna Orientation: 154° True

Frequency: 88.1 MHz

Number of Bays: 6

Azimuth	Envelope			Polarization	Azimuth	Envelope			Polarization
	Field	kW	dBk			Field	kW	dBk	
0°	0.176	2.024	3.062	Vertical	180°	0.896	52.178	17.175	Horizontal
5°	0.182	2.153	3.330	Vertical	185°	0.916	54.560	17.369	Horizontal
10°	0.188	2.290	3.598	Vertical	190°	0.933	56.560	17.525	Horizontal
15°	0.235	3.595	5.557	Vertical	195°	0.946	58.150	17.645	Horizontal
20°	0.295	5.660	7.528	Vertical	200°	0.955	59.312	17.731	Horizontal
25°	0.372	8.995	9.540	Vertical	205°	0.961	60.033	17.784	Horizontal
30°	0.459	13.669	11.357	Vertical	210°	0.963	60.278	17.802	Horizontal
35°	0.521	17.637	12.464	Vertical	215°	0.959	59.814	17.768	Horizontal
40°	0.573	21.311	13.286	Vertical	220°	0.949	58.585	17.678	Horizontal
45°	0.625	25.388	14.046	Vertical	225°	0.933	56.615	17.529	Horizontal
50°	0.678	29.890	14.755	Vertical	230°	0.911	53.942	17.319	Horizontal
55°	0.738	35.364	15.486	Horizontal	235°	0.882	50.622	17.043	Horizontal
60°	0.830	44.828	16.515	Horizontal	240°	0.864	48.471	16.855	Vertical
65°	0.889	51.355	17.106	Horizontal	245°	0.849	46.854	16.707	Vertical
70°	0.929	56.063	17.487	Horizontal	250°	0.830	44.776	16.510	Vertical
75°	0.959	59.827	17.769	Horizontal	255°	0.807	42.380	16.272	Vertical
80°	0.982	62.618	17.967	Horizontal	260°	0.782	39.797	15.998	Vertical
85°	0.995	64.368	18.087	Horizontal	265°	0.753	36.882	15.668	Vertical
90°	1.000	65.000	18.129	Horizontal	270°	0.718	33.532	15.255	Vertical
95°	0.999	64.866	18.120	Vertical	275°	0.676	29.695	14.727	Vertical
100°	0.998	64.794	18.115	Vertical	280°	0.624	25.336	14.037	Vertical
105°	0.990	63.770	18.046	Vertical	285°	0.565	20.716	13.163	Vertical
110°	0.976	61.914	17.918	Vertical	290°	0.499	16.155	12.083	Vertical
115°	0.955	59.263	17.728	Vertical	295°	0.430	12.001	10.792	Vertical
120°	0.927	55.872	17.472	Vertical	300°	0.362	8.508	9.299	Vertical
125°	0.893	51.811	17.144	Vertical	305°	0.300	5.859	7.679	Vertical
130°	0.852	47.170	16.737	Vertical	310°	0.250	4.058	6.083	Vertical
135°	0.800	41.635	16.195	Vertical	315°	0.216	3.026	4.809	Vertical
140°	0.787	40.288	16.052	Horizontal	320°	0.190	2.341	3.695	Vertical
145°	0.788	40.368	16.060	Horizontal	325°	0.172	1.921	2.836	Vertical
150°	0.793	40.885	16.116	Horizontal	330°	0.162	1.710	2.330	Vertical
155°	0.802	41.785	16.210	Horizontal	335°	0.160	1.672	2.232	Vertical
160°	0.814	43.076	16.342	Horizontal	340°	0.161	1.694	2.290	Vertical
165°	0.830	44.777	16.511	Horizontal	345°	0.164	1.740	2.404	Vertical
170°	0.850	46.909	16.713	Horizontal	350°	0.167	1.809	2.574	Vertical
175°	0.873	49.490	16.945	Horizontal	355°	0.171	1.903	2.794	Vertical

Horizontal Polarization:

Maximum: 3.734 (5.721 dB)

Horizontal Plane: 3.734 (5.721 dB)

Maximum ERP: 65.000 kW

Vertical Polarization:

Maximum: 3.734 (5.721 dB)

Horizontal Plane: 3.734 (5.721 dB)

Maximum ERP: 65.000 kW

Total Input Power: 17.409 kW

Reference: KWAQ1M.FIG

This list shows the the maximum azimuth values of either the horizontal or vertical components.

ERI[®] Horizontal Plane Relative Field Pattern

Electronics Research, Inc. 7777 Gardner Rd. Chandler, IN 47610 Phone(812) 925-6000 Fax(812) 925-4030 Web: www.eriinc.com

Figure# 1A

Date: 8/17/2020

Station: KWAQ

Antenna: MP-6E-DA-HW

Location: Vashon, WA

Antenna Orientation: 154° True

Frequency: 88.1 MHz

Number of Bays: 6

Azimuth	Horizontal			Vertical			Azimuth	Horizontal			Vertical		
	Field	kW	dBk	Field	kW	dBk		Field	kW	dBk	Field	kW	dBk
0°	0.141	1.288	1.099	0.176	2.024	3.062	180°	0.896	52.178	17.175	0.687	30.713	14.873
5°	0.160	1.670	2.228	0.182	2.153	3.330	185°	0.916	54.560	17.369	0.708	32.549	15.125
10°	0.186	2.248	3.518	0.188	2.290	3.598	190°	0.933	56.560	17.525	0.735	35.079	15.451
15°	0.226	3.319	5.210	0.235	3.595	5.557	195°	0.946	58.150	17.645	0.768	38.376	15.841
20°	0.278	5.006	6.995	0.295	5.660	7.528	200°	0.955	59.312	17.731	0.805	42.074	16.240
25°	0.337	7.373	8.677	0.372	8.995	9.540	205°	0.961	60.033	17.784	0.834	45.236	16.555
30°	0.406	10.692	10.291	0.459	13.669	11.357	210°	0.963	60.278	17.802	0.857	47.759	16.791
35°	0.460	13.752	11.384	0.521	17.637	12.464	215°	0.959	59.814	17.768	0.873	49.580	16.953
40°	0.513	17.126	12.336	0.573	21.311	13.286	220°	0.949	58.585	17.678	0.883	50.659	17.047
45°	0.578	21.722	13.369	0.625	25.388	14.046	225°	0.933	56.615	17.529	0.885	50.962	17.072
50°	0.653	27.711	14.427	0.678	29.890	14.755	230°	0.911	53.942	17.319	0.883	50.623	17.044
55°	0.738	35.364	15.486	0.732	34.810	15.417	235°	0.882	50.622	17.043	0.875	49.752	16.968
60°	0.830	44.828	16.515	0.785	40.008	16.021	240°	0.848	46.721	16.695	0.864	48.471	16.855
65°	0.889	51.355	17.106	0.834	45.187	16.550	245°	0.807	42.325	16.266	0.849	46.854	16.707
70°	0.929	56.063	17.487	0.879	50.197	17.007	250°	0.758	37.367	15.725	0.830	44.776	16.510
75°	0.959	59.827	17.769	0.918	54.778	17.386	255°	0.684	30.432	14.833	0.807	42.380	16.272
80°	0.982	62.618	17.967	0.950	58.684	17.685	260°	0.610	24.209	13.840	0.782	39.797	15.998
85°	0.995	64.368	18.087	0.974	61.696	17.903	265°	0.544	19.226	12.839	0.753	36.882	15.668
90°	1.000	65.000	18.129	0.991	63.775	18.047	270°	0.473	14.514	11.618	0.718	33.532	15.255
95°	0.995	64.416	18.090	0.999	64.866	18.120	275°	0.373	9.031	9.558	0.676	29.695	14.727
100°	0.983	62.784	17.979	0.998	64.794	18.115	280°	0.278	5.031	7.017	0.624	25.336	14.037
105°	0.962	60.175	17.794	0.990	63.770	18.046	285°	0.206	2.770	4.424	0.565	20.716	13.163
110°	0.934	56.652	17.532	0.976	61.914	17.918	290°	0.152	1.505	1.775	0.499	16.155	12.083
115°	0.897	52.329	17.187	0.955	59.263	17.728	295°	0.100	0.649	-1.874	0.430	12.001	10.792
120°	0.860	48.100	16.821	0.927	55.872	17.472	300°	0.068	0.304	-5.167	0.362	8.508	9.299
125°	0.830	44.791	16.512	0.893	51.811	17.144	305°	0.070	0.316	-4.999	0.300	5.859	7.679
130°	0.808	42.425	16.276	0.852	47.170	16.737	310°	0.092	0.548	-2.610	0.250	4.058	6.083
135°	0.794	40.937	16.121	0.800	41.635	16.195	315°	0.117	0.895	-0.482	0.216	3.026	4.809
140°	0.787	40.288	16.052	0.752	36.750	15.653	320°	0.137	1.224	0.876	0.190	2.341	3.695
145°	0.788	40.368	16.060	0.723	33.945	15.308	325°	0.148	1.429	1.550	0.172	1.921	2.836
150°	0.793	40.885	16.116	0.699	31.781	15.022	330°	0.149	1.444	1.596	0.162	1.710	2.330
155°	0.802	41.785	16.210	0.682	30.205	14.801	335°	0.141	1.294	1.121	0.160	1.672	2.232
160°	0.814	43.076	16.342	0.670	29.176	14.650	340°	0.128	1.071	0.298	0.161	1.694	2.290
165°	0.830	44.777	16.511	0.664	28.669	14.574	345°	0.118	0.912	-0.401	0.164	1.740	2.404
170°	0.850	46.909	16.713	0.667	28.931	14.614	350°	0.119	0.925	-0.341	0.167	1.809	2.574
175°	0.873	49.490	16.945	0.674	29.519	14.701	355°	0.127	1.051	0.217	0.171	1.903	2.794

Horizontal Polarization:

Maximum: 3.734 (5.721 dB)

Horizontal Plane: 3.734 (5.721 dB)

Maximum ERP: 65.000 kW

Vertical Polarization:

Maximum: 3.734 (5.721 dB)

Horizontal Plane: 3.734 (5.721 dB)

Maximum ERP: 65.000 kW

Total Input Power: 17.409 kW

Reference: KWAQ1M.FIG

This list shows the azimuth values for the horizontal and vertical components.

ERI[®] Vertical Plane Relative Field Pattern

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Figure No: 3

Call Sign: KWAQ

Location: Vashon, WA

Frequency: 88.1 MHz

Antenna: 6 bay MP-6E-DA-HW

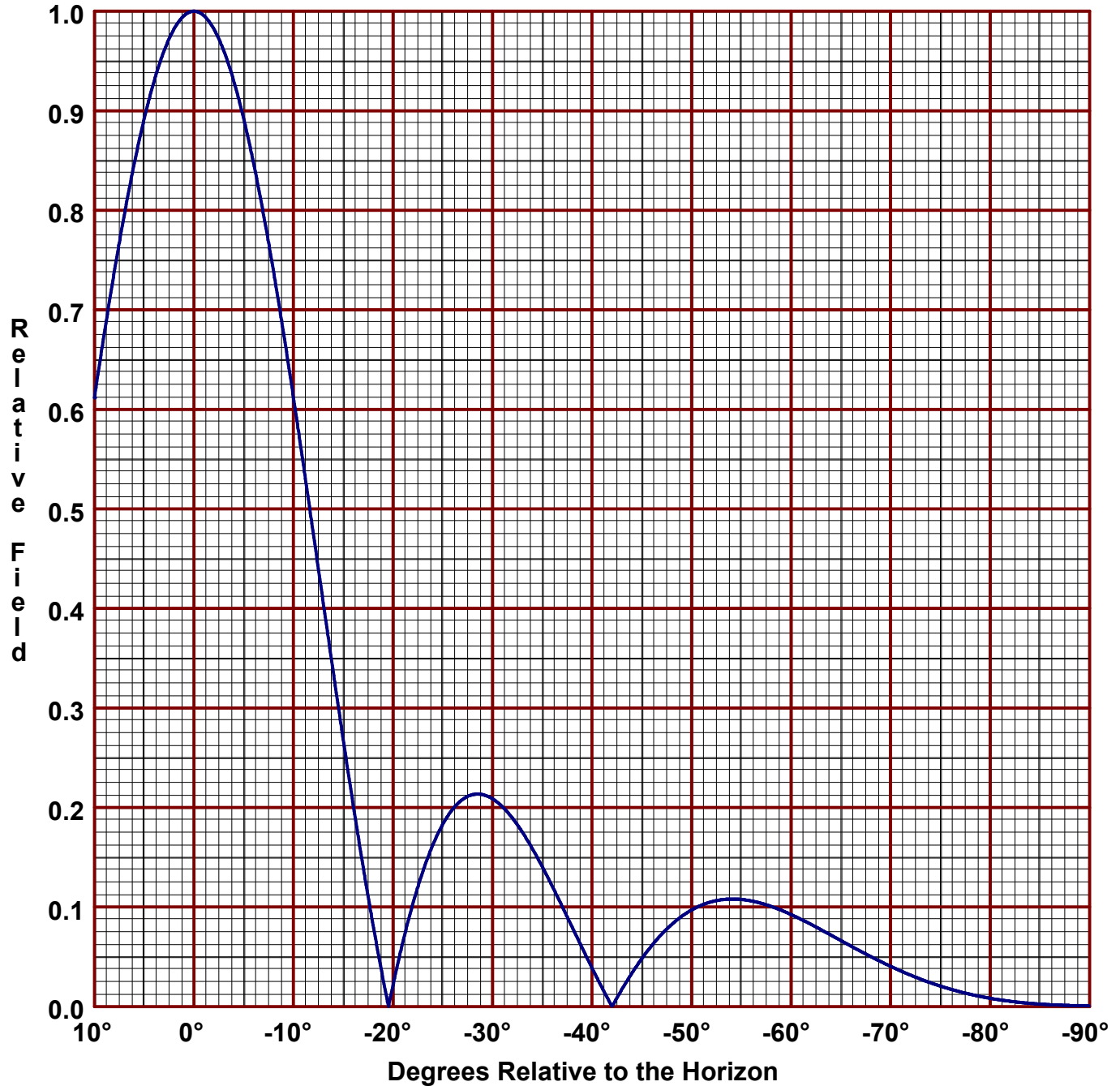
Date: 8/17/2020

H/V Power Ratio: 1

.5 Wave-length Spacing

0° Beam Tilt

0% First Null Fill



Horizontal Polarization:

Maximum: 3.734 (5.721 dB)

Horizontal Plane: 3.734 (5.721 dB)

Maximum ERP: 65.000 kW

Vertical Polarization:

Maximum: 3.734 (5.721 dB)

Horizontal Plane: 3.734 (5.721 dB)

Maximum ERP: 65.000 kW

Directional Antenna System for KWAO, Vashon, Washington

(continued)

ANTENNA SPECIFICATIONS

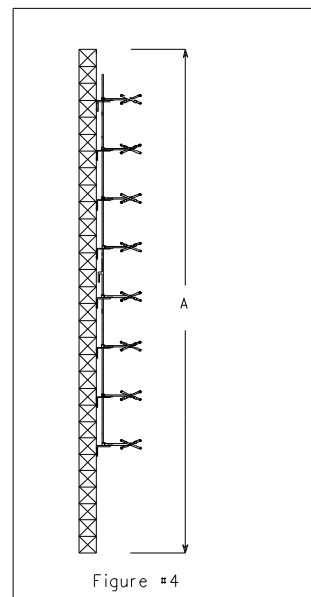
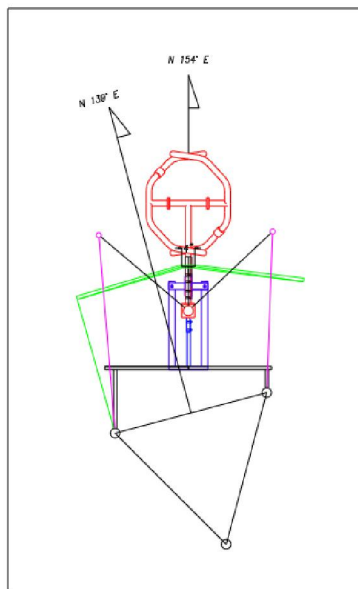
Antenna Type:	MP-6E-DA-HW
Frequency:	88.1 MHz
Number of Bays:	Six

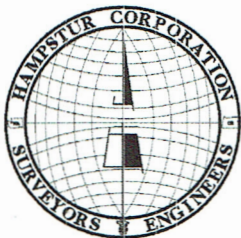
MECHANICAL SPECIFICATIONS

Mounting:	Custom
System length:	36 ft 9 in
Aperture length required:	47 ft 9 in
Orientation:	154° true
Input flange to the antenna 3 1/8" female.	

ELECTRICAL SPECIFICATIONS (For directional use)

Maximum horizontal ERP:	65.000 kW (18.129 dBk)
Horizontal maximum power gain:	3.734 (5.721 dB)
Maximum vertical ERP:	65 kW (18.129 dBk)
Vertical maximum power gain:	3.734 (5.721 dB)
Total input power:	17.409 kW (12.408dBk)





HAMPSTUR CORPORATION

P.O. Box 368 • Kelso, WA 98626 • (360) 423-8166 • Fax (360) 423-1714

Planners
Engineers
Surveyors

March 26, 2021

Attn: George Grimes
EDUCATIONAL MEDIA FOUNDATION
KLOVE Radio/Air1 Radio
5700 West Oaks Blvd.
Rockin, CA 95765

Re: Orientation Verification
KWAQ - Vashon, Washington
Directional Antenna

On March 18, 2021, we determined the orientation of the antenna at the above referenced site, to be pointed at a true azimuth of 154 degrees, plus or minus 1/2 of a degree.

The above azimuth is based on True North, as determined with GPS on NAD83, for Washington South Zone. The orientation was checked using a Leica TS06+ total station, holding the previously established ground control from the GPS data. The accuracy of the above azimuth is within 1 degree.

If you have any questions or if we can be of any further assistance, please give us a call.

Sincerely,

Calvin J. Hampton

WA. PLS #18087

President

Hampstur Corp.

champton@hampstur.com



Educational Media Foundation
5700 West Oaks Boulevard
Rocklin, CA 95765

Vashon, WA

Engineer Certification

Certification for KWAQ Antenna Installation

RE: BPED-20170213AAP

April 14, 2021


This is to certify the installation of the ERI directional antenna for KWAQ, model MP-6E-DA-HW was installed in accordance with the manufacturer's detailed instructions.

All work was performed by qualified personnel using good engineering practices and under my direct supervision. Radio Tower Co. performed all antenna work at this site.

Certifying engineer qualifications:

Kyle McGuire
Field Engineer II
EMF Broadcasting
5700 West Oaks Blvd
Rocklin, CA 95765

10+ years of FM broadcast experience


X

Kyle McGuire

Exhibit 1-D
Vashon, WA Community of License Coverage

KWAO.C

BPED20170213AAP

Latitude: 47-18-45.97 N

Longitude: 123-22-15.02 W

ERP: 65.00 kW

Channel: 201

Frequency: 88.1 MHz

AMSL Height: 947.0 m

Elevation: 920.0 m

Horiz. Pattern: Directional

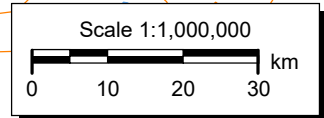
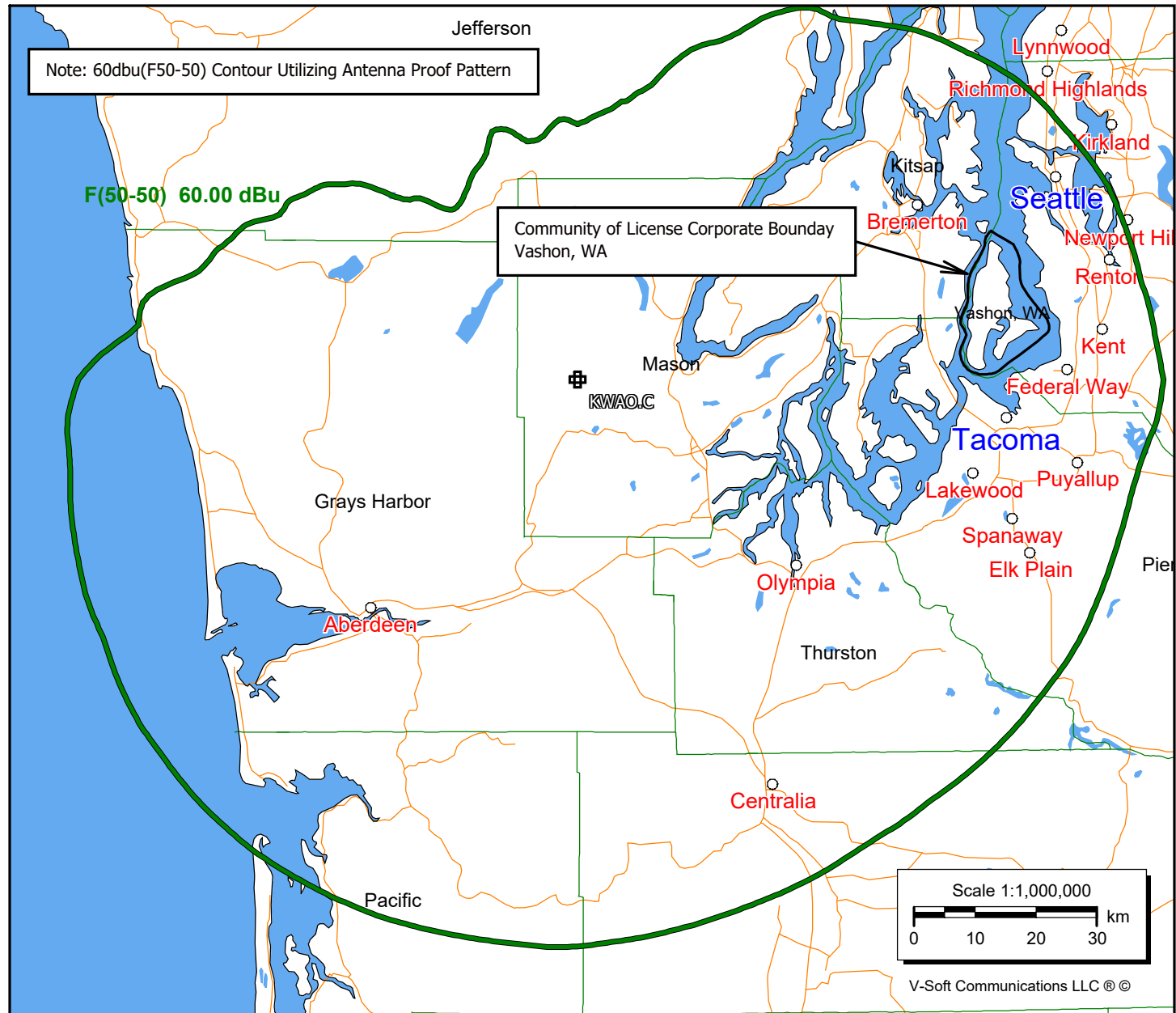
Vert. Pattern: No

Prop Model: None

Note: 60dbu(F50-50) Contour Utilizing Antenna Proof Pattern

F(50-50) 60.00 dBu

Community of License Corporate Boundary
Vashon, WA



V-Soft Communications LLC ©

Radiofrequency Electromagnetic Field Exposure Report

KWAO Vashon, WA

FIN: 121867

88.1 MHz

April 21, 2021

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Introduction

The permittee for the KWAQ construction permit (file number BPED-20170213AAP) is Educational Media Foundation. The Radiofrequency Exposure Study was completed on April 21st, 2021. Measurements were recorded at the facility using a Narda SRM 3000 instrument which properly analyzes and compensates for frequency dependent variables in the requirements of OET-65. Measurements were taken while slowly moving the instrument probe between approximately two and eight feet above ground, as well as side-to-side while walking to and from each measurement point. If an area had higher than average readings, further investigation was conducted to determine the extent of the area.

Equipment

- Narda SRM 3000
- SN: N-0010
- Firmware: SRM-FW V1.5.6

Summary

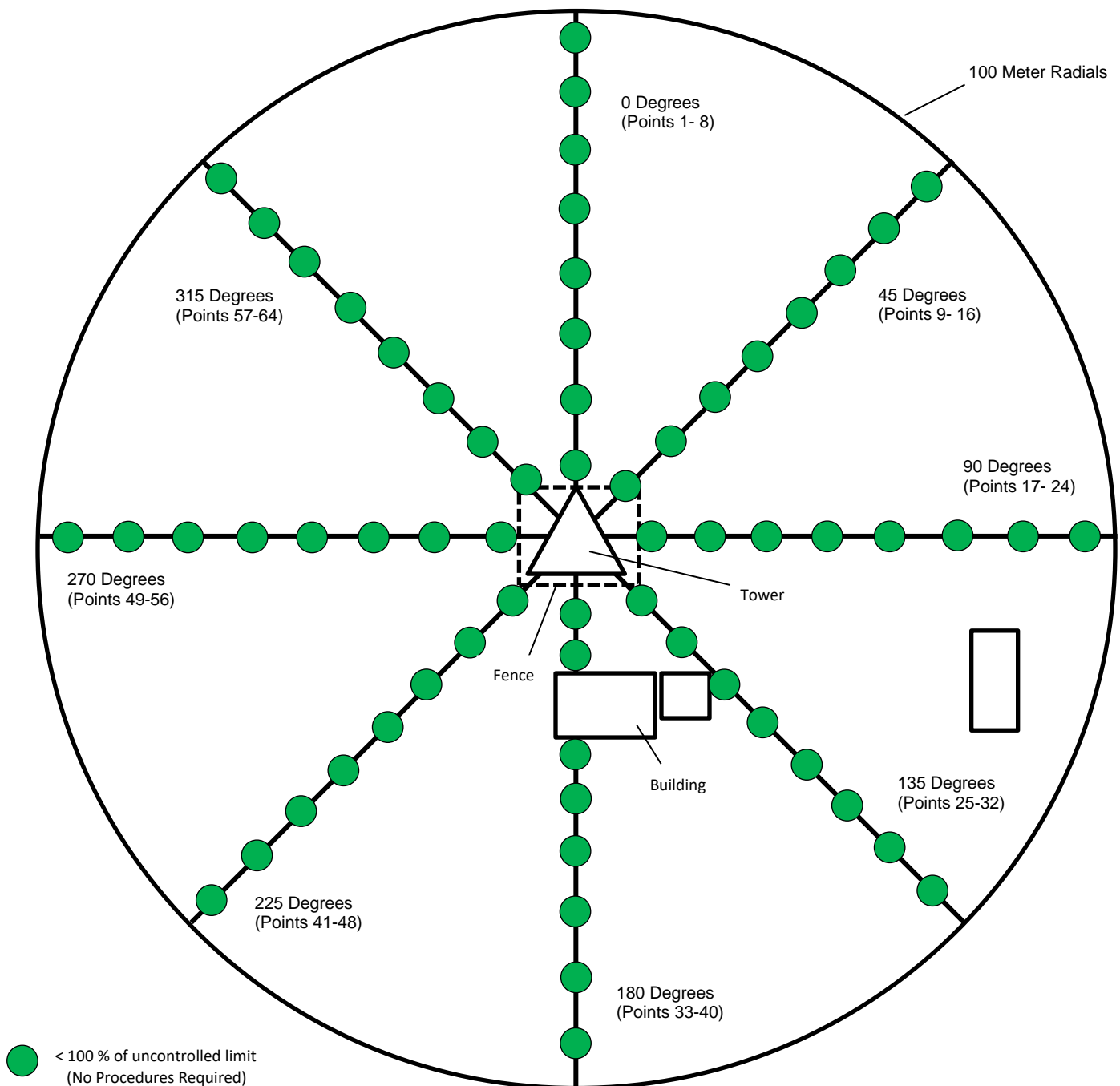
The KWAQ transmissions were confirmed to be operating at 100% ERP prior to recording measurements. Measurement points were recorded along eight equally spaced radials as well as throughout the accessible areas of the facility.

All measurement points and areas throughout the KWAQ facility were measured to be below 100% of the uncontrolled limits of OET-65. Therefore, the KWAQ facility fully complies with the FCC's maximum permissible radiofrequency electromagnetic exposure limits for controlled and uncontrolled environments.

Lastly, though the site will fully comply with the FCC's controlled and uncontrolled exposure limits, access to the site will be restricted and appropriately marked with signage. When it becomes necessary for workers to ascend the antenna structure, the permittee will reduce power or cease operation as necessary to protect persons having access to the site, tower or antenna from radiofrequency electromagnetic fields in excess of FCC guidelines.

Drawings

RF Exposure Measurement Area



Measurement Points

General Public and Occupational Exposure Measurement Points

Point	Total General Public %	General Public % 88.1 MHz	Total Occupational %	Occupational % 88.1 MHz
1	33.99	10.82	6.80	2.16
2	33.99	10.82	6.80	2.16
3	26.46	8.44	5.29	1.69
4	26.46	8.44	5.29	1.69
5	59.98	6.37	12.00	1.27
6	34.02	4.81	6.80	0.96
7	34.02	4.81	6.80	0.96
8	47.79	27.59	9.56	5.52
9	61.91	26.72	12.38	5.34
10	24.32	13.95	4.86	2.79
11	31.71	22.04	6.34	4.41
12	73.64	35.90	14.73	7.18
13	19.78	5.73	3.96	1.15
14	19.78	5.73	3.96	1.15
15	29.55	18.96	5.91	3.79
16	47.02	32.73	9.40	6.55
17	87.90	36.40	17.58	7.28
18	78.72	43.93	15.74	8.79
19	69.03	48.14	13.81	9.63
20	63.34	40.86	12.67	8.17
21	35.50	12.71	7.10	2.54
22	43.54	13.29	8.71	2.66
23	96.24	44.14	19.25	8.83
24	72.23	32.49	14.45	6.50
25	51.85	28.00	10.37	5.60
26	71.04	36.60	14.21	7.32
27	84.94	37.73	16.99	7.55
28	82.55	35.93	16.51	7.19
29	32.34	4.13	6.47	0.83
30	25.97	6.05	5.19	1.21
31	25.97	6.05	5.19	1.21
32	45.85	15.89	9.17	3.18
33	43.43	10.31	8.69	2.06
34	18.12	4.43	3.62	0.89

SWE Services, LLC

35	56.39	36.71	11.28	7.34
36	45.39	26.12	9.08	5.22
37	45.39	26.12	9.08	5.22
38	77.41	46.86	15.48	9.37
39	55.10	39.55	11.02	7.91
40	56.26	41.34	11.25	8.27
41	52.43	35.13	10.49	7.03
42	51.46	20.72	10.29	4.14
43	43.06	17.18	8.61	3.44
44	45.72	19.37	9.14	3.87
45	32.17	13.48	6.43	2.70
46	32.17	13.48	6.43	2.70
47	25.01	6.45	5.00	1.29
48	67.36	10.21	13.47	2.04
49	40.45	13.85	8.09	2.77
50	22.15	12.63	4.43	2.53
51	37.16	17.02	7.43	3.40
52	30.08	11.65	6.02	2.33
53	20.45	1.60	4.09	0.32
54	28.49	4.16	5.70	0.83
55	16.46	6.76	3.29	1.35
56	64.08	15.23	12.82	3.05
57	53.79	12.25	10.76	2.45
58	59.03	15.38	11.81	3.08
59	28.70	3.39	5.74	0.68
60	39.63	7.75	7.93	1.55
61	62.81	18.63	12.56	3.73
62	39.23	21.54	7.85	4.31
63	34.66	10.86	6.93	2.17
64	33.07	12.81	6.61	2.56