

**Engineering Statement  
In Support of an  
Application for a Construction Permit  
KMSW, Channel 224C3, The Dalles, OR**

**General**

The instant application is being filed in order to correct the current coordinates of KMSW on file to match the actual coordinates of the tower. Exhibit E, Figure 1 is a channel spacing study demonstrating that KMSW is still in compliance with all FCC spacing requirements. Exhibit E, Figure 2 is a terrain contour study to support the coverage contour map in Figure 3.

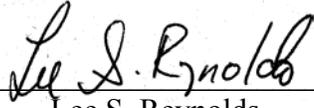
**Human Exposure to Radiofrequency Radiation**

The FCC's Worksheet #1A (multiple FM stations on the same tower) was used to determine whether or not the proposed facility would propose any human exposure concerns. When combined with KACIFM, the two combined to offer 6.67% of the allowable controlled/occupational limit and 33.28% of the uncontrolled limit. This is well below the uncontrolled/general public figure the FCC requires. As a result, human exposure will not be a problem to any persons on the ground.

**Summary**

The instant application meets all the FCC's engineering requirements, and it corrects KMSW's coordinates to the actual tower coordinates.

For the applicant:

A handwritten signature in black ink that reads "Lee S. Reynolds". The signature is written in a cursive style with a large initial "L".

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Lee S. Reynolds

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205-618-2020

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**KMSW, The Dalles, Oregon**

**Channel Spacing Study**

REFERENCE		DISPLAY DATES
45 38 58 N	CLASS = C3	DATA 04-05-07
121 16 25 W	Current Spacings	SEARCH 04-23-07
----- Channel 224 - 92.7 MHz -----		

Call	Channel	Location	Dist	Azi	FCC	Margin
<b>KMSW</b>	<b>LIC 224C3</b>	<b>The Dalles</b>	<b>OR 0.12</b>	<b>119.8</b>	<b>153.0</b>	<b>-152.88</b>
<b>RDEL</b>	<b>DEL 224C3</b>	<b>The Dalles</b>	<b>OR 0.12</b>	<b>119.8</b>	<b>153.0</b>	<b>-152.88</b>

Of no concern:  
Coordinates used by KMSW

RADD	ADD 226A	Trout Lake	WA 41.77	330.9	42.0	-0.23
KDBL	LIC 225C2	Toppenish	WA 116.93	35.3	117.0	-0.07
KRXF	LIC 224C2	Sunriver	OR 179.24	186.6	177.0	2.24
RDEL	DEL 224C2	Sunriver	OR 179.24	186.6	177.0	2.24
AP1084	APP 224C2	Sunriver	OR 185.55	182.1	177.0	8.55
RADD	ADD 225C0	Bend	OR 179.24	186.6	163.0	16.24
KGON	LIC 222C	Portland	OR 112.34	261.3	96.0	16.34
KQMV	LIC-N 223C	Bellevue	WA 213.00	345.8	176.0	37.00

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**KMSW Terrain/Contour Study**

Reference Coordinates:

North Latitude: 45-38-58  
West Longitude: 121-16-25

ERP: 3.4 kW

<u>Azimuth (°T)</u>	<u>Average Terrain (m)</u>	<u>HAAT (m)</u>	<u>Distance to F(50,50) 70 dBu (km)</u>	<u>Distance to F(50,50) 60 dBu (km)</u>
0.0	324.6	288.4	23.8	40.1
5.0	324.8	288.2	23.8	40.1
10.0	329.5	283.5	23.6	39.8
15.0	303.7	309.3	24.6	41.3
20.0	196.9	416.1	28.4	47.0
25.0	304.9	308.1	24.6	41.2
30.0	405.8	207.2	20.3	34.8
35.0	428.7	184.3	19.3	32.9
40.0	459.0	154.0	17.6	30.1
45.0	467.6	145.4	17.0	29.3
50.0	493.8	119.2	15.2	26.9
55.0	547.1	65.9	11.4	20.4
60.0	585.9	27.1	7.7	13.6
65.0	548.9	64.1	11.3	20.2
70.0	441.7	171.3	18.6	31.7
75.0	320.2	292.8	24.0	40.4
80.0	238.1	374.9	27.0	44.9
85.0	177.0	436.0	29.0	48.0
90.0	108.7	504.3	31.4	51.8
95.0	97.6	515.4	31.9	52.5
100.0	104.6	508.4	31.6	52.1
105.0	95.0	518.0	32.0	52.6
110.0	90.9	522.1	32.1	52.9
115.0	114.5	498.5	31.2	51.5
120.0	115.5	497.5	31.2	51.4
125.0	133.7	479.3	30.5	50.4
130.0	153.2	459.8	29.8	49.3
135.0	188.7	424.3	28.6	47.4
140.0	232.8	380.2	27.2	45.2
145.0	265.2	347.8	26.1	43.5
150.0	296.7	316.3	24.9	41.7
155.0	324.9	288.1	23.8	40.1
160.0	342.7	270.3	23.1	39.0

continued

ERP: 3.4 kW

<b>Azimuth (°T)</b>	<b>Average Terrain (m)</b>	<b>HAAT (m)</b>	<b>Distance to F(50,50) 70 dBu (km)</b>	<b>Distance to F(50,50) 60 dBu (km)</b>
165.0	360.6	252.4	22.4	37.9
170.0	376.8	236.2	21.7	36.9
175.0	390.2	222.8	21.1	36.0
180.0	398.7	214.3	20.7	35.4
185.0	425.1	187.9	19.4	33.2
190.0	431.1	181.9	19.2	32.7
195.0	405.8	207.2	20.3	34.8
200.0	449.3	163.7	18.2	31.0
205.0	487.9	125.1	15.6	27.5
210.0	516.0	97.0	13.7	24.6
215.0	574.5	38.5	8.7	15.3
220.0	593.2	19.8	7.7	13.6
225.0	601.1	11.9	7.7	13.6
230.0	581.3	31.7	7.9	13.9
235.0	589.1	23.9	7.7	13.6
240.0	590.0	23.0	7.7	13.6
245.0	574.1	38.9	8.7	15.4
250.0	524.7	88.3	13.0	23.5
255.0	468.5	144.5	16.9	29.2
260.0	424.5	188.5	19.5	33.3
265.0	397.5	215.5	20.7	35.5
270.0	359.6	253.4	22.4	38.0
275.0	328.7	284.3	23.6	39.9
280.0	293.1	319.9	25.0	41.9
285.0	243.0	370.0	26.9	44.6
290.0	151.7	461.3	29.9	49.4
295.0	150.6	462.4	29.9	49.5
300.0	235.6	377.4	27.1	45.0
305.0	294.4	318.6	25.0	41.8
310.0	301.9	311.1	24.7	41.4
315.0	285.9	327.1	25.3	42.3
320.0	277.8	335.2	25.6	42.8
325.0	188.3	424.7	28.6	47.4
330.0	258.3	354.7	26.3	43.8
335.0	311.4	301.6	24.3	40.9
340.0	332.1	280.9	23.5	39.7
345.0	343.5	269.5	23.1	39.0
350.0	339.1	273.9	23.2	39.3
355.0	332.1	280.9	23.5	39.7

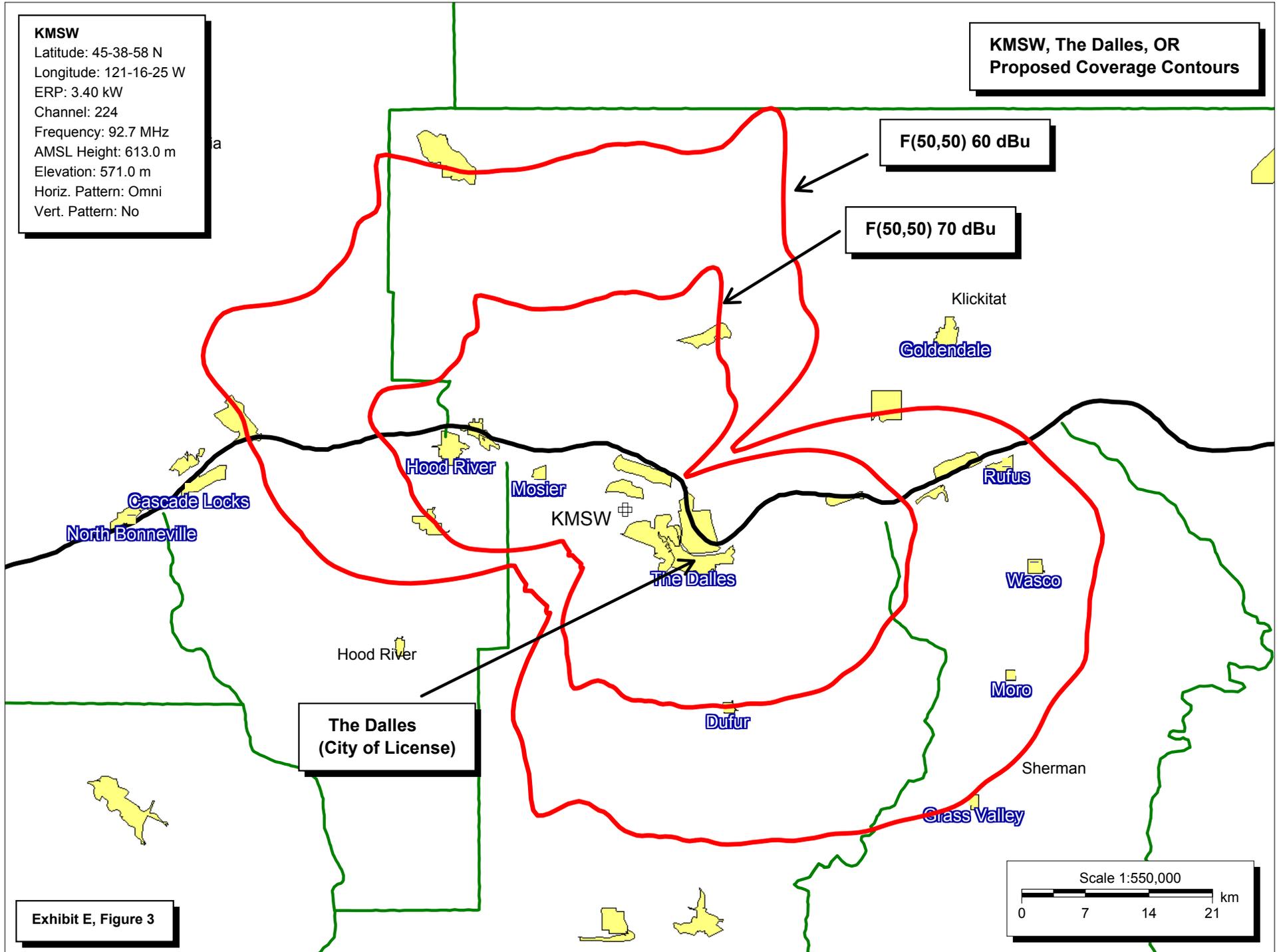
**KMSW**

Latitude: 45-38-58 N  
Longitude: 121-16-25 W  
ERP: 3.40 kW  
Channel: 224  
Frequency: 92.7 MHz  
AMSL Height: 613.0 m  
Elevation: 571.0 m  
Horiz. Pattern: Omni  
Vert. Pattern: No

**KMSW, The Dalles, OR  
Proposed Coverage Contours**

**F(50,50) 60 dBu**

**F(50,50) 70 dBu**



**Exhibit E, Figure 3**

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**Human Exposure To Radiofrequency Radiation Study**

<u>CALL</u>	<u>Service</u>	<u>Channel</u>	<u>Freq.</u>	<u>Polarization</u>	<u>Antenna Height** (AGL)</u>	<u>ERP (kW)</u>	<u>Relative Field Factor</u>	<u>Vertical Predicted Power Density (mW/cm<sup>2</sup>)</u>	<u>FCC Uncontrolled Limit (W/cm<sup>2</sup>)</u>	<u>Percent of Uncontrolled Limit</u>
KMSW	FM	224	92.7	H&V	42	3.400	1.000	0.0266228	0.200	13.3114%
KACI-FM	FM	249	97.7	H&V	42	5.100	1.000	0.0399341	0.200	19.9671%

Total Percentage of ANSI (uncontrolled) value = 33.28%

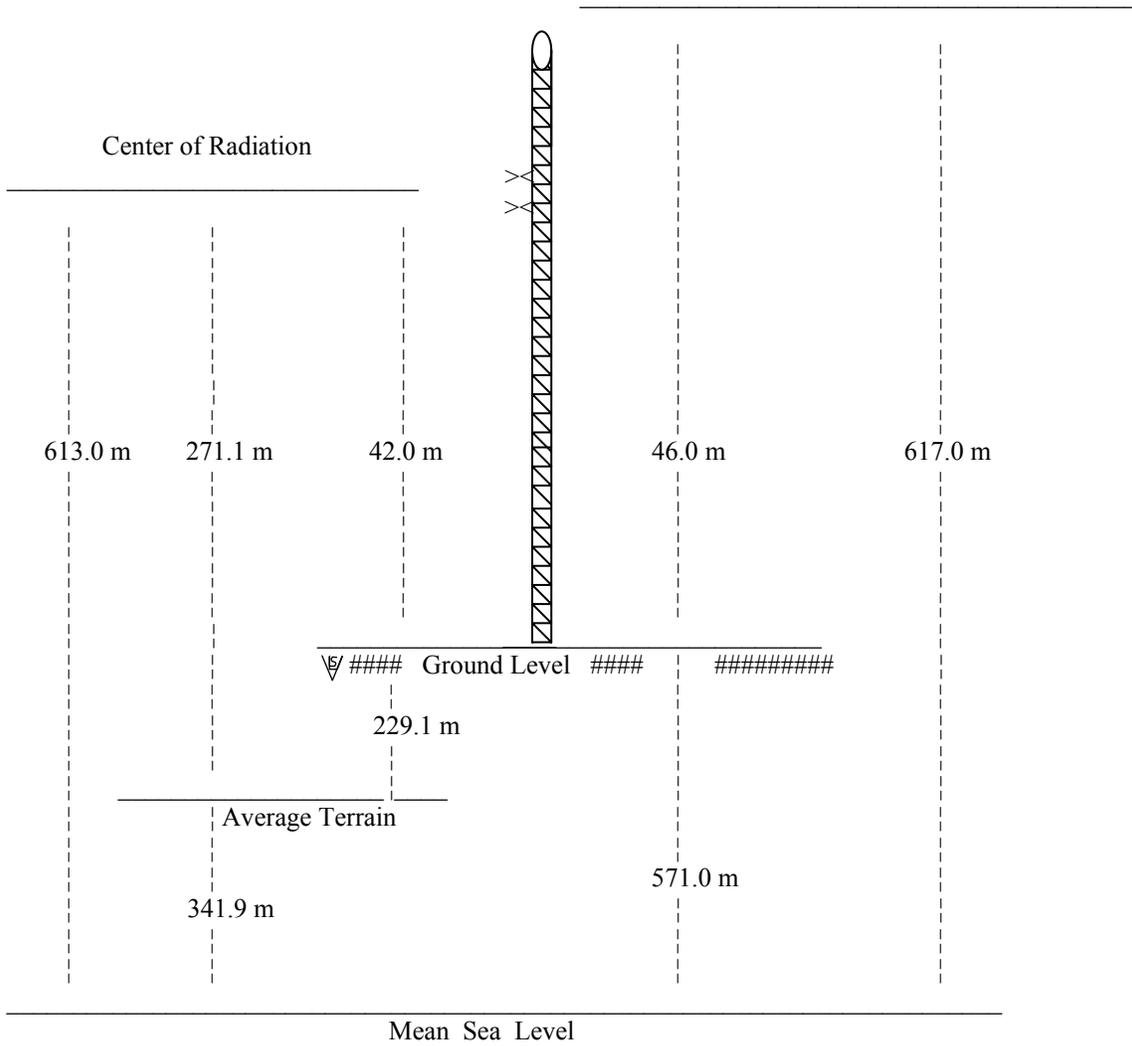
\* The antenna height indicated above is 2 meters less than the actual antenna height so that the predicted power density consider the 2 meter human height allowance.

KMSW and KACI-FM share the same antenna (Jampro JMPC-2), mounted 42 meters above ground level. KMSW operates with 3.4 kilowatts (horizontal and vertical) and KACI-FM operates with 5.1 kilowatts (horizontal and vertical). By using the Jampro “Double V” (EPA) antenna of the FM Model for Windows it was determined that KMSW would produce 26.623  $\mu\text{W}/\text{cm}^2$  at 23 meters from the base of the tower and 9.941  $\mu\text{W}/\text{cm}^2$  at the base of the tower. KACI-FM would produce 39.934  $\mu\text{W}/\text{cm}^2$  at 23 meters from the base of the tower and 19.912  $\mu\text{W}/\text{cm}^2$  at the base of the tower. The highest numbers were used for this study.

The results of the detailed study is that the power density is 33.28% of the limit for “uncontrolled” environments and 6.67% of the limit for “controlled” environments.

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**KMSW Class C3 Tower Vertical Sketch**



Proposed Location: 45° 38' 58" N. Lat. 121° 16' 25" W. Long. [NAD 27]

NOT DRAWN TO SCALE

Proposed antenna: 2 element