

May 2023
FM Translator K254DP
Pasco, Washington Channel 254D
Allocation Study

Allocation Study

The attached spacing study shows the spacing between the proposed translator site and the location of cochannel and adjacent channel stations and proposals. This study was made with the Commission's Class A spacing requirements, and individual situations were examined to determine the lack of prohibited contour overlap per the requirements of §74.1204 of the Rules. The attached allocation study map demonstrates compliance with the Commission's Rules for protection of FM broadcast stations and FM translators as outlined in §74.1204. Detail maps are included to demonstrate that the proposed K254DP facility provides contour protection to cochannel KMNA 254C2 Mabton, and no conflict with the pending application for modification of cochannel K254DK Walla Walla.

The attached spacing study demonstrates compliance with §73.207 of the Commission's Rules regarding spacing restrictions to stations which are 53 or 54 channels removed from the proposed operation.

KEYW 252C1 Pasco

KUJ-FM 256C1 Burbank

The proposed translator transmitter site is located within the 60 dBu protected contour of two second-adjacent channel stations. The following calculation, performed using the *Living Way* methodology, demonstrates interference protection to that station.

Protected Station	Distance & Bearing to Proposal	Station ERP and HAAT on that azimuth	Station Field Strength at Proposal	Corresponding Translator Interfering Contour	Distance to Translator Interfering Contour
KEYW 252C1	0.03 km ¹ 244 deg True	25 kW 267 meters	151.4 dBu Free Space	191.4 dBu	0.03 meters Free Space

¹ K254DP will in fact be located on the KEYW tower. The spacing study indicates a distance of 0.03 km due to the KEYW coordinates (2013 license) reflecting NAD27 coordinates which were rounded to the nearest whole second, and then converted to NAD83 coordinates rounded to the nearest tenth of a second.

KUJ-FM 256C1	3.19 km 234 deg True	52 kW 301 meters	112.2 dBu F(50,50)	152.2 dBu	2.72 meters Free Space
-----------------	-------------------------	---------------------	-----------------------	-----------	---------------------------

The worst-case interfering contour (152.2 dBu to KUJ-FM) extends at most 2.72 meters from the antenna and does not reach ground level. This area is unpopulated. Therefore, the proposed facility is believed to satisfy the requirements of §74.1204(d) with respect to KEYW and KUJ-FM.

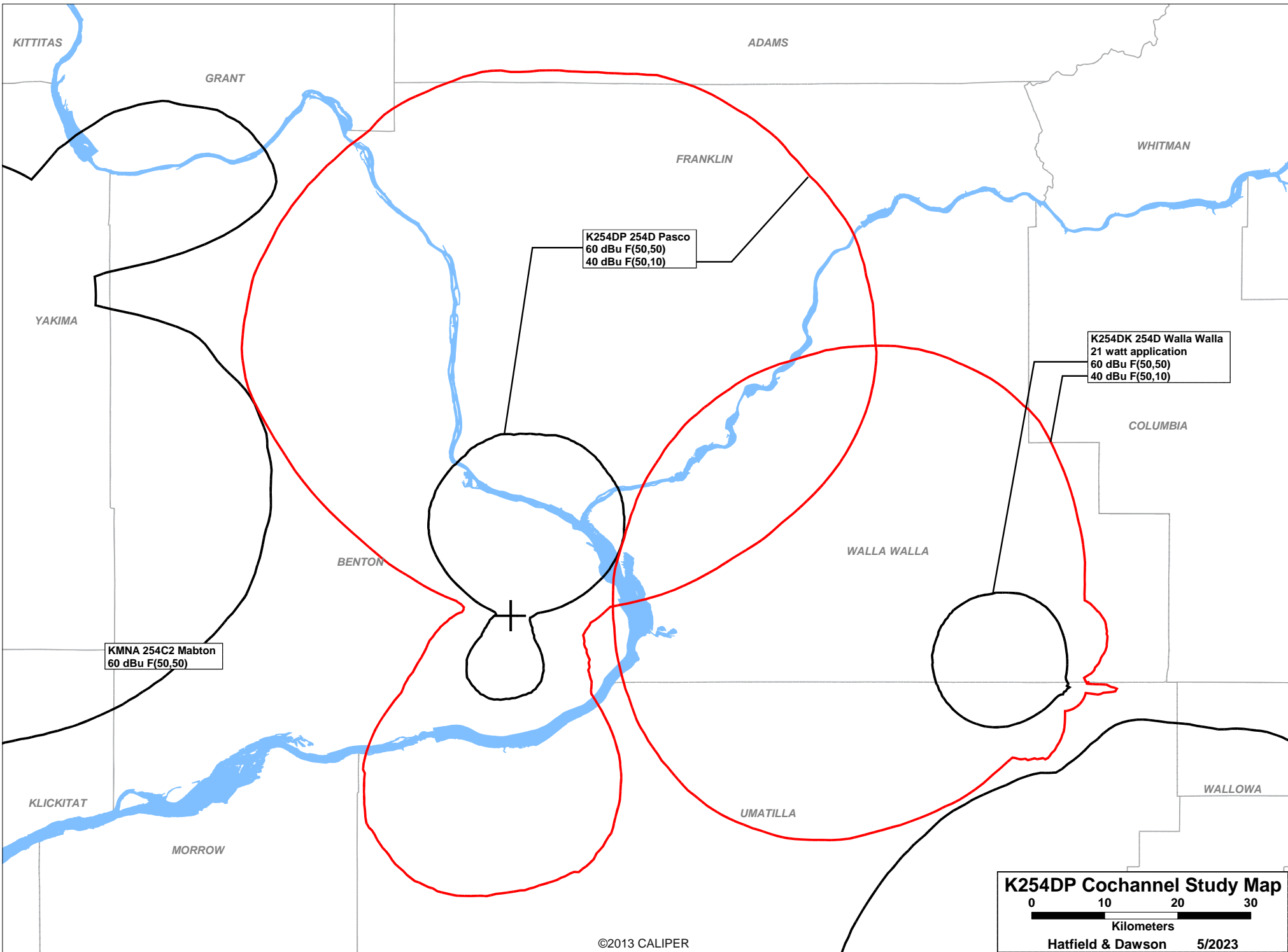
```

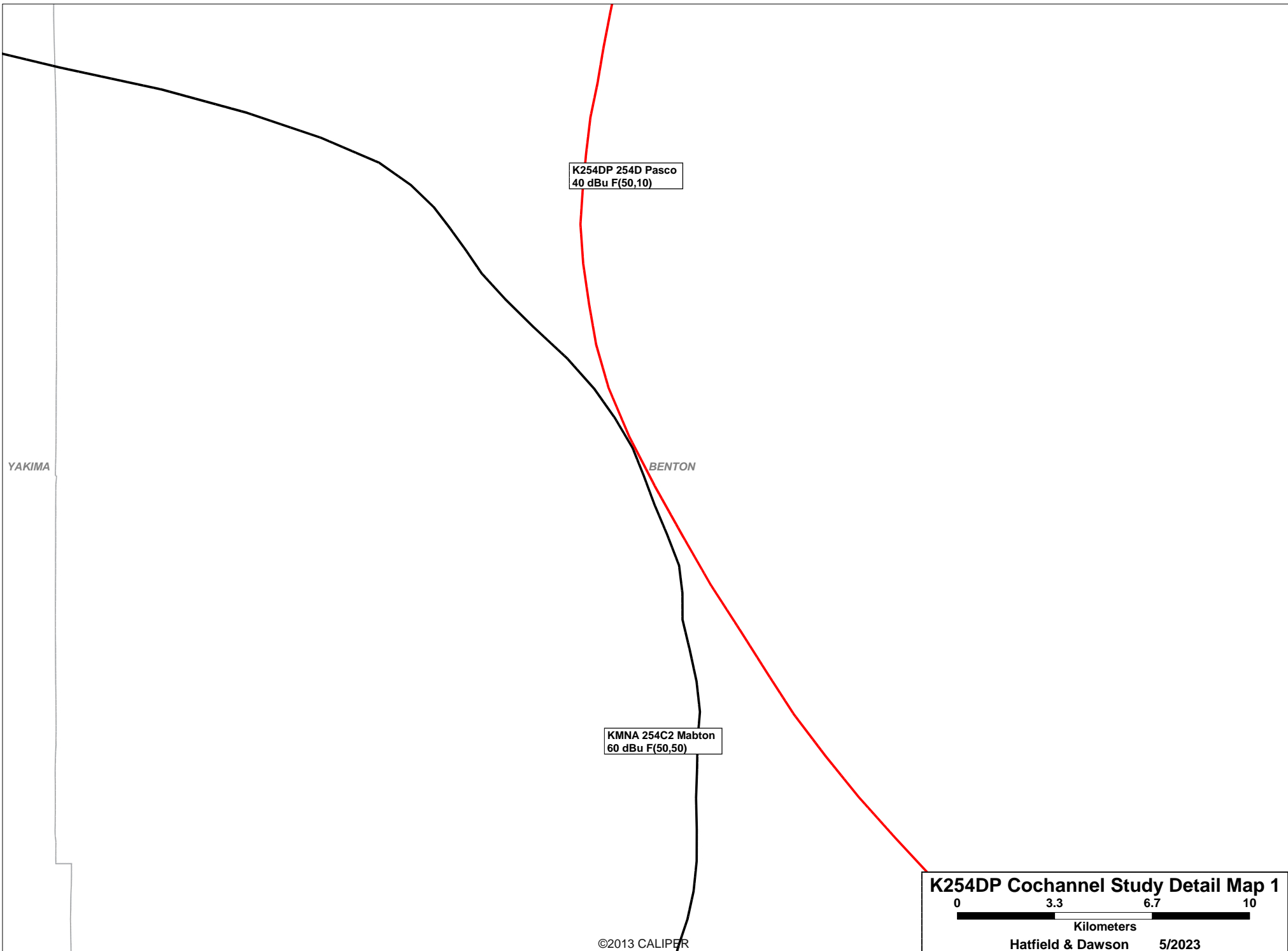
=====
SEARCH PARAMETERS                               FM Database Date: 20230515
Channel: 254A      98.7 MHz                      Page 1
Latitude: 46  4 57.0 (NAD83)
Longitude: 119  9 44.2
Safety Zone: 50 km
Job Title: K254DP PASCO

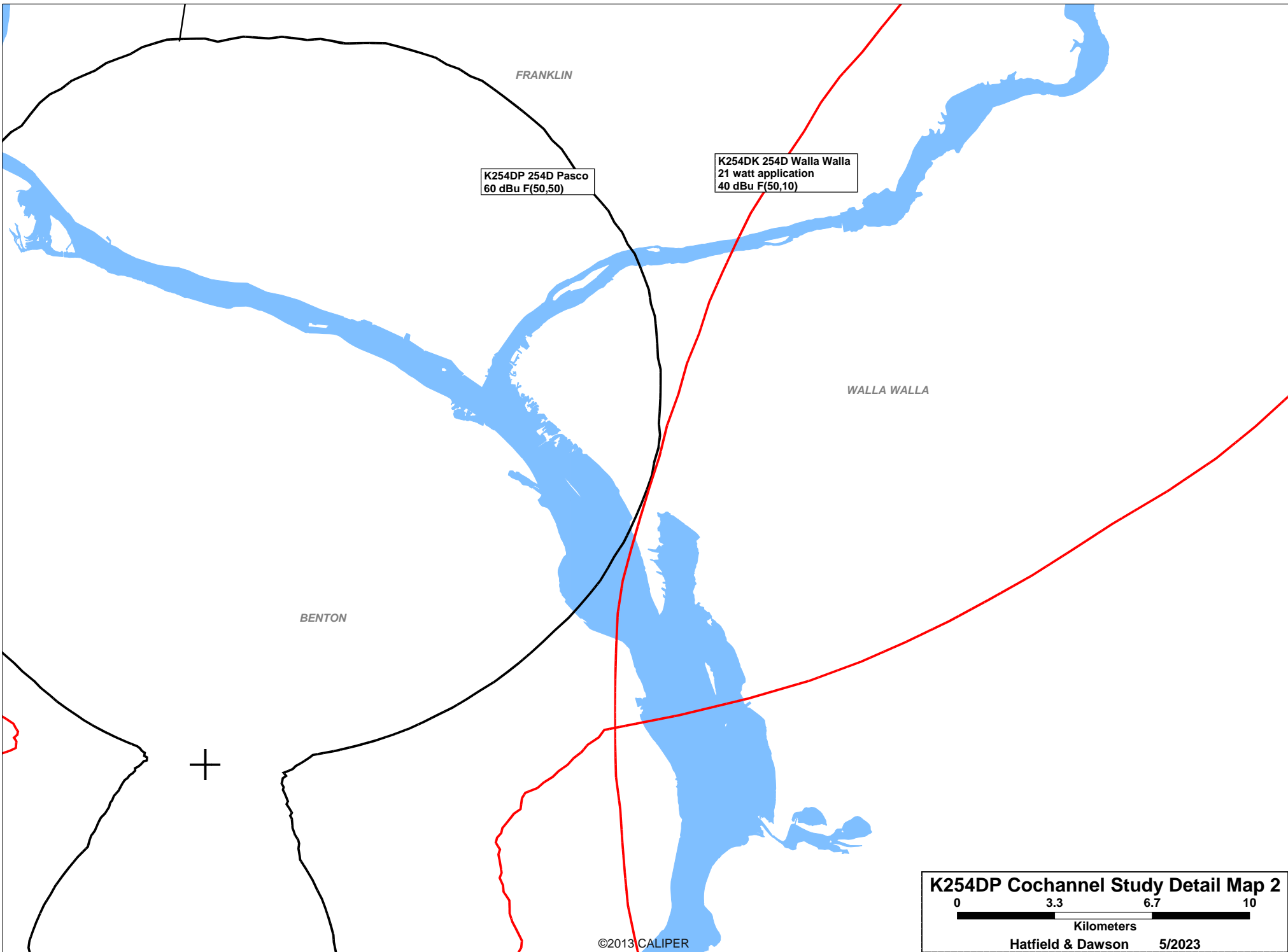
```

Call Status	City St	FCC File No.	Channel Freq.	ERP(kW) HAAT(m)	Latitude Longitude	Bearing deg-True	Dist (km)	Req (km)
K201DH LIC	PENDLETON OR	BMLFT-20130430AB	201D 88.1	0.250 0.0	45 41 41.4 118 50 27.9	149.9	49.78 0.00	0 TRANS
KTCV LIC	KENNEWICK WA	BLED-20100122ABI	201A 88.1	3.500 -28.0	46 13 6.5 119 12 5.1	348.7	15.41 5.41	10 CLOSE
KEYW LIC	PASCO WA	BLH-20130311ABH	252C1 98.3	25.000 304.0	46 4 57.4 119 9 43.0	64.3 SS	0.03 -74.97	75 SHORT
KEYG-FM LIC	GRAND COULEE WA	0000195914	253C0 98.5	100.000 303.0	47 49 18.0 118 55 59.0	5.1	194.13 42.13	152 CLEAR
KUBQ LIC	LA GRANDE OR	BLH-19930909KB	254C2 98.7	2.250 592.0	45 26 25.4 117 53 34.7	125.5	121.84 -44.16	166 SHORT
KMNA LIC	MABTON WA	BLH-20030325ADO	254C2 98.7	11.500 266.4	46 28 32.4 120 8 41.1	300.4 SS	87.43 -78.57	166 SHORT
K254DK LIC	WALLA WALLA WA	BLFT-20190702AAY	254D 98.7	0.010 0.0	DA 45 59 37.5 118 10 50.8	97.1	76.62 0.00	0 TRANS
K254DK APP	WALLA WALLA WA	0000214781	254D 98.7	0.021 0.0	DA 45 59 37.5 118 10 50.8	97.1	76.62 0.00	0 TRANS
K254DP LIC	PASCO WA	0000100060	254D 98.7	0.250 0.0	DA 46 8 46.5 119 6 3.1	33.7	8.53 0.00	0 TRANS
KUJ-FM LIC	BURBANK WA	BLH-20060905AAY	256C1 99.1	52.000 385.0	DA 46 5 57.5 119 7 44.0	54.0 SS	3.19 -71.81	75 SHORT

===== END OF FM SPACING STUDY FOR CHANNEL 254 =====







May 2023
FM Translator K254DP
pASCO, Washington Channel 254D
RF Exposure Study

Facilities Proposed

The proposed operation will be on Channel 254D (98.7 MHz) with a maximum lobe effective radiated power of 250 watts. Operation is proposed with an antenna to be mounted on an existing tower.

The proposed antenna support structure will not exceed 60.96 meters (200 feet) above ground and does not require notification to the Federal Aviation Administration. Therefore, this structure does not require an Antenna Structure Registration Number.

DETERMINATION Results	
Structure does not require registration. There are no airports within 8 kilometers (5 miles) of the coordinates you provided.	
Your Specifications	
NAD83 Coordinates	
Latitude	46-04-57.0 north
Longitude	119-09-44.2 west
Measurements (Meters)	
Overall Structure Height (AGL)	46
Support Structure Height (AGL)	46
Site Elevation (AMSL)	606
Structure Type	
LTOWER - Lattice Tower	

RF Exposure Calculations

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.

$$S(\mu W / cm^2) = \frac{33.4 \times AdjERP(Watts)}{D^2}$$

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 500 meters. Values past this point are increasingly negligible.

Calculations of the power density produced by the proposed K254DP antenna system have been made using the manufacturer's elevation pattern for the Scala CA2-CP antenna to be used. The translator will operate with a single CA2-CP element and so the manufacturer's elevation pattern is considered to be a valid source for data concerning the power to be radiated towards ground level.

The highest calculated ground level power density from K254DP occurs at a point 15 meters from the base of the antenna support structure. At this point the power density is calculated to be 20.3 $\mu W/cm^2$, which is 10.2% of 200 $\mu W/cm^2$ (the FCC MPE for uncontrolled environments).

There are three full-power FM stations located at this hilltop transmitter site. KEYW 252C1 Pasco and KBLD 219C3 Kennewick are located on the same tower as the proposed K254DP facility, while KOLU 211C1 Pasco is located on a tower 110 meters to the east. The most recent of these to be licensed is KOLU (2015) and detailed post-construction ground-level RF exposure measurements were made at that time. These measurements were necessitated by the fact that the calculated maximum from KOLU alone was 111% of the FCC MPE for uncontrolled environments. A report describing those measurements was included in the KOLU license application BLED-20150601AEJ (incorporated herein by reference) and found that the highest reading outside of the fenceline was 73.1% of the FCC MPE for uncontrolled environments.

Given that the highest calculated ground-level power density from K254DP is 10.2% of the FCC MPE for uncontrolled environments (at a location which is just 15 meters from the K254DP tower and therefore at least 95 meters from the KOLU tower), the worst-case result from the addition of K254DP to this site would be 83.3% of the FCC MPE for uncontrolled environments. In reality,

given the 110 meter distance between the two towers, the real-world maximum would be expected to be even lower than this figure. In this situation, it is not believed necessary to include a condition on the K254DP construction permit, requiring new post-construction measurements.

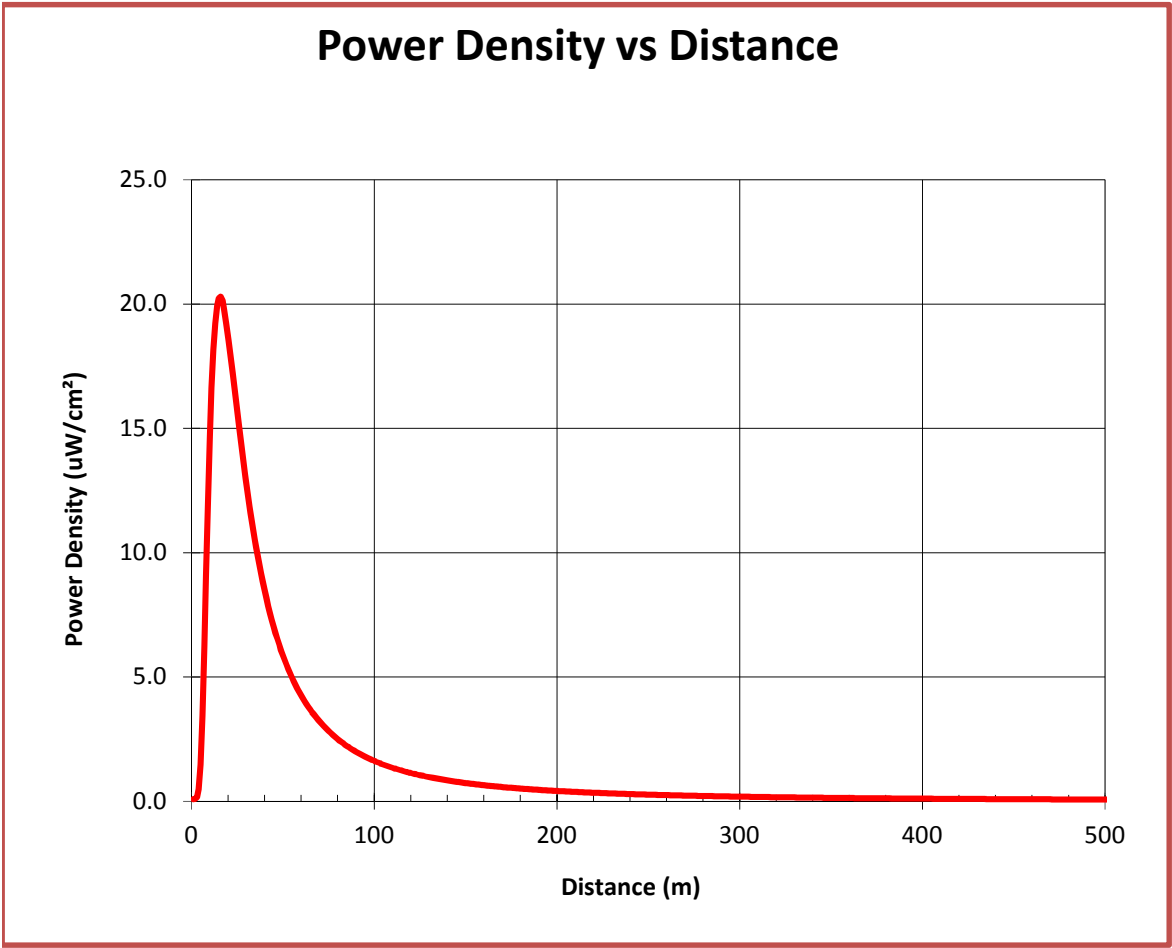
The permittee/licensee in coordination with other users of the site must reduce power or cease operation as necessary to protect persons having access to the site, tower or antenna from radiofrequency exposure in excess of FCC guidelines.



K254DP Pasco
Ground-Level Power Density Calculations
Using Manufacturer's Vertical Plane Pattern

Antenna	CA2CP		
ERP	250	Watts H (avg)	
	250	Watts V (avg)	
Antenna AGL	15.2	meters less 2m is	13.2 meters above the reference plane
MBT	0	degrees	

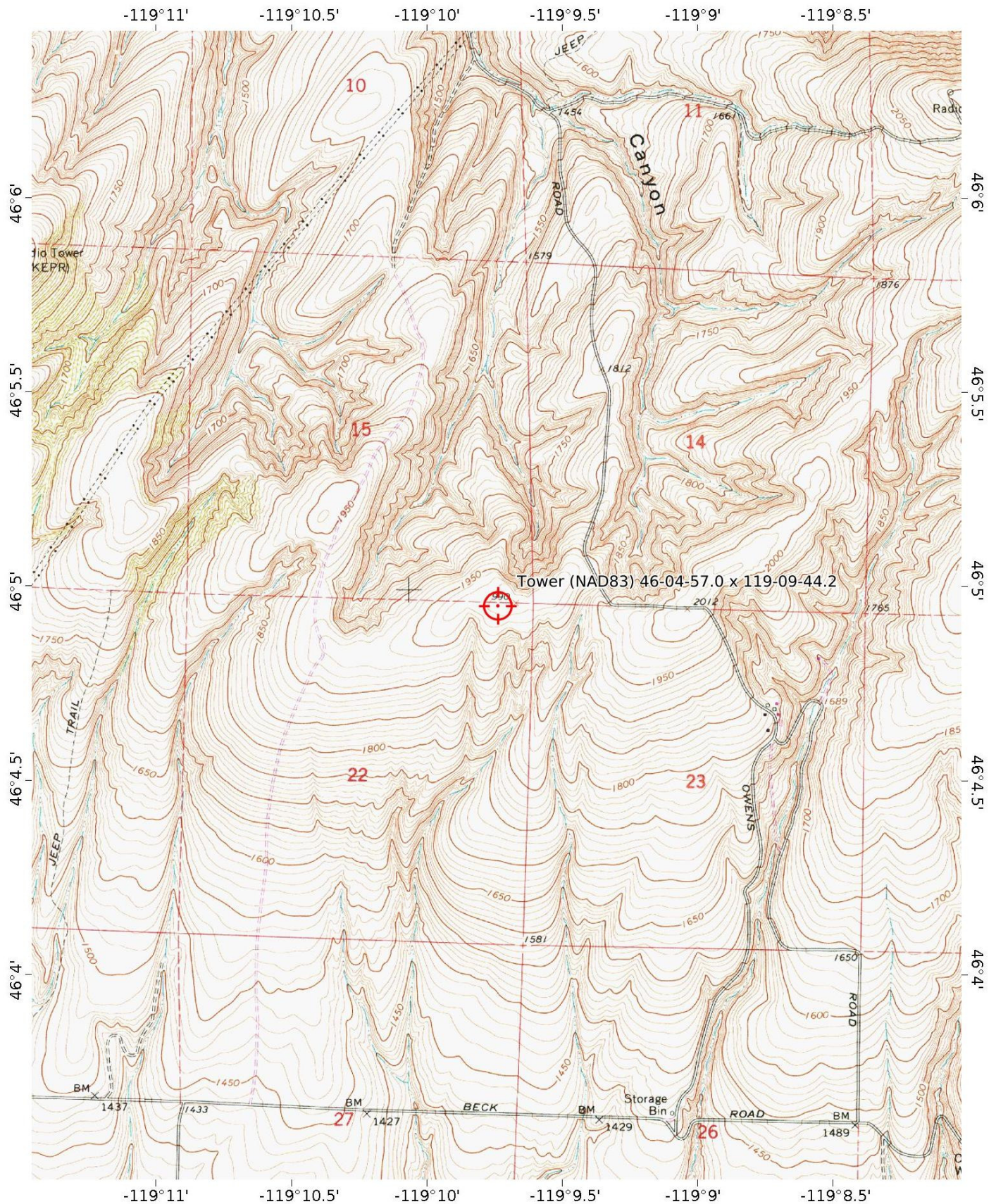
Calculated
Maximum is 20.3 $\mu\text{W}/\text{cm}^2$ at 15 meters from the tower



K254DP Pasco
Ground-Level Power Density Calculations
Using Manufacturer's Vertical Plane Pattern

Distance From Tower (meters)	Hypotenuse (meters)	Depression Angle (with MBT adjust) (degrees)	Interpolated Rel Field	Adjusted ERP (watts)	Power Density uW/cm ²
0	13.20	90.00	0.030	0.5	0.09
1	13.24	85.67	0.031	0.5	0.09
2	13.35	81.38	0.041	0.9	0.16
3	13.54	77.20	0.073	2.7	0.49
4	13.79	73.14	0.129	8.4	1.47
5	14.12	69.25	0.203	20.5	3.44
6	14.50	65.56	0.280	39.3	6.24
7	14.94	62.06	0.349	60.8	9.10
8	15.44	58.78	0.412	85.0	11.92
9	15.98	55.71	0.473	111.7	14.63
10	16.56	52.85	0.522	136.5	16.63
11	17.18	50.19	0.567	160.6	18.17
12	17.84	47.73	0.605	183.1	19.22
13	18.53	45.44	0.640	204.8	19.93
14	19.24	43.32	0.670	224.2	20.23
15	19.98	41.35	0.696	242.5	20.30
16	20.74	39.52	0.720	259.4	20.14
17	21.52	37.83	0.740	273.7	19.74
18	22.32	36.25	0.757	286.7	19.22
19	23.14	34.79	0.774	299.8	18.71
20	23.96	33.42	0.790	312.0	18.15
21	24.80	32.15	0.804	323.5	17.57
22	25.66	30.96	0.818	334.9	17.00
23	26.52	29.85	0.830	344.8	16.38
24	27.39	28.81	0.841	353.4	15.74
25	28.27	27.83	0.850	361.0	15.09
26	29.16	26.92	0.859	368.7	14.49
27	30.05	26.05	0.867	375.4	13.89
28	30.96	25.24	0.875	382.5	13.33
29	31.86	24.47	0.881	388.3	12.78
30	32.78	23.75	0.887	393.6	12.24
31	33.69	23.06	0.893	399.1	11.75
32	34.62	22.42	0.899	404.3	11.27
33	35.54	21.80	0.905	409.1	10.82
34	36.47	21.22	0.909	413.4	10.38
35	37.41	20.66	0.914	417.7	9.97
36	38.34	20.14	0.919	422.1	9.59
37	39.28	19.63	0.923	425.6	9.21
38	40.23	19.16	0.926	428.7	8.85
39	41.17	18.70	0.929	431.3	8.50
40	42.12	18.26	0.931	433.8	8.17
41	43.07	17.85	0.934	436.1	7.85
42	44.03	17.45	0.936	438.3	7.56
43	44.98	17.07	0.939	440.5	7.27
44	45.94	16.70	0.941	442.8	7.01

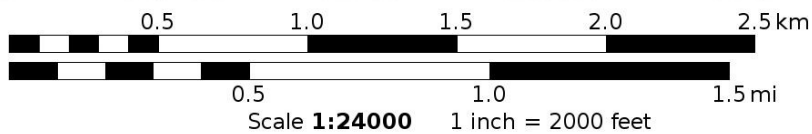
45	46.90	16.35	0.944	445.2	6.76
46	47.86	16.01	0.946	447.4	6.53
47	48.82	15.69	0.948	449.2	6.30
48	49.78	15.38	0.950	451.0	6.08
49	50.75	15.08	0.952	452.7	5.87
50	51.71	14.79	0.953	454.4	5.68
51	52.68	14.51	0.955	455.9	5.49
52	53.65	14.24	0.957	457.5	5.31
53	54.62	13.99	0.958	459.0	5.14
54	55.59	13.74	0.959	460.1	4.97
55	56.56	13.50	0.961	461.3	4.82
56	57.53	13.26	0.962	462.4	4.67
57	58.51	13.04	0.963	463.5	4.52
58	59.48	12.82	0.964	464.7	4.39
59	60.46	12.61	0.965	465.9	4.26
60	61.43	12.41	0.967	467.1	4.13
61	62.41	12.21	0.968	468.3	4.02
62	63.39	12.02	0.969	469.4	3.90
63	64.37	11.83	0.970	470.3	3.79
64	65.35	11.65	0.971	471.2	3.69
65	66.33	11.48	0.972	472.0	3.58
66	67.31	11.31	0.972	472.8	3.49
67	68.29	11.15	0.973	473.6	3.39
68	69.27	10.99	0.974	474.4	3.30
69	70.25	10.83	0.975	475.2	3.22
70	71.23	10.68	0.976	475.9	3.13
71	72.22	10.53	0.976	476.6	3.05
72	73.20	10.39	0.977	477.3	2.98
73	74.18	10.25	0.978	478.0	2.90
74	75.17	10.11	0.978	478.7	2.83
75	76.15	9.98	0.979	479.3	2.76
76	77.14	9.85	0.979	479.5	2.69
77	78.12	9.73	0.980	479.8	2.63
78	79.11	9.61	0.980	480.0	2.56
79	80.10	9.49	0.980	480.2	2.50
80	81.08	9.37	0.980	480.5	2.44
81	82.07	9.26	0.980	480.7	2.38
82	83.06	9.14	0.981	480.9	2.33
83	84.04	9.04	0.981	481.1	2.28
84	85.03	8.93	0.981	481.4	2.22
85	86.02	8.83	0.982	481.7	2.17
86	87.01	8.73	0.982	482.0	2.13
87	88.00	8.63	0.982	482.3	2.08
88	88.98	8.53	0.982	482.6	2.04
89	89.97	8.44	0.983	482.8	1.99
90	90.96	8.34	0.983	483.1	1.95
91	91.95	8.25	0.983	483.4	1.91
92	92.94	8.16	0.984	483.6	1.87
93	93.93	8.08	0.984	483.9	1.83
94	94.92	7.99	0.984	484.1	1.80
95	95.91	7.91	0.984	484.3	1.76
96	96.90	7.83	0.984	484.5	1.72



Mercator Projection

WGS84

UTM Zone 11T



Hatfield & Dawson Consulting Engineers

