

**January 2021
KQFO(FM) Channel 261C1
Pasco, Washington
Allocation Study**

This application proposes a new construction permit for KQFO on Channel 261C1, at Pasco, Washington. "One step" upgrade of KQFO from Channel 261C2 to Channel 261C1 has previously been authorized.

Channel 261C1 Transmitter Site

The attached spacing study shows that the proposed transmitter site meets the co-channel and adjacent channel spacing requirements for Class C1 stations as prescribed in §73.207 of the Commission's Rules, with the exception of a short-spacing to the licensed operation of KZLY on Channel 258C3 at lone. Processing pursuant to §73.215 of the Commission's Rules is requested with respect to KZLY, and the attached allocation study map is included to demonstrate the lack of prohibited contour overlap with that facility.

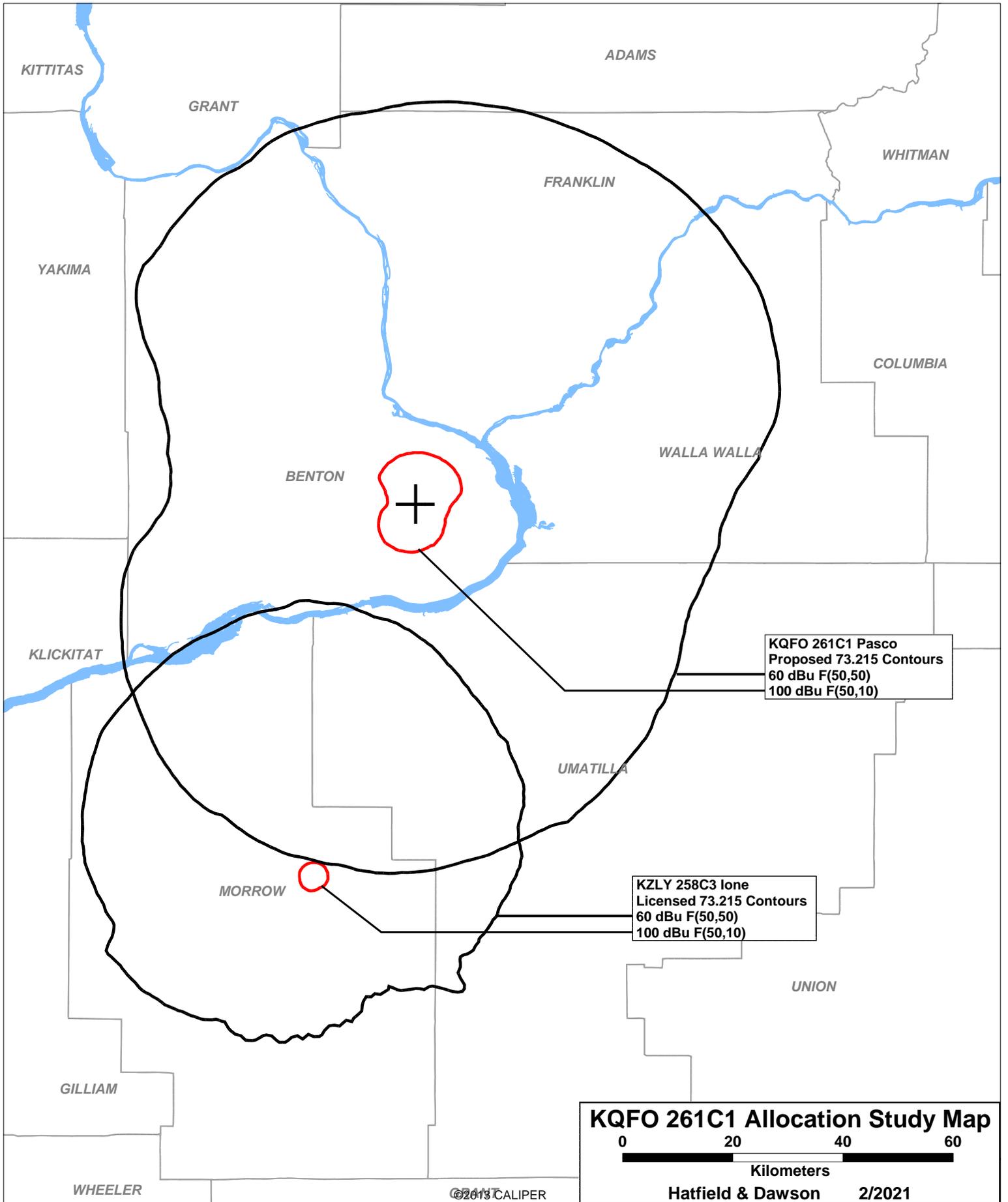
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SEARCH PARAMETERS FM Database Date: 20210104
Page 1

Channel: 261C1 100.1 MHz
 Latitude: 46 5 42.9 (NAD83)
 Longitude: 119 11 45.5
 Safety Zone: 32 km
 Job Title: KQFO 261C1 JOHNSON BUTTE

Call Status	City St	FCC File No.	Channel Freq.	ERP(kW) HAAT(m)	Latitude Longitude	Bearing deg-True	Dist (km)	Req (km)
KZLY	IONE		258C3	1.800	45 29 11.4	195.2	70.11	76
LIC	OR	BLH-20131126BMX	99.5	370.0	119 25 56.0		-5.89	SHORT
ABSOLUTE MINIMUM 73.215 SPACING = 70 KM								
K258CN	RICHLAND		258D	0.250	46 6 14.4	79.0	5.11	0
LIC	WA	BLFT-20161122ACD	99.5	0.0	119 7 52.0		0.00	TRANS
K259CR	MILTON-FREEWATER		259D	0.170	45 59 22.4	98.1	79.80	0
LIC	OR	BLFT-20151104GKB	99.7	0.0	118 10 34.8		0.00	TRANS
KHHK	YAKIMA		259C3	4.100	46 31 19.4	298.9	99.86	76
LIC	WA	BMLH-20140204ABJ	99.7	245.0	120 20 12.2		23.86	CLEAR
K260DL	QUINCY		260D	0.250	47 19 12.4	341.5	143.81	0
CP	WA	BNPFT-20171212AA	99.9	0.0	119 48 4.1		0.00	TRANS
KVGD-LP	GOLDENDALE		261L1	0.099	45 49 6.8	256.8	129.76	0
LIC	WA	BLL-20150921AAL	100.1	0.0	120 49 19.6		0.00	LPFM
KQFO	PASCO		261C1	40.000	46 5 46.5	46.7	0.16	245
CP	WA	BPH-20170818AAI	100.1	317.0	119 11 40.0		-244.84	SHORT
KQFO	PASCO		261C2	8.400	46 6 14.4	79.0	5.11	224
LIC	WA	BLH-20171115AAM	100.1	362.0	119 7 52.0		-218.89	SHORT
K261BH	HEPPNER		261D	0.048	45 23 27.4	197.2	81.90	0
LIC	OR	BLFT-19850226TC	100.1	0.0	119 30 19.0		0.00	TRANS
KBWN-LP	BUENA		262L1	0.100	46 25 49.4	293.9	93.64	0
LIC	WA	BLL-20150714ACV	100.3	0.0	120 18 37.2		0.00	LPFM
K262DB	WENATCHEE		262D	0.250	47 22 50.5	330.2	165.51	0
CP	WA	BNPFT-20171212AA	100.3	0.0	120 17 19.3		0.00	TRANS
K263BJ	RICHLAND		263D	0.015	46 14 7.4	328.3	18.34	0
LIC	WA	BLFT-20160125AAE	100.5	0.0	119 19 17.0		0.00	TRANS
KHSS	ATHENA		264C2	6.300	45 59 22.4	98.1	79.80	79
LIC	OR	BLH-20091029AAL	100.7	403.0	118 10 34.8		0.80	CLOSE

==== END OF FM SPACING STUDY FOR CHANNEL 261 =====

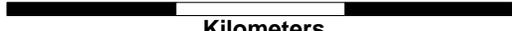


KQFO 261C1 Pasco
Proposed 73.215 Contours
60 dBu F(50,50)
100 dBu F(50,10)

KZLY 258C3 lone
Licensed 73.215 Contours
60 dBu F(50,50)
100 dBu F(50,10)

KQFO 261C1 Allocation Study Map

0 20 40 60



Kilometers

Hatfield & Dawson 2/2021

**January 2021
KQFO(FM) Channel 261C1
Pasco, Washington
RF Exposure Study**

Facilities Proposed

The proposed operation will be on Channel 261C1 (100.1 MHz) with an effective radiated power of 52 kilowatts. Operation is proposed with a 5-element circularly-polarized omni-directional 0.9-wavelength-spaced antenna. The antenna will be side-mounted on an existing tower on Johnson Butte.

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	46-05-42.9 north
Longitude	119-11-45.5 west
Measurements (Meters)	
Overall Structure Height (AGL)	30.5
Support Structure Height (AGL)	30.5
Site Elevation (AMSL)	613.0
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.

$$S(\mu W / cm^2) = \frac{33.40981 \times AdjERP(Watts)}{D^2}$$

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 500 meters. Values past this point are increasingly negligible.

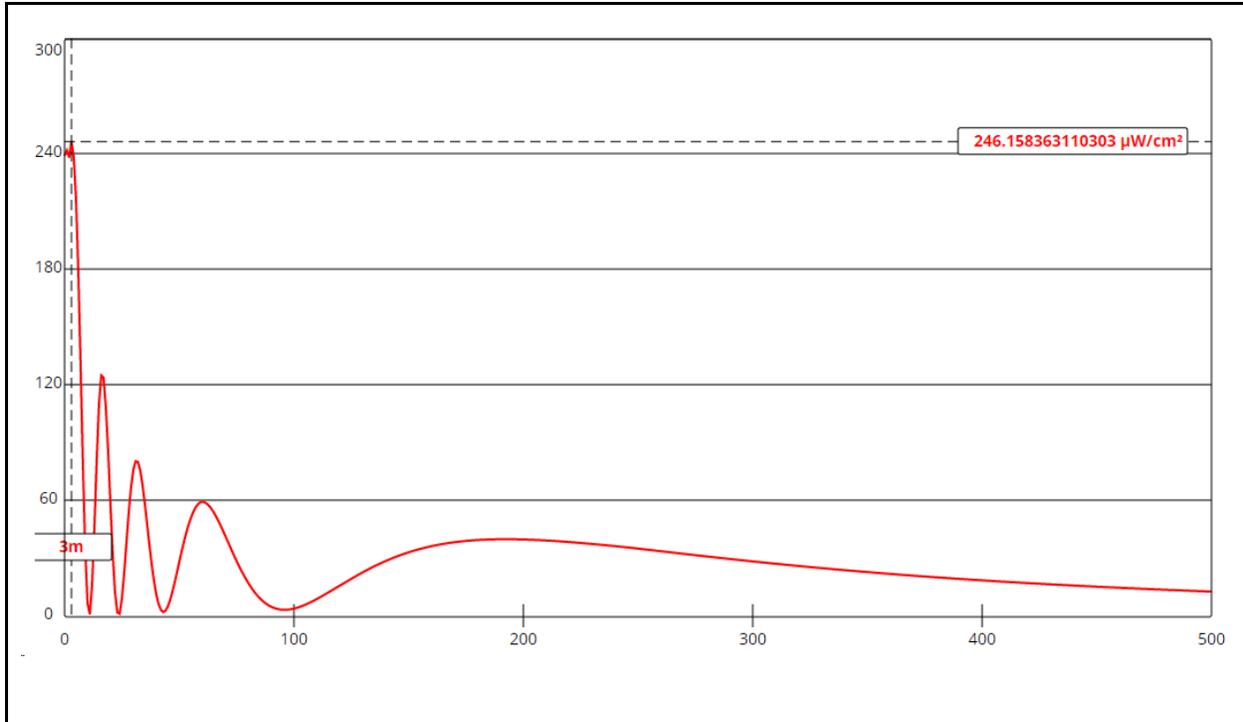
Calculations of the power density produced by the proposed KQFO antenna system assume a Type 2 element pattern, which is the element pattern for the Jampro JMPC-5 RFR.9 antenna proposed for use. The highest calculated ground level power density occurs at a distance of 3 meters from the base of the antenna support structure. At this point the power density is calculated to be 246.2 $\mu W/cm^2$.

The tower is located within a fenced compound which is not accessible to the general population, and which is considered to be a controlled access area. The compound is fenced to a distance of at least 6 meters from the leg on which the KQFO antenna will be installed. At a distance of 6 meters from the antenna, the ground-level power density is calculated to be 178.6 $\mu W/cm^2$.

FM station KFAE is located on a taller tower adjacent to the proposed KQFO tower, and within the same fenced compound. Calculations of the power density produced by the existing KFAE antenna system assume a Type 6 element pattern, which is the element pattern for the Shively 6810-8 antenna which has long been in use by that station.¹ The highest calculated ground level power density occurs at a distance of 23 meters from the base of the antenna support structure. At this point the power density is calculated to be 35.5 $\mu W/cm^2$. The KQFO and KFAE maxima will not coincide, and therefore no areas (whether inside or outside the fenced compound) are expected to exceed the applicable FCC MPE level.

¹ Based on this firm's experience with field measurements of the ground-level exposure levels from Shively model 6810 antennas, we find that their performance most closely matches the Type 6 element model from FMModel version 2.10. Use of the Type 1 element model dramatically overstates the power density levels from these antennas. Therefore, we have used FMModel v2.10 for the purposes of calculating exposure from KFAE in this application.

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.



Ground-Level RF Exposure

OET FMModel

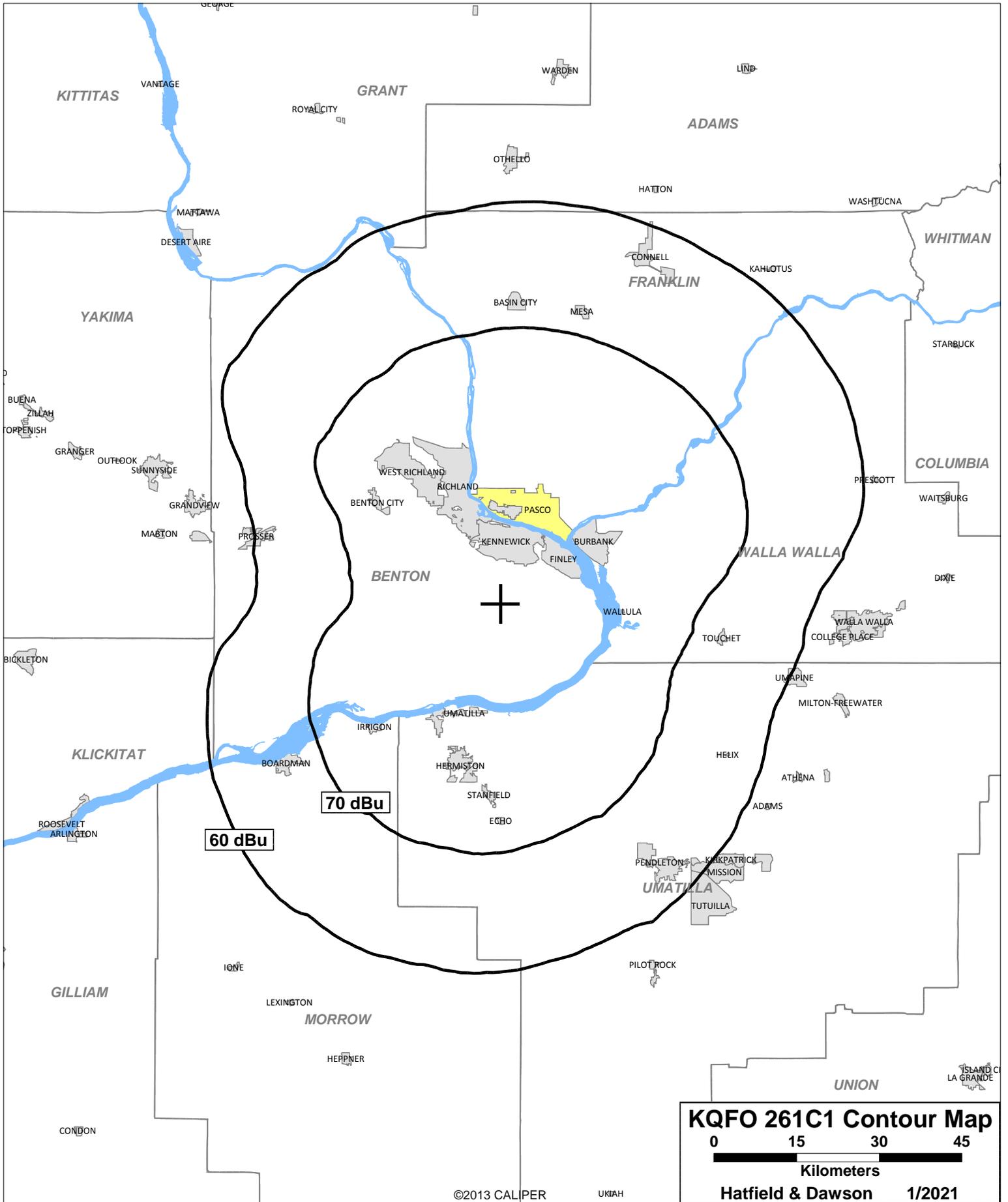
KQFO 261C1 Pasco

Antenna Type: Jampro JMPC-5 RFR.9 (Type 2)
 No. of Elements: 5
 Element Spacing: 0.9 wavelength

Distance: 500 meters
 Horizontal ERP: 52 kW
 Vertical ERP: 52 kW

Antenna Height: 23.5 meters AGL

Maximum Calculated Power Density is 246.2 $\mu\text{W}/\text{cm}^2$ at 3 meters from the antenna structure.

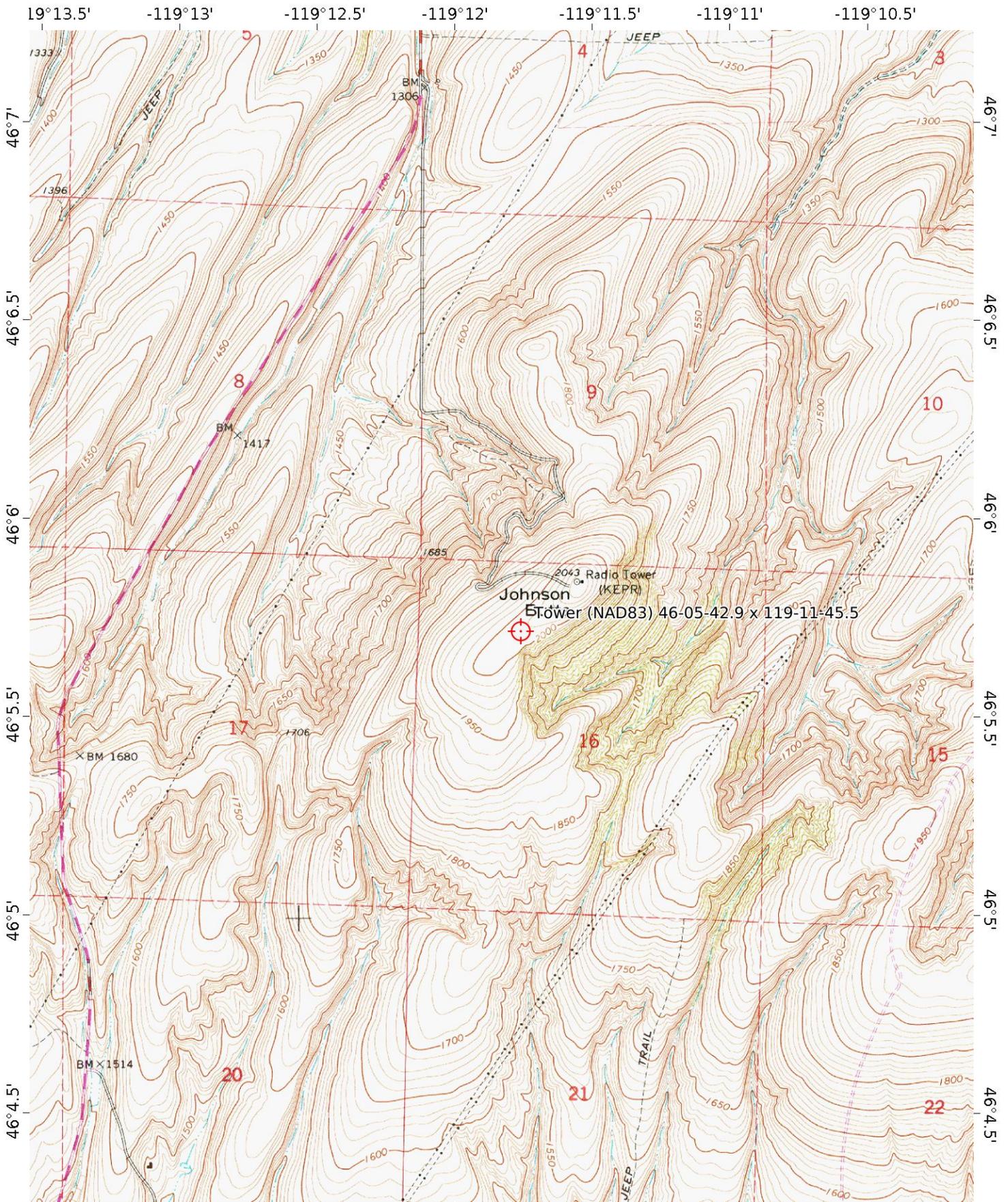


KQFO 261C1 Contour Map

0 15 30 45

Kilometers

Hatfield & Dawson 1/2021



Mercator Projection
WGS84
USNG Zone 11TLM