January 2015
FM Translator K283BX
Wapato, Washington Channel 283D
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.

The proposed translator transmitter site is located within the 60 dBu protected contour of second-adjacent channel station KXDD 281C1 Yakima. The proposed site is 4.53 km from the KXDD transmitter site at a bearing of 297 degrees True. Given the KXDD antenna's 282 meter HAAT and 100 kW ERP along this radial, KXDD places a 110.8 dBu contour at the translator transmitter site. The corresponding interfering contour from the translator is 110.8 + 40 = 150.8 dBu. This contour extends at most 3.2 meters from the translator antenna per a Free Space calculation and does not reach ground level. There is no population within this contour. Therefore, the proposed facility is believed to satisfy the requirements of §74.1204(d) with respect to KXDD.

The proposed translator transmitter site is located within the 60 dBu protected contour of second-adjacent channel station KYXE 285A Union Gap. The proposed site is 4.57 km from the KYXE transmitter site at a bearing of 297 degrees True. Given the KYXE antenna's 335 meter HAAT and 0.680 kW ERP along this radial, KYXE places an 89.7 dBu contour at the translator transmitter site. The corresponding interfering contour from the translator is 89.7 + 40 = 129.7 dBu. Taking into account the vertical plane pattern of the Nicom BKG77-1 antenna to be used, Free Space calculations demonstrate that this contour does not reach ground level. There is no population within this contour. Therefore, the proposed facility is believed to satisfy the requirements of §74.1204(d) with respect to KYXE.

K229AD Yakima Application

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, with the exception of a short-spacing to an application for site change which was recently filed by K229AD Yakima. The short-spacing was in fact created by the K229AD application (BPFT-20150106ABN), and K229AD has proposed operation with 99 watts ERP so as to avoid the spacing requirement.

Since K283BX is already authorized with 250 watts at its current transmitter site, the K229AD application is not believed to be any impediment to continued 250 watt operation by K283BX at its new site.

FMSTUDY.EXE Copyright 2013, Hatfield & Dawson, LLC Version 1.82

SEARCH PARAMETERS FM Database Date: 150109

Channel: 283A 104.5 MHz

Latitude: 46 31 55

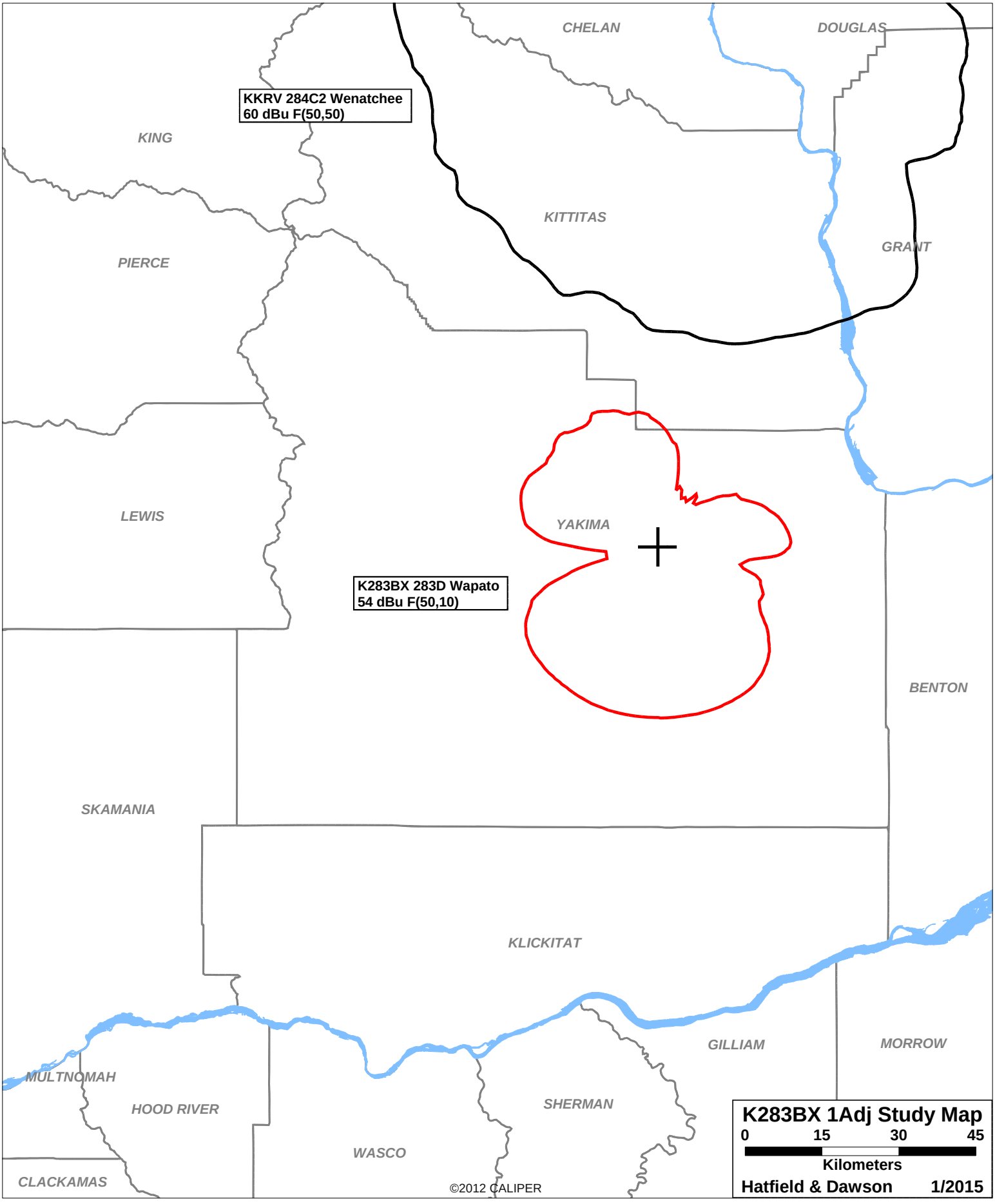
Longitude: 120 27 14

Safety Zone: 50 km

Job Title: K283BX WAPATO

Call Status	City St	FCC File No.	Channel Freq.	ERP(kW) HAAT(m)		Latitude Longitude	Bearing deg-True	Dist (km)	Req (km)
K229AD	YAKIMA		229D	0.099	DA	46-30-48	117.0	4.57	0
APP	WA	BPFT-50106ABN	93.7	0.0		120-24-03		0.00	TRANS
K229AD	YAKIMA		229D	0.035	DA	46-37-49	330.9	12.52	0
LIC	WA	BLFT-30815ADU	93.7	0.0		120-32-01		0.00	TRANS
KXDDaux	YAKIMA		281C1	1.000		46-36-09	334.2	8.72	0
LIC	WA	BXLH-40718ABE	104.1	-59.0		120-30-13		0.00	AUX
KXDD	YAKIMA		281C1	100.000	DA	46-30-48	117.2	4.53	75
LIC	WA	BLH-20305AAX	104.1	245.0		120-24-05	SS	-70.47	SHORT
K282AA	KENNEWICK, ETC. (OR)		282D	0.274		46-06-15	114.6	112.55	0
LIC	WA	BRFT-840723ND	104.3	525.0		119-07-46		0.00	TRANS
	MORO		283C2	0.000		45-29-03	190.5	118.41	166
VAC	OR	RM-10663	104.5	0.0		120-43-48		-47.59	SHORT
KMCQ	COVINGTON		283C2	7.100	DA	47-32-35	312.5	168.58	166
LIC	WA	BLH-00125AEW	104.5	388.0		122-06-25		2.58	CLOSE
K283BX	WAPATO		283D	0.250		46-30-48	117.0	4.57	0
CP MOD	WA	BMPFT-40915ABT	104.5	418.0		120-24-03		0.00	TRANS
KKRV	WENATCHEE		284C2	6.500		47-28-44	9.7	106.85	106
LIC	WA	BLH-20205AAA	104.7	403.0		120-12-49		0.85	CLOSE
KKRVaux	WENATCHEE		284C2	1.800		47-28-44	9.7	106.85	0
LIC	WA	BXMLH-40228AHD	104.7	405.0		120-12-49		0.00	AUX
KYXE	UNION GAP		285A	0.680		46-30-48	117.0	4.57	31
LIC	WA	BLH-21010ACI	104.9	297.0		120-24-03		-26.43	SHORT
KYXEaux	UNION GAP		285A	0.040		46-30-48	117.2	4.53	0
CP	WA	BXPH-41031ABX	104.9	221.0		120-24-05		0.00	AUX

==== END OF FM SPACING STUDY FOR CHANNEL 283 ====


CHELAN
DOUGLAS
KKRV 284C2 Wenatchee
60 dBu F(50,50)
KING
KITTITAS
GRANT
PIERCE
LEWIS
YAKIMA
K283BX 283D Wapato
54 dBu F(50,10)
BENTON
SKAMANIA
KLICKITAT
GILLIAM
MORROW
MULTNOMAH
HOOD RIVER
SHERMAN
WASCO
CLACKAMAS
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K283BX 1Adj Study Map
0 15 30 45
Kilometers
Hatfield & Dawson 1/2015

Free Space Interference Area Calculator
Interference Area to KYXE

Antenna Height: 27 meters AGL
Contour Level: 129.7 dBu equals 3.1 V/m
ERP in Watts: 250 Watts

Maximum distance
to interfering contour is: 119.0 feet equals 36.3 meters

Antenna: BKG77-1

Depression Angle (degrees)	Nicom BKG77-1 Relative Field	Adjusted ERP (Watts)	Free Space Distance To 129.7 dBu Contour Along the depression angle	Horizontal Distance (meters)	Contour AGL (meters)	
-90	0.105	2.8	3.8 meters	0	23.2	(Straight down)
-89	0.104	2.7	3.8	0.1	23.2	
-88	0.102	2.6	3.7	0.1	23.3	
-87	0.100	2.5	3.6	0.2	23.4	
-86	0.102	2.6	3.7	0.3	23.3	
-85	0.103	2.7	3.7	0.3	23.3	
-84	0.105	2.8	3.8	0.4	23.2	
-83	0.110	3.0	4.0	0.5	23.0	
-82	0.115	3.3	4.2	0.6	22.9	
-81	0.120	3.6	4.4	0.7	22.7	
-80	0.129	4.2	4.7	0.8	22.4	
-79	0.137	4.7	5.0	0.9	22.1	
-78	0.145	5.3	5.3	1.1	21.9	
-77	0.155	6.0	5.6	1.3	21.5	
-76	0.166	6.9	6.0	1.5	21.2	
-75	0.176	7.7	6.4	1.7	20.8	
-74	0.188	8.8	6.8	1.9	20.4	
-73	0.199	9.9	7.2	2.1	20.1	
-72	0.211	11.1	7.7	2.4	19.7	
-71	0.225	12.7	8.2	2.7	19.3	
-70	0.239	14.3	8.7	3.0	18.9	
-69	0.253	16.0	9.2	3.3	18.4	
-68	0.268	18.0	9.7	3.6	18.0	
-67	0.282	19.9	10.2	4.0	17.6	
-66	0.297	22.1	10.8	4.4	17.2	
-65	0.313	24.5	11.4	4.8	16.7	
-64	0.329	27.1	11.9	5.2	16.3	
-63	0.345	29.8	12.5	5.7	15.8	
-62	0.361	32.6	13.1	6.1	15.4	
-61	0.376	35.3	13.6	6.6	15.1	
-60	0.391	38.2	14.2	7.1	14.7	
-59	0.406	41.2	14.7	7.6	14.4	
-58	0.421	44.3	15.3	8.1	14.0	
-57	0.436	47.5	15.8	8.6	13.7	
-56	0.450	50.6	16.3	9.1	13.5	
-55	0.465	54.1	16.9	9.7	13.2	
-54	0.479	57.4	17.4	10.2	12.9	
-53	0.494	61.0	17.9	10.8	12.7	
-52	0.508	64.5	18.4	11.3	12.5	
-51	0.523	68.4	19.0	11.9	12.3	
-50	0.539	72.6	19.6	12.6	12.0	
-49	0.553	76.5	20.1	13.2	11.9	

-48	0.568	80.7	20.6	13.8	11.7	
-47	0.584	85.3	21.2	14.5	11.5	
-46	0.600	90.0	21.8	15.1	11.3	
-45	0.616	94.9	22.4	15.8	11.2	
-44	0.631	99.5	22.9	16.5	11.1	
-43	0.646	104.3	23.4	17.1	11.0	
-42	0.661	109.2	24.0	17.8	11.0	
-41	0.676	114.2	24.5	18.5	10.9	
-40	0.691	119.4	25.1	19.2	10.9	
-39	0.706	124.6	25.6	19.9	10.9	
-38	0.719	129.2	26.1	20.6	10.9	
-37	0.732	134.0	26.6	21.2	11.0	
-36	0.745	138.8	27.0	21.9	11.1	
-35	0.758	143.6	27.5	22.5	11.2	
-34	0.771	148.6	28.0	23.2	11.4	
-33	0.783	153.3	28.4	23.8	11.5	
-32	0.795	158.0	28.8	24.5	11.7	
-31	0.806	162.4	29.2	25.1	11.9	
-30	0.818	167.3	29.7	25.7	12.2	
-29	0.829	171.8	30.1	26.3	12.4	
-28	0.840	176.4	30.5	26.9	12.7	
-27	0.852	181.5	30.9	27.5	13.0	
-26	0.862	185.8	31.3	28.1	13.3	
-25	0.872	190.1	31.6	28.7	13.6	
-24	0.881	194.0	32.0	29.2	14.0	
-23	0.891	198.5	32.3	29.8	14.4	
-22	0.900	202.5	32.7	30.3	14.8	
-21	0.910	207.0	33.0	30.8	15.2	
-20	0.918	210.7	33.3	31.3	15.6	
-19	0.926	214.4	33.6	31.8	16.1	
-18	0.934	218.1	33.9	32.2	16.5	
-17	0.941	221.4	34.1	32.7	17.0	
-16	0.947	224.2	34.4	33.0	17.5	
-15	0.954	227.5	34.6	33.4	18.0	
-14	0.960	230.4	34.8	33.8	18.6	
-13	0.966	233.3	35.1	34.2	19.1	
-12	0.972	236.2	35.3	34.5	19.7	
-11	0.977	238.6	35.4	34.8	20.2	
-10	0.982	241.1	35.6	35.1	20.8	
-9	0.987	243.5	35.8	35.4	21.4	
-8	0.991	245.5	36.0	35.6	22.0	
-7	0.995	247.5	36.1	35.8	22.6	
-6	0.999	249.5	36.2	36.0	23.2	
-5	0.999	249.5	36.2	36.1	23.8	
-4	0.999	249.5	36.2	36.2	24.5	
-3	0.999	249.5	36.2	36.2	25.1	
-2	1.000	250.0	36.3	36.3	25.7	
-1	1.000	250.0	36.3	36.3	26.4	
0	1.000	250.0	36.3	36.3	27.0	(Horizontal)

January 2015
FM Translator K283BX Wapato
FM Translator K291BV Wapato
FM Translator K295BT Wapato
RF Exposure Study

Facilities Proposed

The proposed translator facilities will operate from a common antenna system, each with an Effective Radiated Power of 250 watts. Operation is proposed with an antenna to be mounted on an existing tower with FCC Antenna Structure Registration Number 1275279.

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.

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

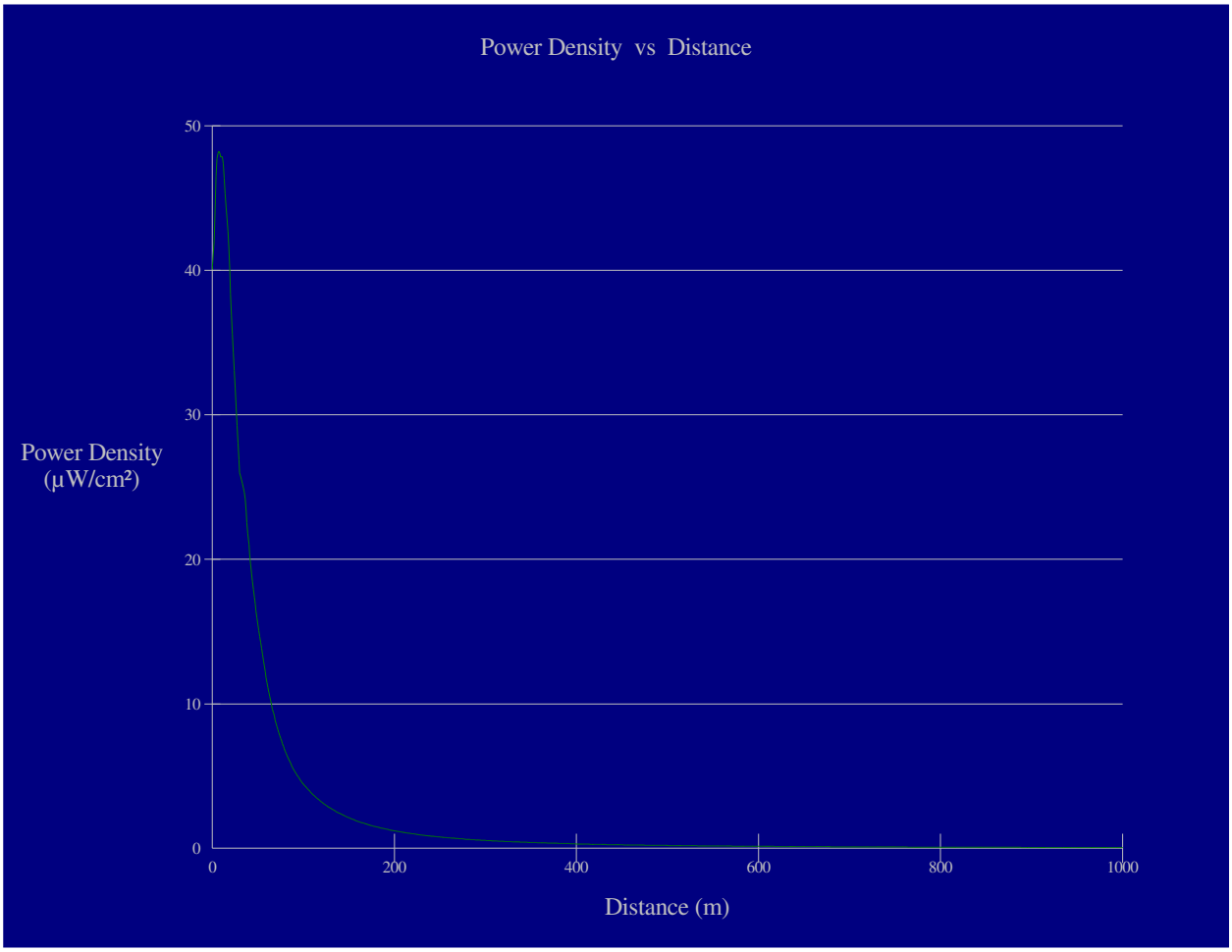
Where: *AdjERP(Watts)* is the maximum lobe effective radiated power times the element pattern factor times the array pattern factor.

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 1000 meters. Values past this point are increasingly negligible.

Calculations of the power density produced by the proposed antenna system assume a Type 1 element pattern, which is the appropriate element pattern for the Nicom BKG77-1 antenna proposed for use. For a simplified analysis, this study uses the total ERP to be emitted from the antenna. The highest calculated ground level power density occurs at a distance of 7 meters from the base of the antenna support structure. At this point the power density is calculated to be 16.1 $\mu W/cm^2$, which is 8.1% of 200 $\mu W/cm^2$ (the FCC standard for uncontrolled environments).

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 radiation in excess of FCC guidelines.

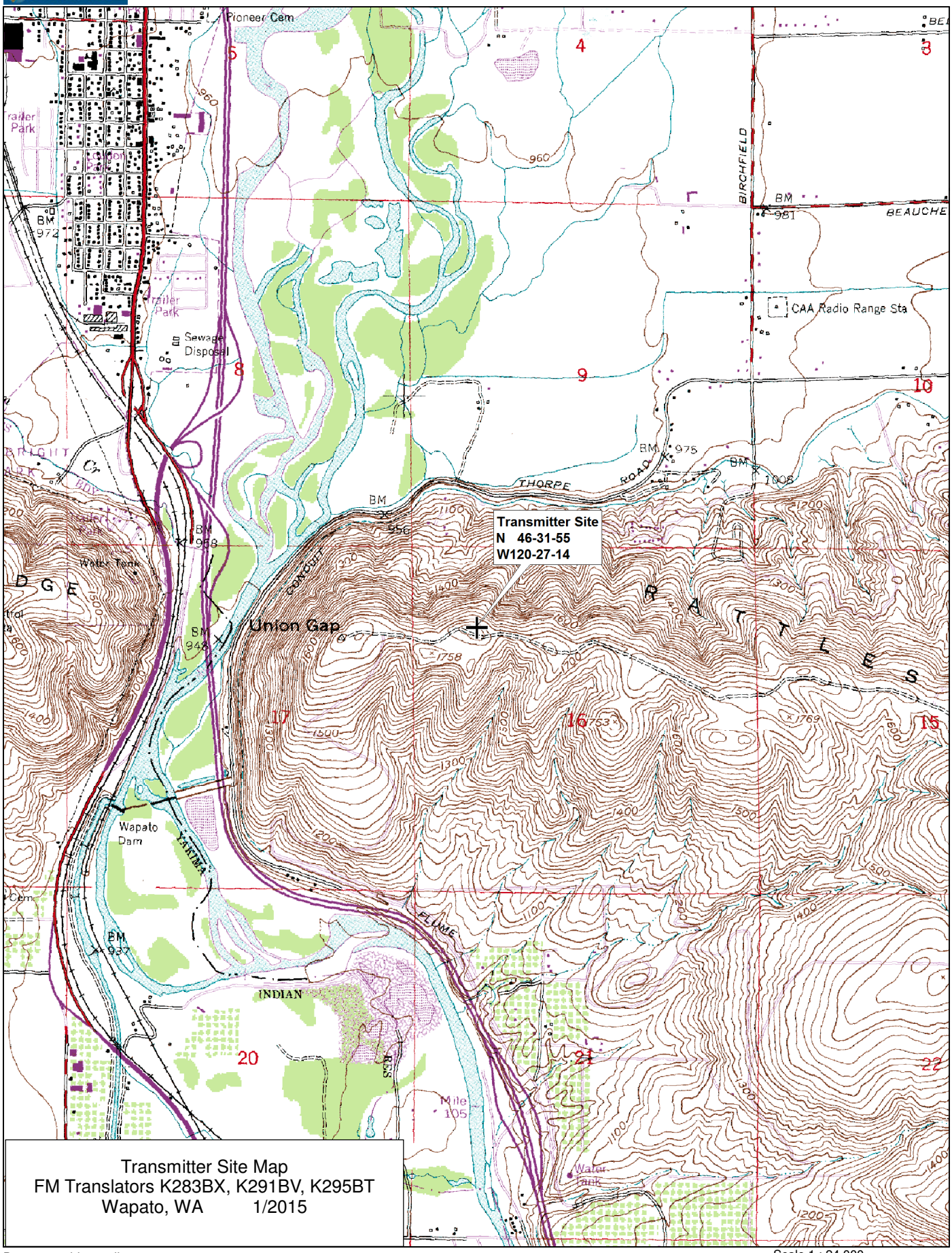


Ground-Level RF Exposure **OET FMModel**

K283BX, K291BV, and K295BT Wapato

Antenna Type:	Nicom BKG77-1 (ring stub assumed)
No. of Elements:	1
Element Spacing:	1.0 wavelength
Distance:	1000 meters
Horizontal ERP:	0.750 kW (total for 3 stations)
Vertical ERP:	0.750 kW (total for 3 stations)
Antenna Height:	27 meters AGL

Maximum Calculated Power Density is 48.2 µW/cm^2 at 7 meters from the antenna structure.



Transmitter Site Map
FM Translators K283BX, K291BV, K295BT
Wapato, WA 1/2015

TN
MN (15.4°E)

Scale 1 : 24,000
1 cm = 240.0 m
Data Zoom 13-1