

THOMAS M. ECKELS, PE
STEPHEN S. LOCKWOOD, PE
DAVID J. PINION, PE
ERIK C. SWANSON, PE

THOMAS S. GORTON, PE
MICHAEL H. MEHIGAN, PE

JAMES B. HATFIELD, PE
BENJAMIN F. DAWSON III, PE
CONSULTANTS

HATFIELD & DAWSON
CONSULTING ELECTRICAL ENGINEERS
9500 GREENWOOD AVE. N.
SEATTLE, WASHINGTON 98103

TELEPHONE (206) 783-9151
FACSIMILE (206) 789-9834
E-MAIL hatdaw@hatdaw.com

MAURY L. HATFIELD, PE
(1942-2009)
PAUL W. LEONARD, PE
(1925-2011)

**Proposed Translator
Channel 291D at Ephrata, WA
To Rebroadcast KTBI(AM) 810 kHz Ephrata, WA
November 2017**

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.

SEARCH PARAMETERS

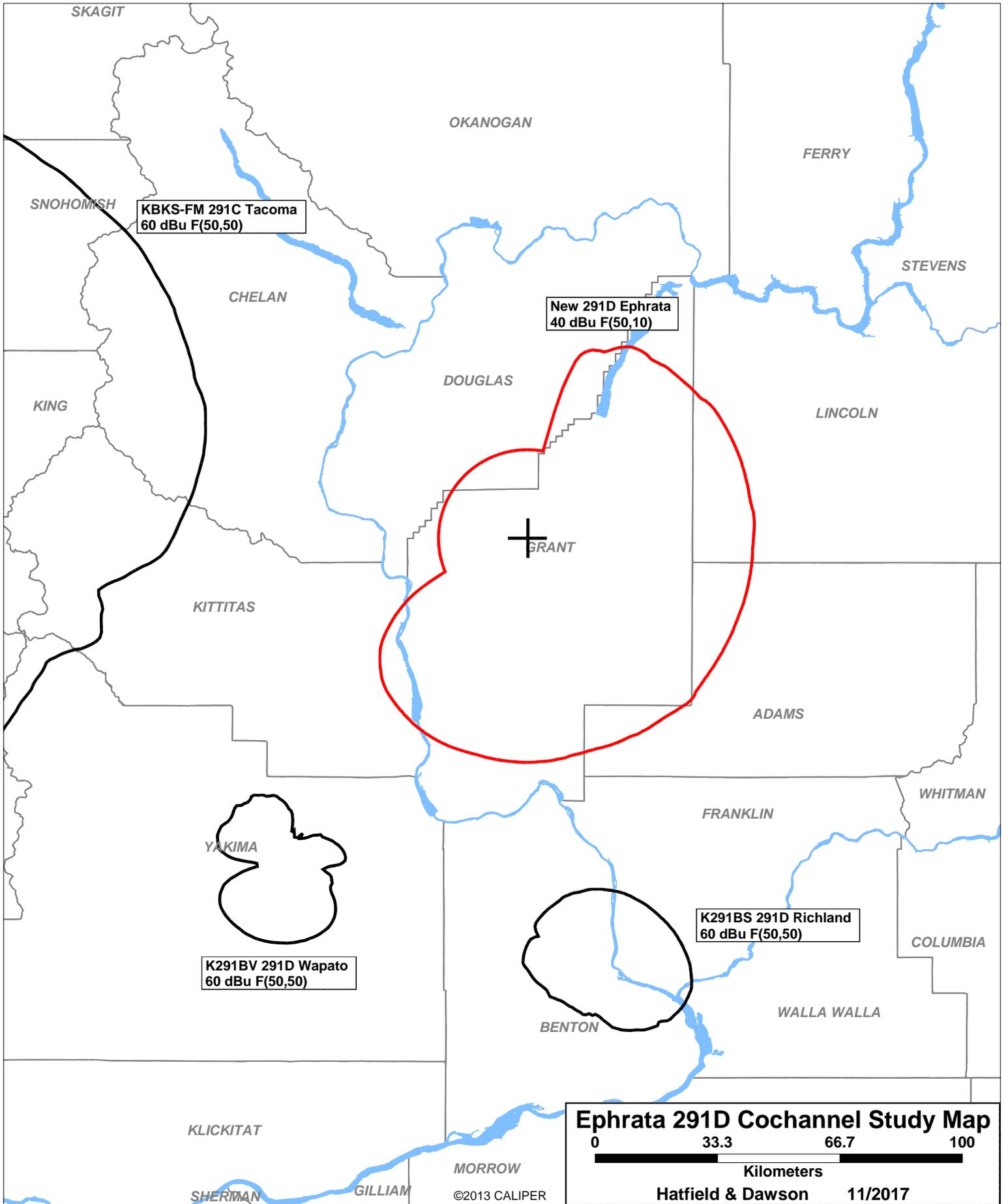
FM Database Date: 171024

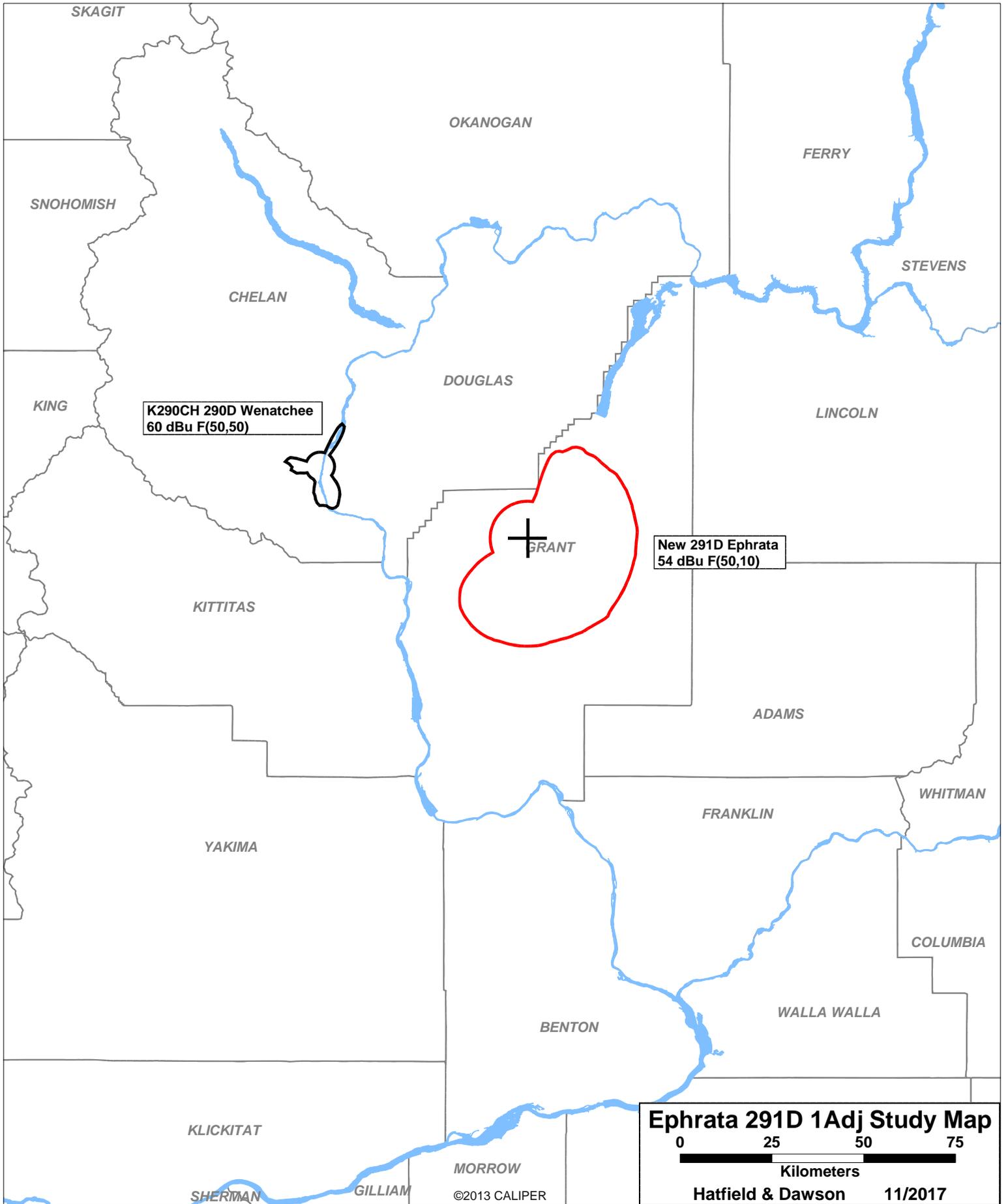
Channel: 291A 106.1 MHz
 Latitude: 47 19 13
 Longitude: 119 34 22
 Safety Zone: 50 km
 Job Title: EPHRATA 291

Page 1

Call Status	City St	FCC File No.	Channel Freq.	ERP(kW) HAAT(m)	Latitude Longitude	Bearing deg-True	Dist (km)	Req (km)
NEW-T APP	EPHRATA WA	BNPFT-70731AJH	238D 95.5	0.250 117.0	47-19-01 119-33-46	116.2	0.84 0.00	0 TRANS
K288GN LIC	CHELAN WA	BLFT-60509AAA	288D 105.5	0.002 871.0	47-48-26 120-02-00	327.6	64.28 0.00	0 TRANS
KRSE LIC	YAKIMA WA	BMLH-30327AIS	289C1 105.7	100.000 172.3	46-42-42 120-37-22	230.0	104.65 29.65	75 CLEAR
K290CH LIC	WENATCHEE WA	BLFT-50512AAB	290D 105.9	0.023 0.0	47-29-46 120-19-06	289.5	59.57 0.00	0 TRANS
	SUMMERLAND BC	-	291B 106.1	0.000 0.0	49-39-33 119-34-23	360.0	260.08 50.08	210 CLEAR
KZFN LIC	MOSCOW ID	BLH-890213KA	291C1 106.1	63.000 281.0	46-40-51 116-58-26	108.9	210.06 10.06	200 CLEAR
KWCQ LIC	CONDON OR	BLH-10104AAW	291C1 106.1	17.000 279.1	45-14-09 120-18-09	193.9	238.43 38.43	200 CLEAR
NEW-T APP	EPHRATA WA	BNPFT-70726APP	291D 106.1	0.250 0.0	47-19-13 119-34-22	0.0	0.00 0.00	0 TRANS
K291BS LIC	RICHLAND WA	BLFT-60422AAE	291D 106.1	0.250 0.0	46-14-08 119-19-13	170.9	122.12 0.00	0 TRANS
KBKS-FM LIC	TACOMA WA	BLH-01023AFA	291C 106.1	73.000 698.0	47-30-17 121-58-04	277.4	181.91 -44.09	226 SHORT
K291BV LIC	WAPATO WA	BLFT-50309AGG	291D 106.1	0.250 299.0	46-31-55 120-27-14	217.7	110.38 0.00	0 TRANS
KCSY LIC	TWISP WA	BLH-940304KF	292A 106.3	0.220 499.0	48-19-06 120-06-46	340.2	118.11 46.11	72 CLEAR
KKWN LIC	CASHMERE WA	BLH-931112KC	294A 106.7	6.000 -73.0	47-30-21 120-24-33	288.5	66.41 35.41	31 CLEAR

===== END OF FM SPACING STUDY FOR CHANNEL 291 =====





Facilities Proposed

The proposed operation will be on Channel 291D (106.1 MHz) with an effective radiated power of 0.250 kilowatts. Operation is proposed with a 2-element circularly-polarized omni-directional half-wave-spaced antenna. The antenna will be side-mounted on an existing tower in the Beezley Hills with FCC Antenna Structure Registration Number 1052663.

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.

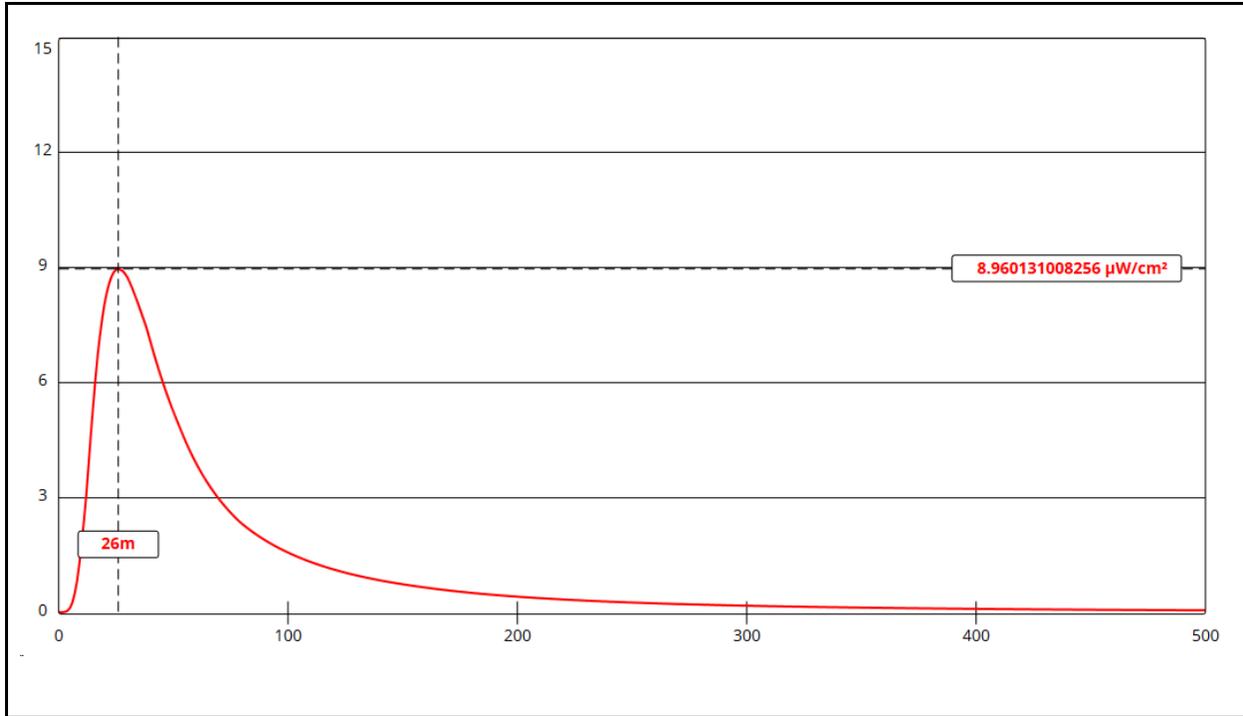
Ground level power densities have been calculated for locations extending from the base of the tower to a distance of 500 meters. Values past this point are increasingly negligible.

Calculations of the power density produced by the proposed translator antenna system assume a Type 2 element pattern, which is the element pattern for the Jampro JLLP-2 half-wave antenna proposed for use. The highest calculated ground level power density occurs at a distance of 26 meters from the base of the antenna support structure. At this point the power density is calculated to be 9.0 $\mu W/cm^2$, which is 4.5% of 200 $\mu W/cm^2$ (the FCC standard for uncontrolled environments).

These calculations show that the maximum calculated power density produced at two meters above ground level by the proposed operation alone is less than 5% of the applicable FCC exposure limit at all locations between 1 and 500 meters from the base of the antenna support structure. Section 1.1307(b)(3) of the Commission's Rules excludes applications for new facilities or modifications to

existing facilities from the requirement of preparing an environmental assessment when the calculated emissions from the applicant's proposed facility are predicted to be less than 5% of the applicable FCC exposure limit. Therefore, the proposed facility is in compliance with Section 1.1301 *et seq* and no further analysis of RF exposure at this site is required 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

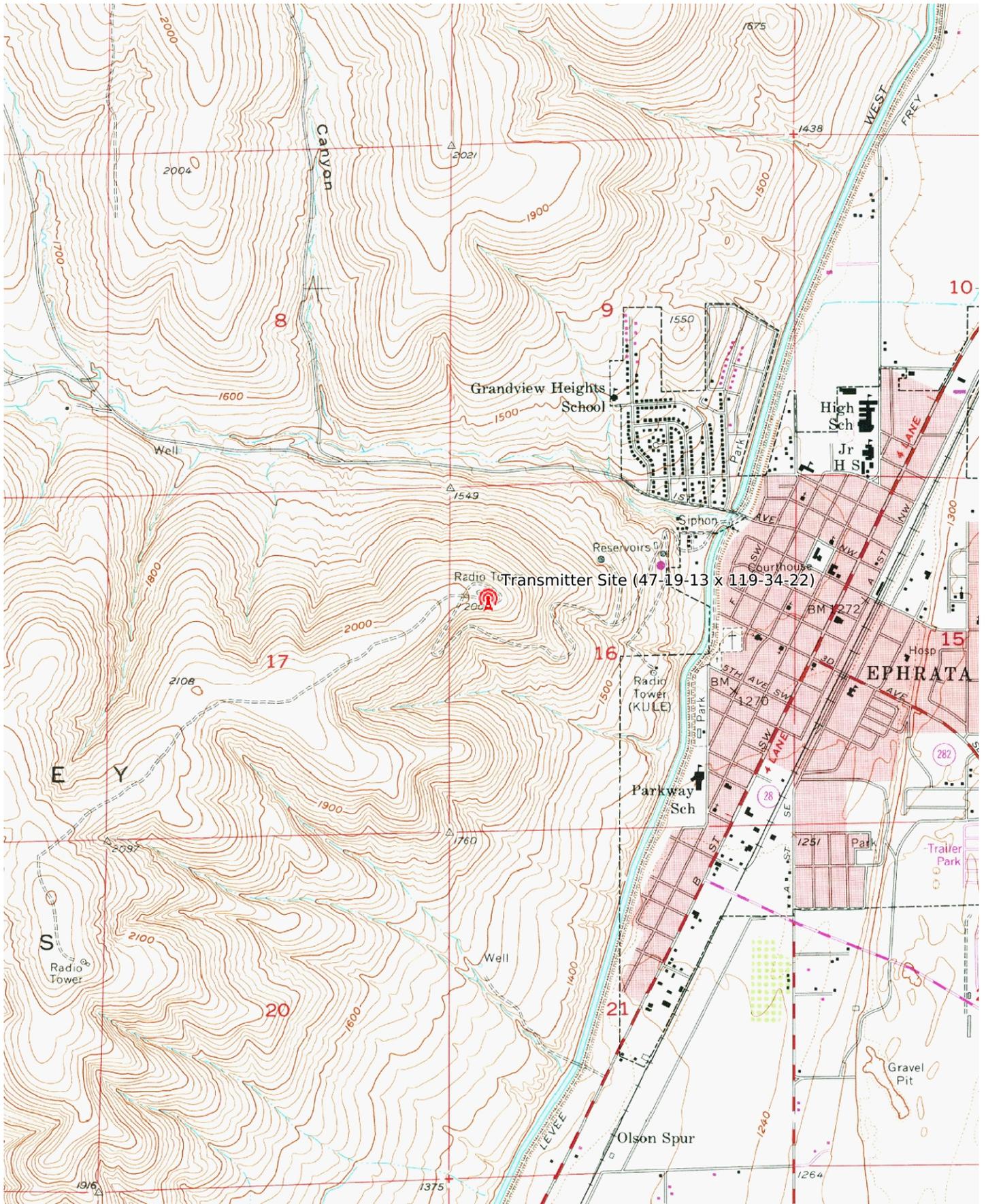
Ephrata 291D

Antenna Type: Jampro JLLP-2 (Type 2)
 No. of Elements: 2
 Element Spacing: 0.5 wavelength

Distance: 500 meters
 Horizontal ERP: 250 watts
 Vertical ERP: 250 watts

Antenna Height: 16 meters AGL

Maximum Calculated Power Density is 9.0 μW/cm² at 26 meters from the antenna structure.



Mercator Projection
 NAD27 Conus
 USNG Zone 11TLN
 CalTopo.com

