

**September 2016
FM Translator K237DS
Spokane, Washington Channel 239D
Allocation Study**

250 Mile Window CP Modification

This application is being filed as a modification of a “250 Mile Window Application” construction permit. K237DS was granted a construction permit on Channel 239 to relocate for use with AM station KMBI during the First Modification Window. This application proposes a change to a tower which is located 20 kilometers from the authorized site. As is demonstrated by the attached contour map, there is overlap of the translator’s authorized and proposed 60 dBu contours.

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 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.

KPND 237C Deer Park

The proposed translator transmitter site is located within the 60 dBu protected contour of second-adjacent channel station KPND 237C Deer Park. 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
KPND 237C	59.27 km 206 deg True	56 kW 726 meters	72.9 dBu F(50,50)	112.9 dBu	see following

Given that the transmitting antenna will be installed at a height of 131 meters above ground, and taking into consideration the vertical plane pattern of the ERI LPX-1 antenna, the attached Free Space calculations demonstrate that the interference area to KPND will 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 KPND.

KIIX-FM 241C Opportunity

The proposed translator transmitter site is located within the 60 dBu protected contour of second-adjacent channel station KIIX-FM 241C Opportunity. 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
KIIX-FM 241C	16.65 km 281 deg True	60 kW 777 meters	96.9 dBu F(50,50)	136.9 dBu	13.1 meters Free Space

The interfering contour will 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 KIIX-FM.

SEARCH PARAMETERS

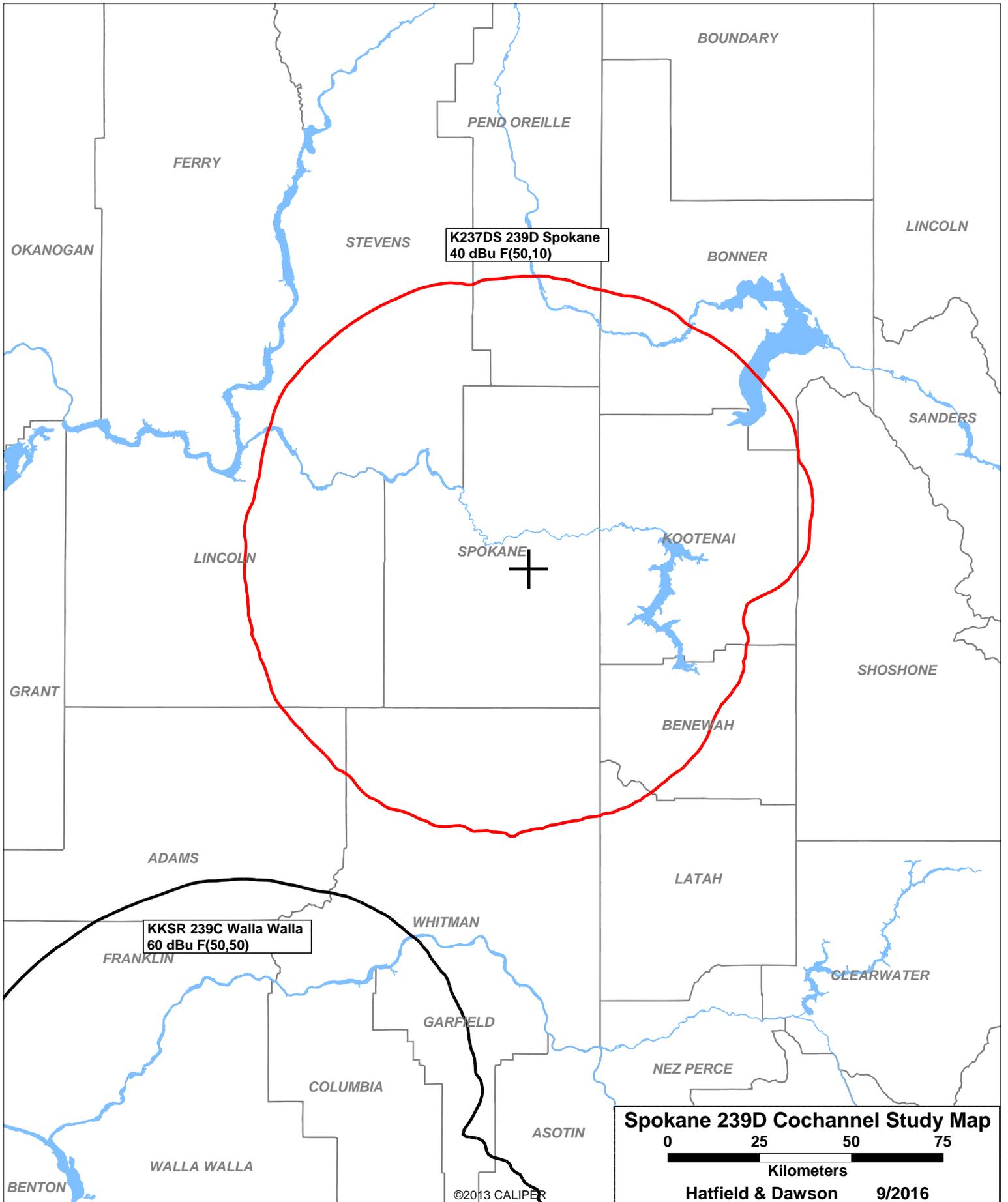
FM Database Date: 160907

Channel: 239A 95.7 MHz
 Latitude: 47 35 58
 Longitude: 117 17 57
 Safety Zone: 50 km
 Job Title: SPOKANE 239 ON PAX TOWER

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Call Status	City St	FCC File No.	Channel Freq.	ERP(kW) HAAT(m)	Latitude Longitude	Bearing deg-True	Dist (km)	Req (km)
KPND LIC	DEER PARK WA	BLH-60718ABU	237C 95.3	56.000 763.0	48-04-44 116-57-11	25.7	59.27 -35.73	95 SHORT
	TRAIL BC	RM-	239C 95.7	0.000 0.0	49-05-33 117-49-12	347.1	170.45 -76.55	247 SHORT
K237DS CP	SPOKANE WA	BPFT-60728AFF	239D 95.7	0.145 181.0	47-41-52 117-31-07	303.7	19.78 0.00	0 TRANS
KKSR LIC	WALLA WALLA WA	BLH-811222AI	239C 95.7	100.000 427.0	45-59-04 118-10-08	200.6	191.42 -34.58	226 SHORT
KIIX-FM LIC	OPPORTUNITY WA	BMLH-41112AIN	241C 96.1	60.000 744.0	47-34-14 117-04-55	101.1	16.65 -78.35	95 SHORT
KSPO LIC	DISHMAN WA	BLH-01219ABI	293A 106.5	2.250 161.0	47-41-39 117-20-03	346.0	10.85 0.85	10 CLOSE

==== END OF FM SPACING STUDY FOR CHANNEL 239 =====



BOUNDARY

PEND OREILLE

FERRY

STEVENS

K237DS 239D Spokane
40 dBu F(50,10)

BONNER

LINCOLN

OKANOGAN

SANDERS

LINCOLN

SPOKANE

KOOTENAI

SHOSHONE

GRANT

BENEWAH

ADAMS

LATAH

KKSR 239C Walla Walla
60 dBu F(50,50)

WHITMAN

FRANKLIN

CLEARWATER

GARFIELD

NEZ PERCE

COLUMBIA

ASOTIN

WALLA WALLA

BENTON

Spokane 239D Free Space Interference Area Calculator

Interference Area to KPND

Antenna Height: 131 meters AGL
 Contour Level: 112.9 dBu equals 0.4 V/m
 ERP in Watts: 172 Watts

Maximum distance
 to interfering contour is: 683.1 feet equals 208.2 meters

Antenna: LPX-1

Depression Angle (degrees)	ERI LPX-1 Relative Field	Adjusted ERP (Watts)	Free Space Distance To 112.9 dBu Contour Along the depression angle	Horizontal Distance (meters)	Contour AGL (meters)
-90	0.016	0.0	3.3 meters	0	127.7
-89	0.020	0.1	4.2	0.1	126.8
-88	0.024	0.1	5.0	0.2	126.0
-87	0.029	0.1	6.0	0.3	125.0
-86	0.035	0.2	7.3	0.5	123.7
-85	0.041	0.3	8.5	0.7	122.5
-84	0.047	0.4	9.8	1.0	121.3
-83	0.054	0.5	11.2	1.4	119.8
-82	0.061	0.6	12.7	1.8	118.4
-81	0.069	0.8	14.4	2.2	116.8
-80	0.077	1.0	16.0	2.8	115.2
-79	0.086	1.3	17.9	3.4	113.4
-78	0.095	1.6	19.8	4.1	111.7
-77	0.104	1.9	21.7	4.9	109.9
-76	0.114	2.2	23.7	5.7	108.0
-75	0.124	2.6	25.8	6.7	106.1
-74	0.135	3.1	28.1	7.7	104.0
-73	0.146	3.7	30.4	8.9	101.9
-72	0.157	4.2	32.7	10.1	99.9
-71	0.169	4.9	35.2	11.5	97.7
-70	0.181	5.6	37.7	12.9	95.6
-69	0.193	6.4	40.2	14.4	93.5
-68	0.206	7.3	42.9	16.1	91.2
-67	0.219	8.2	45.6	17.8	89.0
-66	0.232	9.3	48.3	19.6	86.9
-65	0.245	10.3	51.0	21.6	84.8
-64	0.259	11.5	53.9	23.6	82.5
-63	0.273	12.8	56.8	25.8	80.4
-62	0.288	14.3	60.0	28.2	78.1
-61	0.302	15.7	62.9	30.5	76.0
-60	0.317	17.3	66.0	33.0	73.8
-59	0.332	19.0	69.1	35.6	71.7
-58	0.347	20.7	72.2	38.3	69.7
-57	0.362	22.5	75.4	41.1	67.8
-56	0.378	24.6	78.7	44.0	65.8
-55	0.394	26.7	82.0	47.1	63.8
-54	0.409	28.8	85.2	50.1	62.1
-53	0.425	31.1	88.5	53.3	60.3
-52	0.441	33.5	91.8	56.5	58.6
-51	0.457	35.9	95.2	59.9	57.1
-50	0.473	38.5	98.5	63.3	55.6
-49	0.489	41.1	101.8	66.8	54.2

-48	0.505	43.9	105.1	70.4	52.9
-47	0.521	46.7	108.5	74.0	51.7
-46	0.537	49.6	111.8	77.7	50.6
-45	0.554	52.8	115.4	81.6	49.4
-44	0.570	55.9	118.7	85.4	48.6
-43	0.586	59.1	122.0	89.2	47.8
-42	0.601	62.1	125.1	93.0	47.3
-41	0.617	65.5	128.5	97.0	46.7
-40	0.633	68.9	131.8	101.0	46.3
-39	0.648	72.2	134.9	104.9	46.1
-38	0.664	75.8	138.3	108.9	45.9
-37	0.679	79.3	141.4	112.9	45.9
-36	0.694	82.8	144.5	116.9	46.1
-35	0.709	86.5	147.6	120.9	46.3
-34	0.723	89.9	150.5	124.8	46.8
-33	0.738	93.7	153.7	128.9	47.3
-32	0.752	97.3	156.6	132.8	48.0
-31	0.766	100.9	159.5	136.7	48.9
-30	0.780	104.6	162.4	140.6	49.8
-29	0.793	108.2	165.1	144.4	51.0
-28	0.806	111.7	167.8	148.2	52.2
-27	0.819	115.4	170.5	151.9	53.6
-26	0.831	118.8	173.0	155.5	55.2
-25	0.843	122.2	175.5	159.1	56.8
-24	0.855	125.7	178.0	162.6	58.6
-23	0.866	129.0	180.3	166.0	60.5
-22	0.877	132.3	182.6	169.3	62.6
-21	0.887	135.3	184.7	172.4	64.8
-20	0.897	138.4	186.8	175.5	67.1
-19	0.907	141.5	188.8	178.6	69.5
-18	0.916	144.3	190.7	181.4	72.1
-17	0.925	147.2	192.6	184.2	74.7
-16	0.933	149.7	194.3	186.7	77.5
-15	0.941	152.3	195.9	189.3	80.3
-14	0.949	154.9	197.6	191.7	83.2
-13	0.956	157.2	199.1	194.0	86.2
-12	0.962	159.2	200.3	195.9	89.4
-11	0.968	161.2	201.6	197.8	92.5
-10	0.974	163.2	202.8	199.7	95.8
-9	0.979	164.9	203.8	201.3	99.1
-8	0.983	166.2	204.7	202.7	102.5
-7	0.987	167.6	205.5	204.0	106.0
-6	0.990	168.6	206.1	205.0	109.5
-5	0.993	169.6	206.8	206.0	113.0
-4	0.996	170.6	207.4	206.9	116.5
-3	0.998	171.3	207.8	207.5	120.1
-2	0.999	171.7	208.0	207.9	123.7
-1	1.000	172.0	208.2	208.2	127.4
0	1.000	172.0	208.2	208.2	131.0

September 2016
FM Translator K237DS
Spokane, Washington Channel 239D
RF Exposure Study

Facilities Proposed

The proposed operation will be on Channel 239D (95.7 MHz) with an effective radiated power of 172 watts. Operation is proposed with an antenna to be mounted on an existing tower on Krell Hill, with FCC Antenna Structure Registration Number 1033014.

RF Exposure Calculations

OET Bulletin 65 Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields (Edition 97-01) states in part that:

When performing an evaluation for compliance with the FCC's RF guidelines all significant contributors to the ambient RF environment should be considered. . . For purposes of such consideration, significance can be taken to mean any transmitter producing more than 5% of the applicable exposure limit (in terms of power density or the square of the electric or magnetic field strength) at accessible locations.

As will be demonstrated below, the proposed operation will produce less than 5% of the applicable exposure limit for both controlled and uncontrolled environments. Thus, the proposed facility is categorically excluded from the requirement of further study. Therefore, pursuant to §1.1307(b)(3) of the Commission's Rules no calculations are required for the other FM and TV facilities in the vicinity, and precise calculations are made only with regard to the levels from this proposal.

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.

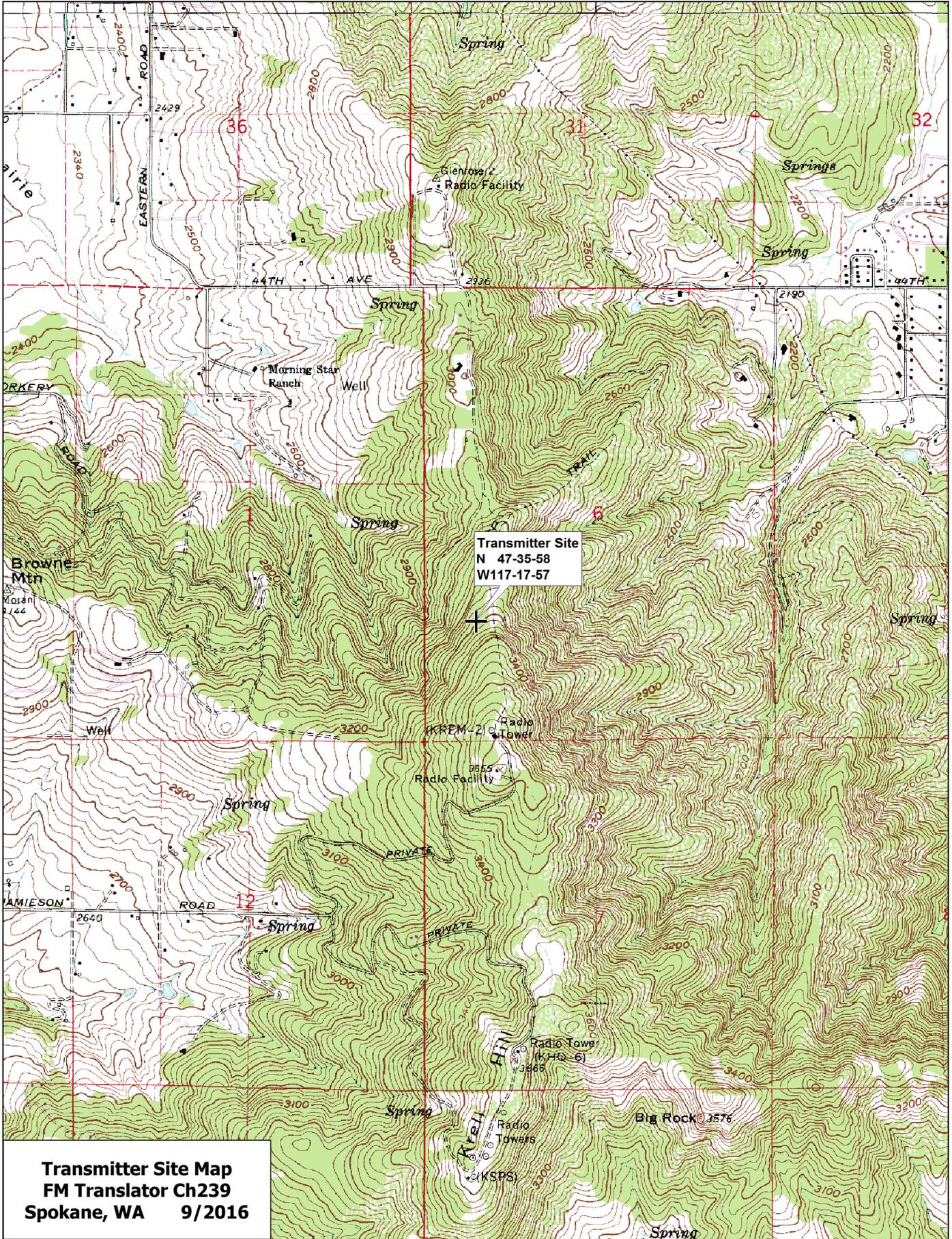
D is the distance in meters from the center of radiation to the calculation point.

Calculations of the power density produced by the proposed antenna system have been made assuming that the antenna will radiate 100% power straight down to a point 2 meters above ground at the base of the tower (129 meters below the antenna). Under this worst-case assumption, the highest calculated ground level power density from the translator occurs at the base of the antenna support structure. At this point the power density is calculated to be 0.7 $\mu W/cm^2$, which is 0.07%

of $1000 \mu\text{W}/\text{cm}^2$ (the FCC standard for controlled environments) and 0.35% of $200 \mu\text{W}/\text{cm}^2$ (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 of the translator alone is less than 5% of the applicable FCC exposure limit at all locations between 1 and 1000 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 applicants 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 radiation in excess of FCC guidelines.



Transmitter Site Map
FM Translator Ch239
Spokane, WA 9/2016

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