

**August 2021
New FM Channel 216A
Cambridge, Idaho
Allocation Study**

The attached spacing study shows the co-channel and adjacent channel spacing between stations and demonstrates that the proposed operation meets the IF channel spacing requirements as prescribed in §73.207 of the Commission's Rules.

Individual stations were examined to confirm the lack of prohibited contour overlap as prescribed in §73.509 of the Commission's Rules. The attached allocation study exhibits demonstrate requisite contour protection for the following domestic stations:

First-adjacent:	KKRH KGCL	215C1 Grangeville 215C1 Jordan Valley
Second-adjacent:	KBSQ KBSX	214C3 McCall 218C0 Boise
Third-adjacent:	KBSM	219C3 McCall

TV Channel 6

Section 73.525 of the Commission's Rules specifies a threshold distance of 177 kilometers for FM stations operating on Channel 216. There is no TV Channel 6 station located within this threshold distance. (The nearest is KTVM-TV Ch6 Butte, at a distance of 368 kilometers.) Therefore, the proposed facility satisfies interference protection requirements of Section 73.525.

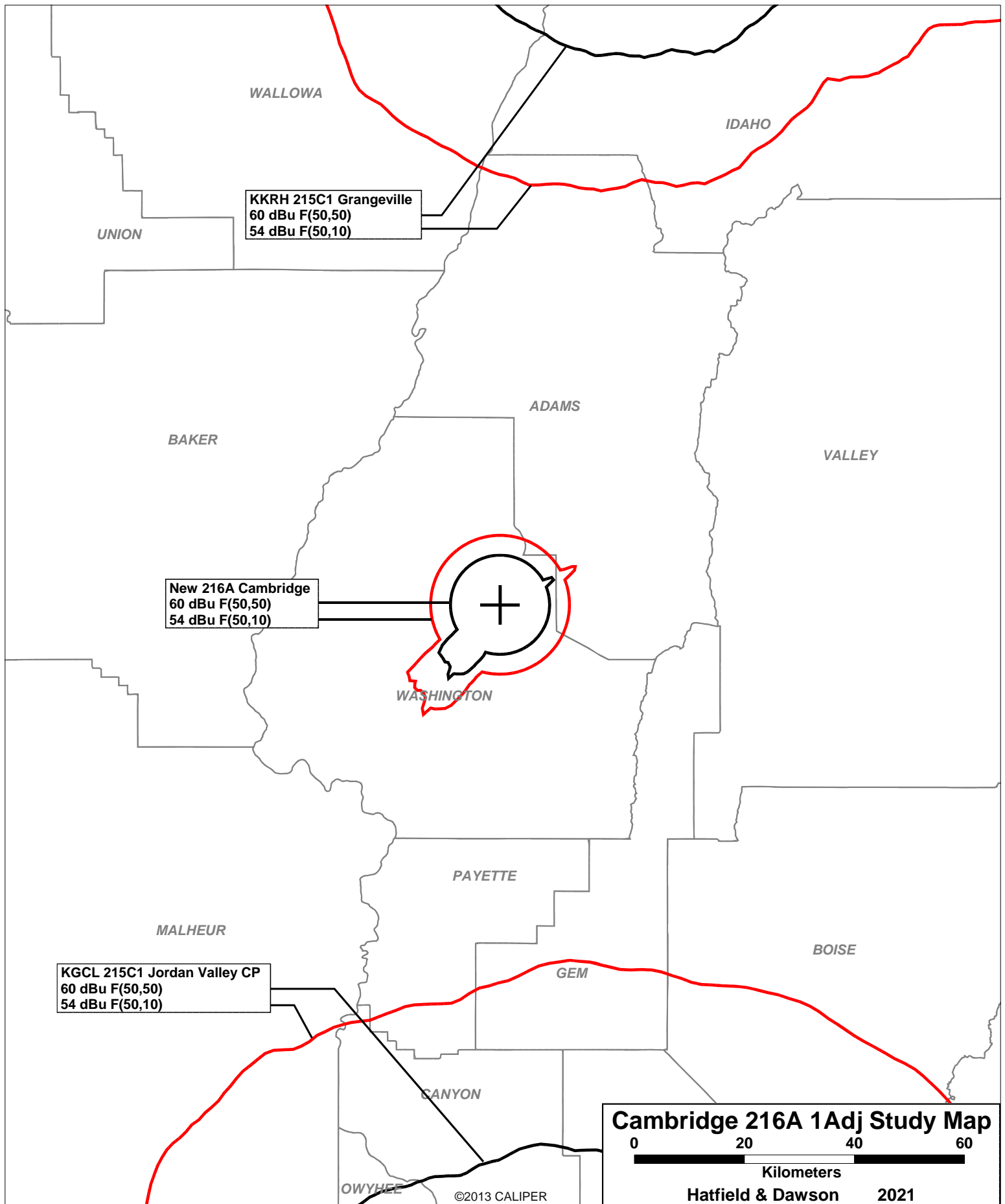
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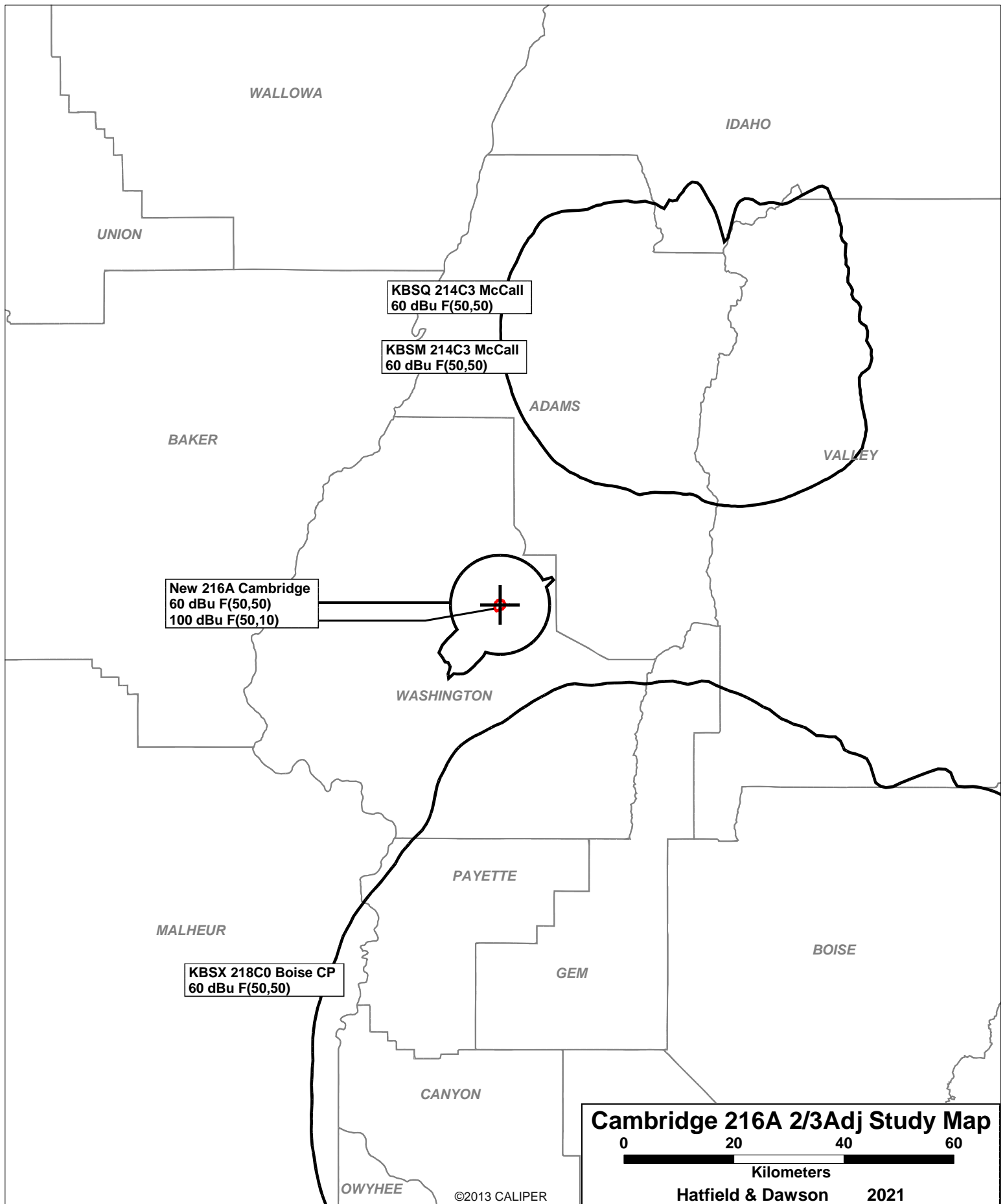
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SEARCH PARAMETERS                               FM Database Date: 20210815
Channel: 216A      91.1 MHz                      Page 1
Latitude: 44 32 0.5 (NAD83)
Longitude: 116 39 23.3
Safety Zone: 50 km
Job Title: CAMBRIDGE 216A

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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)
KBSQ LIC	MCCALL ID	BLED-20190102ABX	214C3 90.7	0.220 602.0	45 0 29.6 116 8 3.4	37.8	67.02 25.02	42 CLEAR
KGCL CP	JORDAN VALLEY OR	0000111645	215C1 90.9	8.000 675.0	43 0 25.0 116 42 16.0	181.3	169.65 36.65	133 CLEAR
KKRH LIC	GRANGEVILLE ID	BLED-20140131AGP	215C1 90.9	1.900 708.5	45 51 47.5 116 7 25.5	15.6	153.59 20.59	133 CLEAR
K215BN LIC	CASCADE ID	BLFT-19911120TB	215D 90.9	0.010 0.0	44 30 55.6 116 2 42.4	92.2	48.64 0.00	0 TRANS
K216FU LIC	ISLAND CITY OR	BLFT-20031031AHH	216D 91.1	0.115 0.0	45 17 57.5 118 5 8.8	307.6	141.35 0.00	0 TRANS
KBSS LIC	SUN VALLEY ID	BLED-20040901ABR	216C2 91.1	0.700 570.0	DA 43 38 35.6 114 23 52.1	118.0	206.17 40.17	166 CLEAR
K216CD CP	STANLEY ID	0000112330	216D 91.1	0.250 0.0	44 12 46.6 114 56 20.6	104.0	141.44 0.00	0 TRANS
KBSS CP	SUN VALLEY ID	0000124911	216C2 91.1	0.750 570.0	43 38 36.2 114 23 52.9	118.0	206.15 40.15	166 CLEAR
K216CD LIC	LOWER STANLEY ID	BLFT-19911113TA	216D 91.1	0.184 0.0	DA 44 12 58.6 114 56 11.3	103.9	141.55 0.00	0 TRANS
K217BO LIC	HALFWAY OR	BLFT-20151216ABM	217D 91.3	0.048 0.0	44 52 46.5 117 1 49.6	322.6	48.56 0.00	0 TRANS
KBSX LIC	BOISE ID	BLED-20010917AAO	218C1 91.5	3.800 827.0	43 45 20.6 116 5 57.4	152.6	97.24 22.24	75 CLEAR
KBSX CP	BOISE ID	0000124942	218C0 91.5	10.500 827.0	43 45 20.8 116 5 57.0	152.6	97.24 11.24	86 CLEAR
KBSM LIC	MCCALL ID	0000093141	219C3 91.7	0.220 602.0	45 0 29.6 116 8 3.4	37.8	67.02 25.02	42 CLEAR

===== END OF FM SPACING STUDY FOR CHANNEL 216 =====





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RF Exposure Study**

Facilities Proposed

The proposed operation will be on Channel 216A (91.1 MHz) with an effective radiated power of 600 watts. Operation is proposed with a 2-bay circularly-polarized antenna to be mounted on an existing tower on a hilltop south of Cambridge, with FCC Antenna Structure Registration Number 1257282.

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.

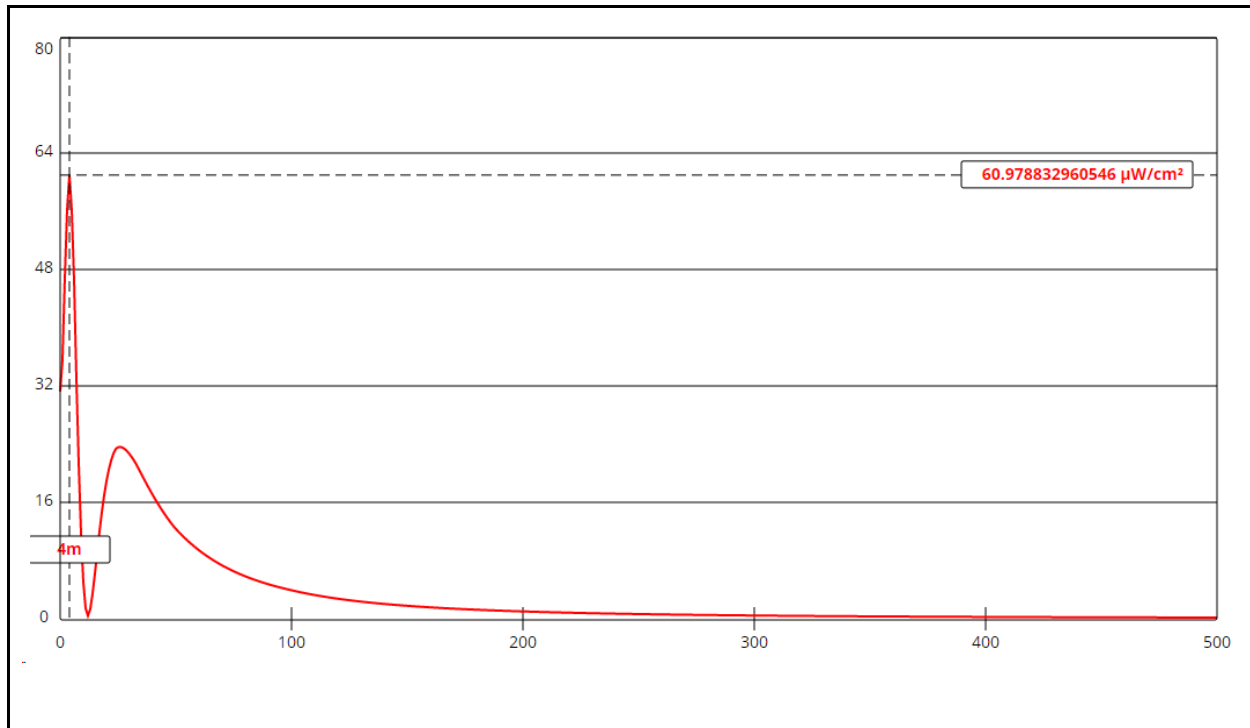
Calculations of the power density produced by the proposed Cambridge 216A antenna system assume a Type 2 element pattern, which is the element pattern for the Nicom BKG77-2 antenna proposed for use. The highest calculated ground level power density occurs at a distance of 4 meters from the base of the antenna support structure. At this point the power density is calculated to be 61.0 $\mu W/cm^2$.

Calculations of the power density produced by Cambridge 216A and the other stations at this transmitter site (including an application for Cambridge 220A being filed by this same applicant during the filing window) are summarized in the following table:

Call	Avg or Peak ERP Antenna Model	Relative Field	Height AGL	Calculated Exposure	Gen Pop FCC Limit	% of Limit
New 216A	0.600 kW H 0.600 kW V NIC BKG77-2 2-bay 0.85 wave	FMMModel	10.7 m	61.0 $\mu\text{W}/\text{cm}^2$	200 $\mu\text{W}/\text{cm}^2$	30.5%
New 220A	0.200 kW H 0.200 kW V NIC BKG77-2 2-bay 0.85 wave	FMMModel	10.7 m	20.3 $\mu\text{W}/\text{cm}^2$	200 $\mu\text{W}/\text{cm}^2$	10.2%
K228CZ	0.060 kW H 0.060 kW V JAM JLLP-1	FMMModel Type 2	8 m	30.6 $\mu\text{W}/\text{cm}^2$	200 $\mu\text{W}/\text{cm}^2$	15.3%
K11PB-D	0.042 kW H SCA CL-713	FMMModel	11 m	17.3 $\mu\text{W}/\text{cm}^2$	200 $\mu\text{W}/\text{cm}^2$	8.7%
K17KF-D	0.510 kW avg RFS LPR4SK	FMMModel	9 m	25.0 $\mu\text{W}/\text{cm}^2$	325.3 $\mu\text{W}/\text{cm}^2$	7.7%

These calculations show that the maximum calculated power density produced at two meters above ground level by the proposed operation of Cambridge 216A and the authorized operations of the other stations at this site (were their maxima to coincide, which they do not) is 72.4% of 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 exposure in excess of FCC guidelines.



Ground-Level RF Exposure

OET FMModel

Cambridge 216A

Antenna Type: Nicom BKG77-2 (Type 2)
No. of Elements: 2
Element Spacing: 0.85 wavelength

Distance: 500 meters
Horizontal ERP: 600 watts
Vertical ERP: 600 watts

Antenna Height: 10.7 meters AGL

Maximum Calculated Power Density is 61.0 $\mu\text{W}/\text{cm}^2$ at 4 meters from the antenna structure.

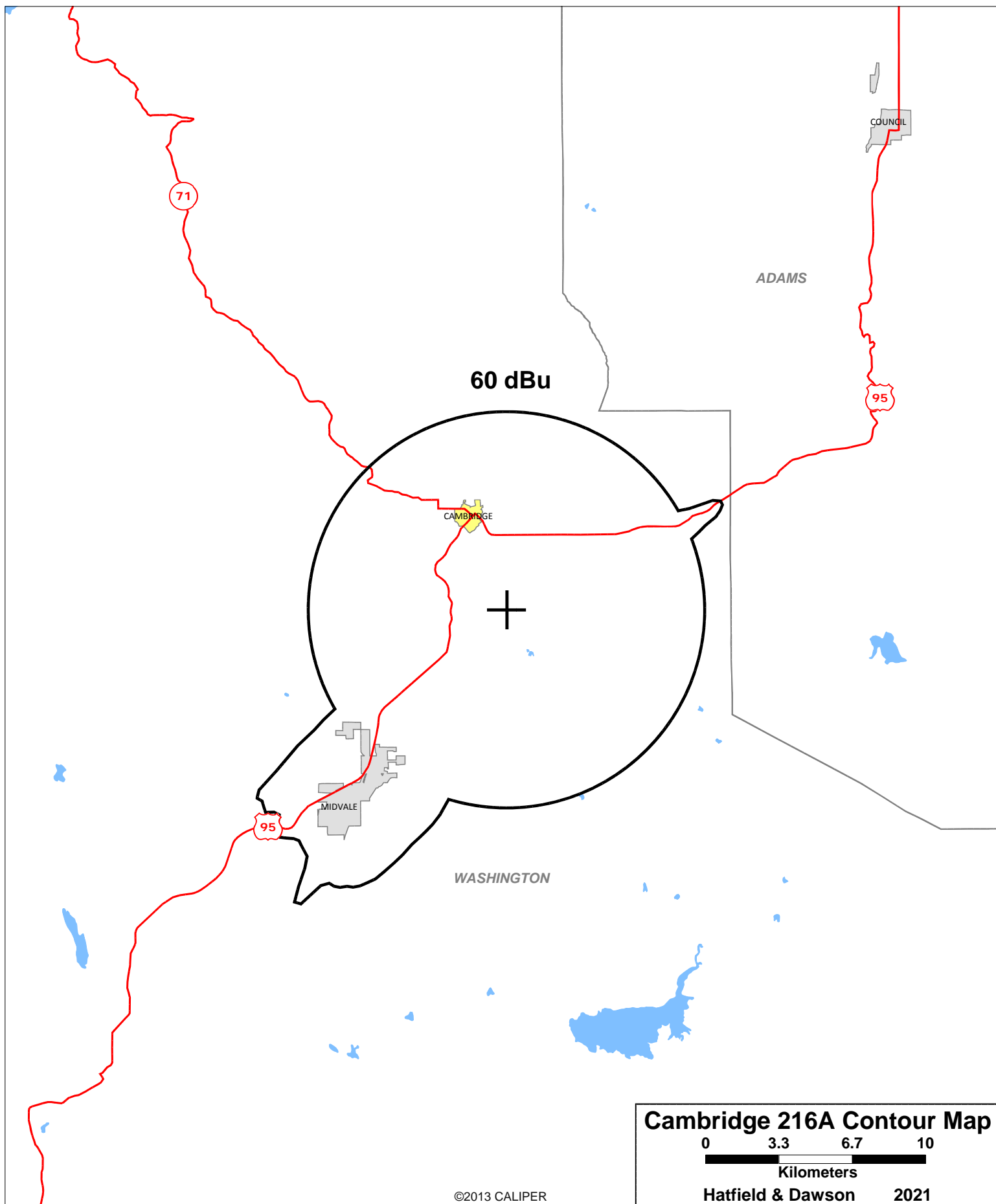
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Area and Population Calculation Methodology**

Calculation of the area within the 60 dBu contour was performed by the mapping program Maptitude, which includes a function which automatically calculates the area within irregular polygons. . In cases where the 60 dBu contour included any large water areas, those were excluded by using a related tool in the program which allows the user to “clip” to the land area within the contour. The software returns the area of the land area.

Total area inside 60 dBu contour:	295 sq km
Water area excluded:	0 sq km
Total land area inside 60 dBu contour:	295 sq km

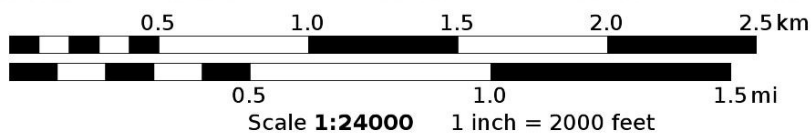
Population was calculated by summing the individual populations of each of the census blocks from the 2010 Census whose centroids are encompassed by the proposed 60 dBu contour.

Population inside 60 dBu contour:	1,211
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Mercator Projection
WGS84
USNG Zone 11TNK
 CALTOPO



Hatfield & Dawson Consulting Engineers