

May 2019
FM Translator K250AN
Tucson, Arizona Channel 250D
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 maps demonstrate compliance with the Commission's Rules for protection of FM broadcast stations and FM translators as outlined in §74.1204.

Protection of KSZR-LIC: The proposed translator transmitter site is located within the 60 dBu protected contour of second-adjacent channel station KSZR 248A Oro Valley. The proposed site is 10.29 km from the KSZR transmitter site at a bearing of 210 degrees True. Given the KSZR antenna's 8 meter HAAT and 6 kW ERP along this radial, KSZR places a 67.6 dBu contour at the translator transmitter site. The corresponding interfering contour from the translator is $67.6 + 40 = 107.6$ dBu. The attached map of the proposed transmitter site depicts the 107.6 dBu contour from the proposed facility, which extends at most 462 meters from the antenna per a Free Space calculation. There is no population within this contour. Therefore, the proposed facility is believed to satisfy the requirements of §74.1204(d) with respect to KSZR-LIC.

Protection of KSZR-APP: The proposed translator transmitter site is located within the 60 dBu protected contour of second-adjacent channel station KSZR 248C3 Oro Valley (pending upgrade application). The proposed site is 10.29 km from the KSZR transmitter site at a bearing of 210 degrees True. Given the KSZR antenna's 8 meter HAAT and 25 kW ERP along this radial, KSZR places a 73.9 dBu contour at the translator transmitter site. The corresponding interfering contour from the translator is $73.9 + 40 = 113.9$ dBu. This is a higher contour value (i.e. smaller area) than the interference contour to KSZR-LIC which is depicted on the attached map of the proposed transmitter site. There is no population within this contour. There is no population within this contour. Therefore, the proposed facility is believed to satisfy the requirements of §74.1204(d) with respect to KSZR-APP.

Protection of KOHT: The proposed translator transmitter site is located within the 60 dBu protected contour of second-adjacent channel station KOHT 252A Marana. The proposed site is 22.72 km from the KOHT transmitter site at a bearing of 187 degrees True. Given the KOHT antenna's 185 meter HAAT and 6 kW ERP along this radial, KOHT places a 69.4 dBu contour at the translator transmitter site. The corresponding interfering contour from the translator is $69.4 + 40 = 109.4$ dBu. This is a higher contour value (i.e. smaller area) than the interference contour to KSZR which is depicted on the attached map of the proposed transmitter site. There is no population within this contour. Therefore, the proposed facility is believed to satisfy the requirements of §74.1204(d) with respect to KOHT.

Compliance with US-Mexico FM Agreement: The proposed facility is located less than 125 kilometers from the common border, and has been carefully designed to comply with the requirements of the US-Mexico FM Agreement. Please see attached map exhibits.

- a) The power has been limited to no more than 50 watts ERP in the direction of Mexico.
- b) The 60 dBu protected contour has been limited to no more than 8.7 kilometers in the direction of Mexico.
- c) The 34 dBu interfering contour has been limited to no more than 32 kilometers in the direction of Mexico.

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SEARCH PARAMETERS                      FM Database Date: 190412
Channel: 250A      97.9 MHz                      Page 1
Latitude: 32 14 56
Longitude: 111 6 59
Safety Zone: 50 km
Job Title: K250AN TUCSON MTN

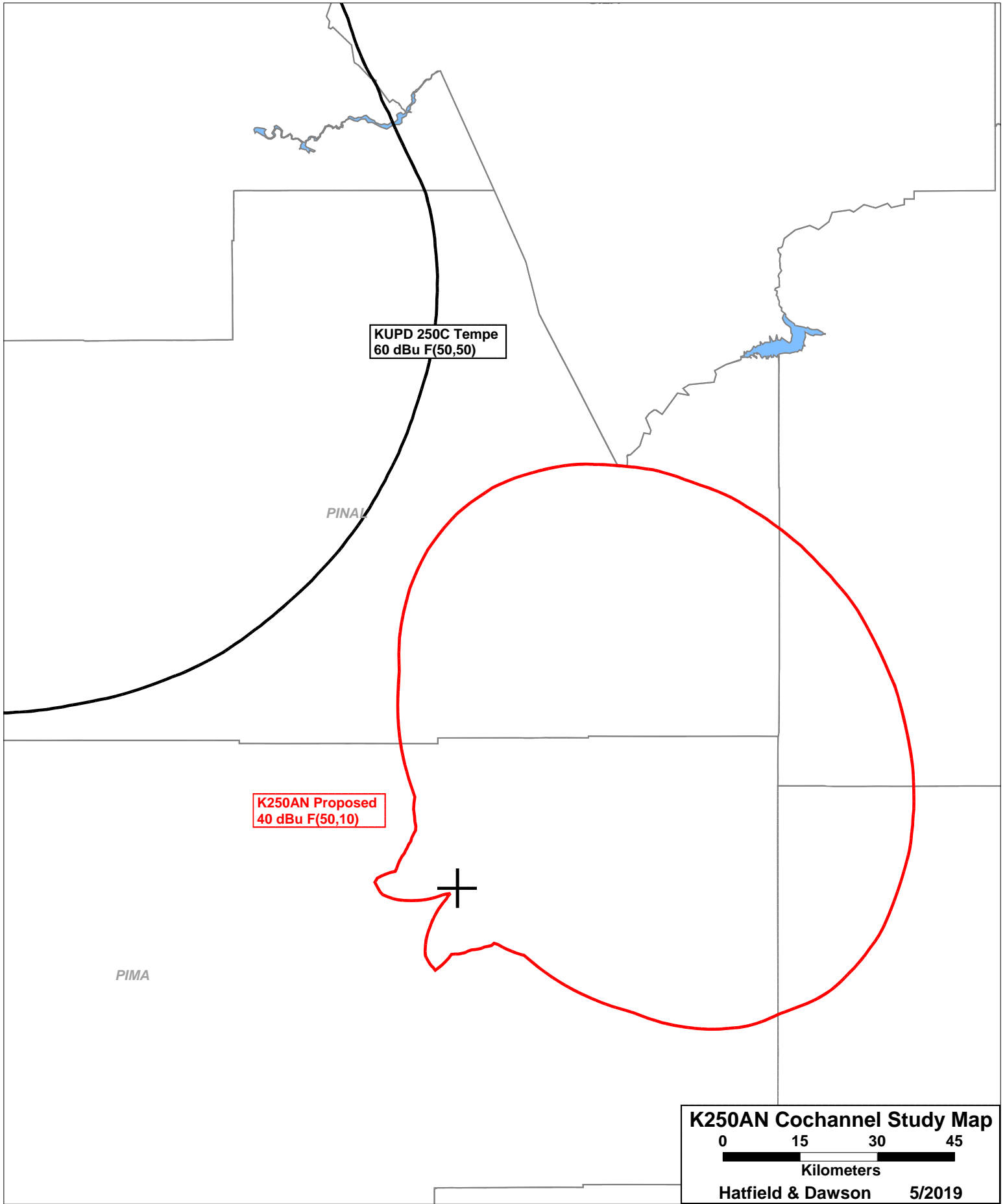
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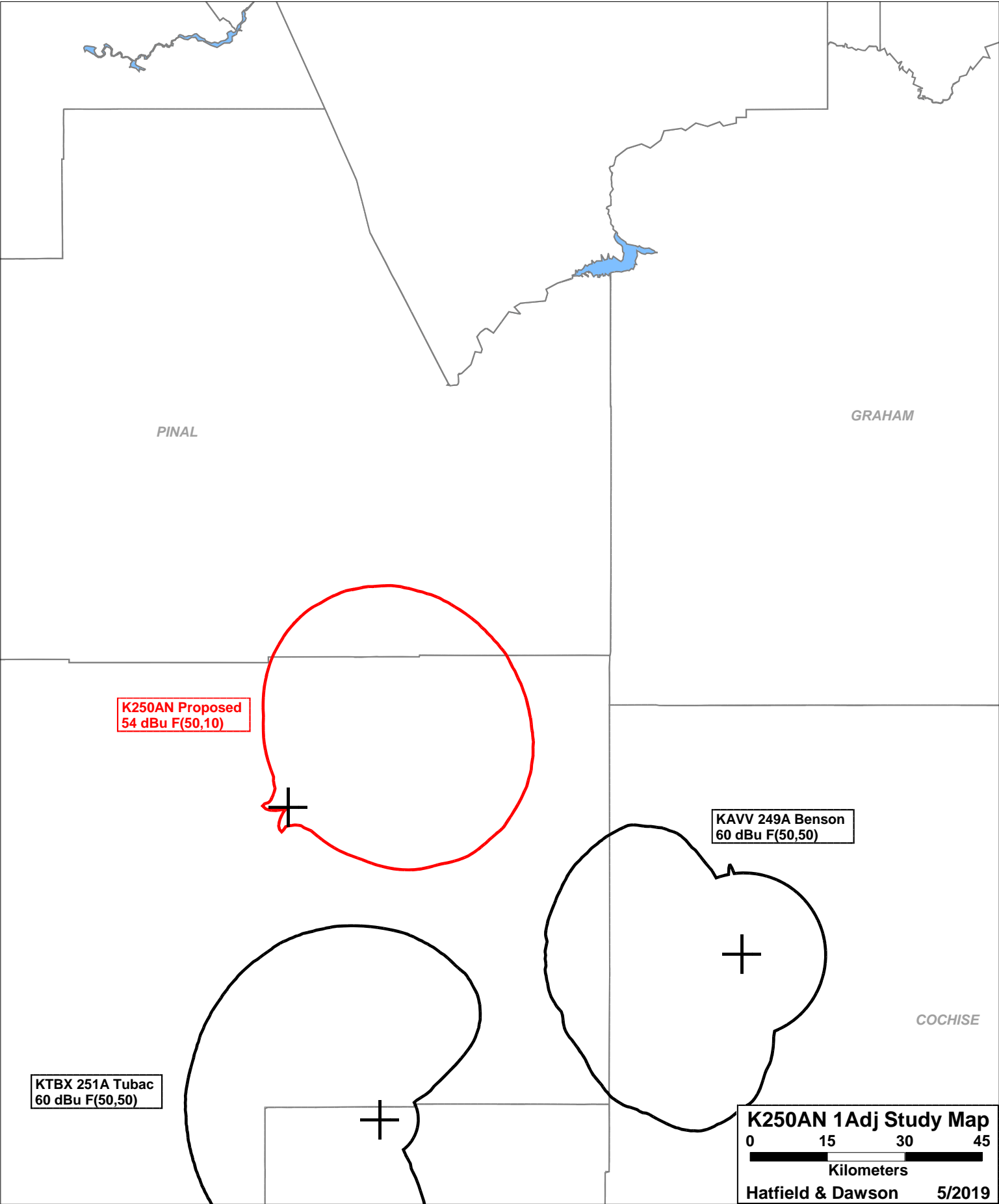
Call Status	City St	FCC File No.	Channel Freq.	ERP(kW) HAAT(m)	Latitude Longitude	Bearing deg-True	Dist (km)	Req (km)
KSZR RSV	ORO VALLEY AZ -	248C3	0.000	32-19-45	30.2	10.31	42	
		97.5	0.0	111-03-40		-31.69	SHORT	
KSZR LIC	ORO VALLEY AZ BLH-00421ABC	248A	6.000	32-19-45	30.2	10.31	31	
		97.5	93.0	111-03-40		-20.69	SHORT	
KSZR APP	ORO VALLEY AZ BPH-81012AAD	248C3	25.000 DA	32-19-45	30.2	10.31	42	
		97.5	92.0	111-03-40		-31.69	SHORT	
KAVV LIC	BENSON AZ BLH-00303ACT	249A	6.000	31-59-29	107.6	93.54	72	
		97.7	45.0	110-10-21		21.54	CLEAR	
ADD	SELLS AZ RM-10690	249A	0.000	31-51-31	238.5	82.58	72	
		97.7	0.0	111-51-40		10.58	CLEAR	
	CABORCA SO -	250B	0.000	30-41-50	210.1	198.49	178	
		97.9	0.0	112-09-29		20.49	CLEAR	
K250AN LIC	ORACLE AZ BLFT-51020ADK	250D	0.005 DA	32-26-29	55.6	38.04	0	
		97.9	1632.0	110-46-55		0.00	TRANS	
NEW-T APP	SIERRA VISTA AZ BNPFT-80130AJN	250D	0.050	31-32-47	134.3	111.39	0	
		97.9	145.0	110-16-29		0.00	TRANS	
KUPD LIC	TEMPE AZ BMLH-30820ABM	250C	100.000	33-19-58	323.9	149.47	226	
		97.9	494.0	112-03-53		-76.53	SHORT	
K250AN CP	TUCSON AZ BPFT-51021AEF	250D	0.250 DA	32-14-56	0.0	0.00	0	
		97.9	647.0	111-06-59		0.00	TRANS	
RSV	LORDSBURG NM RM-coord-38	250C	0.000	32-19-04	87.5	249.63	226	
		97.9	0.0	108-28-04		23.63	CLEAR	
NEW-T APP	SIERRA VISTA AZ BNPFT-80504ABC	251D	0.050 DA	31-32-48	134.3	111.33	0	
		98.1	145.0	110-16-31		0.00	TRANS	
KTBX LIC	TUBAC AZ BLH-20723ACF	251A	0.270	31-42-17	163.2	63.03	72	
		98.1	461.0	110-55-25		-8.97	SHORT	

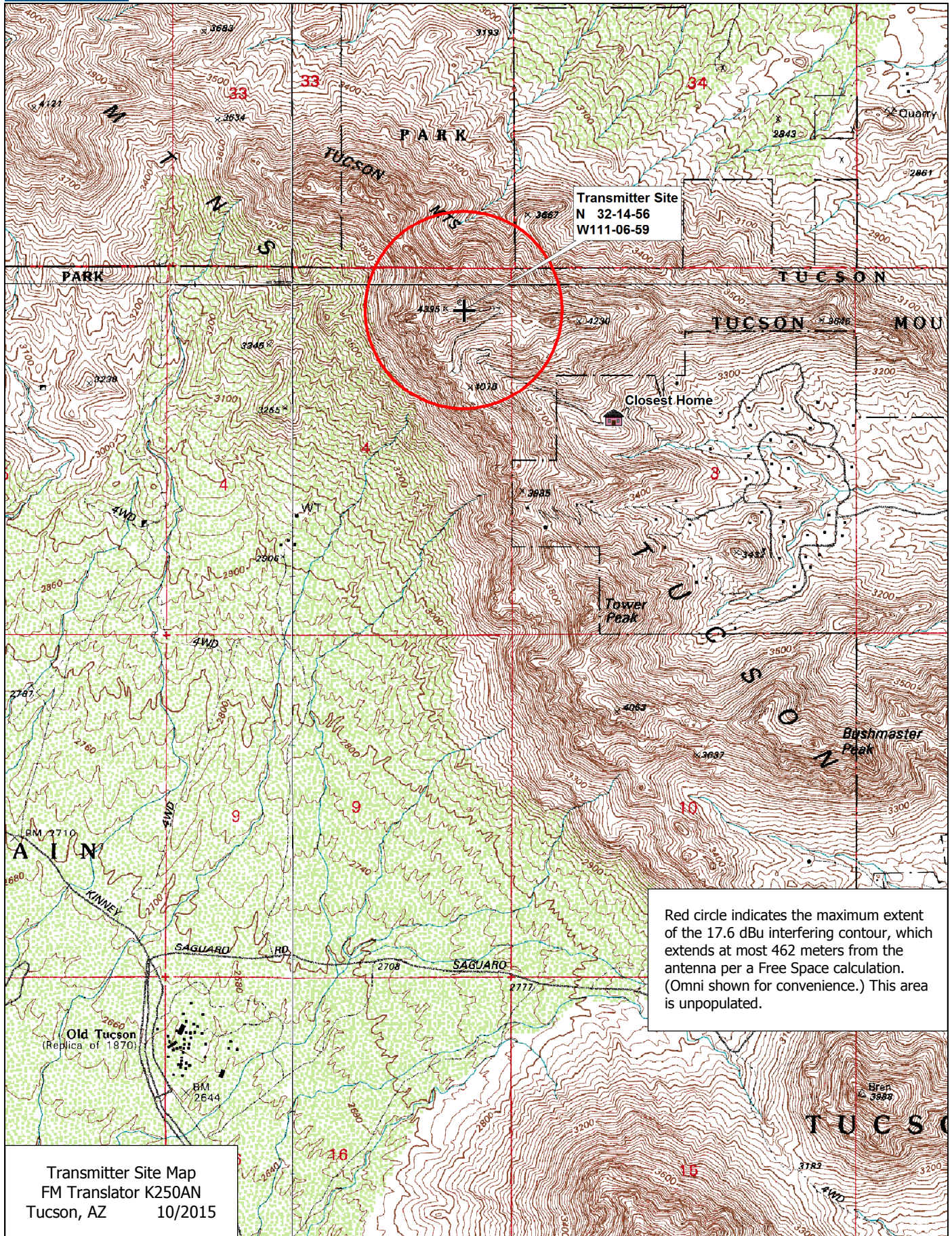
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SEARCH PARAMETERS                               FM Database Date: 190412
Channel: 250A      97.9 MHz                      Page 2
Latitude: 32 14 56
Longitude: 111 6 59
Safety Zone: 50 km
Job Title: K250AN TUCSON MTN
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Call Status	City St	FCC File No.	Channel Freq.	ERP(kW) HAAT(m)	Latitude Longitude	Bearing deg-True	Dist (km)	Req (km)
K251CG LIC	WILLCOX AZ	BLFT-70404AAT	251D 98.1	0.050 57.0	32-16-01 109-50-00	88.7	120.92 0.00	0 TRANS
KOHT LIC	MARANA AZ	BLH-980218KG	252A 98.3	6.000 56.0	32-27-09 111-05-11	7.1 SS	22.75 -8.25	31 SHORT
ADD	CORONA DE TUCSON AZ	RM-11357	253A 98.5	0.000 0.0	31-55-39 110-37-57	128.0	57.94 26.94	31 CLEAR
DEL	VAIL AZ	RM-11357	253A 98.5	0.000 0.0	31-55-39 110-37-57	128.0	57.94 26.94	31 CLEAR
RSV	VAIL AZ	RM-9815	253A 98.5	0.000 0.0	31-55-39 110-37-57	128.0	57.94 26.94	31 CLEAR
KRDX LIC	VAIL AZ	BLH-51103ADD	253A 98.5	3.900 DA 125.0	31-55-39 110-37-57	128.0	57.94 26.94	31 CLEAR

===== END OF FM SPACING STUDY FOR CHANNEL 250 =====



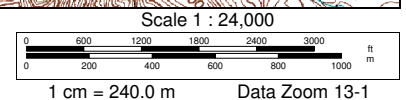


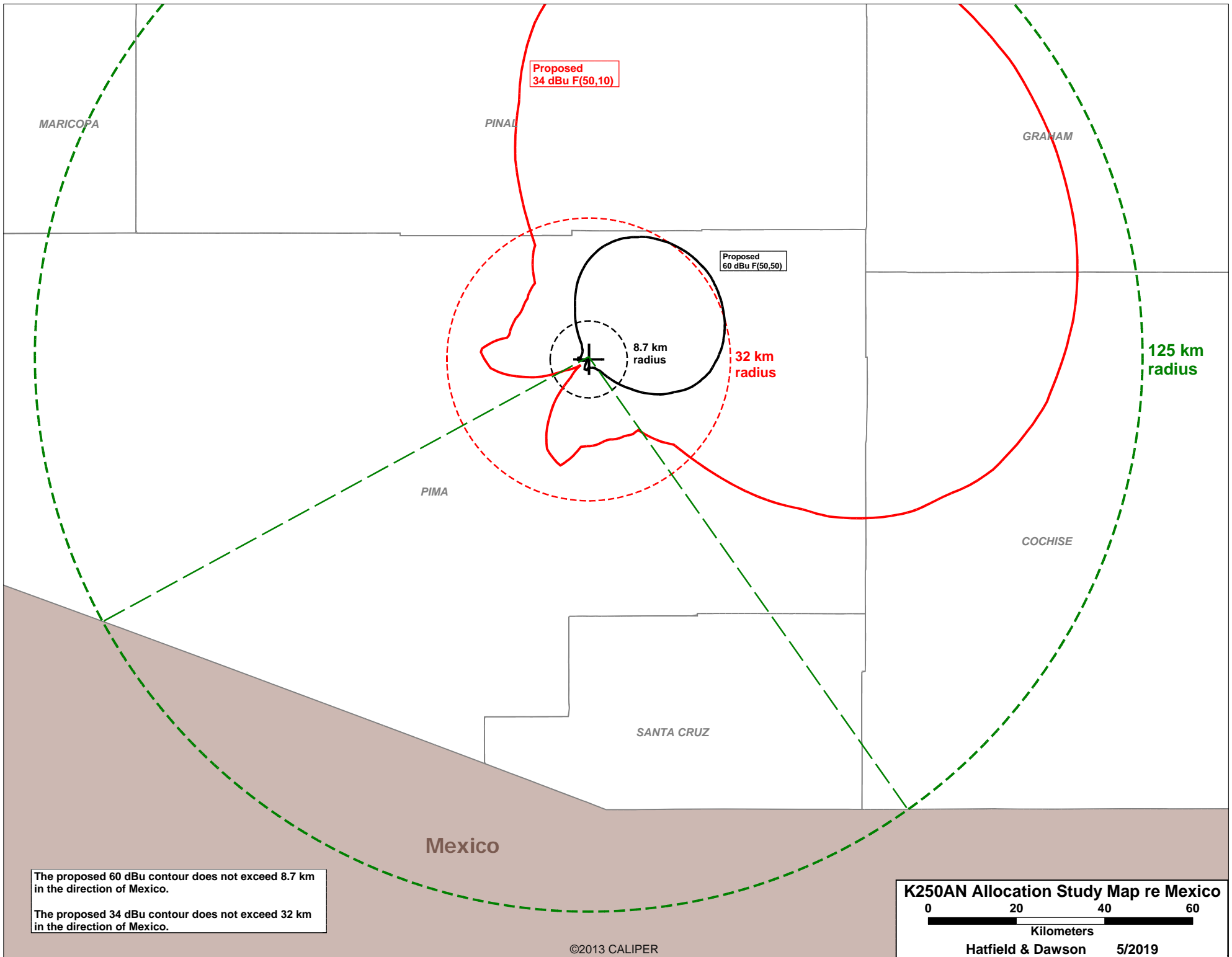


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The proposed 60 dBu contour does not exceed 8.7 km in the direction of Mexico.

The proposed 34 dBu contour does not exceed 32 km in the direction of Mexico.

K250AN Allocation Study Map re Mexico

0 20 40 60

Kilometers

Hatfield & Dawson

5/2019

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May 2019
FM Translator K250AN
Tucson, Arizona Channel 250D
RF Exposure Study

Facilities Proposed

The proposed operation will be on Channel 250D (97.9 MHz) with a maximum lobe effective radiated power of 250 Watts. Operation is proposed with an antenna array to be mounted on an existing tower at Tucson Mountain with FCC Antenna Structure Registration Number 1218272.

Diplexed operation is proposed with K237FX and K265CW.

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.

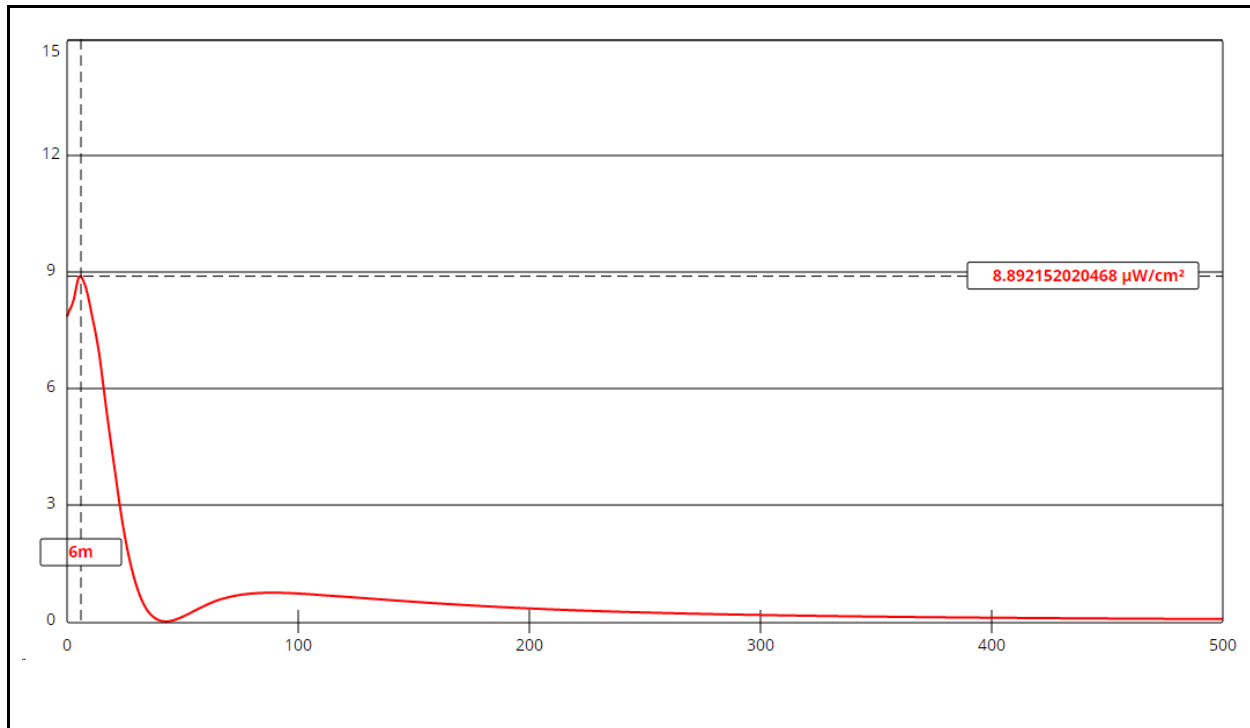
D is the distance in meters from the center of radiation to the calculation point.

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.

The proposed facility will use a 2CA2CP Reduced Rear pattern comprised of two stacked Scala CA2CP antennas at 0.87 wavelength bay spacing. Calculations of the power density produced by the proposed antenna system assume a Type 1 element pattern, which is the "worst case" element pattern. The highest calculated ground level power density occurs at a distance of 6 meters from

the base of the antenna support structure. At this point the power density is calculated to be 8.9 $\mu\text{W}/\text{cm}^2$, which is 4.5% 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 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.



Ground-Level RF Exposure

OET FMModel

K250AN Tucson

Antenna Type: 2CA2CP Reduced Rear ("ring stub" element model assumed)

No. of Elements: 2

Element Spacing: 0.87 wavelength

Distance: 500 meters

Horizontal ERP: 250 W

Vertical ERP: 250 W

Antenna Height: 32 meters AGL

Maximum Calculated Power Density is 8.9 $\mu\text{W}/\text{cm}^2$ at 6 meters from the antenna structure.

