

**January 2016**  
**FM Translator K223AL**  
**Reno, Nevada Channel 223D**  
**Allocation Study**

**Purpose of Application**

The instant application proposes to modify the licensed FM translator facility, to operate with a circularly polarized antenna rather than a vertically-polarized antenna. There is no change in the translator's protected or interfering contours as a result of this modification.

**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 KWFP 221C3 Sparks. The proposed site is 0.26 km from the KWFP transmitter site at a bearing of 97 degrees True. Given the KWFP antenna's 226 meter HAAT and 8.9 kW ERP along this radial, KWFP places a 128.1 dBu contour at the translator transmitter site. The corresponding interfering contour from the translator is  $128.1 + 40 = 168.1$  dBu. The 107.5 dBu contour from the proposed facility extends at most 0.4 meters from the 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 KWFP.

The proposed translator transmitter site is located within the 60 dBu protected contour of second-adjacent channel station KLRH 225C2 Reno. The proposed site is 0.26 km from the KLRH transmitter site at a bearing of 97 degrees True. Given the KLRH antenna's 226 meter HAAT and 48 kW ERP along this radial, KLRH places a 135.4 dBu contour at the translator transmitter site. The corresponding interfering contour from the translator is  $135.4 + 40 = 175.4$  dBu. The 107.5 dBu contour from the proposed facility extends at most 0.2 meters from the 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 KLRH.

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.

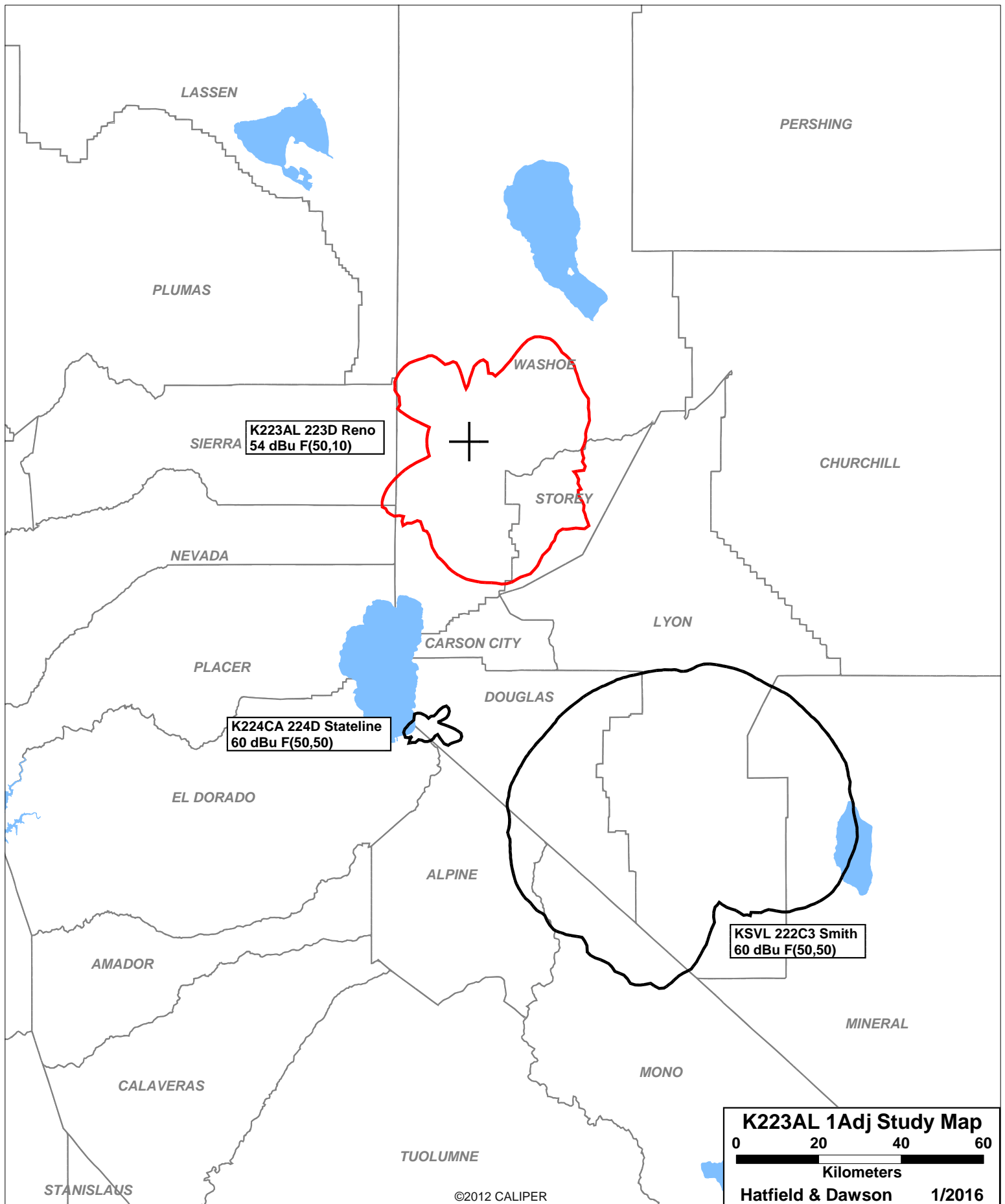
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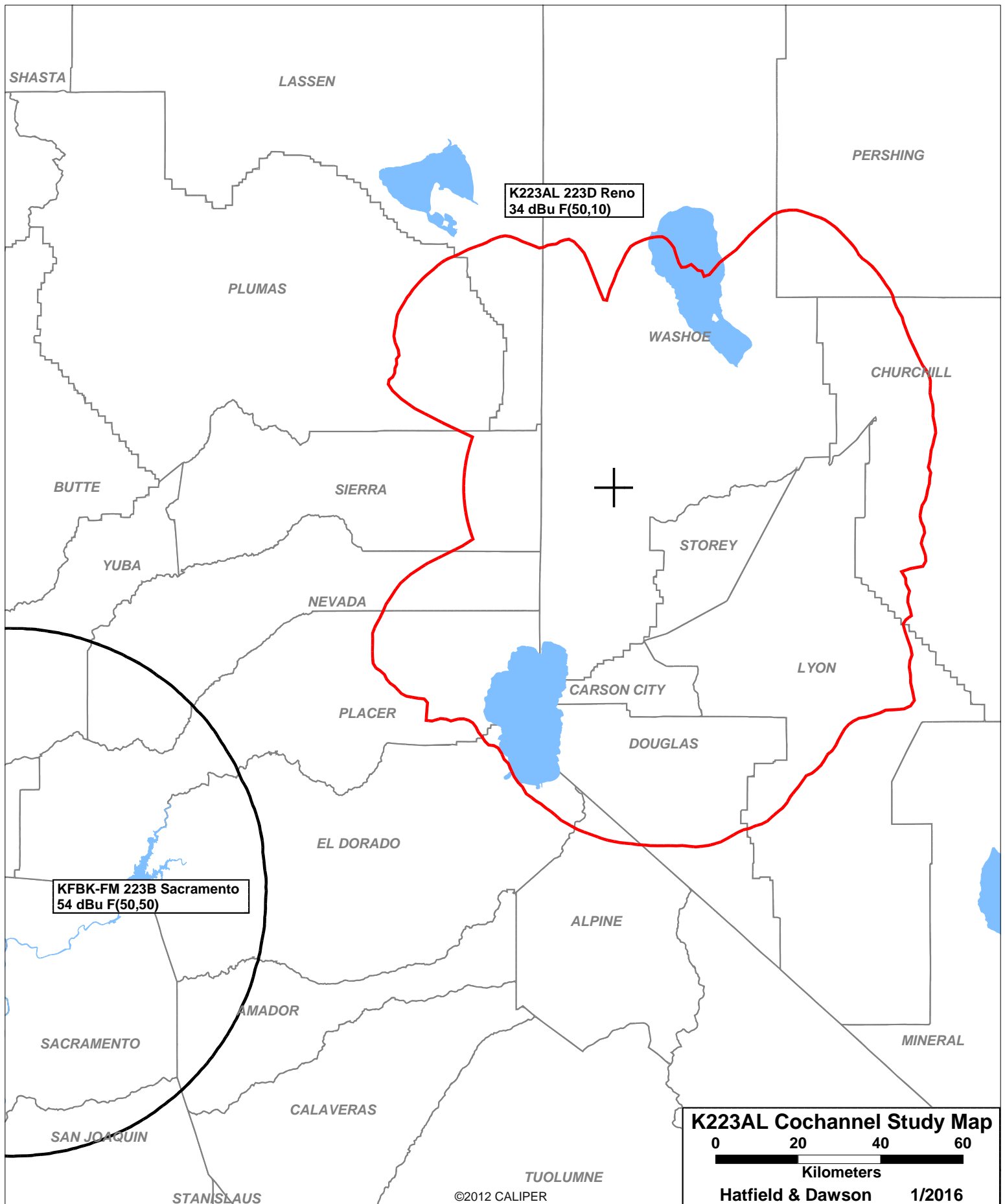
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SEARCH PARAMETERS                      FM Database Date: 160115
Channel: 223A      92.5 MHz                      Page 1
Latitude: 39 35 2
Longitude: 119 47 55
Safety Zone: 50 km
Job Title: K223AL RENO

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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)
K220CO LIC	SOUTH LAKE TAHOE, CA	ET 220D BLFT-50928AAB	220D 91.9	0.149 334.0	38-54-37 120-02-06	195.3	77.52 0.00	0 TRANS
K220BC LIC	YERINGTON, ETC. NV	220D BLFT-861215TG	220D 91.9	0.045 DA 610.0	38-59-15 119-14-35	144.0	81.74 0.00	0 TRANS
KWFP LIC	SPARKS NV	221C3 BLH-41102ABT	221C3 92.1	8.900 153.0	39-35-03 119-48-06	276.7 SS	0.26 -41.74	42 SHORT
KSVL LIC	SMITH NV	222C3 BLH-20326AEQ	222C3 92.3	0.490 624.0	38-41-06 119-11-04	151.9	113.04 24.04	89 CLEAR
KBEB LIC	SACRAMENTO CA	223B BLH-850412KK	223B 92.5	50.000 137.0	38-42-26 121-28-33	236.6	174.63 -3.37	178 SHORT
K223AL LIC	RENO NV	223D BLFT-40226AFO	223D 92.5	0.250 0.0	39-35-02 119-47-55	0.0	0.00 0.00	0 TRANS
K224DZ LIC	QUINCY CA	224D BLFT-01119AEE	224D 92.7	0.250 DA 113.0	39-56-25 120-55-43	292.7	104.60 0.00	0 TRANS
K224DA LIC	SUSANVILLE CA	224D BLFT-70521ABC	224D 92.7	0.170 133.0	40-26-37 120-38-34	323.3	119.61 0.00	0 TRANS
K224CA LIC	STATELINE NV	224D BLFT-890825TA	224D 92.7	0.053 DA 537.0	38-58-16 119-54-15	187.6	68.64 0.00	0 TRANS
KLRH LIC	RENO NV	225C2 BMLED-40516AAV	225C2 92.9	48.000 153.0	39-35-03 119-48-06	276.7	0.26 -54.74	55 SHORT
K226AL LIC	CARSON CITY NV	226D BLFT-01220ADF	226D 93.1	0.095 DA 368.0	39-12-50 119-46-10	176.5	41.15 0.00	0 TRANS
K277BW LIC	RENO NV	277D BLFT-30506ACA	277D 103.3	0.010 DA 1016.0	39-35-22 119-55-40	273.2	11.11 1.11	10 TRANS
K277CL CP	STATELINE NV	277D BNPFT-30829AIG	277D 103.3	0.001 1288.0	39-02-37 119-52-57	186.9	60.42 50.42	10 TRANS

===== END OF FM SPACING STUDY FOR CHANNEL 223 =====





**January 2016**  
**FM Translator K223AL**  
**Reno, Nevada Channel 223D**  
**RF Exposure Study**

**Facilities Proposed**

The proposed operation will be on Channel 223D (92.5 MHz) with an effective radiated power of 250 watts. Operation is proposed with a two-element antenna (98 inch interbay spacing) to be mounted on an existing tower on Red Peak. The antenna system will be shared by FM translators K223AL, K241AK, K245BV, and K285EQ.

The antenna support structure does not exceed 60.96 meters (200 feet) above ground and does not require notification to the Federal Aviation Administration. Therefore, this structure does not require an Antenna Structure Registration Number.

**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.

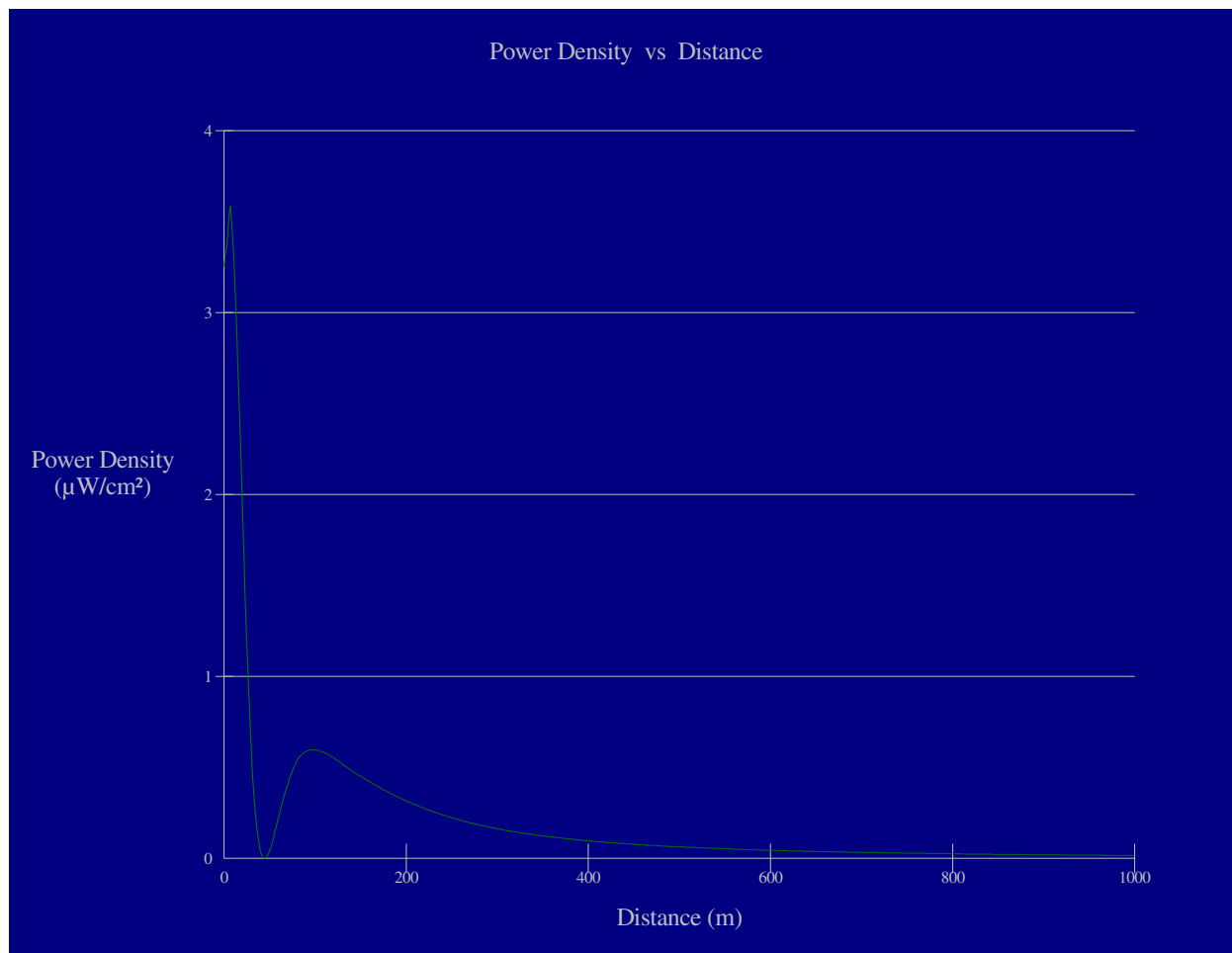
Ground level power densities have been calculated for locations extending from the base of the tower to a distance of 1000 meters. Values past this point are increasingly negligible.

Calculations of the power density produced by the proposed K223AL 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 7 meters from the base of the antenna support structure. At this point the power density is calculated to be 3.6  $\mu W/cm^2$ , which is 1.8% 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 of K223AL 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 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 radiation in excess of FCC guidelines.



## Ground-Level RF Exposure

OET FMModel

### K223AL Reno

Antenna Type: Shively 6832-2

No. of Elements: 2

Element Spacing: 0.77 wavelength (2.49 meter spacing between bays)

Distance: 1000 meters

Horizontal ERP: 0.250 kW

Vertical ERP: 0.250 kW

Antenna Height: 40 meters AGL

Maximum Calculated Power Density is 3.6  $\mu\text{W}/\text{cm}^2$  at 7 meters from the antenna structure.

Hatfield & Dawson Consulting Engineers