

**November 2020
FM Translator K280CV
Cathedral City, CA Channel 280D
Allocation Study**

Allocation Study

By the instant application, it is proposed to relocate the K280CV transmitting antenna to a tower just 140 meters from the licensed site.

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.

K280FO Coachella

It is noted that the 40 dBu F(50,10) contour from the modified K280CV facility overlaps the 60 dBu contour of cochannel K280FO Coachella. As is depicted on the attached allocation study map, however, the instant application will slightly reduce the overlap caused to the Coachella facility when compared with the licensed K280CV facility. Therefore, the overlap with K280FO Coachella is not an impediment to grant of this application.

KHCV 282A Mecca

It is noted that the 100 dBu F(50,10) contour from the modified K280CV facility overlaps the 60 dBu contour of second-adjacent channel KHCV 282A Mecca. The same is also true of the 100 dBu F(50,10) contour from the licensed K280CV facility. This situation came about because K280CV was constructed and licensed at this location in 2012, which KHCV was first licensed three years later in 2015. The proposed modification of K280CV proposes a move of only 140 meters, using the same ERP and directional antenna pattern. Thus, the area of 100 dBu overlap to the KHCV 60 dBu contour remains the same. Additionally, the attached transmitter site map depicts the 100 dBu F(50,10) contour from the proposed facility. This entire area of overlap is unpopulated; while the USGS 7.5 minute map indicates six structures within the proposed 100 dBu F(50,10) contour, review of satellite imagery reveals that the only two standing structures are transmitter buildings.

The other four structures indicated on the USGS map are no longer in existence. Therefore, the continued overlap caused to KHCV is no impediment to grant of this application.

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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SEARCH PARAMETERS

Channel: 280A 103.9 MHz
 Latitude: 33 51 58.4 (NAD83)
 Longitude: 116 26 5.7
 Safety Zone: 50 km
 Job Title: K280CV CATHEDRAL CITY

Page 1

Call Status	City St	FCC File No.	Channel Freq.	ERP(kW) HAAT(m)	Latitude Longitude	Bearing deg-True	Dist (km)	Req (km)
K226BT LIC	INDIO CA	0000097558	226D 93.1	0.036 0.0	DA 33 47 45.8 116 13 20.0	111.6	21.17 0.00	0 TRANS
K227BX LIC	PALM SPRINGS CA	BLFT-20141003ABX	227D 93.3	0.010 0.0	33 51 56.1 116 26 12.0	246.3	0.18 0.00	0 TRANS
KBHR LIC	BIG BEAR CITY CA	BLH-20050103AJG	227A 93.3	1.300 214.0	34 16 41.0 116 47 34.1	324.4 SS	56.37 46.37	10 CLEAR
KTMQ LIC	TEMECULA CA	BLH-20010109AAA	277A 103.3	1.250 218.0	33 28 51.1 117 11 1.1	238.5	81.54 50.54	31 CLEAR
KPST-FM LIC	COACHELLA CA	BLH-20120521BEN	278A 103.5	1.900 179.0	DA 33 39 23.1 115 59 32.0	119.6	47.16 16.16	31 CLEAR
K279CO LIC	YUCCA VALLEY CA	BLFT-20150203AAR	279D 103.7	0.250 0.0	34 7 51.0 116 22 15.0	11.3	29.94 0.00	0 TRANS
KIQQ-FM LIC	NEWBERRY SPRINGS CA	BLH-20001219ABK	279A 103.7	6.000 86.0	34 53 6.9 116 53 48.1	339.6	120.75 48.75	72 CLEAR
KSON LIC	SAN DIEGO CA	BLH-20070409AAQ	279B 103.7	26.500 210.0	32 50 20.2 117 14 59.1	213.8	136.87 23.87	113 CLEAR
KHTI LIC	LAKE ARROWHEAD CA	BLH-19960502KA	280A 103.9	0.180 548.0	34 14 3.0 117 8 28.1	302.4	76.93 -38.07	115 SHORT
K280CV LIC	CATHEDRAL CITY CA	BLFT-20120501AFC	280D 103.9	0.250 0.0	DA 33 51 56.1 116 26 1.0	120.5	0.14 0.00	0 TRANS
K280FO LIC	COACHELLA CA	BLFT-20151013ABL	280D 103.9	0.022 0.0	33 41 18.1 116 10 37.0	129.6	30.99 0.00	0 TRANS
950921M ALC	KESSEX CA		280B 103.9	0.000 0.0	34 44 12.0 115 14 50.9	48.1	145.85 -32.15	178 SHORT
KKLM CP	MURRIETA CA	BPED-20190131AAY	281A 104.1	1.200 226.0	33 28 52.1 117 11 2.1	238.5	81.54 9.54	72 CLOSE
KKLM LIC	MURRIETA CA	BLED-20180301AAC	281A 104.1	4.100 121.4	33 27 58.8 117 8 29.9	236.0	79.14 7.14	72 CLOSE

SEARCH PARAMETERS

Channel: 280A 103.9 MHz Page 2
 Latitude: 33 51 58.4 (NAD83)
 Longitude: 116 26 5.7
 Safety Zone: 50 km
 Job Title: K280CV CATHEDRAL CITY

Call Status	City St	FCC File No.	Channel Freq.	ERP(kW) HAAT(m)	Latitude Longitude	Bearing deg-True	Dist (km)	Req (km)
XHBAFM LIC	MEXICALI BN		281C 104.1	100.000 40.0	32 34 15.2 115 26 58.0	147.3	170.52 5.52	165 CLOSE
XHBAFM ALC	MEXICALI BN		281C 104.1	0.000 0.0	32 34 15.2 115 26 58.0	147.3	170.52 5.52	165 CLOSE
KHCV LIC	MECCA CA	BLH-20150522AGF	282A 104.3	6.000 19.0	DA 33 42 9.1 116 0 44.0	114.9 SS	43.16 12.16	31 CLEAR
KCLZ CP	TWENTYNINE PALMS CA	BAS 0000085760	283A 104.5	6.000 70.0	34 9 16.0 116 12 7.0	33.8	38.54 7.54	31 CLOSE
KQCM ALC	TWENTYNINE PALMS CA	BAS	283A 104.5	0.000 0.0	34 9 16.0 116 12 7.0	33.8	38.54 7.54	31 CLOSE

==== END OF FM SPACING STUDY FOR CHANNEL 280 =====

KHTI 280A Lake Arrowhead
60 dBu F(50,50)

SAN BERNARDINO

K280FO 280D Coachella
60 dBu F(50,50)

RIVERSIDE



SAN DIEGO

K280CV 280D Cathedral City
40 dBu F(50,10) Proposed (Red)
40 dBu F(50,10) Licensed (Orange)

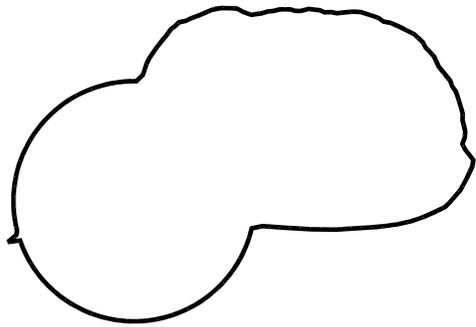
K280CV Cochannel Study Map

0 5 10 15

Kilometers

Hatfield & Dawson

11/2020



SAN BERNARDINO

K279CO 279D Yucca Valley
60 dBu F(50,50)



RIVERSIDE

K280CV 280D Cathedral City
54 dBu F(50,10)

KKLM 281A Murrieta
60 dBu F(50,50) License
60 dBu F(50,50) CP

SAN DIEGO

K280CV 1Adj Study Map

0 5 10 15

Kilometers

Hatfield & Dawson

11/2020

SAN BERNARDINO

KCLZ 283A Twentynine Palms Base
60 dBu F(50,50) CP

K280CV 280D Cathedral City
100 dBu F(50,10)

RIVERSIDE

KHCV 282A Mecca
60 dBu F(50,50)

KPST-FM 278A Coachella
60 dBu F(50,50)

SAN DIEGO

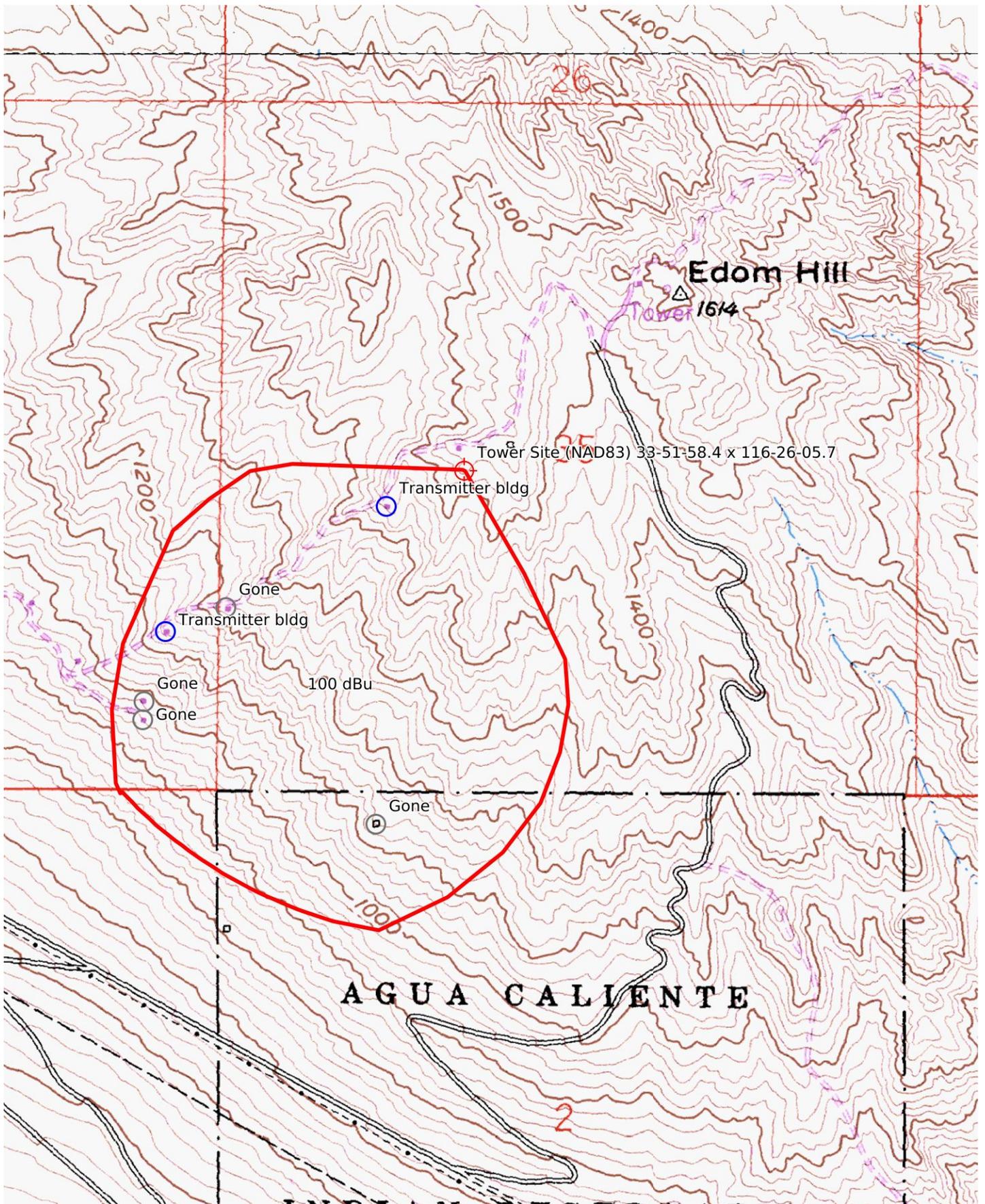
K280CV 2/3Adj Study Map

0 5 10 15

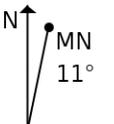
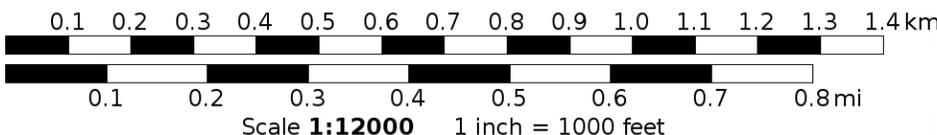
Kilometers

Hatfield & Dawson

11/2020



Mercator Projection
WGS84
USNG Zone 11SNT

**November 2020
FM Translator K280CV
Cathedral City, CA Channel 280D
RF Exposure Study**

Facilities Proposed

The proposed operation will be on Channel 280D (103.9 MHz) with a maximum lobe effective radiated power of 250 watts. Operation is proposed with an antenna to be mounted on an existing pole structure on Edom Hill.

The proposed antenna support structure will 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 500 meters. Values past this point are increasingly negligible.

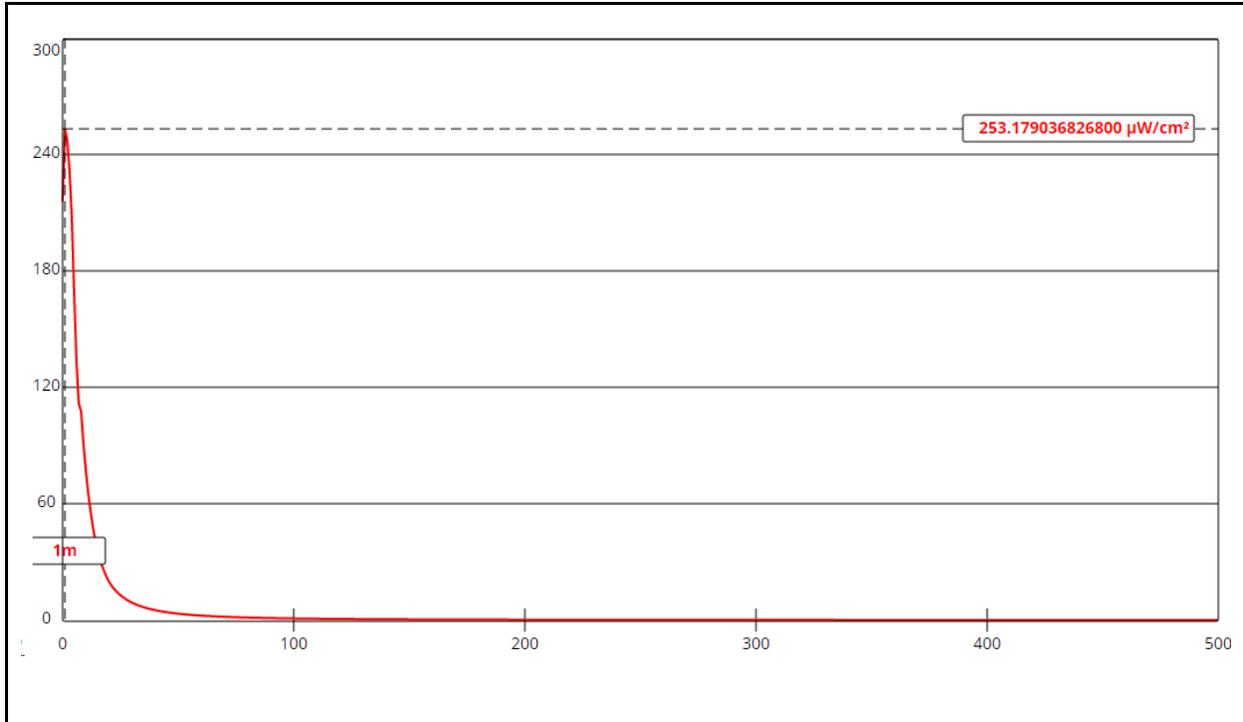
Calculations of the power density produced by the proposed antenna system assume a Type 1 element pattern, which is the element pattern presumed in the Commission's FMModel software for

the Scala CL-FM(V) antenna proposed for use. The highest calculated ground level power density occurs at a distance of 1 meters from the base of the antenna support structure. At this point the power density is calculated to be 253.2 $\mu\text{W}/\text{cm}^2$.

This maximum occurs at the base of the structure, within the fenced transmitter site compound, which is considered a controlled area subject to the controlled area MPE. Per the FMModel calculations, the contribution from the proposed K280CV facility falls below 5% of the uncontrolled area MPE at locations which are at least 29 meters from the antenna. Taking into account the compound fencing and the terrain that falls away from the site, the maximum calculated power density produced at two meters above ground level by the proposed operation of K280CV alone will be less than 5% of the uncontrolled area MPE at all locations which are accessible to the general population.

Additionally, it is known that FMModel dramatically overstates the exposure levels from antennas such as the Scala CL-FM(V). When OET-65 calculations are performed using the manufacturer's vertical plane pattern (see attached additional calculations), the highest calculated ground level power density occurs at a distance of 9 meters from the base of the antenna support structure. At this point (which is within the fenced compound) the power density is calculated to be 28.0 $\mu\text{W}/\text{cm}^2$, which is less than 5% of the controlled area MPE.

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

K280CV Cathedral City

Antenna Type: Scala CL-FM(V) (Type 1 assumed)
 No. of Elements: 1
 Element Spacing: 1.0 wavelength

Distance: 500 meters
 Horizontal ERP: zero kW
 Vertical ERP: 0.250 kW

Antenna Height: 7.6 meters AGL

Maximum Calculated Power Density is 253.2 $\mu\text{W}/\text{cm}^2$ at 1 meters from the antenna structure.

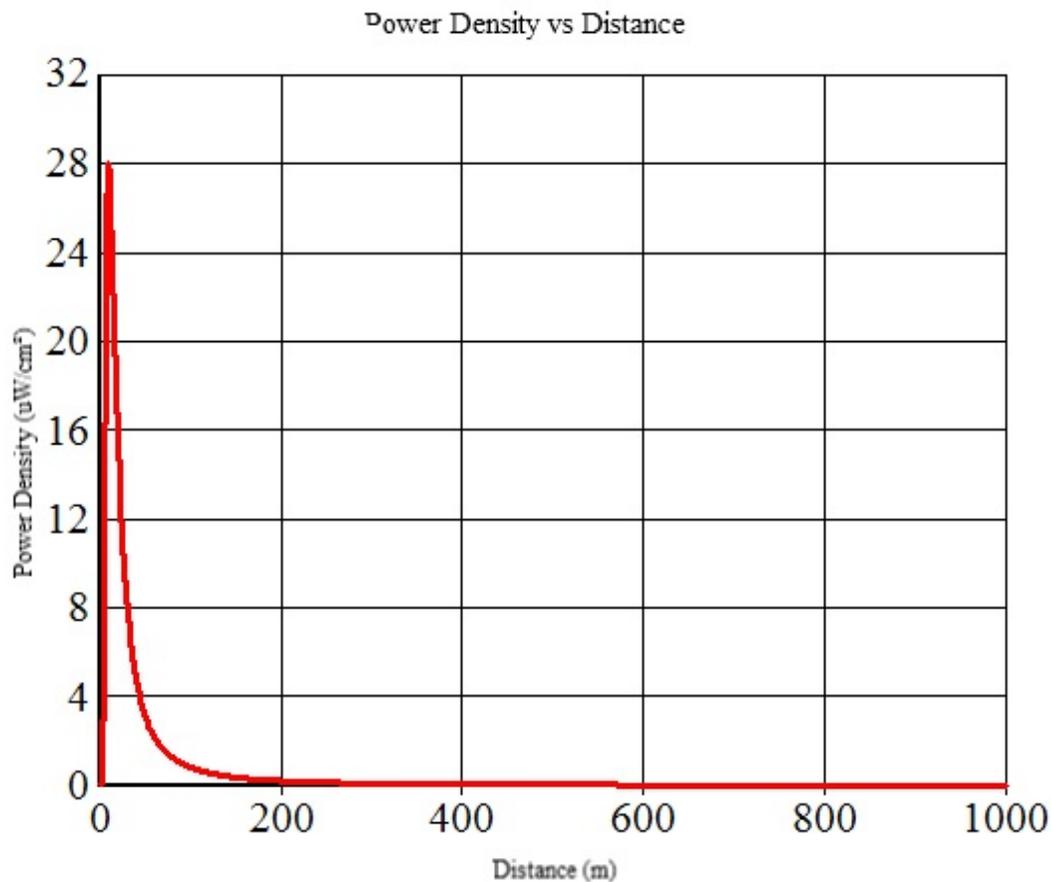
K280CV Cathedral City

Ground-Level Power Density Calculations

Using Manufacturer's Vertical Plane Pattern

Antenna CLFMV
 ERP 0 Watts H (avg)
 250 Watts V (avg)
 Antenna AGL 7.6 meters less 2m is 5.6 meters above the reference plane

Calculated
 Maximum is 28.00 uW/cm² at 9 meters from the tower



Distance From Tower (meters)	Hypotenuse (meters)	Depression Angle (degrees)	Interp Rel Field	Adjusted ERP (watts)	Power Density uW/cm ²
0	5.60	90.00	0.010	0.0	0.03
1	5.69	79.88	0.010	0.0	0.03
2	5.95	70.35	0.019	0.1	0.09
3	6.35	61.82	0.070	1.2	1.03
4	6.88	54.46	0.165	6.8	4.81
5	7.51	48.24	0.289	20.8	12.35
6	8.21	43.03	0.403	40.7	20.18
7	8.96	38.66	0.494	61.1	25.41
8	9.77	34.99	0.563	79.3	27.78
9	10.60	31.89	0.614	94.2	28.00
10	11.46	29.25	0.659	108.4	27.57
11	12.34	26.98	0.699	122.3	26.81
12	13.24	25.02	0.735	134.9	25.71
13	14.15	23.30	0.764	145.9	24.32

