July 2019
KSON(FM) Channel 279B
San Diego, California
Auxiliary Antenna Engineering

Facilities Proposed

The proposed auxiliary antenna operation will be on Channel 279B (103.7 MHz) with a maximum lobe effective radiated power of 1.8 kilowatts. Operation is proposed with a 1-element circularly-polarized directional panel antenna which is installed on a tower on San Miguel Mountain. This antenna is already in use by the auxiliary facilities for KBZT 235B San Diego, KWFN 247B San Diego, and KXSN 251B San Diego, and will also be used by the auxiliary facility for KYXY 243B San Diego (as proposed in a separately-filed Form 301 application).

The transmission system is comprised of a broadband panel antenna which is connected to a frequency-agile transmitter, such that only one station can operate via this system at any given time. There is no combiner installed, and there will be no need for a spurious emissions measurement requirement on the construction permit.

The KSON and KYXY applications specify updated coordinates for the tower location.

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 500 meters. Values past this point are increasingly negligible.

The Commission's FMModel software does not include an element model for the ERI model 1080-1CP-DA-SP panel antenna that will be used for this auxiliary facility. Therefore, calculations of the power density produced by the proposed antenna system assume a Type 1 element pattern, which is the "worst case" element pattern. Under this worst-case assumption, the highest calculated ground level power density from the auxiliary facility alone occurs at a distance of 8 meters from the base of the antenna support structure. At this point the power density is calculated to be 92.3 $\mu W/cm^2$.

Simple summation of the maxima of all stations operating from this transmitter site would suggest a result which exceeds the FCC standard for uncontrolled environments. However, the panel antenna used by most of these facilities has a much more favorable vertical plane pattern than the Commission's Type 1 element model. Experience with panel antennas has shown their real-world results to be much more similar to the Type 3 element model, or even better.[1] Furthermore, the facilities at San Miguel Mountain are situated on towers which are separated by as much as 300 meters. As a result, actual ground-level exposure values are expected to be much lower than a worst-case summation would indicate. Should the Commission so require, post-construction RF exposure measurements will be made at the transmitter site in order to ensure compliance with the applicable FCC standard.

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.

[1] For a Type 3 element model, the calculated maxima from the KSON auxiliary would be 34.1 $\mu W/cm^2$. Furthermore, the terrain falls away from the tower site in the direction the panel antenna is pointing, which will further decrease the real-world ground-level power density from this facility.


Main 60 dBu
Auxiliary 60 dBu
California
RIVERSIDE
SAN DIEGO
LAGUNA BEACH
MISSION VIEJO
LAGUNA NIGUEL
SAN JUAN CAPISTRANO
DANA POINT
SAN CLEMENTE
TEMECULA
LAKE RIVERSIDE
ANZA
AGUANGA
RAINBOW
FALLBROOK
CAMP PENDLETON NORTH
BONSALL
CAMP PENDLETON SOUTH
OCEANSIDE
HIDDEN MEADOWS
VALLEY CENTER
VISTA
SAN MARCOS
ESCONDIDO
CARLSBAD
JULIAN
ENCINITAS
RAMONA
RANCHO SANTA FE
SAN DIEGO COUNTRY ESTATES
SOLANA BEACH
POWAY
DEL MAR
EUCALYPTUS HILLS
DESCANSO
SANTEE
LAKESIDE
WINTER GARDENS
ALPINE
SAN DIEGO
HARBISON CANYON
BOSTONIA
EL CAJON
CREST
LA MESA
RANCHO SAN DIEGO
SPRING VALLEY
JAMUL
LA PRESA
CORONADO
NATIONAL CITY
CHULA VISTA
POTRERO
IMPERIAL BEACH
KSON 279B Auxiliary Contour Map
0
15
30
45
Kilometers
Hatfield & Dawson
7/2019
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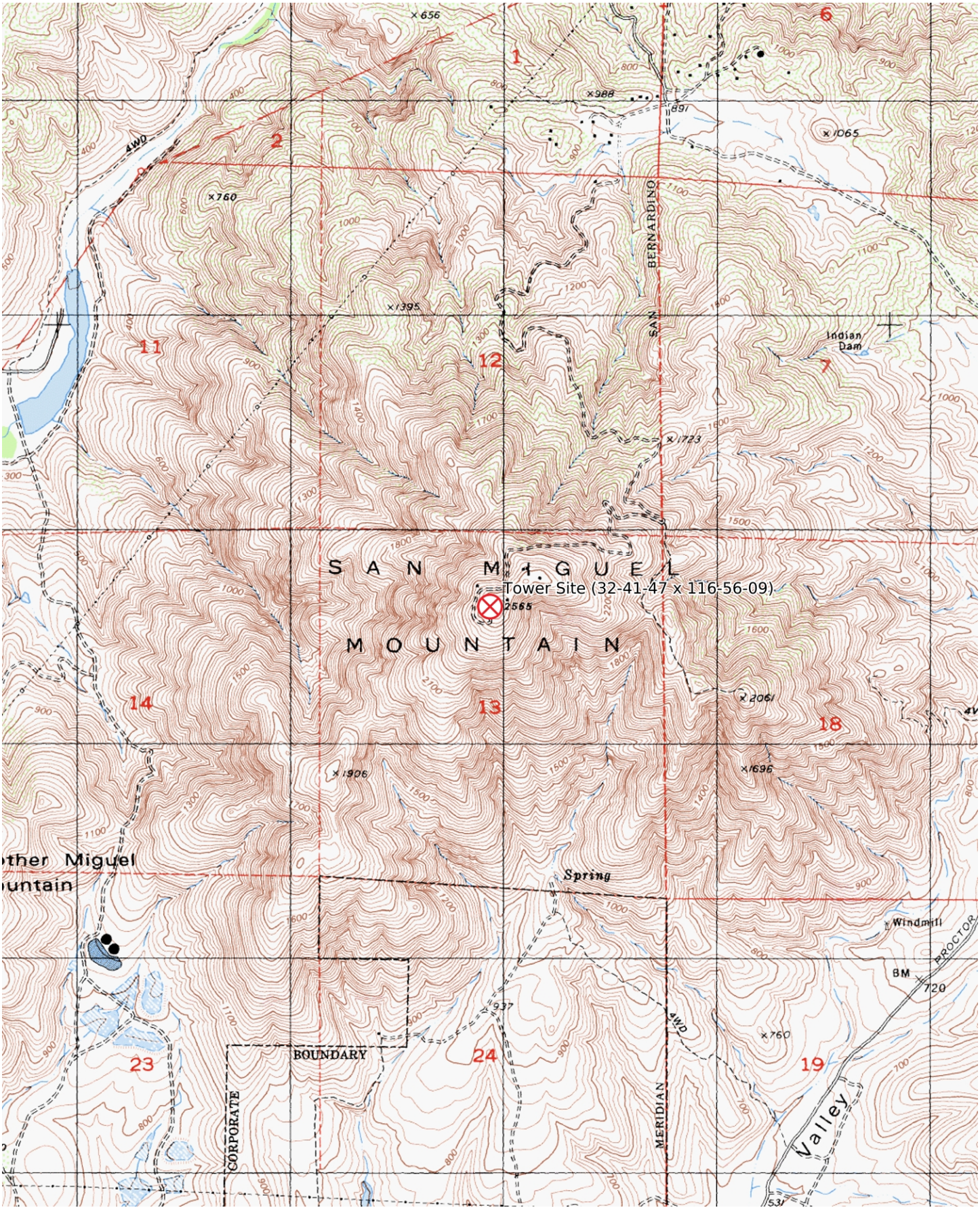
Tower Site (32-41-47 x 116-56-09)
SAN MIGUEL
MOUNTAIN
2565
Indian Dam
Spring
Windmill
BM 720
BOUNDARY
CORPORATE
MERIDIAN
SAN BERNARDINO
PROCTOR
Valley
4WD
Mercator Projection
NAD27 Conus
USNG Zone 11SNS
0.5 1.0 1.5 2.0 2.5 km
0.5 1.0 1.5 mi
Scale 1:24000 1 inch = 2000 feet
N
MN
11°
CalTopo