

THOMAS M. ECKELS, PE
STEPHEN S. LOCKWOOD, PE
DAVID J. PINION, PE
ERIK C. SWANSON, PE

THOMAS S. GORTON, PE
MICHAEL H. MEHIGAN, PE

JAMES B. HATFIELD, PE
BENJAMIN F. DAWSON III, PE
CONSULTANTS

HATFIELD & DAWSON
CONSULTING ELECTRICAL ENGINEERS
9500 GREENWOOD AVE. N.
SEATTLE, WASHINGTON 98103

TELEPHONE (206) 783-9151
FACSIMILE (206) 789-9834
E-MAIL hatdaw@hatdaw.com

MAURY L. HATFIELD, PE
(1942-2009)
PAUL W. LEONARD, PE
(1925-2011)

**Engineering Statement
Post-Auction Technical Facilities for KDTV-CD
Channel 21 at Santa Rosa, CA
June 2017**

Repack Application

This Engineering Statement has been prepared on behalf of KDTV License Partnership, G.P. , licensee of digital Class A television station KDTV-CD at Santa Rosa, California. KDTV-CD presently operates on Channel 28. The instant application is being filed in response to the Commission's *Channel Reassignment Public Notice* (DA 17-314), released on April 13, 2017, specifying the station's post-auction facilities on Channel 21.

The following table lists the KDTV-CD assigned post-auction facilities, as well as the requested facilities as proposed in this Form 2100 application:

	Technical Parameters from Post Auction Table	Technical Parameters from Proposed Form 2100
Channel	21	21
ERP	3.16 kW	3.1 kW
HAAT	(not specified for Class A)	
RCAMSL	1221.51 meters*	1219 meters
Antenna	ID #18052 directional at 195 deg T	RFS RD-08RFS(A)-470578-SL directional at 195 deg T
Coordinates (NAD83)	38-39-23 122-36-58	38-39-22.7 122-36-57.9

* It is not clear why the Table indicates this height AMSL for KDTV-CD, given that the station license indicates a height of 1219 meters.

Interference Study

The proposed technical facilities utilize an antenna pattern which is essentially identical to the licensed KDTV-CD pattern, but with some variation due to the fact that it was not possible to exactly match the existing pattern. Therefore, an interference study has been conducted using the Commission's TVStudy software. The results of the study demonstrate that this proposal will have no additional interference impact on other stations, and will not expand the service area more than 1% beyond the baseline.

Study created: 2017.06.02 14:28:52

Study build station data: LMS TV 2017-05-30 (16)

Proposal: KDTV-CD D21 DC BL SANTA ROSA, CA
 File number: KDTVCD21PREROT3.1KW
 Facility ID: 18148
 Station data: User record
 Record ID: 29
 Country: U.S.

Stations potentially affected:

Call	Chan	Svc	Status	City, State	File Number	Distance
KNVN	D20	DT	BL	CHICO, CA	DTVBL33745	183.7 km
K20JX-D	D20	DC	LIC	SACRAMENTO, CA	BLDTA20101006AAS	114.1
KDTV-DT	D20	DT	BL	SAN FRANCISCO, CA	DTVBL33778	144.2
KFTV-DT	D21	DT	BL	HANFORD, CA	DTVBL34439	330.2
KFTL-CD	D21	DC	BL	SAN FRANCISCO, CA	DTVBL52887	108.9
KAEF-TV	D22	DT	LIC	ARCATA, CA	BLCDT20071012ASQ	257.8
KSPX-TV	D22	DT	BL	SACRAMENTO, CA	DTVBL52953	107.1
KAXT-CD	D22	DC	BL	SAN FRANCISCO, SAN JO, CA	DTVBL37689	144.2

No non-directional AM stations found within 0.8 km

No directional AM stations found within 3.2 km

Record parameters as studied:

Channel: D21
 Mask: Full Service
 Latitude: 38 39 22.70 N (NAD83)
 Longitude: 122 36 57.90 W
 Height AMSL: 1221.6 m
 HAAT: 0.0 m
 Peak ERP: 3.10 kW
 Antenna: RFS-RD-08RFS(A)-470578-SL 195.0 deg

49.5 dBu contour:

Azimuth	ERP	HAAT	Distance
0.0 deg	0.141 kW	824.0 m	43.8 km
45.0	0.177	790.6	44.7
90.0	2.10	775.8	60.5
135.0	2.92	928.7	65.2
180.0	2.92	919.5	65.1

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225.0	2.66	977.1	65.4
270.0	3.05	998.6	66.7
315.0	1.21	399.1	48.2

Database HAAT does not agree with computed HAAT

Database HAAT: 0 m Computed HAAT: 827 m

Proposal service area is within baseline plus 1.0%

Proposal service area population is more than 95.0% of baseline

Distance to Canadian border: 1066.1 km

Distance to Mexican border: 819.0 km

Conditions at FCC monitoring station: Livermore CA

Bearing: 143.7 degrees Distance: 128.0 km

ERP: 2.80 kW Field strength: 8.1 dBu, 0.0 mV/m

Proposal is not within the West Virginia quiet zone area

Conditions at Table Mountain receiving zone:

Bearing: 78.3 degrees Distance: 1497.9 km

No land mobile station failures found

Study cell size: 2.00 km

Profile point spacing: 1.00 km

Maximum new IX to full-service and Class A: 0.50%

Maximum new IX to LPTV: 2.00%

Proposal receives 6.91% interference from scenario 1

No IX check failures found.

Facilities Proposed

The proposed operation will be on Channel 21 with a maximum lobe effective radiated power of 3.1 kilowatts (H pol). Operation is proposed with an RFS model RD-08RFS(A)-470578-SL antenna, which will be mounted on an existing tower at the Mayacamas Mountains communications site. There is no FCC Antenna Structure Registration Number required for this tower.

RF Exposure Calculations

OET Bulletin 65 Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields (Edition 97-01) states in part that:

When performing an evaluation for compliance with the FCC's RF guidelines all significant contributors to the ambient RF environment should be considered. . . For purposes of such consideration, significance can be taken to mean any transmitter producing more than 5% of the applicable exposure limit (in terms of power density or the square of the electric or magnetic field strength) at accessible locations.

As will be demonstrated below, the proposed operation will produce less than 5% of the applicable exposure limit for both controlled and uncontrolled environments. Thus, the proposed facility is categorically excluded from the requirement of further study. Therefore, pursuant to §1.1307(b)(3) of the Commission's Rules no calculations are required for the other FM and TV facilities in the vicinity, and precise calculations are made only with regard to the levels from this proposal.

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.

Power density levels produced by the proposed facility were calculated for an elevation of 2 meters above ground (16 meters below the antenna radiation center). The worst case power density levels occur at depression angles between 45 and 90 degrees below the horizontal. The calculations in this report assume a worst-case relative field value of 0.036 at these angles, based on the manufacturer's vertical plane pattern for the elliptically-polarized RFS model RD-08RFS(A)-470578-SL antenna proposed in this application. This relative field value yields a worst-case adjusted average effective radiated power of 4.02 watts at depression angles between 45 and 90 degrees below the horizontal. Assuming this power and the shortest distance between the antenna radiation center and 2 meters above ground level (i.e. straight down), the highest calculated power density from the proposed antenna alone occurs at the base of the antenna support structure. At this point the power density is calculated to be $0.5 \mu\text{W}/\text{cm}^2$, which is 0.15% of $341.3 \mu\text{W}/\text{cm}^2$ (the FCC maximum for uncontrolled environments at the Channel 21 frequency).

These calculations show that the maximum calculated power density produced at two meters above ground level by the proposed operation 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 applicants 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.

Access to the transmitter site is restricted and appropriately marked with RF warning signs. Pursuant to OET Bulletin No. 65, all station personnel and contractors are required to follow appropriate safety procedures before any work is commenced on the antenna tower, including reduction in power or discontinuance of operation before any maintenance work is undertaken. 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.