

ENGINEERING EXHIBIT

Application for Modification of Digital Television Station Construction Permit

prepared for

Sacramento Television Stations, Inc.

KMAX-TV Sacramento, CA

Facility ID 51499

Ch. 21 725 kW 556 m

Sacramento Television Stations, Inc. ("STSI") is the licensee of television station KMAX-TV, pre-auction Channel 21, Sacramento CA, Facility ID 51499 (BLCDDT-20041018ABT). KMAX-TV is licensed to operate with 850 kW effective radiated power ("ERP") at an antenna height above average terrain ("HAAT") of 581 meters with a nondirectional antenna. A Construction Permit ("CP" file #0000029216) authorizes relocation of KMAX-TV to another site 2.9 km from the licensed site and operation at 785 kW ERP and 543 meters HAAT on Channel 21 with a side mounted antenna.

During buildout of the Channel 21 CP, it was determined that the antenna's height above ground level had to be increased by 12.5 meters in order to provide adequate clearance to other existing appurtenances on the tower structure. Therefore, *STSI* proposes herein to modify¹ the CP to utilize slightly increased antenna height and slightly decreased ERP that will maintain the same coverage contour as the CP. The proposed ERP is 725 kW and the proposed antenna HAAT is 556 meters. The proposal complies with the FCC's April 5, 2013 freeze on contour extensions.

As with the current authorization, the proposed Channel 21 facility will utilize a side-mount antenna on the tower associated with FCC Antenna Structure Registration number 1011404. No change to the overall structure height will result.

¹Reassignment of KMAX-TV from Channel 21 to Channel 24 was specified in the *Incentive Auction Closing and Channel Reassignment Public Notice* ("CCRPN", DA 17-317, released April 13, 2017). This application concerns the pre-auction Channel 21 facility which *STSI* is relocating prior to the phase transition date when KMAX-TV will change to Channel 24. The FCC's Licensing and Management System pre-fills the reassignment Channel 24 on the accompanying electronic application form and will not permit the applicant to set it to the intended pre-auction Channel 21. FCC staff advises that they will manually change the channel to the intended Channel 21 in the system after the application has been submitted.

Figure 1 supplies a map that demonstrates compliance with §73.625(a)(1) regarding coverage of the entire principal community. The proposed facility's predicted population exceeds 95 percent of the MB Docket 87-268 Seventh Report and Order Appendix B facility (see table below). The post-transition Appendix B KMAX-TV facility parameters are the same as the licensed KMAX-TV parameters (BLCDT-20041018ABT and underlying BMPCDT-20040227ABF).

Digital Television Population Summary
TVStudy Software, 2010 Census

Population Summary (2010 Census) OET Bulletin 69: TVStudy	Baseline - Licensed 850 kW 581 m	Proposed 725 kW 556 m
Within Noise Limited Contour	10,691,054	10,644,556
Not affected by terrain losses	6,955,879	6,974,200
Lost to all interference	265	1,386
Net DTV Service	6,955,614	6,972,814
Match of Baseline - Licensed	---	100.25%

Interference study per FCC OET Bulletin 69² shows that the proposal complies with the 0.5 percent limit of new interference caused to pertinent pre-auction nearby full service and Class A television stations as required by §73.616. The interference study output report is provided as Table 1.

The FCC's "freeze" Public Notice³ of April 5, 2013 (DA 13-618) imposed limitations on the filing and processing of full power station applications that propose an increase in their authorized noise-limited service contour ("NLSC"). The proposed KMAX-TV facility complies with the freeze. As shown in Figure 2, the proposed 725 kW / 556 m HAAT facility's NLSC (41 dBμ) does not extend beyond that of the licensed facility (850 kW / 581 m), and is essentially identical to the CP facility's NLSC (785 kW / 543 m HAAT).

²FCC Office of Engineering and Technology Bulletin number 69, *Longley-Rice Methodology for Evaluating TV Coverage and Interference*, February 6, 2004 ("OET-69"). This analysis employed the FCC's current "TVStudy" software with the default application processing template settings, 2 km cell size, and 1 km terrain increment. Comparisons of various results of this computer program (run on a Mac processor) to the FCC's implementation of TVStudy show excellent correlation.

³"Media Bureau Announces Limitations on the Filing and Processing of Full Power and Class A Television Station Modification Applications, Effective Immediately, and Reminds Stations of Spectrum Act Preservation Mandate," DA 13-618, Public Notice, released April 5, 2013.

The proposed 725 kW ERP exceeds the maximum allowed for the proposed antenna HAAT of 556 meters permitted by §73.622(f)(8)(i). Section 73.622(f)(5) permits the maximum ERP to be exceeded in order to provide the same geographic coverage area as the largest station within the same market. Since the proposed KMAX-TV 41 dBμ contour is encompassed by the licensed KMAX-TV contour (see Figure 2), the proposal will result in a slightly smaller service area than that of the existing KMAX-TV. Additionally, the total area within the proposed KMAX-TV 41 dBμ contour is 41,680 square kilometers, which does not exceed the coverage contour area of KXTV(DT) (47,583 sq. km, Ch. 10, Sacramento, CA, BLCDT-20120201AAM). Thus, the 725 kW ERP specified herein is in compliance with §73.622(f)(5) of the FCC's Rules.

The nearest FCC monitoring station is 61 km distant at Livermore, CA. Using the FCC propagation curves, the proposed F(50,90) signal level at the monitoring station is 3.6 mV/m, which is below the 10 mV/m threshold of §73.1030(c) for further analysis. The site is not located within the areas requiring coordination with "quiet" zones specified in §73.1030(a) and (b). There are no authorized AM stations within 3 kilometers of the site. The site location is beyond the border areas requiring international coordination.

Human Exposure to Radiofrequency Electromagnetic Field

The proposed operation was evaluated for human exposure to RF energy using the procedures outlined in the FCC's OET Bulletin Number 65. Based on OET-65 equation (10), and considering 10 percent antenna relative field in downward elevations, the calculated signal density near the tower at two meters above ground level attributable to the proposed facility is $0.8 \mu\text{W}/\text{cm}^2$, which is 0.23 percent of the general population/uncontrolled maximum permitted exposure limit. This is well below the five percent threshold limit described in §1.1307(b) regarding sites with multiple emitters, categorically excluding the applicant from responsibility for taking any corrective action in the areas where the proposal's contribution is less than five percent.

The general public will not be exposed to RF levels attributable to the proposal in excess of the FCC's guidelines. RF exposure warning signs will continue to be posted. With respect to worker safety, the applicant will coordinate exposure procedures with all pertinent stations and will

reduce power or cease operation as necessary to protect persons having access to the site, tower or antenna from RF electromagnetic field exposure in excess of FCC guidelines.

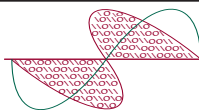
This exhibit is limited to the evaluation of exposure to RF electromagnetic field. The proposed transmitting antenna will be installed on an existing antenna support structure which was constructed prior to March 16, 2001. No increase in structure height is proposed.

List of Attachments

Figure 1	Proposed Coverage Contours
Figure 2	Coverage Contour Comparison
Table 1	OET Bulletin 69 Interference Study
Form 2100	Saved Version of Engineering Sections from FCC Form at Time of Upload

Chesapeake RF Consultants, LLC

Joseph M. Davis, P.E.	January 15, 2018	
207 Old Dominion Road	Yorktown, VA 23692	703-650-9600

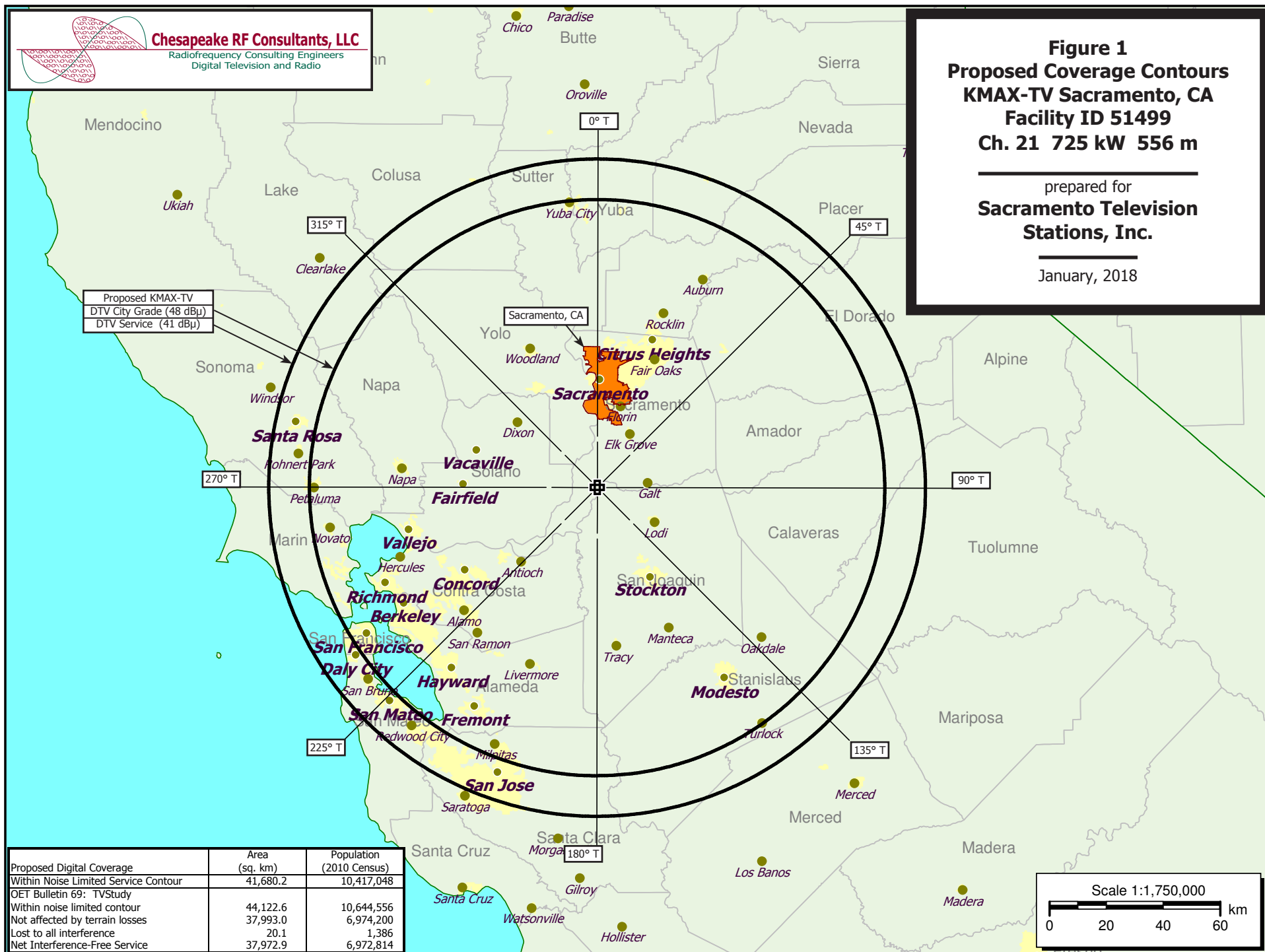


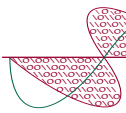
Chesapeake RF Consultants, LLC
Radiofrequency Consulting Engineers
Digital Television and Radio

Figure 1
Proposed Coverage Contours
KMAX-TV Sacramento, CA
Facility ID 51499
Ch. 21 725 kW 556 m

prepared for
Sacramento Television
Stations, Inc.

January, 2018





Chesapeake RF Consultants, LLC
Radiofrequency Consulting Engineers
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Figure 2
Coverage Contour Comparison
KMAX-TV Sacramento, CA
Facility ID 51499
Ch. 21 725 kW 556 m

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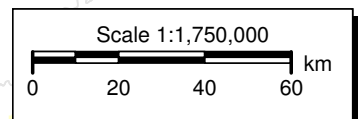
January, 2018

Licensed KMAX-TV
850 kW 581 m
41 dBu Contour (NLSC)

Proposed KMAX-TV
725 kW 556 m
Identical to KMAX-TV CP
File# 0000029216
785 kW 543 m
41 dBu Contour (NLSC)

Licensed Site

CP Site



**Table 1 KMAX-TV OET Bulletin 69 Interference Study
Pre-Auction Facilities and Channels**
(page 1 of 4)



tvstudy v2.2.4 (Z2Qqz3)
Database: localhost, Study: KMAX-TV 21 side-mount 725KW PROP, Model: Longley-Rice
Start: 2018.01.10 16:57:52

Study created: 2018.01.10 16:57:52

Study build station data: LMS TV 2018-01-09 LMSTV

Proposal: KMAX-TV D21 DT APP SACRAMENTO, CA
File number: KMAX-TV 21 side-mount 725KW
Facility ID: 51499
Station data: User record
Record ID: 1639
Country: U.S.
Zone: II

Proposal "before": KMAX-TV D21 DT CP *A SACRAMENTO, CA
File number: BMPCDT20040227ABF
Facility ID: 51499
Station data: LMS TV 2018-01-09 LMSTV
Record ID: 4c7567e19b6f478b98c5cf6212b6c0ea
Country: U.S.

Build options:
Protect pre-transition records not on baseline channel

Search options:
All post-transition APP, CP, and baseline records excluded

Individual records excluded:
0000029688 KSEE D20 DT CP FRESNO, CA BLANK0000029688
0000030649 KSPX-TV D21 DT APP *P SACRAMENTO, CA BLANK0000030649
0000030659 KTXL D22 DT APP *P SACRAMENTO, CA BLANK0000030659

Stations potentially affected by proposal:

IX	Call	Chan	Svc	Status	City, State	File Number	Distance
No	KFTV-DT	D20	DT	LIC	HANFORD, CA	BLCDT20020906ABE	223.7 km
Yes	KCVU	D20	DT	LIC	PARADISE, CA	BLCDT20081222AAV	192.2
Yes	K20JX-D	D20	DC	APP	SACRAMENTO, CA	BLANK0000036141	64.4
Yes	K20JX-D	D20	DC	LIC	SACRAMENTO, CA	BLDTA20101006AAS	67.8
No	KAME-TV	D20	DT	LIC	RENO, NV	BLANK0000001059	209.8
No	KAME-TV	D20	DT	APP	RENO, NV	BLANK0000035790	209.8
No	KPMR	D21	DT	LIC	SANTA BARBARA, CA	BLCDT20110607ABB	435.4
No	KPMR	D21	DT	APP	SANTA BARBARA, CA	BPCDT20120817ABD	434.8

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
Latitude: 38 14 24.00 N (NAD83)
Longitude: 121 30 7.00 W
Height AMSL: 557.8 m
HAAT: 555.8 m
Peak ERP: 725 kW
Antenna: Omnidirectional
Elev Pattn: Generic
Elec Tilt: 0.75

39.5 dBu contour:

Azimuth	ERP	HAAT	Distance
0.0 deg	725 kW	555.7 m	118.4 km
45.0	725	552.1	118.2
90.0	725	551.9	118.1
135.0	725	555.2	118.3
180.0	725	558.7	118.5
225.0	725	558.6	118.5
270.0	725	558.2	118.5
315.0	725	556.4	118.4

**Table 1 KMAX-TV OET Bulletin 69 Interference Study
Pre-Auction Facilities and Channels**
(page 2 of 4)



ERP exceeds maximum

ERP: 725 kW ERP maximum: 390 kW

Distance to Canadian border: 1121.9 km

Distance to Mexican border: 726.6 km

**Proposal is within coordination distance of FCC monitoring station

Conditions at FCC monitoring station: Livermore CA

Bearing: 201.2 degrees Distance: 61.4 km

ERP: 725 kW HAAT: 559.2 m Field strength: 71.1 dBu, 3.6 mV/m

Proposal is not within the West Virginia quiet zone area

Conditions at Table Mountain receiving zone:

Bearing: 76.4 degrees Distance: 1413.4 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%

Interference to BLCDT20081222AAV LIC scenario 1

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	KCVU	D20	DT	LIC	PARADISE, CA	BLCDT20081222AAV	
Undesireds:	KMAX-TV	D21	DT	CP	SACRAMENTO, CA	BMPCDT20040227ABF	189.6 km
	KMAX-TV	D21	DT	APP	SACRAMENTO, CA	KMAX-TV 21 side-mount	192.2
	K20JX-D	D20	DC	APP	SACRAMENTO, CA	BLANK0000036141	139.1
	KAME-TV	D20	DT	LIC	RENO, NV	BLANK0000001059	168.8
Service area		Terrain-limited		IX-free, before		IX-free, after	Percent New IX
24623.4	630,068	21496.1	616,068	21423.9	615,419	21423.9 615,419	0.00 0.00
Undesired		Total IX		Unique IX, before		Unique IX, after	
KMAX-TV	D21 DT CP	12.0	2	8.0	0		
KMAX-TV	D21 DT APP	8.0	0		8.0	0	
K20JX-D	D20 DC APP	60.2	649	52.2	647	56.2 649	
KAME-TV	D20 DT LIC	8.0	0	4.0	0	4.0	0

Interference to BLCDT20081222AAV LIC scenario 2

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	KCVU	D20	DT	LIC	PARADISE, CA	BLCDT20081222AAV	
Undesireds:	KMAX-TV	D21	DT	CP	SACRAMENTO, CA	BMPCDT20040227ABF	189.6 km
	KMAX-TV	D21	DT	APP	SACRAMENTO, CA	KMAX-TV 21 side-mount	192.2
	K20JX-D	D20	DC	LIC	SACRAMENTO, CA	BLDTA20101006AAS	130.0
	KAME-TV	D20	DT	LIC	RENO, NV	BLANK0000001059	168.8
Service area		Terrain-limited		IX-free, before		IX-free, after	Percent New IX
24623.4	630,068	21496.1	616,068	21432.2	615,869	21436.2 615,871	-0.02 -0.00
Undesired		Total IX		Unique IX, before		Unique IX, after	
KMAX-TV	D21 DT CP	12.0	2	12.0	2		
KMAX-TV	D21 DT APP	8.0	0		8.0	0	
K20JX-D	D20 DC LIC	43.9	197	43.9	197	43.9 197	
KAME-TV	D20 DT LIC	8.0	0	8.0	0	8.0	0

Table 1 KMAX-TV OET Bulletin 69 Interference Study
Pre-Auction Facilities and Channels
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 Interference to BLCDT20081222AAV LIC scenario 3

	Call	Chan	Svc	Status	City, State	File Number	Distance
Desired:	KCVU	D20	DT	LIC	PARADISE, CA	BLCDT20081222AAV	
Undesireds:	KMAX-TV	D21	DT	CP	SACRAMENTO, CA	BMPCDT20040227ABF	189.6 km
	KMAX-TV	D21	DT	APP	SACRAMENTO, CA	KMAX-TV 21 side-mount	192.2
	K20JX-D	D20	DC	APP	SACRAMENTO, CA	BLANK0000036141	139.1
	KAME-TV	D20	DT	APP	RENO, NV	BLANK0000035790	168.8
Service area		Terrain-limited		IX-free, before		IX-free, after	Percent New IX
24623.4	630,068	21496.1	616,068	21419.9	615,419	21419.9 615,419	0.00 0.00
Undesired		Total IX		Unique IX, before		Unique IX, after	
KMAX-TV	D21 DT CP	12.0	2	8.0	0		
KMAX-TV	D21 DT APP	8.0	0			8.0 0	
K20JX-D	D20 DC APP	60.2	649	52.2	647	56.2 649	
KAME-TV	D20 DT APP	12.1	0	8.0	0	8.0 0	

 Interference to BLCDT20081222AAV LIC scenario 4

	Call	Chan	Svc	Status	City, State	File Number	Distance
Desired:	KCVU	D20	DT	LIC	PARADISE, CA	BLCDT20081222AAV	
Undesireds:	KMAX-TV	D21	DT	CP	SACRAMENTO, CA	BMPCDT20040227ABF	189.6 km
	KMAX-TV	D21	DT	APP	SACRAMENTO, CA	KMAX-TV 21 side-mount	192.2
	K20JX-D	D20	DC	LIC	SACRAMENTO, CA	BLDTA20101006AAS	130.0
	KAME-TV	D20	DT	APP	RENO, NV	BLANK0000035790	168.8
Service area		Terrain-limited		IX-free, before		IX-free, after	Percent New IX
24623.4	630,068	21496.1	616,068	21428.2	615,869	21432.2 615,871	-0.02 -0.00
Undesired		Total IX		Unique IX, before		Unique IX, after	
KMAX-TV	D21 DT CP	12.0	2	12.0	2		
KMAX-TV	D21 DT APP	8.0	0			8.0 0	
K20JX-D	D20 DC LIC	43.9	197	43.9	197	43.9 197	
KAME-TV	D20 DT APP	12.1	0	12.1	0	12.1 0	

 Interference to BLANK0000036141 APP scenario 1

	Call	Chan	Svc	Status	City, State	File Number	Distance
Desired:	K20JX-D	D20	DC	APP	SACRAMENTO, CA	BLANK0000036141	
Undesireds:	KMAX-TV	D21	DT	CP	SACRAMENTO, CA	BMPCDT20040227ABF	61.5 km
	KMAX-TV	D21	DT	APP	SACRAMENTO, CA	KMAX-TV 21 side-mount	64.4
	KAME-TV	D20	DT	LIC	RENO, NV	BLANK0000001059	151.4
Service area		Terrain-limited		IX-free, before		IX-free, after	Percent New IX
2278.3	1,607,173	2266.3	1,603,987	2169.7	1,600,988	2209.9 1,602,177	-1.86 -0.07
Undesired		Total IX		Unique IX, before		Unique IX, after	
KMAX-TV	D21 DT CP	96.6	2,999	96.6	2,999		
KMAX-TV	D21 DT APP	56.3	1,810			56.3 1,810	

 Interference to BLDTA20101006AAS LIC scenario 1

	Call	Chan	Svc	Status	City, State	File Number	Distance
Desired:	K20JX-D	D20	DC	LIC	SACRAMENTO, CA	BLDTA20101006AAS	
Undesireds:	KMAX-TV	D21	DT	CP	SACRAMENTO, CA	BMPCDT20040227ABF	64.9 km
	KMAX-TV	D21	DT	APP	SACRAMENTO, CA	KMAX-TV 21 side-mount	67.8
	KAME-TV	D20	DT	LIC	RENO, NV	BLANK0000001059	155.3
Service area		Terrain-limited		IX-free, before		IX-free, after	Percent New IX
1617.5	1,161,591	1617.5	1,161,591	1533.2	1,099,764	1565.4 1,113,974	-2.10 -1.29
Undesired		Total IX		Unique IX, before		Unique IX, after	
KMAX-TV	D21 DT CP	84.3	61,827	84.3	61,827		

Table 1 KMAX-TV OET Bulletin 69 Interference Study
Pre-Auction Facilities and Channels
 (page 4 of 4)



KMAX-TV D21 DT APP 52.2 47,617 52.2 47,617

 Interference to proposal scenario 1

	Call	Chan	Svc	Status	City, State	File Number	Distance
Desired:	KMAX-TV	D21	DT	APP	SACRAMENTO, CA	KMAX-TV 21 side-mount	
Undesireds:	K20JX-D	D20	DC	APP	SACRAMENTO, CA	BLANK00000036141	64.4 km
	KAME-TV	D20	DT	LIC	RENO, NV	BLANK0000001059	209.8
	Service area		Terrain-limited		IX-free	Percent IX	
44122.6	10,644,556	37993.0	6,974,200	37972.9	6,972,814	0.05 0.02	
Undesired			Total IX		Unique IX	Prcnt Unique IX	
K20JX-D D20 DC APP		20.1	1,386	20.1	1,386	0.05 0.02	

 Interference to proposal scenario 2

	Call	Chan	Svc	Status	City, State	File Number	Distance
Desired:	KMAX-TV	D21	DT	APP	SACRAMENTO, CA	KMAX-TV 21 side-mount	
Undesireds:	K20JX-D	D20	DC	LIC	SACRAMENTO, CA	BLDTA20101006AAS	67.8 km
	KAME-TV	D20	DT	LIC	RENO, NV	BLANK0000001059	209.8
	Service area		Terrain-limited		IX-free	Percent IX	
44122.6	10,644,556	37993.0	6,974,200	37977.0	6,973,481	0.04 0.01	
Undesired			Total IX		Unique IX	Prcnt Unique IX	
K20JX-D D20 DC LIC		16.0	719	16.0	719	0.04 0.01	

Channel and Facility Information

Section	Question	Response
Proposed Community of License	Facility ID	51499
	State	California
	City	SACRAMENTO
	DTV Channel	24
Facility Type	Facility Type	Commercial
	Station Type	Main
Zone	Zone	2

Pre-filled and fixed to post-auction Ch-24 on electronic form. FCC Staff to change to intended, pre-auction Ch-21 after form is submitted.

Antenna Location Data

Section	Question	Response
Antenna Structure Registration	Do you have an FCC Antenna Structure Registration (ASR) Number?	Yes
	ASR Number	1011404
Coordinates (NAD83)	Latitude	38° 14' 24.0" N+
	Longitude	121° 30' 07.0" W-
	Structure Type	GTOWER-Guyed Structure Used for Communication Purposes
	Overall Structure Height	624.5 meters
	Support Structure Height	583.7 meters
	Ground Elevation (AMSL)	0.0 meters
Antenna Data	Height of Radiation Center Above Ground Level	557.8 meters
	Height of Radiation Center Above Average Terrain	555.8 meters
	Height of Radiation Center Above Mean Sea Level	557.8 meters
	Effective Radiated Power	725 kW

**Antenna
Technical Data**

Section	Question	Response
Antenna Type	Antenna Type	Non-Directional
	Do you have an Antenna ID?	
	Antenna ID	
Antenna Manufacturer and Model	Manufacturer:	DIE
	Model	TFU-24DSC-R O3
	Rotation	
	Electrical Beam Tilt	0.75
	Mechanical Beam Tilt	Not Applicable
	toward azimuth	
	Polarization	Horizontal
DTV and DTS: Elevation Pattern	Does the proposed antenna propose elevation radiation patterns that vary with azimuth for reasons other than the use of mechanical beam tilt?	No
	Uploaded file for elevation antenna (or radiation) pattern data	

**Construction
Permit
Certifications**

Section	Question	Response
Post-Incentive Auction Expedited Processing	It will operate on the DTV channel for this station as established in the post-incentive auction channel reassignment public notice.	No
	It will operate post-incentive auction facilities that do not expand the noise-limited service contour in any direction beyond that established by the post-incentive auction channel reassignment public notice.	Yes
	It will operate post-incentive auction facilities that match or reduce by no more than five percent with respect to predicted population from those defined in the post-incentive auction channel reassignment public notice.	Yes
	The antenna structure to be used by this facility has been registered by the Commission and will not require re-registration to support the proposed antenna, OR the FAA has previously determined that the proposed structure will not adversely affect safety in air navigation and this structure qualifies for later registration under the Commission's phased registration plan, OR the proposed installation on this structure does not require notification to the FAA pursuant to 47 C.F.R. Section 17.7.	Yes
Environmental Effect	Would a Commission grant of Authorization for this location be an action which may have a significant environmental effect? (See Section 1.1306 of 47 C.F.R.)	No
Broadcast Facility	The proposed facility complies with the applicable engineering standards and assignment requirements of 47 C. F.R. Sections 73.616, 73.622(i), 73.623(e), 73.625, 73.1030, and 73.1125.	Yes