

TECHNICAL SUMMARY
APPLICATION FOR CONSTRUCTION PERMIT
LOW POWER DIGITAL STATION K31GZ-D
LAKE HAVASU CITY, ARIZONA
CHANNEL 31 15 KW (DA)

1. Application Purpose: The instant application proposes to change the licensed K31GZ-D directional antenna system from a Scala model 4DR-16S to a Kathrein model 4x1 750 0000049 E-pol panel array, increase the ERP from 2.21 kW (horizontal polarization) to 15 kW (elliptical polarization) and decrease the antenna height by 6 meters. No other changes are proposed.

2. Interference Compliance: As indicated in the attached *TVStudy* analysis summary, K31GZ-D's proposed 15 kW operation meets the FCC's interference protection requirements with respect to all protected facilities. A cell size of 1.0 km and a profile resolution of 1.0 km points/km were utilized for the *TVStudy* analysis.

3. RFR Compliance: The proposed facilities were evaluated in terms of potential radiofrequency radiation (RFR) exposure at ground level to workers and the general public. The radiation center for the proposed DTV antenna will be located 16 meters above ground level. The total DTV ERP is 21.43 kW (15 kW H-pol, 6.43 kW V-pol). A greater than expected vertical plane relative field value of 0.164 is presumed for the antenna's downward radiation (-60° to -90° elevation, see attached vertical plane relative field pattern). The calculated power density at a point 2 meters above ground level is 300.8 uW/cm^2 which is 78.5% of the FCC's recommended limit of 383.3 uW/cm^2 for channel 31 for an uncontrolled environment. Thus, it is believed that the proposed K31GZ-D facility is in compliance with the FCC's requirements with regard to RF radiation exposure. However, if necessary, measurements will be made to substantiate compliance with the FCC's RF radiation exposure requirements.

Access to the transmitting site will be restricted and appropriately marked with RFR warning signs. Furthermore, as this is a multi-user site, a protocol shall be in effect in the event that workers or other authorized personnel enter the restricted area or climb the supporting structure to ensure that appropriate measures will be taken to assure worker safety with respect to RF energy exposure.

K31GZ-D TVSTUDY INTERFERENCE ANALYSIS

tvstudy v2.2.5 (4uoc83)
Database: localhost, Study: k31gz030, Model: Longley-Rice
Start: 2023.07.06 12:20:12

Study created: 2023.07.06 12:20:12

Study build station data: LMS TV 2023-07-03

Proposal: K31GZ030 D31 LD APP LAKE HAVASU CITY, AZ
File number: k31gz030
Facility ID: 43376
Station data: User record
Record ID: 452
Country: U.S.

Search options:
Non-U.S. records included

Stations potentially affected by proposal:

IX	Call	Chan	Svc	Status	City, State	File Number	Distance
No	K23BJ-D	N23	TX	LIC	LAKE HAVASU CITY, AZ	BLTTL19891127JR	0.1 km
No	KYPO-LD	N27	TX	LIC	TACNA, AZ	BLTTL20080818AAL	114.1
No	K30GG-D	D30	LD	LIC	CHLORIDE, AZ	BLDTT20130308AAS	90.1
No	K30LL-D	D30	LD	LIC	KINGMAN, AZ	BLDTT20111207AFE	68.3
No	K30JD-D	D30	LD	LIC	PRESCOTT, AZ	BLDTT20130130AIN	168.7
No	K30QU-D	D30	LD	CP	DESERT CENTER, CA	BNPDTL20100514ACU	130.2
No	DK30BQ	D30	LD	APP	NEEDLES, CA	BDFCDTT20100519ADJ	48.2
No	KDNU-LD	D30	LD	LIC	LAS VEGAS, NV	BLANK0000165183	161.3
No	DK31LZ	N31	TX	APP	CAMP VERDE, AZ	BLTTL20130125AAC	229.1
No	K31PA-D	D31	LD	LIC	DOLAN SPRINGS, AZ	BLANK0000071728	110.9
No	K31NV-D	D31	LD	LIC	GLOBE-MIAMI, AZ	BLANK0000064182	351.7
Yes	K31BI-D	D31	LD	LIC	KINGMAN, AZ	BLDTT20130308ABE	71.9
No	K31KS-D	D31	LD	LIC	LECHEE, ETC., AZ	BLDTT20110531AAD	364.1
No	K31EA-D	D31	LD	LIC	LITTLEFIELD, AZ	BLDTL20130308ABV	287.1
No	KPPX-TV	D31	DT	LIC	TOLLESON, AZ	BLANK0000035245	255.4
No	K31NF-D	D31	LD	LIC	VERDE VALLEY, ETC., AZ	BLANK0000061922	206.3
No	K31NE-D	D31	LD	LIC	WILLIAMS, AZ	BLANK0000058812	208.4
No	KBTF-CD	D31	DC	LIC	BAKERSFIELD, CA	BLANK0000127171	408.4
No	KCBS-TV	D31	DT	LIC	LOS ANGELES, CA	BLANK0000216847	341.9
Yes	K31HY-D	D31	LD	LIC	NEEDLES, ETC., CA	BLDTT20130308ACE	48.2
No	KRET-CD	D31	DC	LIC	PALM SPRINGS, CA	BLDTA20140702ADK	206.6
No	K31MB-D	D31	LD	LIC	RIDGECREST, CA	BLANK0000004746	320.8
No	KSDY-LD	D31	LD	APP	San Diego, CA	BLANK0000176760	318.2
No	KSDY-LD	D31	LD	LIC	San Diego, CA	BLANK0000068967	318.2
No	K31AD-D	N31	TX	LIC	VICTORVILLE, ETC., CA	BLTT19900108IL	266.8
No	K31AD-D	D31	LD	LIC	VICTORVILLE, ETC., CA	BLANK0000143998	266.8
No	K31NR-D	D31	LD	LIC	VERTON, NV	BLANK0000137689	231.9
No	K31OY-D	D31	LD	LIC	PAHRUMP, NV	BLANK0000067694	181.8
No	K31KP-D	D31	LD	LIC	ALTON, UT	BLDTT20091228ABU	349.4
No	K31OI-D	D31	LD	LIC	BERYL, MODENA ETC., UT	BLANK0000091061	349.3
No	K31EI-D	D31	LD	LIC	CEDAR CANYON, UT	BLDTT20090728ABS	359.7
No	K18DN-D	D31	LD	LIC	KANAB, UT	BLANK0000060008	320.0
No	K31JX-D	D31	LD	LIC	ROCKVILLE, UT	BLDTT20100802AUE	308.0
No	K31IS-D	D31	LD	LIC	TOQUERVILLE, UT	BLDTT20070214ABW	314.5
No	K32DW-D	D32	LD	LIC	CHLORIDE, AZ	BLDTT20130308AAU	90.1
No	KAZF	D32	DT	CP	FLAGSTAFF, AZ	BLANK0000216485	264.5
No	K32LO-D	D32	LD	LIC	PRESCOTT, AZ	BLDTL20141201BCU	168.7
No	K32OS-D	D32	LD	CP	DESERT CENTER, CA	BNPDTL20100514ACN	162.2
Yes	KMCC	D32	DD	LIC	LAUGHLIN, NV	BLANK0000216254	124.2
No	XHLRT	D32	DT	LIC	SAN LUIS RIO COLORAD, SO	BLANKBPFS20160315ABL	239.8

No non-directional AM stations found within 0.8 km

No directional AM stations found within 3.2 km

Record parameters as studied:

Channel: D31
Mask: Stringent
Latitude: 34 36 9.00 N (NAD83)
Longitude: 114 22 16.00 W
Height AMSL: 402.0 m
HAAT: 48.0 m
Peak ERP: 15.0 kW
Antenna: Kat_4x1_750_0000049_E 350.0 deg
Elev Pattnr: Generic

K31GZ-D TVSTUDY INTERFERENCE ANALYSIS

50.4 dBu contour:

Azimuth	ERP	HAAT	Distance
0.0 deg	0.039 kW	29.8 m	7.7 km
45.0	0.035	-13.4	7.5
90.0	0.286	-304.1	12.6
135.0	8.33	-11.2	27.2
180.0	10.3	249.9	51.4
225.0	0.475	167.6	30.8
270.0	0.028	107.4	13.3
315.0	0.045	161.8	18.6

Distance to Canadian border: 1600.3 km

**Proposal is within coordination distance of Mexican border
Distance to Mexican border: 211.8 km

Conditions at FCC monitoring station: Douglas AZ
Bearing: 126.8 degrees Distance: 558.4 km

Proposal is not within the West Virginia quiet zone area

Conditions at Table Mountain receiving zone:
Bearing: 50.0 degrees Distance: 1011.3 km

Study cell size: 1.00 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 BLDTT20130308ABE LIC scenario 1

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	K31BI-D	D31	LD	LIC	KINGMAN, AZ	BLDTT20130308ABE	
Undesireds:	K31GZ030	D31	LD	APP	LAKE HAVASU CITY, AZ	k31gz030	71.9 km
	K30GG-D	D30	LD	LIC	CHLORIDE, AZ	BLDTT20130308AAS	41.3
	K30LL-D	D30	LD	LIC	KINGMAN, AZ	BLDTT20111207AFE	3.7
	K31PA-D	D31	LD	LIC	DOLAN SPRINGS, AZ	BLANK0000071728	63.2
	KPPX-TV	D31	DT	LIC	TOLLESON, AZ	BLANK0000035245	258.8
	K31NF-D	D31	LD	LIC	VERDE VALLEY, ETC., AZ	BLANK0000061922	167.7
	K31NE-D	D31	LD	LIC	WILLIAMS, AZ	BLANK0000058812	152.9
	K31HY-D	D31	LD	LIC	NEEDLES, ETC., CA	BLDTT20130308ACE	45.2
	K31AD-D	N31	TX	LIC	VICTORVILLE, ETC., CA	BLTT19900108IL	315.4
	K31OY-D	D31	LD	LIC	PAHRUMP, NV	BLANK0000067694	173.5
	K32DW-D	D32	LD	LIC	CHLORIDE, AZ	BLDTT20130308AAU	41.3
	KMCC	D32	DD	LIC	LAUGHLIN, NV	BLANK0000216254	86.9

Service area	Terrain-limited	IX-free, before	IX-free, after	Percent New IX
6199.5	63,804	5428.0	62,076	4865.2
			60,249	4865.2
				60,249
				0.00
				0.00

Undesired	Total IX	Unique IX, before	Unique IX, after
K31GZ030 D31 LD APP	1.0	0	0.0
K30GG-D D30 LD LIC	5.0	4	0.0
K30LL-D D30 LD LIC	473.2	1,809	446.3
K31PA-D D31 LD LIC	69.6	21	53.7
KPPX-TV D31 DT LIC	5.0	0	4.0
K31NF-D D31 LD LIC	1.0	0	1.0
K31NE-D D31 LD LIC	7.0	0	7.0
K31HY-D D31 LD LIC	17.9	2	16.9
K31OY-D D31 LD LIC	8.0	6	1.0
K32DW-D D32 LD LIC	6.0	4	0.0
KMCC D32 DD LIC	24.9	13	1.0

----- Interference to BLDTT20130308ACE LIC scenario 1

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	K31HY-D	D31	LD	LIC	NEEDLES, ETC., CA	BLDTT20130308ACE	
Undesireds:	K31GZ030	D31	LD	APP	LAKE HAVASU CITY, AZ	k31gz030	48.2 km
	K30LL-D	D30	LD	LIC	KINGMAN, AZ	BLDTT20111207AFE	42.8
	K31PA-D	D31	LD	LIC	DOLAN SPRINGS, AZ	BLANK0000071728	63.2

K31GZ-D TVSTUDY INTERFERENCE ANALYSIS

K31BI-D	D31	LD	LIC	KINGMAN, AZ	BLDTT20130308ABE	45.2
KSDY-LD	D31	LD	APP	San Diego, CA	BLANK0000176760	351.6
K31AD-D	N31	TX	LIC	VICTORVILLE, ETC., CA	BLTT19900108IL	270.2
K31OY-D	D31	LD	LIC	PAHRUMP, NV	BLANK0000067694	144.3

Service area	Terrain-limited	IX-free, before	IX-free, after	Percent New IX
4418.6	77,690	3400.5	75,289	2835.4
		75,121	2803.3	75,121
				1.13
				0.00

Undesired	Total IX	Unique IX, before	Unique IX, after
K31GZ030 D31 LD APP	32.1	0	32.1
K30LL-D D30 LD LIC	2.0	0	1.0
K31PA-D D31 LD LIC	1.0	0	1.0
K31BI-D D31 LD LIC	560.1	168	556.1
K31OY-D D31 LD LIC	6.0	0	3.0

----- Interference to BLANK0000216254 LIC scenario 1

Call	Chan	Svc	Status	City, State	File Number	Distance
Desired: KMCC	D32	DD	LIC	LAUGHLIN, NV	BLANK0000216254	
Undesireds: K31GZ030	D31	LD	APP	LAKE HAVASU CITY, AZ	k31gz030	124.2 km
KAZF	D32	DT	CP	FLAGSTAFF, AZ	BLANK0000216485	282.8

Service area	Terrain-limited	IX-free, before	IX-free, after	Percent New IX
39746.5	2,064,588	27362.6	2,010,177	27249.4
		2,010,166	27241.4	2,010,166
				0.03
				0.00

Undesired	Total IX	Unique IX, before	Unique IX, after
K31GZ030 D31 LD APP	8.0	0	8.0
KAZF D32 DT CP	113.2	11	113.2

----- Interference to BLANK0000216254 LIC scenario 2

Call	Chan	Svc	Status	City, State	File Number	Distance
Desired: KMCC	D32	DD	LIC	LAUGHLIN, NV	BLANK0000216254	
Undesireds: K31GZ030	D31	LD	APP	LAKE HAVASU CITY, AZ	k31gz030	124.2 km
KAZF	D32	DT	BL	FLAGSTAFF, AZ	DTVBL776273	263.4

Service area	Terrain-limited	IX-free, before	IX-free, after	Percent New IX
39746.5	2,064,588	27362.6	2,010,177	27118.5
		2,010,163	27110.4	2,010,163
				0.03
				0.00

Undesired	Total IX	Unique IX, before	Unique IX, after
K31GZ030 D31 LD APP	8.0	0	8.0
KAZF D32 DT BL	244.2	14	244.2

----- Interference to proposal scenario 1

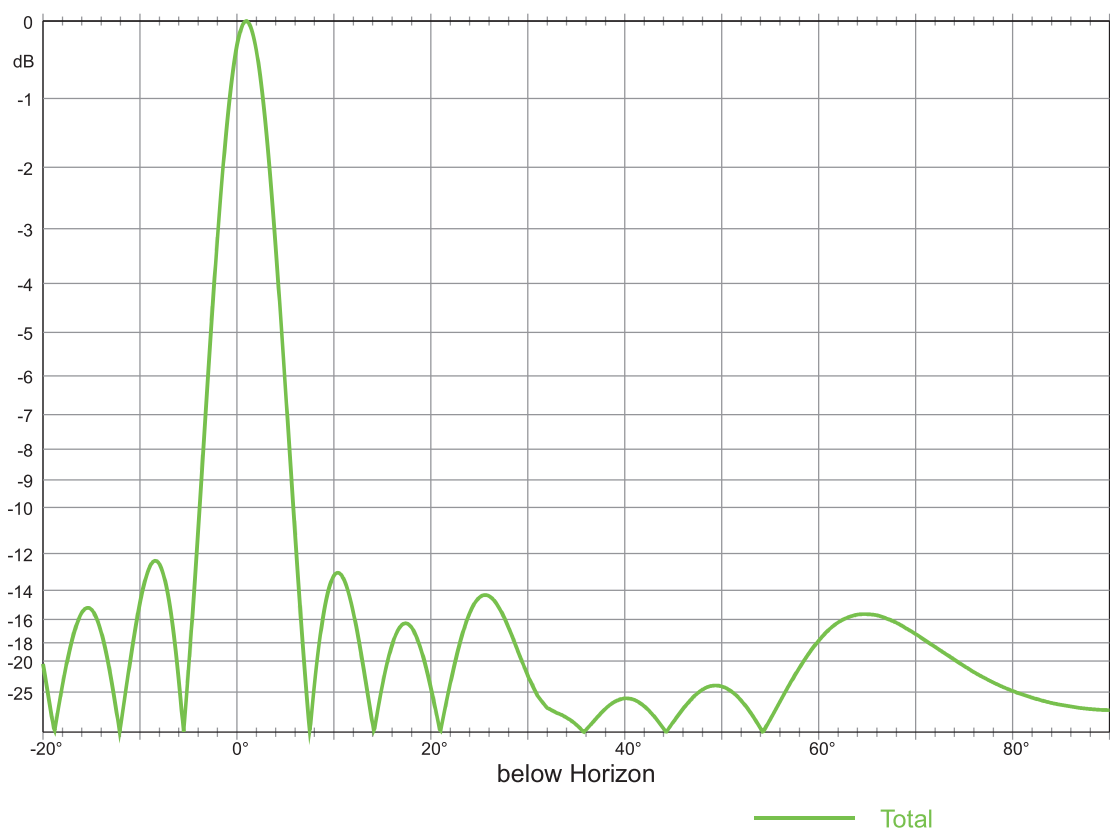
Call	Chan	Svc	Status	City, State	File Number	Distance
Desired: K31GZ030	D31	LD	APP	LAKE HAVASU CITY, AZ	k31gz030	
Undesireds: K30LL-D	D30	LD	LIC	KINGMAN, AZ	BLDTT20111207AFE	68.3 km
K31HY-D	D31	LD	LIC	NEEDLES, ETC., CA	BLDTT20130308ACE	48.2
KSDY-LD	D31	LD	APP	San Diego, CA	BLANK0000176760	318.2
K31AD-D	N31	TX	LIC	VICTORVILLE, ETC., CA	BLTT19900108IL	266.8

Service area	Terrain-limited	IX-free	Percent IX
2041.7	61,474	1509.3	56,315
		1345.3	56,313
			10.87
			0.00

Undesired	Total IX	Unique IX	Prcnt Unique IX
K30LL-D D30 LD LIC	17.1	0	16.1
K31HY-D D31 LD LIC	147.9	2	146.9

Subject to alternation

Elevation Pattern (cartesian-linear)



Antenna, Order No. 7500000049
Number of Bays: 4

Frequency: 575 MHz
Elevation Directivity: 9.76 dBd
Directivity: 17.56 dBd
Downtilt: 1°
Compensation: 14.04 %

No.	Vert. Distance [mm]	Power	Phase [°]
4	3450	1	41.5
3	2300	1	27.8
2	1150	1	13.8
1	0	1	0