

## **ENGINEERING EXHIBIT**

### **Digital Low Power Television Station Application for Minor Modification of Licensed Facility Amendment to LMS File# 0000197967** prepared for

**Gray Television Licensee, LLC**  
K30RA-D Racine, MN  
Facility ID 186459  
Ch. 30 15 kW Directional

*Gray Television Licensee, LLC* (“Gray”) is the licensee of digital Low Power Television station K30RA-D, Channel 30, Facility ID 186459, Racine MN. K30RA-D is licensed to operate at 1.55 kW effective radiated power (“ERP”) with a directional antenna (file# 0000178831). A minor modification application is pending (file# 0000197967) for a Construction Permit to relocate K30RA-D, increase antenna height, and reduce ERP. *Gray* herein amends the pending application to specify an alternate directional antenna at increased ERP and height.

The proposed facility will employ an antenna to be top-mounted on an existing tower at the studio location for K30RA-D and *Gray*’s full power television station KTTC (Facility ID 35678, Rochester, MN), located 20.2 km (12.6 miles) from the licensed K30RA-D site. The proposed K30RA-D antenna will be installed in place of an existing weather radar antenna (no longer in use). The structure’s overall height above ground will increase by 1.8 meters to 47.5 meters. The structure does not require an FCC Antenna Structure Registration number since the overall height is less than 61 meters above ground and the structure passes the FCC’s “TOWAIR” slope test program.

The proposed antenna is a Dielectric model TLP-8M/VP having elliptical polarization. The proposed ERP is 15 kW horizontally polarized and 4.5 kW vertically polarized using a “full service” out of channel emission mask. A plot of the directional antenna’s azimuthal pattern is supplied in Figure 1.

Figure 2 depicts the coverage contour of the proposed facility as well as that of the licensed facility, demonstrating compliance with §73.3572 for a minor change. Since the proposed 51 dBμ contour encompasses that of the licensed facility, no service loss area will be created. Significant service improvement will result as the population within the 51 dBμ contour increases to 167,007 persons (2010 census), which is a 40.0 percent increase beyond the 119,320 persons within the licensed K30RA-D facility's 51 dBμ contour.

Interference study per OET Bulletin 69<sup>1</sup> shows that the proposal complies with the FCC's interference protection requirements toward all digital television, television translator, LPTV, and Class A stations. FCC processing of this proposal is requested using a 0.5 km cell size and 1.0 km terrain profile increment. The results, summarized in Table 1, show that any new interference does not exceed the FCC's interference limits (0.5 percent to full power and Class A stations, and 2.0 percent to secondary stations) to any facility except with respect to K29OE-D which does not present a conflict for the proposal.

The licensed facility for K29OE-D (Ch. 29, Fac ID 186458, Racine MN, file# 0000179250) would receive 4.73 percent new interference from the proposed K30RA-D facility, which exceeds the 2.0 percent limit towards other low power television stations. A pending application facility (file# 0000197968) for K29OE-D would receive 7.36 percent new interference. *Gray* is also the licensee of K29OE-D and consents to interference exceeding 2.0 percent from the proposed K30RA-D facility. Further, *Gray* is contemporaneously submitting a minor modification application amendment regarding K29OE-D to share the antenna that is proposed herein for K30RA-D, which will eliminate any interference conflict between these first-adjacent channel facilities. Buildout of the K30RA-D and K29OE-D facilities will be coordinated such that both stations are relocated simultaneously, thus avoiding any actual interference. The proposed K29OE-D facility is also included in the interference analysis of Table 1. Accordingly, the

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<sup>1</sup>FCC 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, 0.5 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.

proposal complies with §74.793 regarding interference protection to digital television, low power television, television translator, and Class A television facilities.

### **Human Exposure to Radiofrequency Electromagnetic Field (Environmental)**

The proposed facility 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 25 percent antenna relative field in downward elevations (pattern data shows 25 percent or less relative field at angles 10 to 90 degrees below the antenna), the calculated power density attributable to the proposed K30RA-D facility at locations near the transmitter site at a height of two meters above ground level is  $22.0 \mu\text{W}/\text{cm}^2$ , which is 5.8 percent of the general population / uncontrolled maximum permissible exposure limit.

The only other significant emitter that would affect locations near the site is that of the proposed K29OE-D facility. Calculations show that the proposed K29OE-D facility would contribute RF signal density at 5.9 percent of the general population / uncontrolled maximum permissible exposure limit. Summing the individual contributions from K30RA-D and K29OE-D, the total maximum calculated RF density at two meters above ground level near the proposed site will be 11.7 percent of the FCC's uncontrolled / general population maximum permissible exposure limit.

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.

**Engineering Exhibit**  
**Gray Television Licensee, LLC (K30RA-D)**  
(page 4 of 4)

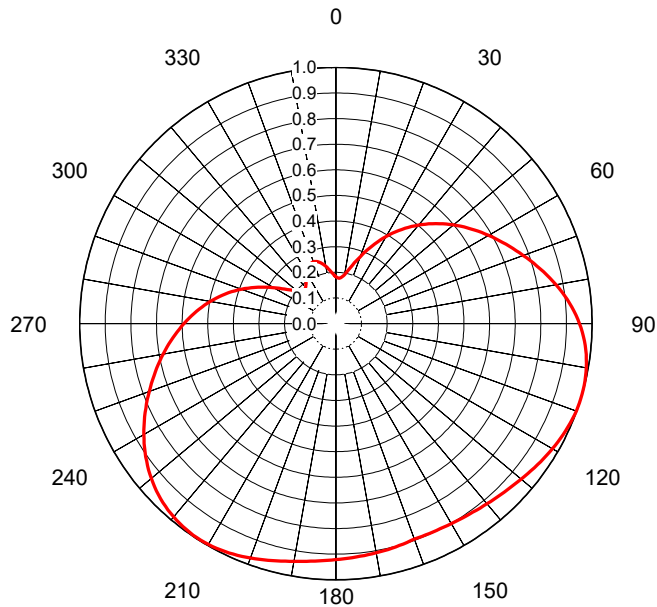


*List of Attachments*

Figure 1	Antenna Azimuthal Pattern
Figure 2	Coverage Contour Comparison
Table 1	TVStudy Analysis of Proposal
Form 2100	Saved Version of Engineering Sections of FCC Form at Time of Upload

**Chesapeake RF Consultants, LLC**

Joseph M. Davis, P.E.	October 25, 2022	
207 Old Dominion Road	Yorktown, VA 23692	703-650-9600



## AZIMUTH PATTERN Horizontal Polarization

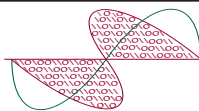
Proposal No. **C-71955-**  
Date **12-Oct-22**  
Call Letters **K30RA-D**  
Channel **30**  
Frequency **569 MHz**  
Antenna Type **TLP-8M/VP**  
Gain **1.88 (2.73dB)**  
Calculated

Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value
0	0.183	36	0.460	72	0.797	108	1.000	144	0.910	180	0.921	216	0.993	252	0.757	288	0.414
1	0.181	37	0.470	73	0.807	109	0.999	145	0.908	181	0.923	217	0.992	253	0.748	289	0.403
2	0.179	38	0.481	74	0.816	110	0.998	146	0.907	182	0.925	218	0.990	254	0.739	290	0.392
3	0.178	39	0.491	75	0.826	111	0.997	147	0.905	183	0.926	219	0.988	255	0.730	291	0.381
4	0.178	40	0.502	76	0.835	112	0.996	148	0.904	184	0.928	220	0.985	256	0.720	292	0.370
5	0.178	41	0.512	77	0.845	113	0.994	149	0.903	185	0.930	221	0.982	257	0.711	293	0.358
6	0.180	42	0.522	78	0.854	114	0.992	150	0.901	186	0.932	222	0.979	258	0.702	294	0.347
7	0.182	43	0.532	79	0.863	115	0.990	151	0.900	187	0.935	223	0.975	259	0.693	295	0.335
8	0.185	44	0.542	80	0.873	116	0.987	152	0.899	188	0.937	224	0.971	260	0.684	296	0.324
9	0.189	45	0.552	81	0.882	117	0.985	153	0.899	189	0.940	225	0.967	261	0.675	297	0.313
10	0.194	46	0.561	82	0.890	118	0.982	154	0.898	190	0.942	226	0.962	262	0.666	298	0.302
11	0.200	47	0.571	83	0.899	119	0.979	155	0.897	191	0.945	227	0.957	263	0.657	299	0.291
12	0.206	48	0.580	84	0.907	120	0.976	156	0.897	192	0.948	228	0.952	264	0.648	300	0.280
13	0.214	49	0.590	85	0.916	121	0.973	157	0.896	193	0.951	229	0.946	265	0.639	301	0.270
14	0.221	50	0.599	86	0.923	122	0.970	158	0.896	194	0.954	230	0.940	266	0.630	302	0.260
15	0.229	51	0.608	87	0.931	123	0.967	159	0.896	195	0.958	231	0.934	267	0.620	303	0.250
16	0.238	52	0.617	88	0.938	124	0.964	160	0.895	196	0.961	232	0.927	268	0.611	304	0.241
17	0.248	53	0.626	89	0.945	125	0.960	161	0.897	197	0.964	233	0.920	269	0.602	305	0.232
18	0.257	54	0.635	90	0.951	126	0.957	162	0.898	198	0.967	234	0.913	270	0.593	306	0.224
19	0.267	55	0.644	91	0.957	127	0.954	163	0.900	199	0.971	235	0.906	271	0.583	307	0.216
20	0.278	56	0.653	92	0.963	128	0.951	164	0.901	200	0.974	236	0.898	272	0.574	308	0.209
21	0.289	57	0.662	93	0.968	129	0.947	165	0.902	201	0.977	237	0.890	273	0.565	309	0.203
22	0.300	58	0.671	94	0.972	130	0.944	166	0.904	202	0.980	238	0.882	274	0.555	310	0.197
23	0.311	59	0.680	95	0.977	131	0.941	167	0.905	203	0.983	239	0.874	275	0.546	311	0.192
24	0.322	60	0.688	96	0.981	132	0.938	168	0.906	204	0.985	240	0.865	276	0.536	312	0.188
25	0.334	61	0.697	97	0.984	133	0.935	169	0.907	205	0.988	241	0.857	277	0.527	313	0.184
26	0.346	62	0.706	98	0.987	134	0.933	170	0.908	206	0.990	242	0.848	278	0.517	314	0.182
27	0.357	63	0.715	99	0.990	135	0.930	171	0.910	207	0.992	243	0.839	279	0.507	315	0.180
28	0.369	64	0.724	100	0.993	136	0.927	172	0.911	208	0.993	244	0.830	280	0.497	316	0.179
29	0.381	65	0.733	101	0.995	137	0.925	173	0.912	209	0.994	245	0.821	281	0.487	317	0.179
30	0.393	66	0.742	102	0.996	138	0.922	174	0.913	210	0.995	246	0.812	282	0.477	318	0.180
31	0.404	67	0.751	103	0.998	139	0.920	175	0.914	211	0.996	247	0.803	283	0.467	319	0.182
32	0.415	68	0.760	104	0.999	140	0.918	176	0.916	212	0.996	248	0.794	284	0.457	320	0.184
33	0.427	69	0.769	105	1.000	141	0.916	177	0.917	213	0.996	249	0.784	285	0.446	321	0.187
34	0.438	70	0.778	106	1.000	142	0.914	178	0.918	214	0.996	250	0.775	286	0.436	322	0.190
35	0.449	71	0.788	107	1.000	143	0.912	179	0.920	215	0.995	251	0.766	287	0.425	323	0.194

**Figure 1**  
**Antenna Azimuthal Pattern**  
**K30RA-D Racine, MN**  
**Facility ID 186459**  
**Ch. 30 15 kW Directional**

prepared for  
**Gray Television Licensee, LLC**

October, 2022

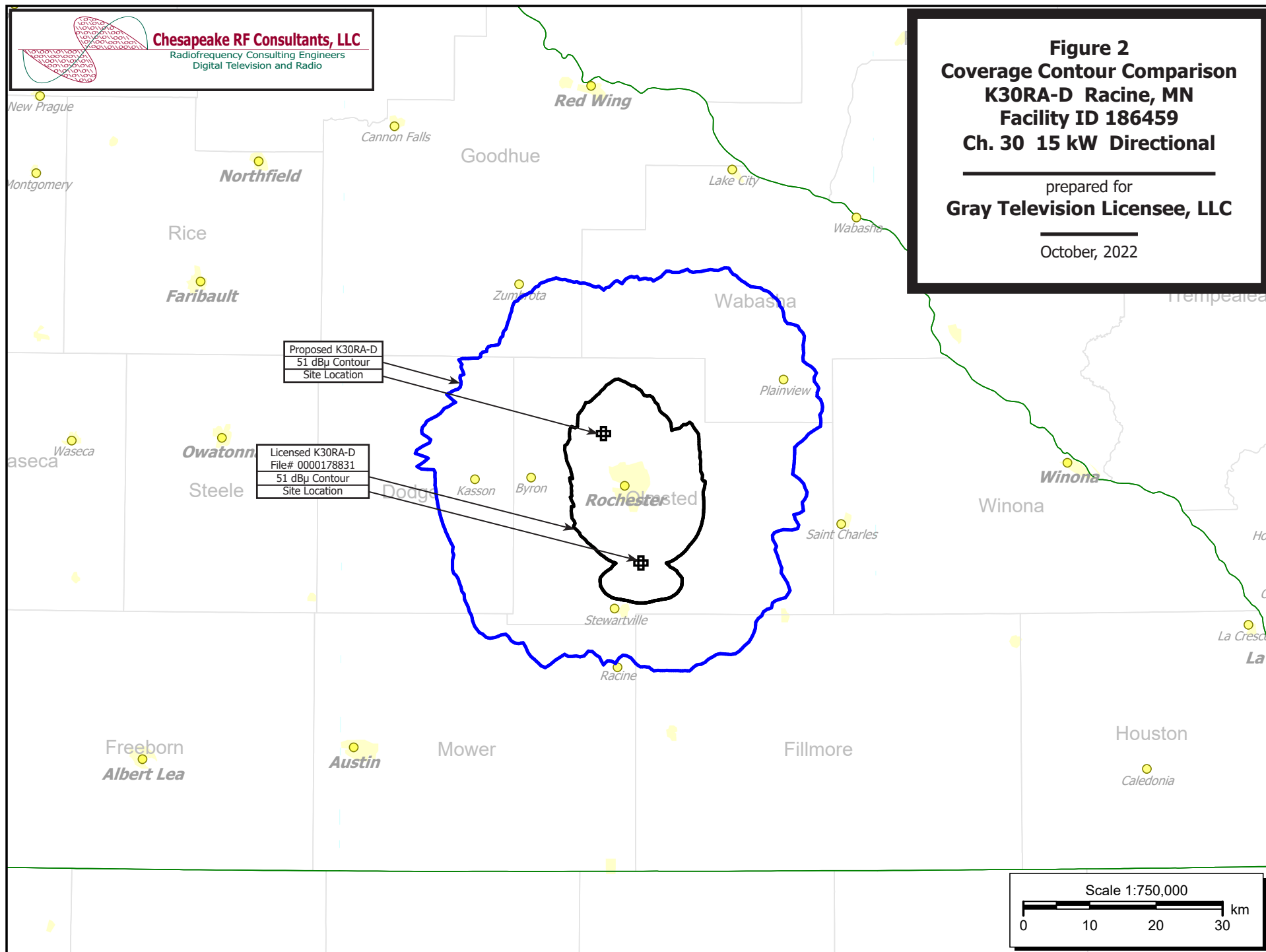


**Chesapeake RF Consultants, LLC**  
Radiofrequency Consulting Engineers  
Digital Television and Radio

**Figure 2**  
**Coverage Contour Comparison**  
**K30RA-D Racine, MN**  
**Facility ID 186459**  
**Ch. 30 15 kW Directional**

prepared for  
**Gray Television Licensee, LLC**

October, 2022



# **Table 1 K30RA-D TVStudy Analysis of Proposal** (page 1 of 5)



tvstudy v2.2.5 (4uoc83)  
Database: localhost, Study: K30RA-D Studio\_TLP-M 0.5-1.0, Model: Longley-Rice  
Start: 2022.10.25 09:41:49

Study created: 2022.10.25 09:41:49

Study build station data: LMS TV 2022-10-24

Proposal: K30RA-D D30 LD APP RACINE, MN  
File number: K30RA-D Studio\_TLP-M  
Facility ID: 186459  
Station data: User record  
Record ID: 4725  
Country: U.S.

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

Search options:  
Baseline record excluded if station has CP

User records included:  
4724 K29OE-D D29 LD APP RACINE, MN K29OE-D Studio\_TLP-M

**contemporaneous amendment to 0000197968**

Stations potentially affected by proposal:

IX	Call	Chan	Svc	Status	City, State	File Number	Distance
No	KGAN	D29	DT	LIC	CEDAR RAPIDS, IA	BLCDT20140416AAI	204.3 km
No	K29IF-D	D29	LD	LIC	FROST, MN	BLDTL20080505ABD	127.0
Yes	WFTC	D29	DT	LIC	MINNEAPOLIS, MN	BLCDT20100809CJF	117.9
Yes	K29OE-D	D29	LD	LIC	RACINE, MN	BLANK0000179250	20.2
Yes	K29OE-D	D29	LD	APP	RACINE, MN	BLANK0000197968	0.0
No	K29OE-D	D29	LD	APP	RACINE, MN	K29OE-D Studio_TLP-M	0.0
No	K29IE-D	D29	LD	LIC	ST. JAMES, MN	BLDTT20090817ACY	166.8
No	KLJB	D30	DT	LIC	DAVENPORT, IA	BLANK0000099537	354.6
No	KPTH	D30	DT	LIC	SIOUX CITY, IA	BLANK0000063710	343.6
No	KCAU-TV	D30	LD	APP	SIOUX CITY, IA	BLCDT20090903AAI	361.6
No	K30AF-D	D30	LD	LIC	ALEXANDRIA, MN	BLDTL20120313ABL	308.4
No	K30QX-D	D30	LD	LIC	DULUTH, MN	BLANK00000197138	300.9
No	K30KQ-D	D30	LD	LIC	JACKSON, MN	BLDTL20130321ACB	206.3
Yes	KSTC-TV	D30	DT	LIC	MINNEAPOLIS, MN	BLANK0000202445	118.8
No	K30QY-D	D30	LD	LIC	OAKLAND, MN	BLANK0000194532	89.0
No	K30QY-D	D30	LD	CP	OAKLAND, MN	BLANK0000195575	113.2
No	K30FN-D	D30	LD	LIC	ST. JAMES, MN	BLANK0000124535	166.5
No	K30FZ-D	D30	LD	LIC	WILLMAR, MN	BLDTT20141107AAY	233.3
Yes	WEAU	D30	LD	LIC	EAU CLAIRE, WI	BLANK0000124038	96.5
No	W30DZ-D	D30	LD	LIC	FENCE, WI	BLANK0000060424	369.5
No	W30BU-D	D30+	LD	LIC	GREEN BAY, WI	BLANK0000194849	361.5
No	W30BU-D	N30+	TX	LIC	GREEN BAY, WI	BLTTL20030923AAD	361.5
No	WPXE-TV	D30	DT	LIC	KENOSHA, WI	BLANK0000087614	387.6
No	K31NJ-D	D31	LD	LIC	LANSING, IA	BLANK0000093973	132.4
No	K31EF-D	D31	LD	LIC	FROST, MN	BLDTT20090730ACQ	127.0
Yes	KARE	D31	DT	LIC	MINNEAPOLIS, MN	BLANK0000165989	118.8
Yes	K31LN-D	D31	LD	LIC	ROCHESTER, MN	BLANK0000195945	14.6
No	K31KV-D	D31	LD	LIC	ST. JAMES, MN	BLDTL20120625AAY	166.8

No non-directional AM stations found within 0.8 km

No directional AM stations found within 3.2 km

Record parameters as studied:

Channel: D30  
Mask: Full Service  
Latitude: 44 5 32.00 N (NAD83)  
Longitude: 92 30 34.00 W  
Height AMSL: 387.6 m  
HAAT: 0.0 m  
Peak ERP: 15.0 kW  
Antenna: DIE TLP-M 160.0 deg  
Elev Pattn: Generic  
Elec Tilt: 0.50

**Table 1 K30RA-D TV Study Analysis of Proposal**  
(page 2 of 5)



50.3 dBu contour:

Azimuth	ERP	HAAT	Distance
0.0 deg	0.502 kW	70.4 m	22.5 km
45.0	4.55	60.7	32.1
90.0	13.6	37.2	31.5
135.0	13.0	57.0	36.5
180.0	12.7	52.2	35.3
225.0	13.9	37.1	31.6
270.0	5.27	40.4	28.1
315.0	0.544	66.0	22.3

Database HAAT does not agree with computed HAAT

Database HAAT: 0 m Computed HAAT: 53 m

Distance to Canadian border: 445.2 km

Distance to Mexican border: 1774.4 km

Conditions at FCC monitoring station: Allegan MI

Bearing: 105.1 degrees Distance: 554.7 km

Proposal is not within the West Virginia quiet zone area

Conditions at Table Mountain receiving zone:

Bearing: 251.7 degrees Distance: 1134.5 km

Study cell size: 0.50 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%

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Interference to BLCDT20100809CJF LIC scenario 1

Desired:	Call WFTC	Chan D29	Svc DT	Status LIC	City, State MINNEAPOLIS, MN	File Number BLCDT20100809CJF	Distance		
Undesireds:	K30RA-D	D30	LD	APP	RACINE, MN	K30RA-D Studio_TLP-M	117.9 km		
	KGAN	D29	DT	LIC	CEDAR RAPIDS, IA	BLCDT20140416AAI	321.3		
	KSTC-TV	D30	DT	LIC	MINNEAPOLIS, MN	BLANK0000202445	1.3		
Service area		Terrain-limited			IX-free, before		IX-free, after	Percent New IX	
36052.5	3,786,759	35492.7	3,773,391		35126.2	3,758,669	35126.2	3,758,669	0.00 0.00
Undesired				Total IX		Unique IX, before		Unique IX, after	
K30RA-D	D30	LD	APP	3.3	2	0.0		0	
KGAN	D29	DT	LIC	151.0	5,215	147.7	5,200	144.5	5,198
KSTC-TV	D30	DT	LIC	218.7	9,522	215.5	9,507	215.5	9,507

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Interference to BLANK0000179250 LIC scenario 1

\*\*IX: 4.73% interference caused

**K290E-D is accepting 4.73% interference, see text**

Desired:	Call K290E-D	Chan D29	Svc LD	Status LIC	City, State RACINE, MN	File Number BLANK0000179250	Distance
Undesireds:	K30RA-D	D30	LD	APP	RACINE, MN	K30RA-D Studio TLP-M	20.2 km
	KGAN	D29	DT	LIC	CEDAR RAPIDS, IA	BLCDT20140416AAI	184.1
	WFTC	D29	DT	LIC	MINNEAPOLIS, MN	BLCDT20100809CJF	138.0
	K30QY-D	D30	LD	LIC	OAKLAND, MN	BLANK0000194532	79.9
Service area		Terrain-limited		IX-free, before		IX-free, after	Percent New IX
556.2	120,405	541.1	120,322	442.3	108,374	431.7 103,245	2.39 4.73
Undesired				Total IX	Unique IX, before	Unique IX, after	
K30RA-D	D30	LD	APP	59.0	14,738	10.6 5,129	
KGAN	D29	DT	LIC	60.4	8,095	25.2 6,759	10.3 650
WFTC	D29	DT	LIC	73.7	5,189	38.4 3,853	29.1 1,497



**Table 1 K30RA-D TVStudy Analysis of Proposal**  
(page 3 of 5)

Interference to BLANK0000197968 APP scenario 1

\*\*MX: 7.36% interference caused

**No interference caused to K29OE-D app 0000197968 as amended contemporaneously, see text**

	Call	Chan	Svc	Status	City, State	File Number	Distance
Desired:	K29OE-D	D29	LD	APP	RACINE, MN	BLANK0000197968	
Undesireds:	K30RA-D	D30	LD	APP	RACINE, MN	K30RA-D Studio_TLP-M	0.0 km
	KGAN	D29	DT	LIC	CEDAR RAPIDS, IA	BLCDT20140416AAI	204.3
	WFTC	D29	DT	LIC	MINNEAPOLIS, MN	BLCDT20100809CJF	117.9
	K30QY-D	D30	LD	LIC	OAKLAND, MN	BLANK0000194532	89.0
Service area		Terrain-limited		IX-free, before		IX-free, after	Percent New IX
508.5 119,783		507.1 119,762		407.9 115,343		382.2 106,857	6.30 7.36
Undesired		Total IX		Unique IX, before		Unique IX, after	
K30RA-D D30 LD APP		28.4 8,648		25.7 8,486			
KGAN D29 DT LIC		4.8 208		2.5 145		1.8 88	
WFTC D29 DT LIC		96.7 4,274		94.4 4,211		92.5 4,106	

Interference to BLANK0000202445 LIC scenario 1

	Call	Chan	Svc	Status	City, State	File Number	Distance
Desired:	KSTC-TV	D30	DT	LIC	MINNEAPOLIS, MN	BLANK0000202445	
Undesireds:	K30RA-D	D30	LD	APP	RACINE, MN	K30RA-D Studio_TLP-M	118.8 km
	WFTC	D29	DT	LIC	MINNEAPOLIS, MN	BLCDT20100809CJF	1.3
	KPTH	D30	DT	LIC	SIOUX CITY, IA	BLANK0000063710	369.8
	KARE	D31	DT	LIC	MINNEAPOLIS, MN	BLANK0000165989	0.0
Service area		Terrain-limited		IX-free, before		IX-free, after	Percent New IX
38766.2 3,850,810		38196.9 3,841,193		38147.1 3,839,636		37270.3 3,829,666	2.30 0.26
Undesired		Total IX		Unique IX, before		Unique IX, after	
K30RA-D D30 LD APP		878.5 9,970		876.8 9,970			
WFTC D29 DT LIC		36.0 637		35.0 637			
KPTH D30 DT LIC		8.8 500		8.8 500		8.0 500	
KARE D31 DT LIC		4.9 420		4.9 420		4.9 420	

Interference to BLANK0000124038 LIC scenario 1

	Call	Chan	Svc	Status	City, State	File Number	Distance
Desired:	WEAU	D30	LD	LIC	EAU CLAIRE, WI	BLANK0000124038	
Undesireds:	K30RA-D	D30	LD	APP	RACINE, MN	K30RA-D Studio_TLP-M	96.5 km
	K29OE-D	D29	LD	LIC	RACINE, MN	BLANK0000179250	86.4
	KLJB	D30	DT	LIC	DAVENPORT, IA	BLANK0000099537	288.7
	KSTC-TV	D30	DT	LIC	MINNEAPOLIS, MN	BLANK0000202445	198.1
	K30QY-D	D30	LD	LIC	OAKLAND, MN	BLANK0000194532	154.0
	W30BU-D	D30+	LD	LIC	GREEN BAY, WI	BLANK0000194849	277.3
	WPXE-TV	D30	DT	LIC	KENOSHA, WI	BLANK0000087614	291.4
	K31NJ-D	D31	LD	LIC	LANSING, IA	BLANK0000093973	52.0
Service area		Terrain-limited		IX-free, before		IX-free, after	Percent New IX
6655.3 228,160		5880.4 197,365		5661.2 192,817		5642.7 192,181	0.33 0.33
Undesired		Total IX		Unique IX, before		Unique IX, after	
K30RA-D D30 LD APP		53.7 2,171		18.5 636			
KLJB D30 DT LIC		4.9 70		0.7 28		0.5 0	
KSTC-TV D30 DT LIC		217.1 4,495		212.0 4,443		180.4 2,971	
WPXE-TV D30 DT LIC		3.6 48		0.5 12		0.0 0	
K31NJ-D D31 LD LIC		1.2 0		0.0 0		0.0 0	

Interference to BLANK0000124038 LIC scenario 2

	Call	Chan	Svc	Status	City, State	File Number	Distance
Desired:	WEAU	D30	LD	LIC	EAU CLAIRE, WI	BLANK0000124038	
Undesireds:	K30RA-D	D30	LD	APP	RACINE, MN	K30RA-D Studio_TLP-M	96.5 km

**Table 1 K30RA-D TV Study Analysis of Proposal**  
(page 4 of 5)

K29OE-D	D29	LD	LIC	RACINE, MN	BLANK0000179250	86.4
KLJB	D30	DT	LIC	DAVENPORT, IA	BLANK0000099537	288.7
KSTC-TV	D30	DT	LIC	MINNEAPOLIS, MN	BLANK0000202445	198.1
K30QY-D	D30	LD	CP	OAKLAND, MN	BLANK0000195575	156.3
W30BU-D	D30+	LD	LIC	GREEN BAY, WI	BLANK0000194849	277.3
WPXE-TV	D30	DT	LIC	KENOSHA, WI	BLANK0000087614	291.4
K31NJ-D	D31	LD	LIC	LANSING, IA	BLANK0000093973	52.0

Service area	Terrain-limited	IX-free, before	IX-free, after	Percent New IX
6655.3 228,160	5880.4 197,365	5660.2 192,730	5641.7 192,094	0.33 0.33

Undesired	Total IX	Unique IX, before	Unique IX, after
K30RA-D D30 LD APP	53.7 2,171	18.5 636	
KLJB D30 DT LIC	4.9 70	0.7 28	0.5 0
KSTC-TV D30 DT LIC	217.1 4,495	210.0 4,443	179.2 2,971
K30QY-D D30 LD CP	3.0 87	1.0 87	1.0 87
WPXE-TV D30 DT LIC	3.6 48	0.5 12	0.0 0
K31NJ-D D31 LD LIC	1.2 0	0.0 0	0.0 0

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Interference to BLANK0000165989 LIC scenario 1

Call	Chan	Svc	Status	City, State	File Number	Distance
Desired: KARE	D31	DT	LIC	MINNEAPOLIS, MN	BLANK0000165989	
Undesireds: K30RA-D	D30	LD	APP	RACINE, MN	K30RA-D Studio_TLP-M	118.8 km
WRPT	D31	DT	LIC	HIBBING, MN	BLEDT20090603AAY	258.1

Service area	Terrain-limited	IX-free, before	IX-free, after	Percent New IX
39768.3 3,866,189	39188.6 3,857,430	39180.0 3,855,834	39176.2 3,855,684	0.01 0.00

Undesired	Total IX	Unique IX, before	Unique IX, after
K30RA-D D30 LD APP	3.8 150	3.8 150	
WRPT D31 DT LIC	8.6 1,596	8.6 1,596	8.6 1,596

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Interference to BLANK0000195945 LIC scenario 1

Call	Chan	Svc	Status	City, State	File Number	Distance
Desired: K31LN-D	D31	LD	LIC	ROCHESTER, MN	BLANK0000195945	
Undesireds: K30RA-D	D30	LD	APP	RACINE, MN	K30RA-D Studio_TLP-M	14.6 km
K30QY-D	D30	LD	LIC	OAKLAND, MN	BLANK0000194532	94.7
K31NJ-D	D31	LD	LIC	LANSING, IA	BLANK0000093973	118.4
K31EF-D	D31	LD	LIC	FROST, MN	BLDTT20090730ACQ	137.2
KARE	D31	DT	LIC	MINNEAPOLIS, MN	BLANK0000165989	129.9
K31GH-D	D31-	LD	LIC	HAYWARD, WI	BLANK0000016624	229.5
W31EV-D	D31	LD	LIC	WAUSAU, WI	BLANK0000187442	224.9

Service area	Terrain-limited	IX-free, before	IX-free, after	Percent New IX
138.9 58,920	133.9 58,341	104.6 46,455	101.1 45,563	3.37 1.92

Undesired	Total IX	Unique IX, before	Unique IX, after
K30RA-D D30 LD APP	16.9 8,608	3.5 892	
K31NJ-D D31 LD LIC	0.5 0	0.0 0	0.0 0
K31EF-D D31 LD LIC	0.5 0	0.0 0	0.0 0
KARE D31 DT LIC	29.3 11,886	28.2 11,886	15.6 4,170

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Interference to proposal scenario 1  
4.02% interference received

Call	Chan	Svc	Status	City, State	File Number	Distance
Desired: K30RA-D	D30	LD	APP	RACINE, MN	K30RA-D Studio_TLP-M	
Undesireds: K29OE-D	D29	LD	LIC	RACINE, MN	BLANK0000179250	20.2 km
KSTC-TV	D30	DT	LIC	MINNEAPOLIS, MN	BLANK0000202445	118.8
K30QY-D	D30	LD	LIC	OAKLAND, MN	BLANK0000194532	89.0
WEAU	D30	LD	LIC	EAU CLAIRE, WI	BLANK0000124038	96.5

Service area	Terrain-limited	IX-free	Percent IX
2941.0 168,658	2908.4 168,243	2407.8 161,480	17.21 4.02

**Table 1 K30RA-D TVStudy Analysis of Proposal**  
(page 5 of 5)



Undesired		Total IX		Unique IX	Prcnt Unique IX
K29OE-D D29 LD LIC	2.7	32	2.2	32	0.08 0.02
KSTC-TV D30 DT LIC	491.0	6,726	474.8	6,602	16.32 3.92
WEAU D30 LD LIC	23.1	129	7.4	5	0.25 0.00

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Interference to proposal scenario 2  
4.03% interference received

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	K30RA-D	D30	LD	APP	RACINE, MN	K30RA-D Studio_TLP-M	
Undesireds:	K29OE-D	D29	LD	LIC	RACINE, MN	BLANK0000179250	20.2 km
	KSTC-TV	D30	DT	LIC	MINNEAPOLIS, MN	BLANK0000202445	118.8
	K30QY-D	D30	LD	CP	OAKLAND, MN	BLANK0000195575	113.2
	WEAU	D30	LD	LIC	EAU CLAIRE, WI	BLANK0000124038	96.5
Service area		Terrain-limited		IX-free		Percent IX	
2941.0	168,658	2908.4	168,243	2406.5	161,463	17.26	4.03

Undesired		Total IX		Unique IX	Prcnt Unique IX
K29OE-D D29 LD LIC	2.7	32	2.2	32	0.08 0.02
KSTC-TV D30 DT LIC	491.0	6,726	473.3	6,594	16.27 3.92
K30QY-D D30 LD CP	4.7	25	1.3	17	0.04 0.01
WEAU D30 LD LIC	23.1	129	7.1	5	0.25 0.00

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Interference to proposal scenario 3  
4.00% interference received

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	K30RA-D	D30	LD	APP	RACINE, MN	K30RA-D Studio_TLP-M	
Undesireds:	K29OE-D	D29	LD	APP	RACINE, MN	BLANK0000197968	0.0 km
	KSTC-TV	D30	DT	LIC	MINNEAPOLIS, MN	BLANK0000202445	118.8
	K30QY-D	D30	LD	LIC	OAKLAND, MN	BLANK0000194532	89.0
	WEAU	D30	LD	LIC	EAU CLAIRE, WI	BLANK0000124038	96.5
Service area		Terrain-limited		IX-free		Percent IX	
2941.0	168,658	2908.4	168,243	2410.0	161,512	17.14	4.00

Undesired		Total IX		Unique IX	Prcnt Unique IX
KSTC-TV D30 DT LIC	491.0	6,726	475.3	6,602	16.34 3.92
WEAU D30 LD LIC	23.1	129	7.4	5	0.25 0.00

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Interference to proposal scenario 4  
4.01% interference received

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	K30RA-D	D30	LD	APP	RACINE, MN	K30RA-D Studio_TLP-M	
Undesireds:	K29OE-D	D29	LD	APP	RACINE, MN	BLANK0000197968	0.0 km
	KSTC-TV	D30	DT	LIC	MINNEAPOLIS, MN	BLANK0000202445	118.8
	K30QY-D	D30	LD	CP	OAKLAND, MN	BLANK0000195575	113.2
	WEAU	D30	LD	LIC	EAU CLAIRE, WI	BLANK0000124038	96.5
Service area		Terrain-limited		IX-free		Percent IX	
2941.0	168,658	2908.4	168,243	2408.8	161,495	17.18	4.01

Undesired		Total IX		Unique IX	Prcnt Unique IX
KSTC-TV D30 DT LIC	491.0	6,726	473.8	6,594	16.29 3.92
K30QY-D D30 LD CP	4.7	25	1.3	17	0.04 0.01
WEAU D30 LD LIC	23.1	129	7.1	5	0.25 0.00

**Channel and  
Facility  
Information**

Section	Question	Response
Facility ID	186459	
State	Minnesota	
City	RACINE	
LPD Channel	30	

Antenna Location  
Data

Section	Question	Response
Antenna Structure Registration	Do you have an FCC Antenna Structure Registration (ASR) Number?	No
	ASR Number	
Coordinates (NAD83)	Latitude	44° 05' 32.0" N+
	Longitude	092° 30' 34.0" W-
	Structure Type	LTOWER-Lattice Tower
	Overall Structure Height	47.5 meters
	Support Structure Height	42.1 meters
	Ground Elevation (AMSL)	342.6 meters
Antenna Data	Height of Radiation Center Above Ground Level	45.0 meters
	Height of Radiation Center Above Mean Sea Level	387.6 meters
	Effective Radiated Power	15 kW

## Antenna Technical Data

Section	Question	Response
Antenna Type	Antenna Type	Directional Custom
	Do you have an Antenna ID?	No
	Antenna ID	
Antenna Manufacturer and Model	Manufacturer:	Dielectric
	Model	TLP-8M/VP
	Rotation	160 degrees
	Electrical Beam Tilt	0.5
	Mechanical Beam Tilt	Not Applicable
	toward azimuth	
	Polarization	Elliptical
Elevation Radiation 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	
	Out-of-Channel Emission Mask:	Full Service

### Directional Antenna Relative Field Values (Pre-rotated Pattern)

Degree	Value	Degree	Value	Degree	Value	Degree	Value
0	0.895	90	0.775	180	0.257	270	0.778
10	0.908	100	0.684	190	0.227	280	0.873
20	0.921	110	0.593	200	0.183	290	0.951
30	0.942	120	0.497	210	0.194	300	0.993
40	0.974	130	0.392	220	0.278	310	0.998
50	0.995	140	0.280	230	0.393	320	0.976
60	0.985	150	0.197	240	0.502	330	0.944
70	0.940	160	0.184	250	0.599	340	0.918
80	0.865	170	0.226	260	0.688	350	0.901

### Additional Azimuths

Degree	V <sub>A</sub>
52	1.000
307	1.000