

## **ENGINEERING EXHIBIT**

### **Digital Low Power Television Station Application for Minor Modification of Licensed Facility** prepared for

**Gray Television Licensee, LLC**  
K29OE-D Rochester, MN  
Facility ID 186458  
Ch. 29 15 kW Directional

*Gray Television Licensee, LLC* (“Gray”) is the licensee of digital Low Power Television station K29OE-D, Channel 29, Facility ID 186458, Rochester MN. K29OE-D is licensed to operate at 1.0 kW effective radiated power (“ERP”) with a directional antenna (file# 0000218704). *Gray* herein seeks a minor modification Construction Permit (“CP”) to utilize a different directional antenna at increased ERP and antenna height. K29OE-D was previously authorized (CP file# 0000197968) to utilize the same technical parameters as those proposed herein.

No change in site location height is proposed. The proposed facility will employ an antenna to be top-mounted on the K29OE-D tower. The proposed K29OE-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, a Dielectric model TLP-8M/VP having elliptical polarization, will be shared with *Gray*’s station K30RA-D (Ch. 30, Fac ID 186459, Racine MN). K30RA-D is already authorized to use the subject antenna (CP file# 0000197967). The proposed K29OE-D 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 41 percent increase beyond the 118,385 persons within the licensed K29OE-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. 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 K30RA-D which does not present a conflict for the proposal.

The licensed facility for K30RA-D (Ch. 30, Fac ID 186459, Racine MN, file# 0000178831) would receive 10.30 percent new interference from the proposed K29OE-D facility, which exceeds the 2.0 percent limit towards other low power television stations. *Gray* is also the licensee of K30RA-D and consents to interference exceeding 2.0 percent from the proposed K29OE-D facility. No interference is predicted to the K30RA-D CP facility (file# 0000197967). Buildout of the K29OE-D and K30RA-D facilities will be coordinated such that both stations are relocated simultaneously, thus avoiding any actual interference. Accordingly, the 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

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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, 1 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.

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 K29OE-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 5.9 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 authorized K30RA-D facility. Calculations show that the K30RA-D CP facility would contribute RF signal density at 5.8 percent of the general population / uncontrolled maximum permissible exposure limit. Summing the individual contributions from K29OE-D and K30RA-D, the total maximum calculated RF density at two meters above ground level near the site will be 11.7 percent of the FCC's uncontrolled / general population maximum permissible exposure limit.

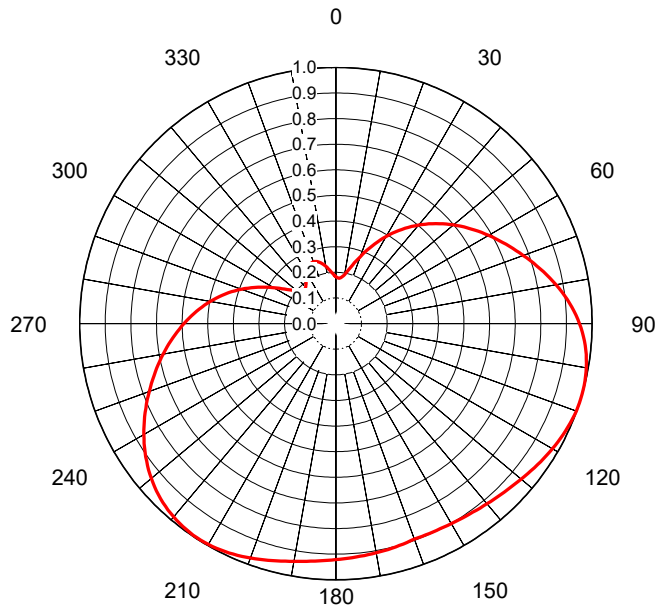
The general public will not be exposed to RF levels attributable to the proposal in excess of the FCC's guidelines. RF exposure warning signs will continue to be posted. With respect to worker safety, the applicant will coordinate exposure procedures with all pertinent stations and will reduce power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

*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.	August 11, 2023	
207 Old Dominion Road	Yorktown, VA 23692	703-650-9600



## AZIMUTH PATTERN Horizontal Polarization

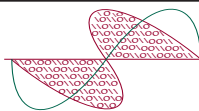
Proposal No. **C-71955-**  
Date **12-Oct-22**  
Call Letters **K29OE**  
Channel **29**  
Frequency **563 MHz**  
Antenna Type **TLP-8M/VP**  
Gain **1.88 (2.73dB)**  
Calculated

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**  
**K29OE-D Rochester, MN**  
**Facility ID 186458**  
**Ch. 29 15 kW Directional**

prepared for  
**Gray Television Licensee, LLC**

August, 2023

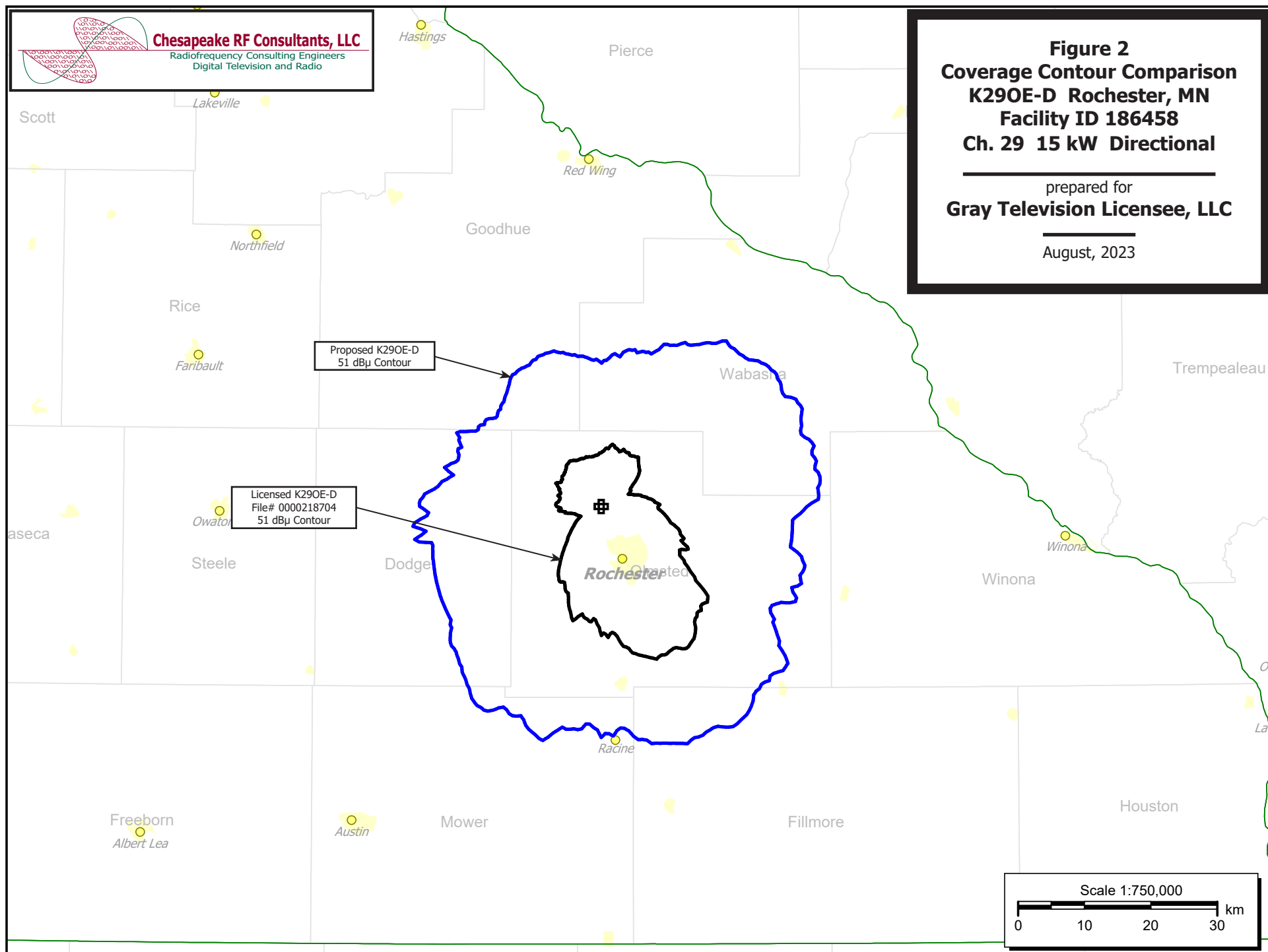


**Chesapeake RF Consultants, LLC**  
Radiofrequency Consulting Engineers  
Digital Television and Radio

**Figure 2**  
**Coverage Contour Comparison**  
**K29OE-D Rochester, MN**  
**Facility ID 186458**  
**Ch. 29 15 kW Directional**

prepared for  
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August, 2023



# **Table 1 K290E-D TVStudy Analysis of Proposal** (page 1 of 5)



tvstudy v2.2.5 (4uoc83)  
Database: localhost, Study: K290E-D prop 0000197968, Model: Longley-Rice  
Start: 2023.08.11 08:02:00

Study created: 2023.08.11 08:02:00

Study build station data: LMS TV 2023-08-10

Proposal: K290E-D D29 LD APP Rochester, MN  
File number: K290E-D prop 0000197968  
Facility ID: 186458  
Station data: User record  
Record ID: 62  
Country: U.S.

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

Search options:  
Baseline record excluded if station has CP

Stations potentially affected by proposal:

IX	Call	Chan	Svc	Status	City, State	File Number	Distance
No	K28PQ-D	D28	LD	LIC	SAINT CLOUD, MN	BLANK0000089168	171.9 km
No	K28OH-D	D28	LD	LIC	ST. JAMES, MN	BLANK0000064440	166.5
Yes	WXOW	D28	DT	LIC	LA CROSSE, WI	BLANK0000058613	96.7
Yes	KGAN	D29	DT	LIC	CEDAR RAPIDS, IA	BLCDT20140416AAI	204.3
No	DDK30NF-D	D29	LD	APP	KEOKUK, IA	BLANK0000072001	421.2
No	KBWF-LD	D29	LD	LIC	SIOUX CITY, IA	BLANK0000063408	364.2
No	WAUR-LD	D29	LD	LIC	AURORA, IL	BLANK0000107754	418.7
No	WMAQ-TV	D29	DT	LIC	CHICAGO, IL	BLANK0000053194	466.3
No	K29NY-D	D29	LD	LIC	ALEXANDRA, MN	BLANK0000195944	308.3
No	K29NY-D	D29	LD	APP	ALEXANDRA, MN	BLANK0000212504	308.3
No	K29IF-D	D29	LD	LIC	FROST, MN	BLDTL20080505ABD	127.0
No	K29EB-D	D29-	LD	LIC	GRAND RAPIDS, MN	BLANK0000016819	367.4
No	K29EB-D	N29-	TX	LIC	GRAND RAPIDS, MN	BLTT20021011AAW	367.4
No	K29LV-D	D29	LD	LIC	JACKSON, MN	BLANK0000064447	206.3
Yes	WFTC	D29	DT	LIC	MINNEAPOLIS, MN	BLCDT20100809CJF	117.9
No	K29MQ-D	D29	LD	LIC	REDWOOD FALLS, MN	BLANK0000063427	201.9
No	K29IE-D	D29	LD	LIC	ST. JAMES, MN	BLDTT20090817ACY	166.8
No	KXVO	D29	DT	LIC	OMAHA, NE	BLANK0000189938	453.0
No	W29ET-D	D29	LD	LIC	COLOMA, WI	BLANK0000060433	235.8
No	WDJT-TV	D29	DT	LIC	MILWAUKEE, WI	BLANK0000086892	384.3
No	WPVS-LD	N29z	TX	LIC	MILWAUKEE, WI	BLTTL20080221AAP	372.2
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
Yes	K30RA-D	D30	LD	LIC	RACINE, MN	BLANK0000178831	20.2
No	K30RA-D	D30	LD	CP	RACINE, MN	BLANK0000197967	0.0
No	K30FN-D	D30	LD	LIC	ST. JAMES, MN	BLANK0000124535	166.5
No	WEAU	D30	LD	LIC	EAU CLAIRE, WI	BLANK0000124038	96.5

No non-directional AM stations found within 0.8 km

No directional AM stations found within 3.2 km

Record parameters as studied:

Channel: D29  
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: Dielectric-TLP-8M/VP (ID 1010173) 160.0 deg  
Elev Pattn: Generic  
Elec Tilt: 0.50

50.2 dBu contour:  
Azimuth ERP HAAT Distance  
0.0 deg 0.502 kW 70.4 m 22.6 km

**Table 1 K29OE-D TV Study Analysis of Proposal**  
(page 2 of 5)



45.0	4.55	60.7	32.2
90.0	13.6	37.2	31.6
135.0	13.0	57.0	36.6
180.0	12.7	52.2	35.4
225.0	13.9	37.1	31.7
270.0	5.27	40.4	28.2
315.0	0.544	66.0	22.4

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: 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%

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Interference to BLANK0000058613 LIC scenario 1

	Call	Chan	Svc	Status	City, State	File Number	Distance
Desired:	WXOW	D28	DT	LIC	LA CROSSE, WI	BLANK0000058613	
Undesireds:	K29OE-D	D29	LD	APP	Rochester, MN	K29OE-D prop 000019796	96.7 km
	WHWC-TV	D27	DT	LIC	MENOMONIE, WI	BLANK0000157562	143.4
	WBXF-CD	D28z	DC	CP	DES MOINES, IA	BLANK0000035778	308.0
	WYOW	D28	DT	LIC	EAGLE RIVER, WI	BLANK0000149930	275.3
	WISN-TV	D28	DT	LIC	MILWAUKEE, WI	BLANK0000089554	288.0
	KGAN	D29	DT	LIC	CEDAR RAPIDS, IA	BLCDT20140416AAI	170.3
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	Service area	Terrain-limited		IX-free, before		IX-free, after	Percent New IX
	24521.5	426,209	23563.4	413,210	23088.7	409,238	23080.6    408,531    0.03    0.17
Undesired				Total IX	Unique IX, before	Unique IX, after	
K29OE-D D29 LD APP				8.1    707	8.1    707		
WHWC-TV D27 DT LIC				46.0    441	46.0    441		
WYOW D28 DT LIC				42.3    299	9.0    53		
WISN-TV D28 DT LIC				377.5    3,306	341.3    3,060		
KGAN D29 DT LIC				45.1    172	42.1    172		

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Interference to BLCDT20140416AAI LIC scenario 1

	Call	Chan	Svc	Status	City, State	File Number	Distance
Desired:	KGAN	D29	DT	LIC	CEDAR RAPIDS, IA	BLCDT20140416AAI	
Undesireds:	K29OE-D	D29	LD	APP	Rochester, MN	K29OE-D prop 000019796	204.3 km
	WBXF-CD	D28z	DC	CP	DES MOINES, IA	BLANK0000035778	167.1
	WXOW	D28	DT	LIC	LA CROSSE, WI	BLANK0000058613	170.3
	WFTC	D29	DT	LIC	MINNEAPOLIS, MN	BLCDT20100809CJF	321.3
	KRCG	D29	DT	LIC	JEFFERSON CITY, MO	BLANK0000194198	403.4
	KXVO	D29	DT	LIC	OMAHA, NE	BLANK0000189938	387.9
	WDJT-TV	D29	DT	LIC	MILWAUKEE, WI	BLANK0000086892	332.7
	KLJB	D30	DT	LIC	DAVENPORT, IA	BLANK0000099537	165.7
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	Service area	Terrain-limited		IX-free, before		IX-free, after	Percent New IX
	45143.3	1,083,310	44458.6	1,061,867	44007.3	1,045,047	44005.3    1,045,045    0.00    0.00
Undesired				Total IX	Unique IX, before	Unique IX, after	

**Table 1 K29OE-D TV Study Analysis of Proposal**  
(page 3 of 5)

K29OE-D D29 LD APP	11.0	39			2.0	2
WBXF-CD D28z DC CP	3.0	26	2.0	26	2.0	26
WXOW D28 DT LIC	10.0	28	3.0	14	3.0	14
WFTC D29 DT LIC	115.0	1,603	99.0	1,531	92.0	1,494
KRCG D29 DT LIC	9.1	89	9.1	89	9.1	89
KXVO D29 DT LIC	9.0	24	7.0	21	7.0	21
WDJT-TV D29 DT LIC	173.9	6,134	158.9	6,065	158.9	6,065
KLJB D30 DT LIC	155.4	9,002	151.4	9,002	151.4	9,002

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Interference to BLCDT20140416AAI LIC scenario 2

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	KGAN	D29	DT	LIC	CEDAR RAPIDS, IA	BLCDT20140416AAI	
Undesireds:	K29OE-D	D29	LD	APP	Rochester, MN	K29OE-D prop 000019796	204.3 km
	WBXF-CD	D28z	DC	LIC	DES MOINES, IA	BLANK0000005069	167.1
	WXOW	D28	DT	LIC	LA CROSSE, WI	BLANK00000058613	170.3
	WFTC	D29	DT	LIC	MINNEAPOLIS, MN	BLCDT20100809CJF	321.3
	KRCG	D29	DT	LIC	JEFFERSON CITY, MO	BLANK0000194198	403.4
	KXVO	D29	DT	LIC	OMAHA, NE	BLANK0000189938	387.9
	WDJT-TV	D29	DT	LIC	MILWAUKEE, WI	BLANK0000086892	332.7
	KLJB	D30	DT	LIC	DAVENPORT, IA	BLANK0000099537	165.7
Service area		Terrain-limited		IX-free, before		IX-free, after	Percent New IX
45143.3	1,083,310	44458.6	1,061,867	44008.3	1,045,047	44006.3 1,045,045	0.00 0.00
Undesired	Total IX		Unique IX, before		Unique IX, after		
K29OE-D D29 LD APP	11.0	39			2.0	2	
WBXF-CD D28z DC LIC	2.0	26	1.0	26	1.0	26	
WXOW D28 DT LIC	10.0	28	3.0	14	3.0	14	
WFTC D29 DT LIC	115.0	1,603	99.0	1,531	92.0	1,494	
KRCG D29 DT LIC	9.1	89	9.1	89	9.1	89	
KXVO D29 DT LIC	9.0	24	7.0	21	7.0	21	
WDJT-TV D29 DT LIC	173.9	6,134	158.9	6,065	158.9	6,065	
KLJB D30 DT LIC	155.4	9,002	151.4	9,002	151.4	9,002	

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Interference to BLCDT20100809CJF LIC scenario 1

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	WFTC	D29	DT	LIC	MINNEAPOLIS, MN	BLCDT20100809CJF	
Undesireds:	K29OE-D	D29	LD	APP	Rochester, MN	K29OE-D prop 000019796	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
36050.2	3,786,936	35475.6	3,771,055	35103.5	3,755,740	34431.2 3,749,217	1.92 0.17
Undesired	Total IX		Unique IX, before		Unique IX, after		
K29OE-D D29 LD APP	756.7	9,477			672.3	6,523	
KGAN D29 DT LIC	152.0	5,363	150.0	5,348	70.6	2,413	
KSTC-TV D30 DT LIC	222.1	9,967	220.1	9,952	215.1	9,933	

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Interference to BLANK0000202445 LIC scenario 1

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	KSTC-TV	D30	DT	LIC	MINNEAPOLIS, MN	BLANK0000202445	
Undesireds:	K29OE-D	D29	LD	APP	Rochester, MN	K29OE-D prop 000019796	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	BLANK0000218442	0.0
Service area		Terrain-limited		IX-free, before		IX-free, after	Percent New IX
38762.4	3,850,706	38181.7	3,839,779	38124.4	3,838,257	38123.4 3,838,257	0.00 0.00
Undesired	Total IX		Unique IX, before		Unique IX, after		
K29OE-D D29 LD APP	1.0	0			1.0	0	
WFTC D29 DT LIC	43.2	397	43.2	397	43.2	397	
KPTH D30 DT LIC	12.1	1,118	12.1	1,118	12.1	1,118	



**Table 1 K290E-D TVStudy Analysis of Proposal**  
(page 4 of 5)

KARE D31 DT LIC 2.0 7 2.0 7 2.0 7

Interference to BLANK0000178831 LIC scenario 1  
\*\*IX: 10.30% interference caused

**K30RA-D is accepting 10.30% interference, see text**

Desired:	Call K30RA-D	Chan D30	Svc LD	Status LIC	City, State RACINE, MN	File Number BLANK0000178831	Distance
Undesireds:	K290E-D	D29	LD	APP	Rochester, MN	K290E-D prop 000019796	20.2 km
	K30QX-D	D30	LD	LIC	DULUTH, MN	BLANK0000197138	319.7
	KSTC-TV	D30	DT	LIC	MINNEAPOLIS, MN	BLANK0000202445	138.9
	K30QY-D	D30	LD	LIC	OAKLAND, MN	BLANK0000194532	79.9
	WEAU	D30	LD	LIC	EAU CLAIRE, WI	BLANK0000124038	86.4
Service area		Terrain-limited		IX-free, before		IX-free, after	Percent New IX
550.0	120,272	534.9	120,191	461.2	115,310	431.0 103,438	6.56 10.30
Undesired				Total IX	Unique IX, before	Unique IX, after	
K290E-D	D29	LD	APP	64.5 14,522		30.2 11,872	
KSTC-TV	D30	DT	LIC	73.6 4,881	72.6 4,881	38.4 2,231	
WEAU	D30	LD	LIC	1.0 0	0.0 0	0.0 0	

Interference to BLANK0000178831 LIC scenario 2  
\*\*IX: 10.25% interference caused

Desired:	Call K30RA-D	Chan D30	Svc LD	Status LIC	City, State RACINE, MN	File Number BLANK0000178831	Distance		
Undesireds:	K290E-D	D29	LD	APP	Rochester, MN	K290E-D prop 000019796	20.2 km		
	K30QX-D	D30	LD	LIC	DULUTH, MN	BLANK0000197138	319.7		
	KSTC-TV	D30	DT	LIC	MINNEAPOLIS, MN	BLANK0000202445	138.9		
	K30QY-D	D30	LD	CP	OAKLAND, MN	BLANK0000195575	98.9		
	WEAU	D30	LD	LIC	EAU CLAIRE, WI	BLANK0000124038	86.4		
Service area		Terrain-limited		IX-free, before		IX-free, after	Percent New IX		
550.0	120,272	534.9	120,191	460.2	115,251	431.0	103,438	6.35	10.25
Undesired				Total IX		Unique IX, before		Unique IX, after	
K290E-D	D29	LD	APP	64.5	14,522	29.2	11,813		
KSTC-TV	D30	DT	LIC	73.6	4,881	68.6	4,830	38.4	2,231
K30QY-D	D30	LD	CP	5.0	110	1.0	59	0.0	0
WEAU	D30	LD	LIC	1.0	0	0.0	0	0.0	0

Interference to proposal scenario 1  
3.45% interference received

	Call	Chan	Svc	Status	City, State	File Number	Distance
Desired:	K290E-D	D29	LD	APP	Rochester, MN	K290E-D prop 000019796	
Undesireds:	KGAN	D29	DT	LIC	CEDAR RAPIDS, IA	BLCDDT20140416AAI	204.3 km
	K29NY-D	D29	LD	LIC	ALEXANDRA, MN	BLANK0000195944	308.3
	WFTC	D29	DT	LIC	MINNEAPOLIS, MN	BLCDDT20100809CJF	117.9
	K30QY-D	D30	LD	LIC	OAKLAND, MN	BLANK0000194532	89.0
	K30RA-D	D30	LD	LIC	RACINE, MN	BLANK0000178831	20.2
Service area		Terrain-limited			IX-free	Percent IX	
2948.3	168,645	2918.1	168,590		2458.1	162,766	15.76 3.45
Undesired				Total IX		Unique IX	Prcnt Unique IX
KGAN	D29	DT	LIC	38.2	575	10.1	337 0.34 0.20
WFTC	D29	DT	LIC	447.9	5,454	420.7	5,249 14.42 3.11
K30RA-D	D30	LD	LIC	2.0	33	1.0	0 0.03 0.00

**Table 1 K29OE-D TVStudy Analysis of Proposal**  
(page 5 of 5)

Interference to proposal scenario 2  
3.45% interference received

	Call	Chan	Svc	Status	City, State	File Number	Distance
Desired:	K29OE-D	D29	LD	APP	Rochester, MN	K29OE-D prop 000019796	
Undesireds:	KGAN	D29	DT	LIC	CEDAR RAPIDS, IA	BLCDT20140416AAI	204.3 km
	K29NY-D	D29	LD	LIC	ALEXANDRA, MN	BLANK0000195944	308.3
	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		Percent IX	
2948.3	168,645	2918.1	168,590	2459.1	162,766	15.73	3.45
Undesired		Total IX		Unique IX		Prct Unique IX	
KGAN	D29 DT LIC	38.2	575	11.1	370	0.38	0.22
WFTC	D29 DT LIC	447.9	5,454	420.7	5,249	14.42	3.11

**Channel and  
Facility  
Information**

Section	Question	Response
Facility ID	186458	
State	Minnesota	
City	Rochester	
LPD Channel	29	

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?	Yes
	Antenna ID	1010173
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