

**Displacement Application**

LPTV or Translator Facility: K40MR-D Caputa, SD Facility ID 186061  
Authorized Ch. 40 File# BNPDTL-20100505AJA

Nature of Displacement: Within 600 MHz wireless spectrum

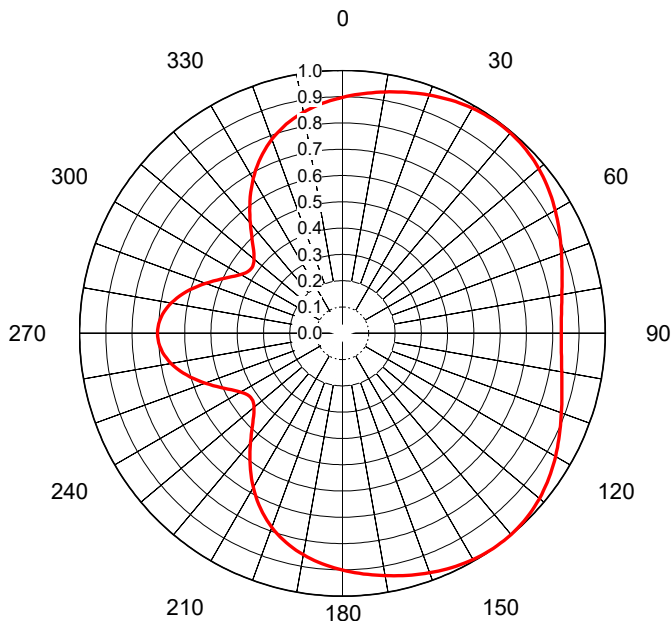
Proposed Facility: Ch. 22 15 kW ERP Directional  
Azimuth pattern in Figure 1

Modification Compliance: 27.7 km from authorized site  
Contour comparison in Figure 2  
TVStudy Analysis report in Table 1  
Satisfies 121 km geographic restriction of DA 09-1487

RF Exposure: The calculated signal density near the tower at two meters above ground level attributable to the proposed facility is 0.3 percent of the general population/uncontrolled maximum permitted exposure limit. Calculations conducted pursuant to FCC OET Bulletin Number 65 and incorporate 15 percent relative field at downward angles (from antenna elevation pattern data). This is 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.

**Chesapeake RF Consultants, LLC**

Joseph M. Davis, P.E. August 18, 2021  
207 Old Dominion Road Yorktown, VA 23692 703-650-9600



## AZIMUTH PATTERN Horizontal Polarization

Proposal No. **20210818jmd**  
Date **18-Aug-21**  
Call Letters **LPTV Ch 22**  
Channel **22**  
Frequency **521 MHz**  
Antenna Type **TFU-8WB-LP/VP-R C160**  
Gain **1.53 (1.85dB)**  
Calculated

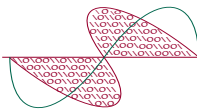
Pattern Number **WB-C160-22 Hpol**

Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value
0	0.897	36	0.995	72	0.878	108	0.877	144	1.000	180	0.901	216	0.599	252	0.579	288	0.579
1	0.901	37	0.995	73	0.873	109	0.882	145	0.999	181	0.897	217	0.585	253	0.591	289	0.567
2	0.905	38	0.995	74	0.869	110	0.887	146	0.999	182	0.893	218	0.571	254	0.602	290	0.555
3	0.908	39	0.995	75	0.865	111	0.891	147	0.998	183	0.889	219	0.558	255	0.614	291	0.542
4	0.912	40	0.994	76	0.861	112	0.896	148	0.997	184	0.885	220	0.544	256	0.624	292	0.530
5	0.915	41	0.994	77	0.858	113	0.901	149	0.995	185	0.880	221	0.531	257	0.634	293	0.518
6	0.919	42	0.993	78	0.854	114	0.906	150	0.994	186	0.876	222	0.518	258	0.644	294	0.506
7	0.922	43	0.991	79	0.851	115	0.911	151	0.992	187	0.871	223	0.505	259	0.653	295	0.495
8	0.925	44	0.990	80	0.848	116	0.916	152	0.990	188	0.866	224	0.493	260	0.662	296	0.484
9	0.929	45	0.988	81	0.845	117	0.921	153	0.988	189	0.861	225	0.482	261	0.669	297	0.473
10	0.932	46	0.986	82	0.843	118	0.926	154	0.986	190	0.856	226	0.471	262	0.676	298	0.464
11	0.936	47	0.984	83	0.840	119	0.931	155	0.983	191	0.850	227	0.462	263	0.683	299	0.455
12	0.939	48	0.981	84	0.838	120	0.936	156	0.981	192	0.844	228	0.453	264	0.688	300	0.447
13	0.942	49	0.978	85	0.837	121	0.941	157	0.978	193	0.838	229	0.445	265	0.693	301	0.440
14	0.945	50	0.975	86	0.835	122	0.946	158	0.975	194	0.831	230	0.439	266	0.697	302	0.434
15	0.949	51	0.972	87	0.834	123	0.950	159	0.972	195	0.825	231	0.433	267	0.700	303	0.430
16	0.952	52	0.969	88	0.833	124	0.955	160	0.969	196	0.818	232	0.429	268	0.702	304	0.427
17	0.955	53	0.965	89	0.833	125	0.959	161	0.966	197	0.810	233	0.427	269	0.703	305	0.425
18	0.958	54	0.961	90	0.833	126	0.963	162	0.963	198	0.802	234	0.425	270	0.703	306	0.425
19	0.961	55	0.957	91	0.833	127	0.967	163	0.960	199	0.794	235	0.426	271	0.703	307	0.427
20	0.964	56	0.953	92	0.833	128	0.971	164	0.957	200	0.785	236	0.427	272	0.702	308	0.429
21	0.967	57	0.949	93	0.834	129	0.975	165	0.953	201	0.776	237	0.430	273	0.700	309	0.433
22	0.970	58	0.944	94	0.835	130	0.978	166	0.950	202	0.767	238	0.435	274	0.697	310	0.439
23	0.973	59	0.940	95	0.836	131	0.982	167	0.947	203	0.757	239	0.441	275	0.693	311	0.445
24	0.976	60	0.935	96	0.838	132	0.984	168	0.943	204	0.747	240	0.447	276	0.688	312	0.453
25	0.978	61	0.930	97	0.840	133	0.987	169	0.940	205	0.736	241	0.455	277	0.682	313	0.462
26	0.981	62	0.925	98	0.842	134	0.990	170	0.936	206	0.725	242	0.464	278	0.676	314	0.472
27	0.983	63	0.921	99	0.845	135	0.992	171	0.933	207	0.714	243	0.474	279	0.669	315	0.483
28	0.985	64	0.916	100	0.847	136	0.994	172	0.930	208	0.702	244	0.484	280	0.661	316	0.494
29	0.987	65	0.911	101	0.850	137	0.995	173	0.926	209	0.690	245	0.495	281	0.653	317	0.506
30	0.989	66	0.906	102	0.854	138	0.997	174	0.923	210	0.678	246	0.507	282	0.644	318	0.519
31	0.990	67	0.901	103	0.857	139	0.998	175	0.919	211	0.665	247	0.518	283	0.634	319	0.532
32	0.992	68	0.896	104	0.861	140	0.999	176	0.915	212	0.652	248	0.531	284	0.624	320	0.545
33	0.993	69	0.891	105	0.865	141	1.000	177	0.912	213	0.639	249	0.543	285	0.613	321	0.558
34	0.994	70	0.887	106	0.869	142	1.000	178	0.908	214	0.626	250	0.555	286	0.602	322	0.572
35	0.994	71	0.882	107	0.873	143	1.000	179	0.904	215	0.612	251	0.567	287	0.591	323	0.586

**Figure 1**  
**Antenna Azimuthal Pattern**  
**K40MR-D Caputa, SD**  
**Facility ID 186061**  
**Ch. 22 15 kW Directional**

prepared for  
**Gray Television Licensee, LLC**

August, 2021

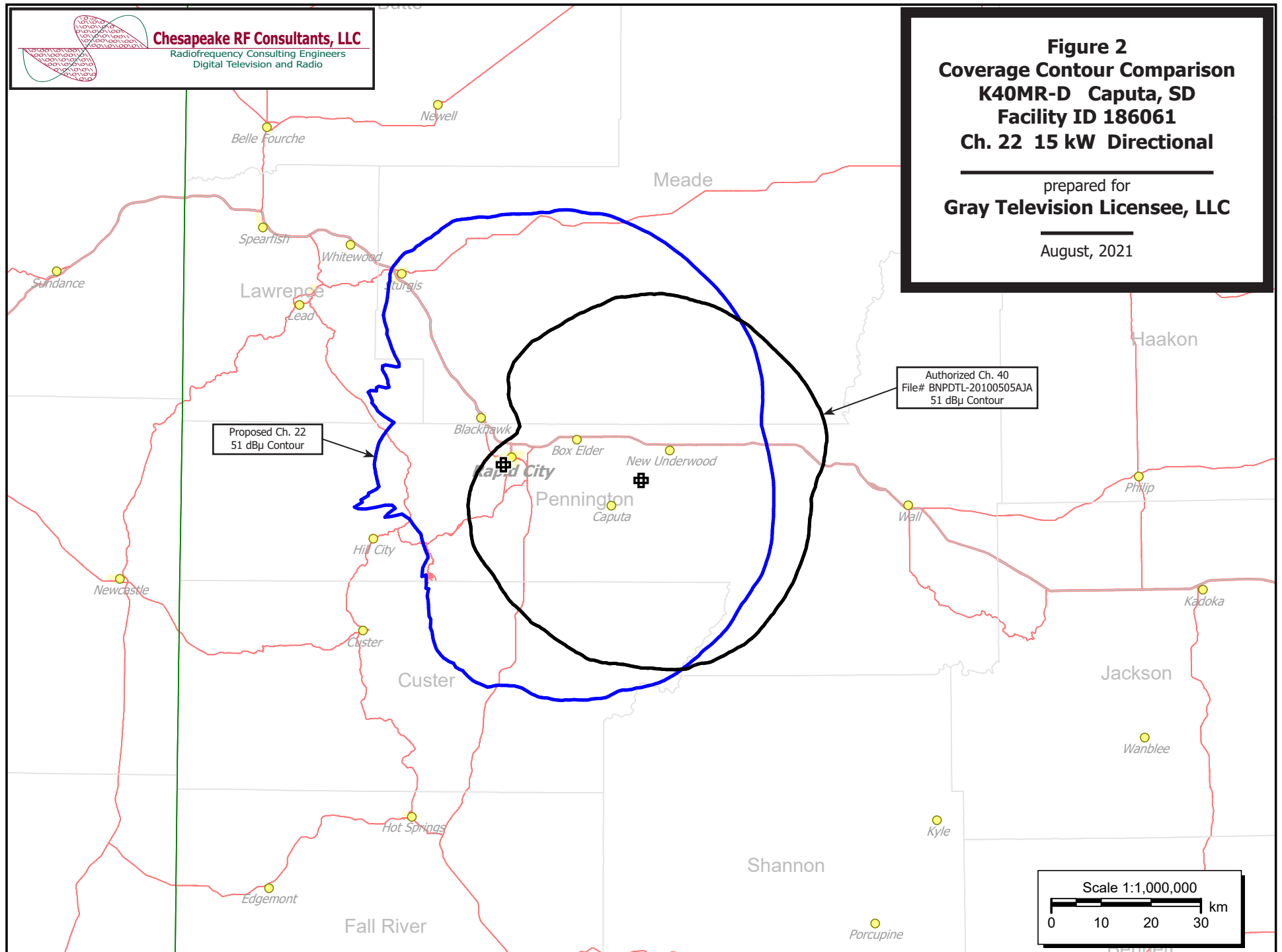


**Chesapeake RF Consultants, LLC**  
Radiofrequency Consulting Engineers  
Digital Television and Radio

**Figure 2**  
**Coverage Contour Comparison**  
**K40MR-D Caputa, SD**  
**Facility ID 186061**  
**Ch. 22 15 kW Directional**

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August, 2021



# **Table 1 K40MR-D TVStudy Analysis of Proposal** (page 1 of 2)



tvstudy v2.2.5 (4uoc83)  
Database: localhost, Study: K40MR-D prop Ch22, Model: Longley-Rice  
Start: 2021.08.18 14:20:05

Study created: 2021.08.18 14:20:05

Study build station data: LMS TV 2021-08-18

Proposal: K40MR-D D22 LD APP CAPUTA, SD  
File number: K40MR-D prop Ch22  
Facility ID: 186061  
Station data: User record  
Record ID: 3814  
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
Yes	KNBN	D21	DT	CP	RAPID CITY, SD	BLANK0000035769	2.9 km
Yes	KNBN	D21	DT	LIC	RAPID CITY, SD	BLCDT20090206ACK	2.9
No	K22KW-D	D22	LD	LIC	JULESBURG, CO	BLDTT20120430AAL	358.6
No	K22NN-D	D22	LD	LIC	FORSYTH, MT	BLANK0000124961	362.5
No	KHMT	D22	DT	LIC	HARDIN, MT	BLCDT20090226AAD	427.3
No	KBME-TV	D22	DT	LIC	BISMARCK, ND	BLEDT20020122AAD	339.5
No	K22OU-D	D22	LD	CP	RELIANCE, SD	BLANK0000157105	291.9
No	K49LJ-D	D22	LD	CP	CASPER, WY	BLANK0000035784	287.4
No	K22AD	D22	LD	CP	GILLETTE, WY	BLANK0000115871	180.1
No	K22AD	N22	TX	LIC	GILLETTE, WY	BLTTL19940224JS	180.1
No	K22NJ-D	D22	LD	LIC	LUCERNE, WY	BLANK0000156701	373.1
No	KEVN-LD	D23	LD	LIC	RAPID CITY, SD	BLANK0000005141	0.0
No	KKRA-LP	N24	TX	LIC	RAPID CITY, SD	BLTTL19980213JB	2.9

No non-directional AM stations found within 0.8 km

No directional AM stations found within 3.2 km

Record parameters as studied:

Channel: D22  
Mask: Full Service  
Latitude: 44 4 0.00 N (NAD83)  
Longitude: 103 15 3.00 W  
Height AMSL: 1275.9 m  
HAAT: 0.0 m  
Peak ERP: 15.0 kW  
Antenna: DIE TFU-WB-C160 Ch-22 AZ 90.0 deg  
Elev Pattn: Generic  
Elec Tilt: 1.05

49.6 dBu contour:

Azimuth	ERP	HAAT	Distance
0.0 deg	12.1 kW	224.8 m	51.8 km
45.0	14.5	294.5	56.7
90.0	10.4	299.1	55.2
135.0	14.7	283.7	56.1
180.0	12.2	125.6	45.7
225.0	3.62	13.3	24.3
270.0	7.41	8.6	27.6
315.0	3.63	65.6	32.6

Database HAAT does not agree with computed HAAT  
Database HAAT: 0 m Computed HAAT: 164 m

Distance to Canadian border: 548.3 km

Distance to Mexican border: 1394.8 km

**Table 1 K40MR-D TV Study Analysis of Proposal**  
(page 2 of 2)



Conditions at FCC monitoring station: Grand Island NE  
Bearing: 129.8 degrees Distance: 527.4 km

Proposal is not within the West Virginia quiet zone area

Conditions at Table Mountain receiving zone:  
Bearing: 201.2 degrees Distance: 464.5 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 BLANK0000035769 CP scenario 1

Desired:	Call KNBN	Chan D21	Svc DT	Status CP	City, State RAPID CITY, SD	File Number BLANK0000035769	Distance
Undesireds:	K40MR-D	D22	LD	APP	CAPUTA, SD	K40MR-D prop Ch22	2.9 km
	Service area 16786.8 152,591	Terrain-limited 15692.8		IX-free, before 138,770	IX-free, after 15691.8 138,770	Percent New IX 0.01 0.00	
Undesired				Total IX	Unique IX, before	Unique IX, after	
K40MR-D D22 LD APP		1.0		0		1.0 0	

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Interference to BLCDT20090206ACK LIC scenario 1

Desired:	Call KNBN	Chan D21	Svc DT	Status LIC	City, State RAPID CITY, SD	File Number BLCDT20090206ACK	Distance
Undesireds:	K40MR-D	D22	LD	APP	CAPUTA, SD	K40MR-D prop Ch22	2.9 km
	Service area 15089.8 145,842	Terrain-limited 14087.7		IX-free, before 135,249	IX-free, after 14082.7 135,249	Percent New IX 0.04 0.00	
Undesired				Total IX	Unique IX, before	Unique IX, after	
K40MR-D D22 LD APP		5.1		0		5.1 0	

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Interference to proposal scenario 1

Desired:	Call K40MR-D	Chan D22	Svc LD	Status APP	City, State CAPUTA, SD	File Number K40MR-D prop Ch22	Distance
Undesireds:	KNBN K22AD	D21 D22	DT LD	CP CP	RAPID CITY, SD GILLETTE, WY	BLANK0000035769 BLANK0000115871	2.9 km 180.1
	Service area 6761.8 122,772	Terrain-limited 6389.8		IX-free 113,917	Percent IX 2.99 1.94		
Undesired				Total IX	Unique IX	Prct Unique IX	
KNBN D21 DT CP		191.1		2,258	191.1 2,258	2.99 1.94	

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Interference to proposal scenario 2

Desired:	Call K40MR-D	Chan D22	Svc LD	Status APP	City, State CAPUTA, SD	File Number K40MR-D prop Ch22	Distance
Undesireds:	KNBN K22AD	D21 D22	DT LD	LIC CP	RAPID CITY, SD GILLETTE, WY	BLCDT20090206ACK BLANK0000115871	2.9 km 180.1
	Service area 6761.8 122,772	Terrain-limited 6389.8		IX-free 115,070	Percent IX 1.70 0.95		
Undesired				Total IX	Unique IX	Prct Unique IX	
KNBN D21 DT LIC		108.7		1,105	108.7 1,105	1.70 0.95	