

## TECHNICAL EXHIBIT

APPLICATION FOR DTV CONSTRUCTION PERMIT  
FACILITY ID 178232  
STATION WHMB-DT  
INDIANAPOLIS, INDIANA  
CH 20 530 KW(MAX-DA) 297 M

### Technical Narrative

This technical exhibit was prepared in support of an application for construction permit for station WHMB-DT at Indianapolis, Indiana. Station WHMB-DT filed a petition for rulemaking (BPRM-20080619AEU) to change its post transition DTV channel from 16 to 20. On July 9, 2008, the FCC released a Report and Order (MB Docket No. 08-122) substituting channel 20 for channel 16 at Indianapolis. In addition, the FCC ordered WHMB-DT to file a minor change application specifying a DTV operation on channel 20 within 45 days of the effective date (April 2, 2009). Therefore, this application is being filed in response to the FCC's Report and Order.

By means of this application, WHMB-DT proposes a post transition DTV operation on channel 20 with a maximum directional effective radiated power (ERP) of 530 kW and an antenna radiation center height above average terrain (HAAT) of 297 meters. No other changes are proposed. The instant application is considered a minor change in facilities pursuant to Section 73.3572(a).

### Proposed Facilities

It is proposed to operate WHMB-DT from its licensed site (FCC Tower registration 1253064; NAD27 coordinates:39-53-40 N, 86-12-21 W) on DTV channel 20 (506-512 MHz) with a directional antenna maximum ERP of 530 kW and an antenna HAAT of 297 meters. It is proposed to utilize a Dielectric TFU-30GTH-R04 directional antenna which will be top-mounted at the 288 meter level on the existing tower structure and will incorporate an electrical beam tilt of 0.75 degrees. The proposed antenna radiation center height above mean sea level will be 551.5 meters.

## Antenna Data

Exhibit 1 is a graph of the horizontal pattern for the proposed Dielectric TFU-30GTH-R04, horizontally polarized, directional antenna system. Exhibit 2 is a tabulation of the horizontal azimuth pattern. Exhibit 3 is a graph of the elevation pattern. Exhibit 4 is a tabulation of the elevation pattern.

## Response to Paragraph 11 - Interference Protection

An interference analysis has been conducted using the procedures outlined in the FCC's OET-69 bulletin which demonstrates that the proposal complies with the interference protection provisions of Section 73.623(c)(2).<sup>1</sup>

## Class A Allocation Considerations

A study has been conducted which indicates that the WHMB-DT proposal will not create prohibited interference to other existing, authorized or proposed Class A stations.

## City Coverage and Replication of Appendix B Service

Exhibit 5 depicts the FCC Predicted 41 dBu and 48 dBu, F(50,90) coverage contours for the herein proposed WHMB-DT channel 20 operation. As indicated, Indianapolis is located within the 48 dBu contour. The Indianapolis city limits were derived from information contained in the 2000 U.S. Census for Indiana.

The distances to the predicted 41 dBu and 48 dBu, F(50,90) coverage contours were determined in accordance with the provisions of Section 73.625. The average elevations from 3.2 to 16.1 kilometers from the transmitter site, were obtained from the USGS 3-second terrain database and were used for determining the distances to coverage contours.

According to Appendix B, the allotted post transition operation of WHMB-DT on channel 20 serves 2,561,000 persons. Results of our interference analysis indicate that the proposed WHMB-DT operation on channel 20 will have an interference free service population of 2,551,848. Therefore, the proposed

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<sup>1</sup> LeSEA's DTV interference analysis program is based on the program and procedures outlined by the FCC in the Sixth Report and Order; subsequent Memorandum Opinion and Order; and FCC OET Bulletin No. 69. A normal grid size resolution of 2 km and nominal terrain increment of 1 km were employed.

operation replicates 99.6% of the Appendix B population.

### Objectionable Interference

Exhibit 6 provides a tabulation of the AM stations within 5.9 kilometers, FM and TV stations within 16 kilometers of the WHMB-DT site. Although no adverse electromagnetic impact is expected, the applicant recognizes its responsibility to correct problems, which are a result of its proposed operation.

The proposed site is more than 1779 kilometers from the closest point of the Mexican border. The closest FCC monitoring station is at Allegan, Michigan located approximately 302 kilometers to the north. The National Radio Quiet Zone (VA/WV) is 494 kilometers to the east. The Table Mountain Radio Quiet Zone (CO) is more than 1616 kilometers to the west. The closest radio astronomy site conducting research on TV channel 37 is at North Liberty, Iowa, located approximately 497 kilometers to the northwest. These separations are sufficient to avoid interference from the proposed operation.

### Canadian Coordination

The proposed transmitter site is 342 kilometers from the Canadian border, which is within the Canadian coordination distance. The proposed facility has received concurrence from the Canadian government for this allotment.

### Environmental Protection Act

The proposed facilities were evaluated in terms of potential radio frequency (RF) energy exposure at ground level to workers and the general public. The radiation center for the proposed DTV antenna is located 297 meters above ground level. The maximum DTV ERP is 530 kW (horizontal polarization). A conservative vertical plane relative field value of 0.1 (for angles below 60 degrees downward) is assumed for the antenna's downward radiation (see Exhibit 3). The calculated power density at a point 2 meters above ground level is 0.002 mW/cm<sup>2</sup>. This is 0.5% of the FCC's recommended limit of 0.34 mW/cm<sup>2</sup> for channel 20 for an "uncontrolled" environment. Thus, it is believed that the WHMB-DT facility complies with the FCC's RF emission rules.

Access to the transmitting site will be restricted and appropriately marked with RFR warning signs. Furthermore, in the event that workers or other authorized personnel enter the

restricted area or climb the tower, to ensure that appropriate measures will be taken to assure worker safety with respect to radio frequency radiation exposure. Such measures include reducing the average exposure by spreading out the work over a longer period of time, wearing "accepted" RFR protective clothing and/or RFR exposure.

Finally, it is noted that this technical exhibit only addresses the potential for radio frequency electromagnetic field exposure. All other aspects of the environmental processing analysis will be or already has been provided to the FCC by the tower owner as part of the tower registration process.

Larry Vehorn

LeSEA Broadcasting  
1030 Shortwave Lane  
Pineland SC 29934  
(803) 625 5551  
[lvehorn@lesea.com](mailto:lvehorn@lesea.com)

April 17, 2009

Date **17 Apr 2009**  
Call Letters **WHMB-DT** Channel **20**  
Location **Indianapolis IN**  
Customer  
Antenna Type **TFU-30GTH-R O4**

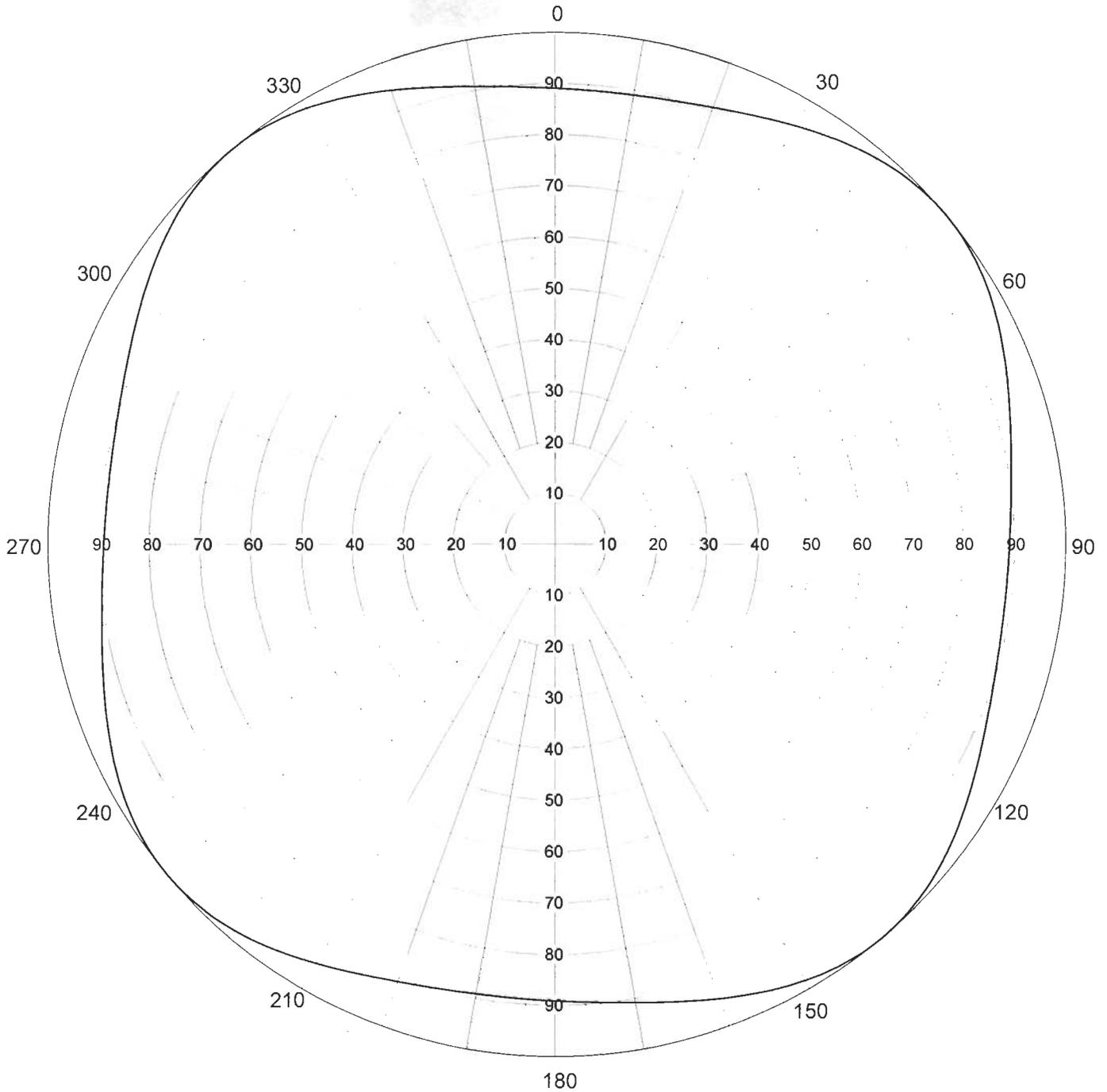
## AZIMUTH PATTERN

Gain  
Calculated / Measured

**1.10 (0.41 dB)**  
**Calculated**

Frequency  
Drawing #

**509 MHz**  
**TFU-O4**



Remarks:



Date **17 Apr 2009**  
 Call Letters **WHMB-DT** Channel **20**  
 Location **Indianapolis IN**  
 Customer  
 Antenna Type **TFU-30GTH-R O4**

### TABULATION OF AZIMUTH PATTERN

Azimuth Pattern Drawing # **TFU-O4**

Angle	Field														
0	0.891	45	0.995	90	0.891	135	0.995	180	0.891	225	0.995	270	0.891	315	0.995
1	0.890	46	0.997	91	0.890	136	0.997	181	0.890	226	0.997	271	0.890	316	0.997
2	0.889	47	0.998	92	0.889	137	0.998	182	0.889	227	0.998	272	0.889	317	0.998
3	0.889	48	0.999	93	0.889	138	0.999	183	0.889	228	0.999	273	0.889	318	0.999
4	0.889	49	1.000	94	0.889	139	1.000	184	0.889	229	1.000	274	0.889	319	1.000
5	0.889	50	1.000	95	0.889	140	1.000	185	0.889	230	1.000	275	0.889	320	1.000
6	0.889	51	1.000	96	0.889	141	1.000	186	0.889	231	1.000	276	0.889	321	1.000
7	0.889	52	0.999	97	0.889	142	0.999	187	0.889	232	0.999	277	0.889	322	0.999
8	0.889	53	0.998	98	0.889	143	0.998	188	0.889	233	0.998	278	0.889	323	0.998
9	0.890	54	0.997	99	0.890	144	0.997	189	0.890	234	0.997	279	0.890	324	0.997
10	0.891	55	0.995	100	0.891	145	0.995	190	0.891	235	0.995	280	0.891	325	0.995
11	0.892	56	0.993	101	0.892	146	0.993	191	0.892	236	0.993	281	0.892	326	0.993
12	0.893	57	0.991	102	0.893	147	0.991	192	0.893	237	0.991	282	0.893	327	0.991
13	0.894	58	0.989	103	0.894	148	0.989	193	0.894	238	0.989	283	0.894	328	0.989
14	0.895	59	0.986	104	0.895	149	0.986	194	0.895	239	0.986	284	0.895	329	0.986
15	0.897	60	0.983	105	0.897	150	0.983	195	0.897	240	0.983	285	0.897	330	0.983
16	0.899	61	0.979	106	0.899	151	0.979	196	0.899	241	0.979	286	0.899	331	0.979
17	0.901	62	0.976	107	0.901	152	0.976	197	0.901	242	0.976	287	0.901	332	0.976
18	0.903	63	0.972	108	0.903	153	0.972	198	0.903	243	0.972	288	0.903	333	0.972
19	0.905	64	0.968	109	0.905	154	0.968	199	0.905	244	0.968	289	0.905	334	0.968
20	0.908	65	0.964	110	0.908	155	0.964	200	0.908	245	0.964	290	0.908	335	0.964
21	0.911	66	0.960	111	0.911	156	0.960	201	0.911	246	0.960	291	0.911	336	0.960
22	0.914	67	0.956	112	0.914	157	0.956	202	0.914	247	0.956	292	0.914	337	0.956
23	0.917	68	0.951	113	0.917	158	0.951	203	0.917	248	0.951	293	0.917	338	0.951
24	0.920	69	0.947	114	0.920	159	0.947	204	0.920	249	0.947	294	0.920	339	0.947
25	0.924	70	0.943	115	0.924	160	0.943	205	0.924	250	0.943	295	0.924	340	0.943
26	0.927	71	0.939	116	0.927	161	0.939	206	0.927	251	0.939	296	0.927	341	0.939
27	0.931	72	0.935	117	0.931	162	0.935	207	0.931	252	0.935	297	0.931	342	0.935
28	0.935	73	0.931	118	0.935	163	0.931	208	0.935	253	0.931	298	0.935	343	0.931
29	0.939	74	0.927	119	0.939	164	0.927	209	0.939	254	0.927	299	0.939	344	0.927
30	0.943	75	0.924	120	0.943	165	0.924	210	0.943	255	0.924	300	0.943	345	0.924
31	0.947	76	0.920	121	0.947	166	0.920	211	0.947	256	0.920	301	0.947	346	0.920
32	0.951	77	0.917	122	0.951	167	0.917	212	0.951	257	0.917	302	0.951	347	0.917
33	0.956	78	0.914	123	0.956	168	0.914	213	0.956	258	0.914	303	0.956	348	0.914
34	0.960	79	0.911	124	0.960	169	0.911	214	0.960	259	0.911	304	0.960	349	0.911
35	0.964	80	0.908	125	0.964	170	0.908	215	0.964	260	0.908	305	0.964	350	0.908
36	0.968	81	0.905	126	0.968	171	0.905	216	0.968	261	0.905	306	0.968	351	0.905
37	0.972	82	0.903	127	0.972	172	0.903	217	0.972	262	0.903	307	0.972	352	0.903
38	0.976	83	0.901	128	0.976	173	0.901	218	0.976	263	0.901	308	0.976	353	0.901
39	0.979	84	0.899	129	0.979	174	0.899	219	0.979	264	0.899	309	0.979	354	0.899
40	0.983	85	0.897	130	0.983	175	0.897	220	0.983	265	0.897	310	0.983	355	0.897
41	0.986	86	0.895	131	0.986	176	0.895	221	0.986	266	0.895	311	0.986	356	0.895
42	0.989	87	0.894	132	0.989	177	0.894	222	0.989	267	0.894	312	0.989	357	0.894
43	0.991	88	0.893	133	0.991	178	0.893	223	0.991	268	0.893	313	0.991	358	0.893
44	0.993	89	0.892	134	0.993	179	0.892	224	0.993	269	0.892	314	0.993	359	0.892

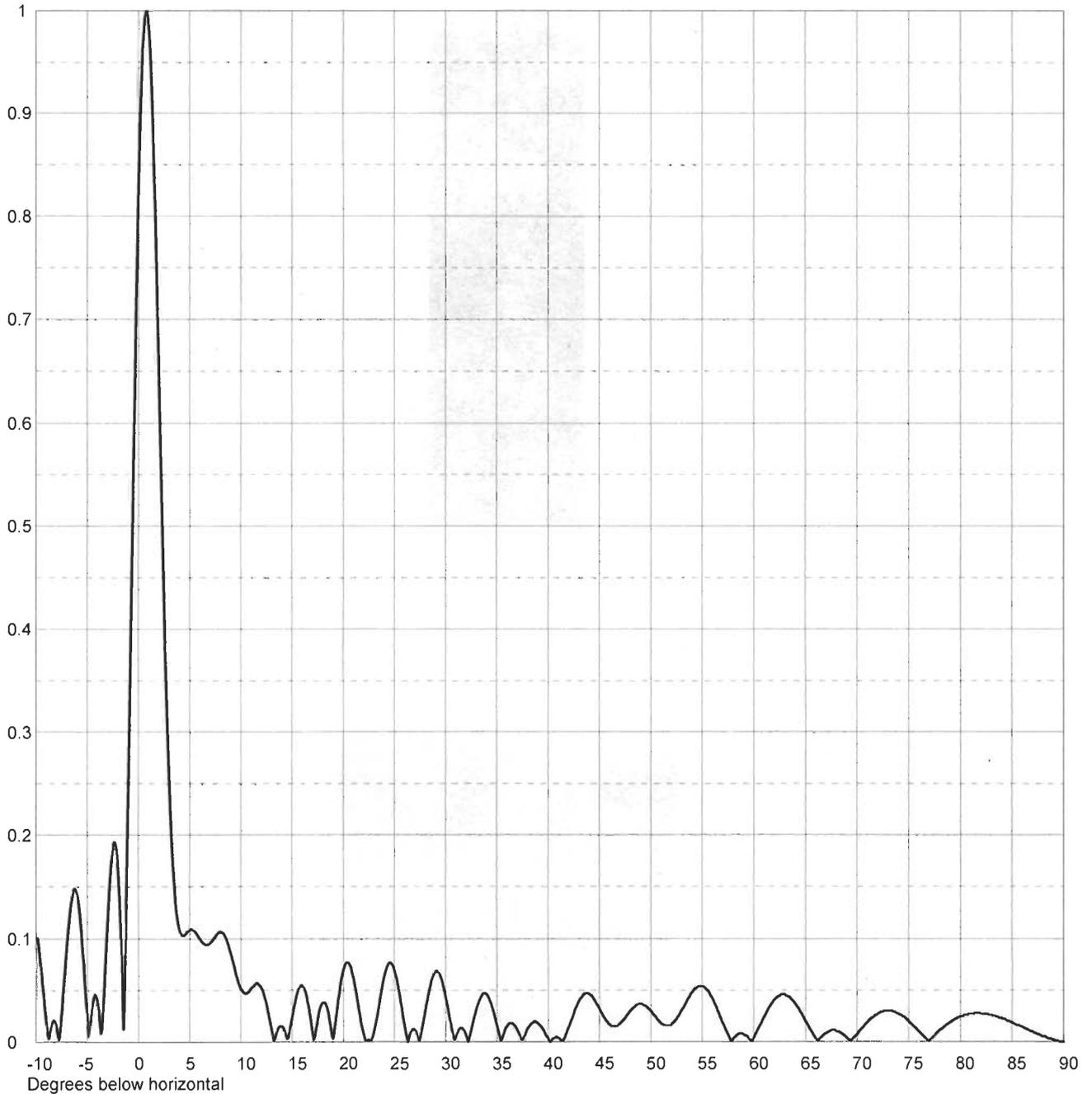
Remarks:



Date **17 Apr 2009**  
Call Letters **WHMB-DT** Channel **20**  
Location **Indianapolis IN**  
Customer  
Antenna Type **TFU-30GTH-R O4**

### ELEVATION PATTERN

RMS Gain at Main Lobe	<b>27.0 (14.31 dB)</b>	Beam Tilt	<b>0.75 Degrees</b>
RMS Gain at Horizontal	<b>18.7 (12.72 dB)</b>	Frequency	<b>509.00 MHz</b>
Calculated / Measured	<b>Calculated</b>	Drawing #	<b>30G270075-90</b>



Remarks:



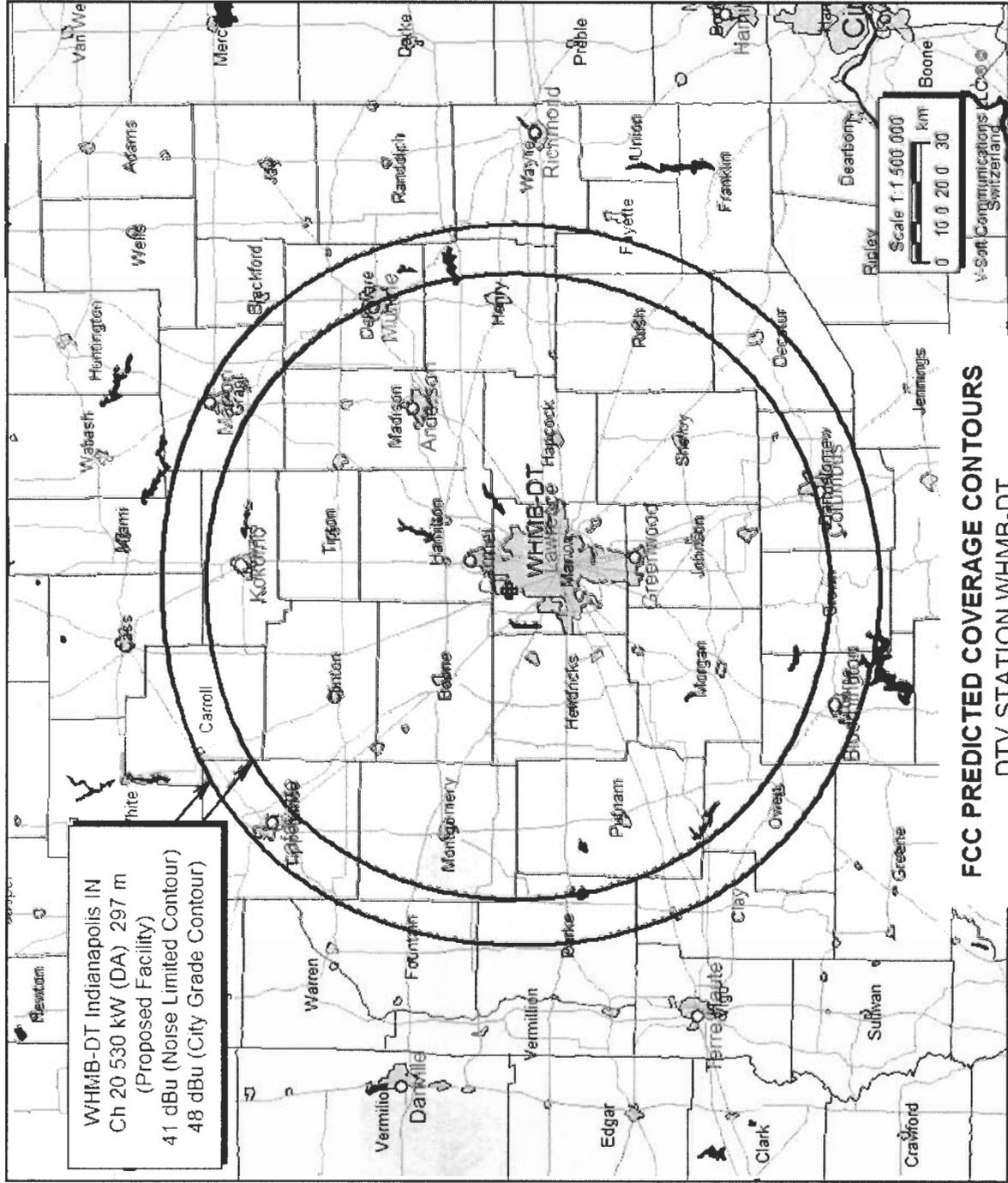
Date **17 Apr 2009**  
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### TABULATION OF ELEVATION PATTERN

Elevation Pattern Drawing # **30G270075-90**

Angle	Field										
-10.0	0.108	2.4	0.458	10.6	0.048	30.5	0.017	51.0	0.018	71.5	0.023
-9.5	0.066	2.6	0.378	10.8	0.049	31.0	0.005	51.5	0.016	72.0	0.027
-9.0	0.015	2.8	0.307	11.0	0.052	31.5	0.013	52.0	0.017	72.5	0.029
-8.5	0.018	3.0	0.247	11.5	0.057	32.0	0.006	52.5	0.022	73.0	0.030
-8.0	0.012	3.2	0.198	12.0	0.052	32.5	0.012	53.0	0.031	73.5	0.029
-7.5	0.033	3.4	0.161	12.5	0.035	33.0	0.032	53.5	0.040	74.0	0.027
-7.0	0.096	3.6	0.135	13.0	0.011	33.5	0.045	54.0	0.048	74.5	0.024
-6.5	0.141	3.8	0.118	13.5	0.010	34.0	0.046	54.5	0.053	75.0	0.020
-6.0	0.141	4.0	0.108	14.0	0.015	34.5	0.035	55.0	0.054	75.5	0.015
-5.5	0.091	4.2	0.104	14.5	0.003	35.0	0.016	55.5	0.050	76.0	0.010
-5.0	0.017	4.4	0.103	15.0	0.024	35.5	0.003	56.0	0.042	76.5	0.005
-4.5	0.038	4.6	0.105	15.5	0.048	36.0	0.015	56.5	0.030	77.0	0.001
-4.0	0.037	4.8	0.107	16.0	0.054	36.5	0.018	57.0	0.018	77.5	0.006
-3.5	0.029	5.0	0.108	16.5	0.039	37.0	0.011	57.5	0.007	78.0	0.011
-3.0	0.124	5.2	0.109	17.0	0.008	37.5	0.002	58.0	0.003	78.5	0.015
-2.8	0.158	5.4	0.108	17.5	0.023	38.0	0.013	58.5	0.007	79.0	0.019
-2.6	0.182	5.6	0.106	18.0	0.038	38.5	0.019	59.0	0.007	79.5	0.022
-2.4	0.193	5.8	0.103	18.5	0.029	39.0	0.018	59.5	0.003	80.0	0.024
-2.2	0.188	6.0	0.100	19.0	0.003	39.5	0.012	60.0	0.004	80.5	0.026
-2.0	0.162	6.2	0.097	19.5	0.041	40.0	0.003	60.5	0.014	81.0	0.027
-1.8	0.116	6.4	0.095	20.0	0.070	40.5	0.003	61.0	0.024	81.5	0.028
-1.6	0.050	6.6	0.094	20.5	0.077	41.0	0.004	61.5	0.034	82.0	0.027
-1.4	0.038	6.8	0.095	21.0	0.061	41.5	0.002	62.0	0.041	82.5	0.027
-1.2	0.140	7.0	0.096	21.5	0.032	42.0	0.014	62.5	0.045	83.0	0.026
-1.0	0.255	7.2	0.098	22.0	0.007	42.5	0.028	63.0	0.046	83.5	0.024
-0.8	0.378	7.4	0.101	22.5	0.002	43.0	0.040	63.5	0.043	84.0	0.023
-0.6	0.503	7.6	0.104	23.0	0.010	43.5	0.046	64.0	0.037	84.5	0.021
-0.4	0.624	7.8	0.106	23.5	0.037	44.0	0.046	64.5	0.029	85.0	0.019
-0.2	0.735	8.0	0.107	24.0	0.064	44.5	0.041	65.0	0.020	85.5	0.016
0.0	0.832	8.2	0.106	24.5	0.077	45.0	0.032	65.5	0.011	86.0	0.014
0.2	0.909	8.4	0.103	25.0	0.069	45.5	0.023	66.0	0.003	86.5	0.012
0.4	0.964	8.6	0.099	25.5	0.045	46.0	0.017	66.5	0.004	87.0	0.010
0.6	0.994	8.8	0.093	26.0	0.015	46.5	0.015	67.0	0.008	87.5	0.007
0.8	1.000	9.0	0.086	26.5	0.007	47.0	0.018	67.5	0.011	88.0	0.005
1.0	0.981	9.2	0.078	27.0	0.011	47.5	0.023	68.0	0.010	88.5	0.003
1.2	0.941	9.4	0.070	27.5	0.004	48.0	0.030	68.5	0.008	89.0	0.002
1.4	0.882	9.6	0.062	28.0	0.030	48.5	0.035	69.0	0.004	89.5	0.001
1.6	0.808	9.8	0.056	28.5	0.055	49.0	0.037	69.5	0.002	90.0	0.000
1.8	0.724	10.0	0.051	29.0	0.068	49.5	0.035	70.0	0.007		
2.0	0.635	10.2	0.048	29.5	0.063	50.0	0.030	70.5	0.013		
2.2	0.545	10.4	0.047	30.0	0.043	50.5	0.024	71.0	0.019		

Remarks:



**FCC PREDICTED COVERAGE CONTOURS**

DTV STATION WHMB-DT

INDIANAPOLIS, INDIANA

CH 20 530 KW (DA) 297 M

**Exhibit 6**

**AM Stations within 5.9 kilometers**

Coordinates: 39-53-40 86-12-21

<b>Fac ID</b>	<b>Call</b>	<b>Status</b>	<b>Freq</b>	<b>City</b>	<b>ST</b>	<b>Mode</b>	<b>Power</b>	<b>Bearing</b>	<b>km</b>
60206	WXLW	Lic	950	Indianapolis	IN	DA2 U	5 kW Day	214.4	5.8
60206	WXLW	Lic	950	Indianapolis	IN	DA2 U	0.12kW Night	214.4	5.8

**Exhibit 6****FM Stations within 16 kilometers**

Coordinates: 39-53-40 86-12-21

<b>Fac ID</b>	<b>Call</b>	<b>Status</b>	<b>Chan</b>	<b>City</b>	<b>ST</b>	<b>kW</b>	<b>HAAT</b>	<b>Bearing</b>	<b>km</b>
59589	WRZX	Lic	277B	Indianapolis	IN	18	259	77.1	0.4
59590	WFBQ	Lic	234B	Indianapolis	IN	58	245	77.1	0.4
47143	WNTR	Lic	300B	Indianapolis	IN	22	232	77.1	0.4
69115	WICR	Lic	204B	Indianapolis	IN	5	279	39	0.7
41394	WFYI	Lic	211B	Indianapolis	IN	10	171	39	0.8
28609	WJJK	Lic	283B	Noblesville	IN	50	150	157	6.5
41316	WJEL	Lic	207A	Indianapolis	IN	1	35	76	6.9
155816	W298BB	Lic	298D	Zionsville	IN	.25		317	8.8
9004	WHJE	Lic	217A	Carmel	IN	.4	30	38	12
60207	WHHH	Lic	242A	Indianapolis	IN	3.3	87	161.1	14
41317	WBDG	Lic	215A	Indianapolis	IN	.4	24	210.8	14.2
54289	WKLU	Lic	270A	Brownsburg	IN	4	110	213.7	14.4
6420	WNOU	Lic	265A	Speedway	IN	6	100	133.7	15.2

**Exhibit 6****TV Stations within 16 kilometers**

Coordinates: 39-53-40 86-12-21

<b>Fac ID</b>	<b>Call</b>	<b>Status</b>	<b>Chan</b>	<b>City</b>	<b>ST</b>	<b>kW</b>	<b>HAAT</b>	<b>Bearing</b>	<b>km</b>
65121	WIPX-LP	CP	34+	Indianapolis	IN	150		0	0
7908	WDTI	CP	44DT	Indianapolis	IN	1000	293	0	0
37102	WHMB-TV	Lic	16DT	Indianapolis	IN	163	302	0	0
7908	WDTI	Lic	44DT	Indianapolis	IN	28	293	0	0
167765	WIIIH-LD	CP	8	Indianapolis	IN	.3		177.1	.5
39269	WISH-TV	CP	9DT	Indianapolis	IN	22.8	284	177.1	.5
39269	WISH-TV	Lic	8-	Indianapolis	IN	316	305	177.1	.5
39269	WISH-TV	Lic	9DT	Indianapolis	IN	19.5	284	177.1	.5
39271	WIIIH-CA	Lic	17+	Indianapolis	IN	14.5		177.1	.5
40877	WRTV	CP	25DT	Indianapolis	IN	1000	294	38.8	.7
40877	WRTV	Lic	25DT	Indianapolis	IN	898	294	38.8	.7
40877	WRTV	Lic	6Z	Indianapolis	IN	100	279	38.8	.7
41397	WFYI	App	21DT	Indianapolis	IN	225	253	40.6	.7
56526	WTTK	CP	29DT	Kokomo	IN	780	300	151.8	.7
146	WXIN	Lic	59-	Indianapolis	IN	4470	304	151.8	.7
146	WXIN	Lic	45DT	Indianapolis	IN	700	285	151.8	.7
41397	WFYI	Lic	20-	Indianapolis	IN	1480	259	38.9	.8
41397	WFYI	Lic	21DT	Indianapolis	IN	200	236	38.9	.8
70162	WTHR	App	13DT	Indianapolis	IN	22	299	28.2	4.3
65121	WIPX-LP	CP	34	Indianapolis	IN	15		28.2	4.3
70162	WTHR	CP	13DT	Indianapolis	IN	15.1	299	28.2	4.3
70161	WALV-CA	CP	46+	Indianapolis	IN	15		28.2	4.3
70161	WALV-CA	CP	46+	Indianapolis	IN	46		28.2	4.3

<b>Fac ID</b>	<b>Call</b>	<b>Status</b>	<b>Chan</b>	<b>City</b>	<b>ST</b>	<b>kW</b>	<b>HAAT</b>	<b>Bearing</b>	<b>km</b>
70161	WALV-CA	Lic	50Z	Indianapolis	IN	14.9		28.2	4.3
70162	WTHR	Lic	13-	Indianapolis	IN	316	299	28.2	4.3
70162	WTHR	Lic	46DT	Indianapolis	IN	1000	265	28.2	4.3
7908	WDTI	App	69Z	Indianapolis	IN	166	167	157.2	6.5
7908	WDTI	Lic	69Z	Indianapolis	IN	9.8	167	157.1	6.5
28199	WDNI-LP	Lic	65-	Indianapolis	IN	40		151.4	8.8
65121	WIPX-LP	Lic	51Z	Indianapolis	IN	6.5		163.3	14.5
70416	WBXI-CA	Lic	47-	Indianapolis	IN	13.9		163.3	14.5
34894	WKOG-LP	Lic	31Z	Indianapolis	IN	55		163.9	14.7
28199	WDNI-LP	CP	19Z	Indianapolis	IN	150		133.7	15.2
28199	WDNI-LP	CP	19	Indianapolis	IN	15		133.7	15.2