

**APPLICATION FOR DIRECT  
MEASUREMENT OF POWER**

**WITHERS BROADCASTING  
COMPANY OF ILLINOIS LLC.**

**STANDARD BROADCAST  
STATION WMIX**

**MOUNT VERNON, ILLINOIS**

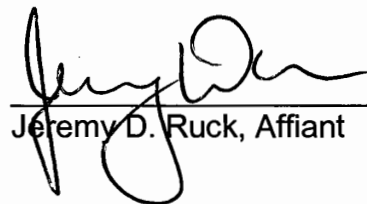
**January 2006**

State of Illinois )

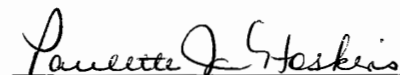
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County of Peoria )

Jeremy D. Ruck, being first duly sworn, deposes and says that he is a Consulting Engineer, employed by D. L. Markley & Associates, Inc. and that he has been retained by Withers Broadcasting Company of Illinois, LLC, to prepare the following engineering exhibits, that he holds a Bachelor of Science Degree in Electrical Engineering, and that his qualifications have been accepted by the Federal Communications Commission, and the following exhibits have been prepared by him and that they are true and correct to the best of his knowledge and belief.

  
Jeremy D. Ruck, Affiant

Subscribed and sworn to before me this 12<sup>th</sup> Day of January 2006:

  
Notary Public

My Commission Expires:



### **Application for Direct Measurement of Power**

The following engineering statement and attached exhibits have been prepared for Withers Broadcasting Company of Illinois, LLC, licensee of standard broadcast station WMIX at Mount Vernon, Illinois, and are in support of their application for direct measurement of power.

This application contains a partial proof of performance for the daytime antenna system for WMIX. The preparation of this proof was necessitated by a condition placed on the construction permit for FM station WBMV(FM) (FCC File Number BPED-20020523AAX). As a result, a copy of this application is also being filed as an amendment to the license application for WBMV(FM) (FCC File Number (BLED-2005019AHR). Tower #1 in the WMIX daytime array supports the transmitting antenna for WBMV(FM)

A minor adjustment of the directional array was performed following the installation of the WBMV(FM) antenna. Following this adjustment, at least 8 points were measured on the three monitor point radials plus an additional three radials, or six radials. As the data in this application demonstrates, the measured pattern is within authorized limits for the facility.

Due to the ratios of the current measurements to those in the last full proof of performance, which was in 1962, a change in the limits of the three monitor

points is respectfully requested. The description page for each of the three monitor points lists the recommended or proposed limit for each of the monitor points.

The monitor point descriptions and photographs have been updated in this application. In addition, route maps to these locations have been included. There are no changes proposed to the monitor points other than a requested change in their limits.

As previously mentioned, this application pertains only to the daytime site for WMIX. There have been no changes proposed or made with regard to the nighttime site.

**SECTION III - LICENSE APPLICATION ENGINEERING DATA**

Name of Applicant

Withers Broadcasting Company of Illinois, LLC

PURPOSE OF AUTHORIZATION APPLIED FOR: (check one)

☐ Station License☒ Direct Measurement of PowerThis application pertains to  
the daytime site only.**1. Facilities authorized in construction permit**

Call Sign	File No. of Construction Permit (if applicable)	Frequency (kHz)	Hours of Operation	Power in kilowatts	
WMIX	Not Applicable	940 kHz	Unlimited	Night 1.5	Day 5.0

**2. Station location**

State Illinois	City or Town Mount Vernon
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**3. Transmitter location**

State IL	County Jefferson	City or Town Mount Vernon	Street address (or other identification) 4 miles north on IL 37
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**4. Main studio location**

State IL	County Jefferson	City or Town Mount Vernon	Street address (or other identification) 3501 Broadway
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**5. Remote control point location (specify only if authorized directional antenna)**

State IL	County Jefferson	City or Town Mount Vernon	Street address (or other identification) 3501 Broadway
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6. Has type-approved stereo generating equipment been installed?

☐ Yes ☒ No

7. Does the sampling system meet the requirements of 47 C.F.R. Section 73.68?

☒ Yes ☐ No☐ Not Applicable

Attach as an Exhibit a detailed description of the sampling system as installed.

Exhibit No.  
E-1**8. Operating constants:**

RF common point or antenna current (in amperes) without modulation for night system This application pertains only to the day site.	RF common point or antenna current (in amperes) without modulation for day system 10.4 amperes
Measured antenna or common point resistance (in ohms) at operating frequency Night DNA Day 50	Measured antenna or common point reactance (in ohms) at operating frequency Night DNA Day 0

**Antenna indications for directional operation**

Towers	Antenna monitor Phase reading(s) in degrees		Antenna monitor sample current ratio(s)		Antenna base currents	
	Night	Day	Night	Day	Night	Day
#1 (E)	---	0	---	1.000	---	4.9 Amps
#2 (W)	---	-29	---	0.320	---	6.7 Amps

Manufacturer and type of antenna monitor: Potomac Instruments AM-19(204)

9. Description of antenna system (If directional antenna is used, the information requested below should be given for each element of the array. Use separate sheets if necessary.)

Type Radiator	Overall height in meters of radiator above base insulator, or above base, if grounded.	Overall height in meters above ground (without obstruction lighting)	Overall height in meters above ground (include obstruction lighting)	If antenna is either top loaded or sectionalized, describe fully in an Exhibit.
guyed steel of uniform cross section.	#1 - 156.8 m #2 - 79.8 m	#1 - 157.7 m #2 - 81.1 m	#1 - 158.7 m #2 - 81.4 m	Exhibit No. DNA

Excitation



Series



Shunt

Geographic coordinates to nearest second. For directional antenna give coordinates of center of array. For single vertical radiator give tower location.

North Latitude	38 °	22 '	14 "	West Longitude	88 °	55 '	24 "
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If not fully described above, attach as an Exhibit further details and dimensions including any other antenna mounted on tower and associated isolation circuits.

Exhibit No.  
E-2

Also, if necessary for a complete description, attach as an Exhibit a sketch of the details and dimensions of ground system.

Exhibit No.  
DNA

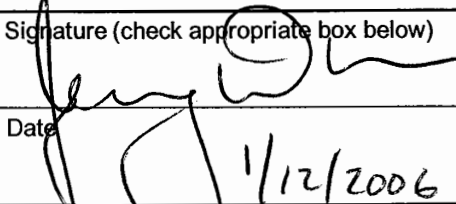
10. In what respect, if any, does the apparatus constructed differ from that described in the application for construction permit or in the permit?

Does Not Apply

11. Give reasons for the change in antenna or common point resistance.

Does Not Apply

I certify that I represent the applicant in the capacity indicated below and that I have examined the foregoing statement of technical information and that it is true to the best of my knowledge and belief.

Name (Please Print or Type) Jeremy D. Ruck	Signature (check appropriate box below) 
Address (include ZIP Code) D.L. Markley & Associates, Inc. 2104 West Moss Peoria, IL 61604	Date 11/12/2006
	Telephone No. (Include Area Code) (309) 673-7511

☐ Technical Director☐ Registered Professional Engineer☐ Chief Operator☐ Technical Consultant☒ Other (specify) Consulting Engineer

**Exhibit E-1**

The sampling system as constructed utilizes toroidal current samples at the base of each tower to obtain the current sample for the phase monitor.

These samples are in turn fed to phase-stabilized direct buried semi-flexible coaxial cables of equal length. These cables have a solid outer conductor. The samples, once at the transmitter building, are measured with a Potomac Instruments AM-19(204) phase monitor.

**Exhibit E-2**

Tower #1 in the array supports two FM antennas. The first of these two FM antennas is for WMIX-FM and is mounted on a pole at the top of tower #1. The transmission line for this antenna is isolated from the tower through the use of standoff insulators. The second antenna is for KBMV, and an iscoupler is utilized to isolate the transmission line for this antenna from the #1 element of the WMIX array.



# SUMMARY OF PARTIAL PROOF OF PERFORMANCE FIELD INTENSITY MEASUREMENTS

AM Broadcast Station WMIX		Mount Vernon, Illinois			Summary of Directional Measurements		
Radial Azimuth	Standard Pattern Inverse Field	Augmented Standard Pattern Inverse Field	1962 Proof Inverse Field	DA-D 2006/1962 Direct Ratio	DA-D 2006/1962 Log Ratio	2006 DA-D Inverse Field by Direct Ratio	2006 DA-D Inverse Field by Log Ratio
<u>DA-D Measurements:</u>							
8.5	1283.54	1283.54	1234.06	0.8961	0.8914	1105.87	1100.03
45.0	724.03	724.03	662.00	0.9419	0.9283	623.52	614.57
<b>90.0</b>	355.90	370.15	348.99	0.8170	0.8132	285.14	283.80
135.0	724.03	724.03	676.39	0.9798	0.9697	662.73	665.9
<b>270.0</b>	520.67	520.67	478.51	0.8933	0.8823	427.46	422.17
<b>305.0</b>	353.32	379.45	320.21	0.9237	0.9017	295.79	288.74
<b>Bold faced azimuth indicates monitor point radial.</b>							

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Consulting Engineers  
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PARTIAL PROOF OF PERFORMANCE FIELD STRENGTH MEASUREMENTS									
RADIO STATION WMIX				Mount Vernon, Illinois					
8.5 Degree True Radial DA-D									
Point Number	km Distance	1962 Proof of Performance			2006 Partial Proof of Performance			2006/1962	
		Date 1962	Time CDT	Field mV/m	Date 2006	Time CST	Field mV/m	Ratio	Log Ratio
9	3.62	Not Available	Not Available	273	5-Jan	1137	288	1.0549	0.0232
10	4.47	Not Available	Not Available	217	5-Jan	1134	180	0.8295	-0.0812
11	5.23	Not Available	Not Available	186	5-Jan	1133	185	0.9946	-0.0023
12	5.44	Not Available	Not Available	186	5-Jan	1132	150	0.8065	-0.0934
13	5.79	Not Available	Not Available	183	5-Jan	1130	145	0.7923	-0.1011
14	6.12	Not Available	Not Available	157	5-Jan	1126	128	0.8153	-0.0887
15	7.72	Not Available	Not Available	130	5-Jan	1113	125	0.9615	-0.0170
16	9.45	Not Available	Not Available	105	5-Jan	1109	96.0	0.9143	-0.0389
Averages:								0.8961	0.8914
Standard Pattern Inverse Field:									
Augmented Standard Pattern Inverse Field:									
Inverse Field Based on 1962 Proof of Performance									
2006 Inverse Field Based on Direct Ratio:									
2006 Inverse Field Based on Logarithmic Ratio:									
				1283.54	mV/m at 1 km				
				1283.54	mV/m at 1 km				
				1234.06	mV/m at 1 km				
				1105.87	mV/m at 1 km				
				1100.03	mV/m at 1 km				

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PARTIAL PROOF OF PERFORMANCE FIELD STRENGTH MEASUREMENTS									
RADIO STATION WMIX				45 Degree True Radial DA-D					
				Mount Vernon, Illinois					
Point Number	km Distance	1962 Proof of Performance			2006 Partial Proof of Performance			2006/1962	
		Date 1962	Time CST	Field mV/m	Date 2006	Time CST	Field mV/m	Ratio	Log Ratio
10	6.89	Not Available	Not Available	79.4	5-Jan	1152	95.0	1.1965	0.0779
11	7.35	Not Available	Not Available	74.9	5-Jan	1154	70.0	0.9346	-0.0294
12	9.17	Not Available	Not Available	55.9	5-Jan	1158	48.0	0.8587	-0.0662
13	9.56	Not Available	Not Available	52.5	5-Jan	1201	53.0	1.0095	0.0041
14	11.51	Not Available	Not Available	36.9	5-Jan	1205	33.0	0.8943	-0.0485
15	11.83	Not Available	Not Available	33.5	5-Jan	1207	38.0	1.1343	0.0547
16	13.60	Not Available	Not Available	28.6	5-Jan	1214	23.8	0.8322	-0.0798
17	15.93	Not Available	Not Available	24.6	5-Jan	1218	15.8	0.6423	-0.1923
18	16.50	Not Available	Not Available	23.5	5-Jan	1220	22.9	0.9745	-0.0112
Averages:								0.9419	0.9283
Standard Pattern Inverse Field:									
Augmented Standard Pattern Inverse Field:									
Inverse Field Based on 1962 Proof of Performance									
2006 Inverse Field Based on Direct Ratio:									
2006 Inverse Field Based on Logarithmic Ratio:									
				724.03	mV/m at 1 km				
				724.03	mV/m at 1 km				
				662.00	mV/m at 1 km				
				623.52	mV/m at 1 km				
				614.57	mV/m at 1 km				

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PARTIAL PROOF OF PERFORMANCE FIELD STRENGTH MEASUREMENTS										90 Degree True Radial DA-D	
RADIO STATION WMIX										Mount Vernon, Illinois	
Point Number	km Distance	1962 Proof of Performance			2006 Partial Proof of Performance			2006/1962			
		Date 1962	Time CST	Field mV/m	Date 2006	Time CST	Field mV/m	Ratio	Current/Original	Log Ratio	
8	2.25	Not Available	Not Available	153.2	4-Jan	1222	130	0.8486	-0.0713		
11	3.14	Not Available	Not Available	99.5	5-Jan	1256	91.0	0.9146	-0.0388		
13	3.99	Not Available	Not Available	72.7	5-Jan	1253	65.0	0.8941	-0.0486		
14	5.63	Not Available	Not Available	52.5	5-Jan	1249	43.0	0.8190	-0.0867		
15	6.44	Not Available	Not Available	40.7	5-Jan	1247	33.2	0.8157	-0.0885		
16	6.66	Not Available	Not Available	39.1	5-Jan	1245	31.0	0.7928	-0.1008		
17	7.82	Not Available	Not Available	32.4	5-Jan	1242	28.2	0.8704	-0.0603		
18	9.54	Not Available	Not Available	29.1	5-Jan	1239	21.8	0.7491	-0.1254		
19	11.38	Not Available	Not Available	20.8	5-Jan	1234	13.5	0.6490	-0.1877		
								Averages:	0.8170	0.8132	
Standard Pattern Inverse Field:										355.90	mV/m at 1 km
Augmented Standard Pattern Inverse Field:										370.15	mV/m at 1 km
Inverse Field Based on 1962 Proof of Performance										348.99	mV/m at 1 km
2006 Inverse Field Based on Direct Ratio:										285.14	mV/m at 1 km
2006 Inverse Field Based on Logarithmic Ratio:										283.80	mV/m at 1 km
Point 8 is the Monitor Point for this Radial.											

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## 135 Degree True Radial DA-D

Mount Vernon, Illinois

RADIO STATION WMIX

Point Number	km Distance	1962 Proof of Performance				2006 Partial Proof of Performance				2006/1962	
		Date 1962	Time CST	Field mV/m	Date 2006	Time CST	Field mV/m	Current/Original			
								Ratio	Log Ratio		
8	5.07	Not Available	Not Available	110.7	5-Jan	1302	106.0	0.9576	-0.0188		
9	5.28	Not Available	Not Available	101.7	5-Jan	1303	116.0	1.1406	0.0571		
10	6.37	Not Available	Not Available	78.3	5-Jan	1309	100.0	1.2771	0.1062		
11	6.65	Not Available	Not Available	77.1	5-Jan	1308	65.0	0.8431	-0.0741		
12	8.27	Not Available	Not Available	70.0	5-Jan	1323	69.0	0.9857	-0.0062		
13	8.58	Not Available	Not Available	66.0	5-Jan	1325	54.0	0.8182	-0.0872		
14	9.98	Not Available	Not Available	50.3	5-Jan	1328	46.5	0.9245	-0.0341		
15	12.99	Not Available	Not Available	44.3	5-Jan	1334	39.5	0.8916	-0.0498		
Averages:								0.9798	0.9697		

Standard Pattern Inverse Field:

Augmented Standard Pattern Inverse Field:

### Inverse Field Based on 1962 Proof of Performance

2006 Inverse Field Based on Direct Ratio:

### 2006 Inverse Field Based on Logarithmic Ratio:

724.03	mV/m at 1 km
724.03	mV/m at 1 km
676.39	mV/m at 1 km
662.73	mV/m at 1 km
655.90	mV/m at 1 km

**D.L. Markley & Associates, Inc.**

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PARTIAL PROOF OF PERFORMANCE FIELD STRENGTH MEASUREMENTS									
RADIO STATION WMIX					270 Degree True Radial DA-D				
Mount Vernon, Illinois									
Point Number	km Distance	1962 Proof of Performance			2006 Partial Proof of Performance			2006/1962	
		Date 1962	Time CST	Field mV/m	Date 2006	Time CST	Field mV/m	Ratio	Log Ratio
5	2.06	Not Available	Not Available	180	4-Jan	1457	200	1.1111	0.0458
6	3.09	Not Available	Not Available	132	4-Jan	1506	99.0	0.7500	-0.1249
7	3.54	Not Available	Not Available	88.3	4-Jan	1508	93.0	1.0532	0.0225
8	4.12	Not Available	Not Available	95.0	4-Jan	1510	70.0	0.7368	-0.1326
9	4.28	Not Available	Not Available	73.1	4-Jan	1512	62.0	0.8482	-0.0715
10	4.51	Not Available	Not Available	78.9	4-Jan	1513	55.0	0.6971	-0.1567
11	4.96	Not Available	Not Available	79.4	4-Jan	1515	64.0	0.8060	-0.0936
12	6.52	Not Available	Not Available	59.3	4-Jan	1519	63.0	1.0624	0.0263
13	6.92	Not Available	Not Available	51.4	4-Jan	1522	48.0	0.9339	-0.0297
14	7.29	Not Available	Not Available	50.3	4-Jan	1524	47.0	0.9344	-0.0295
Averages:								0.8933	0.8823
Standard Pattern Inverse Field: Augmented Standard Pattern Inverse Field: Inverse Field Based on 1962 Proof of Performance 2006 Inverse Field Based on Direct Ratio: 2006 Inverse Field Based on Logarithmic Ratio: <b>Point 5 is the Monitor Point for this Radial.</b>									
					520.67	mV/m at 1 km			
					520.67	mV/m at 1 km			
					478.51	mV/m at 1 km			
					427.46	mV/m at 1 km			
					422.17	mV/m at 1 km			

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PARTIAL PROOF OF PERFORMANCE FIELD STRENGTH MEASUREMENTS										
RADIO STATION WMIX				Mount Vernon, Illinois						
				305 Degree True Radial DA-D						
Point Number	km Distance	1962 Proof of Performance			2006 Partial Proof of Performance			2006/1962		
		Date 1962	Time CST	Field mV/m	Date 2006	Time CST	Field mV/m	Ratio	Log Ratio	
5	3.43	Not Available	Not Available	72.7	4-Jan	1415	73.0	1.0041	0.0018	
6	4.30	Not Available	Not Available	44.7	5-Jan	0943	54.0	1.2081	0.0821	
9	6.07	Not Available	Not Available	37.6	5-Jan	0946	37.0	0.9840	-0.0070	
10	6.28	Not Available	Not Available	38.0	5-Jan	0948	32.0	0.8421	-0.0746	
11	7.64	Not Available	Not Available	32.4	5-Jan	0953	19.3	0.5957	-0.2250	
12	9.04	Not Available	Not Available	25.3	5-Jan	0959	30.0	1.1858	0.0740	
13	9.82	Not Available	Not Available	25.7	5-Jan	1001	19.5	0.7588	-0.1199	
14	11.75	Not Available	Not Available	22.8	5-Jan	1006	18.5	0.8114	-0.0908	
Averages:								0.9237	0.9017	
Standard Pattern Inverse Field:										
Augmented Standard Pattern Inverse Field:										
Inverse Field Based on 1962 Proof of Performance										
2006 Inverse Field Based on Direct Ratio:										
2006 Inverse Field Based on Logarithmic Ratio:										
Point 5 is the Monitor Point for this Radial.										
					353.32	mV/m at 1 km				
					379.45	mV/m at 1 km				
					320.21	mV/m at 1 km				
					295.79	mV/m at 1 km				
					288.74	mV/m at 1 km				

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# Photographs and Descriptions of Monitor Points



**Photograph and Description of 90 Degree True Monitor Point**



From the entrance to the WMIX daytime transmitter site, proceed north on Illinois Route 37 for 0.2 miles to Old Salem Road. Turn right on Old Salem Road and proceed for 0.3 miles to Idlewood Road. Turn right (east) on Idlewood Road and proceed for 1.2 miles to JC Lake Lane. Turn right (south) on JC Lake Lane and proceed for 0.9 miles to the monitor point, which is located on the east side of the lake. The measured field intensity at this location is 130 mV/m with a recommended limit of 168 mV/m. This location is point 8 on the 90 degree true radial, and is located 2.25 kilometers (1.40 miles) from the WMIX daytime antenna.

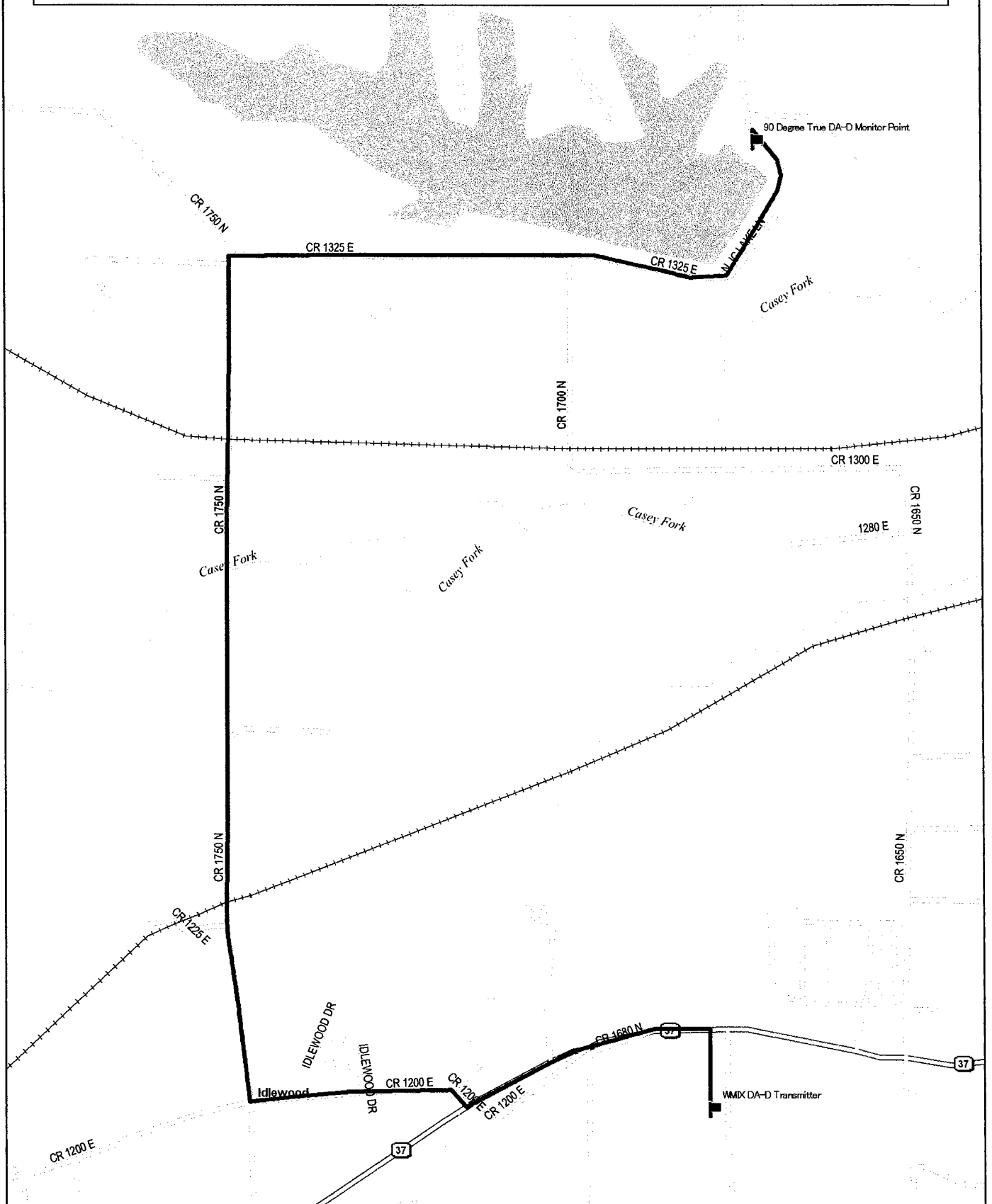
**Photograph and Description of 305 Degree True Monitor Point**



From the 270 Degree True monitor point return north on Old Centralia Road for 1.5 miles to a lane. Turn right on this dirt lane and proceed east for 0.2 miles to the monitor point. The monitor point is located in line with the east edge of a grouping of trees located north of the road. The measured field intensity at this location is 73.0 mV/m with a recommended limit of 93.6 mV/m. This location is point 5 on the 305 degree true radial and is located 3.43 kilometers (2.13 miles) from the WMIX daytime antenna.

# Monitor Point Route Maps

# Route from WMIX DA-D Transmitter to 90 Degree Monitor Point



[illegible]

# Route from 270 Degree MP to 305 Degree MP

