

**Comprehensive Technical Exhibit**  
*Application for Modification of Construction Permit*  
KAYH(FM) - Fayetteville, Arkansas  
FCC File No. BPED-20070907AEV  
Community Broadcasting, Inc.  
January 2012

**Application for Modification of Construction Permit**

The following engineering statement and attached exhibits have been prepared for **Community Broadcasting, Inc.** ("CBI"), licensee of non-commercial educational station KAYH(FM) at Fayetteville, Arkansas, and are in support of their application for modification of construction permit.<sup>1</sup>

CBI currently has a construction permit to increase the effective radiated power of KAYH and change to the use of a directional antenna to employ requisite contour protection.<sup>2</sup> This application seeks to modify that construction permit by changing from vertical polarization to circular polarization, and by modifying the proposed directional pattern envelope.

The use of vertical only in the original construction permit was proposed in order to protect television station KOTV at Tulsa, Oklahoma, which at that time operated its analog facility on channel six. KOTV has since vacated channel six, and is operating its post transition DTV facilities on channel 45.<sup>3</sup> As a result of this change, there is no longer any need to employ only vertical polarization, thus CBI seeks to change the authorization of the facility to utilize the optional circular polarization.

The use of a directional antenna was originally proposed to maintain adequate contour protection to KGFS(FM) at Green Forest, AR.<sup>4</sup> The licensee of that facility, since the grant of the KAYH construction permit, has been approved under the *Raleigh Waiver* concept to increase their

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<sup>1</sup> The Facility ID for KAYH(FM) at Fayetteville, Arkansas is 79130.

<sup>2</sup> See FCC File No. BPED-20070907AEV.

<sup>3</sup> The Facility ID for KOTV at Tulsa, Oklahoma is 35434.

<sup>4</sup> The Facility ID for KGFS(FM) at Green Forest, Arkansas is 92987.

service area.<sup>5</sup> The directional pattern envelope proposed under this application would permit an increase in the service area for KAYH under similar conditions. The request for a necessary waiver of Section 73.509 of the Commission's Rules will be subsequently discussed in this application.

No other changes in the facility are proposed by CBI. The center of radiation above mean sea level would remain at the same elevation. In addition, no change to the maximum effective radiated power is proposed.

The main studio for the facility does not comply with the provisions of Section 73.1125 of the Commission's Rules. On March 8, 2011, the Commission granted a waiver of the main studio rule (See File No. -20110120ADK) to permit KAYH to be operated as a satellite station of KSIV(FM) at St. Louis, Missouri.<sup>6</sup> CBI wishes to continue this waiver, and will abide by the representations proffered in the approved waiver request.

The proposed facility will continue to comply with the community coverage requirements of Section 73.515 of the Commission's Rules. Exhibit E-1 depicts the predicted 60 dBu service contour for the proposed facility. As is demonstrated, the predicted 60 dBu service contour would totally encompass the community of license.

Exhibit E-2 is a tabulated contour overlap study for the proposed facility. This study lists contour overlap with the authorized and licensed facilities for KGSF. This contour overlap is the

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<sup>5</sup> See FCC File No. BPED-20111207AJW.

<sup>6</sup> The Facility ID for KSIV-FM at St. Louis, Missouri is 4276.

subject of the previously mentioned waiver of section 73.509. Exhibit E-3 provides a contour based overview of this allocation situation on a map of the region.

Exhibit E-4 and E-5 provide additional detail for the allocation study. These two maps respectively illustrate detail between the proposed facility and KWGS at Tulsa, Oklahoma, and between the proposed facility and KWFC at Springfield, Missouri.<sup>7</sup> As demonstrated in these two maps, there is no prohibited contour overlap between the proposed facility and either of these other two facilities.

Exhibit E-6 illustrates the allocation situation between KAYH and KGSF. Indicated on this map are the licensed contours for both facilities as well as the authorized KGSF contours and the proposed KAYH contours. This map demonstrates that there would be normally prohibited contour overlap between these two facilities.

Under BPED-20111207AJW, recently granted by the Commission, the licensee of KGSF was granted a waiver of Section 73.509 of the Commission's Rules. This waiver authorized an increase in the effective radiated power of KGSF resulting in received contour overlap from the licensed, and by extension currently authorized, KAYH facilities. As part of the authorization waiving this section of the Commission's Rules, KGSF is not permitted to contest additional modifications of KAYH.

CBI, therefore, respectfully requests a waiver of the provisions of Section 73.509 with regard to KGSF. There would be no normally prohibited contour overlap with any other proposed or

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<sup>7</sup> The Facility ID for KWGS at Tulsa, Oklahoma is 66586. The Facility ID for KWFC at Springfield, Missouri is 3681.

existing facility. The proposed contour overlap that would result between KAYH and KGSG is consistent with the Commission's historical *Raleigh Waiver* procedures.

The current licensed KAYH 60 dBu service contour has a resident population of 338,691 persons. The resident population within the proposed KAYH 60 dBu service contour is 441,131 persons. By way of comparison, the resident population within the authorized KGSG 100 dBu F(50,10) interference contour is 402 persons. The population within the authorized KGSG 100 dBu interfering contour is 0.12 percent of the population within the licensed KAYH service contour and 0.09 percent of the population within the proposed KAYH service contour. The proposed KAYH facilities represent a 30.2 percent in the population served by that facility. Looking at the situation a different way, the resident population within the authorized KGSG interference contour is 0.39 percent of KAYH gain population. In other words, for person within the authorized KGSG 100 dBu interfering contour, approximately 254 persons would be served by an additional NCE facility. As a result, it is respectfully submitted that the benefits of the proposed increase in service by KAYH would greatly outweigh any deleterious effects that would potentially result from the proposed contour overlap.

Exhibit E-7 is a single channel spacing study for the proposed facility. This study demonstrates that the proposed facility would comply with the intermediate frequency spacing requirements under Section 73.207 of the Commission's Rules. This study also demonstrates that there are no television channel six facilities within the affected distance described in Section 73.525 of the Commission's Rules.

The proposed facility is not located within 320 kilometers of the common border between the United States and Canada. Similarly, the proposed facility is located at a distance greater than

320 kilometers from the common border between the United States and Mexico. Exhibit E-8 illustrates the location of the facility, and demonstrates the distance to the respective border exceeds 320 kilometers. No changes to the physical location of the facility are proposed.

The proposed facility would not constitute a significant environmental impact, and should be exempt from environmental processing. KAYH would continue to utilize a tower that is registered with the Commission. The replacement of the antenna at the facility would not require any excavation at the site, thus the existing environmental impact would not be increased.

The proposed KAYH facilities will not constitute an RF exposure hazard to persons at the site. The Commission's *FM Model* software package was utilized to calculate the predicted power density at ground level from the proposed facility. The proposed facility would utilize an Electronics Research (ERI) roto-tiller style antenna. This antenna will have no more than six sections, and no fewer than four sections. The spacing between sections will be one wavelength.

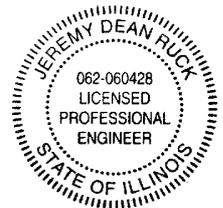
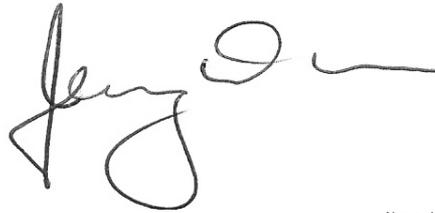
The four bay model by *FM Model* will have a maximum predicted power density of 164.0  $\mu\text{W}/\text{cm}^2$  at a distance of 16 meters from the tower base. As expected, the six bay model would have a slightly lower predicted power density. At ground level for the increased number of bays, the predicted power density is 129.9  $\mu\text{W}/\text{cm}^2$  at a distance of 12 meters from the tower base. In both cases, the radiation from the proposed facility would not exceed the uncontrolled environment condition of the applicable safety standards.

CBI certifies that it will cooperate and coordinate with all present and future users of the tower to ensure that workers having access to the site are not exposed to levels of radiofrequency

radiation in excess of the applicable safety guidelines. Such coordination will include, but is not necessarily limited to, a reduction in transmitter power and/or cessation of operation.

**Affidavit**

The preceding statement and attached exhibits have been prepared by me, or under my direction, and are true and accurate to the best of my belief and knowledge.



Above signature is digitized copy of actual signature  
License Expires November 30, 2013

**Jeremy D. Ruck, PE**  
**January 24, 2012**

**KAYH.X**

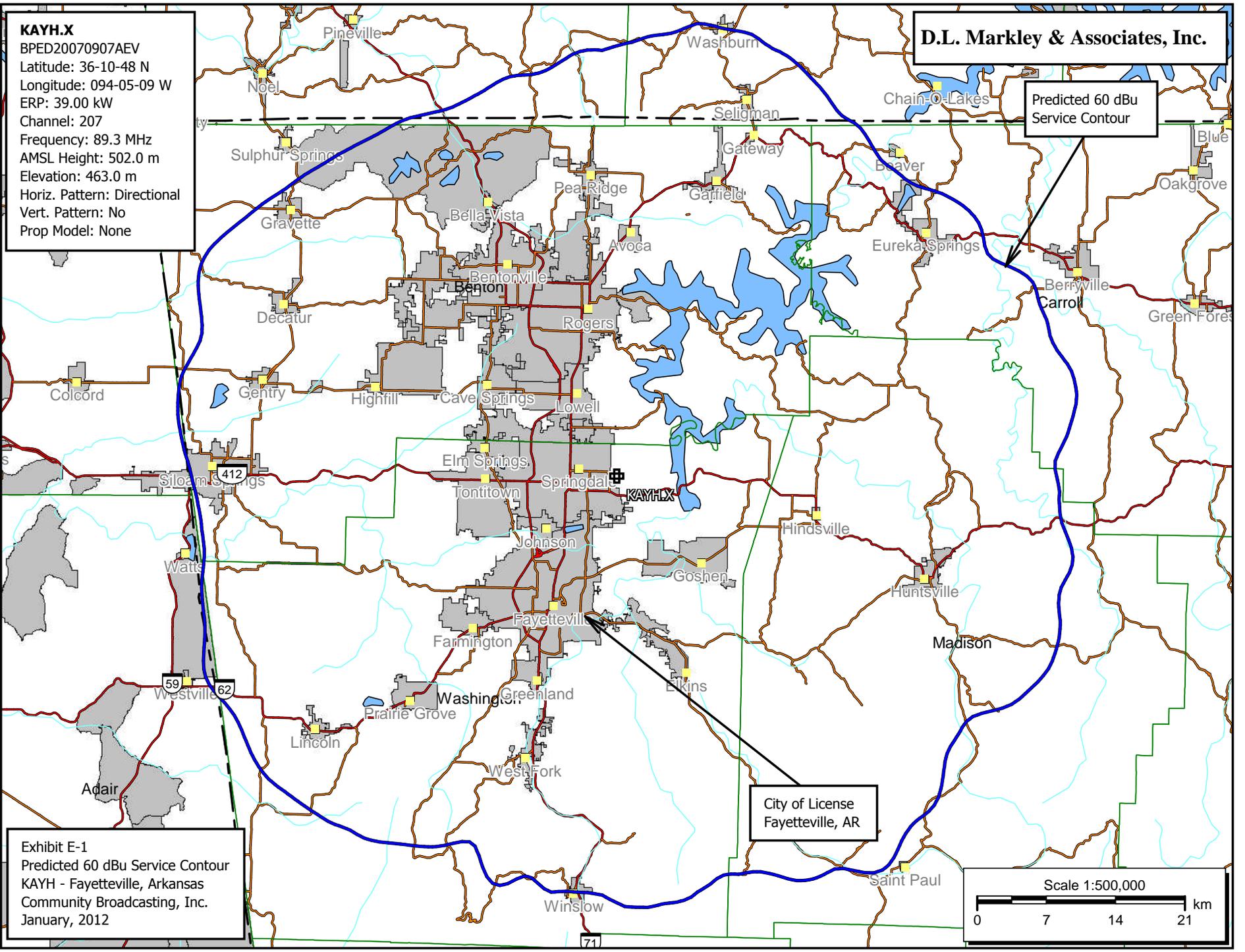
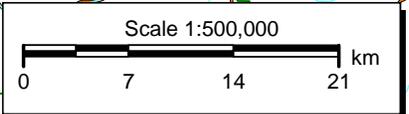
BPED20070907AEV  
Latitude: 36-10-48 N  
Longitude: 094-05-09 W  
ERP: 39.00 kW  
Channel: 207  
Frequency: 89.3 MHz  
AMSL Height: 502.0 m  
Elevation: 463.0 m  
Horiz. Pattern: Directional  
Vert. Pattern: No  
Prop Model: None

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

Predicted 60 dBu  
Service Contour

City of License  
Fayetteville, AR

Exhibit E-1  
Predicted 60 dBu Service Contour  
KAYH - Fayetteville, Arkansas  
Community Broadcasting, Inc.  
January, 2012



D.L. Markley & Associates, Inc.  
Consulting Engineers

Exhibit E-2 - Tabular Allocation Study

KAYH - Fayetteville, Arkansas

REFERENCE  
36 10 48.0 N.  
94 05 09.0 W.

CH# 207C2 - 89.3 MHz, Pwr= 39 kW DA, HAAT= 111.8 M, COR= 502 M  
Average Protected F(50-50)= 44.58 km  
Standard Directional

DISPLAY DATES  
DATA 01-23-12  
SEARCH 01-24-12

CH CITY	CALL	TYPE STATE	ANT STATE	AZI <--	DIST FILE #	LAT LNG	PWR(kw) HAAT(M)	INT(km) COR(M)	PRO(km) LICENSEE	*IN* (Overlap in km)	*OUT*
207C2 Fayetteville	KAYH	CP AR	DVX	0.0 0.0	0.0 BPED20070907AEV	36 10 48.0 94 05 09.0	39.000 112	98.7 502	34.0 Community Broadcasting, In	-142.3*	-159.7*
207C3 Fayetteville	KAYH	LIC AR	_C_	270.0 90.0	0.0 BLED20000713ABF	36 10 48.0 94 05 10.0	6.000 116	89.6 507	30.5 Community Broadcasting, In	-132.4*	-155.3*
204C3 Green Forest	KGSF	CP AR	DVX	56.3 236.5	36.3 BPED20111207AJW	36 21 38.0 93 44 54.0	4.950 182	3.3 571	35.2 Calvary Chapel Of Twin Fal	-11.0*	-3.5
204C3 Green Forest	KGSF	LIC AR	DVX	56.3 236.5	36.3 BLED20080512AFU	36 21 38.0 93 44 54.0	3.600 182	2.9 571	32.6 Calvary Chapel Of Twin Fal	-10.7*	-0.9
206C Springfield	KWFC	LIC MO	DCY	41.6 222.2	152.6 BLED19980501KA	37 12 06.0 92 56 33.0	100.000 342	109.6 782	75.2 Baptist Bible College, Inc	1.4	14.3
208C1 Tulsa	KWGS	LIC OK	_C_	263.4 82.5	144.2 BMLLED20101110AAU	36 01 15.0 95 40 32.0	50.000 325	100.5 519	68.9 The University of Tulsa	1.6	9.8
208C2 Sarcoxi	KITG	LIC MO	DC_	8.2 188.3	100.5 BLED20090803AFD	37 04 34.0 93 55 27.0	34.000 96	25.2 470	17.1 Calvary Chapel Of Joplin	29.6	13.8
205A Grove	KWXC	LIC OK	DVX	313.4 133.0	67.4 BLED20080313AAP	36 35 42.0 94 38 05.0	6.000 73	1.8 354	17.6 Grove Broadcasting Inc.	22.1	45.1
208C1 Heber Springs	KBMJ	LIC AR	DVX	106.3 287.4	172.0 BLED20050715AAG	35 44 00.0 92 15 37.0	70.000 224	92.4 540	62.6 American Family Associatio	32.8	38.3
206C1 Bartlesville	KWRI	LIC OK	DVX	294.9 114.0	140.8 BLED20041021AEQ	36 42 13.0 95 30 57.0	100.000 191	52.9 410	35.5 Educational Media Foundati	41.7	34.9
209C2 Branson	KOZO	CP MO	_CX	61.1 241.6	86.1 BPED20090821ACG	36 33 04.0 93 14 36.0	20.000 130	4.2 450	40.6 Creative Educational Media	37.3	40.7
209C2 Branson	KOZO	LIC MO	_EN	61.1 241.6	86.1 BLED19980529KB	36 33 04.0 93 14 36.0	20.000 130	4.2 450	40.6 Creative Educational Media	37.3	40.7
205A Fort Smith	KAOW	LIC AR	_C_	197.2 17.1	85.1 BLED20000901AIG	35 26 50.0 94 21 54.0	1.387 147	1.7 307	17.9 American Family Associatio	41.1	62.7

Terrain database is NGDC 30 SEC , R= 73.215 qualifying spacings or FCC minimum spacings in KM, M= Margin in KM  
Contour distances are on direct line to and from reference station. Reference zone= - Zone 2, Co to 3rd adjacent.  
Ant Column: (D= DA Standard, Z= DA 73.215, N= Not DA 73.215, \_= Omni), Polarization (C,H,V,E), Beamtilt(Y,N,X)  
"\*"affixed to 'IN' or 'OUT' values = site inside protected contour.  
<< = Station meets FCC minimum distance spacing for its class.

**KAYH.X**  
BPED20070907AEV  
Latitude: 36-10-48 N  
Longitude: 094-05-09 W  
ERP: 39.00 kW  
Channel: 207  
Frequency: 89.3 MHz  
AMSL Height: 502.0 m  
Elevation: 463.0 m  
Horiz. Pattern: Directional  
Vert. Pattern: No  
Prop Model: None

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

- 60 dBu F(50,50) Service Contour
- 40 dBu F(50,10) Interference Contour
- 54 dBu F(50,10) Interference Contour
- 100 dBu F(50,10) Interference Contour

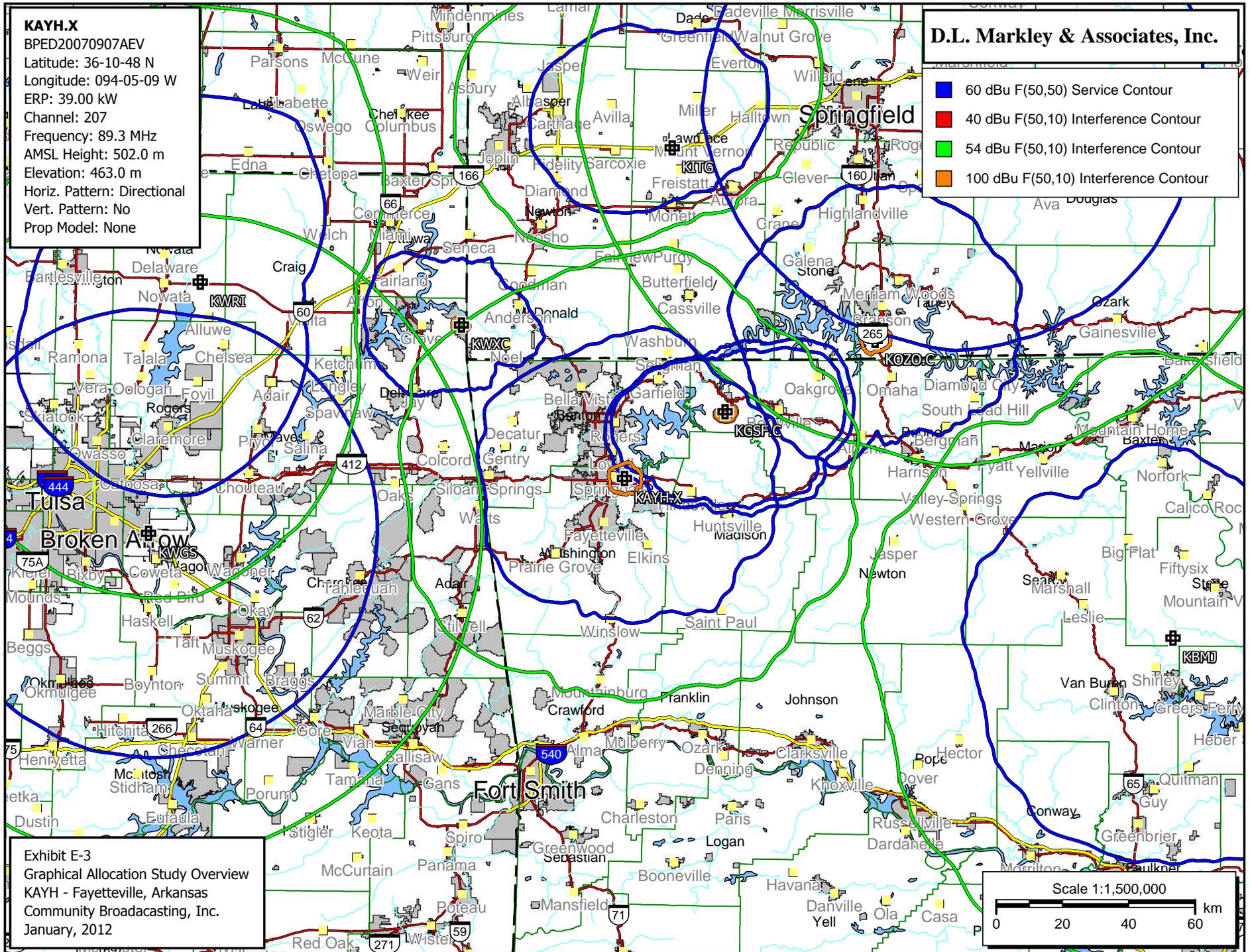
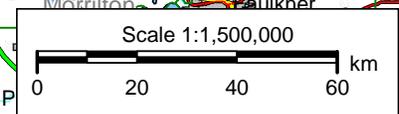


Exhibit E-3  
Graphical Allocation Study Overview  
KAYH - Fayetteville, Arkansas  
Community Broadcasting, Inc.  
January, 2012



**KAYH.X**

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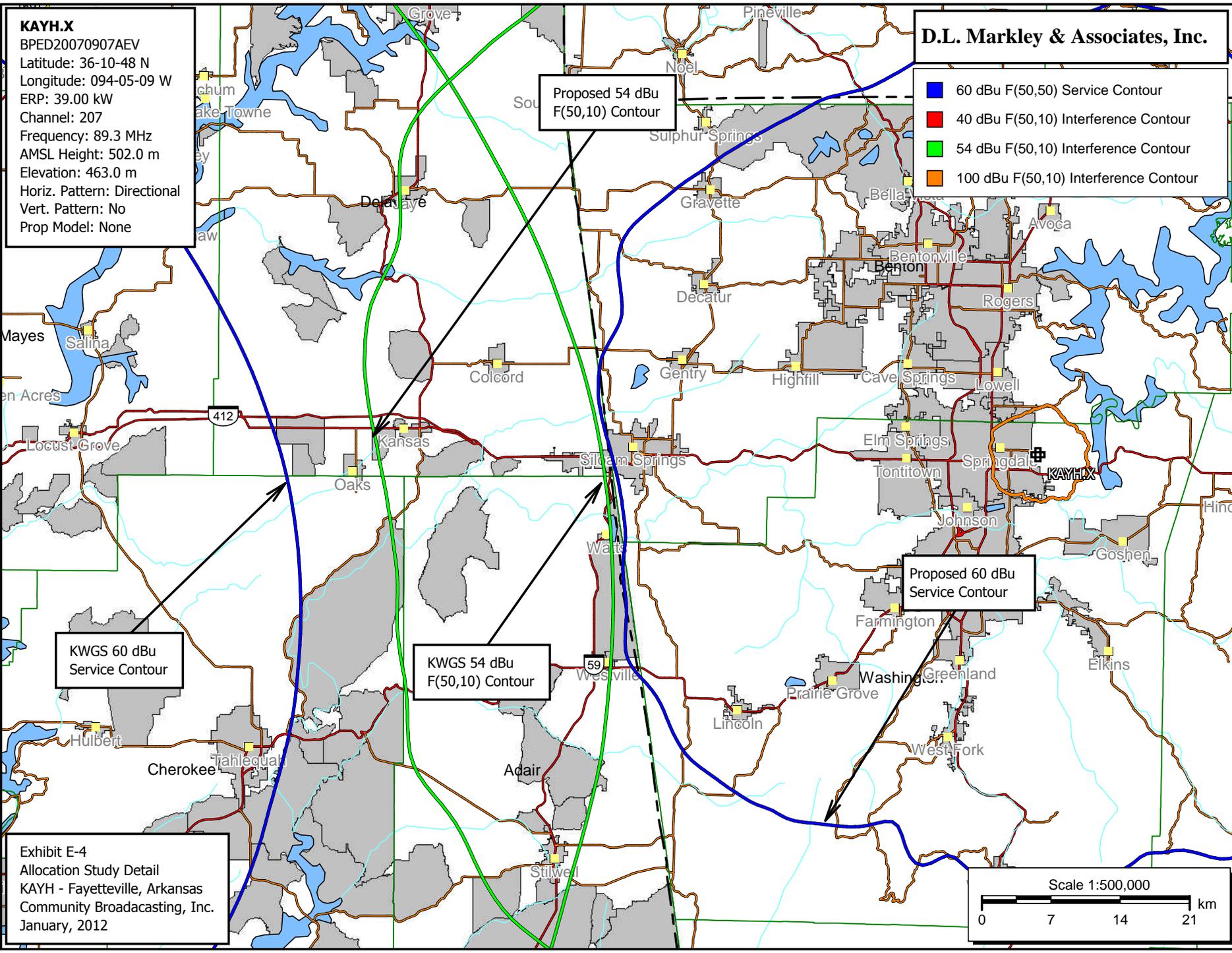
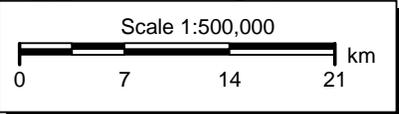
Proposed 54 dBu F(50,10) Contour

Proposed 60 dBu Service Contour

KWGS 60 dBu Service Contour

KWGS 54 dBu F(50,10) Contour

Exhibit E-4  
Allocation Study Detail  
KAYH - Fayetteville, Arkansas  
Community Broadcasting, Inc.  
January, 2012

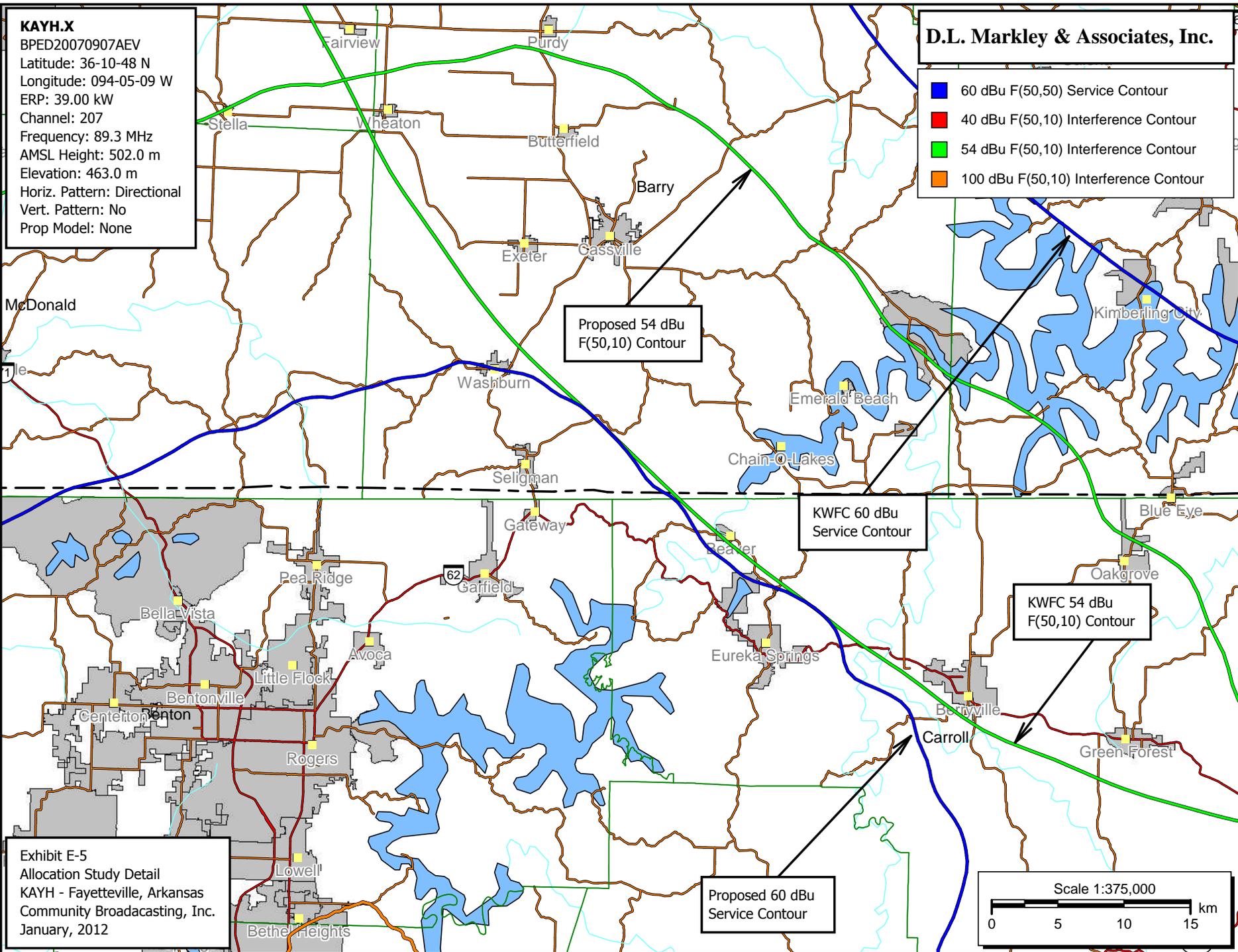


**KAYH.X**

BPED20070907AEV  
Latitude: 36-10-48 N  
Longitude: 094-05-09 W  
ERP: 39.00 kW  
Channel: 207  
Frequency: 89.3 MHz  
AMSL Height: 502.0 m  
Elevation: 463.0 m  
Horiz. Pattern: Directional  
Vert. Pattern: No  
Prop Model: None

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

- 60 dBu F(50,50) Service Contour
- 40 dBu F(50,10) Interference Contour
- 54 dBu F(50,10) Interference Contour
- 100 dBu F(50,10) Interference Contour



Proposed 54 dBu F(50,10) Contour

KWFC 60 dBu Service Contour

KWFC 54 dBu F(50,10) Contour

Proposed 60 dBu Service Contour

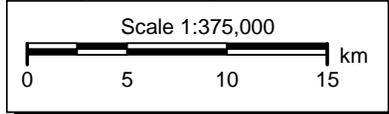


Exhibit E-5  
Allocation Study Detail  
KAYH - Fayetteville, Arkansas  
Community Broadcasting, Inc.  
January, 2012

**KAYH.X**

BPED20070907AEV  
Latitude: 36-10-48 N  
Longitude: 094-05-09 W  
ERP: 39.00 kW  
Channel: 207  
Frequency: 89.3 MHz  
AMSL Height: 502.0 m  
Elevation: 463.0 m  
Horiz. Pattern: Directional  
Vert. Pattern: No  
Prop Model: None

- 60 dBu F(50,50) Contour
- 100 dBu F(50,10) Contour

Note: Dashed contours denote the licensed parameters for both facilities. Solid contours represent CP facilities for KGSF and proposed facilities for KAYH.

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

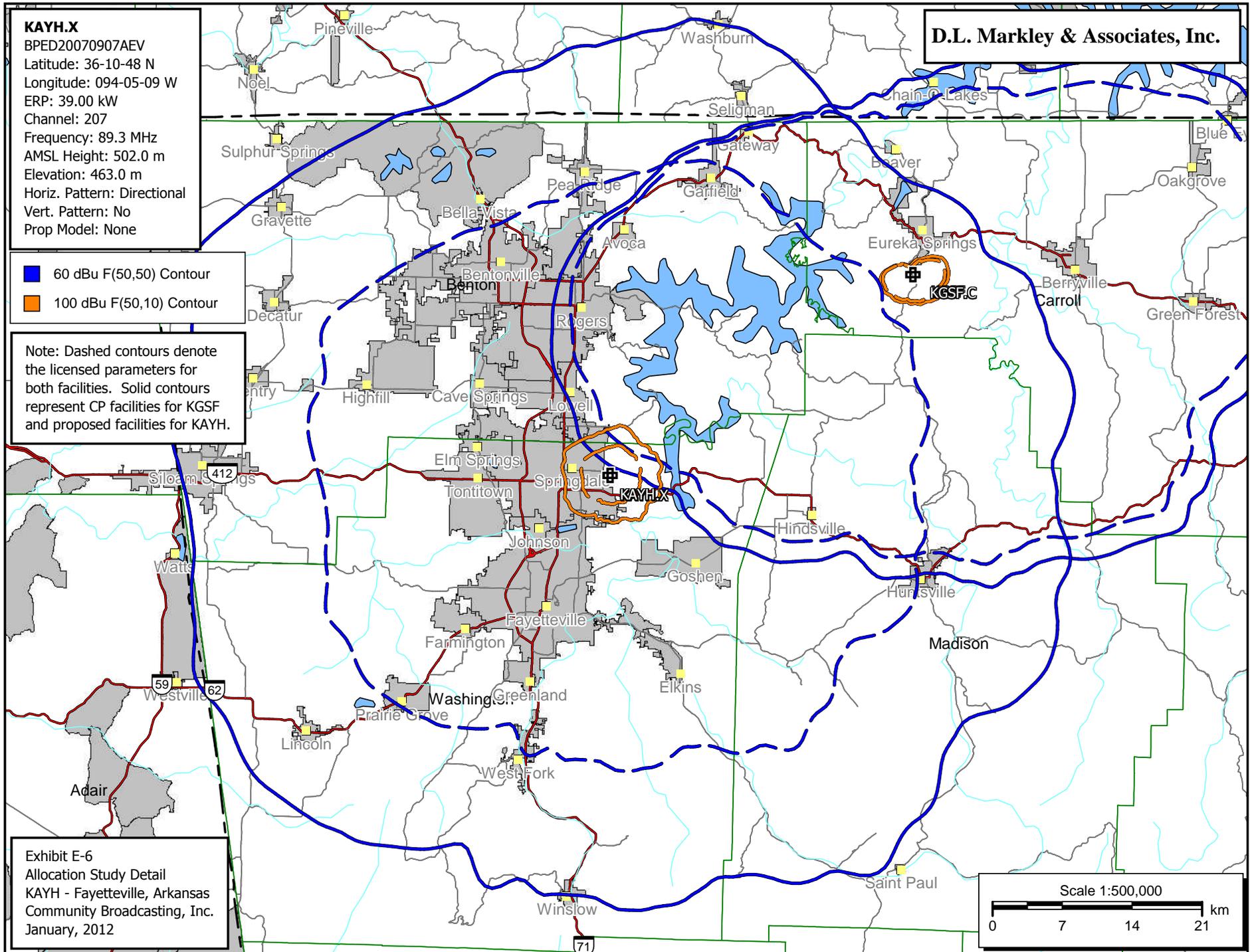
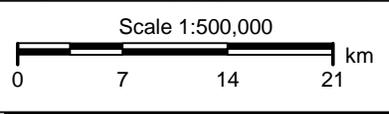


Exhibit E-6  
Allocation Study Detail  
KAYH - Fayetteville, Arkansas  
Community Broadcasting, Inc.  
January, 2012



D.L. Markley & Associates, Inc.  
 Consulting Engineers  
 Exhibit E-7 - Single Channel Spacing Study  
 KAYH - Fayetteville, Arkansas

REFERENCE  
 36 10 48.0 N.  
 94 05 09.0 W.

CLASS = C2  
 Current Spacings to 3rd Adj.  
 ----- Channel 207 - 89.3 MHz -----

DISPLAY DATES  
 DATA 01-23-12  
 SEARCH 01-24-12

Call	Channel	Location		Azi	Dist	FCC	Margin
KAYH	CP -D 207C2	Fayetteville	AR	0.0	0.0	190.0	-190.0
KAYH	LIC 207C3	Fayetteville	AR	270.0	0.0	177.0	-177.0
KWFC	LIC-D 206C	Springfield	MO	41.6	152.6	188.0	-35.4
KITG	LIC-D 208C2	Sarcoxie	MO	8.2	100.5	130.0	-29.5
KGSF	LIC-D 204C3	Green Forest	AR	56.3	36.3	56.0	-19.7
KGSF	CP -D 204C3	Green Forest	AR	56.3	36.3	56.0	-19.7
KWRI	LIC-D 206C1	Bartlesville	OK	294.9	140.8	158.0	-17.2
KWGS	LIC 208C1	Tulsa	OK	263.4	144.2	158.0	-13.8
KWXC	LIC-D 205A	Grove	OK	313.4	67.4	55.0	12.4
KBMJ	LIC-D 208C1	Heber Springs	AR	106.3	172.0	158.0	14.0
KOZO	CP 209C2	Branson	MO	61.1	86.1	58.0	28.1
KOZO	LIC 209C2	Branson	MO	61.1	86.1	58.0	28.1
KAOW	LIC 205A	Fort Smith	AR	197.2	85.1	55.0	30.1
KBHN	LIC 209C1	Booneville	AR	178.9	115.4	79.0	36.4
KRPS	LIC 210C	Pittsburg	KS	332.9	141.6	105.0	36.6

**KAYH.X**

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Horiz. Pattern: Directional  
Vert. Pattern: No  
Prop Model: None

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

**KAYH.X**

Exhibit E-8  
International Agreement Compliance  
KAYH - Fayetteville, Arkansas  
Community Broadcasting, Inc.  
January, 2012

