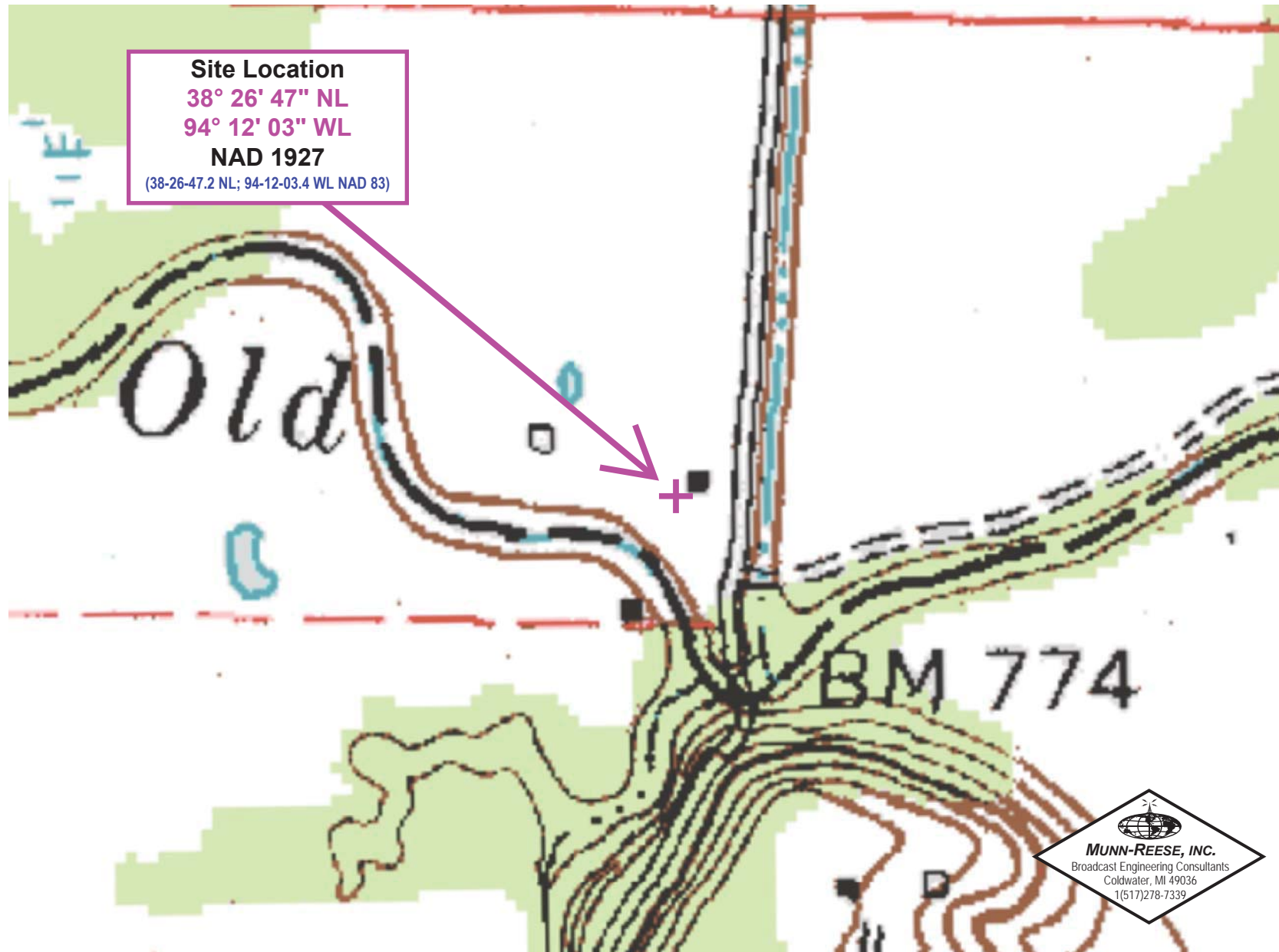


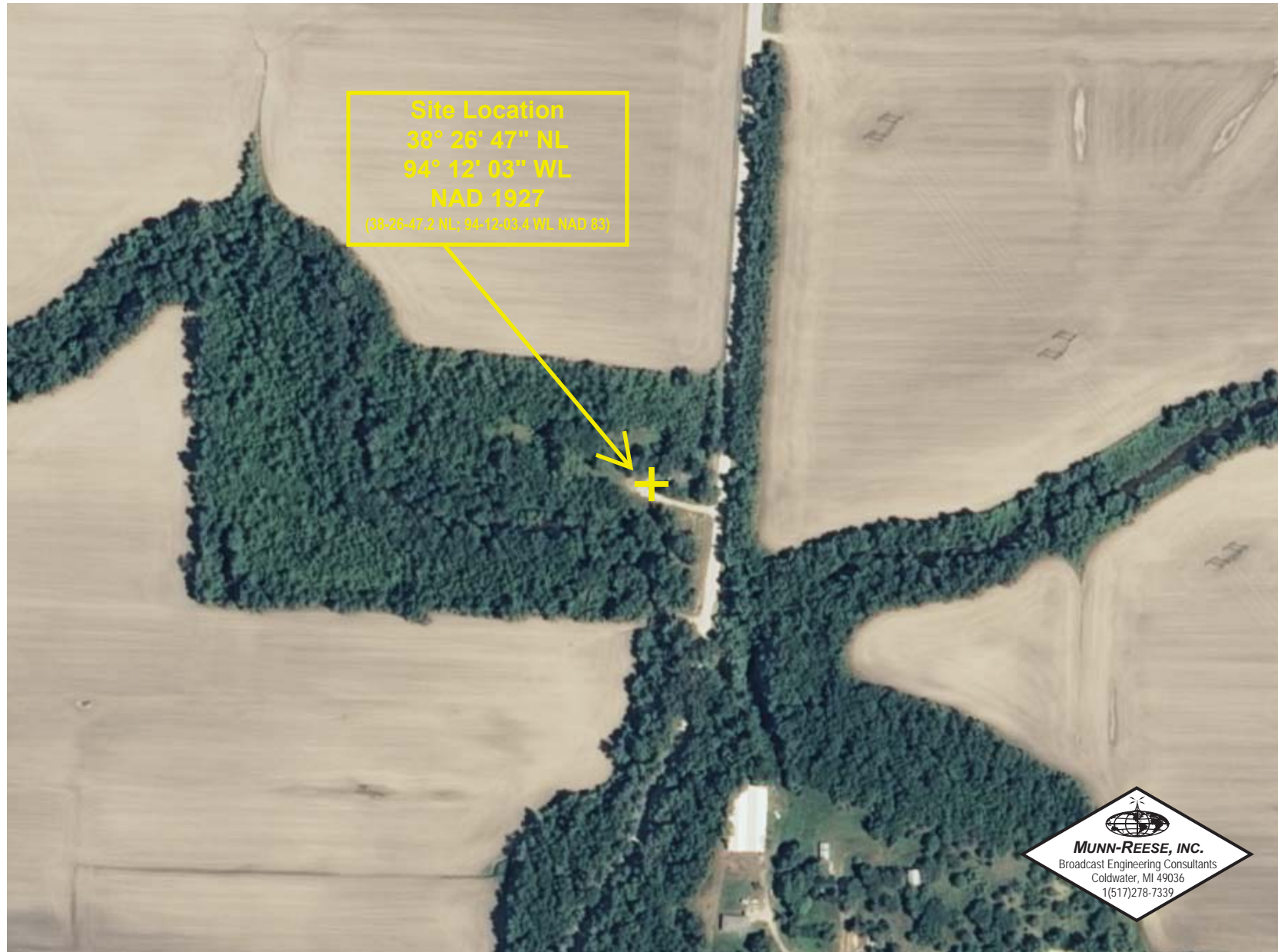
**Exhibit 13.1**  
**USGS Topographic Map of Existing Site**

USGS - The National Map



**Exhibit 13.2**  
**USGS Photograph of Existing Site**

USGS - The National Map



# Exhibit 13.3

## Vertical Plan of Antenna System

The site is located 0.75 km south of the  
South Grand River on South Pollard Road,  
Daytown township, Cass County, Missouri.

### Site Location (NAD 27)

NL: 38° 26' 47"

WL: 94° 12' 03"

(38-26-47.2 NL; 94-12-03.4 WL NAD 83)

Proposed Antenna  
COR: 241 meters AMSL  
max HAAT: N/A (Fill-In Status)

240.7 meters AMSL (790 feet)

Antenna Structure Registration No.  
**Not Required**

9 meters

9.1 meters AGL  
(30 feet)

Ground Elevation = 231.6 m AMSL (760 feet)

Drawing is not to Scale

**MUNN-REESE, INC.**

Broadcast Engineering Consultants  
Coldwater, MI 49036



CH296D.P  
Proposed Operation  
Latitude: 38-26-47 N  
Longitude: 094-12-03 W  
ERP: 0.005 kW  
Channel: 296  
Frequency: 107.1 MHz  
AMSL Height: 241.0 m  
Horiz. Pattern: Directional  
Vert. Pattern: No  
Prop Model: None

60 dBu Contour  
Total Population: 2  
Total Area: 5 sq. km

K293BM.L  
BLFT20110919ACV  
Latitude: 38-26-47 N  
Longitude: 094-12-03 W  
ERP: 0.04 kW  
Channel: 293  
Frequency: 106.5 MHz  
AMSL Height: 241.0 m  
Horiz. Pattern: Directional  
Vert. Pattern: No  
Prop Model: None

60 dBu Contour  
Total Population: 110  
Total Area: 29 sq. km

## Exhibit 13.4 Present vs. Proposed Service Contour Study

USGS 03 SEC terrain database  
U.S. Census 2010 PL database

*Proposed 60 dBu F(50:50)*

*Present 60 dBu F(50:50)*

CH296D.P  
K293BM.L



Terrain  
223 286 m

Scale 1:50,000  
0 0.7 1.4 2.1 km



Terrain  
154 412 m

USGS 03 SEC terrain database  
U.S. Census 2010 PL database

## Exhibit 13.5 Proposed vs. Primary Service Contour Study

**KLRQ.L**  
BMLED20030926AQB  
Latitude: 38-28-27 N  
Longitude: 093-30-28 W  
ERP: 100.00 kW  
Channel: 241  
Frequency: 96.1 MHz  
AMSL Height: 560.0 m  
Horiz. Pattern: Omni  
Vert. Pattern: No  
Prop Model: None

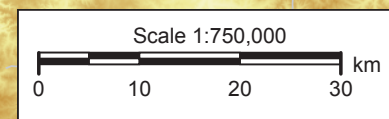
**CH296D.P**  
Proposed Operation  
Latitude: 38-26-47 N  
Longitude: 094-12-03 W  
ERP: 0.005 kW  
Channel: 296  
Frequency: 107.1 MHz  
AMSL Height: 241.0 m  
Horiz. Pattern: Directional  
Vert. Pattern: No  
Prop Model: None

*Proposed 60 dBu F(50:50)*

  
CH296D.P

  
KLRQ.L

  
Clinton



# Exhibit 13.6

## Tabulation of Proposed Translator Allocation

| Alpine Broadcasting Corporation<br>CH# 296D - 107.1 MHz, Pwr= 0.005 kW DA, HAAT= -15.0 M, COR= 241 M<br>Average Protected F(50-50)= 2.68 km<br>Standard Directional |                     |                |             |                        |                       |  |                |                                   |                      |       |
|---|---------------------|----------------|-------------|------------------------|-----------------------|--|----------------|-----------------------------------|----------------------|-------|
| REFERENCE   |                     | CH#            |             | 296D - 107.1           |                       | MHz, Pwr= 0.005 kW DA, HAAT= -15.0 M, COR= 241 M |                | DISPLAY DATES                     |                      |       |
| 38 26 47.0 N.   |                     |                |             |                        |                       | Average Protected F(50-50)= 2.68 km              |                | DATA 10-03-11                     |                      |       |
| 94 12 03.0 W.   |                     |                |             |                        |                       | Standard Directional                             |                | SEARCH 10-05-11                   |                      |       |
| CH CITY   | CALL                | TYPE ANT STATE | AZI <--     | DIST FILE #            | LAT LNG               | PWR(kW) HAAT(M)                                  | INT(km) COR(M) | PRO(km) LICENSEE                  | *IN* (Overlap in km) | *OUT* |
| 297C1   | KMJK                | LIC C MO       | 7.1 187.2   | 72.5 BLH20071003AA0    | 39 05 40.0 94 05 47.0 | 100.000 299                                      | 103.8 539      | 71.3 Vol t Radio, LI c, As Truste | -31.3*               | 1.0   |
| 293D  | K293BM Clinton      | LIC DH MO      | 0.0 0.0     | 0.0 BLFT20110919ACV    | 38 26 47.0 94 12 03.0 | 0.040  | 0.0 241        | Alpine Broadcasting Corpor        | -0.2*                | -1.6* |
| 293C1   | WDAF-FM Liberty     | LIC CX MO      | 340.6 160.4 | 73.8 BMLH20040802BEU   | 39 04 24.0 94 29 06.0 | 100.000 299                                      | 9.8 565        | 70.9 Entercom Kansas Ci ty Licen  | 63.9                 | 3.0   |
| 294D  | 650215 Butler       | APP C_ MO      | 215.9 35.8  | 24.7 BNPFT20030317JAB  | 38 16 00.0 94 22 00.0 | 0.250 55   | 1.1 308        | 7.4 Covenant Network              | 21.9                 | 17.2  |
| 295D  | 632175 Butler       | APP DV_ MO     | 192.5 12.5  | 27.9 BNPFT20030310BFZ  | 38 12 04.0 94 16 12.0 | 0.100 31   | 8.0 283        | 5.6 Full Smile, Inc.              | 19.4                 | 21.3  |
| 296C3   | KJML Columbus       | LIC NCX KS     | 199.5 19.2  | 142.2 BLH20090204ABQ   | 37 14 15.0 94 44 15.0 | 11.500 149                                       | 105.1 420      | 39.3 American Media Investments   | 36.0                 | 100.7 |
| 295C  | KTXJ Jefferson City | LIC CY MO      | 81.3 262.4  | 150.4 BLH19900727KA    | 38 38 16.0 92 29 34.0 | 100.000 381                                      | 112.6 609      | 76.5 Zimmer Radio Of Mid-missou   | 36.8                 | 72.3  |
| 295C  | KTPK Topeka         | LIC CX KS      | 294.0 112.9 | 162.5 BMLH20040913ABR  | 39 01 34.0 95 55 01.0 | 100.000 369                                      | 112.0 687      | 76.3 Jmj Broadcasting Company,    | 48.1                 | 83.0  |
| 294D  | 631721 Nevada       | APP C_ MO      | 193.1 13.0  | 68.2 BNPFT20030312BAM  | 37 50 56.0 94 22 36.0 | 0.250 88   | 1.1 334        | 13.1 Community Broadcasting, In   | 66.5                 | 55.0  |
| 293D  | 632176 Nevada       | APP DV_ MO     | 190.8 10.7  | 64.2 BNPFT20030310BGD  | 37 52 45.0 94 20 15.0 | 0.100 13   | 0.7 258        | 5.6 Full Smile, Inc.              | 63.1                 | 58.5  |
| 299C3   | KRWP Stockton       | LIC CX MO      | 164.5 344.7 | 106.3 BLH20030204ABP   | 37 31 24.0 93 52 40.0 | 11.700 146                                       | 4.1 443        | 40.5 Cumulus Licensing LIc        | 102.2                | 66.0  |
| 299A  | KCVK Otterville     | LIC NCX MO     | 77.3 258.2  | 119.4 BLEDT20110511AFK | 38 40 26.0 92 51 44.0 | 3.700 125  | 2.8 378        | 30.0 Lake Area Educational Broa   | 115.7                | 89.1  |
| 299C1   | KMAJ-FM Carbondale  | LIC CX KS      | 291.4 110.3 | 159.2 BLH20090618ABH   | 38 57 15.0 95 54 43.0 | 53.000 235                                       | 7.5 575        | 61.0 Cumulus Licensing LIc        | 149.1                | 97.7  |
| 294C3   | KRVI Mount Vernon   | LIC CX MO      | 160.1 340.5 | 152.4 BLH20031119AFT   | 37 09 16.0 93 36 58.0 | 19.000 115                                       | 4.3 486        | 41.1 Journal Broadcast Corporat   | 148.1                | 111.4 |

Terrain database is USGS 03 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= West Zone, 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.

Yellow Highlighted Text denotes supplemental contour protection studies toward KMJK(FM) - North Kansas City, MO as included in **Exhibit 13.7**.

Blue Highlighted Text denotes the K293BM facility to be modified by this minor change proposal. The facility need not be protected.

## Exhibit 13.7

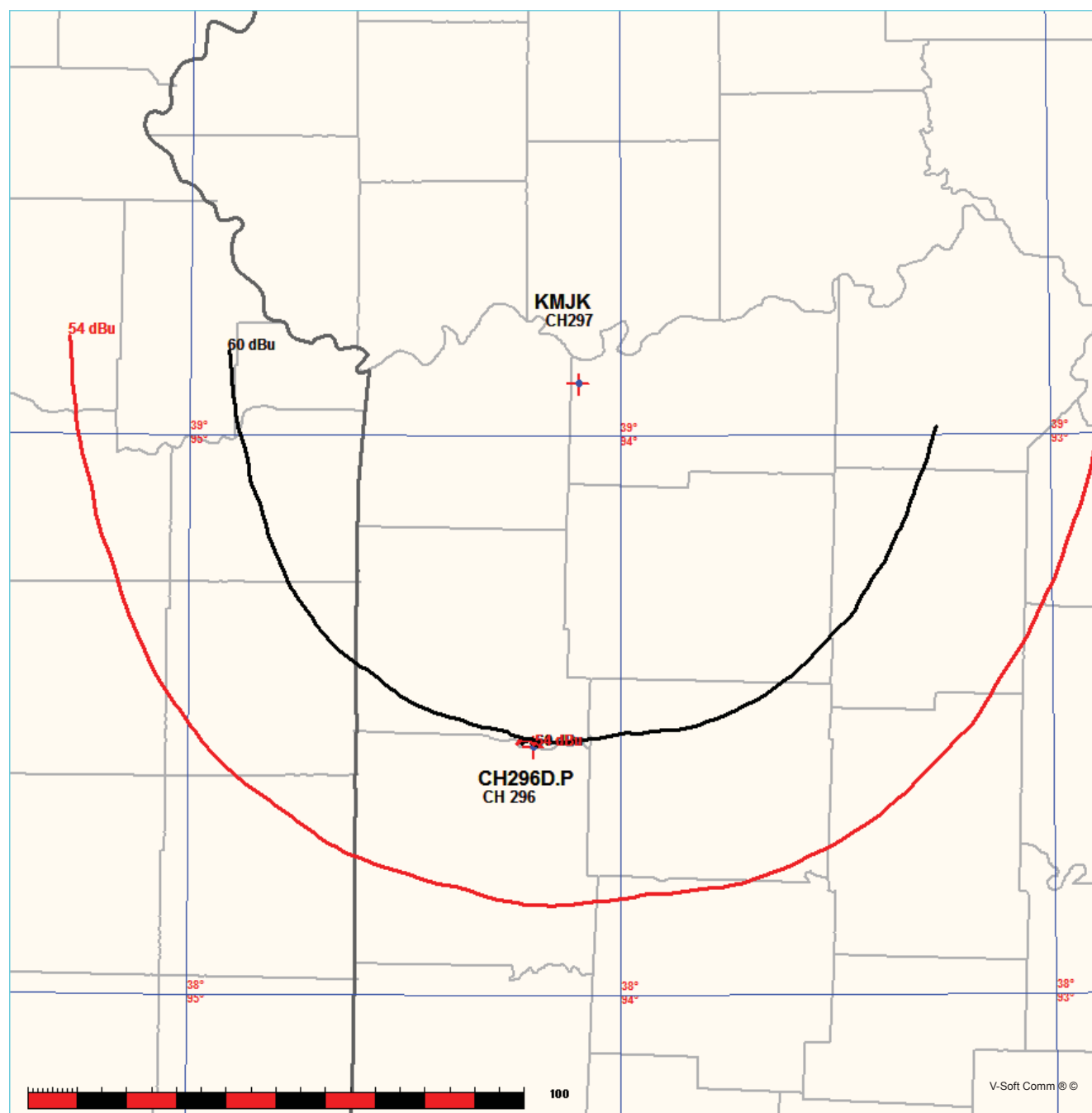
### Contour Protection Studies Toward KMJK - North Kansas City, MO

Alpine Broadcasting Corporation

FMCommander Single Allocation Study - 10-05-2011 - USGS 03 SEC  
CH296D.P's Overlaps (In= -31.34 km, Out= 0.97 km)

CH296D.P CH 296 D DA  
Lat= 38 26 47.0, Lng= 94 12 03.0  
0.005 kW -15 M HAAT, 241 M COR  
Prot.= 60 dBu, Intef.= 54 dBu

KMJK CH 297 C1 BLH20071003AAO  
Lat= 39 05 40.0, Lng= 94 05 47.0  
100.0 kW 299 M HAAT, 538.6 M COR  
Prot.= 60 dBu, Intef.= 54 dBu



**Munn-Reese, Inc.**

Broadcast Engineering Consultants  
Coldwater, MI 49036



## Exhibit 13.7

### Contour Protection Studies Toward KMJK - North Kansas City, MO

10-05-2011

Terrain Data: USGS 03 SEC

FMOver Analysis

CH296D.P

KMJK BLH20071003AAO

Channel = 296D  
Max ERP = 0.005 kW  
RCAMSL = 241 M  
N. Lat. 38 26 47.0  
W. Lng. 94 12 03.0  
Protected  
60 dBu

Channel = 297C1  
Max ERP = 100 kW  
RCAMSL = 538.6 M  
N. Lat. 39 05 40.0  
W. Lng. 94 05 47.0  
Interfering  
54 dBu

| Azimuth<br>(degrees) | ERP<br>(kW) | HAAT<br>(m) | Dist<br>(km) | Azimuth<br>(degrees) | ERP<br>(kW) | HAAT<br>(m) | Dist<br>(km) | Actual<br>(dBu) | IX<br>(km) |
|----------------------|-------------|-------------|--------------|----------------------|-------------|-------------|--------------|-----------------|------------|
| 325.0                | 000.0000    | -0010.6     | 000.7        | 187.6                | 100.0000    | 0286.4      | 072.1        | 64.15**         | 31.65      |
| 326.0                | 000.0000    | -0009.4     | 000.6        | 187.5                | 100.0000    | 0286.4      | 072.1        | 64.13**         | 31.61      |
| 327.0                | 000.0000    | -0008.6     | 000.5        | 187.5                | 100.0000    | 0286.5      | 072.2        | 64.11**         | 31.56      |
| 328.0                | 000.0000    | -0008.4     | 000.5        | 187.4                | 100.0000    | 0286.5      | 072.3        | 64.10**         | 31.51      |
| 329.0                | 000.0000    | -0008.8     | 000.4        | 187.4                | 100.0000    | 0286.6      | 072.3        | 64.08**         | 31.46      |
| 330.0                | 000.0000    | -0009.3     | 000.3        | 187.3                | 100.0000    | 0286.6      | 072.4        | 64.06**         | 31.41      |
| 331.0                | 000.0000    | -0010.4     | 000.3        | 187.3                | 100.0000    | 0286.7      | 072.4        | 64.05**         | 31.39      |
| 332.0                | 000.0000    | -0010.5     | 000.3        | 187.3                | 100.0000    | 0286.7      | 072.4        | 64.05**         | 31.37      |
| 333.0                | 000.0000    | -0010.5     | 000.2        | 187.3                | 100.0000    | 0286.7      | 072.4        | 64.04**         | 31.35      |
| 334.0                | 000.0000    | -0010.2     | 000.2        | 187.3                | 100.0000    | 0286.8      | 072.5        | 64.03**         | 31.33      |
| 335.0                | 000.0000    | -0009.5     | 000.2        | 187.3                | 100.0000    | 0286.8      | 072.5        | 64.02**         | 31.31      |
| 336.0                | 000.0000    | -0009.2     | 000.2        | 187.3                | 100.0000    | 0286.8      | 072.5        | 64.03**         | 31.31      |
| 337.0                | 000.0000    | -0008.9     | 000.2        | 187.3                | 100.0000    | 0286.8      | 072.5        | 64.03**         | 31.31      |
| 338.0                | 000.0000    | -0008.7     | 000.2        | 187.3                | 100.0000    | 0286.8      | 072.5        | 64.03**         | 31.31      |
| 339.0                | 000.0000    | -0008.7     | 000.2        | 187.3                | 100.0000    | 0286.8      | 072.5        | 64.03**         | 31.31      |
| 340.0                | 000.0000    | -0008.9     | 000.2        | 187.3                | 100.0000    | 0286.8      | 072.5        | 64.03**         | 31.31      |
| 341.0                | 000.0000    | -0009.3     | 000.2        | 187.2                | 100.0000    | 0286.8      | 072.5        | 64.03**         | 31.32      |
| 342.0                | 000.0000    | -0009.4     | 000.2        | 187.2                | 100.0000    | 0286.8      | 072.5        | 64.03**         | 31.32      |
| 343.0                | 000.0000    | -0009.5     | 000.2        | 187.2                | 100.0000    | 0286.8      | 072.5        | 64.03**         | 31.32      |
| 344.0                | 000.0000    | -0009.3     | 000.2        | 187.2                | 100.0000    | 0286.8      | 072.5        | 64.03**         | 31.32      |
| 345.0                | 000.0000    | -0008.9     | 000.2        | 187.2                | 100.0000    | 0286.8      | 072.5        | 64.03**         | 31.32      |
| 346.0                | 000.0000    | -0008.6     | 000.2        | 187.2                | 100.0000    | 0286.8      | 072.5        | 64.03**         | 31.32      |
| 347.0                | 000.0000    | -0010.6     | 000.2        | 187.2                | 100.0000    | 0286.8      | 072.5        | 64.03**         | 31.33      |
| 348.0                | 000.0000    | -0013.7     | 000.2        | 187.2                | 100.0000    | 0286.8      | 072.5        | 64.03**         | 31.33      |
| 349.0                | 000.0000    | -0015.7     | 000.2        | 187.2                | 100.0000    | 0286.9      | 072.5        | 64.03**         | 31.33      |
| 350.0                | 000.0000    | -0016.9     | 000.2        | 187.2                | 100.0000    | 0286.9      | 072.5        | 64.03**         | 31.33      |
| 351.0                | 000.0000    | -0018.4     | 000.2        | 187.2                | 100.0000    | 0286.9      | 072.5        | 64.03**         | 31.33      |
| 352.0                | 000.0000    | -0019.7     | 000.2        | 187.2                | 100.0000    | 0286.9      | 072.5        | 64.03**         | 31.33      |
| 353.0                | 000.0000    | -0020.3     | 000.2        | 187.2                | 100.0000    | 0286.9      | 072.5        | 64.03**         | 31.33      |
| 354.0                | 000.0000    | -0021.0     | 000.2        | 187.2                | 100.0000    | 0286.9      | 072.5        | 64.03**         | 31.33      |
| 355.0                | 000.0000    | -0021.9     | 000.2        | 187.2                | 100.0000    | 0286.9      | 072.5        | 64.03**         | 31.34      |
| 356.0                | 000.0000    | -0023.2     | 000.2        | 187.2                | 100.0000    | 0286.9      | 072.5        | 64.04**         | 31.34      |
| 357.0                | 000.0000    | -0024.4     | 000.2        | 187.2                | 100.0000    | 0286.9      | 072.5        | 64.04**         | 31.34      |

**Munn-Reese, Inc.**

Broadcast Engineering Consultants

Coldwater, MI 49036



## Exhibit 13.7

### Contour Protection Studies Toward KMJK - North Kansas City, MO

| Azimuth<br>(degrees) | ERP<br>(kW) | HAAT<br>(m) | Dist<br>(km) | Azimuth<br>(degrees) | ERP<br>(kW) | HAAT<br>(m) | Dist<br>(km) | Actual<br>(dBu) |       |
|----------------------|-------------|-------------|--------------|----------------------|-------------|-------------|--------------|-----------------|-------|
| 358.0                | 000.0000    | -0025.7     | 000.2        | 187.2                | 100.0000    | 0286.9      | 072.5        | 64.04**         | 31.34 |
| 359.0                | 000.0000    | -0026.9     | 000.2        | 187.2                | 100.0000    | 0286.9      | 072.5        | 64.04**         | 31.34 |
| 000.0                | 000.0000    | -0028.5     | 000.2        | 187.2                | 100.0000    | 0286.9      | 072.5        | 64.04**         | 31.34 |
| 001.0                | 000.0000    | -0029.8     | 000.2        | 187.2                | 100.0000    | 0286.9      | 072.5        | 64.04**         | 31.34 |
| 002.0                | 000.0000    | -0030.9     | 000.2        | 187.2                | 100.0000    | 0286.9      | 072.5        | 64.04**         | 31.34 |
| 003.0                | 000.0000    | -0031.9     | 000.2        | 187.2                | 100.0000    | 0286.9      | 072.5        | 64.04**         | 31.34 |
| 004.0                | 000.0000    | -0032.4     | 000.2        | 187.2                | 100.0000    | 0286.9      | 072.5        | 64.04**         | 31.34 |
| 005.0                | 000.0000    | -0032.4     | 000.2        | 187.2                | 100.0000    | 0286.9      | 072.5        | 64.04**         | 31.34 |
| 006.0                | 000.0000    | -0032.4     | 000.2        | 187.2                | 100.0000    | 0286.9      | 072.5        | 64.04**         | 31.34 |
| 007.0                | 000.0000    | -0032.5     | 000.2        | 187.2                | 100.0000    | 0286.9      | 072.5        | 64.04**         | 31.34 |
| 008.0                | 000.0000    | -0033.0     | 000.2        | 187.2                | 100.0000    | 0286.9      | 072.5        | 64.04**         | 31.34 |
| 009.0                | 000.0000    | -0034.1     | 000.2        | 187.2                | 100.0000    | 0286.9      | 072.5        | 64.04**         | 31.35 |
| 010.0                | 000.0000    | -0032.8     | 000.2        | 187.2                | 100.0000    | 0286.9      | 072.5        | 64.04**         | 31.35 |
| 011.0                | 000.0000    | -0030.4     | 000.2        | 187.2                | 100.0000    | 0287.0      | 072.5        | 64.04**         | 31.35 |
| 012.0                | 000.0000    | -0029.3     | 000.2        | 187.2                | 100.0000    | 0287.0      | 072.4        | 64.04**         | 31.36 |
| 013.0                | 000.0000    | -0029.4     | 000.2        | 187.2                | 100.0000    | 0287.0      | 072.4        | 64.05**         | 31.38 |
| 014.0                | 000.0000    | -0029.3     | 000.2        | 187.2                | 100.0000    | 0287.0      | 072.4        | 64.05**         | 31.38 |
| 015.0                | 000.0000    | -0029.2     | 000.2        | 187.2                | 100.0000    | 0287.0      | 072.4        | 64.05**         | 31.38 |
| 016.0                | 000.0000    | -0029.3     | 000.2        | 187.2                | 100.0000    | 0287.0      | 072.4        | 64.06**         | 31.39 |
| 017.0                | 000.0000    | -0028.8     | 000.2        | 187.2                | 100.0000    | 0287.0      | 072.4        | 64.05**         | 31.39 |
| 018.0                | 000.0000    | -0027.9     | 000.2        | 187.2                | 100.0000    | 0287.0      | 072.4        | 64.06**         | 31.41 |
| 019.0                | 000.0000    | -0027.1     | 000.2        | 187.2                | 100.0000    | 0287.0      | 072.4        | 64.06**         | 31.41 |
| 020.0                | 000.0000    | -0026.2     | 000.2        | 187.2                | 100.0000    | 0287.0      | 072.4        | 64.07**         | 31.42 |
| 021.0                | 000.0000    | -0025.3     | 000.3        | 187.1                | 100.0000    | 0287.0      | 072.4        | 64.07**         | 31.44 |
| 022.0                | 000.0000    | -0024.9     | 000.3        | 187.1                | 100.0000    | 0287.0      | 072.4        | 64.08**         | 31.45 |
| 023.0                | 000.0000    | -0024.7     | 000.3        | 187.1                | 100.0000    | 0287.0      | 072.3        | 64.08**         | 31.47 |
| 024.0                | 000.0000    | -0024.7     | 000.3        | 187.1                | 100.0000    | 0287.1      | 072.3        | 64.09**         | 31.49 |
| 025.0                | 000.0000    | -0024.5     | 000.3        | 187.1                | 100.0000    | 0287.1      | 072.3        | 64.09**         | 31.50 |
| 026.0                | 000.0000    | -0023.7     | 000.3        | 187.1                | 100.0000    | 0287.1      | 072.3        | 64.10**         | 31.52 |
| 027.0                | 000.0000    | -0023.2     | 000.3        | 187.1                | 100.0000    | 0287.1      | 072.3        | 64.10**         | 31.53 |
| 028.0                | 000.0000    | -0022.0     | 000.4        | 187.1                | 100.0000    | 0287.1      | 072.3        | 64.11**         | 31.54 |
| 029.0                | 000.0000    | -0021.0     | 000.4        | 187.1                | 100.0000    | 0287.2      | 072.3        | 64.11**         | 31.56 |
| 030.0                | 000.0000    | -0020.1     | 000.4        | 187.1                | 100.0000    | 0287.2      | 072.3        | 64.12**         | 31.57 |
| 031.0                | 000.0000    | -0019.9     | 000.4        | 187.1                | 100.0000    | 0287.2      | 072.2        | 64.12**         | 31.59 |
| 032.0                | 000.0000    | -0020.3     | 000.4        | 187.1                | 100.0000    | 0287.2      | 072.2        | 64.13**         | 31.60 |
| 033.0                | 000.0000    | -0020.9     | 000.4        | 187.0                | 100.0000    | 0287.2      | 072.2        | 64.13**         | 31.60 |
| 034.0                | 000.0000    | -0021.4     | 000.4        | 187.0                | 100.0000    | 0287.3      | 072.2        | 64.13**         | 31.61 |
| 035.0                | 000.0000    | -0021.7     | 000.5        | 187.0                | 100.0000    | 0287.3      | 072.2        | 64.13**         | 31.62 |
| 036.0                | 000.0000    | -0021.6     | 000.5        | 187.0                | 100.0000    | 0287.3      | 072.2        | 64.14**         | 31.64 |
| 037.0                | 000.0000    | -0021.7     | 000.5        | 187.0                | 100.0000    | 0287.3      | 072.2        | 64.14**         | 31.65 |
| 038.0                | 000.0000    | -0021.7     | 000.5        | 187.0                | 100.0000    | 0287.4      | 072.2        | 64.15**         | 31.66 |
| 039.0                | 000.0000    | -0021.8     | 000.5        | 187.0                | 100.0000    | 0287.4      | 072.2        | 64.15**         | 31.67 |
| 040.0                | 000.0000    | -0021.8     | 000.5        | 187.0                | 100.0000    | 0287.4      | 072.2        | 64.15**         | 31.68 |
| 041.0                | 000.0000    | -0021.6     | 000.5        | 187.0                | 100.0000    | 0287.4      | 072.2        | 64.15**         | 31.68 |
| 042.0                | 000.0000    | -0020.8     | 000.5        | 187.0                | 100.0000    | 0287.4      | 072.2        | 64.15**         | 31.67 |
| 043.0                | 000.0000    | -0019.8     | 000.5        | 186.9                | 100.0000    | 0287.5      | 072.2        | 64.15**         | 31.68 |
| 044.0                | 000.0000    | -0019.5     | 000.6        | 186.9                | 100.0000    | 0287.5      | 072.2        | 64.16**         | 31.69 |
| 045.0                | 000.0000    | -0019.5     | 000.6        | 186.9                | 100.0000    | 0287.5      | 072.2        | 64.16**         | 31.69 |

**Munn-Reese, Inc.**

Broadcast Engineering Consultants  
Coldwater, MI 49036

## Exhibit 13.7

# Contour Protection Studies Toward KMJK - North Kansas City, MO

10-05-2011

Terrain Data: USGS 03 SEC

FMOver Analysis

KMJK BLH20071003AAO

CH296D.P

Channel = 297C1

Max ERP = 100 kW

RCAMSL = 538.6 M

N. Lat. 39 05 40.0

W. Lng. 94 05 47.0

Protected

60 dBu

Channel = 296D

Max ERP = 0.005 kW

RCAMSL = 241 M

N. Lat. 38 26 47.0

W. Lng. 94 12 03.0

Interfering

54 dBu

| Azimuth<br>(degrees) | ERP<br>(kW) | HAAT<br>(m) | Dist<br>(km) | Azimuth<br>(degrees) | ERP<br>(kW) | HAAT<br>(m) | Dist<br>(km) | Actual<br>(dBu) | IX<br>(km) |
|----------------------|-------------|-------------|--------------|----------------------|-------------|-------------|--------------|-----------------|------------|
| 142.0                | 100.0000    | 0295.7      | 072.0        | 074.0                | 000.0000    | 0001.4      | 055.6        | -16.24          |            |
| 143.0                | 100.0000    | 0297.0      | 072.1        | 074.5                | 000.0000    | 0001.5      | 054.3        | -15.96          |            |
| 144.0                | 100.0000    | 0297.5      | 072.2        | 075.0                | 000.0000    | 0001.7      | 053.2        | -15.72          |            |
| 145.0                | 100.0000    | 0297.7      | 072.2        | 075.6                | 000.0000    | 0001.9      | 052.0        | -15.46          |            |
| 146.0                | 100.0000    | 0298.0      | 072.2        | 076.1                | 000.0000    | 0002.0      | 050.8        | -15.21          |            |
| 147.0                | 100.0000    | 0298.5      | 072.3        | 076.6                | 000.0000    | 0002.4      | 049.7        | -14.95          |            |
| 148.0                | 100.0000    | 0299.1      | 072.3        | 077.2                | 000.0000    | 0003.0      | 048.5        | -14.70          |            |
| 149.0                | 100.0000    | 0299.4      | 072.3        | 077.7                | 000.0000    | 0003.6      | 047.3        | -14.44          |            |
| 150.0                | 100.0000    | 0299.3      | 072.3        | 078.2                | 000.0000    | 0004.2      | 046.1        | -14.16          |            |
| 151.0                | 100.0000    | 0298.9      | 072.3        | 078.6                | 000.0000    | 0004.9      | 044.9        | -13.85          |            |
| 152.0                | 100.0000    | 0298.0      | 072.2        | 079.1                | 000.0000    | 0005.4      | 043.7        | -13.53          |            |
| 153.0                | 100.0000    | 0297.2      | 072.2        | 079.5                | 000.0000    | 0005.8      | 042.5        | -13.18          |            |
| 154.0                | 100.0000    | 0296.7      | 072.1        | 079.9                | 000.0000    | 0006.3      | 041.2        | -12.82          |            |
| 155.0                | 100.0000    | 0296.5      | 072.1        | 080.4                | 000.0000    | 0007.0      | 040.0        | -12.45          |            |
| 156.0                | 100.0000    | 0296.2      | 072.1        | 080.8                | 000.0000    | 0007.8      | 038.8        | -12.06          |            |
| 157.0                | 100.0000    | 0295.8      | 072.1        | 081.3                | 000.0000    | 0008.5      | 037.6        | -11.65          |            |
| 158.0                | 100.0000    | 0295.3      | 072.0        | 081.7                | 000.0000    | 0009.1      | 036.4        | -11.23          |            |
| 159.0                | 100.0000    | 0294.9      | 072.0        | 082.1                | 000.0000    | 0009.7      | 035.1        | -10.79          |            |
| 160.0                | 100.0000    | 0294.6      | 072.0        | 082.6                | 000.0000    | 0010.2      | 033.9        | -10.34          |            |
| 161.0                | 100.0000    | 0294.1      | 071.9        | 083.0                | 000.0000    | 0010.6      | 032.7        | -09.87          |            |
| 162.0                | 100.0000    | 0293.1      | 071.8        | 083.3                | 000.0000    | 0010.9      | 031.4        | -09.38          |            |
| 163.0                | 100.0000    | 0291.4      | 071.7        | 083.5                | 000.0000    | 0011.0      | 030.2        | -08.81          |            |
| 164.0                | 100.0000    | 0289.3      | 071.5        | 083.6                | 000.0000    | 0011.2      | 028.9        | -08.18          |            |
| 165.0                | 100.0000    | 0286.4      | 071.3        | 083.5                | 000.0000    | 0011.1      | 027.7        | -07.48          |            |
| 166.0                | 100.0000    | 0282.4      | 071.0        | 083.2                | 000.0000    | 0010.8      | 026.4        | -06.71          |            |
| 167.0                | 100.0000    | 0279.9      | 070.8        | 083.1                | 000.0000    | 0010.7      | 025.1        | -05.90          |            |
| 168.0                | 100.0000    | 0279.0      | 070.7        | 083.2                | 000.0000    | 0010.8      | 023.9        | -05.06          |            |
| 169.0                | 100.0000    | 0278.5      | 070.6        | 083.3                | 000.0000    | 0010.9      | 022.7        | -04.18          |            |
| 170.0                | 100.0000    | 0277.1      | 070.5        | 083.2                | 000.0000    | 0010.8      | 021.5        | -03.25          |            |

**Munn-Reese, Inc.**

Broadcast Engineering Consultants  
Coldwater, MI 49036

## Exhibit 13.7

### Contour Protection Studies Toward KMJK - North Kansas City, MO

| Azimuth<br>(degrees) | ERP<br>(kW) | HAAT<br>(m) | Dist<br>(km) | Azimuth<br>(degrees) | ERP<br>(kW) | HAAT<br>(m) | Dist<br>(km) | Actual<br>(dBu) |
|----------------------|-------------|-------------|--------------|----------------------|-------------|-------------|--------------|-----------------|
| 171.0                | 100.0000    | 0274.4      | 070.3        | 082.8                | 000.0000    | 0010.4      | 020.2        | -02.29          |
| 172.0                | 100.0000    | 0271.8      | 070.1        | 082.2                | 000.0000    | 0009.8      | 019.0        | -01.31          |
| 173.0                | 100.0000    | 0271.8      | 070.1        | 082.2                | 000.0000    | 0009.7      | 017.8        | -00.31          |
| 174.0                | 100.0000    | 0273.7      | 070.2        | 082.7                | 000.0000    | 0010.3      | 016.5        | 00.72           |
| 175.0                | 100.0000    | 0275.0      | 070.3        | 082.9                | 000.0000    | 0010.6      | 015.3        | 01.77           |
| 176.0                | 100.0000    | 0275.6      | 070.4        | 082.9                | 000.0000    | 0010.6      | 014.1        | 03.11           |
| 177.0                | 100.0000    | 0276.7      | 070.5        | 083.0                | 000.0000    | 0010.6      | 012.9        | 04.75           |
| 178.0                | 100.0000    | 0277.9      | 070.6        | 083.1                | 000.0000    | 0010.7      | 011.6        | 06.59           |
| 179.0                | 100.0000    | 0278.8      | 070.7        | 082.8                | 000.0000    | 0010.5      | 010.4        | 08.61           |
| 180.0                | 100.0000    | 0281.0      | 070.8        | 083.1                | 000.0000    | 0010.7      | 009.2        | 10.81           |
| 181.0                | 100.0000    | 0283.5      | 071.1        | 083.5                | 000.0000    | 0011.0      | 007.9        | 13.19           |
| 182.0                | 100.0000    | 0285.2      | 071.2        | 083.2                | 000.0000    | 0010.8      | 006.7        | 16.13           |
| 183.0                | 100.0000    | 0286.3      | 071.3        | 082.0                | 000.0000    | 0009.6      | 005.4        | 19.68           |
| 184.0                | 100.0000    | 0286.5      | 071.3        | 078.9                | 000.0000    | 0005.2      | 004.2        | 23.90           |
| 185.0                | 100.0000    | 0286.8      | 071.3        | 072.9                | 000.0000    | 0001.1      | 003.0        | 29.68           |
| 186.0                | 100.0000    | 0288.2      | 071.4        | 061.7                | 000.0000    | -0009.1     | 001.9        | 38.53           |
| 187.0                | 100.0000    | 0287.3      | 071.4        | 020.8                | 000.0000    | -0025.4     | 001.2        | 46.47           |
| 188.0                | 100.0000    | 0286.4      | 071.3        | 329.1                | 000.0000    | -0008.9     | 001.6        | 37.13           |
| 189.0                | 100.0000    | 0286.1      | 071.3        | 307.4                | 000.0005    | -0014.9     | 002.6        | 50.58           |
| 190.0                | 100.0000    | 0284.9      | 071.2        | 299.8                | 000.0011    | -0002.7     | 003.7        | 47.52           |
| 191.0                | 100.0000    | 0282.9      | 071.0        | 296.9                | 000.0014    | 0000.1      | 005.0        | 43.59           |
| 192.0                | 100.0000    | 0279.0      | 070.7        | 296.8                | 000.0014    | 0000.1      | 006.2        | 39.70           |
| 193.0                | 100.0000    | 0277.7      | 070.6        | 295.3                | 000.0015    | 0000.6      | 007.5        | 37.04           |
| 194.0                | 100.0000    | 0278.4      | 070.6        | 293.3                | 000.0017    | 0001.7      | 008.7        | 35.14           |
| 195.0                | 100.0000    | 0280.8      | 070.8        | 291.1                | 000.0020    | 0001.3      | 009.8        | 33.48           |
| 196.0                | 100.0000    | 0282.4      | 071.0        | 289.7                | 000.0021    | 0000.9      | 011.1        | 31.72           |
| 197.0                | 100.0000    | 0282.4      | 071.0        | 289.5                | 000.0021    | 0000.9      | 012.3        | 29.86           |
| 198.0                | 100.0000    | 0282.0      | 070.9        | 289.4                | 000.0021    | 0000.9      | 013.5        | 28.13           |
| 199.0                | 100.0000    | 0281.5      | 070.9        | 289.5                | 000.0021    | 0000.9      | 014.8        | 26.57           |
| 200.0                | 100.0000    | 0281.5      | 070.9        | 289.5                | 000.0021    | 0000.9      | 016.0        | 25.45           |
| 201.0                | 100.0000    | 0283.6      | 071.1        | 289.0                | 000.0022    | 0000.8      | 017.2        | 24.52           |
| 202.0                | 100.0000    | 0285.6      | 071.2        | 288.7                | 000.0022    | 0000.7      | 018.5        | 23.56           |
| 203.0                | 100.0000    | 0287.1      | 071.3        | 288.6                | 000.0022    | 0000.6      | 019.7        | 22.58           |
| 204.0                | 100.0000    | 0288.4      | 071.5        | 288.6                | 000.0022    | 0000.6      | 021.0        | 21.59           |
| 205.0                | 100.0000    | 0289.3      | 071.5        | 288.8                | 000.0022    | 0000.7      | 022.2        | 20.61           |
| 206.0                | 100.0000    | 0290.8      | 071.6        | 288.8                | 000.0022    | 0000.7      | 023.5        | 19.67           |
| 207.0                | 100.0000    | 0292.4      | 071.8        | 288.9                | 000.0022    | 0000.8      | 024.7        | 18.78           |
| 208.0                | 100.0000    | 0292.6      | 071.8        | 289.3                | 000.0022    | 0000.9      | 026.0        | 17.87           |
| 209.0                | 100.0000    | 0292.0      | 071.8        | 289.8                | 000.0021    | 0001.0      | 027.2        | 16.98           |
| 210.0                | 100.0000    | 0291.0      | 071.7        | 290.4                | 000.0020    | 0001.1      | 028.4        | 16.14           |
| 211.0                | 100.0000    | 0289.5      | 071.5        | 291.1                | 000.0020    | 0001.3      | 029.6        | 15.35           |
| 212.0                | 100.0000    | 0288.7      | 071.5        | 291.7                | 000.0019    | 0001.4      | 030.8        | 14.65           |
| 213.0                | 100.0000    | 0287.6      | 071.4        | 292.3                | 000.0018    | 0001.6      | 032.1        | 14.01           |
| 214.0                | 100.0000    | 0286.6      | 071.3        | 292.8                | 000.0018    | 0001.7      | 033.3        | 13.40           |
| 215.0                | 100.0000    | 0285.9      | 071.2        | 293.3                | 000.0017    | 0001.7      | 034.5        | 12.83           |

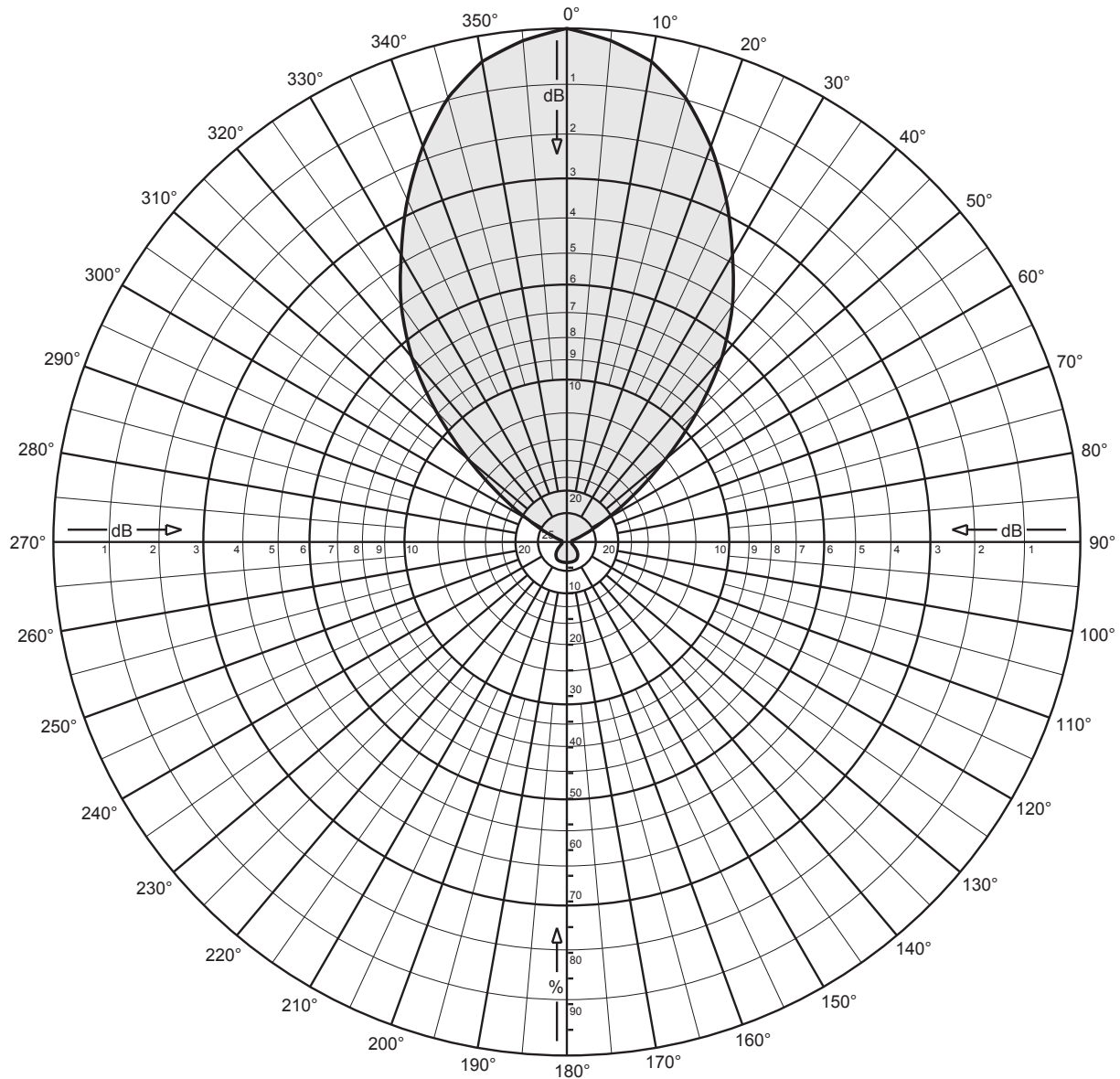
**Munn-Reese, Inc.**

Broadcast Engineering Consultants

Coldwater, MI 49036



**Exhibit 13.8 - Copy of Directional Pattern  
Documentation from Antenna Manufacturer  
(Actual Pattern Rotated to 260.0°T)**



CL-FM Log-periodic

FM

Maximum gain: 7.0 dBd

Horizontal polarization

Horizontal radiation pattern

0 degree electrical downtilt



# Exhibit 13.8 - Copy of Directional Pattern Documentation from Antenna Manufacturer (Actual Pattern Rotated to 260.0°T)



CL-FM Log-periodic

FM

Maximum gain: 7.0 dBd

Horizontal polarization

Horizontal radiation pattern

0 degree electrical downtilt

| Angle | Field | Rel.dB | dBd   | PwrMult | Angle | Field | Rel.dB | dBd    | PwrMult |
|-------|-------|--------|-------|---------|-------|-------|--------|--------|---------|
| 0     | 1.000 | 0.00   | 7.00  | 5.01    | 45    | 0.360 | -8.87  | -1.87  | 0.65    |
| 1     | 0.996 | -0.03  | 6.97  | 4.97    | 46    | 0.338 | -9.42  | -2.42  | 0.57    |
| 2     | 0.992 | -0.07  | 6.93  | 4.93    | 47    | 0.316 | -10.01 | -3.01  | 0.50    |
| 3     | 0.988 | -0.10  | 6.90  | 4.89    | 48    | 0.294 | -10.63 | -3.63  | 0.43    |
| 4     | 0.984 | -0.14  | 6.86  | 4.85    | 49    | 0.272 | -11.31 | -4.31  | 0.37    |
| 5     | 0.980 | -0.18  | 6.82  | 4.81    | 50    | 0.250 | -12.04 | -5.04  | 0.31    |
| 6     | 0.974 | -0.23  | 6.77  | 4.75    | 51    | 0.231 | -12.73 | -5.73  | 0.27    |
| 7     | 0.968 | -0.28  | 6.72  | 4.70    | 52    | 0.212 | -13.47 | -6.47  | 0.23    |
| 8     | 0.962 | -0.34  | 6.66  | 4.64    | 53    | 0.193 | -14.29 | -7.29  | 0.19    |
| 9     | 0.956 | -0.39  | 6.61  | 4.58    | 54    | 0.174 | -15.19 | -8.19  | 0.15    |
| 10    | 0.950 | -0.45  | 6.55  | 4.52    | 55    | 0.155 | -16.19 | -9.19  | 0.12    |
| 11    | 0.939 | -0.55  | 6.45  | 4.42    | 56    | 0.141 | -17.02 | -10.02 | 0.10    |
| 12    | 0.928 | -0.65  | 6.35  | 4.32    | 57    | 0.127 | -17.92 | -10.92 | 0.08    |
| 13    | 0.917 | -0.75  | 6.25  | 4.21    | 58    | 0.113 | -18.94 | -11.94 | 0.06    |
| 14    | 0.906 | -0.86  | 6.14  | 4.11    | 59    | 0.099 | -20.09 | -13.09 | 0.05    |
| 15    | 0.895 | -0.96  | 6.04  | 4.01    | 60    | 0.085 | -21.41 | -14.41 | 0.04    |
| 16    | 0.880 | -1.11  | 5.89  | 3.88    | 61    | 0.077 | -22.27 | -15.27 | 0.03    |
| 17    | 0.865 | -1.26  | 5.74  | 3.75    | 62    | 0.069 | -23.22 | -16.22 | 0.02    |
| 18    | 0.850 | -1.41  | 5.59  | 3.62    | 63    | 0.061 | -24.29 | -17.29 | 0.02    |
| 19    | 0.835 | -1.57  | 5.43  | 3.49    | 64    | 0.053 | -25.51 | -18.51 | 0.01    |
| 20    | 0.820 | -1.72  | 5.28  | 3.37    | 65    | 0.045 | -26.94 | -19.94 | 0.01    |
| 21    | 0.803 | -1.91  | 5.09  | 3.23    | 66    | 0.040 | -27.96 | -20.96 | 0.01    |
| 22    | 0.786 | -2.09  | 4.91  | 3.10    | 67    | 0.035 | -29.12 | -22.12 | 0.01    |
| 23    | 0.769 | -2.28  | 4.72  | 2.96    | 68    | 0.030 | -30.46 | -23.46 | 0.00    |
| 24    | 0.752 | -2.48  | 4.52  | 2.83    | 69    | 0.025 | -32.04 | -25.04 | 0.00    |
| 25    | 0.735 | -2.67  | 4.33  | 2.71    | 70    | 0.020 | -33.98 | -26.98 | 0.00    |
| 26    | 0.717 | -2.89  | 4.11  | 2.58    | 71    | 0.018 | -34.89 | -27.89 | 0.00    |
| 27    | 0.699 | -3.11  | 3.89  | 2.45    | 72    | 0.016 | -35.92 | -28.92 | 0.00    |
| 28    | 0.681 | -3.34  | 3.66  | 2.32    | 73    | 0.014 | -37.08 | -30.08 | 0.00    |
| 29    | 0.663 | -3.57  | 3.43  | 2.20    | 74    | 0.012 | -38.42 | -31.42 | 0.00    |
| 30    | 0.645 | -3.81  | 3.19  | 2.09    | 75    | 0.010 | -40.00 | -33.00 | 0.00    |
| 31    | 0.628 | -4.03  | 2.97  | 1.98    | 76    | 0.010 | -40.00 | -33.00 | 0.00    |
| 32    | 0.612 | -4.26  | 2.74  | 1.88    | 77    | 0.010 | -40.00 | -33.00 | 0.00    |
| 33    | 0.595 | -4.50  | 2.50  | 1.78    | 78    | 0.010 | -40.00 | -33.00 | 0.00    |
| 34    | 0.579 | -4.75  | 2.25  | 1.68    | 79    | 0.010 | -40.00 | -33.00 | 0.00    |
| 35    | 0.562 | -5.00  | 2.00  | 1.59    | 80    | 0.010 | -40.00 | -33.00 | 0.00    |
| 36    | 0.544 | -5.29  | 1.71  | 1.48    | 81    | 0.010 | -40.00 | -33.00 | 0.00    |
| 37    | 0.525 | -5.59  | 1.41  | 1.38    | 82    | 0.010 | -40.00 | -33.00 | 0.00    |
| 38    | 0.507 | -5.90  | 1.10  | 1.29    | 83    | 0.010 | -40.00 | -33.00 | 0.00    |
| 39    | 0.488 | -6.22  | 0.78  | 1.20    | 84    | 0.010 | -40.00 | -33.00 | 0.00    |
| 40    | 0.470 | -6.56  | 0.44  | 1.11    | 85    | 0.010 | -40.00 | -33.00 | 0.00    |
| 41    | 0.448 | -6.97  | 0.03  | 1.01    | 86    | 0.010 | -40.00 | -33.00 | 0.00    |
| 42    | 0.426 | -7.41  | -0.41 | 0.91    | 87    | 0.010 | -40.00 | -33.00 | 0.00    |
| 43    | 0.404 | -7.87  | -0.87 | 0.82    | 88    | 0.010 | -40.00 | -33.00 | 0.00    |
| 44    | 0.382 | -8.36  | -1.36 | 0.73    | 89    | 0.010 | -40.00 | -33.00 | 0.00    |

# Exhibit 13.8 - Copy of Directional Pattern Documentation from Antenna Manufacturer (Actual Pattern Rotated to 260.0°T)



CL-FM Log-periodic  
FM

Maximum gain: 7.0 dBd  
Horizontal polarization

Horizontal radiation pattern  
0 degree electrical downtilt

| Angle | Field | Rel.dB | dBd    | PwrMult | Angle | Field | Rel.dB | dBd    | PwrMult |
|-------|-------|--------|--------|---------|-------|-------|--------|--------|---------|
| 90    | 0.010 | -40.00 | -33.00 | 0.00    | 135   | 0.029 | -30.75 | -23.75 | 0.00    |
| 91    | 0.010 | -40.00 | -33.00 | 0.00    | 136   | 0.030 | -30.49 | -23.49 | 0.00    |
| 92    | 0.010 | -40.00 | -33.00 | 0.00    | 137   | 0.031 | -30.23 | -23.23 | 0.00    |
| 93    | 0.010 | -40.00 | -33.00 | 0.00    | 138   | 0.032 | -29.98 | -22.98 | 0.01    |
| 94    | 0.010 | -40.00 | -33.00 | 0.00    | 139   | 0.033 | -29.74 | -22.74 | 0.01    |
| 95    | 0.010 | -40.00 | -33.00 | 0.00    | 140   | 0.034 | -29.50 | -22.50 | 0.01    |
| 96    | 0.010 | -40.00 | -33.00 | 0.00    | 141   | 0.034 | -29.37 | -22.37 | 0.01    |
| 97    | 0.010 | -40.00 | -33.00 | 0.00    | 142   | 0.034 | -29.24 | -22.24 | 0.01    |
| 98    | 0.010 | -40.00 | -33.00 | 0.00    | 143   | 0.035 | -29.12 | -22.12 | 0.01    |
| 99    | 0.010 | -40.00 | -33.00 | 0.00    | 144   | 0.036 | -29.00 | -22.00 | 0.01    |
| 100   | 0.010 | -40.00 | -33.00 | 0.00    | 145   | 0.036 | -28.87 | -21.87 | 0.01    |
| 101   | 0.010 | -40.00 | -33.00 | 0.00    | 146   | 0.036 | -28.75 | -21.75 | 0.01    |
| 102   | 0.010 | -40.00 | -33.00 | 0.00    | 147   | 0.037 | -28.64 | -21.64 | 0.01    |
| 103   | 0.010 | -40.00 | -33.00 | 0.00    | 148   | 0.038 | -28.52 | -21.52 | 0.01    |
| 104   | 0.010 | -40.00 | -33.00 | 0.00    | 149   | 0.038 | -28.40 | -21.40 | 0.01    |
| 105   | 0.010 | -40.00 | -33.00 | 0.00    | 150   | 0.038 | -28.29 | -21.29 | 0.01    |
| 106   | 0.010 | -40.00 | -33.00 | 0.00    | 151   | 0.039 | -28.25 | -21.25 | 0.01    |
| 107   | 0.010 | -40.00 | -33.00 | 0.00    | 152   | 0.039 | -28.20 | -21.20 | 0.01    |
| 108   | 0.010 | -40.00 | -33.00 | 0.00    | 153   | 0.039 | -28.16 | -21.16 | 0.01    |
| 109   | 0.010 | -40.00 | -33.00 | 0.00    | 154   | 0.039 | -28.11 | -21.11 | 0.01    |
| 110   | 0.010 | -40.00 | -33.00 | 0.00    | 155   | 0.039 | -28.07 | -21.07 | 0.01    |
| 111   | 0.010 | -39.58 | -32.58 | 0.00    | 156   | 0.040 | -28.05 | -21.05 | 0.01    |
| 112   | 0.011 | -39.17 | -32.17 | 0.00    | 157   | 0.040 | -28.02 | -21.02 | 0.01    |
| 113   | 0.012 | -38.79 | -31.79 | 0.00    | 158   | 0.040 | -28.00 | -21.00 | 0.01    |
| 114   | 0.012 | -38.42 | -31.42 | 0.00    | 159   | 0.040 | -27.98 | -20.98 | 0.01    |
| 115   | 0.012 | -38.06 | -31.06 | 0.00    | 160   | 0.040 | -27.96 | -20.96 | 0.01    |
| 116   | 0.013 | -37.72 | -30.72 | 0.00    | 161   | 0.040 | -27.96 | -20.96 | 0.01    |
| 117   | 0.013 | -37.39 | -30.39 | 0.00    | 162   | 0.040 | -27.96 | -20.96 | 0.01    |
| 118   | 0.014 | -37.08 | -30.08 | 0.00    | 163   | 0.040 | -27.96 | -20.96 | 0.01    |
| 119   | 0.014 | -36.77 | -29.77 | 0.00    | 164   | 0.040 | -27.96 | -20.96 | 0.01    |
| 120   | 0.015 | -36.48 | -29.48 | 0.00    | 165   | 0.040 | -27.96 | -20.96 | 0.01    |
| 121   | 0.016 | -35.92 | -28.92 | 0.00    | 166   | 0.040 | -27.96 | -20.96 | 0.01    |
| 122   | 0.017 | -35.39 | -28.39 | 0.00    | 167   | 0.040 | -27.96 | -20.96 | 0.01    |
| 123   | 0.018 | -34.89 | -27.89 | 0.00    | 168   | 0.040 | -27.96 | -20.96 | 0.01    |
| 124   | 0.019 | -34.42 | -27.42 | 0.00    | 169   | 0.040 | -27.96 | -20.96 | 0.01    |
| 125   | 0.020 | -33.98 | -26.98 | 0.00    | 170   | 0.040 | -27.96 | -20.96 | 0.01    |
| 126   | 0.021 | -33.56 | -26.56 | 0.00    | 171   | 0.040 | -27.96 | -20.96 | 0.01    |
| 127   | 0.022 | -33.15 | -26.15 | 0.00    | 172   | 0.040 | -27.96 | -20.96 | 0.01    |
| 128   | 0.023 | -32.77 | -25.77 | 0.00    | 173   | 0.040 | -27.96 | -20.96 | 0.01    |
| 129   | 0.024 | -32.40 | -25.40 | 0.00    | 174   | 0.040 | -27.96 | -20.96 | 0.01    |
| 130   | 0.025 | -32.04 | -25.04 | 0.00    | 175   | 0.040 | -27.96 | -20.96 | 0.01    |
| 131   | 0.026 | -31.77 | -24.77 | 0.00    | 176   | 0.040 | -27.96 | -20.96 | 0.01    |
| 132   | 0.027 | -31.50 | -24.50 | 0.00    | 177   | 0.040 | -27.96 | -20.96 | 0.01    |
| 133   | 0.027 | -31.24 | -24.24 | 0.00    | 178   | 0.040 | -27.96 | -20.96 | 0.01    |
| 134   | 0.028 | -31.00 | -24.00 | 0.00    | 179   | 0.040 | -27.96 | -20.96 | 0.01    |



# Exhibit 13.8 - Copy of Directional Pattern Documentation from Antenna Manufacturer (Actual Pattern Rotated to 260.0°T)



CL-FM Log-periodic

FM

Maximum gain: 7.0 dBd

Horizontal polarization

Horizontal radiation pattern

0 degree electrical downtilt

| Angle | Field | Rel.dB | dBd    | PwrMult | Angle | Field | Rel.dB | dBd    | PwrMult |
|-------|-------|--------|--------|---------|-------|-------|--------|--------|---------|
| 180   | 0.040 | -27.96 | -20.96 | 0.01    | 225   | 0.029 | -30.75 | -23.75 | 0.00    |
| 181   | 0.040 | -27.96 | -20.96 | 0.01    | 226   | 0.028 | -31.00 | -24.00 | 0.00    |
| 182   | 0.040 | -27.96 | -20.96 | 0.01    | 227   | 0.027 | -31.24 | -24.24 | 0.00    |
| 183   | 0.040 | -27.96 | -20.96 | 0.01    | 228   | 0.027 | -31.50 | -24.50 | 0.00    |
| 184   | 0.040 | -27.96 | -20.96 | 0.01    | 229   | 0.026 | -31.77 | -24.77 | 0.00    |
| 185   | 0.040 | -27.96 | -20.96 | 0.01    | 230   | 0.025 | -32.04 | -25.04 | 0.00    |
| 186   | 0.040 | -27.96 | -20.96 | 0.01    | 231   | 0.024 | -32.40 | -25.40 | 0.00    |
| 187   | 0.040 | -27.96 | -20.96 | 0.01    | 232   | 0.023 | -32.77 | -25.77 | 0.00    |
| 188   | 0.040 | -27.96 | -20.96 | 0.01    | 233   | 0.022 | -33.15 | -26.15 | 0.00    |
| 189   | 0.040 | -27.96 | -20.96 | 0.01    | 234   | 0.021 | -33.56 | -26.56 | 0.00    |
| 190   | 0.040 | -27.96 | -20.96 | 0.01    | 235   | 0.020 | -33.98 | -26.98 | 0.00    |
| 191   | 0.040 | -27.96 | -20.96 | 0.01    | 236   | 0.019 | -34.42 | -27.42 | 0.00    |
| 192   | 0.040 | -27.96 | -20.96 | 0.01    | 237   | 0.018 | -34.89 | -27.89 | 0.00    |
| 193   | 0.040 | -27.96 | -20.96 | 0.01    | 238   | 0.017 | -35.39 | -28.39 | 0.00    |
| 194   | 0.040 | -27.96 | -20.96 | 0.01    | 239   | 0.016 | -35.92 | -28.92 | 0.00    |
| 195   | 0.040 | -27.96 | -20.96 | 0.01    | 240   | 0.015 | -36.48 | -29.48 | 0.00    |
| 196   | 0.040 | -27.96 | -20.96 | 0.01    | 241   | 0.014 | -36.77 | -29.77 | 0.00    |
| 197   | 0.040 | -27.96 | -20.96 | 0.01    | 242   | 0.014 | -37.08 | -30.08 | 0.00    |
| 198   | 0.040 | -27.96 | -20.96 | 0.01    | 243   | 0.013 | -37.39 | -30.39 | 0.00    |
| 199   | 0.040 | -27.96 | -20.96 | 0.01    | 244   | 0.013 | -37.72 | -30.72 | 0.00    |
| 200   | 0.040 | -27.96 | -20.96 | 0.01    | 245   | 0.012 | -38.06 | -31.06 | 0.00    |
| 201   | 0.040 | -27.98 | -20.98 | 0.01    | 246   | 0.012 | -38.42 | -31.42 | 0.00    |
| 202   | 0.040 | -28.00 | -21.00 | 0.01    | 247   | 0.012 | -38.79 | -31.79 | 0.00    |
| 203   | 0.040 | -28.02 | -21.02 | 0.01    | 248   | 0.011 | -39.17 | -32.17 | 0.00    |
| 204   | 0.040 | -28.05 | -21.05 | 0.01    | 249   | 0.010 | -39.58 | -32.58 | 0.00    |
| 205   | 0.039 | -28.07 | -21.07 | 0.01    | 250   | 0.010 | -40.00 | -33.00 | 0.00    |
| 206   | 0.039 | -28.11 | -21.11 | 0.01    | 251   | 0.010 | -40.00 | -33.00 | 0.00    |
| 207   | 0.039 | -28.16 | -21.16 | 0.01    | 252   | 0.010 | -40.00 | -33.00 | 0.00    |
| 208   | 0.039 | -28.20 | -21.20 | 0.01    | 253   | 0.010 | -40.00 | -33.00 | 0.00    |
| 209   | 0.039 | -28.25 | -21.25 | 0.01    | 254   | 0.010 | -40.00 | -33.00 | 0.00    |
| 210   | 0.038 | -28.29 | -21.29 | 0.01    | 255   | 0.010 | -40.00 | -33.00 | 0.00    |
| 211   | 0.038 | -28.40 | -21.40 | 0.01    | 256   | 0.010 | -40.00 | -33.00 | 0.00    |
| 212   | 0.038 | -28.52 | -21.52 | 0.01    | 257   | 0.010 | -40.00 | -33.00 | 0.00    |
| 213   | 0.037 | -28.64 | -21.64 | 0.01    | 258   | 0.010 | -40.00 | -33.00 | 0.00    |
| 214   | 0.036 | -28.75 | -21.75 | 0.01    | 259   | 0.010 | -40.00 | -33.00 | 0.00    |
| 215   | 0.036 | -28.87 | -21.87 | 0.01    | 260   | 0.010 | -40.00 | -33.00 | 0.00    |
| 216   | 0.036 | -29.00 | -22.00 | 0.01    | 261   | 0.010 | -40.00 | -33.00 | 0.00    |
| 217   | 0.035 | -29.12 | -22.12 | 0.01    | 262   | 0.010 | -40.00 | -33.00 | 0.00    |
| 218   | 0.034 | -29.24 | -22.24 | 0.01    | 263   | 0.010 | -40.00 | -33.00 | 0.00    |
| 219   | 0.034 | -29.37 | -22.37 | 0.01    | 264   | 0.010 | -40.00 | -33.00 | 0.00    |
| 220   | 0.034 | -29.50 | -22.50 | 0.01    | 265   | 0.010 | -40.00 | -33.00 | 0.00    |
| 221   | 0.033 | -29.74 | -22.74 | 0.01    | 266   | 0.010 | -40.00 | -33.00 | 0.00    |
| 222   | 0.032 | -29.98 | -22.98 | 0.01    | 267   | 0.010 | -40.00 | -33.00 | 0.00    |
| 223   | 0.031 | -30.23 | -23.23 | 0.00    | 268   | 0.010 | -40.00 | -33.00 | 0.00    |
| 224   | 0.030 | -30.49 | -23.49 | 0.00    | 269   | 0.010 | -40.00 | -33.00 | 0.00    |

# Exhibit 13.8 - Copy of Directional Pattern Documentation from Antenna Manufacturer (Actual Pattern Rotated to 260.0°T)



CL-FM Log-periodic

FM

Maximum gain: 7.0 dBd

Horizontal polarization

Horizontal radiation pattern

0 degree electrical downtilt

| Angle | Field | Rel.dB | dBd    | PwrMult | Angle | Field | Rel.dB | dBd   | PwrMult |
|-------|-------|--------|--------|---------|-------|-------|--------|-------|---------|
| 270   | 0.010 | -40.00 | -33.00 | 0.00    | 315   | 0.360 | -8.87  | -1.87 | 0.65    |
| 271   | 0.010 | -40.00 | -33.00 | 0.00    | 316   | 0.382 | -8.36  | -1.36 | 0.73    |
| 272   | 0.010 | -40.00 | -33.00 | 0.00    | 317   | 0.404 | -7.87  | -0.87 | 0.82    |
| 273   | 0.010 | -40.00 | -33.00 | 0.00    | 318   | 0.426 | -7.41  | -0.41 | 0.91    |
| 274   | 0.010 | -40.00 | -33.00 | 0.00    | 319   | 0.448 | -6.97  | 0.03  | 1.01    |
| 275   | 0.010 | -40.00 | -33.00 | 0.00    | 320   | 0.470 | -6.56  | 0.44  | 1.11    |
| 276   | 0.010 | -40.00 | -33.00 | 0.00    | 321   | 0.488 | -6.22  | 0.78  | 1.20    |
| 277   | 0.010 | -40.00 | -33.00 | 0.00    | 322   | 0.507 | -5.90  | 1.10  | 1.29    |
| 278   | 0.010 | -40.00 | -33.00 | 0.00    | 323   | 0.525 | -5.59  | 1.41  | 1.38    |
| 279   | 0.010 | -40.00 | -33.00 | 0.00    | 324   | 0.544 | -5.29  | 1.71  | 1.48    |
| 280   | 0.010 | -40.00 | -33.00 | 0.00    | 325   | 0.562 | -5.00  | 2.00  | 1.59    |
| 281   | 0.010 | -40.00 | -33.00 | 0.00    | 326   | 0.579 | -4.75  | 2.25  | 1.68    |
| 282   | 0.010 | -40.00 | -33.00 | 0.00    | 327   | 0.595 | -4.50  | 2.50  | 1.78    |
| 283   | 0.010 | -40.00 | -33.00 | 0.00    | 328   | 0.612 | -4.26  | 2.74  | 1.88    |
| 284   | 0.010 | -40.00 | -33.00 | 0.00    | 329   | 0.628 | -4.03  | 2.97  | 1.98    |
| 285   | 0.010 | -40.00 | -33.00 | 0.00    | 330   | 0.645 | -3.81  | 3.19  | 2.09    |
| 286   | 0.012 | -38.42 | -31.42 | 0.00    | 331   | 0.663 | -3.57  | 3.43  | 2.20    |
| 287   | 0.014 | -37.08 | -30.08 | 0.00    | 332   | 0.681 | -3.34  | 3.66  | 2.32    |
| 288   | 0.016 | -35.92 | -28.92 | 0.00    | 333   | 0.699 | -3.11  | 3.89  | 2.45    |
| 289   | 0.018 | -34.89 | -27.89 | 0.00    | 334   | 0.717 | -2.89  | 4.11  | 2.58    |
| 290   | 0.020 | -33.98 | -26.98 | 0.00    | 335   | 0.735 | -2.67  | 4.33  | 2.71    |
| 291   | 0.025 | -32.04 | -25.04 | 0.00    | 336   | 0.752 | -2.48  | 4.52  | 2.83    |
| 292   | 0.030 | -30.46 | -23.46 | 0.00    | 337   | 0.769 | -2.28  | 4.72  | 2.96    |
| 293   | 0.035 | -29.12 | -22.12 | 0.01    | 338   | 0.786 | -2.09  | 4.91  | 3.10    |
| 294   | 0.040 | -27.96 | -20.96 | 0.01    | 339   | 0.803 | -1.91  | 5.09  | 3.23    |
| 295   | 0.045 | -26.94 | -19.94 | 0.01    | 340   | 0.820 | -1.72  | 5.28  | 3.37    |
| 296   | 0.053 | -25.51 | -18.51 | 0.01    | 341   | 0.835 | -1.57  | 5.43  | 3.49    |
| 297   | 0.061 | -24.29 | -17.29 | 0.02    | 342   | 0.850 | -1.41  | 5.59  | 3.62    |
| 298   | 0.069 | -23.22 | -16.22 | 0.02    | 343   | 0.865 | -1.26  | 5.74  | 3.75    |
| 299   | 0.077 | -22.27 | -15.27 | 0.03    | 344   | 0.880 | -1.11  | 5.89  | 3.88    |
| 300   | 0.085 | -21.41 | -14.41 | 0.04    | 345   | 0.895 | -0.96  | 6.04  | 4.01    |
| 301   | 0.099 | -20.09 | -13.09 | 0.05    | 346   | 0.906 | -0.86  | 6.14  | 4.11    |
| 302   | 0.113 | -18.94 | -11.94 | 0.06    | 347   | 0.917 | -0.75  | 6.25  | 4.21    |
| 303   | 0.127 | -17.92 | -10.92 | 0.08    | 348   | 0.928 | -0.65  | 6.35  | 4.32    |
| 304   | 0.141 | -17.02 | -10.02 | 0.10    | 349   | 0.939 | -0.55  | 6.45  | 4.42    |
| 305   | 0.155 | -16.19 | -9.19  | 0.12    | 350   | 0.950 | -0.45  | 6.55  | 4.52    |
| 306   | 0.174 | -15.19 | -8.19  | 0.15    | 351   | 0.956 | -0.39  | 6.61  | 4.58    |
| 307   | 0.193 | -14.29 | -7.29  | 0.19    | 352   | 0.962 | -0.34  | 6.66  | 4.64    |
| 308   | 0.212 | -13.47 | -6.47  | 0.23    | 353   | 0.968 | -0.28  | 6.72  | 4.70    |
| 309   | 0.231 | -12.73 | -5.73  | 0.27    | 354   | 0.974 | -0.23  | 6.77  | 4.75    |
| 310   | 0.250 | -12.04 | -5.04  | 0.31    | 355   | 0.980 | -0.18  | 6.82  | 4.81    |
| 311   | 0.272 | -11.31 | -4.31  | 0.37    | 356   | 0.984 | -0.14  | 6.86  | 4.85    |
| 312   | 0.294 | -10.63 | -3.63  | 0.43    | 357   | 0.988 | -0.10  | 6.90  | 4.89    |
| 313   | 0.316 | -10.01 | -3.01  | 0.50    | 358   | 0.992 | -0.07  | 6.93  | 4.93    |
| 314   | 0.338 | -9.42  | -2.42  | 0.57    | 359   | 0.996 | -0.03  | 6.97  | 4.97    |