

ENGINEERING STATEMENT  
RE BROADCAST ENGINEERING DATA  
APPLICATION FOR DIGITAL DISPLACEMENT  
OF A LICENSED ANALOG LPTV FACILITY  
K69CS, MEETEETSE, WYOMING  
CHANNEL 21 15 KW ND ERP 1971.0 METERS RCAMSL

JUNE 2009

COHEN, DIPPELL AND EVERIST, P.C.  
CONSULTING ENGINEERS  
RADIO AND TELEVISION  
WASHINGTON, D.C.

COHEN, DIPPELL AND EVERIST, P. C.

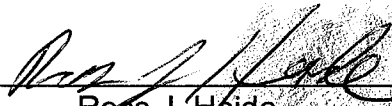
City of Washington                    )  
  ) ss  
District of Columbia                )

Ross J. Heide, being duly sworn upon his oath, deposes and states that:

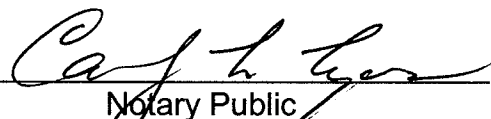
He is a graduate of the Massachusetts Institute of Technology in Operations Research and Management Science, a Registered Professional Engineer in the District of Columbia, and employed by Cohen, Dippell and Everist, P.C., Consulting Engineers, Radio - Television, with offices at 1300 L Street, N.W., Suite 1100, Washington, D.C. 20005;

That the attached engineering report was prepared by him or under his supervision and direction and

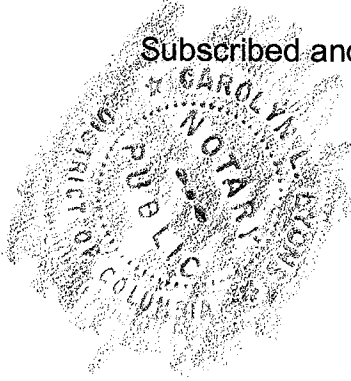
That the facts stated herein are true of his own knowledge, except such facts as are stated to be on information and belief, and as to such facts he believes them to be true.

  
\_\_\_\_\_  
Ross J. Heide  
District of Columbia  
Professional Engineer  
Registration No. PE900748

Subscribed and sworn to before me this 30th day of June, 2009.

  
\_\_\_\_\_  
Notary Public

My Commission Expires: 2/28/2013



This engineering statement has been prepared in support of an application for construction permit for the digital displacement of a currently licensed low-power television ("LPTV") facility on behalf of Park County, licensee of TV translator station K69CS, Meeteetse, Wyoming ("K69CS"). K69CS is licensed to operate on NTSC television Channel 69 with a maximum visual effective radiated power ("ERP") of 2.9 kW and an antenna radiation center above mean sea level ("RCAMSL") of 1971 meters.

The purpose of this application is to propose "in-core" digital LPTV facilities of 15 kW ERP (non-directional) at a RCAMSL of 1971 meters. A coverage map of the proposed facility has been included as Exhibit E-1 of this report. The proposed translator will rebroadcast the DTV transmission of KTVQ-DT, Ch. 10, Billings, Montana (Facility ID Number 35694). The translator input channel will be Ch. 10, KTVQ-DT over-the-air.

The existing transmitter site is located on a ridge approximately 3 km west of Meeteetse, Wyoming. The existing tower has a total overall structure height above ground of 17 meters (55.8 feet) and is not registered. The K69CS antenna will be side-mounted on this tower with center of radiation at 15 meters above ground level.

The geographic coordinates of the proposed site are as follows:

North Latitude: 44° 08' 45"

West Longitude: 108° 54' 15"

NAD-27

Equipment Data

Antenna: Kathrein Scala, Type SL-8NF Paraslot (or equivalent) antenna with 1.25° electrical beam tilt. The vertical plane pattern and other exhibits are herein included as Exhibit E-2.

Transmission Line: Dielectric, FlexLine, 7/8", 50 ohm, coaxial TL, 18.3 meters (60 feet)

Power Data

|  |         |           |
|--|---------|-----------|
| Transmitter output   | 1.52 kW | 1.83 dBk  |
| Transmission line efficiency/loss<br>18.3 meters (60 feet) | 87.8%   | 0.57 dB   |
| Input power to the antenna                                 | 1.34 kW | 1.26 dBk  |
| Antenna power gain   | 11.22   | 10.50 dB  |
| Effective Radiated Power                                   | 15 kW   | 11.76 dBk |

Elevation Data

|   |                            |
|---|----------------------------|
| Vertical dimension for Channel 21 antenna   | 7.3 meters<br>24 feet      |
| Overall height above ground of the<br>proposed antenna structure (including beacon) | 17 meters<br>55.8 feet     |
| Center of radiation of Channel 21<br>antenna above ground                           | 15 meters<br>49.2 feet     |
| Elevation of site above mean sea level  | 1956 meters<br>6417.3 feet |
| Center of radiation of Channel 21<br>antenna above mean sea level                   | 1971 meters<br>6466.5 feet |

|  |             |
|--|-------------|
| Overall height above mean sea level              | 1973 meters |
| of proposed tower and antenna (including beacon) | 6473.1 feet |

Note: Slight height differences may result due to conversion to metric.

#### Allocation

The proposed digital operation on Channel 21 at Meeteetse, New York, conforms to the requirements of Sections 74.709, 74.793(e), 74.793(f), 74.793(g), 74.793(h), 74.794(b), and 73.1030 of the Commission's Rules. The requirements of these sections regarding this proposed Channel 21 operation of K69CS are met through demonstration of Longley-Rice prediction methodology where applicable, attached as Table I. The proposed digital low-power television station will not cause any objectionable interference to any existing or proposed full-service DTV station or LPTV/TV translators. Additionally, the proposed operation includes plans for installing a filter that will meet the stringent emission mask with attenuation of at least 85 dB in the L5 (1164-1215 MHz), L2 (1215-1240 MHz), and L1 (1559-1610 MHz) bands in order to comply with Section 74.794(b) of the FCC Rules. The proposed operation is beyond the Canadian coordination distance.

#### Interference Analysis

A study of predicted interference caused by the proposed K69CS low-power television station operation has been performed as shown in Table I using the Longley-Rice program for which the source data has been posted by the Commission on its website at [http://www.fcc.gov/oet/dtv/dtv\\_apps.html](http://www.fcc.gov/oet/dtv/dtv_apps.html). The FCC's FORTRAN-77 code was modified only to the extent necessary (primarily input/output handling) for the program to run on a Microsoft

Windows XP platform. Comparison of service/interference areas and population indicates this model closely matches the FCC's digital low-power TV/translator evaluation program. Best efforts have been made to use data and calculation identical to the FCC's program with the simple emission mask. The model employs the Longley-Rice propagation methodology and evaluates in grid cells of approximately 1 sq. km. Using 3-second terrain data sampled approximately every 1.0 km at one-degree azimuth intervals with 1990 census centroids, all studies are based upon data in the current CDBS database update of the FCC's engineering database. A Longley-Rice study was performed with the proposed K69CS low-power digital facilities and all relevant stations listed in the FCC database as of June 26, 2009.

#### RFF Analysis

There are no AM stations located within two km of the existing K69CS tower site. According to the FCC CDBS database, there are five LPTV stations including K69CS located on this tower. There are no other broadcast stations located within 1 km of the site. The tower property is located in a remote area with access to the site controlled by a locked gate.

The proposed operation, based upon the current OET Bulletin No. 65, Edition 97-01, dated August 1997 and Supplement A, meets the provisions of the FCC radio frequency field ("RFF") guidelines, and thus, complies with Section 1.1307 of the FCC Rules.

K69CS proposes to operate with a Scala, Type SL-8NF antenna with an effective radiated power of 15 kW on UHF Channel 21 with a center of radiation above ground of 15 meters (24 feet). As shown, the elevation pattern for this antenna shows a maximum relative field of less than 0.28 towards the ground in the vicinity of the tower. Using this relative field

factor and the procedures prescribed in OET Bulletin 65, the maximum RFF resulting from the proposed operation is  $233 \mu\text{W}/\text{cm}^2$ . This is 68% of the  $341.3 \mu\text{W}/\text{cm}^2$  maximum human exposure to RFF recommended by the FCC guidelines for an uncontrolled environment.

Although the total RFF contribution of all proposed LPTV operations at the site will exceed the FCC guidelines for the general population, authorized personnel and rigging contractors will be alerted to the potential zone of high radiation on the tower, and if necessary, the station will operate with reduced power or terminate the operation of the transmitter as appropriate when it is necessary for authorized personnel or contractors to perform work on the tower. When the proposed facilities are constructed, the area will be posted with the appropriate warning signs. Workers and the general public, therefore, will not be subjected to RFF levels in excess of the current FCC guidelines.

#### Environmental Statement

An environmental assessment ("EA") is categorically excluded under Section 1.1306 of the FCC Rules and Regulations as the tower was constructed prior to the requirements specified in WT Docket No. 03-128 and the licensee indicates:

- (a)(1) The proposed facilities are not located in an officially designated wilderness area.
- (a)(2) The proposed facilities are not located in an officially designated wildlife preserve.
- (a)(3) The proposed facilities will not affect any listed threatened or endangered species or habitats.

- (a)(3)(ii) The proposed facilities will not jeopardize the continued existence of any proposed endangered or threatened species or likely to result in the destruction or adverse modification of proposed critical habitats.
- (a)(4) The proposed facilities located on a tower which was built prior to the adoption of WT Docket No. 03-128 and is grandfathered and has not affected any known districts, sites, buildings, structures, or objects significant in American history, architecture, archaeology, engineering, or culture.
- (a)(5) The existing tower is not located near any known Indian religious sites.
- (a)(6) The existing tower is not located in a flood plain.
- (a)(7) The installation of the DTV facilities on an existing tower at an existing site will not involve a significant change in surface features of the ground in the vicinity of the tower.
- (a)(8) The existing tower lighting will remain unchanged.
- (b) Workers and the general public will not be subjected to RFF levels in excess of the current FCC guidelines contained in OET Bulletin 65 (Edition 97-01) and Supplement A. Authorized personnel will be alerted to areas of the antennas where potential radiation levels are in excess of the FCC guidelines. A security fence with a locked gate precludes access to the tower site.



**COHEN, DIPPELL AND EVERIST, P.C. Consulting Engineers Washington, D.C.**

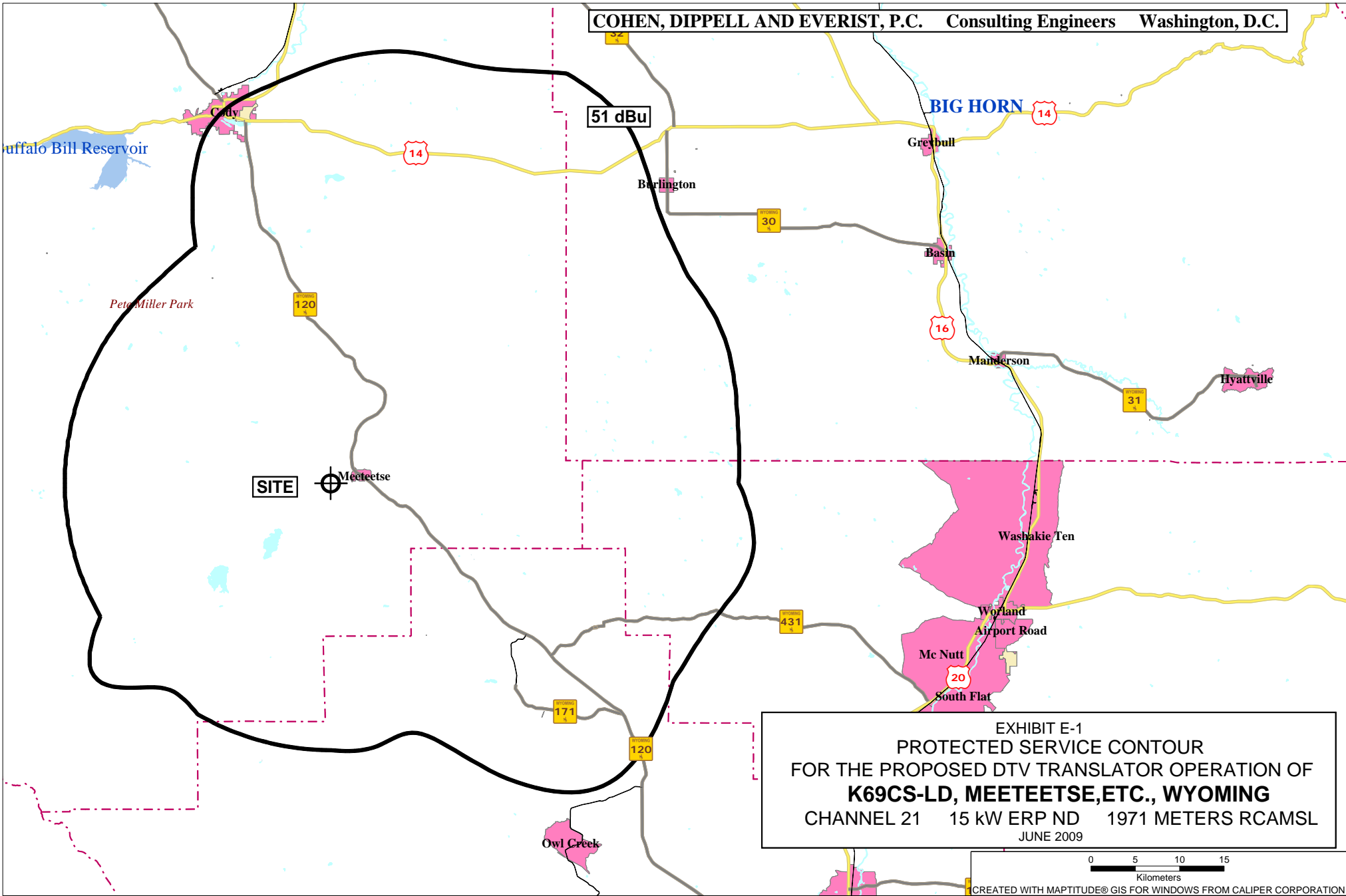


EXHIBIT E-1  
PROTECTED SERVICE CONTOUR  
FOR THE PROPOSED DTV TRANSLATOR OPERATION OF  
**K69CS-LD, MEETEETSE, ETC., WYOMING**  
CHANNEL 21 15 kW ERP ND 1971 METERS RCAMSL  
JUNE 2009

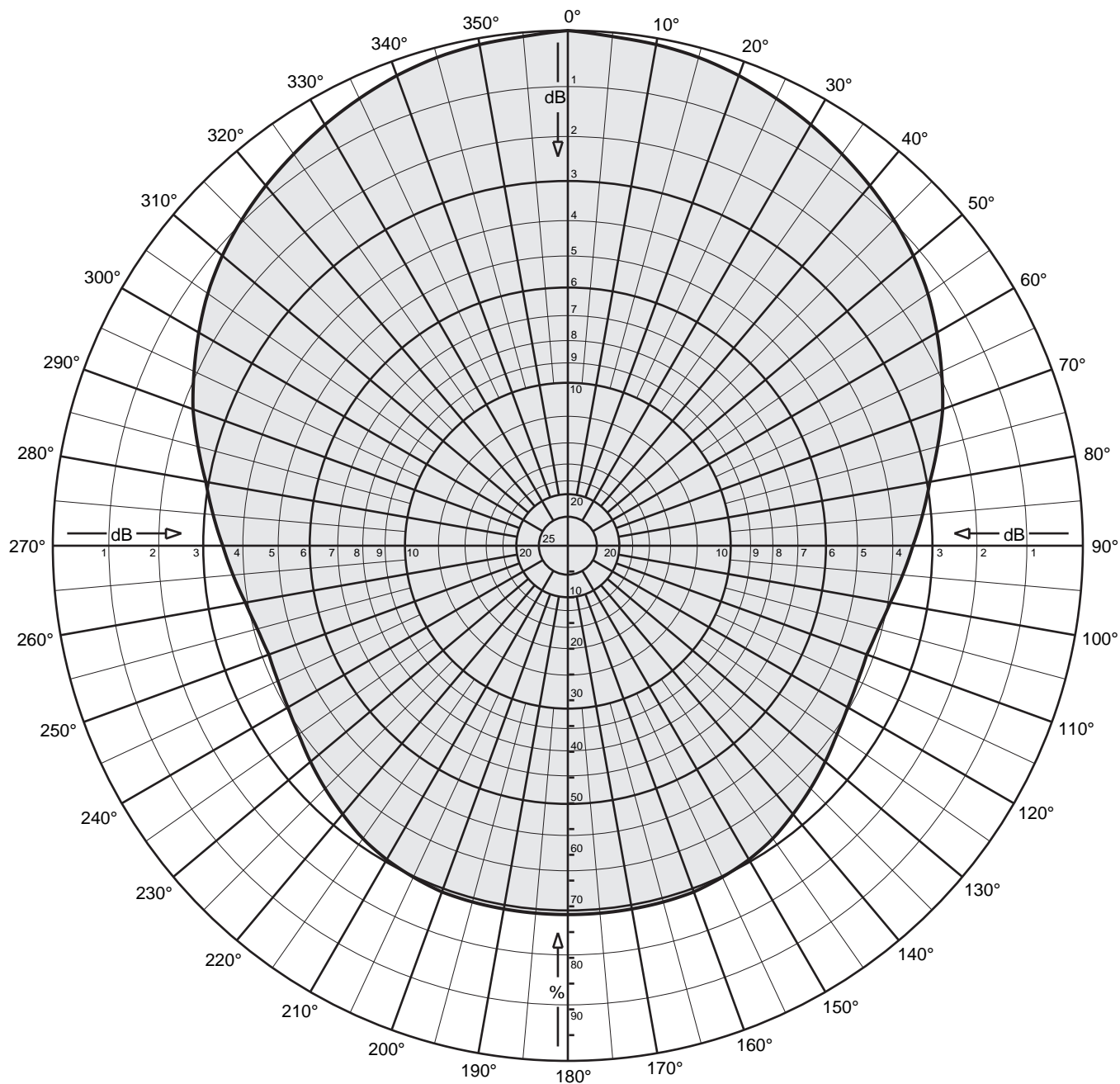
1CREATED WITH MAPTITUDE® GIS FOR WINDOWS FROM CALIPER CORPORATION

COHEN, DIPPELL AND EVERIST, P.C.

EXHIBIT E-2

ANTENNA MANUFACTURER DATA

K69CS, MEETEETSE, WYOMING



SL-8NF Paraslot w/ null-fill

Ch-21

Maximum gain: 10.5 dBd

Horizontal polarization

Horizontal radiation pattern

1.25 degree electrical downtilt

(Azimuth pattern at horizon)



SL-8NF Paraslot w/ null-fill  
Ch-21

Maximum gain: 10.5 dBd

Horizontal polarization

Horizontal radiation pattern  
1.25 degree electrical downtilt

(Azimuth pattern at horizon)

| Angle | Field | Rel.dB | dBd  | PwrMult | Angle | Field | Rel.dB | dBd  | PwrMult |
|-------|-------|--------|------|---------|-------|-------|--------|------|---------|
| 0     | 1.000 | 0.00   | 9.70 | 9.33    | 45    | 0.895 | -0.96  | 8.74 | 7.48    |
| 1     | 0.998 | -0.01  | 9.69 | 9.30    | 46    | 0.891 | -1.00  | 8.70 | 7.42    |
| 2     | 0.997 | -0.03  | 9.67 | 9.27    | 47    | 0.888 | -1.04  | 8.66 | 7.35    |
| 3     | 0.995 | -0.04  | 9.66 | 9.24    | 48    | 0.884 | -1.07  | 8.63 | 7.29    |
| 4     | 0.993 | -0.06  | 9.64 | 9.21    | 49    | 0.880 | -1.11  | 8.59 | 7.22    |
| 5     | 0.992 | -0.07  | 9.63 | 9.19    | 50    | 0.876 | -1.15  | 8.55 | 7.16    |
| 6     | 0.991 | -0.08  | 9.62 | 9.17    | 51    | 0.871 | -1.20  | 8.50 | 7.09    |
| 7     | 0.990 | -0.08  | 9.62 | 9.15    | 52    | 0.867 | -1.24  | 8.46 | 7.02    |
| 8     | 0.989 | -0.09  | 9.61 | 9.14    | 53    | 0.863 | -1.28  | 8.42 | 6.94    |
| 9     | 0.989 | -0.10  | 9.60 | 9.12    | 54    | 0.858 | -1.33  | 8.37 | 6.87    |
| 10    | 0.988 | -0.11  | 9.59 | 9.11    | 55    | 0.853 | -1.38  | 8.32 | 6.80    |
| 11    | 0.987 | -0.12  | 9.58 | 9.08    | 56    | 0.849 | -1.43  | 8.27 | 6.72    |
| 12    | 0.985 | -0.13  | 9.57 | 9.06    | 57    | 0.843 | -1.48  | 8.22 | 6.64    |
| 13    | 0.984 | -0.14  | 9.56 | 9.04    | 58    | 0.838 | -1.53  | 8.17 | 6.55    |
| 14    | 0.983 | -0.15  | 9.55 | 9.01    | 59    | 0.833 | -1.59  | 8.11 | 6.47    |
| 15    | 0.981 | -0.17  | 9.53 | 8.98    | 60    | 0.827 | -1.64  | 8.06 | 6.39    |
| 16    | 0.979 | -0.18  | 9.52 | 8.95    | 61    | 0.822 | -1.70  | 8.00 | 6.31    |
| 17    | 0.977 | -0.20  | 9.50 | 8.92    | 62    | 0.817 | -1.76  | 7.94 | 6.23    |
| 18    | 0.975 | -0.22  | 9.48 | 8.88    | 63    | 0.811 | -1.82  | 7.88 | 6.14    |
| 19    | 0.973 | -0.24  | 9.46 | 8.84    | 64    | 0.806 | -1.87  | 7.83 | 6.06    |
| 20    | 0.971 | -0.25  | 9.45 | 8.80    | 65    | 0.801 | -1.93  | 7.77 | 5.98    |
| 21    | 0.969 | -0.28  | 9.42 | 8.75    | 66    | 0.795 | -1.99  | 7.71 | 5.91    |
| 22    | 0.966 | -0.30  | 9.40 | 8.71    | 67    | 0.790 | -2.04  | 7.66 | 5.83    |
| 23    | 0.963 | -0.33  | 9.37 | 8.66    | 68    | 0.785 | -2.10  | 7.60 | 5.75    |
| 24    | 0.961 | -0.35  | 9.35 | 8.61    | 69    | 0.780 | -2.16  | 7.54 | 5.67    |
| 25    | 0.958 | -0.37  | 9.33 | 8.56    | 70    | 0.775 | -2.22  | 7.48 | 5.60    |
| 26    | 0.955 | -0.40  | 9.30 | 8.51    | 71    | 0.768 | -2.29  | 7.41 | 5.51    |
| 27    | 0.952 | -0.43  | 9.27 | 8.46    | 72    | 0.762 | -2.36  | 7.34 | 5.42    |
| 28    | 0.949 | -0.45  | 9.25 | 8.41    | 73    | 0.756 | -2.43  | 7.27 | 5.33    |
| 29    | 0.946 | -0.48  | 9.22 | 8.36    | 74    | 0.749 | -2.50  | 7.20 | 5.24    |
| 30    | 0.944 | -0.50  | 9.20 | 8.31    | 75    | 0.743 | -2.58  | 7.12 | 5.16    |
| 31    | 0.941 | -0.53  | 9.17 | 8.26    | 76    | 0.737 | -2.65  | 7.05 | 5.07    |
| 32    | 0.937 | -0.56  | 9.14 | 8.20    | 77    | 0.731 | -2.72  | 6.98 | 4.99    |
| 33    | 0.934 | -0.59  | 9.11 | 8.15    | 78    | 0.725 | -2.79  | 6.91 | 4.91    |
| 34    | 0.931 | -0.62  | 9.08 | 8.09    | 79    | 0.720 | -2.86  | 6.84 | 4.83    |
| 35    | 0.928 | -0.65  | 9.05 | 8.04    | 80    | 0.714 | -2.93  | 6.77 | 4.75    |
| 36    | 0.925 | -0.68  | 9.02 | 7.98    | 81    | 0.709 | -2.98  | 6.72 | 4.69    |
| 37    | 0.922 | -0.71  | 8.99 | 7.93    | 82    | 0.705 | -3.04  | 6.66 | 4.64    |
| 38    | 0.919 | -0.74  | 8.96 | 7.88    | 83    | 0.700 | -3.09  | 6.61 | 4.58    |
| 39    | 0.916 | -0.77  | 8.93 | 7.82    | 84    | 0.696 | -3.15  | 6.55 | 4.52    |
| 40    | 0.912 | -0.80  | 8.90 | 7.77    | 85    | 0.691 | -3.20  | 6.50 | 4.46    |
| 41    | 0.909 | -0.83  | 8.87 | 7.71    | 86    | 0.687 | -3.26  | 6.44 | 4.41    |
| 42    | 0.906 | -0.86  | 8.84 | 7.65    | 87    | 0.683 | -3.31  | 6.39 | 4.35    |
| 43    | 0.902 | -0.89  | 8.81 | 7.60    | 88    | 0.679 | -3.37  | 6.33 | 4.30    |
| 44    | 0.899 | -0.93  | 8.77 | 7.54    | 89    | 0.674 | -3.42  | 6.28 | 4.24    |



SL-8NF Paraslot w/ null-fill  
Ch-21

Maximum gain: 10.5 dBd

Horizontal polarization

Horizontal radiation pattern  
1.25 degree electrical downtilt

(Azimuth pattern at horizon)

| Angle | Field | Rel.dB | dBd  | PwrMult | Angle | Field | Rel.dB | dBd  | PwrMult |
|-------|-------|--------|------|---------|-------|-------|--------|------|---------|
| 90    | 0.670 | -3.48  | 6.22 | 4.19    | 135   | 0.666 | -3.52  | 6.18 | 4.15    |
| 91    | 0.666 | -3.52  | 6.18 | 4.15    | 136   | 0.669 | -3.49  | 6.21 | 4.18    |
| 92    | 0.663 | -3.57  | 6.13 | 4.10    | 137   | 0.672 | -3.45  | 6.25 | 4.21    |
| 93    | 0.659 | -3.62  | 6.08 | 4.06    | 138   | 0.675 | -3.42  | 6.28 | 4.25    |
| 94    | 0.656 | -3.66  | 6.04 | 4.02    | 139   | 0.677 | -3.38  | 6.32 | 4.28    |
| 95    | 0.653 | -3.71  | 5.99 | 3.97    | 140   | 0.680 | -3.35  | 6.35 | 4.32    |
| 96    | 0.649 | -3.75  | 5.95 | 3.93    | 141   | 0.683 | -3.31  | 6.39 | 4.35    |
| 97    | 0.646 | -3.80  | 5.90 | 3.89    | 142   | 0.686 | -3.28  | 6.42 | 4.39    |
| 98    | 0.642 | -3.84  | 5.86 | 3.85    | 143   | 0.689 | -3.24  | 6.46 | 4.43    |
| 99    | 0.639 | -3.89  | 5.81 | 3.81    | 144   | 0.691 | -3.20  | 6.50 | 4.46    |
| 100   | 0.636 | -3.93  | 5.77 | 3.77    | 145   | 0.694 | -3.18  | 6.52 | 4.49    |
| 101   | 0.633 | -3.97  | 5.73 | 3.74    | 146   | 0.696 | -3.15  | 6.55 | 4.52    |
| 102   | 0.631 | -4.00  | 5.70 | 3.71    | 147   | 0.698 | -3.12  | 6.58 | 4.55    |
| 103   | 0.628 | -4.03  | 5.67 | 3.69    | 148   | 0.700 | -3.10  | 6.60 | 4.57    |
| 104   | 0.626 | -4.07  | 5.63 | 3.66    | 149   | 0.702 | -3.08  | 6.62 | 4.59    |
| 105   | 0.624 | -4.09  | 5.61 | 3.64    | 150   | 0.703 | -3.06  | 6.64 | 4.62    |
| 106   | 0.622 | -4.12  | 5.58 | 3.62    | 151   | 0.705 | -3.04  | 6.66 | 4.64    |
| 107   | 0.621 | -4.14  | 5.56 | 3.60    | 152   | 0.706 | -3.02  | 6.68 | 4.65    |
| 108   | 0.620 | -4.15  | 5.55 | 3.59    | 153   | 0.707 | -3.01  | 6.69 | 4.67    |
| 109   | 0.619 | -4.17  | 5.53 | 3.57    | 154   | 0.709 | -2.99  | 6.71 | 4.69    |
| 110   | 0.618 | -4.19  | 5.51 | 3.56    | 155   | 0.710 | -2.98  | 6.72 | 4.70    |
| 111   | 0.618 | -4.18  | 5.52 | 3.57    | 156   | 0.711 | -2.96  | 6.74 | 4.72    |
| 112   | 0.619 | -4.17  | 5.53 | 3.58    | 157   | 0.712 | -2.95  | 6.75 | 4.73    |
| 113   | 0.620 | -4.16  | 5.54 | 3.58    | 158   | 0.713 | -2.94  | 6.76 | 4.75    |
| 114   | 0.620 | -4.15  | 5.55 | 3.59    | 159   | 0.714 | -2.92  | 6.78 | 4.76    |
| 115   | 0.621 | -4.13  | 5.57 | 3.60    | 160   | 0.715 | -2.91  | 6.79 | 4.77    |
| 116   | 0.622 | -4.12  | 5.58 | 3.61    | 161   | 0.715 | -2.91  | 6.79 | 4.78    |
| 117   | 0.624 | -4.10  | 5.60 | 3.63    | 162   | 0.716 | -2.91  | 6.79 | 4.78    |
| 118   | 0.625 | -4.08  | 5.62 | 3.64    | 163   | 0.716 | -2.91  | 6.79 | 4.78    |
| 119   | 0.626 | -4.07  | 5.63 | 3.66    | 164   | 0.716 | -2.90  | 6.80 | 4.78    |
| 120   | 0.627 | -4.05  | 5.65 | 3.67    | 165   | 0.716 | -2.90  | 6.80 | 4.78    |
| 121   | 0.630 | -4.02  | 5.68 | 3.70    | 166   | 0.716 | -2.90  | 6.80 | 4.78    |
| 122   | 0.632 | -3.99  | 5.71 | 3.72    | 167   | 0.716 | -2.90  | 6.80 | 4.78    |
| 123   | 0.634 | -3.96  | 5.74 | 3.75    | 168   | 0.716 | -2.90  | 6.80 | 4.78    |
| 124   | 0.636 | -3.94  | 5.76 | 3.77    | 169   | 0.716 | -2.90  | 6.80 | 4.78    |
| 125   | 0.638 | -3.90  | 5.80 | 3.80    | 170   | 0.716 | -2.90  | 6.80 | 4.78    |
| 126   | 0.641 | -3.87  | 5.83 | 3.83    | 171   | 0.716 | -2.90  | 6.80 | 4.78    |
| 127   | 0.644 | -3.83  | 5.87 | 3.87    | 172   | 0.716 | -2.90  | 6.80 | 4.78    |
| 128   | 0.646 | -3.79  | 5.91 | 3.90    | 173   | 0.716 | -2.90  | 6.80 | 4.78    |
| 129   | 0.649 | -3.75  | 5.95 | 3.94    | 174   | 0.716 | -2.90  | 6.80 | 4.78    |
| 130   | 0.652 | -3.71  | 5.99 | 3.97    | 175   | 0.716 | -2.90  | 6.80 | 4.78    |
| 131   | 0.655 | -3.67  | 6.03 | 4.01    | 176   | 0.716 | -2.90  | 6.80 | 4.78    |
| 132   | 0.658 | -3.64  | 6.06 | 4.04    | 177   | 0.716 | -2.90  | 6.80 | 4.78    |
| 133   | 0.661 | -3.60  | 6.10 | 4.08    | 178   | 0.716 | -2.90  | 6.80 | 4.78    |
| 134   | 0.664 | -3.56  | 6.14 | 4.11    | 179   | 0.716 | -2.90  | 6.80 | 4.78    |



SL-8NF Paraslot w/ null-fill  
Ch-21

Maximum gain: 10.5 dBd

Horizontal polarization

Horizontal radiation pattern  
1.25 degree electrical downtilt

(Azimuth pattern at horizon)

| Angle | Field | Rel.dB | dBd  | PwrMult | Angle | Field | Rel.dB | dBd  | PwrMult |
|-------|-------|--------|------|---------|-------|-------|--------|------|---------|
| 180   | 0.716 | -2.90  | 6.80 | 4.78    | 225   | 0.666 | -3.52  | 6.18 | 4.15    |
| 181   | 0.716 | -2.90  | 6.80 | 4.78    | 226   | 0.664 | -3.56  | 6.14 | 4.11    |
| 182   | 0.716 | -2.90  | 6.80 | 4.78    | 227   | 0.661 | -3.60  | 6.10 | 4.08    |
| 183   | 0.716 | -2.90  | 6.80 | 4.78    | 228   | 0.658 | -3.64  | 6.06 | 4.04    |
| 184   | 0.716 | -2.90  | 6.80 | 4.78    | 229   | 0.655 | -3.67  | 6.03 | 4.01    |
| 185   | 0.716 | -2.90  | 6.80 | 4.78    | 230   | 0.652 | -3.71  | 5.99 | 3.97    |
| 186   | 0.716 | -2.90  | 6.80 | 4.78    | 231   | 0.649 | -3.75  | 5.95 | 3.94    |
| 187   | 0.716 | -2.90  | 6.80 | 4.78    | 232   | 0.646 | -3.79  | 5.91 | 3.90    |
| 188   | 0.716 | -2.90  | 6.80 | 4.78    | 233   | 0.644 | -3.83  | 5.87 | 3.87    |
| 189   | 0.716 | -2.90  | 6.80 | 4.78    | 234   | 0.641 | -3.87  | 5.83 | 3.83    |
| 190   | 0.716 | -2.90  | 6.80 | 4.78    | 235   | 0.638 | -3.90  | 5.80 | 3.80    |
| 191   | 0.716 | -2.90  | 6.80 | 4.78    | 236   | 0.636 | -3.94  | 5.76 | 3.77    |
| 192   | 0.716 | -2.90  | 6.80 | 4.78    | 237   | 0.634 | -3.96  | 5.74 | 3.75    |
| 193   | 0.716 | -2.90  | 6.80 | 4.78    | 238   | 0.632 | -3.99  | 5.71 | 3.72    |
| 194   | 0.716 | -2.90  | 6.80 | 4.78    | 239   | 0.630 | -4.02  | 5.68 | 3.70    |
| 195   | 0.716 | -2.90  | 6.80 | 4.78    | 240   | 0.627 | -4.05  | 5.65 | 3.67    |
| 196   | 0.716 | -2.90  | 6.80 | 4.78    | 241   | 0.626 | -4.07  | 5.63 | 3.66    |
| 197   | 0.716 | -2.91  | 6.79 | 4.78    | 242   | 0.625 | -4.08  | 5.62 | 3.64    |
| 198   | 0.716 | -2.91  | 6.79 | 4.78    | 243   | 0.624 | -4.10  | 5.60 | 3.63    |
| 199   | 0.715 | -2.91  | 6.79 | 4.78    | 244   | 0.622 | -4.12  | 5.58 | 3.61    |
| 200   | 0.715 | -2.91  | 6.79 | 4.77    | 245   | 0.621 | -4.13  | 5.57 | 3.60    |
| 201   | 0.714 | -2.92  | 6.78 | 4.76    | 246   | 0.620 | -4.15  | 5.55 | 3.59    |
| 202   | 0.713 | -2.94  | 6.76 | 4.75    | 247   | 0.620 | -4.16  | 5.54 | 3.58    |
| 203   | 0.712 | -2.95  | 6.75 | 4.73    | 248   | 0.619 | -4.17  | 5.53 | 3.58    |
| 204   | 0.711 | -2.96  | 6.74 | 4.72    | 249   | 0.618 | -4.18  | 5.52 | 3.57    |
| 205   | 0.710 | -2.98  | 6.72 | 4.70    | 250   | 0.618 | -4.19  | 5.51 | 3.56    |
| 206   | 0.709 | -2.99  | 6.71 | 4.69    | 251   | 0.619 | -4.17  | 5.53 | 3.57    |
| 207   | 0.707 | -3.01  | 6.69 | 4.67    | 252   | 0.620 | -4.15  | 5.55 | 3.59    |
| 208   | 0.706 | -3.02  | 6.68 | 4.65    | 253   | 0.621 | -4.14  | 5.56 | 3.60    |
| 209   | 0.705 | -3.04  | 6.66 | 4.64    | 254   | 0.622 | -4.12  | 5.58 | 3.62    |
| 210   | 0.703 | -3.06  | 6.64 | 4.62    | 255   | 0.624 | -4.09  | 5.61 | 3.64    |
| 211   | 0.702 | -3.08  | 6.62 | 4.59    | 256   | 0.626 | -4.07  | 5.63 | 3.66    |
| 212   | 0.700 | -3.10  | 6.60 | 4.57    | 257   | 0.628 | -4.03  | 5.67 | 3.69    |
| 213   | 0.698 | -3.12  | 6.58 | 4.55    | 258   | 0.631 | -4.00  | 5.70 | 3.71    |
| 214   | 0.696 | -3.15  | 6.55 | 4.52    | 259   | 0.633 | -3.97  | 5.73 | 3.74    |
| 215   | 0.694 | -3.18  | 6.52 | 4.49    | 260   | 0.636 | -3.93  | 5.77 | 3.77    |
| 216   | 0.691 | -3.20  | 6.50 | 4.46    | 261   | 0.639 | -3.89  | 5.81 | 3.81    |
| 217   | 0.689 | -3.24  | 6.46 | 4.43    | 262   | 0.642 | -3.84  | 5.86 | 3.85    |
| 218   | 0.686 | -3.28  | 6.42 | 4.39    | 263   | 0.646 | -3.80  | 5.90 | 3.89    |
| 219   | 0.683 | -3.31  | 6.39 | 4.35    | 264   | 0.649 | -3.75  | 5.95 | 3.93    |
| 220   | 0.680 | -3.35  | 6.35 | 4.32    | 265   | 0.653 | -3.71  | 5.99 | 3.97    |
| 221   | 0.677 | -3.38  | 6.32 | 4.28    | 266   | 0.656 | -3.66  | 6.04 | 4.02    |
| 222   | 0.675 | -3.42  | 6.28 | 4.25    | 267   | 0.659 | -3.62  | 6.08 | 4.06    |
| 223   | 0.672 | -3.45  | 6.25 | 4.21    | 268   | 0.663 | -3.57  | 6.13 | 4.10    |
| 224   | 0.669 | -3.49  | 6.21 | 4.18    | 269   | 0.666 | -3.52  | 6.18 | 4.15    |



SL-8NF Paraslot w/ null-fill  
Ch-21

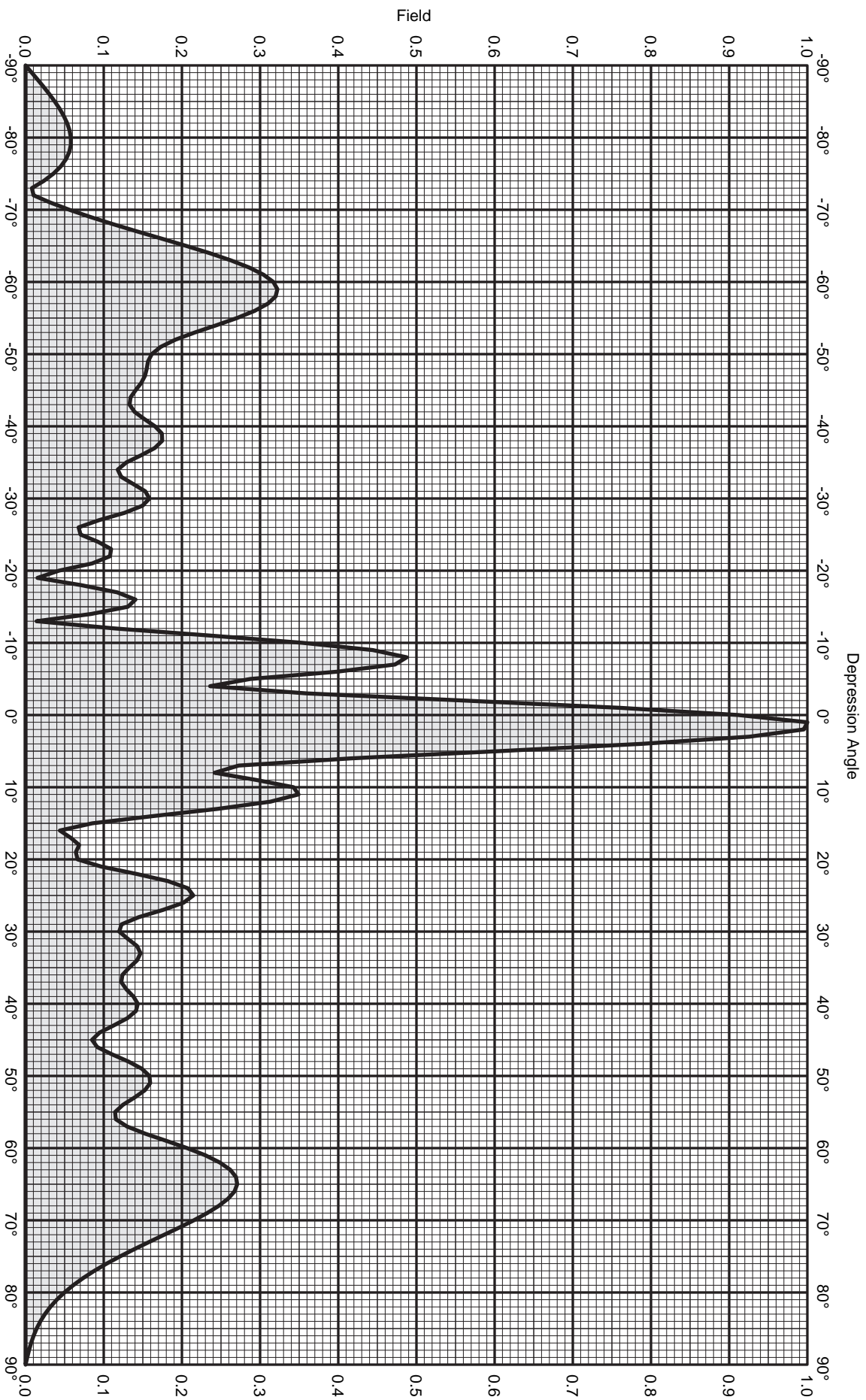
Maximum gain: 10.5 dBd

Horizontal polarization

Horizontal radiation pattern  
1.25 degree electrical downtilt

(Azimuth pattern at horizon)

| Angle | Field | Rel.dB | dBd  | PwrMult | Angle | Field | Rel.dB | dBd  | PwrMult |
|-------|-------|--------|------|---------|-------|-------|--------|------|---------|
| 270   | 0.670 | -3.48  | 6.22 | 4.19    | 315   | 0.895 | -0.96  | 8.74 | 7.48    |
| 271   | 0.674 | -3.42  | 6.28 | 4.24    | 316   | 0.899 | -0.93  | 8.77 | 7.54    |
| 272   | 0.679 | -3.37  | 6.33 | 4.30    | 317   | 0.902 | -0.89  | 8.81 | 7.60    |
| 273   | 0.683 | -3.31  | 6.39 | 4.35    | 318   | 0.906 | -0.86  | 8.84 | 7.65    |
| 274   | 0.687 | -3.26  | 6.44 | 4.41    | 319   | 0.909 | -0.83  | 8.87 | 7.71    |
| 275   | 0.691 | -3.20  | 6.50 | 4.46    | 320   | 0.912 | -0.80  | 8.90 | 7.77    |
| 276   | 0.696 | -3.15  | 6.55 | 4.52    | 321   | 0.916 | -0.77  | 8.93 | 7.82    |
| 277   | 0.700 | -3.09  | 6.61 | 4.58    | 322   | 0.919 | -0.74  | 8.96 | 7.88    |
| 278   | 0.705 | -3.04  | 6.66 | 4.64    | 323   | 0.922 | -0.71  | 8.99 | 7.93    |
| 279   | 0.709 | -2.98  | 6.72 | 4.69    | 324   | 0.925 | -0.68  | 9.02 | 7.98    |
| 280   | 0.714 | -2.93  | 6.77 | 4.75    | 325   | 0.928 | -0.65  | 9.05 | 8.04    |
| 281   | 0.720 | -2.86  | 6.84 | 4.83    | 326   | 0.931 | -0.62  | 9.08 | 8.09    |
| 282   | 0.725 | -2.79  | 6.91 | 4.91    | 327   | 0.934 | -0.59  | 9.11 | 8.15    |
| 283   | 0.731 | -2.72  | 6.98 | 4.99    | 328   | 0.937 | -0.56  | 9.14 | 8.20    |
| 284   | 0.737 | -2.65  | 7.05 | 5.07    | 329   | 0.941 | -0.53  | 9.17 | 8.26    |
| 285   | 0.743 | -2.58  | 7.12 | 5.16    | 330   | 0.944 | -0.50  | 9.20 | 8.31    |
| 286   | 0.749 | -2.50  | 7.20 | 5.24    | 331   | 0.946 | -0.48  | 9.22 | 8.36    |
| 287   | 0.756 | -2.43  | 7.27 | 5.33    | 332   | 0.949 | -0.45  | 9.25 | 8.41    |
| 288   | 0.762 | -2.36  | 7.34 | 5.42    | 333   | 0.952 | -0.43  | 9.27 | 8.46    |
| 289   | 0.768 | -2.29  | 7.41 | 5.51    | 334   | 0.955 | -0.40  | 9.30 | 8.51    |
| 290   | 0.775 | -2.22  | 7.48 | 5.60    | 335   | 0.958 | -0.37  | 9.33 | 8.56    |
| 291   | 0.780 | -2.16  | 7.54 | 5.67    | 336   | 0.961 | -0.35  | 9.35 | 8.61    |
| 292   | 0.785 | -2.10  | 7.60 | 5.75    | 337   | 0.963 | -0.33  | 9.37 | 8.66    |
| 293   | 0.790 | -2.04  | 7.66 | 5.83    | 338   | 0.966 | -0.30  | 9.40 | 8.71    |
| 294   | 0.795 | -1.99  | 7.71 | 5.91    | 339   | 0.969 | -0.28  | 9.42 | 8.75    |
| 295   | 0.801 | -1.93  | 7.77 | 5.98    | 340   | 0.971 | -0.25  | 9.45 | 8.80    |
| 296   | 0.806 | -1.87  | 7.83 | 6.06    | 341   | 0.973 | -0.24  | 9.46 | 8.84    |
| 297   | 0.811 | -1.82  | 7.88 | 6.14    | 342   | 0.975 | -0.22  | 9.48 | 8.88    |
| 298   | 0.817 | -1.76  | 7.94 | 6.23    | 343   | 0.977 | -0.20  | 9.50 | 8.92    |
| 299   | 0.822 | -1.70  | 8.00 | 6.31    | 344   | 0.979 | -0.18  | 9.52 | 8.95    |
| 300   | 0.827 | -1.64  | 8.06 | 6.39    | 345   | 0.981 | -0.17  | 9.53 | 8.98    |
| 301   | 0.833 | -1.59  | 8.11 | 6.47    | 346   | 0.983 | -0.15  | 9.55 | 9.01    |
| 302   | 0.838 | -1.53  | 8.17 | 6.55    | 347   | 0.984 | -0.14  | 9.56 | 9.04    |
| 303   | 0.843 | -1.48  | 8.22 | 6.64    | 348   | 0.985 | -0.13  | 9.57 | 9.06    |
| 304   | 0.849 | -1.43  | 8.27 | 6.72    | 349   | 0.987 | -0.12  | 9.58 | 9.08    |
| 305   | 0.853 | -1.38  | 8.32 | 6.80    | 350   | 0.988 | -0.11  | 9.59 | 9.11    |
| 306   | 0.858 | -1.33  | 8.37 | 6.87    | 351   | 0.989 | -0.10  | 9.60 | 9.12    |
| 307   | 0.863 | -1.28  | 8.42 | 6.94    | 352   | 0.989 | -0.09  | 9.61 | 9.14    |
| 308   | 0.867 | -1.24  | 8.46 | 7.02    | 353   | 0.990 | -0.08  | 9.62 | 9.15    |
| 309   | 0.871 | -1.20  | 8.50 | 7.09    | 354   | 0.991 | -0.08  | 9.62 | 9.17    |
| 310   | 0.876 | -1.15  | 8.55 | 7.16    | 355   | 0.992 | -0.07  | 9.63 | 9.19    |
| 311   | 0.880 | -1.11  | 8.59 | 7.22    | 356   | 0.993 | -0.06  | 9.64 | 9.21    |
| 312   | 0.884 | -1.07  | 8.63 | 7.29    | 357   | 0.995 | -0.04  | 9.66 | 9.24    |
| 313   | 0.888 | -1.04  | 8.66 | 7.35    | 358   | 0.997 | -0.03  | 9.67 | 9.27    |
| 314   | 0.891 | -1.00  | 8.70 | 7.42    | 359   | 0.998 | -0.01  | 9.69 | 9.30    |



SL-8NF Paraslot w/ null-fill

Ch-21

Maximum gain: 10.5 dBd

Horizontal polarization

Vertical radiation pattern

1.25 degree electrical downtilt



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SL-8NF Paraslot w/ null-fill  
Ch-21  
Maximum gain: 10.5 dBd  
Horizontal polarization

Vertical radiation pattern  
1.25 degree electrical downtilt

| Angle | Field | Rel.dB | dBd    | PwrMult | Angle | Field | Rel.dB | dBd    | PwrMult |
|-------|-------|--------|--------|---------|-------|-------|--------|--------|---------|
| -90   | 0.010 | -40.00 | -29.50 | 0.00    | -45   | 0.141 | -17.03 | -6.53  | 0.22    |
| -89   | 0.010 | -40.00 | -29.50 | 0.00    | -44   | 0.134 | -17.44 | -6.94  | 0.20    |
| -88   | 0.016 | -36.08 | -25.58 | 0.00    | -43   | 0.133 | -17.52 | -7.02  | 0.20    |
| -87   | 0.023 | -32.65 | -22.15 | 0.01    | -42   | 0.139 | -17.11 | -6.61  | 0.22    |
| -86   | 0.031 | -30.29 | -19.79 | 0.01    | -41   | 0.152 | -16.36 | -5.86  | 0.26    |
| -85   | 0.037 | -28.55 | -18.05 | 0.02    | -40   | 0.166 | -15.62 | -5.12  | 0.31    |
| -84   | 0.044 | -27.22 | -16.72 | 0.02    | -39   | 0.174 | -15.17 | -4.67  | 0.34    |
| -83   | 0.049 | -26.22 | -15.72 | 0.03    | -38   | 0.175 | -15.15 | -4.65  | 0.34    |
| -82   | 0.053 | -25.48 | -14.98 | 0.03    | -37   | 0.165 | -15.63 | -5.13  | 0.31    |
| -81   | 0.056 | -24.99 | -14.49 | 0.04    | -36   | 0.148 | -16.59 | -6.09  | 0.25    |
| -80   | 0.058 | -24.74 | -14.24 | 0.04    | -35   | 0.129 | -17.79 | -7.29  | 0.19    |
| -79   | 0.058 | -24.74 | -14.24 | 0.04    | -34   | 0.118 | -18.57 | -8.07  | 0.16    |
| -78   | 0.056 | -25.05 | -14.55 | 0.04    | -33   | 0.122 | -18.25 | -7.75  | 0.17    |
| -77   | 0.052 | -25.73 | -15.23 | 0.03    | -32   | 0.138 | -17.21 | -6.71  | 0.21    |
| -76   | 0.045 | -26.93 | -16.43 | 0.02    | -31   | 0.153 | -16.30 | -5.80  | 0.26    |
| -75   | 0.036 | -28.96 | -18.46 | 0.01    | -30   | 0.158 | -16.00 | -5.50  | 0.28    |
| -74   | 0.023 | -32.62 | -22.12 | 0.01    | -29   | 0.150 | -16.50 | -6.00  | 0.25    |
| -73   | 0.010 | -40.00 | -29.50 | 0.00    | -28   | 0.126 | -17.97 | -7.47  | 0.18    |
| -72   | 0.010 | -39.77 | -29.27 | 0.00    | -27   | 0.094 | -20.53 | -10.03 | 0.10    |
| -71   | 0.032 | -29.98 | -19.48 | 0.01    | -26   | 0.068 | -23.37 | -12.87 | 0.05    |
| -70   | 0.056 | -25.03 | -14.53 | 0.04    | -25   | 0.070 | -23.05 | -12.55 | 0.06    |
| -69   | 0.083 | -21.62 | -11.12 | 0.08    | -24   | 0.093 | -20.66 | -10.16 | 0.10    |
| -68   | 0.112 | -19.01 | -8.51  | 0.14    | -23   | 0.109 | -19.22 | -8.72  | 0.13    |
| -67   | 0.143 | -16.91 | -6.41  | 0.23    | -22   | 0.108 | -19.33 | -8.83  | 0.13    |
| -66   | 0.174 | -15.18 | -4.68  | 0.34    | -21   | 0.085 | -21.40 | -10.90 | 0.08    |
| -65   | 0.205 | -13.75 | -3.25  | 0.47    | -20   | 0.043 | -27.38 | -16.88 | 0.02    |
| -64   | 0.235 | -12.57 | -2.07  | 0.62    | -19   | 0.015 | -36.35 | -25.85 | 0.00    |
| -63   | 0.262 | -11.62 | -1.12  | 0.77    | -18   | 0.071 | -22.99 | -12.49 | 0.06    |
| -62   | 0.286 | -10.87 | -0.37  | 0.92    | -17   | 0.117 | -18.62 | -8.12  | 0.15    |
| -61   | 0.304 | -10.33 | 0.17   | 1.04    | -16   | 0.141 | -17.04 | -6.54  | 0.22    |
| -60   | 0.317 | -9.98  | 0.52   | 1.13    | -15   | 0.131 | -17.66 | -7.16  | 0.19    |
| -59   | 0.322 | -9.84  | 0.66   | 1.16    | -14   | 0.084 | -21.53 | -11.03 | 0.08    |
| -58   | 0.320 | -9.90  | 0.60   | 1.15    | -13   | 0.014 | -37.05 | -26.55 | 0.00    |
| -57   | 0.310 | -10.17 | 0.33   | 1.08    | -12   | 0.114 | -18.89 | -8.39  | 0.14    |
| -56   | 0.293 | -10.66 | -0.16  | 0.96    | -11   | 0.237 | -12.49 | -1.99  | 0.63    |
| -55   | 0.270 | -11.36 | -0.86  | 0.82    | -10   | 0.355 | -9.00  | 1.50   | 1.41    |
| -54   | 0.244 | -12.25 | -1.75  | 0.67    | -9    | 0.444 | -7.05  | 3.45   | 2.21    |
| -53   | 0.217 | -13.29 | -2.79  | 0.53    | -8    | 0.488 | -6.24  | 4.26   | 2.67    |
| -52   | 0.192 | -14.35 | -3.85  | 0.41    | -7    | 0.473 | -6.51  | 3.99   | 2.51    |
| -51   | 0.173 | -15.25 | -4.75  | 0.33    | -6    | 0.398 | -8.00  | 2.50   | 1.78    |
| -50   | 0.161 | -15.84 | -5.34  | 0.29    | -5    | 0.288 | -10.82 | -0.32  | 0.93    |
| -49   | 0.157 | -16.10 | -5.60  | 0.28    | -4    | 0.236 | -12.54 | -2.04  | 0.63    |
| -48   | 0.155 | -16.19 | -5.69  | 0.27    | -3    | 0.359 | -8.89  | 1.61   | 1.45    |
| -47   | 0.153 | -16.32 | -5.82  | 0.26    | -2    | 0.562 | -5.00  | 5.50   | 3.55    |
| -46   | 0.148 | -16.60 | -6.10  | 0.25    | -1    | 0.760 | -2.38  | 8.12   | 6.49    |
|       |       |        |        |         | 0     | 0.912 | -0.80  | 9.70   | 9.33    |



SL-8NF Paraslot w/ null-fill  
Ch-21

Maximum gain: 10.5 dBd  
Horizontal polarization

Vertical radiation pattern  
1.25 degree electrical downtilt

| Angle | Field | Rel.dB | dBd    | PwrMult | Angle | Field | Rel.dB | dBd    | PwrMult |
|-------|-------|--------|--------|---------|-------|-------|--------|--------|---------|
| 0     | 0.912 | -0.80  | 9.70   | 9.33    | 45    | 0.085 | -21.41 | -10.91 | 0.08    |
| 1     | 1.000 | 0.00   | 10.50  | 11.22   | 46    | 0.092 | -20.76 | -10.26 | 0.09    |
| 2     | 0.995 | -0.04  | 10.46  | 11.12   | 47    | 0.110 | -19.14 | -8.64  | 0.14    |
| 3     | 0.926 | -0.67  | 9.83   | 9.62    | 48    | 0.132 | -17.62 | -7.12  | 0.19    |
| 4     | 0.787 | -2.08  | 8.42   | 6.95    | 49    | 0.149 | -16.55 | -6.05  | 0.25    |
| 5     | 0.606 | -4.35  | 6.15   | 4.12    | 50    | 0.158 | -16.00 | -5.50  | 0.28    |
| 6     | 0.417 | -7.60  | 2.90   | 1.95    | 51    | 0.159 | -15.95 | -5.45  | 0.29    |
| 7     | 0.273 | -11.29 | -0.79  | 0.83    | 52    | 0.152 | -16.34 | -5.84  | 0.26    |
| 8     | 0.242 | -12.33 | -1.83  | 0.66    | 53    | 0.139 | -17.12 | -6.62  | 0.22    |
| 9     | 0.295 | -10.59 | -0.09  | 0.98    | 54    | 0.125 | -18.09 | -7.59  | 0.17    |
| 10    | 0.343 | -9.30  | 1.20   | 1.32    | 55    | 0.115 | -18.82 | -8.32  | 0.15    |
| 11    | 0.349 | -9.14  | 1.36   | 1.37    | 56    | 0.115 | -18.75 | -8.25  | 0.15    |
| 12    | 0.313 | -10.08 | 0.42   | 1.10    | 57    | 0.130 | -17.74 | -7.24  | 0.19    |
| 13    | 0.246 | -12.19 | -1.69  | 0.68    | 58    | 0.153 | -16.30 | -5.80  | 0.26    |
| 14    | 0.163 | -15.75 | -5.25  | 0.30    | 59    | 0.180 | -14.88 | -4.38  | 0.36    |
| 15    | 0.085 | -21.37 | -10.87 | 0.08    | 60    | 0.207 | -13.69 | -3.19  | 0.48    |
| 16    | 0.044 | -27.16 | -16.66 | 0.02    | 61    | 0.230 | -12.76 | -2.26  | 0.59    |
| 17    | 0.058 | -24.77 | -14.27 | 0.04    | 62    | 0.249 | -12.09 | -1.59  | 0.69    |
| 18    | 0.069 | -23.27 | -12.77 | 0.05    | 63    | 0.262 | -11.64 | -1.14  | 0.77    |
| 19    | 0.064 | -23.83 | -13.33 | 0.05    | 64    | 0.269 | -11.40 | -0.90  | 0.81    |
| 20    | 0.067 | -23.53 | -13.03 | 0.05    | 65    | 0.271 | -11.35 | -0.85  | 0.82    |
| 21    | 0.097 | -20.27 | -9.77  | 0.11    | 66    | 0.267 | -11.46 | -0.96  | 0.80    |
| 22    | 0.141 | -16.99 | -6.49  | 0.22    | 67    | 0.259 | -11.73 | -1.23  | 0.75    |
| 23    | 0.182 | -14.80 | -4.30  | 0.37    | 68    | 0.247 | -12.14 | -1.64  | 0.69    |
| 24    | 0.208 | -13.65 | -3.15  | 0.48    | 69    | 0.232 | -12.68 | -2.18  | 0.61    |
| 25    | 0.215 | -13.37 | -2.87  | 0.52    | 70    | 0.215 | -13.34 | -2.84  | 0.52    |
| 26    | 0.202 | -13.89 | -3.39  | 0.46    | 71    | 0.197 | -14.12 | -3.62  | 0.43    |
| 27    | 0.176 | -15.10 | -4.60  | 0.35    | 72    | 0.177 | -15.02 | -4.52  | 0.35    |
| 28    | 0.145 | -16.78 | -6.28  | 0.24    | 73    | 0.158 | -16.02 | -5.52  | 0.28    |
| 29    | 0.123 | -18.22 | -7.72  | 0.17    | 74    | 0.139 | -17.13 | -6.63  | 0.22    |
| 30    | 0.120 | -18.43 | -7.93  | 0.16    | 75    | 0.121 | -18.35 | -7.85  | 0.16    |
| 31    | 0.131 | -17.67 | -7.17  | 0.19    | 76    | 0.104 | -19.68 | -9.18  | 0.12    |
| 32    | 0.143 | -16.92 | -6.42  | 0.23    | 77    | 0.088 | -21.11 | -10.61 | 0.09    |
| 33    | 0.147 | -16.65 | -6.15  | 0.24    | 78    | 0.074 | -22.65 | -12.15 | 0.06    |
| 34    | 0.143 | -16.92 | -6.42  | 0.23    | 79    | 0.061 | -24.30 | -13.80 | 0.04    |
| 35    | 0.133 | -17.55 | -7.05  | 0.20    | 80    | 0.050 | -26.07 | -15.57 | 0.03    |
| 36    | 0.124 | -18.14 | -7.64  | 0.17    | 81    | 0.040 | -27.96 | -17.46 | 0.02    |
| 37    | 0.122 | -18.24 | -7.74  | 0.17    | 82    | 0.032 | -29.98 | -19.48 | 0.01    |
| 38    | 0.129 | -17.79 | -7.29  | 0.19    | 83    | 0.025 | -32.13 | -21.63 | 0.01    |
| 39    | 0.138 | -17.20 | -6.70  | 0.21    | 84    | 0.019 | -34.45 | -23.95 | 0.00    |
| 40    | 0.144 | -16.86 | -6.36  | 0.23    | 85    | 0.014 | -36.97 | -26.47 | 0.00    |
| 41    | 0.141 | -17.00 | -6.50  | 0.22    | 86    | 0.010 | -39.76 | -29.26 | 0.00    |
| 42    | 0.130 | -17.70 | -7.20  | 0.19    | 87    | 0.010 | -40.00 | -29.50 | 0.00    |
| 43    | 0.113 | -18.95 | -8.45  | 0.14    | 88    | 0.010 | -40.00 | -29.50 | 0.00    |
| 44    | 0.095 | -20.48 | -9.98  | 0.10    | 89    | 0.010 | -40.00 | -29.50 | 0.00    |
|       |       |        |        |         | 90    | 0.010 | -40.00 | -29.50 | 0.00    |

COHEN, DIPPELL AND EVERIST, P.C.

TABLE I  
INTERFERENCE ANALYSIS  
FOR THE DIGITAL OPERATION OF  
K69CS, MEETEETSE, WYOMING  
CHANNEL 21 15 KW ND ERP 1971.0 METERS AMSL  
JUNE 2009

| <u>Channel</u> | <u>Call</u> | <u>City/State</u>   | <u>Dist(km)</u> | <u>Status</u> | <u>FCC File No.</u> | <u>Result</u>   |
|----------------|-------------|---------------------|-----------------|---------------|---------------------|-----------------|
| 20             | K20HB       | BILLINGS MT         | 183.5           | TEST          | #NAME?              | 0.00%           |
| 20             | K20HB       | BILLINGS MT         | 183.5           | CP            | BDFCDTT-20061207ACB | 0.00%           |
| 20             | K20HB       | BILLINGS MT         | 183.5           | LIC           | BLTT-20041123AKE    | 0.00%           |
| 20             | NEW         | LIVINGSTON, ETC. MT | 206.8           | CP            | BDCCDTL-20070416AAW | 0.00%           |
| 21             | K21HV       | MALAD ID            | 352.9           | CP            | BDFCDTT-20081212ACF | No interference |
| 21             | K52CO       | MALAD CITY ID       | 352.9           | LIC           | BLTT-20080722AEI    | No interference |
| 21             | K21CE       | MONTPELIER ID       | 280             | LIC           | BLTT-19980709JI     | No interference |
| 21             | K21JC-D     | POCATELLO ID        | 323.8           | LIC           | BLDTL-20090217ACR   | No interference |
| 21             | K22DV       | PRESTON ID          | 323.5           | LIC           | BLTT-20040503AFI    | No interference |
| 21             | NEW         | BUTTE MT            | 352             | CP            | BNPTTL-20000830BCV  | No interference |
| 21             | NEW         | EMIGRANT MT         | 193.2           | CP            | BDCCDTT-20070410ADZ | No interference |
| 21             | KHBB-LP     | HELENA MT           | 379.7           | LIC           | BLDTL-20081126ADG   | No interference |
| 21             | KHBB-LP     | HELENA MT           | 379.7           | CP            | BDFCDTL-20060331BNR | No interference |
| 21             | NEW         | EVANSTON WY         | 256.8           | APP           | BNPTTL-20000831EHB  | No interference |
| 21             | K58GQ       | GLENDON WY          | 371.9           | LIC           | BLTT-20090312ABA    | 0.00%           |
| 21             | K21CV       | RAWLINS WY          | 296.7           | LIC           | BLTT-19910225JP     | No interference |
| 21             | NEW         | RIVERTON, ETC. WY   | 128.2           | CP            | BDCCDTT-20061017AAY | No interference |
| 22             | KHMT        | HARDIN MT           | 187.2           | STA           | #NAME?              | 0.00%           |
| 22             | KHMT-DT     | HARDIN MT           | 187.2           | CP MO         | BMPCDT-20070125ACV  | No interference |
| 22             | K05DK       | BIG PINEY WY        | 163.1           | CP            | BDISTT-20080317AIG  | 0.00%           |
| 22             | K22CI       | LANDER WY           | 138.8           | LIC           | BLTT-19890112ID     | 0.00%           |
| 25             | K25AU       | DUBOIS, ETC. WY     | 95.4            | LIC           | BLTT-19890123JM     | 0.00%           |
| 28             | K08GO       | RIVERTON WY         | 94.2            | LIC           | BLTT-20040922ABU    | 0.00%           |

### Section III - Engineering (Digital)

#### TECHNICAL SPECIFICATIONS

Ensure that the specifications below are accurate. Contradicting data found elsewhere in this application will be disregarded. All items must be completed. The response "on file" is not acceptable.

#### TECH BOX

1. Channel: \_\_\_\_\_
2. Translator Input Channel No. \_\_\_\_\_
3. Station proposed to be rebroadcast:

| Call Sign | City | State | Channel |
|-----------|------|-------|---------|
|-----------|------|-------|---------|

4. Antenna Location Coordinates: (NAD 27)

\_\_\_\_\_ ° \_\_\_\_\_ ' \_\_\_\_\_ " ☐ N ☐ S Latitude  
\_\_\_\_\_ ° \_\_\_\_\_ ' \_\_\_\_\_ " ☐ E ☐ W Longitude

5. Antenna Structure Registration Number: \_\_\_\_\_

☐ Not applicable ☐ See Explanation in Exhibit No. ☐ FAA Notification Filed with FAA

6. Antenna Location Site Elevation Above Mean Sea Level: \_\_\_\_\_ meters
7. Overall Tower Height Above Ground Level: \_\_\_\_\_ meters
8. Height of Radiation Center Above Ground Level: \_\_\_\_\_ meters
9. Maximum Effective Radiated Power (ERP): \_\_\_\_\_ kW
10. Transmitter Output Power: \_\_\_\_\_ kW

11. a. Transmitting Antenna: ☐ Nondirectional ☐ Directional ☐ Directional composite

| Manufacturer | Model |
|--------------|-------|
|--------------|-------|

- b. Electrical Beam Tilt: \_\_\_\_\_ degrees ☐ Not applicable

c. Directional Antenna Relative Field Values:

Rotation: \_\_\_\_\_ ° ☐ No rotation ☐ N/A (Nondirectional)

| Degree              | Value | Degree | Value | Degree | Value | Degree | Value | Degree | Value | Degree | Value |
|---------------------|-------|--------|-------|--------|-------|--------|-------|--------|-------|--------|-------|
| 0                   |       | 60     |       | 120    |       | 180    |       | 240    |       | 300    |       |
| 10                  |       | 70     |       | 130    |       | 190    |       | 250    |       | 310    |       |
| 20                  |       | 80     |       | 140    |       | 200    |       | 260    |       | 320    |       |
| 30                  |       | 90     |       | 150    |       | 210    |       | 270    |       | 330    |       |
| 40                  |       | 100    |       | 160    |       | 220    |       | 280    |       | 340    |       |
| 50                  |       | 110    |       | 170    |       | 230    |       | 290    |       | 350    |       |
| Additional Azimuths |       |        |       |        |       |        |       |        |       |        |       |

**NOTE: In addition to the information called for in this section, an explanatory exhibit providing full particulars must be submitted for each question for which a "No" response is provided.**

12. **Out-of-Channel Emission Mask:** Simple ☐ Stringent ☐

**CERTIFICATION**

13. **Interference.** The proposed facility complies with all of the following applicable rule sections. 47 C.F.R. Sections 74.709, 74.793(e), 74.793(f), 74.793(g), 74.793(h), 74.794(b) and 73.1030. ☐ Yes ☐ No 

See Explanation in Exhibit No.

14. **Environmental Protection Act.** The proposed facility is excluded from environmental processing under 47 C.F.R. Section 1.1306 (*i.e.*, the facility will not have a significant environmental impact and complies with the maximum permissible radiofrequency electromagnetic exposure limits for controlled and uncontrolled environments). Unless the applicant can determine RF compliance. An **Exhibit is required.** ☐ Yes ☐ No 

See Explanation in Exhibit No.

Exhibit No.

By checking "Yes" above, the applicant also certifies that it, in coordination with other users of the site, will reduce power or cease operation as necessary to protect persons having access to the site, tower or antenna from radiofrequency electromagnetic exposure in excess of FCC guidelines.

15. **Channels 52-59.** If the proposed channel is within channels 52-59, the applicant certifies compliance with the following requirements, as applicable:

☐ The applicant is applying for a digital companion channel for which no suitable channel from channel 2-51 is available.

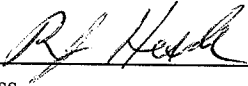
☐ Pursuant to Section 74.786(d), the applicant has notified, within 30 days of filing this application, all commercial wireless licensees of the spectrum comprising the proposed TV channel and the first adjacent channels thereto, for which the proposed digital LPTV or TV translator antenna site lies inside the licensed geographic boundaries of the wireless licensees or within 75 miles and 50 miles, respectively, of the geographic boundaries of co-channel and adjacent-channel wireless licensees.

**PREPARER'S CERTIFICATION ON PAGE 8 MUST BE COMPLETED AND SIGNED.**

16. **Channels 60-69.** If the proposed channel is within channels 60-69, the applicant certifies compliance with the following requirements, as applicable:

- ☐ Pursuant to Section 74.786(e), the applicant has notified, within 30 days of filing this application, all commercial wireless licensees of the spectrum comprising the proposed TV channel and the first adjacent channels thereto, for which the proposed digital LPTV or TV translator antenna site lies inside the licensed geographic boundaries of the wireless licensees or within 75 miles and 50 miles, respectively, of the geographic boundaries of co-channel and adjacent-channel wireless licensees,
- ☐ Pursuant to Section 74.786(e), the applicant proposing operation on channel 63, 64, 68 and 69 ("public safety channels") has secured a coordinated spectrum use agreement(s) with 700 MHz public safety regional planning committee(s) and state frequency administrator(s) of the region(s) and state(s) within which the antenna site of the digital LPTV or TV translator station is proposed to locate, and those adjoining regions and states with boundaries within 75 miles of the proposed station location.
- ☐ Pursuant to Section 74.786(e), an applicant for a channel adjacent to channel 63, 64, 68 or 69 has notified, within 30 days of filing this application, the 700 MHz public safety regional planning committee(s) and state administrator(s) of the region and state containing the proposed digital LPTV or TV translator antenna site and regions and states whose geographic boundaries lie within 50 miles of the proposed LPTV or TV translator antenna site.

I certify that I have prepared Section III (Engineering Data) on behalf of the applicant, and that after such preparation, I have examined and found it to be accurate and true to the best of my knowledge and belief.

|  |   |  |                   |
|--|---|--|-------------------|
| Name<br>Ross J. Heide  |   | Relationship to Applicant (e.g., Consulting Engineer)<br>Consulting Engineer |                   |
| Signature<br> |   | Date<br>June 30, 2009  |                   |
| Mailing Address<br>Cohen, Dippell and Everist, P.C., 1300 L Street, NW, Suite 1100               |   |  |                   |
| City<br>Washington   | State or Country (if foreign address)<br>DC |  | ZIP Code<br>20005 |
| Telephone Number (include area code)<br>(202) 898-0111   |   | E-Mail Address (if available)<br>cde@attglobal.net                           |                   |

WILLFUL FALSE STATEMENTS ON THIS FORM ARE PUNISHABLE BY FINE AND/OR IMPRISONMENT (U.S. CODE, TITLE 18, SECTION 1001), AND/OR REVOCATION OF ANY STATION LICENSE OR CONSTRUCTION PERMIT (U.S. CODE, TITLE 47, SECTION 312(a)(1)), AND/OR FORFEITURE (U.S. CODE, TITLE 47, SECTION 503).