

# FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for

**Intelsat License LLC  
Hagerstown, Maryland  
(Call Sign: KA275)**

**Satellite Earth Station**

Prepared By:  
COMSEARCH  
19700 Janelia Farm Boulevard  
Ashburn, Virginia 20147  
March 24, 2013

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## 1. CONCLUSIONS

An interference study considering all existing, proposed and prior coordinated microwave facilities within the coordination contours of the proposed earth station demonstrates that this site will operate satisfactorily with the common carrier microwave environment. Further, there will be no restrictions of its operation due to interference considerations.

## 2. SUMMARY OF RESULTS

A number of great circle interference cases were identified during the interference study of the proposed earth station. Each of the cases, which exceeded the interference objective on a line-of-sight basis, was profiled and the propagation losses estimated using NBS TN101 (Revised) techniques. The losses were found to be sufficient to reduce the signal levels to acceptable magnitudes in every case.

The following companies reported potential great circle interference conflicts that did not meet the objectives on a line-of-sight basis. When over-the-horizon losses are considered on the interfering paths, sufficient blockage exists to negate harmful interference from occurring with the proposed transmit-receive earth station.

### Company

Adams County Emergency Management Agency  
AT&T Communication of Maryland  
B20, LLC  
Baltimore County of Maryland  
Baltimore Gas and Electric Company  
Blue Ridge Carriers  
Cellco Partnership – PA Region  
County of Frederick  
ECW Wireless, LLC  
Exelon Generation Company, LLC  
FELHC, Inc.  
Garden State Transmissions  
Hardy Cellular Telephone Company  
New Cingular Wireless PCS, LLC - DC  
New Cingular Wireless PCS, LLC – PA  
SCTF NET  
State of Maryland, MIEMSS  
Thopught Transmissions, LLC  
USCOC of Cumberland, Inc.  
Washington Gas Light Company  
WV DHHR/BPH STECS

No other carriers reported potential interference cases.

### 3. SUPPLEMENTAL SHOWING

Pursuant to Part 25.203(c) of the FCC Rules and Regulations, the satellite earth station proposed in this application was coordinated by Comsearch using computer techniques and in accordance with Part 25 of the FCC Rules and Regulations.

Coordination data for this earth station was sent to the below listed carriers with a letter dated July 6, 2012. A coordination extension notice was forwarded on January 4, 2013.

#### Company

AB Services LLC  
ADAMS COUNTY EMERGENCY MANAGEMENT AGENCY  
AT&T COMMUNICATIONS OF MARYLAND INC  
AT&T Communications of Virginia, LLC  
AT&T Corp.  
Alltel Communications LLC-Southern VA  
Alltel Communications of Petersburg Inc  
Appalachia Engineering Services  
Appalachian Broadcasting  
Atlantic Broadband (Delmar), LLC  
Atlantic Broadband (Penn), LLC  
Atlantic City Electric Company  
Auburn Data Systems, LLC  
B20 LLC  
BAY BROADBAND COMMUNICATIONS LLC  
BLAIR COUNTY 911  
Baltimore County of Maryland  
Baltimore Gas and Electric Company  
Bedford, County of  
Believe Wireless, LLC  
Berks, County of  
Blue Ridge Carriers  
CHESTER, COUNTY OF  
CLEARFIELD, COUNTY OF  
CNG Transmission Corporation  
COLLEGE OF SOUTHERN MARYLAND  
CROWN COMMUNICATION, INC.  
Cable Of The Carolinas  
Cambria, County of  
Capital Communications of America  
Cellco Partnership - Bridgeville, PA/WV  
Cellco Partnership - Southern Virginia  
Cellco Partnership- PA Region  
Cellco Partnership-Newark-Dallas Verizon  
Cellco Partnership-WDC/Baltimore  
Cellco Prtnrshp - Phil. Tri-State Rgn  
Charles, County of

Company (Continued)

Commonwealth of Pennsylvania-Radio Proj.  
Comprehensive Wireless LLC  
Conterra Ultra Broadband, LLC  
Converge Towers LLC  
Coral Reef Technologies Ltd  
Coralinks  
County of Frederick  
DAUPHIN COUNTY EMERGENCY MANAGEMENT  
Delaware Division of Communications  
Delmarva Power & Light Company  
ECW Wireless, LLC  
EG Broadcast Newco Corp  
Eastern MLG LLC  
Enoch Pratt Free Library  
Exelon Generation Company, L.L.C  
FELHC, Inc.  
Fayette, County of  
Frederick County  
Fundamental Broadcasting LLC  
Garden State Transmissions  
Greene, County of (PA)  
Hardy Cellular Telephone Company  
Harrisonburg-Rockingham ECC  
High Voltage Communications LLC  
Huntingdon, County of  
INDIANA, COUNTY OF  
Jefferson Microwave, LLC  
Juniata County Emergency Services  
Kreider Networks  
Kryptic Technologies  
Last Mile Inc.  
Loudoun, County of  
MCI Communications Services Inc.  
MVC Research. LLC  
Maryland Public Broadcasting Commission  
Maryland State Highway Administration  
Maryland, State of - Dept.of Info & Tech  
National Radio Astronomy Observatory  
New Cingular Wireless PCS LLC -NJ  
New Cingular Wireless PCS - Maryland  
New Cingular Wireless PCS LLC - DC  
New Cingular Wireless PCS LLC - VA  
New Cingular Wireless PCS LLC- WV/NC/SC  
New Cingular Wireless PCS LLC-DE/NH/RI  
New Cingular Wireless PCS, LLC - PA  
New Jersey, State of -NJ Transit  
Newgig Networks, LLC  
Norfolk Southern Railway  
PENNSYLVANIA TURNPIKE COMMISSION  
PSEG Services Corporation  
Peco Energy Company

Company (Continued)

Penn Service Microwave Co., Inc.  
Pittsburgh SMSA Limited Partnership  
Prince George's County  
Prince William, County of  
RAPPAHANNOCK ELECTRIC COOPERATIVE  
SCTF NET  
SHENANDOAH VALLEY ELECTRIC COOPERATIVE  
SOMERSET COUNTY  
SW Networks  
Southern Maryland Electric Cooperative I  
St. Mary's County of (MD)  
Stafford, County of  
State of Maryland, MIEMSS  
State of WV DHHR/BPH STECS  
Texas Eastern Communications, Inc.  
Thought Transmissions, LLC  
Turtle Networks 6386  
US Cellular Operating Company, LLC (WI)  
USCOC of Cumberland, Inc.  
Velox Networks LLC  
Verizon Maryland, Inc.  
Verizon Wireless (VAW) LLC - Delaware  
Verizon Wireless (VAW) LLC - Maryland  
Verizon Wireless (VAW) LLC - W/B/V Mkts  
Verizon Wireless (VAW) LLC-Pennsylvania  
Verizon Wireless LLC - West Virginia  
Verizon Wireless VAW LLC-Southern VA  
Virginia Broadband, LLC  
Virginia Cellular LLC  
Virginia Department of State Police  
Virginia Electric & Power Company  
Virginia PCS Alliance, L.C.  
WITF Inc.  
Washington D.C. SMSA L.P.  
Washington Gas Light Company  
Washington Suburban Sanitary Commission  
Weblin Holdings LLC  
Wireless Backhaul Infrastructure, LLC  
Wireless Internet Work II.  
Wireless Internetwork LLC  
World Class Wireless LLC  
York County Dept of Emergency Services  
Zen Networks, Inc  
iSignal

## **4. EARTH STATION COORDINATION DATA**

This section presents the data pertinent to frequency coordination of the proposed earth station that was circulated to all carriers within its coordination contours.



# COMSEARCH

## Earth Station Data Sheet

19700 Janelia Farm Boulevard, Ashburn, VA 20147  
(703)726-5500 <http://www.comsearch.com>

Date: 03/24/2013  
Job Number: 130104COMSJC01

### Administrative Information

Status ENGINEER PROPOSAL  
Call Sign KA275  
Licensee Code INTELS  
Licensee Name Intelsat License LLC

### Site Information HAGERSTOWN, MARYLAND

Venue Name  
Latitude (NAD 83) 39° 35' 54.7" N  
Longitude (NAD 83) 77° 45' 35.3" W  
Climate Zone A  
Rain Zone 2  
Ground Elevation (AMSL) 171.3 m / 562.0 ft

### Link Information

Satellite Type Geostationary  
Mode TR - Transmit-Receive  
Modulation Analog and Digital  
Satellite Arc 6° W to 143° West Longitude  
Azimuth Range 101.9° to 253.6°  
Corresponding Elevation Angles 5.3° / 10.3°  
Antenna Centerline (AGL) 12.5 m / 41.0 ft

### Antenna Information

Manufacturer TIW  
Model 19.0 Meter  
Gain / Diameter 55.6 dBi / 19.0 m  
3-dB / 15-dB Beamwidth 0.20° / 0.60°

### Receive

TIW  
19.0 Meter  
55.6 dBi / 19.0 m  
0.20° / 0.60°

### Transmit

TIW  
19.0 Meter  
59.1 dBi / 19.0 m  
0.20° / 0.40°

Max Available RF Power (dBW/4 kHz)  
(dBW/MHz)

SEE ATTACHMENT 1  
SEE ATTACHMENT 1

Maximum EIRP (dBW/4 kHz)  
(dBW/MHz)  
(dBW)

SEE ATTACHMENT 1  
SEE ATTACHMENT 1  
SEE ATTACHMENT 1

Interference Objectives: Long Term -156.0 dBW/MHz 20%  
Short Term -146.0 dBW/MHz 0.01%

-154.0 dBW/4 kHz 20%  
-131.0 dBW/4 kHz 0.0025%

### Frequency Information

Emission / Frequency Range (MHz)

### Receive 4.0 GHz

N0N / 3700.0 - 4200.0  
660KF2D / 3700.0 - 4200.0  
1M00F2D / 3700.0 - 4200.0  
56K0G7W - 72M0G7W / 3700.0 - 4200.0

### Transmit 6.1 GHz

N0N / 5925.0 - 6425.0  
660KF2D / 5925.0 - 6425.0  
1M00F2D / 5925.0 - 6425.0  
56K0G7W - 72M0G7W / 5925.0 - 6425.0

Max Great Circle Coordination Distance 759.4 km / 471.8 mi  
Precipitation Scatter Contour Radius 613.5 km / 381.2 mi

453.8 km / 281.9 mi  
101.4 km / 63.0 mi

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## Earth Station Data Sheet

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ATTACHMENT 1

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TIW:  
Model: 19.0 Meter

4 GHz Gain: 55.6 dBi  
6 GHz Gain: 59.1 dBi

Satellite Arc: 6.0 to 143.0 West Longitude

Receive Band: 3700.0 to 4200.0 MHz

### Emissions

NON  
660KF2D  
1M00F2D  
56K0G7W – 72M0G7W

-----  
Satellite Arc: 6.0 to 143.0 West Longitude

Transmit Band: 5850.0 – 6425.0 MHz

| <u>Emission</u>       | <u>RF Power Density<br/>(dBW/4 kHz)</u> | <u>EIRP/Carrier<br/>(dBW)</u> | <u>EIRP Density<br/>(dBW/ 4 kHz)</u> |
|-----------------------|---|-------------------------------|--------------------------------------|
| NON                   | -2.7                                    | 56.4                          | 56.4                                 |
| 660KF2D               | -2.7                                    | 78.6                          | 56.4                                 |
| 1M00F2D               | -2.7                                    | 80.4                          | 56.4                                 |
| 56K0G7W to<br>72M0G7W | -2.7 to<br>-14.7                        | 67.9 to<br>87.0               | 56.4 to<br>44.4                      |

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## Earth Station Data Sheet

19700 Janelia Farm Boulevard, Ashburn, VA 20147  
(703)726-5500 <http://www.comsearch.com>

### Coordination Values

### HAGERSTOWN, MD

Licensee Name Intelsat License LLC  
Latitude (NAD 83) 39° 35' 54.7" N  
Longitude (NAD 83) 77° 45' 35.3" W  
Ground Elevation (AMSL) 171.3 m / 562.0 ft  
Antenna Centerline (AGL) 12.5 m / 41.0 ft  
Antenna Model TIW 19.0 Meter  
Antenna Mode Receive 4.0 GHz Transmit 6.1 GHz  
Interference Objectives: Long Term -156.0 dBW/MHz 20% -154.0 dBW/4 kHz 20%  
Short Term -146.0 dBW/MHz 0.01% -131.0 dBW/4 kHz 0.0025%  
Max Available RF Power -2.7 (dBW/4 kHz)

| Azimuth (°) | Horizon Elevation (°) | Antenna Discrimination (°) | Receive 4.0 GHz    |                            | Transmit 6.1 GHz   |                            |
|-------------|-----------------------|----------------------------|--------------------|----------------------------|--------------------|----------------------------|
|             |                       |                            | Horizon Gain (dBi) | Coordination Distance (km) | Horizon Gain (dBi) | Coordination Distance (km) |
| 0           | 0.00                  | 101.81                     | -10.00             | 285.28                     | -10.00             | 170.66                     |
| 5           | 0.00                  | 96.84                      | -10.00             | 285.28                     | -10.00             | 170.66                     |
| 10          | 0.00                  | 91.86                      | -10.00             | 285.28                     | -10.00             | 170.66                     |
| 15          | 0.00                  | 86.88                      | -10.00             | 285.28                     | -10.00             | 170.66                     |
| 20          | 0.00                  | 81.90                      | -10.00             | 285.28                     | -10.00             | 170.66                     |
| 25          | 0.00                  | 76.92                      | -10.00             | 285.28                     | -10.00             | 170.66                     |
| 30          | 0.00                  | 71.95                      | -10.00             | 285.28                     | -10.00             | 170.66                     |
| 35          | 0.00                  | 66.97                      | -10.00             | 285.28                     | -10.00             | 170.66                     |
| 40          | 0.00                  | 62.00                      | -10.00             | 285.28                     | -10.00             | 170.66                     |
| 45          | 0.00                  | 57.03                      | -10.00             | 285.28                     | -10.00             | 170.66                     |
| 50          | 0.00                  | 52.06                      | -10.00             | 285.28                     | -10.00             | 170.66                     |
| 55          | 0.00                  | 47.09                      | -9.82              | 286.40                     | -9.82              | 171.34                     |
| 60          | 0.00                  | 42.14                      | -8.62              | 294.23                     | -8.62              | 176.03                     |
| 65          | 0.00                  | 37.19                      | -7.26              | 303.30                     | -7.26              | 181.28                     |
| 70          | 0.00                  | 32.26                      | -5.72              | 314.62                     | -5.72              | 187.24                     |
| 75          | 0.00                  | 27.34                      | -3.92              | 327.41                     | -3.92              | 194.13                     |
| 80          | 0.00                  | 22.47                      | -1.79              | 343.08                     | -1.79              | 202.28                     |
| 85          | 0.00                  | 17.65                      | 0.83               | 362.99                     | 0.83               | 210.76                     |
| 90          | 0.00                  | 12.98                      | 4.17               | 388.88                     | 4.17               | 224.77                     |
| 95          | 0.00                  | 8.66                       | 8.56               | 426.09                     | 8.56               | 245.21                     |
| 100         | 0.00                  | 5.61                       | 13.27              | 759.39                     | 13.27              | 453.75                     |
| 105         | 0.00                  | 6.15                       | 12.28              | 546.45                     | 12.28              | 314.02                     |
| 110         | 0.00                  | 9.60                       | 7.45               | 416.37                     | 7.45               | 239.82                     |
| 115         | 0.00                  | 13.27                      | 3.93               | 387.53                     | 3.93               | 223.71                     |
| 120         | 0.00                  | 16.89                      | 1.31               | 366.72                     | 1.31               | 212.69                     |
| 125         | 0.00                  | 20.41                      | -0.75              | 350.91                     | -0.75              | 204.62                     |
| 130         | 0.00                  | 23.83                      | -2.43              | 338.33                     | -2.43              | 199.84                     |
| 135         | 0.00                  | 27.11                      | -3.83              | 328.09                     | -3.83              | 194.49                     |
| 140         | 0.00                  | 30.23                      | -5.01              | 319.61                     | -5.01              | 189.96                     |
| 145         | 0.00                  | 33.14                      | -6.01              | 311.94                     | -6.01              | 186.11                     |
| 150         | 0.00                  | 35.82                      | -6.85              | 306.10                     | -6.85              | 182.86                     |
| 155         | 0.00                  | 38.20                      | -7.55              | 301.33                     | -7.55              | 180.15                     |
| 160         | 0.00                  | 40.26                      | -8.12              | 297.51                     | -8.12              | 177.95                     |
| 165         | 0.00                  | 41.93                      | -8.56              | 294.59                     | -8.56              | 176.24                     |
| 170         | 0.00                  | 43.16                      | -8.88              | 292.52                     | -8.88              | 175.02                     |
| 175         | 0.00                  | 43.92                      | -9.07              | 291.29                     | -9.07              | 174.29                     |
| 180         | 0.00                  | 44.18                      | -9.13              | 290.88                     | -9.13              | 174.04                     |
| 185         | 0.00                  | 43.92                      | -9.07              | 291.29                     | -9.07              | 174.28                     |

# COMSEARCH

## Earth Station Data Sheet

19700 Janelia Farm Boulevard, Ashburn, VA 20147  
(703)726-5500 <http://www.comsearch.com>

### Coordination Values

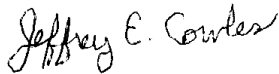
### HAGERSTOWN, MD

|                                    |                      |       |                  |         |
|------------------------------------|----------------------|-------|------------------|---------|
| Licensee Name                      | Intelsat License LLC |       |                  |         |
| Latitude (NAD 83)                  | 39° 35' 54.7" N      |       |                  |         |
| Longitude (NAD 83)                 | 77° 45' 35.3" W      |       |                  |         |
| Ground Elevation (AMSL)            | 171.3 m / 562.0 ft   |       |                  |         |
| Antenna Centerline (AGL)           | 12.5 m / 41.0 ft     |       |                  |         |
| Antenna Model                      | TIW 19.0 Meter       |       |                  |         |
| Antenna Mode                       | Receive 4.0 GHz      |       | Transmit 6.1 GHz |         |
| Interference Objectives: Long Term | -156.0 dBW/MHz       | 20%   | -154.0 dBW/4 kHz | 20%     |
| Short Term                         | -146.0 dBW/MHz       | 0.01% | -131.0 dBW/4 kHz | 0.0025% |
| Max Available RF Power             |                      |       | -2.7 (dBW/4 kHz) |         |

| Azimuth (°) | Horizon Elevation (°) | Antenna Discrimination (°) | Receive 4.0 GHz    |                            | Transmit 6.1 GHz   |                            |
|-------------|-----------------------|----------------------------|--------------------|----------------------------|--------------------|----------------------------|
|             |                       |                            | Horizon Gain (dBi) | Coordination Distance (km) | Horizon Gain (dBi) | Coordination Distance (km) |
| 190         | 0.00                  | 43.16                      | -8.88              | 292.52                     | -8.88              | 175.02                     |
| 195         | 0.00                  | 41.93                      | -8.56              | 294.59                     | -8.56              | 176.24                     |
| 200         | 0.00                  | 40.26                      | -8.12              | 297.51                     | -8.12              | 177.95                     |
| 205         | 0.00                  | 38.20                      | -7.55              | 301.32                     | -7.55              | 180.15                     |
| 210         | 0.00                  | 35.81                      | -6.85              | 306.10                     | -6.85              | 182.86                     |
| 215         | 0.00                  | 33.14                      | -6.01              | 311.94                     | -6.01              | 186.11                     |
| 220         | 0.00                  | 30.22                      | -5.01              | 319.62                     | -5.01              | 189.96                     |
| 225         | 0.00                  | 27.11                      | -3.83              | 328.08                     | -3.83              | 194.49                     |
| 230         | 0.00                  | 23.83                      | -2.43              | 338.32                     | -2.43              | 199.84                     |
| 235         | 0.00                  | 20.42                      | -0.75              | 350.90                     | -0.75              | 204.61                     |
| 240         | 0.00                  | 16.89                      | 1.31               | 366.75                     | 1.31               | 212.70                     |
| 245         | 0.00                  | 13.37                      | 3.84               | 386.86                     | 3.84               | 223.34                     |
| 250         | 0.00                  | 10.88                      | 6.08               | 404.73                     | 6.08               | 233.40                     |
| 255         | 0.00                  | 10.36                      | 6.62               | 467.66                     | 6.62               | 268.26                     |
| 260         | 0.00                  | 12.07                      | 4.95               | 395.30                     | 4.95               | 228.25                     |
| 265         | 0.00                  | 15.29                      | 2.39               | 375.25                     | 2.39               | 217.15                     |
| 270         | 0.00                  | 19.26                      | -0.12              | 355.71                     | -0.12              | 207.04                     |
| 275         | 0.00                  | 23.62                      | -2.33              | 339.05                     | -2.33              | 200.21                     |
| 280         | 0.00                  | 28.18                      | -4.25              | 325.06                     | -4.25              | 192.88                     |
| 285         | 0.00                  | 32.86                      | -5.92              | 313.21                     | -5.92              | 186.47                     |
| 290         | 0.00                  | 37.61                      | -7.38              | 302.47                     | -7.38              | 180.81                     |
| 295         | 0.00                  | 42.42                      | -8.69              | 293.76                     | -8.69              | 175.75                     |
| 300         | 0.00                  | 47.25                      | -9.86              | 286.17                     | -9.86              | 171.20                     |
| 305         | 0.00                  | 52.11                      | -10.00             | 285.28                     | -10.00             | 170.66                     |
| 310         | 0.00                  | 56.99                      | -10.00             | 285.28                     | -10.00             | 170.66                     |
| 315         | 0.00                  | 61.88                      | -10.00             | 285.28                     | -10.00             | 170.66                     |
| 320         | 0.00                  | 66.79                      | -10.00             | 285.28                     | -10.00             | 170.66                     |
| 325         | 0.00                  | 71.69                      | -10.00             | 285.28                     | -10.00             | 170.66                     |
| 330         | 0.00                  | 76.61                      | -10.00             | 285.28                     | -10.00             | 170.66                     |
| 335         | 0.00                  | 81.52                      | -10.00             | 285.28                     | -10.00             | 170.66                     |
| 340         | 0.00                  | 86.44                      | -10.00             | 285.28                     | -10.00             | 170.66                     |
| 345         | 0.00                  | 91.36                      | -10.00             | 285.28                     | -10.00             | 170.66                     |
| 350         | 0.00                  | 96.28                      | -10.00             | 285.28                     | -10.00             | 170.66                     |
| 355         | 0.00                  | 101.20                     | -10.00             | 285.28                     | -10.00             | 170.66                     |

## 5. CERTIFICATION

I HEREBY CERTIFY THAT I AM THE TECHNICALLY QUALIFIED PERSON RESPONSIBLE FOR THE PREPARATION OF THE FREQUENCY COORDINATION DATA CONTAINED IN THIS APPLICATION, THAT I AM FAMILIAR WITH PARTS 101 AND 25 OF THE FCC RULES AND REGULATIONS, THAT I HAVE EITHER PREPARED OR REVIEWED THE FREQUENCY COORDINATION DATA SUBMITTED WITH THIS APPLICATION, AND THAT IT IS COMPLETE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.



Jeffrey E. Cowles  
Engineer III, Telecommunications  
COMSEARCH  
19700 Janelia Farm Boulevard  
Ashburn, Va. 20147

DATED: March 24, 2013