

# FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for

**Intelsat License LLC  
HAGERSTOWN, MARYLAND**

**Satellite Earth Station**

Prepared By:  
COMSEARCH  
19700 Janelia Farm Boulevard  
Ashburn, Virginia 20147  
August 27, 2014

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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

AT&T Communications of Maryland, Inc.  
County of Frederick  
Hardy Cellular Telephone Company  
PEG Bandwidth, LLC  
State of Maryland, MIEMSS  
USCOC of Cumberland, Inc.  
Washington Gas Light Company

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 June 30, 2014.

#### Company

256Q Networks  
AB Services LLC  
AT&T COMMUNICATIONS OF MARYLAND INC  
AT&T Communications of Virginia, LLC  
AT&T Corporation  
AWC Networks  
Adams County Department of Emergency Svc  
Affiniti PA, LLC  
Alltel Communications LLC-Southern VA  
Alltel Communications of Petersburg Inc  
Appalachia Engineering Services  
Appalachian Broadcasting  
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  
Beaver Springs Faith Baptist Church, Inc  
Bedford, County of  
Believe Wireless, LLC  
Berks County Department of Emergency Ser  
Blue Ridge Carriers  
CLEARFIELD, COUNTY OF  
CNG Transmission Corporation  
CROWN COMMUNICATION, INC.  
Cable Of The Carolinas  
Cambria, County of  
Capital Communications of America  
Caroline County Public Works  
Carroll, County of  
Cellco Partnership - Bridgeville, PA/WV  
Cellco Partnership - Southern Virginia

Company (Continued)

Cellco Partnership- PA Region  
Cellco Partnership-WDC/Baltimore  
Cellco Prtnrshp - Phil. Tri-State Rgn  
Centre, County of  
Charles, County of  
Chester, County of  
Columbia Gas Transmission Corporation  
Commonwealth of Pennsylvania-Radio Proj.  
Comprehensive Wireless LLC  
Conterra Ultra Broadband, LLC  
Converge Towers LLC  
Coralinks  
County of Fayette  
County of Frederick  
DAUPHIN COUNTY EMERGENCY MANAGEMENT  
Delaware County (PA) Emergency Services  
Delaware Division of Communications  
Delmarva Power and Light Company  
ECW Wireless, LLC  
EG Broadcast Newco Corp  
Eastern MLG LLC  
Enoch Pratt Free Library  
Exelon Generation Company, LLC  
FELHC  
Firstlevel Networks  
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  
Kryptic Technologies  
Lancaster County-Wide Communications  
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  
Mifflin Mobilecom  
National Tower Company LLC  
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

## Company (Continued)

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  
Northumberland, County of  
Old Dominion LLC  
Open Line Communications  
PA Communications  
PEG Bandwidth, LLC  
PSEG Services Corporation  
Peco Energy Company  
Penn Service Microwave Co., Inc.  
Pennsylvania Turnpike Commission  
Pitt Power  
Pittsburgh SMSA Limited Partnership  
Prince George's County  
Prince William, County of  
RAPPAHANNOCK ELECTRIC COOPERATIVE  
Radio One Inc  
Rendezvous Communications LLC  
Rural Broadband Network Services LLC  
SCTF NET  
SHENANDOAH VALLEY ELECTRIC COOPERATIVE  
SOMERSET COUNTY  
SW Networks  
Southern Maryland Electric Cooperative I  
Spotsylvania, County of  
St. Mary's County of (MD)  
Stafford, County of  
Standard Backhaul Communications LLC  
State of Maryland, MIEMSS  
Texas Eastern Communications, LLC  
Thought Transmissions, LLC  
Turtle Networks 6559  
Turtle Networks 6562  
Turtle Networks 6569  
US Cellular Operating Company, LLC (WI)  
USCOC of Cumberland, Inc.  
Velox Networks LLC  
Verizon Maryland, Inc.  
Verizon Wireless (VAW) LLC - Delaware/NJ  
Verizon Wireless (VAW) LLC - Maryland  
Verizon Wireless (VAW) LLC-Pennsylvania  
Verizon Wireless VAW 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.

Company (Continued)

WITF Inc.  
WV DHHR BPH, Office of EMS, Com. Div.  
Washington D.C. SMSA L.P.  
Washington Gas Light Company  
Washington Suburban Sanitary Commission  
Wireless Internetwork LLC  
Wireless World Enterprises, 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: 08/27/2014  
Job Number: 140630COMSJC01

### Administrative Information

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

### Site Information HAGERSTOWN, MARYLAND

Venue Name:  
Latitude (NAD 83): 39° 35' 53.5" N  
Longitude (NAD 83): 77° 45' 23.0" W  
Climate Zone: A  
Rain Zone: 2  
Ground Elevation (AMSL): 169.99 m / 557.7 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): 10.67 m / 35.0 ft

### Antenna Information

	Receive	Transmit
Manufacturer	GD SATCOM	GD SATCOM
Model	16.4 Meter	16.4 Meter
Gain / Diameter	55.1 dBi / 16.4 m	59.0 dBi / 16.4 m
3-dB / 15-dB Beamwidth	0.30° / 0.60°	0.19° / 0.40°

800KFXW, 36M0F8W, 72M0G7W

Max Available RF Power	(dBW/4 kHz)	-2.7	-2.7	-18.6	
	(dBW/MHz)	21.3	21.3	5.4	
Maximum EIRP	(dBW/4 kHz)	56.3	56.3	40.4	
	(dBW/MHz)	80.3	80.3	64.4	
	(dBW)	79.3	83.3	83.0	
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%

### Frequency Information

	Receive 4.0 GHz	Transmit 6.1 GHz
Emission / Frequency Range (MHz)	800KFXW / 3700.0 - 4200.0 36M0F8W / 3700.0 - 4200.0 72M0G7W / 3700.0 - 4200.0	800KFXW / 5925.0 - 6425.0 36M0F8W / 5925.0 - 6425.0 72M0G7W / 5925.0 - 6425.0

Max Great Circle Coordination Distance	750.6 km / 466.4 mi	452.5 km / 281.1 mi
Precipitation Scatter Contour Radius	613.5 km / 381.2 mi	101.4 km / 63.0 mi

# COMSEARCH

## Earth Station Data Sheet

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### Coordination Values

### HAGERSTOWN, MD

Licensee Name Intelsat License LLC  
Latitude (NAD 83) 39° 35' 53.5" N  
Longitude (NAD 83) 77° 45' 23.0" W  
Ground Elevation (AMSL) 169.99 m / 557.7 ft  
Antenna Centerline (AGL) 10.67 m / 35.0 ft  
Antenna Model GD Satcom 16.4 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	101.82	-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	47.10	-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	314.61	-5.72	187.24
75	0.00	27.35	-3.92	327.40	-3.92	194.13
80	0.00	22.47	-1.79	343.07	-1.79	202.28
85	0.00	17.66	0.83	362.98	0.83	210.75
90	0.00	12.98	4.17	388.86	4.17	224.76
95	0.00	8.67	8.55	426.05	8.55	245.19
100	0.00	5.62	13.26	750.63	13.26	452.51
105	0.00	6.15	12.27	542.70	12.27	313.51
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	306.09	-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

# COMSEARCH

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### Coordination Values

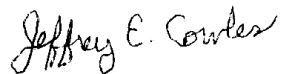
### HAGERSTOWN, MD

Licensee Name	Intelsat License LLC			
Latitude (NAD 83)	39° 35' 53.5" N			
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Ground Elevation (AMSL)	169.99 m / 557.7 ft			
Antenna Centerline (AGL)	10.67 m / 35.0 ft			
Antenna Model	GD Satcom 16.4 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)
185	0.00	43.92	-9.07	291.28	-9.07	174.28
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	6.09	404.74	6.09	233.41
255	0.00	10.36	6.62	465.67	6.62	268.07
260	0.00	12.07	4.96	395.33	4.96	228.27
265	0.00	15.28	2.40	375.27	2.40	217.16
270	0.00	19.26	-0.12	355.72	-0.12	207.05
275	0.00	23.61	-2.33	339.06	-2.33	200.22
280	0.00	28.18	-4.25	325.07	-4.25	192.88
285	0.00	32.86	-5.92	313.22	-5.92	186.47
290	0.00	37.61	-7.38	302.48	-7.38	180.81
295	0.00	42.41	-8.69	293.77	-8.69	175.76
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	66.78	-10.00	285.28	-10.00	170.66
325	0.00	71.69	-10.00	285.28	-10.00	170.66
330	0.00	76.60	-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: August 27, 2014