

# FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for

**Intelsat License LLC  
Hagerstown, Maryland  
Call Sign: E000355**

**Satellite Earth Station**

Prepared By:  
COMSEARCH  
19700 Janelia Farm Boulevard  
Ashburn, VA 20147  
July 5, 2012

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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.  
B20, LLC  
Baltimore County of Maryland  
Baltimore Gas & Electric Company  
Blue Ridge Carriers  
Cellco Partnership – Newark-Dallas Verizon Region  
Cellco Partnership – PA Region  
County of Frederick  
ECW Wireless, LLC  
FELHC, Inc  
Garden State Transmissions  
New Cingular Wireless PCS, LLC -PA.  
SCTF NET  
State of Maryland, MIEMSS  
Thought 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 March 26, 2012.

#### Company

AB Services LLC  
AT&T COMMUNICATIONS OF MARYLAND INC  
AT&T COMMUNICATIONS OF VIRGINIA INC  
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  
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  
Berks, County of  
Blue Ridge Carriers  
Borough of Huntingdon  
CHESTER, COUNTY OF  
COLLEGE OF SOUTHERN MARYLAND  
CROWN COMMUNICATION, INC.  
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-WA/Baltimore  
Cellco Prtnrshp - Phil. Tri-State Rgn  
Charles, County of  
Commonwealth of Pennsylvania-Radio Proj.  
Comprehensive Wireless LLC  
Conterra Ultra Broadband, LLC

Company (Continued)

Coral Reef Technologies Ltd  
 Coralinks  
 County of Frederick  
 County of Stafford  
 DAUPHIN COUNTY EMERGENCY MANAGEMENT  
 DELAWARE STATE - DTI  
 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  
 Fibertrack, LLC  
 Frederick County  
 Fundamental Broadcasting LLC  
 Garden State Transmissions  
 Hardy Cellular Telephone Company  
 Harrisonburg-Rockingham ECC  
 High Voltage Communications LLC  
 INDIANA, COUNTY OF  
 Jefferson Microwave, LLC  
 Juniata County Emergency Services  
 Kryptic Technologies  
 LACKAWANNA COMMUNICATIONS  
 Last Mile Inc.  
 Loudoun, County of  
 MAHANTANGO MOUNTAIN MICROWAVE  
 MB Microwave, LLC  
 MCI Communications Services Inc.  
 METROPOLITAN AREA NETWORKS, 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-DE/NH/RI  
 New Cingular Wireless PCS, LLC - PA  
 Newgig Networks, LLC  
 Norfolk Southern Railway  
 Northern Virginia Electric Cooperative  
 PENNSYLVANIA TURNPIKE COMMISSION  
 PSEG Services Corporation  
 Peco Energy Company  
 Prince George's County  
 Prince William, County of  
 RAPPAHANNOCK ELECTRIC COOPERATIVE

Company (Continued)

SCTF NET  
SHENANDOAH VALLEY ELECTRIC COOPERATIVE  
SOMERSET COUNTY  
SW Networks  
Southern Maryland Electric Cooperative I  
St. Mary's County of  
State of Maryland, MIEMSS  
State of WV DHHR/BPH STECS  
Texas Eastern Communications, Inc.  
Thought Transmissions, LLC  
Turtle Networks 6384  
Turtle Networks 6386  
USCOC of Cumberland, Inc.  
Velox Networks LLC  
Verizon Maryland, Inc.  
Virginia Broadband, LLC  
Virginia Department of State Police  
Virginia Electric & Power Company  
Virginia PCS Alliance, L.C.  
WASHINGTON SUBURBAN SANITARY COMMISSION  
WITF Inc.  
Washington D.C. SMSA L.P.  
Washington Gas Light Company  
Weblin Holdings LLC  
Wireless Backhaul Infrastructure, LLC  
Wireless Internetwork LLC  
World Class Wireless LLC  
York County Dept of Emergency Services  
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: 07/05/2012  
Job Number: 120326COMSJC03

**Administrative Information**

Status ENGINEER PROPOSAL  
Call Sign E000355  
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' 21.9" W  
Climate Zone A  
Rain Zone 2  
Ground Elevation (AMSL) 166.0 m / 544.6 ft

**Link Information**

Satellite Type Geostationary  
Mode TR - Transmit-Receive  
Modulation Digital  
Satellite Arc 18° W to 42° West Longitude  
Azimuth Range 110.4° to 131.5°  
Corresponding Elevation Angles 14.4° / 31.3°  
Antenna Centerline (AGL) 6.1 m / 20.0 ft

**Antenna Information**

Manufacturer Andrew  
Model ES9.3B  
Gain / Diameter 50.5 dBi / 9.3 m  
3-dB / 15-dB Beamwidth 0.55° / 0.95°

**Receive**

Andrew  
ES9.3B  
50.5 dBi / 9.3 m  
0.55° / 0.95°

**Transmit**

Andrew  
ES9.3B  
53.9 dBi / 9.3 m  
0.35° / 0.87°

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 / 3625.0 - 4200.0  
660KF2D / 3625.0 - 4200.0  
1M00F2D / 3625.0 - 4200.0  
56K0G7W - 72M0G7W / 3625.0 - 4200.0

**Transmit 6.1 GHz**

N0N / 5850.0 - 6425.0  
660KF2D / 5850.0 - 6425.0  
1M00F2D / 5850.0 - 6425.0  
56K0G7W - 72M0G7W / 5850.0 - 6425.0

Max Great Circle Coordination Distance 380.3 km / 236.3 mi  
Precipitation Scatter Contour Radius 520.9 km / 323.6 mi

219.8 km / 136.6 mi  
100.0 km / 62.1 mi

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ATTACHMENT 1

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Andrew Corporation:  
 Model: 9.3 Meter

4 GHz Gain: 50.5 dBi  
 6 GHz Gain: 53.9 dBi

Satellite Arc: 18.0 to 42.0 West Longitude

Receive Band: 3625.0 to 4200.0 MHz

Emissions

660KF2D  
 1M00F2D  
 N0N  
 56KG7W – 72M0G7W

Satellite Arc: 18.0 to 42.0 West Longitude

Transmit Band: 5850.0 – 6425.0 MHz

<u>Emission</u>	<u>RF Power Density (dBW/4 kHz)</u>	<u>EIRP Density (dBW/ 4 kHz)</u>	<u>EIRP/Carrier (dBW)</u>
660KF2D	-2.7	51.2	73.3
1M00F2D	-2.7	51.2	75.2
N0N	-2.7	51.2	51.2
56K0G7W to 72M0G7W	-2.7 to -13.8	51.2 to 40.1	62.7 to 82.7

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**Coordination Values****HAGERSTOWN, MD**

Licensee Name	Intelsat License LLC				
Latitude (NAD 83)	39° 35' 54.7" N				
Longitude (NAD 83)	77° 45' 21.9" W				
Ground Elevation (AMSL)	166.0 m / 544.6 ft				
Antenna Centerline (AGL)	6.1 m / 20.0 ft				
Antenna Model	Andrew ES9.3B				
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	0.33	109.75	-10.00	268.65	-10.00	154.63
5	0.27	104.91	-10.00	276.59	-10.00	161.43
10	0.23	100.07	-10.00	281.02	-10.00	165.30
15	0.29	95.23	-10.00	274.52	-10.00	159.65
20	0.28	90.38	-10.00	275.65	-10.00	160.62
25	0.26	85.53	-10.00	277.89	-10.00	162.57
30	0.22	80.69	-10.00	283.07	-10.00	168.73
35	0.20	75.85	-10.00	284.75	-10.00	170.20
40	0.37	71.00	-10.00	264.39	-10.00	151.07
45	0.28	66.18	-10.00	275.12	-10.00	160.17
50	0.00	61.41	-10.00	285.28	-10.00	170.66
55	0.00	56.62	-10.00	285.28	-10.00	170.66
60	0.00	51.87	-10.00	285.28	-10.00	170.66
65	0.23	47.09	-9.82	283.04	-9.82	168.41
70	0.21	42.41	-8.69	292.79	-8.69	174.93
75	0.23	37.78	-7.43	297.64	-7.43	176.91
80	0.23	33.25	-6.04	307.12	-6.04	182.32
85	0.00	28.96	-4.54	322.93	-4.54	191.74
90	0.00	24.79	-2.86	335.17	-2.86	198.20
95	0.00	20.97	-1.04	348.72	-1.04	205.14
100	0.00	17.70	0.80	362.76	0.80	210.64
105	0.00	15.37	2.33	374.79	2.33	216.91
110	0.00	14.42	3.03	380.29	3.03	219.83
115	0.00	15.12	2.51	376.20	2.51	217.65
120	0.00	17.27	1.07	364.86	1.07	211.72
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	38.38	-7.60	300.98	-7.60	179.96
160	0.00	41.30	-8.40	295.66	-8.40	176.87
165	0.00	44.53	-9.22	290.31	-9.22	173.70
170	0.00	48.01	-10.00	285.28	-10.00	170.66
175	0.00	51.67	-10.00	285.28	-10.00	170.66
180	0.00	55.49	-10.00	285.28	-10.00	170.66
185	0.00	59.43	-10.00	285.28	-10.00	170.66

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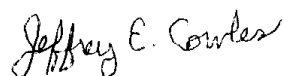
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Short Term	-146.0 dBW/MHz	0.01%	-131.0 dBW/4 kHz	0.0025%	
Max Available RF Power			-2.7 (dBW/4 kHz)		

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	63.46	-10.00	285.28	-10.00	170.66
195	0.00	67.57	-10.00	285.28	-10.00	170.66
200	0.00	71.73	-10.00	285.28	-10.00	170.66
205	0.00	75.94	-10.00	285.28	-10.00	170.66
210	0.00	80.17	-10.00	285.28	-10.00	170.66
215	0.33	84.41	-10.00	269.18	-10.00	155.09
220	0.51	88.70	-10.00	249.30	-10.00	139.00
225	0.55	92.99	-10.00	246.32	-10.00	136.71
230	0.42	97.27	-10.00	258.76	-10.00	146.44
235	0.51	101.56	-10.00	248.92	-10.00	138.71
240	0.53	105.81	-10.00	248.05	-10.00	138.04
245	0.61	110.04	-10.00	242.91	-10.00	134.11
250	0.62	114.22	-10.00	242.07	-10.00	133.48
255	0.65	118.34	-10.00	240.40	-10.00	133.49
260	0.69	122.39	-10.00	237.90	-10.00	131.60
265	0.69	126.33	-10.00	237.91	-10.00	131.61
270	0.75	130.16	-10.00	234.28	-10.00	128.83
275	0.73	133.80	-10.00	235.47	-10.00	129.75
280	0.57	137.13	-10.00	245.43	-10.00	136.03
285	0.40	140.18	-10.00	260.48	-10.00	147.84
290	0.40	142.99	-10.00	260.47	-10.00	147.83
295	0.24	145.23	-10.00	280.27	-10.00	164.64
300	0.25	147.11	-10.00	278.64	-10.00	163.22
305	0.32	148.43	-10.00	269.95	-10.00	155.73
310	0.41	149.10	-10.00	259.97	-10.00	147.42
315	0.34	148.89	-10.00	267.79	-10.00	153.91
320	0.29	147.47	-10.00	273.47	-10.00	158.74
325	0.21	142.93	-10.00	284.64	-10.00	170.10
330	0.23	138.32	-10.00	280.93	-10.00	165.22
335	0.39	133.68	-10.00	262.30	-10.00	149.34
340	0.39	128.95	-10.00	261.82	-10.00	148.94
345	0.36	124.18	-10.00	265.73	-10.00	152.18
350	0.28	119.38	-10.00	275.23	-10.00	160.26
355	0.37	114.58	-10.00	264.33	-10.00	151.01

## 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: July 5, 2012