

# **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  
March 1, 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

None

No 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.

Expedited coordination data for this earth station was emailed and sent to the below listed carriers with a letter dated February 24, 2012.

#### Company

ALLEGANY COLLEGE OF MARYLAND  
ALLEGANY COUNTY GOVERNMENT  
ART Licensing Corp.  
AT&T COMMUNICATIONS OF MARYLAND INC  
AT&T COMMUNICATIONS OF VIRGINIA INC  
AT&T CORP  
Aerbender, LLC  
Airband Communications Inc  
Albermarle, County of, Virginia  
Allegheny County  
Allentown SMSA Limited Partnership  
Alltel Communications LLC-Southern VA  
Alltel Communications of Petersburg Inc  
Atlantic Broadband (Delmar), LLC  
Atlantic Broadband (Penn), LLC  
Auburn Data Systems, LLC  
BALTIMORE CITY DEPARTMENT OF PUBLIC WORK  
BAY BROADBAND COMMUNICATIONS LLC  
Baltimore County of Maryland  
Baltimore Gas and Electric Company  
Bedford, County of  
Believe Wireless, LLC  
Berks, County of  
Blaze Broadband  
Blue Ridge Carriers  
Bucks, County of  
Buggs Island Telephone Cooperative, Inc.  
CAMDEN COUNTY  
CHESTER, COUNTY OF  
CROWN COMMUNICATION, INC.  
Cambria, County of  
Cape May County Municipal Utilities Auth  
Cape May County, MIS Department

Company (Continued)

Cellco Partnership - Bridgeville, PA  
Cellco Partnership - Southern Virginia  
Cellco Partnership- PA Region  
Cellco Partnership-Newark-Dallas Verizon  
Cellco Prtnrshp - Phil. Tri-State Rgn  
Central Virginia Electric Cooperative  
Chesterfield, County of  
City of Laurel  
City of Ocean City, MD  
Clearwire Spectrum Holdings II, LLC  
Clearwire Spectrum Holdings III, LLC  
Clearwire Spectrum Holdings LLC  
Commonwealth of Pennsylvania-Radio Proj.  
Comprehensive Wireless LLC  
Conterra Ultra Broadband, LLC  
County of Nelson  
County of Stafford  
Cumberland, County of  
D&E Communications, Inc.  
DAUPHIN COUNTY EMERGENCY MANAGEMENT  
DELAWARE STATE - DTI  
ECW Wireless, LLC  
Eduro Networks LLC  
Enoch Pratt Free Library  
Exelon Generation Company, L.L.C  
FELHC, Inc.  
FiberTower Network Services Corp.  
Franklin County Dept. of Emergency Servi  
Frederick County  
Fundamental Broadcasting LLC  
GEORGE MASON UNIVERSITY INSTR FNDTION  
GETWIRELESS.NET  
GREATER PHILADELPHIA RADIO INC  
Garden State Transmissions  
Globecomm Systems, Inc.  
Gloucester Township  
Greene, County of (PA)  
HENRICO COUNTY  
Hanover County Emergency Communications  
Hardy Cellular Telephone Company  
Harrisonburg-Rockingham ECC  
High Voltage Communications LLC  
Huntingdon County of  
INDIANA COUNTY  
JEFFERSON COUNTY OF PENNSYLVANIA  
Jefferson Microwave, LLC  
Jubatus, LLC  
Juniata County Emergency Services  
Kent County Levy Court  
King George County  
Kryptic Technologies

Company (Continued)

LACKAWANNA COMMUNICATIONS  
LANCASTER COUNTY OF  
LOWER SHORE BROADBAND COOPERATIVE  
LYCOMING COUNTY  
Last Mile Inc.  
Lehigh, County of  
Loudoun County Public Schools  
Loudoun Wireless LLC  
Loudoun, County of  
M&T Bank  
MB Microwave, LLC  
MCI Communications Services Inc.  
METROPOLITAN AREA NETWORKS, INC.  
MIT LINCOLN LABORATORY  
MVC Research. LLC  
Maryland Port Administration  
Maryland Public Broadcasting Commission  
Maryland State Highway Administration  
Maryland, State of - Dept.of Info & Tech  
Meridian Microwave  
Middle East Broadcasting Networks, Inc.  
Mifflin County  
Millersburg Area School District  
Mobile Satellite Communications Inc  
Montgomery, County of  
NEW JERSEY STATE DEPT OF TRANSPORTATION  
NOROC Broadband LLC  
National Radio Astronomy Observatory  
Netrepid, Inc.  
New Cingular Wireless PCS - Maryland  
New Cingular Wireless PCS LLC - AL, MS,  
New Cingular Wireless PCS LLC - DC  
New Cingular Wireless PCS LLC - VA  
New Cingular Wireless PCS LLC- DE/NH/RI  
New Cingular Wireless PCS LLC-WV/NC/SC  
New Cingular Wireless PCS of PA LLC  
New Cingular Wireless PCS, LLC - PA  
New Jersey State Police  
New Jersey Turnpike Authority-Pkwy Div  
New Jersey, State of -NJ Transit  
Newgig Networks, LLC  
Nextlink Wireless, LLC  
Northern Virginia Electric Cooperative  
PENNSYLVANIA MICROWAVE NETWORK INC.  
PENNSYLVANIA TURNPIKE COMMISSION  
Peco Energy Company  
Philly Sports Wireless  
Pitt Power  
Pittsburgh, City of (PA)  
Pontis Communications, Inc.  
Port Networks, LLC  
Posen Pipeline Properties  
Public Broadcasting Service

Company (Continued)

QUALCOMM INC.  
RADIO ONE, INC - MD  
RAYTHEON COMPANY  
Radio One, Inc  
RapidDSL & Wireless, Inc.  
Roadstar Internet, Inc.  
Rural Broadband Network Services LLC  
SCHUYLKILL, COUNTY OF  
SCTF NET  
SECOM NET  
SOMERSET COUNTY  
SOUTHEASTERN PENNSYLVANIA TRANSIT AUTH  
SW Networks  
Salem County Information Technology  
Shenandoah Personal Communications Co  
Somerset County, Maryland  
Sprint Spectrum, LP  
State of Maryland, MIEMSS  
State of WV DHHR/BPH STECS  
Sussex County Council  
Synergy Telecommunications Corp  
Telecom Transport Management, Inc  
Thought Transmissions, LLC  
Turtle Networks 6384  
Turtle Networks, 6386  
UNION, COUNTY OF  
UNIVERSITY OF MARYLAND  
USCOC of Cumberland, Inc.  
USCOC of Virginia RSA #3, Inc.  
Velox Networks LLC  
Verizon Maryland, Inc.  
Verizon New Jersey, Inc.  
Verizon Virginia, Inc.  
Verizon Wireless VAW LLC-Southern VA  
Virginia Broadband, LLC  
Virginia Electric & Power Company  
Virginia RSA #7, Inc.  
Virginia Tech Foundation , Inc.  
WASHINGTON SUBURBAN SANITARY COMMISSION  
WEST VIRGINIA RADIO CORPORATION  
WHYY, INC.  
WICOMICO BOARD OF EDUCATION  
WPNT, Inc.  
Warrenton Fauquier Joint Communications  
Washington Gas Light Company  
Webline Holdings LLC  
West Virginia PCS Alliance, L.C.  
Western PA Internet Access, Inc.  
Wireless Backhaul Infrastructure, LLC  
Wireless Internetwork LLC  
World Class Wireless LLC



Company (Continued)

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: 03/01/2012  
Job Number: 120224COMSJC01

### 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' 54.7" N  
Longitude (NAD 83): 77° 45' 21.9" W  
Climate Zone: A  
Rain Zone: 2  
Ground Elevation (AMSL): 166.1 m / 545.0 ft

### Link Information

Satellite Type: Geostationary  
Mode: TR - Transmit-Receive  
Modulation: Digital  
Satellite Arc: 18° W to 133° West Longitude  
Azimuth Range: 110.4° to 246.1°  
Corresponding Elevation Angles: 14.4° / 17.8°  
Antenna Centerline (AGL): 6.1 m / 20.0 ft

### Antenna Information

	Receive	Transmit
Manufacturer	GD SATCOM Technologies	GD SATCOM Technologies
Model	9 Meter KPK	9 Meter KPK
Gain / Diameter	58.5 dBi / 9.0 m	60.1 dBi / 9.0 m
3-dB / 15-dB Beamwidth	0.18° / 0.38°	0.16° / 0.34°

660KF2D, 1M00F2D, 56K0G7D - 72M0G7D

Max Available RF Power	(dBW/4 kHz)	-14.0	-14.0	-14.0	-14.5
	(dBW/MHz)	8.2	10.0	-2.5	9.5
Maximum EIRP	(dBW/4 kHz)	46.1	46.1	46.1	45.6
	(dBW/MHz)	68.3	70.1	57.6	69.6
	(dBW)	68.3	70.1	57.6	88.2
Interference Objectives:	Long Term	-156.0 dBW/MHz	20%	-151.0 dBW/4 kHz	20%
	Short Term	-146.0 dBW/MHz	0.01%	-128.0 dBW/4 kHz	0.0025%

### Frequency Information

	Receive 11.0 GHz	Transmit 14.0 GHz
Emission / Frequency Range (MHz)	56K0G7W - 1M00G7W / 11451.25 56K0G7W - 1M00G7W / 11451.75 56K0G7W - 1M00G7W / 11453.25 56K0G7W - 1M00G7W / 11453.75	660KF2D / 14000.0 - 14500.0 1M00F2D / 14000.0 - 14500.0 56K0G7W - 72M0G7W / 14000.0 - 14500.0

Max Great Circle Coordination Distance	295.0 km / 183.3 mi	151.1 km / 93.9 mi
Precipitation Scatter Contour Radius	512.3 km / 318.3 mi	100.0 km / 62.1 mi

# COMSEARCH

## Earth Station Data Sheet

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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)	166.1 m / 545.0 ft				
Antenna Centerline (AGL)	6.1 m / 20.0 ft				
Antenna Model	GD SATCOM Technologies 9 Meter KPK				
Antenna Mode	Receive 11.0 GHz		Transmit 14.0 GHz		
Interference Objectives:	Long Term	-156.0 dBW/MHz	20%	-151.0 dBW/4 kHz	20%
	Short Term	-146.0 dBW/MHz	0.01%	-128.0 dBW/4 kHz	0.0025%
Max Available RF Power			-14.0 (dBW/4 kHz)		

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 11.0 GHz		Transmit 14.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
0	0.33	109.75	-10.00	218.78	-10.00	105.54
5	0.27	104.91	-10.00	224.82	-10.00	110.53
10	0.23	100.07	-10.00	228.22	-10.00	113.28
15	0.28	95.23	-10.00	223.35	-10.00	109.33
20	0.27	90.38	-10.00	224.20	-10.00	110.02
25	0.26	85.53	-10.00	225.91	-10.00	111.42
30	0.21	80.69	-10.00	229.92	-10.00	114.65
35	0.00	75.86	-10.00	231.37	-10.00	115.80
40	0.36	71.00	-10.00	216.07	-10.00	103.25
45	0.27	66.18	-10.00	224.17	-10.00	110.00
50	0.00	61.41	-10.00	231.37	-10.00	115.80
55	0.00	56.62	-10.00	231.37	-10.00	115.80
60	0.00	51.87	-10.00	231.37	-10.00	115.80
65	0.22	47.09	-9.82	229.93	-9.82	114.48
70	0.20	42.41	-8.69	236.89	-8.69	118.83
75	0.23	37.78	-7.43	239.99	-7.43	119.91
80	0.23	33.25	-6.04	246.66	-6.04	123.44
85	0.00	28.96	-4.54	257.06	-4.54	129.65
90	0.00	24.79	-2.86	265.64	-2.86	132.87
95	0.00	20.97	-1.04	275.25	-1.04	138.08
100	0.00	17.70	0.80	285.31	0.80	143.74
105	0.00	15.37	2.33	294.01	2.33	148.78
110	0.00	14.42	3.03	295.03	3.03	151.14
115	0.00	15.12	2.51	295.04	2.51	149.38
120	0.00	17.27	1.07	286.83	1.07	144.60
125	0.00	20.41	-0.75	276.81	-0.75	138.95
130	0.00	23.83	-2.43	267.88	-2.43	134.07
135	0.00	27.11	-3.83	260.66	-3.83	130.26
140	0.00	30.23	-5.01	254.75	-5.01	128.44
145	0.00	33.14	-6.01	249.86	-6.01	125.87
150	0.00	35.82	-6.85	245.83	-6.85	123.72
155	0.00	38.20	-7.55	242.41	-7.55	121.94
160	0.00	40.26	-8.12	239.78	-8.12	120.50
165	0.00	41.93	-8.56	237.77	-8.56	119.39
170	0.00	43.16	-8.88	236.35	-8.88	118.60
175	0.00	43.92	-9.07	235.50	-9.07	118.13
180	0.00	44.18	-9.13	235.21	-9.13	117.97

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Antenna Centerline (AGL): 6.1 m / 20.0 ft  
Antenna Model: GD SATCOM Technologies 9 Meter KPK  
Antenna Mode: Receive 11.0 GHz  
Interference Objectives: Long Term: -156.0 dBW/MHz 20% Transmit 14.0 GHz -151.0 dBW/4 kHz 20%  
Short Term: -146.0 dBW/MHz 0.01% -128.0 dBW/4 kHz 0.0025%  
Max Available RF Power: -14.0 (dBW/4 kHz)

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 11.0 GHz		Transmit 14.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
185	0.00	43.92	-9.07	235.50	-9.07	118.13
190	0.00	43.16	-8.88	236.35	-8.88	118.60
195	0.00	41.93	-8.56	237.77	-8.56	119.39
200	0.00	40.26	-8.12	239.78	-8.12	120.50
205	0.00	38.20	-7.55	242.41	-7.55	121.94
210	0.00	35.81	-6.85	245.83	-6.85	123.72
215	0.32	32.89	-5.93	237.84	-5.93	116.47
220	0.50	29.85	-4.87	226.10	-4.87	105.60
225	0.55	26.71	-3.67	229.26	-3.67	106.59
230	0.41	23.53	-2.29	246.79	-2.29	118.73
235	0.50	20.46	-0.78	246.32	-0.78	116.23
240	0.51	18.29	0.44	251.82	0.44	118.79
245	0.59	17.22	1.10	250.64	1.10	116.88
250	0.61	17.59	0.87	248.67	0.87	115.66
255	0.63	19.24	-0.10	242.01	-0.10	111.90
260	0.67	21.89	-1.51	233.17	-1.51	106.76
265	0.67	25.25	-3.06	225.73	-3.06	102.80
270	0.73	29.03	-4.57	215.73	-4.57	100.00
275	0.71	33.15	-6.01	210.48	-6.01	100.00
280	0.55	37.52	-7.36	212.81	-7.36	100.00
285	0.38	42.01	-8.58	220.07	-8.58	105.05
290	0.38	46.52	-9.69	215.41	-9.69	102.35
295	0.23	51.15	-10.00	227.98	-10.00	113.09
300	0.25	55.78	-10.00	226.67	-10.00	112.03
305	0.32	60.44	-10.00	219.95	-10.00	106.51
310	0.41	65.14	-10.00	212.37	-10.00	100.08
315	0.34	69.88	-10.00	218.54	-10.00	105.34
320	0.29	74.63	-10.00	222.90	-10.00	108.96
325	0.20	79.39	-10.00	231.24	-10.00	115.70
330	0.23	84.15	-10.00	228.33	-10.00	113.37
335	0.38	88.91	-10.00	214.13	-10.00	101.60
340	0.39	93.68	-10.00	213.73	-10.00	101.26
345	0.36	98.45	-10.00	216.67	-10.00	103.76
350	0.28	103.21	-10.00	223.89	-10.00	109.77
355	0.37	107.97	-10.00	215.52	-10.00	102.78

## 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 1, 2012