

FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for

**Intelsat License LLC
Hagerstown, Maryland
(Call Sign: E980200)**

Satellite Earth Station

Prepared By:
COMSEARCH
19700 Janelia Farm Boulevard
Ashburn, Virginia 20147
March 7, 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
B20 LLC
Baltimore, County of Maryland
Baltimore Gas & Electric Company
Blue Ridge Carriers
Capital Communications of America
Celco Partnership – PA Region
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
State of WV DHHR/BPH STECS
Thought Transmissions, LLC
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 December 20, 2012.

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

Company (Continued)

Charles, County of
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

Company (Continued)

Peco Energy Company
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: 03/07/2013
Job Number: 121220COMSJC04

Administrative Information

Status ENGINEER PROPOSAL
Call Sign E980200
Licensee Code INTELS
Licensee Name Intelsat License LLC

Site Information HAGERSTOWN, MARYLAND

Venue Name
Latitude (NAD 83) 39° 35' 53.7" N
Longitude (NAD 83) 77° 45' 34.2" W
Climate Zone A
Rain Zone 2
Ground Elevation (AMSL) 175.26 m / 575.0 ft

Link Information

Satellite Type Geostationary
Mode TR - Transmit-Receive
Modulation Analog and Digital
Satellite Arc 6° W to 149° West Longitude
Azimuth Range 101.9° to 257.8°
Corresponding Elevation Angles 5.3° / 5.7°
Antenna Centerline (AGL) 2.74 m / 9.0 ft

Antenna Information

Receive
Manufacturer ASC Signal
Model 4.6 Meter
Gain / Diameter 44.4 dBi / 4.6 m
3-dB / 15-dB Beamwidth 0.92° / 1.82°

Transmit

ASC Signal
4.6 Meter
48.2 dBi / 4.6 m
0.64° / 1.22°

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 - 1M00F2D / 3700.0 - 4200.0
56K0G7W - 72M0G7W / 3700.0 - 4200.0

Transmit 6.1 GHz

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

Max Great Circle Coordination Distance 582.3 km / 361.8 mi
Precipitation Scatter Contour Radius 613.5 km / 381.2 mi

343.0 km / 213.1 mi
101.4 km / 63.0 mi

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ATTACHMENT 1

Page 1 of 1

ASC Signal
Model: 4.6 Meter
Call Sign: E980200

6.175 GHz Gain: 48.2 dBi
3.950 GHz Gain: 44.4 dBi

Satellite Arc: 6.0° to 149.0° West Longitude

Receive Band: 3700.0 to 4200.0 MHz

Emissions

N0N
660KF2D to 1M00F2D
56K0G7W to 72M0G7W

Transmit Band: 5925.0 to 6425.0 MHz

<u>Emission</u>	<u>EIRP (dBW)</u>	<u>RF Power Density (dBW/4 kHz)</u>	<u>EIRP Density (dBW/ 4 kHz)</u>
N0N	45.5	-2.7	45.5
660KF2D to 1M00F2D	62.2	-8.2	40.0
56K0G7W to 72M0G7W	62.2	-10.0	38.2
	57.0	-2.7	45.5
	62.2	-28.6	19.6

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Coordination Values

HAGERSTOWN, MD

Licensee Name Intelsat License LLC
Latitude (NAD 83) 39° 35' 53.7" N
Longitude (NAD 83) 77° 45' 34.2" W
Ground Elevation (AMSL) 175.26 m / 575.0 ft
Antenna Centerline (AGL) 2.74 m / 9.0 ft
Antenna Model ASC Signal 4.6 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	582.31	13.27	343.01
105	0.00	6.15	12.28	482.04	12.28	271.25
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
185	0.00	43.92	-9.07	291.28	-9.07	174.28

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Coordination Values

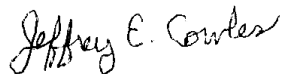
HAGERSTOWN, MD

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Latitude (NAD 83)	39° 35' 53.7" N			
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Antenna Model	ASC Signal 4.6 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	13.28	3.92	387.51	3.92	223.69
250	0.00	9.59	7.46	416.47	7.46	239.87
255	0.00	6.33	11.96	486.37	11.96	273.61
260	0.00	6.11	12.35	567.67	12.35	332.03
265	0.00	9.18	7.93	420.53	7.93	242.12
270	0.00	13.46	3.77	386.30	3.77	223.04
275	0.20	18.05	0.59	361.00	0.59	209.70
280	0.25	22.84	-1.97	335.09	-1.97	196.69
285	0.22	27.72	-4.07	323.75	-4.07	191.58
290	0.00	32.66	-5.85	313.67	-5.85	186.72
295	0.00	37.59	-7.38	302.52	-7.38	180.83
300	0.00	42.53	-8.72	293.57	-8.72	175.64
305	0.00	47.48	-9.91	285.84	-9.91	171.00
310	0.00	52.44	-10.00	285.28	-10.00	170.66
315	0.00	57.40	-10.00	285.28	-10.00	170.66
320	0.00	62.37	-10.00	285.28	-10.00	170.66
325	0.00	67.34	-10.00	285.28	-10.00	170.66
330	0.00	72.31	-10.00	285.28	-10.00	170.66
335	0.00	77.28	-10.00	285.28	-10.00	170.66
340	0.00	82.26	-10.00	285.28	-10.00	170.66
345	0.00	87.23	-10.00	285.28	-10.00	170.66
350	0.00	92.21	-10.00	285.28	-10.00	170.66
355	0.00	97.18	-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 7, 2013