

FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for

**Intelsat License LLC
Hagerstown, Maryland
(Call Sign: KA264)**

Satellite Earth Station

Prepared By:
COMSEARCH
19700 Janelia Farm Boulevard
Ashburn, Virginia 20147
August 27, 2013

TABLE OF CONTENTS

1. CONCLUSIONS	3
2. SUMMARY OF RESULTS	4
3. SUPPLEMENTAL SHOWING	5
4. EARTH STATION COORDINATION DATA.....	8
5. CERTIFICATION.....	13

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 transmit-receive earth station.

Company

AT&T Communications of Maryland, Inc.
Hardy Cellular Telephone Company
PEG Bandwidth
State of Maryland MIEMSS
USCOC of Cumberland, Inc.

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.

Expedited coordination data for this earth station was emailed and sent sent to the below listed carriers with a letter dated August 6, 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-E OH WV
Alltel Communications LLC-Southern VA
Alltel Communications of Petersburg Inc
American Electric Power Service Corp.
Appalachia Engineering Services
Appalachian Broadcasting
Atlantic Broadband (Delmar), LLC
Atlantic Broadband (Penn), LLC
Atlantic City Electric Company
B20 LLC
BAY BROADBAND COMMUNICATIONS LLC
BLAIR COUNTY 911
Baltimore County of Maryland
Baltimore Gas and Electric Company
Bedford, County of
Believe Wireless, LLC
Blue Ridge Carriers
CENTRE COUNTY
CHESTER, COUNTY OF
CNG Transmission Corporation
CROWN COMMUNICATION, INC.
Cable Of The Carolinas
Cambria, County of
Capital Communications of America
Cellco Partnership - Bridgeville, PA/WV
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
County of Fayette
County of Frederick
Cumberland, County of
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.
Firstlevel Networks
Frederick County
Fundamental Broadcasting LLC
Garden State Transmissions
Hardy Cellular Telephone Company
Harrisonburg-Rockingham ECC
High Voltage Communications LLC
Huntingdon, County of
INDIANA, COUNTY OF
Juniata County Emergency Services
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
Norfolk Southern Railway
Old Dominion LLC
Open Line Communications
PA Communications
PEG Bandwidth
PENNSYLVANIA TURNPIKE COMMISSION
PSEG Services Corporation
Peco Energy Company
Pittsburgh SMSA Limited Partnership

Company (Continued)

Prince George's County
Prince William, County of
RAPPAHANNOCK ELECTRIC COOPERATIVE
Radio One Inc, LLC
Rural Broadband Network Services LLC
SCTF NET
SHENANDOAH VALLEY ELECTRIC COOPERATIVE
SOMERSET COUNTY
SPOTSYLVANIA COUNTY
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
US Cellular Operating Company, LLC (WI)
USCOC of Cumberland, Inc.
Verizon Maryland, Inc.
Verizon Wireless (VAW) LLC - Delaware
Verizon Wireless (VAW) LLC - Maryland
Verizon Wireless (VAW) LLC-Pennsylvania
Verizon Wireless VAW LLC-Southern VA
Virginia Broadband, 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
Wireless Internetwork LLC
Wireless World Enterprises, 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: 08/27/2013
Job Number: 130806COMSJC01

Administrative Information

Status ENGINEER PROPOSAL
Call Sign KA264
Licensee Code INTELS
Licensee Name Intelsat License LLC

Site Information HAGERSTOWN, MARYLAND

Venue Name
Latitude (NAD 83) 39° 35' 54.8" N
Longitude (NAD 83) 77° 45' 21.1" W
Climate Zone A
Rain Zone 2
Ground Elevation (AMSL) 167.64 m / 550.0 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) 5.18 m / 17.0 ft

Antenna Information

	Receive - V40901	Transmit - V60901
Manufacturer	VERTEX COMMUNICATIONS	VERTEX COMMUNICATIONS
Model	9 KPC	9 KPC
Gain / Diameter	50.1 dBi / 9.0 m	53.5 dBi / 9.0 m
3-dB / 15-dB Beamwidth	0.55° / 1.20°	0.40° / 0.80°
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 -144.0 dBW/MHz 0.01%	-154.0 dBW/4 kHz 20% -131.0 dBW/4 kHz 0.0025%

Frequency Information

	Receive 4.0 GHz	Transmit 6.1 GHz
Emission / Frequency Range (MHz)	SEE ATTACHMENT 1	SEE ATTACHMENT 1
Max Great Circle Coordination Distance	626.4 km / 389.2 mi	391.4 km / 243.2 mi
Precipitation Scatter Contour Radius	610.3 km / 379.2 mi	101.4 km / 63.0 mi

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ATTACHMENT 1

Page 1 of 1

Vertex Communications:
Model: 9 Meter KPC

4 GHz Gain: 50.1 dBi
6 GHz Gain: 53.5 dBi

Satellite Arc: 6.0 to 149.0 West Longitude

Receive Band: 3625.0 to 4200.0 MHz

Emissions

NON
660KF2D
1M00F2D
56KG7W – 72M0G7W

Satellite Arc: 6.0 to 149.0 West Longitude

Transmit Band: 5850.0 – 6425.0 MHz

<u>Emission</u>	<u>RF Power Density (dBW/4 kHz)</u>	<u>EIRP/Carrier (dBW)</u>	<u>EIRP Density (dBW/ 4 kHz)</u>
NON	-2.7	50.8	50.8
800KFXD	-2.7	73.8	50.8
800KGXD	-2.7	73.8	50.8
1M50F3X	-2.7	76.5	50.8
600KF2D to 1M00F2D	-2.7 to -2.7	72.6 to 74.8	50.8 to 50.8
56K0G7W to 72M0G7W	-2.7 to -12.6	62.3 to 83.5	50.8 to 40.9

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Coordination Values

HAGERSTOWN, MD

Licensee Name Intelsat License LLC
Latitude (NAD 83) 39° 35' 54.8" N
Longitude (NAD 83) 77° 45' 21.1" W
Ground Elevation (AMSL) 167.64 m / 550.0 ft
Antenna Centerline (AGL) 5.18 m / 17.0 ft
Antenna Model VERTEX COMMUNICATIONS 9 KPC
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 -144.0 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	101.82	-15.90	226.22	-15.50	137.17
5	0.26	96.84	-15.90	233.06	-15.50	142.96
10	0.23	91.86	-15.90	236.61	-15.50	146.04
15	0.26	86.88	-15.90	233.45	-15.50	143.30
20	0.25	81.90	-15.90	233.83	-15.50	143.63
25	0.24	76.92	-15.90	235.39	-15.50	144.98
30	0.00	71.95	-15.90	239.92	-15.50	148.92
35	0.23	66.96	-15.90	237.02	-15.50	146.39
40	0.33	61.98	-14.90	231.22	-15.50	137.28
45	0.21	57.02	-14.30	247.33	-15.50	148.15
50	0.00	52.06	-13.31	253.75	-15.50	148.92
55	0.00	47.10	-12.32	259.30	-15.50	148.92
60	0.00	42.14	-11.33	265.00	-14.21	153.31
65	0.00	37.19	-9.22	277.66	-11.38	163.68
70	0.00	32.26	-6.80	293.00	-9.95	170.84
75	0.22	27.31	-5.90	296.40	-7.89	176.72
80	0.21	22.42	-5.90	297.85	-5.47	187.28
85	0.00	17.66	-5.90	298.99	-4.63	191.40
90	0.00	12.98	-4.88	305.89	-4.65	191.32
95	0.00	8.67	-1.57	329.99	-4.17	193.19
100	0.00	5.62	0.48	626.37	-2.12	391.39
105	0.00	6.15	0.10	432.08	-2.65	252.62
110	0.00	9.60	-2.50	323.28	-4.50	191.91
115	0.00	13.27	-4.90	305.76	-4.66	191.30
120	0.00	16.89	-5.90	298.99	-4.51	191.88
125	0.00	20.41	-5.90	298.99	-4.67	191.28
130	0.00	23.83	-5.90	298.99	-6.03	186.02
135	0.00	27.11	-5.90	298.99	-7.77	179.33
140	0.00	30.23	-5.99	298.38	-9.55	172.43
145	0.00	33.14	-7.16	290.70	-10.13	170.16
150	0.00	35.82	-8.39	282.82	-10.83	165.81
155	0.00	38.20	-9.82	273.96	-11.78	162.15
160	0.00	40.26	-10.95	267.20	-12.71	158.70
165	0.00	41.93	-11.29	265.25	-14.04	153.92
170	0.00	43.16	-11.53	263.81	-15.03	150.51
175	0.00	43.92	-11.68	262.94	-15.64	148.47
180	0.00	44.18	-11.74	262.64	-15.84	147.79
185	0.00	43.92	-11.68	262.93	-15.64	148.47

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Short Term -144.0 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	-11.53	263.81	-15.03	150.51
195	0.00	41.93	-11.29	265.25	-14.04	153.91
200	0.00	40.26	-10.95	267.21	-12.71	158.71
205	0.00	38.20	-9.82	273.96	-11.78	162.15
210	0.00	35.81	-8.39	282.82	-10.83	165.82
215	0.30	32.90	-7.06	278.55	-10.08	157.76
220	0.43	29.90	-5.90	270.45	-9.44	147.39
225	0.54	26.71	-5.90	259.75	-7.53	145.51
230	0.41	23.54	-5.90	273.18	-5.92	162.90
235	0.32	20.19	-5.90	284.15	-4.58	179.56
240	0.38	16.63	-5.90	276.24	-4.54	172.97
245	0.51	12.93	-4.83	268.51	-4.62	158.21
250	0.47	9.28	-2.18	289.99	-4.50	161.96
255	0.52	5.87	0.23	425.39	-2.37	246.01
260	0.57	5.57	0.53	597.67	-2.07	370.27
265	0.58	8.84	-1.74	284.42	-4.34	155.53
270	0.52	13.25	-4.90	267.62	-4.51	158.29
275	0.50	17.96	-5.90	262.30	-4.67	158.46
280	0.40	22.81	-5.90	274.00	-5.62	164.82
285	0.27	27.71	-5.90	289.83	-8.13	170.21
290	0.21	32.63	-6.95	290.47	-10.03	169.21
295	0.22	37.56	-9.43	274.36	-11.52	161.41
300	0.22	42.50	-11.40	261.89	-14.50	150.08
305	0.34	47.45	-12.39	243.12	-15.50	136.41
310	0.40	52.40	-13.38	231.19	-15.50	132.49
315	0.30	57.38	-14.38	236.54	-15.50	139.47
320	0.22	62.35	-14.90	243.26	-15.50	147.36
325	0.00	67.33	-15.90	239.92	-15.50	148.92
330	0.24	72.30	-15.90	235.39	-15.50	144.97
335	0.37	77.27	-15.90	221.48	-15.50	133.24
340	0.36	82.25	-15.90	223.05	-15.50	134.53
345	0.32	87.23	-15.90	226.95	-15.50	137.78
350	0.27	92.21	-15.90	232.62	-15.50	142.59
355	0.36	97.18	-15.90	222.34	-15.50	133.94

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, 2013