

FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for

**SES Americom, Inc.
BRISTOW, VIRGINIA
(9.0 Meter)**

Satellite Earth Station

Prepared By:
COMSEARCH
19700 Janelia Farm Boulevard
Ashburn, Virginia 20147
June 3, 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 Emergence Management Agency
Alltel Communications of Petersburg Inc.
Appalachia Engineering Services
Baltimore County of Maryland
Baltimore Gas and Electric Company
Believe Wireless, LLC
Calvert Cliffs Nuclear Power Plant
Capital Communications of America
Cellco Partnership – Southern Virginia
Eastern MLG, LLC
ECW Wireless, LLC
Garden State Transmissions
Hardy Cellular Telephone Company
MVC Research, LLC
New Cingular Wireless PCS LLC – DC
New Cingular Wireless PCS - Maryland
New Cingular Wireless PCS LLC – WV/NC/SC
Norfolk Southern Railway
PEG Bandwidth
Potomac Electric Power Company
Prince William, County of

Company (Continued)

Southern Maryland Electric Cooperative, Inc.
St. Mary's County of (MD)
State of Maryland, MIEMSS
Transcontinental Gas Pipeline Corp.
Verizon Maryland, Inc.
Verizon Wireless (VAW) LLC - Maryland
Virginia Cellular LLC
Virginia Department of State Police
Virginia Electric & Power Company
Virginia PCS Alliance, LC.
Washington DC SMSA L.P.
Washington Gas Light Company
Washington Suburban Sanitary Commission

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 September 4, 2012. A minor revision was forwarded on October 22, 2012. Modification notices were forwarded on January 18, 2013 and April 19, 2013.

Company

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
Atlantic Broadband (Delmar), LLC
Atlantic Broadband (Penn), LLC
B20 LLC
BAY BROADBAND COMMUNICATIONS LLC
Baltimore County of Maryland
Baltimore Gas and Electric Company
Bedford, County of
Believe Wireless, LLC
Blue Ridge Carriers
COLLEGE OF SOUTHERN MARYLAND
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
Charles City County Sheriffs Office
Charles, County of
Chesterfield, County of
Comprehensive Wireless LLC
Conterra Ultra Broadband, LLC
County of Frederick
Delaware Division of Communications
ECW Wireless, LLC
Eastern MLG LLC
Enoch Pratt Free Library
Exelon Generation Company, L.L.C

Company (Continued)

FELHC, Inc.
Firstlevel Networks
Frederick County
Fundamental Broadcasting LLC
Garden State Transmissions
Goochland County
HENRICO COUNTY
Hanover, County of
Hardy Cellular Telephone Company
Harrisonburg-Rockingham ECC
King and Queen County
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 - 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 Kent County
Norfolk Southern Railway
Open Line Communications
PA Communications
PEG Bandwidth
Petersburg Cellular Partnership
Prince George's County
Prince William, County of
RAPPAHANNOCK ELECTRIC COOPERATIVE
RCTC Wholesale Corporation
RICHMOND, CITY OF
SCTF NET
SHENANDOAH VALLEY ELECTRIC COOPERATIVE
Southern Maryland Electric Cooperative I
Sprint Spectrum, LP
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.
USCOC of Virginia RSA #2, Inc.
USCOC of Virginia RSA #3, Inc.

Company (Continued)

Verizon Maryland, Inc.
Verizon Virginia, Inc.
Verizon Wireless (VAW) LLC - Delaware
Verizon Wireless (VAW) LLC - Maryland
Verizon Wireless VAW LLC-Southern VA
Verizon Wireless(VAW) LLC-AZ/CO/NM/NV/UT
Virginia RSA 5 Limited Partnership
Virginia Broadband, LLC
Virginia Cellular LLC
Virginia Department of State Police
Virginia Electric & Power Company
Virginia PCS Alliance, L.C.
Washington D.C. SMSA L.P.
Washington Gas Light Company
Washington Suburban Sanitary Commission
World Class Wireless LLC
York County Dept of Emergency Services
iSignal
ANNE ARUNDEL, COUNTY OF
Albermarle, County of, Virginia
American Electric Power Service Corp.
Appalachia Engineering Services
CARROLL COUNTY
CBS Communications Services Inc.
CTAB Holdings LLC
Calvert Cliffs Nuclear Power Plant
Calvert County Government
Capital Communications of America
City of Richmond
Columbia Gas Transmission Corporation
Commonwealth of Pennsylvania
Commonwealth of Pennsylvania-Radio Proj.
County of Culpeper
County of Louisa, VA
County of Nelson
Egan LLC
Franklin County Dept. of Emergency Servi
George Washington University
Howard, County of
Last Mile Inc.
Loudoun, County of M&T Bank
MARYLAND EMERG MANAGEMENT AGENCY COMM
MARYLAND STATE DEPT OF GENERAL SERVICES
Maryland, State Of - MDOT - MTA
Maryland, State of - DNR
Montgomery, County of
Morgan, County of
PENNSYLVANIA MICROWAVE NETWORK INC.
Potomac Electric Power Company
Powhatan, County of

Company (Continued)

RCYM Holdings LLC
Redi-Call Communications Company
SPOTSYLVANIA COUNTY
Southside Electric Cooperative
Transcontinental Gas Pipeline Corp.
Warrenton Fauquier Joint Communications

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: 06/03/2013
Job Number: 130419COMSJC02

Administrative Information

Status ENGINEER PROPOSAL
Call Sign
Licensee Code P3210
Licensee Name SES Americom, Inc.

Site Information

BRISTOW, VIRGINIA
Venue Name
Latitude (NAD 83) 38° 47' 3.3" N
Longitude (NAD 83) 77° 34' 21.7" W
Climate Zone A
Rain Zone 2
Ground Elevation (AMSL) 86.87 m / 285.0 ft

Link Information

Satellite Type Geostationary
Mode TR - Transmit-Receive
Modulation Analog and Digital
Satellite Arc 10° W to 139° West Longitude
Azimuth Range 104.5° to 251.2°
Corresponding Elevation Angles 8.7° / 13.4°
Antenna Centerline (AGL) 5.79 m / 19.0 ft

Antenna Information

Receive
Manufacturer GD Satcom
Model 9 Meter
Gain / Diameter 51.2 dBi / 9.0 m
3-dB / 15-dB Beamwidth 0.47° / 0.88°

Transmit

GD Satcom
9 Meter
53.5 dBi / 9.0 m
0.36° / 0.76°

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

SEE ATTACHMENT 1

Transmit 6.1 GHz

SEE ATTACHMENT 1

Max Great Circle Coordination Distance 485.2 km / 301.5 mi
Precipitation Scatter Contour Radius 555.5 km / 345.1 mi

287.6 km / 178.7 mi
153.6 km / 95.5 mi

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ATTACHMENT 1

Page 1 of 2

GD SATCOM Technologies:
Model: 9 Meter

4 GHz Gain: 51.2 dBi
6 GHz Gain: 53.5 dBi

Satellite Arc: 10.0 to 55.5 West Longitude

Receive Band: 3625.0 to 3700.0 MHz

Emissions

100KN0N
1M00F8D
102KG7W – 36M0G7W

Satellite Arc: 10.0 to 139.0 West Longitude

Receive Band: 3700.0 to 4200.0 MHz

Emissions

100KN0N
1M00F8D
102KG7W – 54M0G7W

Satellite Arc: 10.0 to 55.5 West Longitude

Transmit Band: 5850.0 to 5925.0 MHz

<u>Emission</u>	<u>RF Power Density (dBW/4 kHz)</u>	<u>EIRP/Carrier (dBW)</u>	<u>EIRP Density (dBW/ 4 kHz)</u>
100KN0N	0.5	68.0	54.0
1M00F8D	0.5	78.0	54.0
102KG7W to	-2.7	64.9	50.8
36M0G7W	-12.6	80.4	40.9

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ATTACHMENT 1

Page 2 of 2

Satellite Arc: 10.0 to 139.0 West Longitude

Transmit Band: 5925.0 to 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>
100KN0N	-0.5	67.0	53.0
1M00F8D	-0.5	77.0	53.0
102KG7W to 54M0G7W	-2.7 -14.6	64.9 80.2	50.8 38.9

Satellite Arc: 40.0 to 48.0 West Longitude

Transmit Band: 6725.0 to 6874.0 MHz

<u>Emission</u>	<u>RF Power Density (dBW/4 kHz)</u>	<u>EIRP/Carrier (dBW)</u>	<u>EIRP Density (dBW/ 4 kHz)</u>
100KN0N	-2.7	64.8	50.8
1M00F8D	-2.7	74.8	50.8
102KG7W to 54M0G7W	-2.7 -14.6	64.9 80.2	50.8 38.9

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Earth Station Data Sheet

19700 Janelia Farm Boulevard, Ashburn, VA 20147
(703)726-5500 <http://www.comsearch.com>

Coordination Values

BRISTOW, VA

Licensee Name SES Americom, Inc.
Latitude (NAD 83) 38° 47' 3.3" N
Longitude (NAD 83) 77° 34' 21.7" W
Ground Elevation (AMSL) 86.87 m / 285.0 ft
Antenna Centerline (AGL) 5.79 m / 19.0 ft
Antenna Model GD Satcom 9 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 -0.5 (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	0.88	104.36	-10.00	226.86	-10.00	129.62
5	0.93	99.41	-10.00	224.09	-10.00	127.38
10	0.83	94.46	-10.00	229.37	-10.00	131.62
15	0.82	89.50	-10.00	230.40	-10.00	132.43
20	0.67	84.55	-10.00	238.82	-10.00	137.79
25	0.62	79.60	-10.00	242.06	-10.00	140.41
30	0.51	74.66	-10.00	249.33	-10.00	146.40
35	0.27	69.73	-10.00	277.00	-10.00	172.07
40	0.42	64.78	-10.00	258.83	-10.00	154.38
45	0.54	59.84	-10.00	247.02	-10.00	144.48
50	0.28	54.94	-10.00	275.67	-10.00	170.89
55	0.38	50.01	-10.00	263.07	-10.00	158.07
60	0.00	45.17	-9.37	289.32	-9.37	181.63
65	0.00	40.29	-8.13	297.45	-8.13	186.41
70	0.00	35.45	-6.74	306.87	-6.74	191.76
75	0.00	30.64	-5.16	318.55	-5.16	197.82
80	0.00	25.91	-3.34	331.67	-3.34	204.77
85	0.00	21.28	-1.20	347.49	-1.20	211.44
90	0.00	16.86	1.33	366.87	1.33	221.98
95	0.00	12.86	4.27	389.72	4.27	235.21
100	0.00	9.79	7.23	414.51	7.23	248.93
105	0.00	8.72	8.49	485.20	8.49	287.60
110	0.00	10.29	6.69	409.91	6.69	246.87
115	0.00	13.61	3.65	385.34	3.65	232.35
120	0.39	17.00	1.24	340.78	1.24	204.76
125	0.69	20.37	-0.72	297.55	-0.72	175.73
130	0.73	23.80	-2.41	282.58	-2.41	164.07
135	0.80	27.07	-3.81	268.51	-3.81	154.19
140	0.88	30.16	-4.99	255.69	-4.99	145.22
145	0.87	33.12	-6.00	250.47	-6.00	142.23
150	0.98	35.73	-6.83	238.69	-6.83	134.05
155	0.92	38.18	-7.55	237.71	-7.55	134.03
160	0.71	40.44	-8.17	246.83	-8.17	141.91
165	0.71	42.12	-8.61	244.32	-8.61	140.47
170	0.39	43.67	-9.00	268.53	-9.00	161.38
175	0.39	44.44	-9.20	267.63	-9.20	160.88
180	0.39	44.70	-9.26	266.46	-9.26	159.94
185	0.28	44.55	-9.22	280.53	-9.22	173.95

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Antenna Centerline (AGL)	5.79 m / 19.0 ft		
Antenna Model	GD Satcom 9 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	-0.5 (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	44.04	-9.10	291.09	-9.10	182.69
195	0.00	42.77	-8.78	293.16	-8.78	183.91
200	0.00	41.06	-8.34	296.08	-8.34	185.62
205	0.00	38.96	-7.76	299.89	-7.76	187.82
210	0.00	36.52	-7.06	304.65	-7.06	190.52
215	0.00	33.79	-6.22	310.47	-6.22	193.76
220	0.00	30.82	-5.22	318.12	-5.22	197.58
225	0.00	27.65	-4.04	326.54	-4.04	202.08
230	0.00	24.31	-2.65	336.72	-2.65	205.77
235	0.24	20.68	-0.89	344.97	-0.89	209.15
240	0.32	17.16	1.14	349.85	1.14	209.69
245	0.36	14.43	3.02	359.45	3.02	213.79
250	0.34	13.14	4.04	369.77	4.04	219.77
255	0.35	13.62	3.64	365.47	3.64	217.21
260	0.41	15.69	2.11	345.42	2.11	205.16
265	0.46	18.88	0.10	324.10	0.10	194.38
270	0.46	22.74	-1.92	307.33	-1.92	185.09
275	0.44	26.96	-3.77	296.33	-3.77	179.04
280	0.46	31.39	-5.42	283.46	-5.42	170.73
285	0.47	35.96	-6.89	271.71	-6.89	161.03
290	0.48	40.61	-8.22	262.35	-8.22	154.81
295	0.52	45.33	-9.41	252.27	-9.41	147.95
300	0.49	50.10	-10.00	251.37	-10.00	148.00
305	0.50	54.89	-10.00	250.36	-10.00	147.16
310	0.50	59.71	-10.00	249.60	-10.00	146.63
315	0.46	64.55	-10.00	254.37	-10.00	150.55
320	0.50	69.40	-10.00	249.73	-10.00	146.74
325	0.53	74.26	-10.00	247.70	-10.00	145.04
330	0.67	79.12	-10.00	239.25	-10.00	138.14
335	0.52	83.99	-10.00	248.40	-10.00	145.63
340	0.57	88.87	-10.00	245.53	-10.00	143.24
345	0.65	93.74	-10.00	240.18	-10.00	138.89
350	0.63	98.62	-10.00	241.67	-10.00	140.10
355	0.68	103.49	-10.00	238.27	-10.00	137.36

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, Virginia 20147

DATED: June 3, 2013