

FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for

**SES Americom, Inc.
Woodbine, Maryland**

Satellite Earth Station

Prepared By:
COMSEARCH
19700 Janelia Farm Boulevard
Ashburn, Virginia 20147
May 29, 2014

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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

Baltimore County of Maryland
Baltimore Gas and Electric Company
Carroll, County of
County of Frederick
Maryland Public Broadcasting Commission
New Cingular Wireless PCS LLC – VA
PEG Bandwidth, LLC
State of Maryland, MIEMSS
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 March 26, 2014.

Company

AT&T COMMUNICATIONS OF MARYLAND INC
AT&T Communications of Virginia, LLC
AT&T Corporation
Adams County Department of Emergency Svc
Affiniti PA, LLC
Alltel Communications LLC-Southern VA
Alltel Communications of Petersburg Inc
Appalachia Engineering Services
Appalachian Broadcasting
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
Capital Communications of America
Carroll, County of
Cellco Partnership - Bridgeville, PA/WV
Cellco Partnership - Southern Virginia
Cellco Partnership-Newark-Dallas Verizon
Cellco Partnership-WDC/Baltimore
Cellco Prtnrshp - Phil. Tri-State Rgn
Charles, County of
Chester, County of
Columbia Gas Transmission Corporation
Comprehensive Wireless LLC
Conterra Ultra Broadband, LLC
County of Frederick
DAUPHIN COUNTY EMERGENCY MANAGEMENT
Delaware Division of Communications
Delmarva Power and Light Company
ECW Wireless, LLC
Eastern MLG LLC

Company (Continued)

Enoch Pratt Free Library
Exelon Generation Company, LLC
FELHC
Frederick County
Fundamental Broadcasting LLC
Garden State Transmissions
Hardy Cellular Telephone Company
Harrisonburg-Rockingham ECC
Lancaster County-Wide Communications
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
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
Norfolk Southern Railway
Old Dominion LLC
Open Line Communications
PA Communications
PEG Bandwidth, LLC
PENNSYLVANIA TURNPIKE COMMISSION
PSEG Services Corporation
Peco Energy Company
Prince George's County
Prince William, County of
RAPPAHANNOCK ELECTRIC COOPERATIVE
Radio One Inc
Rural Broadband Network Services LLC
SCTF NET
SHENANDOAH VALLEY ELECTRIC COOPERATIVE
Southern Maryland Electric Cooperative I
Spotsylvania, County of
St. Mary's County of (MD)
Stafford, County of
State of Maryland, MIEMSS
Texas Eastern Communications, LLC
Thought Transmissions, LLC
US Cellular Operating Company, LLC (WI)
USCOC of Cumberland, Inc.
Verizon Maryland, Inc.
Verizon Wireless (VAW) LLC - Delaware/NJ
Verizon Wireless (VAW) LLC - Maryland
Verizon Wireless VAW LLC-Southern VA

Company (Continued)

Virginia Broadband, LLC
Virginia Department of State Police
Virginia Electric & Power Company
Virginia PCS Alliance, L.C.
WITF Inc.
WV DHHR BPH, Office of EMS, Com. Div.
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

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: 05/29/2014
Job Number: 140326COMSJC08

Administrative Information

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

Site Information

WOODBINE, MARYLAND
Venue Name C14
Latitude (NAD 83) 39° 22' 39.5" N
Longitude (NAD 83) 77° 4' 51.5" W
Climate Zone A
Rain Zone 2
Ground Elevation (AMSL) 198.21 m / 650.3 ft

Link Information

Satellite Type Geostationary
Mode TR - Transmit-Receive
Modulation Analog and Digital
Satellite Arc 60° W to 144° West Longitude
Azimuth Range 154.2° to 254.9°
Corresponding Elevation Angles 41.1° / 9.1°
Antenna Centerline (AGL) 4.88 m / 16.0 ft

Antenna Information

	Receive	Transmit
Manufacturer	ASC Signal	ASC Signal
Model	7.3 Meter	7.3 Meter
Gain / Diameter	48.3 dBi / 7.3 m	51.6 dBi / 7.3 m
3-dB / 15-dB Beamwidth	0.67° / 1.28°	0.44° / 0.85°

Max Available RF Power	(dBW/4 kHz)	0.5
	(dBW/MHz)	24.5

Maximum EIRP	(dBW/4 kHz)	52.1
	(dBW/MHz)	76.1

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%

Frequency Information

	Receive 4.0 GHz	Transmit 6.1 GHz
Emission / Frequency Range (MHz)	N0N / 3700.0 - 4200.0	N0N / 5925.0 - 6425.0
	500KG9D / 3700.0 - 4200.0	1M00F9D / 5925.0 - 6425.0
	100KD7W - 36M0D7W / 3700.0 - 4200.0	100KD7W - 36M0D7W / 5925.0 - 6425.0
	100KG7W - 36M0G7W / 3700.0 - 4200.0	100KG7W - 36M0G7W / 5925.0 - 6425.0

Max Great Circle Coordination Distance	464.2 km / 288.4 mi	279.6 km / 173.7 mi
Precipitation Scatter Contour Radius	551.1 km / 342.4 mi	180.1 km / 111.9 mi

COMSEARCH

Earth Station Data Sheet

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

Coordination Values

WOODBINE, MD

Licensee Name SES Americom, Inc.
Latitude (NAD 83) 39° 22' 39.5" N
Longitude (NAD 83) 77° 4' 51.5" W
Ground Elevation (AMSL) 198.21 m / 650.3 ft
Antenna Centerline (AGL) 4.88 m / 16.0 ft
Antenna Model ASC Signal 7.3 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	4.10	105.07	-10.00	146.43	-10.00	100.00
5	3.59	110.04	-10.00	156.33	-10.00	100.00
10	3.29	115.00	-10.00	163.04	-10.00	100.00
15	2.45	119.91	-10.00	184.15	-10.00	100.00
20	2.21	122.84	-10.00	189.73	-10.00	100.00
25	1.75	119.23	-10.00	201.34	-10.00	108.21
30	1.45	115.62	-10.00	207.05	-10.00	115.75
35	1.13	111.93	-10.00	216.36	-10.00	124.00
40	1.01	108.25	-10.00	220.01	-10.00	127.08
45	1.10	104.56	-10.00	217.28	-10.00	124.78
50	1.15	100.81	-10.00	215.65	-10.00	123.39
55	0.73	96.97	-10.00	235.25	-10.00	138.16
60	0.67	93.17	-10.00	239.34	-10.00	141.52
65	0.72	89.36	-10.00	235.99	-10.00	138.76
70	0.76	85.55	-10.00	233.90	-10.00	137.06
75	0.77	81.76	-10.00	233.15	-10.00	136.45
80	0.67	78.01	-10.00	239.18	-10.00	141.39
85	0.68	74.28	-10.00	238.21	-10.00	140.59
90	0.59	70.65	-10.00	244.26	-10.00	145.65
95	0.64	67.04	-10.00	240.73	-10.00	142.68
100	0.59	63.56	-10.00	244.05	-10.00	145.47
105	0.58	60.19	-10.00	244.89	-10.00	146.18
110	0.42	57.03	-10.00	258.23	-10.00	157.64
115	0.31	54.05	-10.00	271.44	-10.00	171.13
120	0.46	51.10	-10.00	253.94	-10.00	153.86
125	0.47	48.48	-10.00	252.93	-10.00	152.98
130	0.40	46.23	-9.62	263.44	-9.62	161.74
135	0.00	44.61	-9.24	290.19	-9.24	186.01
140	0.00	43.05	-8.85	292.70	-8.85	187.50
145	0.00	41.92	-8.56	294.59	-8.56	188.60
150	0.00	41.27	-8.39	295.73	-8.39	189.26
155	0.00	41.10	-8.35	296.02	-8.35	189.43
160	0.00	41.43	-8.43	295.44	-8.43	189.10
165	0.29	41.97	-8.57	283.07	-8.57	179.12
170	0.38	43.03	-8.84	270.00	-8.84	168.10
175	0.38	43.79	-9.03	268.83	-9.03	165.70
180	0.49	43.93	-9.07	255.92	-9.07	154.29

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Antenna Model	ASC Signal 7.3 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)
185	0.45	43.72	-9.02	261.77	-9.02	159.36
190	0.49	42.93	-8.82	257.76	-8.82	155.56
195	0.44	41.75	-8.52	265.06	-8.52	161.59
200	0.36	40.16	-8.10	278.15	-8.10	174.23
205	0.48	38.00	-7.50	267.10	-7.50	162.01
210	0.36	35.71	-6.82	285.29	-6.82	178.49
215	0.25	33.12	-6.00	305.03	-6.00	193.15
220	0.00	30.39	-5.07	319.20	-5.07	201.98
225	0.36	26.99	-3.78	306.20	-3.78	190.97
230	0.60	23.53	-2.29	292.51	-2.29	178.28
235	0.65	20.08	-0.57	301.68	-0.57	183.27
240	0.47	16.67	1.45	333.23	1.45	203.28
245	0.37	13.11	4.06	365.87	4.06	221.30
250	0.41	9.91	7.10	387.14	7.10	232.46
255	0.47	8.58	8.67	464.19	8.67	279.55
260	0.46	10.00	7.00	379.55	7.00	226.76
265	0.43	13.28	3.92	358.12	3.92	215.76
270	0.44	17.36	1.01	332.86	1.01	203.63
275	0.56	21.78	-1.45	301.96	-1.45	184.63
280	0.57	26.44	-3.55	286.13	-3.55	174.73
285	0.64	31.18	-5.35	269.11	-5.35	160.92
290	0.74	35.98	-6.90	252.87	-6.90	149.04
295	1.00	40.80	-8.27	229.27	-8.27	132.77
300	1.41	45.64	-9.48	210.49	-9.48	118.29
305	1.94	50.50	-10.00	196.15	-10.00	103.48
310	2.20	55.42	-10.00	190.05	-10.00	100.00
315	2.30	60.36	-10.00	187.65	-10.00	100.00
320	3.25	65.27	-10.00	163.86	-10.00	100.00
325	3.44	70.23	-10.00	159.68	-10.00	100.00
330	4.06	75.19	-10.00	147.00	-10.00	100.00
335	4.29	80.17	-10.00	143.44	-10.00	100.00
340	4.58	85.15	-10.00	139.29	-10.00	100.00
345	4.54	90.13	-10.00	139.85	-10.00	100.00
350	4.48	95.11	-10.00	140.73	-10.00	100.00
355	4.35	100.10	-10.00	142.65	-10.00	100.00

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: May 29, 2014