

# FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for  
**Intelsat License LLC**  
**HAGERSTOWN, MD**  
**E000296**  
**Satellite Earth Station**

Prepared By:  
COMSEARCH  
19700 Janelia Farm Boulevard  
Ashburn, VA 20147  
July 31, 2019

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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.

### 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 07/01/2019.

Company

AQ2AT LLC  
AT&T Corp.  
AT&T Wireless Services 3 LLC - PA  
Access MLP Operating LLC  
Adams County Department of Emergency Svc  
Affiniti PA, LLC  
Albemarle, County of  
Allentown SMSA Limited Partnership  
Alltel Communications LLC - Western PA  
Alltel Communications LLC-E OH WV  
American Electric Power Service Corp  
Anne Arundel, County of  
Appalachia Engineering Services  
Appalachian Power Company  
Argos Engineering, LLC  
Atlantic Broadband (Penn), LLC  
Atlantic City Electric Company  
Atlantic Coast Pipeline, LLC  
Atlantic, County of  
Baltimore County of Maryland  
Baltimore Gas and Electric Company  
Beaver Springs Faith Baptist Church, Inc  
Bedford County of  
Believe Wireless, LLC  
Berks County Department of Emergency Ser  
Blair County 911  
Blue Ridge Carriers  
Blueline Communications  
CNX Midstream, LLC  
Calvert, County of  
Cambria, County of  
Capital Communications of America  
Caroline County, VA  
Carroll, County of  
Cellco Partnership - Bridgeville, PA/WV  
Cellco Partnership - Southern Virginia  
Cellco Partnership- PA Region  
Cellco Partnership-WDC/Baltimore  
Cellco Prtnrshp - Phil. Tri-State Rgn  
Charles, County of  
Chester, County of

City of Fredericksburg  
Citynet, LLC  
Clearfield, County of  
Clinton, County of  
Columbia, County  
Commonwealth of Pennsylvania  
Commonwealth of Pennsylvania-Radio Proj.  
Comprehensive Wireless LLC  
Conterra Ultra Broadband, LLC  
County of Augusta  
County of Burlington, Public Safety Cntr  
County of Camden  
County of Centre  
County of Culpeper  
County of Fayette  
County of Frederick  
County of Orange, VA  
County of York  
DC2A LLC  
DSRC Networks  
Dauphin County Emergency Management  
Delaware County (PA) Emergency Services  
Delaware Division of Communications  
Delmarva Power and Light Company  
Dominion Energy Transmission, Inc.  
ECW Wireless, LLC  
Eastern MLG LLC  
Electric Railroad, LLC  
Enoch Pratt Free Library  
Entercom License, LLC  
Essex, County of  
Exelon Generation Company, LLC  
FELHC, Inc.  
FM Radio License, LLC  
Fulton County PA  
Fundamental Broadcasting LLC  
GTT America LLC  
Garden State Transmissions  
Getwireless.Net  
Gloucester, County of  
Greene, County of (PA)  
Hanover, County of  
Hardy Cellular Telephone Company  
Hardy County OEM/E911  
Harrisonburg-Rockingham ECC  
Henrico County  
High Voltage Communications LLC (CFN)  
Huntingdon, County of  
Indiana, County of  
Jefferson County of Pennsylvania  
Jefferson Microwave, LLC  
Juniata County Emergency Services  
Kentucky Power Company  
King and Queen County  
Kryptick Technologies  
Lancaster County-Wide Communications

Limitless Mobile, LLC  
Loudoun, County of  
MCI Communications Services Inc.  
MGW Networks, LLC  
Maryland Public Broadcasting Commission  
Maryland State Highway Administration  
Maryland, State of - Dept.of Info & Tech  
Mifflin County  
Montgomery County Of  
Montgomery, County of  
Mountain State Communications, llc  
New Cingular Wireless PCS LLC - NJ  
New Cingular Wireless PCS - Maryland  
New Cingular Wireless PCS LLC - DC  
New Cingular Wireless PCS LLC - Ohio  
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 Turnpike Authority-Pkwy Div  
New Jersey, State of -NJ Transit  
New Line Networks, LLC  
Norfolk Southern Railway  
Northumberland County DPS/911  
Ohio Valley Electric Company  
PSEG Services Corporation  
Peco Energy Company  
Pennsylvania Turnpike Commission  
Perry, County of  
Pittsburgh SMSA Limited Partnership  
Preston County Office of Emergency Manag  
Prince George's County  
Prince William, County of  
Radio License Holding CBC, LLC  
Radio One Inc  
Rappahannock Electric Cooperative  
Rockbridge Reg. Pub Safety Comm Ctr  
Rural Broadband Network Services LLC  
Rural Broadband, LLC  
SW Networks  
Shenandoah Personal Communications, LLC  
Shenandoah Valley Electric Cooperative  
Snyder, County of  
Somerset County, Maryland  
Somerset, County of  
South Central Task Force (SCTFNET)  
Southern Maryland Electric Cooperative I  
Spotsylvania, County of  
Sprintcom, Inc  
St. Mary's County of (MD)  
Stafford, County of  
State of Maryland, MIEMSS  
T-Mobile License LLC  
Texas Eastern Communications, LLC  
Thought Transmissions, LLC  
Torellco LLC

Transcontinental Gas Pipeline Corp.  
US Cellular Operating Company, LLC (WI)  
USCOC of Cumberland, Inc.  
USCOC of Virginia RSA #3, Inc.  
USOC of Pennsylvania RSA No 10 B2 Inc.  
Uniti Fiber PEG, LLC  
Ursa Navigation Solutions, Inc.  
Verizon Maryland, Inc.  
Verizon Wireless (VAW) LLC - Maryland  
Verizon Wireless (VAW) LLC - W/B/V Mkts  
Verizon Wireless (VAW) LLC-Pennsylvania  
Verizon Wireless VAW LLC - West Virginia  
Verizon Wireless VAW LLC-Southern VA  
Virginia RSA 5 Limited Partnership  
Virginia Broadband, LLC  
Virginia Department of State Police  
Virginia Electric & Power Company  
WV DHSEM, SIRN System  
Warrenton Fauquier Joint Communications  
Washington Gas Light Company  
Washington Suburban Sanitary Commission  
Washington, County of  
Weblin Holdings LLC  
West Virginia Radio Corporation  
Westmoreland, County of  
Wheeling Power Company  
Wicomico County  
Williamson Enterprise LLC  
Wireless Internetwork LLC  
World Class Wireless, LLC  
iSignal  
xWave Engineering LLC



## **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: 07/31/2019  
Job Number: 190701COMSGE04

### Administrative Information

Status ENGINEER PROPOSAL  
Call Sign E000296  
Licensee Code INTELS  
Licensee Name Intelsat License LLC

### Site Information HAGERSTOWN, MD

Venue Name  
Latitude (NAD 83) 39° 35' 54.0" N  
Longitude (NAD 83) 77° 45' 35.0" W  
Climate Zone A  
Rain Zone 2  
Ground Elevation (AMSL) 173.74 m / 570.0 ft

### Link Information

Satellite Type Geostationary  
Mode TR - Transmit-Receive  
Modulation 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) 5.79 m / 19.0 ft

### Antenna Information

		Receive - FCC32		Transmit - FCC32	
Manufacturer		Vertex		Vertex	
Model		9 KPC		9 KPC	
Gain / Diameter		50.1 dBi / 9.0 m		53.5 dBi / 9.0 m	
3-dB / 15-dB Beamwidth		0.65° / 1.00°		0.36° / 0.67°	
Max Available RF Power	(dBW/4 kHz) (dBW/MHz)			7.2 31.2	
Maximum EIRP	(dBW/4 kHz) (dBW/MHz)			60.7 84.7	
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)	300KG7D / 3698.0 300KG7D / 3944.5 300KG7D / 3955.5 300KG7D / 4199.8	850KF7D / 5924.0 850KF7D / 5927.5 850KF7D / 6170.0 850KF7D / 6180.0
Max Great Circle Coordination Distance	662.2 km / 411.4 mi	507.1 km / 315.0 mi
Precipitation Scatter Contour Radius	613.5 km / 381.2 mi	431.6 km / 268.1 mi

# COMSEARCH

## Earth Station Data Sheet

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### Coordination Values

### HAGERSTOWN, MD

Licensee Name Intelsat License LLC  
Latitude (NAD 83) 39° 35' 54.0" N  
Longitude (NAD 83) 77° 45' 35.0" W  
Ground Elevation (AMSL) 173.74 m / 570.0 ft  
Antenna Centerline (AGL) 5.79 m / 19.0 ft  
Antenna Model Vertex 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 7.2 (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	207.10
5	0.00	96.84	-10.00	285.28	-10.00	207.10
10	0.00	91.86	-10.00	285.28	-10.00	207.10
15	0.00	86.88	-10.00	285.28	-10.00	207.10
20	0.00	81.90	-10.00	285.28	-10.00	207.10
25	0.00	76.92	-10.00	285.28	-10.00	207.10
30	0.00	71.95	-10.00	285.28	-10.00	207.10
35	0.00	66.97	-10.00	285.28	-10.00	207.10
40	0.00	62.00	-10.00	285.28	-10.00	207.10
45	0.00	57.03	-10.00	285.28	-10.00	207.10
50	0.00	52.06	-10.00	285.28	-10.00	207.10
55	0.00	47.09	-9.82	286.40	-9.82	207.79
60	0.00	42.14	-8.62	294.23	-8.62	212.59
65	0.00	37.19	-7.26	303.30	-7.26	218.19
70	0.00	32.26	-5.72	314.62	-5.72	224.84
75	0.00	27.34	-3.92	327.41	-3.92	232.91
80	0.00	22.47	-1.79	343.08	-1.79	243.02
85	0.00	17.65	0.83	362.99	0.83	255.60
90	0.00	12.98	4.17	388.88	4.17	274.11
95	0.00	8.66	8.56	426.09	8.56	301.31
100	0.00	5.61	13.27	662.20	13.27	507.05
105	0.00	6.15	12.28	510.47	12.28	371.03
110	0.00	9.60	7.45	416.37	7.45	294.11
115	0.00	13.27	3.93	387.53	3.93	272.70
120	0.00	16.89	1.31	366.72	1.31	258.14
125	0.00	20.41	-0.75	350.91	-0.75	248.15
130	0.00	23.83	-2.43	338.33	-2.43	239.94
135	0.00	27.11	-3.83	328.09	-3.83	233.34
140	0.00	30.23	-5.01	319.61	-5.01	227.97
145	0.00	33.14	-6.01	311.94	-6.01	223.55
150	0.00	35.82	-6.85	306.09	-6.85	219.92
155	0.00	38.20	-7.55	301.33	-7.55	216.96
160	0.00	40.26	-8.12	297.51	-8.12	214.61
165	0.00	41.93	-8.56	294.59	-8.56	212.81
170	0.00	43.16	-8.88	292.52	-8.88	211.54
175	0.00	43.92	-9.07	291.29	-9.07	210.78
180	0.00	44.18	-9.13	290.88	-9.13	210.53
185	0.00	43.92	-9.07	291.28	-9.07	210.78

# COMSEARCH

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### Coordination Values

### HAGERSTOWN, MD

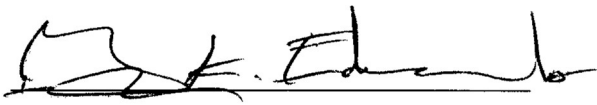
Licensee Name	Intelsat License LLC			
Latitude (NAD 83)	39° 35' 54.0" N			
Longitude (NAD 83)	77° 45' 35.0" W			
Ground Elevation (AMSL)	173.74 m / 570.0 ft			
Antenna Centerline (AGL)	5.79 m / 19.0 ft			
Antenna Model	Vertex 9 meter			
Antenna Mode	Receive 4.0 GHz		Transmit 6.1 GHz	
Interference Objectives: 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			7.2 (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	211.54
195	0.00	41.93	-8.56	294.59	-8.56	212.81
200	0.00	40.26	-8.12	297.51	-8.12	214.61
205	0.00	38.20	-7.55	301.32	-7.55	216.96
210	0.00	35.81	-6.85	306.10	-6.85	219.92
215	0.00	33.14	-6.01	311.94	-6.01	223.55
220	0.00	30.22	-5.01	319.62	-5.01	227.97
225	0.00	27.11	-3.83	328.08	-3.83	233.34
230	0.00	23.83	-2.43	338.32	-2.43	239.93
235	0.00	20.42	-0.75	350.90	-0.75	248.14
240	0.00	16.89	1.31	366.75	1.31	258.16
245	0.00	13.28	3.92	387.51	3.92	272.68
250	0.00	9.59	7.46	416.47	7.46	294.19
255	0.00	6.33	11.96	518.47	11.96	378.50
260	0.00	6.11	12.35	641.44	12.35	489.18
265	0.00	9.18	7.93	420.53	7.93	297.19
270	0.00	13.46	3.77	386.29	3.77	271.82
275	0.00	18.11	0.55	360.86	0.55	254.16
280	0.00	22.90	-2.00	341.54	-2.00	242.02
285	0.00	27.76	-4.09	326.22	-4.09	232.16
290	0.00	32.66	-5.85	313.67	-5.85	224.24
295	0.00	37.59	-7.38	302.52	-7.38	217.70
300	0.00	42.53	-8.72	293.57	-8.72	212.18
305	0.00	47.48	-9.91	285.84	-9.91	207.44
310	0.00	52.44	-10.00	285.28	-10.00	207.10
315	0.00	57.40	-10.00	285.28	-10.00	207.10
320	0.00	62.37	-10.00	285.28	-10.00	207.10
325	0.00	67.34	-10.00	285.28	-10.00	207.10
330	0.00	72.31	-10.00	285.28	-10.00	207.10
335	0.00	77.28	-10.00	285.28	-10.00	207.10
340	0.00	82.26	-10.00	285.28	-10.00	207.10
345	0.00	87.23	-10.00	285.28	-10.00	207.10
350	0.00	92.21	-10.00	285.28	-10.00	207.10
355	0.00	97.18	-10.00	285.28	-10.00	207.10

## 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.

BY: \_



Gary K. Edwards  
Senior Manager  
COMSEARCH  
19700 Janelia Farm Boulevard  
Ashburn, VA 20147

DATED: July 31, 2019