EXHIBIT A

FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for

INTELSAT, LLC
HAGERSTOWN 33, MARYLAND

Satellite Earth Station

Prepared By:
COMSEARCH
19700 JANELIA FARM BOULEVARD
ASHBURN, VIRGINIA 20147
MARCH 2, 2004

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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.

<u>Company</u>

Cellco Partnership – Pa. Region
Hardy Cellular Telephone Company
Vanguard Cellular Pennsylvania, LLC

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 January 27, 2004.

<u>Company</u>

ACC Pennsylvania License, LLC
ACCELACOM-BALTIMORE LLC
ALBEMARLE COUNTY POLICE DEPARTMENT
ALLENTOWN SMSA LIMITED PARTNERSHIP
AT&T COMMUNICATIONS OF MARYLAND INC
AT&T COMMUNICATIONS OF PENNSYLVANIA, INC
AT&T COMMUNICATIONS OF VIRGINIA INC
Alltel Communications of Virginia, Inc.
Bucks County Dept of Emergency Comm
CELLCO PARTNERSHIP - NEWARK-DALLAS-ROUTE
CELLCO PARTNERSHIP - VIRGINIA
CELLCO PARTNERSHIP- PA REGION
CHARLOTTESVILLE CELLULAR PARTNERSHIP
CHARTER COMMUNICATIONS VI, LLC.
COMMONWEALTH OF PENNSYLVANIA,RADIO PROJ.
CORBAN COMMUNICATIONS INC.
CROWN COMMUNICATION, INC.
County of Berks
DAUPHIN COUNTY EMERGENCY MANAGEMENT
EASTERBROOKE CELLULAR CORPORATION
Enoch Pratt Free Library
GANNETT COMPANY INC
GEORGE MASON UNIVERSITY INSTR FNDTION
HARDY CELLULAR TELEPHONE COMPANY
Intermedia Services, LLC.
JUNIATA COUNTY OF
LANCASTER COUNTY OF
LB Tower Company LLC
LOUDOUN COUNTY GOVERNMENT
Local Communications Network, Inc.
MARYLAND PUBLIC BROADCATING COMMISSION
MARYLAND, STATE OF MIEMSS COMMUNICATIONS
MCI Network Services, Inc.
MOBILE SATELLITE COMMUNICATIONS INC

ORBCOMM GLOBAL LP
NATIONAL RADIO ASTRONOMY OBSERVATORY
NEWCOM 9-1-1
PENNSYLVANIA MICROWAVE NETWORK INC.
PENNSYLVANIA TURNPIKE COMMISSION
PITTSBURGH CELLULAR TELEPHONE COMPANY
PITTSBURGH CITY TELECOM BUREAU
PITTSBURGH SMSA LIMITED PARTNERSHIP
PUBLIC BROADCASTING SERVICE
Peco Energy Company
Philly Sports Wireless
SCHUYLKILL COUNTY PUBLIC SAFETY 911
SOUTHWESTERN BELL MOBILE SYS LLC - DC
TELIGENT INC.
UNIVERSITY OF MARYLAND ITV SYSTEM
USCOC OF CUMBERLAND, INC.
VIRGINIA RSA #7, INC.
Vanguard Cellular Pennsylvania, LLC
Verizon New Jersey, Inc.
Verizon Virginia, Inc.
WHYY, INC.
WINEMILLER COMMUNICATIONS, INC.
WINSTAR WIRELESS FIBER CORPORATION
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.

Date:	01/27/2004
Job Number:	

Administrative Information

Status	ENGINEER PROPOSAL
Call Sign	
Licensee Code	INTELS
Licensee Name	INTELSAT, LLC

Site Information — HAGERSTOWN 33, MARYLAND

Venue Name	
Latitude (NAD 83)	39° 35' 59.7" N
Longitude (NAD 83)	77° 45' 29.7" W
Climate Zone	A
Rain Zone	2
Ground Elevation (AMSL)	171.3 m / 562.0 ft

Link Information

Satellite Type	Geostationary
Mode	TR - Transmit-Receive
Modulation	Digital
Satellite Arc	6° W to 143° West Longitude
Azimuth Range	101.9° to 253.6°
Corresponding Elevation Angles	5.3° / 10.3°
Antenna Centerline (AGL)	3.05 m / 10.0 ft

Antenna Information

Antenna Information		Receive		Transmit	
Manufacturer		Vertex/RSI		Vertex/RSI	
Model		4.8 KPK		4.8 KPK	
Gain / Diameter		53.5 dBi / 4.8 m		55.2 dBi / 4.8 m	
3-dB / 15-dB Beamwidth		0.34° / 0.72°		0.28° / 0.59°	
Max Available RF Power	(dBW/4 kHz)			-14.0	
	(dBW/MHz)			10.0	
Maximum EIRP	(dBW/4 kHz)			41.2	
	(dBW/MHz)			65.2	
	(dBW)			79.0	
Interference Objectives:	Long Term	-156.0 dBW/MHz	20%	-151.0 dBW/4 kHz	20%
	Short Term	-146.0 dBW/MHz	0.01%	-128.0 dBW/4 kHz	0.0025%

Frequency Information

Frequency Information	Receive 11.0 GHz	Transmit 14.0 GHz
Emission / Frequency Range (MHz)	43K8G7W - 72M0G7W / 10950.0 - 11200.0	43K8G7W - 72M0G7W / 14000.0 - 14500.0
		43K8G7W - 72M0G7W / 11450.0 - 12200.0
Max Great Circle Coordination Distance	566.8 km / 352.1 mi	251.4 km / 156.2 mi
Precipitation Scatter Contour Radius	602.2 km / 374.2 mi	100.0 km / 62.1 mi

Coordination Values	**HAGERSTOWN 33, MD**			
Licensee Name	INTELSAT, LLC			
Latitude (NAD 83)	39° 35' 59.7" N			
Longitude (NAD 83)	77° 45' 29.7" W			
Ground Elevation (AMSL)	171.3 m / 562.0 ft			
Antenna Centerline (AGL)	3.05 m / 10.0 ft			
Antenna Model	Vertex/RSI 4.8 KPK			
Antenna Mode		Receive 11.0 GHz		Transmit 14.0 GHz
Interference Objectives: Long Term		-156.0 dBW/MHz 20%		-151.0 dBW/4 kHz 20%
Short Term		-146.0 dBW/MHz 0.01%		-128.0 dBW/4 kHz 0.0025%
Max Available RF Power				-14.0 (dBW/4 kHz)

			Receive 11.0 GHz		Transmit 14.0 GHz	
Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
0	0.36	101.82	-10.00	216.68	-10.00	103.77
5	0.26	96.84	-10.00	225.85	-10.00	111.37
10	0.22	91.86	-10.00	229.77	-10.00	114.53
15	0.21	86.88	-10.00	230.37	-10.00	115.01
20	0.22	81.90	-10.00	229.77	-10.00	114.53
25	0.22	76.92	-10.00	229.58	-10.00	114.38
30	0.21	71.94	-10.00	230.15	-10.00	114.83
35	0.00	66.97	-10.00	231.37	-10.00	115.80
40	0.00	62.00	-10.00	231.37	-10.00	115.80
45	0.00	57.03	-10.00	231.37	-10.00	115.80
50	0.00	52.06	-10.00	231.37	-10.00	115.80
55	0.00	47.10	-9.82	232.14	-9.82	116.24
60	0.00	42.14	-8.62	237.52	-8.62	119.26
65	0.00	37.19	-7.26	243.78	-7.26	122.68
70	0.00	32.26	-5.72	251.29	-5.72	126.62
75	0.00	27.35	-3.92	260.19	-3.92	130.01
80	0.00	22.47	-1.79	271.24	-1.79	135.88
85	0.00	17.66	0.83	285.48	0.83	143.83
90	0.00	12.98	4.17	301.97	4.17	155.17
95	0.00	8.66	8.56	332.92	8.56	173.17
100	0.00	5.61	13.27	566.78	13.27	251.39
105	0.00	6.15	12.28	420.50	12.28	195.99
110	0.00	9.60	7.45	324.46	7.45	168.95
115	0.00	13.27	3.93	300.47	3.93	154.30
120	0.00	16.89	1.31	288.17	1.31	145.38
125	0.00	20.41	-0.75	276.81	-0.75	138.95
130	0.00	23.83	-2.43	267.88	-2.43	134.07
135	0.00	27.11	-3.83	260.67	-3.83	130.26
140	0.00	30.23	-5.01	254.75	-5.01	128.44
145	0.00	33.14	-6.01	249.87	-6.01	125.87
150	0.00	35.81	-6.85	245.83	-6.85	123.72
155	0.00	38.20	-7.55	242.42	-7.55	121.94
160	0.00	40.26	-8.12	239.78	-8.12	120.50
165	0.00	41.92	-8.56	237.77	-8.56	119.40
170	0.00	43.16	-8.88	236.35	-8.88	118.61
175	0.00	43.92	-9.07	235.50	-9.07	118.13
180	0.00	44.17	-9.13	235.22	-9.13	117.97
185	0.00	43.92	-9.07	235.50	-9.07	118.13

Coordination Values	**HAGERSTOWN33, MD**	
Licensee Name	INTELSAT, LLC	
Latitude (NAD 83)	39° 35' 59.7" N	
Longitude (NAD 83)	77° 45' 29.7" W	
Ground Elevation (AMSL)	171.3 m / 562.0 ft	
Antenna Centerline (AGL)	3.05 m / 10.0 ft	
Antenna Model	Vertex/RSI 4.8 KPK	
Antenna Mode	Receive 11.0 GHz	Transmit 14.0 GHz
Interference Objectives: Long Term	-156.0 dBW/MHz 20%	-151.0 dBW/4 kHz 20%
Short Term	-146.0 dBW/MHz 0.01%	-128.0 dBW/4 kHz 0.0025%
Max Available RF Power		-14.0 (dBW/4 kHz)

			Receive 11.0 GHz		Transmit 14.0 GHz	
Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
190	0.00	43.16	-8.88	236.35	-8.88	118.61
195	0.00	41.92	-8.56	237.77	-8.56	119.40
200	0.00	40.26	-8.12	239.79	-8.12	120.51
205	0.31	37.94	-7.48	231.50	-7.48	113.21
210	0.55	35.37	-6.72	215.42	-6.72	100.00
215	0.58	32.69	-5.86	217.61	-5.86	100.00
220	0.52	29.84	-4.87	225.17	-4.87	104.81
225	0.39	26.82	-3.71	241.80	-3.71	116.82
230	0.34	23.59	-2.32	254.38	-2.32	124.70
235	0.31	20.19	-0.63	265.48	-0.63	129.66
240	0.35	16.64	1.47	272.76	1.47	132.22
245	0.45	13.04	4.12	278.26	4.12	132.40
250	0.44	10.47	6.50	293.28	6.50	140.48
255	0.21	10.15	6.84	358.90	6.84	173.32
260	0.32	11.80	5.20	294.49	5.20	146.54
265	0.31	15.08	2.54	283.67	2.54	139.38
270	0.36	19.07	-0.01	263.71	-0.01	128.68
275	0.36	23.47	-2.26	251.78	-2.26	122.60
280	0.27	28.09	-4.21	251.06	-4.21	124.62
285	0.00	32.86	-5.92	250.32	-5.92	126.11
290	0.00	37.61	-7.38	243.20	-7.38	122.37
295	0.00	42.41	-8.69	237.20	-8.69	119.08
300	0.20	47.22	-9.85	231.87	-9.85	116.06
305	0.24	52.08	-10.00	227.17	-10.00	112.44
310	0.29	56.96	-10.00	222.78	-10.00	108.86
315	0.23	61.86	-10.00	228.90	-10.00	113.83
320	0.22	66.77	-10.00	229.05	-10.00	113.95
325	0.00	71.69	-10.00	231.37	-10.00	115.80
330	0.00	76.61	-10.00	231.37	-10.00	115.80
335	0.24	81.52	-10.00	227.83	-10.00	112.97
340	0.36	86.44	-10.00	215.89	-10.00	103.10
345	0.33	91.36	-10.00	218.72	-10.00	105.48
350	0.33	96.29	-10.00	219.34	-10.00	106.01
355	0.21	101.21	-10.00	230.80	-10.00	115.35

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

JEFFREY E. COWLES
PRINCIPAL FREQUENCY PLANNER
COMSEARCH
19700 JANELIA FARM BLVD.
ASHBURN, VA 20147

DATED: MARCH 2, 2004

EXHIBIT B

Analysis of Non-Ionizing Radiation for a 4.8-Meter Earth Station System

This report analyzes the non-ionizing radiation levels for a 4.8-meter earth station system. The analysis and calculations performed in this report comply with the methods described in the FCC Office of Engineering and Technology Bulletin, No. 65 first published in 1985 and revised in 1997 in Edition 97-01. The radiation safety limits used in the analysis are in conformance with the FCC R&O 96-326. Bulletin No. 65 and the FCC R&O specifies that there are two separate tiers of exposure limits that are dependant on the situation in which the exposure takes place and/or the status of the individuals who are subject to the exposure. The Maximum Permissible Exposure (MPE) limits for persons in a General Population/Uncontrolled environment are shown in Table 1. The General Population/Uncontrolled MPE is a function of transmit frequency and is for an exposure period of thirty minutes or less. The MPE limits for persons in an Occupational/Controlled environment are shown in Table 2. The Occupational MPE is a function of transmit frequency and is for an exposure period of six minutes or less. The purpose of the analysis described in this report is to determine the p ower flux density levels of the earth station in the far-field, near-field, transition region, between the subreflector or feed and main reflector surface, at the main reflector surface, and between the antenna edge and the ground and to compare these levels to the specified MPEs.

Table 1. Limits for General Population/Uncontrolled Exposure (MPE)

Frequency Range (MHz)	Power Density (mW/cm^2)
30-300	0.2
300-1500	Frequency (MHz)*(0.8/1200)
1500-100,000	1.0

Table 2. Limits for Occupational/Controlled Exposure (MPE)

Frequency Range (MHz)	Power Density (mW/cm^2)
30-300	1.0
300-1500	Frequency (MHz)*(4.0/1200)
1500-100,000	5.0

Table 3. Formulas and Parameters Used for Determining Power Flux Densities

Parameter	Symbol	Formula	Value	Units
Antenna Diameter	D	Input	4.8	m
Antenna Surface Area	$A_{surface}$	$\pi D^2 / 4$	18.10	m^2
Subreflector Diameter	D_{sr}	Input	36.6	cm
Area of Subreflector	A_{sr}	$\pi D_{sr}^2/4$	1052.09	cm^2
Frequency	F	Input	14250	MHz
Wavelength	λ	300 / F	0.021053	m
Transmit Power	P	Input	750.00	W
Antenna Gain (dBi)	G_{es}	Input	55.2	dBi
Antenna Gain (factor)	G	$10^{Ges/10}$	331131.1	n/a
Pi	π	Constant	3.1415927	n/a
Antenna Efficiency	η	$G\lambda^2/(\pi^2D^2)$	0.65	n/a

1. Far Field Distance Calculation

The distance to the beginning of the far field can be determined from the following equation:

Distance to the Far Field Region $R_{ff} = 0.60\ D^2 / \lambda$ (1)
$= 656.6$ m

The maximum main beam power density in the far field can be determined from the following equation:

On-Axis Power Density in the Far Field $S_{ff} = G\ P / (4\ \pi\ R_{ff}^2)$ (2)
$= 45.835$ W/m^2
$= 4.583$ mW/cm^2

2. Near Field Calculation

Power flux density is considered to be at a maximum value throughout the entire length of the defined Near Field region. The region is contained within a cylindrical volume having the same diameter as the antenna. Past the boundary of the Near Field region, the power density from the antenna decreases linearly with respect to increasing distance.

The distance to the end of the Near Field can be determined from the following equation:

Extent of the Near Field $R_{nf} = D^2 / (4\ \lambda)$ (3)
$= 273.6$ m

The maximum power density in the Near Field can be determined from the following equation:

Near Field Power Density $S_{nf} = 16.0\ \eta\ P / (\pi\ D^2)$ (4)
$= 106.999$ W/m^2
$= 10.700$ mW/cm^2

3. Transition Region Calculation

The Transition region is located between the Near and Far Field regions. The power density begins to decrease linearly with increasing distance in the Transition region. While the power density decreases inversely with distance in the Transition region, the power density decreases inversely with the square of the distance in the Far Field region. The maximum power density in the Transition region will not exceed that calculated for the Near Field region. The power density calculated in Section 1 is the highest power density the antenna can produce in any of the regions away from the antenna. The power density at a distance R_t can be determined from the following equation:

Transition Region Power Density $S_t = S_{nf}\ R_{nf} / R_t$ (5)
$= 10.700$ mW/cm^2

4. Region between the Main Reflector and the Subreflector

Transmissions from the feed assembly are directed toward the subreflector surface, and are reflected back toward the main reflector. The most common feed assemblies are waveguide flanges, horns or subreflectors. The energy between the subreflector and the reflector surfaces can be calculated by determining the power density at the subreflector surface. This can be determined from the following equation:

Power Density at the Subreflector

$$S_{sr} = 4000\ P\ /\ A_{sr} = 2851.473\ \text{mW/cm}^2 \quad (6)$$

5. Main Reflector Region

The power density in the main reflector is determined in the same manner as the power density at the subreflector. The area is now the area of the main reflector aperture and can be determined from the following equation:

Power Density at the Main Reflector Surface

$$S_{surface} = 4\ P\ /\ A_{surface} = 165.786\ \text{W/m}^2 = 16.579\ \text{mW/cm}^2 \quad (7)$$

6. Region between the Main Reflector and the Ground

Assuming uniform illumination of the reflector surface, the power density between the antenna and the ground can be determined from the following equation:

Power Density between Reflector and Ground

$$S_g = P\ /\ A_{surface} = 41.447\ \text{W/m}^2 = 4.145\ \text{mW/cm}^2 \quad (8)$$

7. Summary of Calculations

Table 4. Summary of Expected Radiation levels for Uncontrolled Environment

Region	Calculated Maximum Radiation Power Density Level (mW/cm^2)		Hazard Assessment
1. Far Field (R_{ff} = 656.6 m)	S_{ff}	4.583	Potential Hazard
2. Near Field (R_{nf} = 273.6 m)	S_{nf}	10.700	Potential Hazard
3. Transition Region ($R_{nf} < R_t < R_{ff}$)	S_t	10.700	Potential Hazard
4. Between Main Reflector and Subreflector	S_{sr}	2851.473	Potential Hazard
5. Main Reflector	$S_{surface}$	16.579	Potential Hazard
6. Between Main Reflector and Ground	S_g	4.145	Potential Hazard

Table 5. Summary of Expected Radiation levels for Controlled Environment

Region	Calculated Maximum Radiation Power Density Level (mW/cm^2)		Hazard Assessment
1. Far Field (R_{ff} = 656.6 m)	S_{ff}	4.583	Satisfies FCC MPE
2. Near Field (R_{nf} = 273.6 m)	S_{nf}	10.700	Potential Hazard
3. Transition Region ($R_{nf} < R_t < R_{ff}$)	S_t	10.700	Potential Hazard
4. Between Main Reflector and Subreflector	S_{sr}	2851.473	Potential Hazard
5. Main Reflector	$S_{surface}$	16.579	Potential Hazard
6. Between Main Reflector and Ground	S_g	4.145	Satisfies FCC MPE

It is the applicant's responsibility to ensure that the public and operational personnel are not exposed to harmful levels of radiation.

8. Conclusions

Based upon the above analysis, it is concluded that harmful levels of radiation may exist in those regions noted for the Uncontrolled (Table 4) and Controlled (Table 5) Environments.

The antennas will be installed at the Intelsat, LLC facility in Hagerstown, Maryland. The facility is surrounded by a fence, which will restrict any public access. The earth stations will be marked with the standard radiation hazard warnings, as well as the area in the vicinity of the earth stations to inform those in the general population, who might be working or otherwise present in or near the direct path of the main beam.

The applicant will ensure that the main beam of the antennas will be pointed at least one diameter away from any building, or other obstacles in those areas that exceed the MPE levels. Since one diameter removed from the center of the main beam the levels are down at least 20 dB, or by a factor of 100, these potential hazards do not exist for either the public, or for earth station personnel.

Finally, the earth station's operating personnel will not have access to areas that exceed the MPE levels, while the earth station is in operation. The transmitter will be turned off during periods of maintenance, so that the MPE standard of 5.0 mw/cm**2 will be complied with for those regions in close proximity to the main reflector, which could be occupied by operating personnel.

EXHIBIT C

FAA Notification Not Required

Per PART 17[17.14(a)] of the FCC rules, FAA notification is not required, as the antenna structure is located in an area with structures of equal or greater heights.

EXHIBIT D

Exhibit D
Response to Question 21

Intelsat LLC seeks to operate this earth station on both a common carrier and non-common carrier basis. However, the electronic response to Question 21 only permits an applicant to check one box. Accordingly, Intelsat LLC checked one box—the box marked non-common carrier—and submits this exhibit to make clear that both boxes—the box marked non-common carrier and the box marked common carrier—should be checked.