FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for
Cisco Systems, Inc.
RESEARCH TRIANGLE PARK, NC
(2.4 Meter)
Satellite Earth Station

Prepared By:
COMSEARCH
19700 Janelia Farm Boulevard
Ashburn, VA 20147
August 26, 2009

TABLE OF CONTENTS

1. CONCLUSIONS 3
2. SUMMARY OF RESULTS 4
3. SUPPLEMENTAL SHOWING 5
4. EARTH STATION COORDINATION DATA 6
5. CERTIFICATION 10

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 and frequency offsets are considered on the interfering paths, sufficient blockage exists to negate harmful interference from occurring with the proposed transmit-receive earth station.

Company

Clearwire Spectrum Holdings III, LLC
Clearwire Spectrum Holdings 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 08/06/2009.

Company
ALLTEL Communications of VA No. 1, Inc.
AT&T COMMUNICATIONS OF VIRGINIA INC
Airband Communications Inc
BLUE RIDGE ELECTRIC MEMBERSHIP CORP.
Bellsouth Telecommunications, Inc.
Board of Trustees UNC at Chapel Hill
Burke, County of
COUNTY OF DINWIDDIE
Cellco Partnership - VA, MD, WV, DC
City of Durham
Clearwire Spectrum Holdings II, LLC
Clearwire Spectrum Holdings III, LLC
Clearwire Spectrum Holdings LLC
Conterra Ultra Broadband, LLC
County of Franklin, VA
FiberTower Network Services Corp.
Hampton Roads Planning District Commissi
Henry County School District
Henry, County of
Isle of Wight, County of
METROPOLITAN AREA NETWORKS, INC.
Microspace Communications Corporation
National Radio Astronomy Observatory
North Carolina State Highway Patrol
North Carolina Wireless, LLC
Petersburg Cellular Partnership
Petersburg Police Department
RCTC Wholesale Corporation
Telecom Transport Management, Inc
Time Warner Cable LLC
Triad Telecom, Inc.
USCOC of Virginia RSA #2, Inc.
USCOC of Virginia RSA #3, Inc.
United Telephone - Southeast
Virginia Department of State Police
Virginia RSA #7, Inc.
WS/FC Interagency Communications
Wilmington Cellular Telephone Company

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:	08/26/2009
Job Number:	090806COMSGE09

Administrative Information

Status	ENGINEER PROPOSAL
Call Sign	
Licensee Code	CISCOS
Licensee Name	Cisco Systems, Inc.

Site Information — RESEARCH TRIANGLE PARK, NC

Venue Name	
Latitude (NAD 83)	35° 51' 14.0" N
Longitude (NAD 83)	78° 52' 5.0" W
Climate Zone	A
Rain Zone	1
Ground Elevation (AMSL)	103.63 m / 340.0 ft

Link Information

Satellite Type	Geostationary
Mode	TR - Transmit-Receive
Modulation	Digital
Satellite Arc	45° W to 143° West Longitude
Azimuth Range	131.1° to 254.1°
Corresponding Elevation Angles	35.2° / 12.2°
Antenna Centerline (AGL)	19.2 m / 63.0 ft

Antenna Information		Receive - FCC32		Transmit - FCC32	
Manufacturer		Prodelin		Prodelin	
Model		1251		1251	
Gain / Diameter		47.6 dBi / 2.4 m		49.2 dBi / 2.4 m	
3-dB / 15-dB Beamwidth		0.70° / 1.40°		0.58° / 1.18°	
Max Available RF Power	(dBW/4 kHz)			-14.0	
	(dBW/MHz)			10.0	
Maximum EIRP	(dBW/4 kHz)			35.2	
	(dBW/MHz)			59.2	
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	Receive 11.0 GHz	Transmit 14.0 GHz
Emission / Frequency Range (MHz)	1M60G7D - 6M50G7D / 10950.0 - 11200.0 1M60G7D - 6M50G7D / 11450.0 - 11700.0 1M60G7D - 6M50G7D / 11700.0 - 12200.0	1M60G7D - 6M50G7D / 14000.0 - 14500.0
Max Great Circle Coordination Distance	306.1 km / 190.2 mi	157.5 km / 97.8 mi
Precipitation Scatter Contour Radius	569.7 km / 354.0 mi	100.0 km / 62.1 mi

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Coordination Values	**RESEARCH TRIANGLE PARK, NC**			
Licensee Name	Cisco Systems, Inc.			
Latitude (NAD 83)	35° 51' 14.0" N			
Longitude (NAD 83)	78° 52' 5.0" W			
Ground Elevation (AMSL)	103.63 m / 340.0 ft			
Antenna Centerline (AGL)	19.2 m / 63.0 ft			
Antenna Model	Prodelin 2.4 Meter			
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	0.00	105.49	-10.00	231.37	-10.00	115.80
5	0.00	110.36	-10.00	231.37	-10.00	115.80
10	0.00	114.98	-10.00	231.37	-10.00	115.80
15	0.00	111.08	-10.00	231.37	-10.00	115.80
20	0.00	107.12	-10.00	231.37	-10.00	115.80
25	0.00	103.11	-10.00	231.37	-10.00	115.80
30	0.00	99.06	-10.00	231.37	-10.00	115.80
35	0.00	94.99	-10.00	231.37	-10.00	115.80
40	0.22	90.91	-10.00	229.58	-10.00	114.38
45	0.21	86.82	-10.00	230.19	-10.00	114.86
50	0.00	82.75	-10.00	231.37	-10.00	115.80
55	0.00	78.69	-10.00	231.37	-10.00	115.80
60	0.00	74.66	-10.00	231.37	-10.00	115.80
65	0.20	70.63	-10.00	230.99	-10.00	115.51
70	0.00	66.75	-10.00	231.37	-10.00	115.80
75	0.21	62.82	-10.00	230.61	-10.00	115.20
80	0.31	59.01	-10.00	221.08	-10.00	107.45
85	0.00	55.50	-10.00	231.37	-10.00	115.80
90	0.00	52.00	-10.00	231.37	-10.00	115.80
95	0.00	48.69	-10.00	231.37	-10.00	115.80
100	0.00	45.61	-9.48	233.68	-9.48	117.11
105	0.00	42.80	-8.79	236.76	-8.79	118.83
110	0.00	40.33	-8.14	239.69	-8.14	120.45
115	0.00	38.28	-7.57	242.32	-7.57	121.89
120	0.00	36.70	-7.12	244.59	-7.12	123.05
125	0.00	35.66	-6.80	246.06	-6.80	123.84
130	0.00	35.22	-6.67	246.70	-6.67	124.19
135	0.00	35.39	-6.72	246.45	-6.72	124.05
140	0.00	36.16	-6.96	245.33	-6.96	123.45
145	0.00	37.51	-7.35	243.34	-7.35	122.44
150	0.25	39.15	-7.82	235.97	-7.82	117.17
155	0.23	41.47	-8.44	235.52	-8.44	117.49
160	0.00	43.95	-9.07	235.47	-9.07	118.11
165	0.00	45.83	-9.53	233.44	-9.53	116.98
170	0.00	47.22	-9.85	232.01	-9.85	116.17
175	0.00	48.09	-10.00	231.37	-10.00	115.80
180	0.00	48.38	-10.00	231.37	-10.00	115.80
185	0.00	48.09	-10.00	231.37	-10.00	115.80

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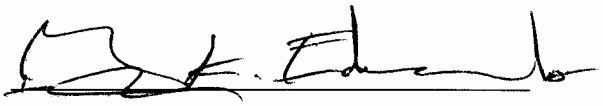
Antenna Centerline (AGL)	19.2 m / 63.0 ft			
Antenna Model	Prodelin 2.4 Meter			
Antenna Mode	Receive 11.0 GHz		Transmit 14.0 GHz	
Interference Objectives: Long Term	-156.0 dBW/MHz	20%	-151.0 dBW/4 kHz	20%
Short Term	-146.0 dBW/MHz	0.01%	-128.0 dBW/4 kHz	0.0025%
Max Available RF Power			-14.0 (dBW/4 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	47.22	-9.85	232.01	-9.85	116.17
195	0.00	45.82	-9.53	233.44	-9.53	116.98
200	0.00	43.95	-9.07	235.46	-9.07	118.11
205	0.00	41.66	-8.49	238.09	-8.49	119.57
210	0.00	39.01	-7.78	241.35	-7.78	121.36
215	0.00	36.08	-6.93	245.45	-6.93	123.52
220	0.00	32.91	-5.93	250.24	-5.93	126.07
225	0.00	29.54	-4.76	255.99	-4.76	129.09
230	0.00	26.01	-3.38	262.95	-3.38	131.46
235	0.00	22.36	-1.74	271.52	-1.74	136.04
240	0.00	18.60	0.26	282.33	0.26	142.04
245	0.00	15.21	2.45	294.66	2.45	149.15
250	0.00	12.88	4.25	302.49	4.25	155.46
255	0.00	12.24	4.81	306.06	4.81	157.49
260	0.00	13.52	3.72	299.21	3.72	153.58
265	0.00	16.28	1.71	290.42	1.71	146.68
270	0.00	19.92	-0.48	278.26	-0.48	139.75
275	0.00	24.03	-2.52	267.40	-2.52	133.81
280	0.00	28.41	-4.34	258.09	-4.34	130.18
285	0.00	32.96	-5.95	250.15	-5.95	126.02
290	0.00	37.61	-7.38	243.20	-7.38	122.37
295	0.00	42.33	-8.67	237.29	-8.67	119.13
300	0.00	47.10	-9.83	232.13	-9.83	116.24
305	0.00	51.90	-10.00	231.37	-10.00	115.80
310	0.00	56.73	-10.00	231.37	-10.00	115.80
315	0.00	61.58	-10.00	231.37	-10.00	115.80
320	0.00	66.44	-10.00	231.37	-10.00	115.80
325	0.00	71.31	-10.00	231.37	-10.00	115.80
330	0.00	76.18	-10.00	231.37	-10.00	115.80
335	0.00	81.07	-10.00	231.37	-10.00	115.80
340	0.00	85.95	-10.00	231.37	-10.00	115.80
345	0.00	90.84	-10.00	231.37	-10.00	115.80
350	0.00	95.72	-10.00	231.37	-10.00	115.80
355	0.00	100.61	-10.00	231.37	-10.00	115.80

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
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19700 Janelia Farm Boulevard
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DATED: August 26, 2009