

FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for
Denali 20020, LLC
BREWSTER, WA
(3.5 Meter)
Satellite Earth Station

Prepared By:
COMSEARCH
19700 Janelia Farm Boulevard
Ashburn, VA 20147
February 27, 2012

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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.

This earth station has been under our continuous monitor and frequency protection service. We have been monitoring all new frequency coordinations on their behalf and maintaining their participation in the frequency coordination process as specified in part 25 of the FCC Rules and Regulations. The protected frequencies are 10950 - 11200 MHz and 11450 – 11700 MHz (Receive).

The frequency coordination of the station has been maintained and no further coordination activity will be necessary. There are no unresolved interference objections with the following companies:

Company

ACCEL NET, INC.
Avista Utilities
BENTON COUNTY EMERGENCY SERVICES
BNSF Railway Company
Benton Rural Electric Association
Boeing Company
Boingo Wireless, Inc.
CITY OF TACOMA
Cellco Partnership - Washington
CenturyTel of Washington, Inc.
City of Tacoma / Tacoma Public Utilities
Clearwire Spectrum Holdings II, LLC
Clearwire Spectrum Holdings III, LLC
Clearwire Spectrum Holdings LLC
Columbia Rural Electric Association, Inc
Cyberdyne Networks, Inc.
Desert Winds Wireless LLC
Eastern Sub-RSA Limited Partnership
Eastside Public Safety Com Agency
Ellensburg Telephone Company
Energy Northwest
Everett Clinic
FIRST STEP INTERNET, LLC
Fisher Broadcasting, Inc.
Franklin County Sheriff
Frontier Communications of the Northwest
Hermiston, City of
J & R Electronics Inc
Jefferson Microwave, LLC
KGY, Inc.
KING COUNTY DEPT OF TRANSPORTATION
KITSAP, COUNTY OF
King, County of
METROPOLITAN AREA NETWORKS, INC.

MTS Allstream Inc
McDaniel Cellular Telephone Company
New Cingular Wireless PCS LLC -OR Region
New Cingular Wireless PCS-WA/NE/SD/ND
Newmax, LLC
Noel Communications, Inc
PACIFICORP
PIERCE COUNTY COMMUNICATIONS DIVISION
PIERCE TRANSIT
PIERCE, COUNTY OF
Pass Word, Inc.
PocketiNet Communications Inc.
Post Falls Police Department
Providence Toppenish Community Hospital
Ptera Wireless, Inc.
Public Util Dist. #1 of Snohomish County
Public Utility District No 1 of Okanogan
Puget Sound Energy
QWEST CORPORATION
RCC Minnesota, Inc - Washington/Oregon
Rivercom 911
SADDLE MOUNTAIN WIRELESS INC
SNOHOMISH COUNTY EMERGENCY RADIO SYSTEM
SPOKANE COUNTY
SW Networks
Seattle City Light
Seattle SMSA Limited Partnership
Seattle, City of
Skotdal Brothers LLC (c/o CSI)
Snohomish County Pub.Trans.Benefit Area
Spectrum Networks Inc.
St. Anthony Hospital
Startouch, Inc.
Stat Network Solutions
Stevens County Fire District #2
T-Mobile License LLC
Thurston 9-1-1 Communications
Time Warner Cable LLC
USCOC of Richland, Inc.
United Telephone Co. of the Northwest
Verizon Wireless (VAW) LLC - (WA)
Verizon Wireless (VAW) LLC -CO/ID/MT/WY
Verizon Wireless VAW LLC (WA,OR, HI)
WASHINGTON STATE DOT
WIRED OR WIRELESS, INC.
Washington RSA No. 8 Limited Partnership
Washington State Patrol
Western Sub-RSA LTD Partnership
Whidbey Telephone Co
Whitman County Fire District #7
Yakima MSA Limited Partnership

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: 02/24/2012
Job Number: 120224COMSGE03

Administrative Information

Status ENGINEER PROPOSAL
Call Sign
Licensee Code DENALI
Licensee Name Denali 20020, LLC

Site Information BREWSTER, WA

Venue Name
Latitude (NAD 83) 48° 8' 47.0" N
Longitude (NAD 83) 119° 41' 29.0" W
Climate Zone A
Rain Zone 5
Ground Elevation (AMSL) 380.0 m / 1246.7 ft

Link Information

Satellite Type Geostationary
Mode TR - Transmit-Receive
Modulation Analog and Digital
Satellite Arc 53° W to 188° West Longitude
Azimuth Range 107.8° to 253.5°
Corresponding Elevation Angles 6.7° / 5.6°
Antenna Centerline (AGL) 2.13 m / 7.0 ft

Antenna Information

	Receive - FCC32	Transmit - FCC32
Manufacturer	Vertex	Vertex
Model	3.5KPK	3.5KPK
Gain / Diameter	50.9 dBi / 3.5 m	52.3 dBi / 3.5 m
3-dB / 15-dB Beamwidth	0.49° / 0.98°	0.41° / 0.82°
Max Available RF Power (dBW/4 kHz)		-5.0
(dBW/MHz)		19.0
Maximum EIRP (dBW/4 kHz)		47.3
(dBW/MHz)		71.3
Interference Objectives:		
Long Term	-155.0 dBW/MHz 20%	-151.0 dBW/4 kHz 20%
Short Term	-145.0 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)	36M0F3F - 36M0G7W / 10950.0 - 11200.0 36M0F3F - 36M0G7W / 11450.0 - 12200.0	36M0F3F - 36M0G7W / 14000.0 - 14500.0 36M0F3F - 36M0G7W / 14000.0 - 14500.0

Max Great Circle Coordination Distance 501.6 km / 311.6 mi 281.6 km / 174.9 mi
Precipitation Scatter Contour Radius 400.1 km / 248.6 mi 121.3 km / 75.4 mi

COMSEARCH

Earth Station Data Sheet

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

Coordination Values

BREWSTER, WA

Licensee Name Denali 20020, LLC
Latitude (NAD 83) 48° 8' 47.0" N
Longitude (NAD 83) 119° 41' 29.0" W
Ground Elevation (AMSL) 380.0 m / 1246.7 ft
Antenna Centerline (AGL) 2.13 m / 7.0 ft
Antenna Model Vertex 3.5KPK
Antenna Mode Receive 11.0 GHz Transmit 14.0 GHz
Interference Objectives: Long Term -155.0 dBW/MHz 20% -151.0 dBW/4 kHz 20%
Short Term -145.0 dBW/MHz 0.01% -128.0 dBW/4 kHz 0.0025%
Max Available RF Power -5.0 (dBW/4 kHz)

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 11.0 GHz		Transmit 14.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
0	0.80	106.45	-10.00	187.61	-10.00	102.25
5	0.99	102.73	-10.00	177.29	-10.00	100.00
10	0.72	97.75	-10.00	192.14	-10.00	106.00
15	1.34	92.78	-10.00	162.61	-10.00	100.00
20	1.64	87.80	-10.00	152.59	-10.00	100.00
25	0.64	82.83	-10.00	196.22	-10.00	109.50
30	0.58	77.86	-10.00	198.94	-10.00	111.90
35	0.77	72.89	-10.00	189.16	-10.00	103.51
40	1.27	67.90	-10.00	167.73	-10.00	100.00
45	1.66	62.91	-10.00	151.98	-10.00	100.00
50	1.47	57.94	-10.00	158.11	-10.00	100.00
55	1.88	52.95	-10.00	145.54	-10.00	100.00
60	1.76	47.99	-10.00	149.08	-10.00	100.00
65	2.23	42.98	-8.83	142.09	-8.83	100.00
70	2.22	38.02	-7.50	148.20	-7.50	100.00
75	2.44	33.04	-5.97	150.15	-5.97	100.00
80	2.66	28.06	-4.20	153.91	-4.20	100.00
85	2.60	23.14	-2.11	169.37	-2.11	100.00
90	2.81	18.20	0.50	178.31	0.50	100.00
95	2.91	13.33	3.88	193.13	3.88	100.00
100	2.71	8.73	8.47	216.56	8.47	112.02
105	2.39	5.11	14.28	258.17	14.28	138.07
110	2.25	4.94	14.66	362.23	14.66	195.97
115	2.25	7.94	9.50	232.45	9.50	124.29
120	2.58	10.72	6.25	208.39	6.25	106.54
125	2.70	13.56	3.70	196.59	3.70	100.00
130	1.86	17.06	1.20	203.56	1.20	104.11
135	1.10	20.37	-0.73	212.66	-0.73	116.94
140	0.45	23.45	-2.25	238.55	-2.25	140.21
145	0.29	25.92	-3.34	248.43	-3.34	150.93
150	0.00	28.31	-4.30	253.33	-4.30	157.11
155	0.00	30.17	-4.99	249.95	-4.99	154.60
160	0.00	31.76	-5.55	247.28	-5.55	152.63
165	0.00	33.03	-5.97	245.26	-5.97	151.15
170	0.00	33.96	-6.27	243.72	-6.27	150.11
175	0.00	34.52	-6.45	242.88	-6.45	149.50
180	0.00	34.71	-6.51	242.60	-6.51	149.29
185	0.00	34.52	-6.45	242.88	-6.45	149.50

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Coordination Values

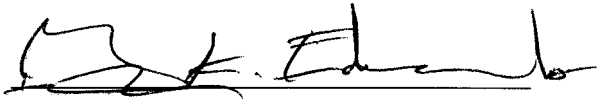
BREWSTER, WA

Licensee Name	Denali 20020, LLC		
Latitude (NAD 83)	48° 8' 47.0" N		
Longitude (NAD 83)	119° 41' 29.0" W		
Ground Elevation (AMSL)	380.0 m / 1246.7 ft		
Antenna Centerline (AGL)	2.13 m / 7.0 ft		
Antenna Model	Vertex 3.5KPK		
Antenna Mode	Receive 11.0 GHz		Transmit 14.0 GHz
Interference Objectives: Long Term	-155.0 dBW/MHz	20%	-151.0 dBW/4 kHz 20%
Short Term	-145.0 dBW/MHz	0.01%	-128.0 dBW/4 kHz 0.0025%
Max Available RF Power	-5.0 (dBW/4 kHz)		

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 11.0 GHz		Transmit 14.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
190	0.00	33.96	-6.27	243.72	-6.27	150.11
195	0.00	33.03	-5.97	245.26	-5.97	151.14
200	0.00	31.76	-5.55	247.28	-5.55	152.63
205	0.00	30.18	-4.99	249.95	-4.99	154.59
210	0.00	28.31	-4.30	253.34	-4.30	157.11
215	0.00	26.18	-3.45	257.53	-3.45	160.25
220	0.00	23.84	-2.43	262.69	-2.43	165.61
225	0.00	21.29	-1.20	269.05	-1.20	170.27
230	0.00	18.59	0.27	276.91	0.27	175.88
235	0.00	15.73	2.08	286.89	2.08	182.75
240	0.00	12.76	4.35	296.95	4.35	191.38
245	0.30	9.47	7.59	305.95	7.59	194.24
250	0.45	6.24	12.12	403.02	12.12	230.67
255	1.85	4.06	16.78	501.56	16.78	281.58
260	1.69	7.60	9.98	250.63	9.98	136.95
265	2.41	11.94	5.07	206.47	5.07	105.71
270	3.01	16.71	1.43	178.29	1.43	100.00
275	3.33	21.62	-1.37	152.85	-1.37	100.00
280	3.45	26.59	-3.62	139.02	-3.62	100.00
285	3.35	31.58	-5.49	133.05	-5.49	100.00
290	3.03	36.59	-7.08	132.63	-7.08	100.00
295	1.91	41.64	-8.49	151.65	-8.49	100.00
300	1.71	46.63	-9.72	151.83	-9.72	100.00
305	2.09	51.59	-10.00	140.20	-10.00	100.00
310	1.79	56.59	-10.00	148.04	-10.00	100.00
315	1.89	61.57	-10.00	145.20	-10.00	100.00
320	2.29	66.55	-10.00	135.90	-10.00	100.00
325	1.92	71.55	-10.00	144.29	-10.00	100.00
330	2.25	76.53	-10.00	136.64	-10.00	100.00
335	1.70	81.53	-10.00	150.99	-10.00	100.00
340	1.16	86.52	-10.00	171.47	-10.00	100.00
345	0.65	91.50	-10.00	195.33	-10.00	108.73
350	0.22	96.48	-10.00	224.67	-10.00	136.00
355	0.00	101.45	-10.00	227.06	-10.00	138.19

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: February 27, 2012

COMSEARCH

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King, County of
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McDaniel Cellular Telephone Company
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New Cingular Wireless PCS-WA/NE/SD/ND
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Post Falls Police Department
Providence Toppenish Community Hospital
Ptera Wireless, Inc.
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Public Utility District No 1 of Okanogan
Puget Sound Energy
QWEST CORPORATION
RCC Minnesota, Inc - Washington/Oregon
Rivercom 911
SADDLE MOUNTAIN WIRELESS INC
SNOHOMISH COUNTY EMERGENCY RADIO SYSTEM
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Thurston 9-1-1 Communications
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USCOC of Richland, Inc.
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Azimuth Range 107.8° to 251.9°
Corresponding Elevation Angles 6.7° / 6.9°
Antenna Centerline (AGL) 3.66 m / 12.0 ft

Antenna Information

		Receive - FCC32		Transmit - FCC32	
Manufacturer		Vertex		Vertex	
Model		6.1KPK		6.1KPK	
Gain / Diameter		55.5 dBi / 6.1 m		56.9 dBi / 6.1 m	
3-dB / 15-dB Beamwidth		0.28° / 0.57°		0.24° / 0.48°	
Max Available RF Power	(dBW/4 kHz) (dBW/MHz)			-5.0 19.0	
Maximum EIRP	(dBW/4 kHz) (dBW/MHz)			51.9 75.9	
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)	1M00G7D - 72M0G7W / 10950.0 - 11200.0 1M00G7D - 72M0G7W / 11450.0 - 12200.0	1M00G7D - 72M0G7W / 14000.0 - 14500.0

Max Great Circle Coordination Distance 442.1 km / 274.6 mi 196.1 km / 121.9 mi
Precipitation Scatter Contour Radius 403.4 km / 250.6 mi 100.0 km / 62.1 mi

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Earth Station Data Sheet

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Coordination Values

BREWSTER, WA

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Interference Objectives:	Long Term	-156.0 dBW/MHz 20%	-151.0 dBW/4 kHz 20%
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Max Available RF Power			-5.0 (dBW/4 kHz)

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 11.0 GHz		Transmit 14.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
0	0.79	107.70	-10.00	192.53	-10.00	100.00
5	0.98	102.73	-10.00	182.58	-10.00	100.00
10	0.70	97.75	-10.00	196.88	-10.00	100.00
15	1.32	92.78	-10.00	170.89	-10.00	100.00
20	1.63	87.80	-10.00	157.83	-10.00	100.00
25	0.62	82.84	-10.00	201.04	-10.00	100.00
30	0.57	77.87	-10.00	203.71	-10.00	100.00
35	0.76	72.89	-10.00	194.03	-10.00	100.00
40	1.26	67.90	-10.00	173.13	-10.00	100.00
45	1.65	62.91	-10.00	157.13	-10.00	100.00
50	1.46	57.94	-10.00	163.52	-10.00	100.00
55	1.87	52.95	-10.00	150.43	-10.00	100.00
60	1.75	47.99	-10.00	154.11	-10.00	100.00
65	2.21	42.98	-8.83	146.89	-8.83	100.00
70	2.21	38.02	-7.50	153.34	-7.50	100.00
75	2.43	33.04	-5.98	155.44	-5.98	100.00
80	2.64	28.06	-4.20	159.48	-4.20	100.00
85	2.59	23.14	-2.11	175.14	-2.11	100.00
90	2.79	18.20	0.50	183.74	0.50	100.00
95	2.89	13.33	3.88	198.19	3.88	100.00
100	2.70	8.74	8.46	222.04	8.46	100.00
105	2.37	5.12	14.26	264.87	14.26	107.02
110	2.24	4.95	14.64	399.19	14.64	165.90
115	2.24	7.95	9.49	238.34	9.49	100.00
120	2.57	10.72	6.24	213.40	6.24	100.00
125	2.69	13.56	3.69	201.47	3.69	100.00
130	1.85	17.07	1.20	205.77	1.20	100.00
135	1.09	20.38	-0.73	217.46	-0.73	100.00
140	0.44	23.46	-2.26	244.91	-2.26	117.19
145	0.28	25.93	-3.35	254.55	-3.35	126.21
150	0.00	28.31	-4.30	258.30	-4.30	130.29
155	0.00	30.17	-4.99	254.84	-4.99	128.49
160	0.00	31.76	-5.55	252.11	-5.55	127.06
165	0.00	33.03	-5.97	250.04	-5.97	125.97
170	0.00	33.96	-6.27	248.59	-6.27	125.19
175	0.00	34.52	-6.45	247.73	-6.45	124.74
180	0.00	34.71	-6.51	247.44	-6.51	124.58
185	0.00	34.52	-6.45	247.73	-6.45	124.73

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Coordination Values

BREWSTER, WA

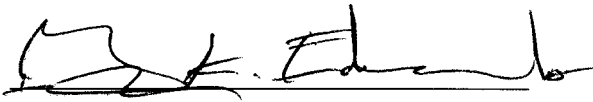
Licensee Name Denali 20020, LLC
Latitude (NAD 83) 48° 8' 47.0" N
Longitude (NAD 83) 119° 41' 29.0" W
Ground Elevation (AMSL) 380.0 m / 1246.7 ft
Antenna Centerline (AGL) 3.66 m / 12.0 ft
Antenna Model Vertex 6.1KPK
Antenna Mode Receive 11.0 GHz Transmit 14.0 GHz
Interference Objectives: Long Term -156.0 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 -5.0 (dBW/4 kHz)

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 11.0 GHz		Transmit 14.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
190	0.00	33.96	-6.27	248.59	-6.27	125.19
195	0.00	33.03	-5.97	250.04	-5.97	125.96
200	0.00	31.76	-5.55	252.11	-5.55	127.06
205	0.00	30.18	-4.99	254.84	-4.99	128.49
210	0.00	28.31	-4.30	258.30	-4.30	130.29
215	0.00	26.18	-3.45	262.59	-3.45	131.27
220	0.00	23.84	-2.43	267.86	-2.43	134.06
225	0.00	21.29	-1.20	274.35	-1.20	137.59
230	0.00	18.59	0.27	282.38	0.27	142.07
235	0.00	15.73	2.08	292.55	2.08	147.92
240	0.00	12.76	4.35	303.12	4.35	155.82
245	0.25	9.51	7.55	318.78	7.55	164.07
250	0.43	6.75	11.26	442.06	11.26	196.13
255	1.84	5.95	12.64	268.75	12.64	112.47
260	1.67	9.64	7.40	241.66	7.40	100.28
265	2.38	13.85	3.46	204.29	3.46	100.00
270	2.98	18.51	0.31	178.42	0.31	100.00
275	3.29	23.37	-2.22	154.40	-2.22	100.00
280	3.42	28.30	-4.29	141.12	-4.29	100.00
285	3.32	33.27	-6.05	135.43	-6.05	100.00
290	3.00	38.27	-7.57	135.26	-7.57	100.00
295	1.88	43.34	-8.92	155.26	-8.92	100.00
300	1.69	48.31	-10.00	155.93	-10.00	100.00
305	2.07	53.26	-10.00	145.02	-10.00	100.00
310	1.77	58.25	-10.00	153.35	-10.00	100.00
315	1.88	63.21	-10.00	150.09	-10.00	100.00
320	2.21	68.18	-10.00	141.73	-10.00	100.00
325	1.87	73.17	-10.00	150.54	-10.00	100.00
330	2.24	78.14	-10.00	141.06	-10.00	100.00
335	1.65	83.13	-10.00	157.17	-10.00	100.00
340	1.13	88.11	-10.00	177.49	-10.00	100.00
345	0.62	93.08	-10.00	200.94	-10.00	100.00
350	0.00	98.04	-10.00	231.37	-10.00	115.80
355	0.00	103.00	-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
COMSEARCH
19700 Janelia Farm Boulevard
Ashburn, VA 20147

DATED: February 27, 2012

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Earth Station Data Sheet

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

FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for
Denali 20020, LLC
BREWSTER, WA
(9.0 Meter)
Satellite Earth Station

Prepared By:
COMSEARCH
19700 Janelia Farm Boulevard
Ashburn, VA 20147
February 27, 2012

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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.

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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.

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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.

This earth station has been under our continuous monitor and frequency protection service. We have been monitoring all new frequency coordinations on their behalf and maintaining their participation in the frequency coordination process as specified in part 25 of the FCC Rules and Regulations. The protected frequencies are 10950 - 11200 MHz and 11450 – 11700 MHz (Receive).

The frequency coordination of the station has been maintained and no further coordination activity will be necessary. There are no unresolved interference objections with the following companies:

Company

ACCEL NET, INC.
Avista Utilities
BNSF Railway Company
Benton Rural Electric Association
Boeing Company
Boingo Wireless, Inc.
CITY OF TACOMA
Cellco Partnership - Washington
CenturyTel of Washington, Inc.
City of Tacoma / Tacoma Public Utilities
Clearwire Spectrum Holdings II, LLC
Clearwire Spectrum Holdings III, LLC
Clearwire Spectrum Holdings LLC
Cyberdyne Networks, Inc.
Desert Winds Wireless LLC
Eastern Sub-RSA Limited Partnership
Eastside Public Safety Com Agency
Ellensburg Telephone Company
Energy Northwest
FIRST STEP INTERNET, LLC
Fisher Broadcasting, Inc.
Frontier Communications of the Northwest
J & R Electronics Inc
Jefferson Microwave, LLC
KING COUNTY DEPT OF TRANSPORTATION
KITSAP, COUNTY OF
King, County of
METROPOLITAN AREA NETWORKS, INC.
New Cingular Wireless PCS LLC -OR Region
New Cingular Wireless PCS-WA/NE/SD/ND
Noel Communications, Inc
PACIFICORP

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PIERCE COUNTY COMMUNICATIONS DIVISION
PIERCE TRANSIT
PIERCE, COUNTY OF
Pass Word, Inc.
PocketiNet Communications Inc.
Providence Toppenish Community Hospital
Ptera Wireless, Inc.
Public Util Dist. #1 of Snohomish County
Public Utility District No 1 of Okanogan
Puget Sound Energy
QWEST CORPORATION
Rivercom 911
SADDLE MOUNTAIN WIRELESS INC
SNOHOMISH COUNTY EMERGENCY RADIO SYSTEM
SPOKANE COUNTY
SW Networks
Seattle City Light
Seattle SMSA Limited Partnership
Seattle, City of
Skotdal Brothers LLC (c/o CSI)
Snohomish County Pub.Trans.Benefit Area
St. Anthony Hospital
Startouch, Inc.
Stat Network Solutions
T-Mobile License LLC
Time Warner Cable LLC
USCOC of Richland, Inc.
United Telephone Co. of the Northwest
Verizon Wireless (VAW) LLC - (WA)
Verizon Wireless (VAW) LLC -CO/ID/MT/WY
Verizon Wireless VAW LLC (WA,OR, HI)
WASHINGTON STATE DOT
WIRED OR WIRELESS, INC.
Washington State Patrol
Western Sub-RSA LTD Partnership
Whidbey Telephone Co
Yakima MSA Limited Partnership

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.

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Earth Station Data Sheet

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Date: 02/24/2012
Job Number: 120224COMSGE04

Administrative Information

Status ENGINEER PROPOSAL
Call Sign
Licensee Code DENALI
Licensee Name Denali 20020, LLC

Site Information BREWSTER, WA

Venue Name
Latitude (NAD 83) 48° 8' 47.0" N
Longitude (NAD 83) 119° 41' 29.0" W
Climate Zone A
Rain Zone 5
Ground Elevation (AMSL) 380.0 m / 1246.7 ft

Link Information

Satellite Type Geostationary
Mode TR - Transmit-Receive
Modulation Analog and Digital
Satellite Arc 53° W to 188° West Longitude
Azimuth Range 107.8° to 253.5°
Corresponding Elevation Angles 6.7° / 5.6°
Antenna Centerline (AGL) 3.05 m / 10.0 ft

Antenna Information

Receive - V80902

Transmit - V90902

Manufacturer	VERTEX COMMUNICATIONS	VERTEX COMMUNICATIONS	
Model	9 KPK	9 KPK	
Gain / Diameter	59.2 dBi / 9.0 m	60.4 dBi / 9.0 m	
3-dB / 15-dB Beamwidth	0.20° / 0.38°	0.16° / 0.32°	
Max Available RF Power (dBW/4 kHz)		-1.4	
(dBW/MHz)		22.6	
Maximum EIRP (dBW/4 kHz)		59.0	
(dBW/MHz)		83.0	
Interference Objectives:	Long Term	-144.0 dBW/MHz 20%	-151.0 dBW/4 kHz 20%
	Short Term	-134.0 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)	1M00G7D - 72M0G7W / 10950.0 - 11200.0	1M00G7D - 72M0G7W / 14000.0 - 14500.0
	1M00G7D - 72M0G7W / 11450.0 - 11700.0	1M00G7D - 72M0G7W / 14000.0 - 14500.0

Max Great Circle Coordination Distance	466.8 km / 290.0 mi	385.1 km / 239.3 mi
Precipitation Scatter Contour Radius	141.9 km / 88.1 mi	100.0 km / 62.1 mi

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Earth Station Data Sheet

19700 Janelia Farm Boulevard, Ashburn, VA 20147
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Coordination Values

BREWSTER, WA

Licensee Name Denali 20020, LLC
Latitude (NAD 83) 48° 8' 47.0" N
Longitude (NAD 83) 119° 41' 29.0" W
Ground Elevation (AMSL) 380.0 m / 1246.7 ft
Antenna Centerline (AGL) 3.05 m / 10.0 ft
Antenna Model VERTEX COMMUNICATIONS 9 KPK
Antenna Mode Receive 11.0 GHz Transmit 14.0 GHz
Interference Objectives: Long Term -144.0 dBW/MHz 20% -151.0 dBW/4 kHz 20%
Short Term -134.0 dBW/MHz 0.01% -128.0 dBW/4 kHz 0.0025%
Max Available RF Power -1.4 (dBW/4 kHz)

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 11.0 GHz		Transmit 14.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
0	0.80	106.45	-7.80	144.41	-9.60	113.22
5	0.99	102.73	-7.80	134.77	-9.60	105.04
10	0.71	97.75	-7.80	149.24	-9.60	117.00
15	1.33	92.78	-7.80	126.89	-9.60	100.00
20	1.64	87.80	-7.80	119.38	-9.60	100.00
25	0.63	82.84	-7.80	154.10	-9.60	120.64
30	0.57	77.86	-7.80	157.47	-9.60	123.09
35	0.77	72.89	-7.80	146.03	-9.60	114.50
40	1.26	67.90	-7.80	128.59	-9.60	100.00
45	1.66	62.91	-7.80	118.88	-9.60	100.00
50	1.46	57.94	-7.80	123.54	-9.60	100.00
55	1.87	52.95	-7.80	113.82	-9.60	100.00
60	1.75	47.99	-7.80	116.63	-9.20	100.00
65	2.22	42.98	-7.80	106.89	-8.20	100.00
70	2.21	38.02	-7.01	109.57	-6.81	100.00
75	2.44	33.04	-5.01	112.22	-5.21	100.00
80	2.65	28.06	-3.02	115.39	-3.82	100.00
85	2.60	23.14	-1.05	123.59	-1.48	100.00
90	2.80	18.20	1.64	129.73	1.48	100.00
95	2.90	13.33	6.20	145.30	4.07	105.81
100	2.71	8.74	8.46	161.54	8.66	126.01
105	2.38	5.12	13.96	199.93	14.16	153.17
110	2.24	4.94	14.31	319.63	14.51	249.34
115	2.24	7.95	9.30	180.63	9.45	136.20
120	2.58	10.72	6.48	154.21	6.68	121.10
125	2.69	13.56	6.20	149.98	3.84	108.70
130	1.85	17.06	2.55	153.57	2.16	119.28
135	1.09	20.38	0.05	169.12	0.17	129.66
140	0.44	23.46	-1.18	199.40	-1.67	155.82
145	0.29	25.93	-2.17	206.36	-2.97	168.10
150	0.00	28.31	-3.12	210.58	-3.92	173.63
155	0.00	30.17	-3.87	207.81	-4.63	170.92
160	0.00	31.76	-4.50	205.51	-4.95	169.71
165	0.00	33.03	-5.01	203.71	-5.21	168.75
170	0.00	33.96	-5.38	204.78	-5.39	168.04
175	0.00	34.52	-5.61	203.98	-5.50	167.61
180	0.00	34.71	-5.69	203.71	-5.54	167.47
185	0.00	34.52	-5.61	203.98	-5.50	167.61

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Earth Station Data Sheet

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Coordination Values

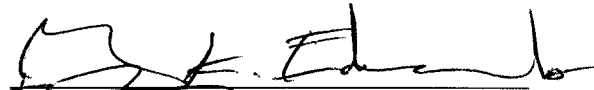
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Antenna Model VERTEX COMMUNICATIONS 9 KPK
Antenna Mode Receive 11.0 GHz Transmit 14.0 GHz
Interference Objectives: Long Term -144.0 dBW/MHz 20% -151.0 dBW/4 kHz 20%
Short Term -134.0 dBW/MHz 0.01% -128.0 dBW/4 kHz 0.0025%
Max Available RF Power -1.4 (dBW/4 kHz)

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 11.0 GHz		Transmit 14.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
190	0.00	33.96	-5.38	204.78	-5.39	168.04
195	0.00	33.03	-5.01	203.71	-5.21	168.75
200	0.00	31.76	-4.50	205.52	-4.95	169.71
205	0.00	30.18	-3.87	207.81	-4.64	170.92
210	0.00	28.31	-3.12	210.58	-3.92	173.63
215	0.00	26.18	-2.27	213.81	-3.07	176.86
220	0.00	23.84	-1.33	217.48	-1.90	181.30
225	0.00	21.29	-0.32	221.58	-0.37	187.11
230	0.00	18.59	1.33	228.48	1.25	193.27
235	0.00	15.73	3.61	238.57	2.96	199.78
240	0.00	12.76	6.20	250.88	4.64	205.33
245	0.25	9.50	7.70	252.65	7.90	213.23
250	0.44	6.25	11.95	360.13	11.91	288.73
255	1.84	4.07	16.92	466.79	16.26	385.11
260	1.68	7.60	9.99	198.54	9.80	151.32
265	2.39	11.94	6.20	157.39	5.46	120.05
270	2.99	16.71	2.83	130.58	2.38	100.00
275	3.31	21.62	-0.45	113.30	-0.57	100.00
280	3.44	26.59	-2.44	103.92	-3.24	100.00
285	3.33	31.58	-4.43	100.00	-4.92	100.00
290	3.01	36.59	-6.43	100.00	-6.23	100.00
295	1.89	41.64	-7.80	113.40	-7.93	100.00
300	1.70	46.63	-7.80	117.89	-8.93	100.00
305	2.07	51.59	-7.80	109.53	-9.60	100.00
310	1.78	56.59	-7.80	115.95	-9.60	100.00
315	1.88	61.57	-7.80	113.55	-9.60	100.00
320	2.24	66.55	-7.80	106.47	-9.60	100.00
325	1.88	71.55	-7.80	113.61	-9.60	100.00
330	2.24	76.53	-7.80	106.40	-9.60	100.00
335	1.67	81.53	-7.80	118.59	-9.60	100.00
340	1.14	86.52	-7.80	130.35	-9.60	100.93
345	0.63	91.50	-7.80	153.61	-9.60	120.28
350	0.21	96.48	-7.80	195.20	-9.60	150.12
355	0.00	101.45	-7.80	196.09	-9.60	151.05

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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DATED: February 27, 2012