

# FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for  
**Denali 20020, LLC**  
**BREWSTER, WA**  
**Satellite Earth Station**

Prepared By:  
COMSEARCH  
19700 Janelia Farm Boulevard  
Ashburn, VA 20147  
June 17, 2010

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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

VERIZON NORTHWEST INC.-FRONTIER  
Verizon Wireless (VAW) LLC - (WA)  
Time Warner Cable LLC  
MULTI AGENCY COMMUNICATIONS CTR E911  
WASHINGTON STATE DOT  
QWEST CORPORATION  
Washington State Patrol  
SBE Coordinator Washington

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 05/17/2010.

Company

AT&T COMMUNICATIONS OF PACIFIC NORTHWEST  
Avista Utilities  
BNSF Railway Company  
Boeing Company  
CenturyTel of Washington, Inc.  
City of Seattle  
City of Tacoma / Tacoma Public Utilities  
Confederated Tribes of the Colville Res.  
Eastern Sub-RSA Limited Partnership  
Eastside Public Safety Com Agency  
International Communications Group, Inc.  
KING COUNTY DEPT OF TRANSPORTATION  
King, County of  
Kittitas County of (KITTCOM 911)  
METROPOLITAN AREA NETWORKS, INC.  
MULTI AGENCY COMMUNICATIONS CTR E911  
New Cingular Wireless PCS -AK,WA,OR, NID  
NEXTEL LICENSE HOLDINGS 4 INC  
Noel Communications, Inc  
Northwest Pipeline Corporation  
PACIFIC WIRELESS SYSTEMS LLC  
PIERCE, COUNTY OF  
PUBLIC UTILITY DIST #1 OF DOUGLAS COUNTY  
PUBLIC UTILITY DIST #2 OF GRANT COUNTY  
Public Utility Dist No 1 of Chelan Count  
Puget Sound Energy  
QWEST CORPORATION  
River Com 911  
SEATTLE CITY LIGHT DEPARTMENT  
SNOHOMISH COUNTY EMERGENCY RADIO SYSTEM  
Snohomish County Pub.Trans.Benefit Area  
SPOKANE COUNTY  
Spokane MSA Limited Partnership  
Startouch, Inc.  
TELUS COMMUNICATIONS,(B.C.)INC.  
THURSTON, COUNTY OF  
Time Warner Cable LLC  
T-Mobile License LLC  
Trans Canada GTN System  
Union Pacific Railroad Company

USCOC of Richland, Inc.  
VALLEY COMMUNICATIONS CENTER  
VERIZON NORTHWEST INC.-FRONTIER  
Verizon Wireless (VAW) LLC - (WA)  
WASHINGTON STATE DOT  
Washington State Patrol  
Washington State University  
Western Sub-RSA LTD Partnership  
Yakima MSA Limited Partnership  
3G Wireless, LLC  
BROADCAST SPORTS CORP  
Broadcast Sports Inc.  
CASPER, JOHN  
Citywide News Network, Inc.  
Cohen, Elena  
FISHMAN BROTHERS ENTERPRISES  
Goodyear Tire & Rubber Company  
Heiden mr., William  
INFORMATION SUPER STATION LLC  
NSM Surveillance  
Onboard Images  
Production & Satellite Services, Inc.  
Regulus Media Services, Inc.  
REMOTE FACILITIES CONSULTING SERVICES  
RF Film, Inc.  
RF Technology, LLC  
TOTAL RF MARKETING INC  
UNIVERSAL SATELLITE COMMUNICATIONS INCORPORATED  
VILLAGE VIDEO PRODUCTION INC  
WEXLER VIDEO INC  
WINGED VISION INC  
Wolfe Air Aviation

## **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: 06/16/2010  
Job Number: 100517COMSGE04

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### Administrative Information

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

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### Site Information BREWSTER, WA

Venue Name  
Latitude (NAD 83) 48° 8' 50.5" N  
Longitude (NAD 83) 119° 41' 32.2" W  
Climate Zone A  
Rain Zone 5  
Ground Elevation (AMSL) 379.78 m / 1246.0 ft

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### Link Information

Satellite Type Geostationary  
Mode TR - Transmit-Receive  
Modulation Digital  
Satellite Arc 53° W to 186° West Longitude  
Azimuth Range 107.8° to 251.9°  
Corresponding Elevation Angles 6.7° / 6.9°  
Antenna Centerline (AGL) 6.4 m / 21.0 ft

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### Antenna Information

		<b>Receive - FCC32</b>		<b>Transmit - FCC32</b>
Manufacturer		COMSAT RSI		COMSAT RSI
Model		16.4 Meter		16.4 Meter
Gain / Diameter		55.5 dBi / 16.4 m		58.7 dBi / 16.4 m
3-dB / 15-dB Beamwidth		0.40° / 0.90°		0.20° / 0.50°
Max Available RF Power	(dBW/4 kHz) (dBW/MHz)			(1) -9.0 (2) -3.1 15.0 20.9
Maximum EIRP	(dBW/4 kHz) (dBW)			49.7 55.6 77.1 83.0
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%

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### Frequency Information

	<b>Receive 4.0 GHz</b>	<b>Transmit 6.1 GHz</b>
Emission / Frequency Range (MHz)	2M20G1D - 36M0F8W / 3700.0 - 4200.0	(1) 2M20G1D - 36M0F8W / 5925.0 - 6425.0 (2) 2M20G1D - 36M0F8W / 6440.8 - 6443.0 (2) 2M20G1D - 36M0F8W / 6454.4 - 6456.6
Max Great Circle Coordination Distance	556.5 km / 345.8 mi	268.8 km / 167.0 mi
Precipitation Scatter Contour Radius	448.7 km / 278.8 mi	100.0 km / 62.1 mi



# COMSEARCH

## Earth Station Data Sheet

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### Coordination Values

### BREWSTER, WA

Licensee Name Denali 20020, LLC  
Latitude (NAD 83) 48° 8' 50.5" N  
Longitude (NAD 83) 119° 41' 32.2" W  
Ground Elevation (AMSL) 379.78 m / 1246.0 ft  
Antenna Centerline (AGL) 6.4 m / 21.0 ft  
Antenna Model COMSAT RSI 16.4 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 -9.0 (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	1.07	107.71	-10.00	218.02	-10.00	100.00
5	0.90	102.73	-10.00	225.74	-10.00	103.88
10	0.69	97.75	-10.00	238.07	-10.00	113.53
15	1.13	92.78	-10.00	216.27	-10.00	100.00
20	1.87	87.80	-10.00	197.92	-10.00	100.00
25	0.50	82.84	-10.00	249.65	-10.00	122.11
30	0.52	77.87	-10.00	248.52	-10.00	121.30
35	0.70	72.89	-10.00	237.21	-10.00	112.87
40	1.23	67.90	-10.00	213.23	-10.00	100.00
45	1.36	62.92	-10.00	209.37	-10.00	100.00
50	1.51	57.94	-10.00	205.28	-10.00	100.00
55	1.83	52.95	-10.00	199.08	-10.00	100.00
60	1.75	47.99	-10.00	201.34	-10.00	100.00
65	2.05	42.99	-8.84	198.77	-8.84	100.00
70	2.11	38.03	-7.50	203.76	-7.50	100.00
75	2.24	33.06	-5.98	205.66	-5.98	100.00
80	2.56	28.07	-4.21	207.39	-4.21	100.00
85	2.57	23.14	-2.11	217.99	-2.11	100.00
90	2.66	18.23	0.48	230.97	0.48	100.00
95	2.85	13.34	3.87	248.72	3.87	100.29
100	2.73	8.73	8.48	288.14	8.48	119.72
105	2.36	5.14	14.23	350.29	14.23	148.03
110	2.22	4.96	14.61	514.10	14.61	237.13
115	2.18	8.00	9.42	313.65	9.42	133.77
120	2.49	10.79	6.18	276.17	6.18	115.53
125	2.65	13.60	3.66	252.80	3.66	103.39
130	1.60	17.27	1.07	266.56	1.07	116.81
135	0.94	20.50	-0.80	280.04	-0.80	129.03
140	0.40	23.49	-2.27	313.09	-2.27	153.23
145	0.25	25.96	-3.36	324.26	-3.36	164.36
150	0.00	28.30	-4.30	324.71	-4.30	168.33
155	0.00	30.17	-4.99	319.75	-4.99	164.02
160	0.00	31.76	-5.55	315.81	-5.55	161.90
165	0.00	33.03	-5.97	312.82	-5.97	160.31
170	0.00	33.96	-6.27	310.10	-6.27	159.19
175	0.00	34.52	-6.45	308.85	-6.45	158.53
180	0.00	34.71	-6.51	308.43	-6.51	158.31
185	0.00	34.52	-6.45	308.85	-6.45	158.53

# COMSEARCH

## Earth Station Data Sheet

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### Coordination Values

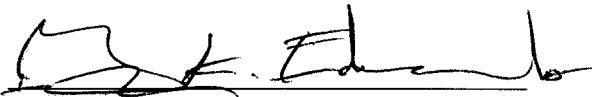
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Antenna Model	COMSAT RSI 16.4 Meter		
Antenna Mode	Receive 4.0 GHz		Transmit 6.1 GHz
Interference Objectives: Long Term	-156.0 dBW/MHz	20%	-154.0 dBW/4 kHz
Short Term	-146.0 dBW/MHz	0.01%	-131.0 dBW/4 kHz
Max Available RF Power			-9.0 (dBW/4 kHz)

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	33.96	-6.27	310.09	-6.27	159.19
195	0.00	33.03	-5.97	312.82	-5.97	160.31
200	0.00	31.76	-5.55	315.81	-5.55	161.90
205	0.00	30.18	-4.99	319.74	-4.99	164.01
210	0.00	28.30	-4.30	324.71	-4.30	168.33
215	0.00	26.18	-3.45	330.84	-3.45	171.63
220	0.00	23.84	-2.43	338.31	-2.43	175.59
225	0.00	21.29	-1.20	347.46	-1.20	180.34
230	0.00	18.59	0.27	358.68	0.27	186.03
235	0.00	15.73	2.08	372.78	2.08	192.99
240	0.00	12.76	4.35	390.35	4.35	201.67
245	0.30	9.47	7.60	403.87	7.60	204.34
250	0.70	6.50	11.67	556.54	11.67	268.76
255	2.53	5.37	13.75	340.29	13.75	142.24
260	1.86	9.54	7.51	307.54	7.51	133.38
265	2.73	13.74	3.55	249.59	3.55	101.37
270	3.30	18.45	0.35	215.34	0.35	100.00
275	3.37	23.36	-2.21	202.86	-2.21	100.00
280	3.38	28.31	-4.30	191.97	-4.30	100.00
285	3.09	33.30	-6.06	189.43	-6.06	100.00
290	2.82	38.29	-7.58	187.73	-7.58	100.00
295	1.54	43.37	-8.93	209.36	-8.93	100.00
300	2.08	48.29	-10.00	192.64	-10.00	100.00
305	1.95	53.26	-10.00	195.80	-10.00	100.00
310	1.71	58.25	-10.00	202.47	-10.00	100.00
315	2.16	63.20	-10.00	190.92	-10.00	100.00
320	2.04	68.19	-10.00	193.68	-10.00	100.00
325	1.96	73.17	-10.00	195.66	-10.00	100.00
330	2.32	78.14	-10.00	187.18	-10.00	100.00
335	1.70	83.13	-10.00	202.66	-10.00	100.00
340	1.31	88.11	-10.00	210.90	-10.00	100.00
345	0.70	93.08	-10.00	237.18	-10.00	112.85
350	0.22	98.05	-10.00	282.69	-10.00	144.33
355	0.00	103.01	-10.00	285.28	-10.00	146.29

## 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: June 17, 2010