FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for
Denali 20020, LLC
VERNON VALLEY, NJ
(WB81)
Satellite Earth Station

Prepared By:
COMSEARCH
19700 Janelia Farm Boulevard
Ashburn, VA 20147
July 28, 2015

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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 06/10/2015.

Company
256Q Networks
AERONAUTICAL RADIO INC
AWC Networks
Appalachian Broadcasting
Auburn Data Systems, LLC
Bergen, County of
Blueline Communications
Bucks County Dept. of Emergency Communic
Carbon, County of 911 Center
Cellco Partnership - (W-NY)
City of Bethlehem
City of New York
Commonwealth of Pennsylvania
Commonwealth of Pennsylvania-Radio Proj.
Community Products, LLC
Connecticut State Police Department
Converge Towers LLC
County of Burlington, Public Safety Cntr
County of Hunterdon
County of Warren, NJ
Delaware County (PA) Emergency Services
Dutchess County Emergency Response
ECW Wireless, LLC
EG Broadcast Newco Corp
Eastern MLG LLC
Eastern Pennsylvania EMS Council
Electric Railroad, LLC
Eversource Energy Service Company
FELHC, INC
Fundamental Broadcasting LLC
GLASTONBURY POLICE DEPARTMENT
Geodesic Networks LLC
Gloucester, County of
Green Line Networks
High Voltage Communications LLC (CFN)
Highway Networks, LLC
Jefferson Microwave, LLC
Keyspan Corp. dba Keyspan Energy
Kryptick Technologies
Lackawanna County Dept. of Emergency Ser
Lehigh, County of

Luzerne County Department of Public Sfty
MONMOUTH, COUNTY OF
MTA - Long Island Railroad
Mahwah Communications
Mifflin County
Mifflin Mobilecom
Monroe County Control Center (PA)
Montgomery County Of
Morris, County of
NBC Telemundo License LLC
Nassau County Police Department
National Tower Company LLC
New Cingular Wireless PCS, LLC - PA
New Jersey State Police
New Jersey Transit Rail Operations, Inc.
New Jersey Turnpike Authority-Pkwy Div
New Jersey, State of -NJ Transit
New Line Networks, LLC
New York City Transit Authority
New York Communications Co., Inc
New York, City of (Police Department)
Northumberland, County of
Orange Poughkeepsie SMSA LTD Partnership
Orange and Rockland Utilities, Inc.
PEG Bandwidth, LLC
PIKE COUNTY COMMISSIONERS
PSEG Services Corporation
Peco Energy Company
Pennsylvania Turnpike Commission
Pitt Power
Port Authority of New York & New Jersey
Rendezvous Communications LLC
Rockland, County of
SCHUYLKILL, COUNTY OF
SCRANTON TIMES, LP
SCS Networks
SECOM NET
SOUTHAMPTON, TOWN OF, POLICE DEPT.
STATE OF NEW JERSEY - OFFICE OF PUBLIC
SUFFOLK COUNTY WATER AUTHORITY
SW Networks
Snyder, County of
Southeastern Pennsylvania Transit Auth
Standard Backhaul Communications LLC
State of New York, Div of State Police
Suffolk County Police Department
Sullivan County DPW
Texas Eastern Communications, LLC
Transcontinental Gas Pipeline Corp.
Turtle Networks 6559
Turtle Networks 6562
WAYNE COUNTY PENNSYLVANIA
Webline Holdings LLC
Wireless Internetwork LLC
World Class Wireless, LLC
Zango LLC

Zen Networks, Inc
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:	07/28/2015
Job Number:	150610COMSGE04

Administrative Information

Status	ENGINEER PROPOSAL
Call Sign	WB81
Licensee Code	DENALI
Licensee Name	Denali 20020, LLC

Site Information — VERNON VALLEY, NJ

Venue Name	
Latitude (NAD 83)	41° 12' 6.3" N
Longitude (NAD 83)	74° 31' 34.6" W
Climate Zone	A
Rain Zone	2
Ground Elevation (AMSL)	182.88 m / 600.0 ft

Link Information

Satellite Type	Geostationary
Mode	TO - Transmit-Only
Modulation	Digital
Satellite Arc	3° W to 143° West Longitude
Azimuth Range	102.4° to 255.4°
Corresponding Elevation Angles	5.1° / 7.4°
Antenna Centerline (AGL)	7.62 m / 25.0 ft

Antenna Information — Transmit - FCC32

Manufacturer		Vertex
Model		13 KPC
Gain / Diameter		56.8 dBi / 13.1 m
3-dB / 15-dB Beamwidth		0.26° / 0.50°
Max Available RF Power	(dBW/4 kHz)	-2.7
	(dBW/MHz)	21.3
Maximum EIRP	(dBW/4 kHz)	54.1
	(dBW/MHz)	78.1
Interference Objectives:	Long Term	-154.0 dBW/4 kHz 20%
	Short Term	-131.0 dBW/4 kHz 0.0025%

Frequency Information — Transmit 6.7 GHz

Emission / Frequency Range (MHz)	215KG7D - 36M0F8W / 6427.0 - 6643.0
Max Great Circle Coordination Distance	434.4 km / 269.9 mi
Precipitation Scatter Contour Radius	101.6 km / 63.1 mi

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Antenna Model	Vertex 13.1 Meter
Antenna Mode	Transmit 6.7 GHz
Interference Objectives: Long Term	-154.0 dBW/4 kHz 20%
Short Term	-131.0 dBW/4 kHz 0.0025%
Max Available RF Power	-2.7 (dBW/4 kHz)

Transmit 6.7 GHz

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Horizon Gain (dBi)	Coordination Distance (km)
0	4.60	102.41	-10.00	100.00
5	3.35	97.41	-10.00	100.00
10	2.56	92.41	-10.00	100.00
15	1.60	87.42	-10.00	102.24
20	2.46	82.42	-10.00	100.00
25	2.82	77.42	-10.00	100.00
30	2.96	72.43	-10.00	100.00
35	1.66	67.46	-10.00	100.82
40	0.60	62.51	-10.00	134.50
45	0.00	57.56	-10.00	170.66
50	0.00	52.59	-10.00	170.66
55	0.00	47.62	-9.95	170.87
60	0.00	42.66	-8.75	175.51
65	0.00	37.71	-7.41	180.70
70	0.00	32.77	-5.89	186.58
75	1.04	27.69	-4.06	133.98
80	1.78	22.65	-1.88	124.22
85	1.89	17.70	0.80	131.06
90	2.20	12.75	4.36	136.79
95	2.45	7.88	9.59	153.33
100	2.73	3.40	18.71	434.35
105	2.79	3.48	18.45	295.44
110	2.65	7.22	10.54	153.39
115	2.45	10.91	6.05	138.31
120	2.95	14.04	3.32	119.94
125	2.81	17.53	0.91	113.32
130	3.44	20.32	-0.70	100.00
135	3.55	23.34	-2.20	100.00
140	4.31	25.66	-3.23	100.00
145	4.26	28.40	-4.33	100.00
150	4.20	30.88	-5.24	100.00
155	4.75	32.54	-5.81	100.00
160	4.04	34.99	-6.60	100.00
165	3.14	37.29	-7.29	100.00
170	3.18	38.33	-7.59	100.00
175	3.36	38.81	-7.72	100.00
180	2.92	39.47	-7.91	100.00
185	2.51	39.65	-7.96	100.00

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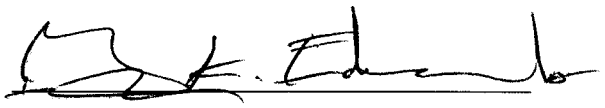
Max Available RF Power	-2.7 (dBW/4 kHz)

Transmit 6.7 GHz

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Horizon Gain (dBi)	Coordination Distance (km)
190	2.11	39.38	-7.88	100.00
195	0.47	39.82	-8.00	149.18
200	0.00	38.67	-7.68	179.65
205	0.25	36.50	-7.06	177.17
210	0.81	33.76	-6.21	136.63
215	1.97	30.27	-5.03	108.58
220	2.18	27.35	-3.93	108.00
225	2.50	24.15	-2.57	106.48
230	3.21	20.50	-0.79	100.00
235	3.79	16.81	1.36	100.00
240	4.15	13.18	4.00	101.80
245	4.47	9.48	7.57	110.77
250	4.86	5.67	13.17	127.44
255	5.32	2.13	23.81	285.61
260	6.01	4.77	15.03	123.38
265	6.93	9.58	7.47	100.00
270	8.06	14.58	2.90	100.00
275	9.28	19.65	-0.34	100.00
280	9.70	24.67	-2.80	100.00
285	10.94	29.76	-4.84	100.00
290	11.33	34.76	-6.53	100.00
295	10.82	39.69	-7.97	100.00
300	10.34	44.64	-9.24	100.00
305	9.65	49.60	-10.00	100.00
310	9.37	54.59	-10.00	100.00
315	9.17	59.58	-10.00	100.00
320	8.36	64.57	-10.00	100.00
325	7.65	69.57	-10.00	100.00
330	8.92	74.57	-10.00	100.00
335	9.02	79.57	-10.00	100.00
340	9.28	84.57	-10.00	100.00
345	8.25	89.57	-10.00	100.00
350	6.92	94.57	-10.00	100.00
355	5.76	99.56	-10.00	100.00

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
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19700 Janelia Farm Boulevard
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DATED: July 28, 2015