

FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for
Denali 20020, LLC
VERNON VALLEY, NJ
(Call Sign E040368)
Satellite Earth Station

Prepared By:
COMSEARCH
19700 Janelia Farm Boulevard
Ashburn, VA 20147
March 30, 2015

TABLE OF CONTENTS

| | |
|---|----|
| 1. CONCLUSIONS | 3 |
| 2. SUMMARY OF RESULTS | 4 |
| 3. SUPPLEMENTAL SHOWING | 5 |
| 4. EARTH STATION COORDINATION DATA..... | 10 |
| 5. CERTIFICATION..... | 14 |

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 02/04/2015.

Company

256Q Networks
ALBANY, COUNTY OF
ALGONQUIN GAS TRANSMISSION, LLC
AMFM Radio Licenses, LLC
AT&T Corporation
AWC Networks
Affiniti PA, LLC
Airband Communications Inc
Allentown SMSA Limited Partnership
Appalachian Broadcasting
Archdiocese of New York Dept of Educatio
Atlantic Telecommunications
Auburn Data Systems, LLC
BAY BROADBAND COMMUNICATIONS LLC
BFI Licenses, LLC
BLAIR COUNTY 911
Baltimore Gas and Electric Company
Bedford, County of
Bergen, County of
Berks County Department of Emergency Ser
Blueline Communications
Buckeye Partners
Bucks County Dept. of Emergency Communic
Business Only Broadband, LLC
CBS Communication Services Inc
COMMUNITY PRODUCTS, LLC
Cambria, County of
Capital Communications of America
Cellco Partnership - (W-NY)
Cellco Partnership - Bridgeville, PA/WV
Cellco Partnership - CT, W-MA, VT
Cellco Partnership- PA Region
Cellco Partnership-Newark-Dallas Verizon
Cellco Prtnrshp - Phil. Tri-State Rgn
Chester, County of
Chester, County of
China Cat Productions LLC
City of Albany
City of Bristol Mayor's Office
City of Jersey City
City of New Haven Police Services

City of New York
City of Springfield Police Department
Clearwire Spectrum Holdings III, LLC
Columbia, County
Commonwealth of Pennsylvania-Radio Proj.
Comprehensive Wireless LLC
Connect-Vision Ltd.
Connecticut State Police Department
Conterra Ultra Broadband, LLC
Converge Towers LLC
Coralinks
County of Burlington
County of Burlington, Public Safety Cntr
County of Camden
County of Mercer
County of Warren, NJ
D&E Communications, Inc.
DAUPHIN COUNTY EMERGENCY MANAGEMENT
Delaware County (PA) Emergency Services
Delaware Division of Communications
Direct Broadcast Services, Inc.
EAST HAMPTON TOWN POLICE DEPARTMENT
ECW Wireless, LLC
EG Broadcast Newco Corp
East Brunswick, Township of, NJ
Eastern MLG LLC
Electric Railroad, LLC
Enoch Pratt Free Library
Essex County Sheriff's Office (NJ)
Exelon Generation Company, LLC
FELHC, INC
FORDHAM UNIVERSITY(WFUV)
Fundamental Broadcasting LLC
GAW High Speed Internet
Garden State Transmissions
Geodesic Networks LLC
Global Crossing Telecommunications, Inc.
Gloucester Township
Gloucester, County of
Goosetown Network Services, LLC
Greater Philadelphia Radio, Inc.
Green Line Networks
Greenwich, Town of (CT)
HARRIS CORPORATION
High Voltage Communications LLC
Highway Networks, LLC
Holy Name Hospital
Hopewell Radiology Group
Hudson County MIS Department
Hudson County Prosecutors Office
Huntingdon County of
Jefferson Microwave, LLC
Juniata County Emergency Services
Kryptick Technologies
LANline Communications, Inc.
Lackawanna, County of

Lancaster County-Wide Communications
Lehigh, County of
Limitless Mobile, LLC
Local Media TV Philadelphia
MB Microwave, LLC
MONMOUTH, COUNTY OF
MVC Research. LLC
Mahwah Communications
Manchester, Township of
Maryland State Highway Administration
Massachusetts Commonwealth of
Massachusetts, Commonwealth of
Metro Networks Communications, Inc.
Mid-Hudson Data Corp
Middlesex, County of
Mifflin County
Mifflin Mobilecom
Millersburg Area School District
Monroe County Control Center (PA)
Montgomery County Of
Morris, County of
NBC Telemundo License LLC
NOROC Broadband LLC
NY Dept of Health and Mental Hygiene
NYC DOT Staten Island Ferry
Nassau County Police Department
National Tower Company LLC
NeXXCom Wireless LLC
New Britain, City of
New Cingular Wireless PCS LLC -NJ
New Cingular Wireless PCS - Maryland
New Cingular Wireless PCS LLC - MA
New Cingular Wireless PCS LLC-DE/NH/RI
New Cingular Wireless PCS of PA LLC
New Cingular Wireless PCS, LLC (NY)
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 York City Police Department TARU
New York Communications Co., Inc
New York SMSA LP (Northern NJ)
New York SMSA Limited Partnership
New York, City of (Police Department)
Norcom Communications Corp.
Norfolk Southern Railway
Northeast Pennsylvania SMSA LTD Prtnrsh
Northeast Utilities Service Company
Northrop Grumman Systems Corp.
Northrop Grumman Systems Corporation Inc
Northumberland, County of
Norton, Douglas R
Ocean, County of - Div of Wireless Tech.
Office of Emergency Telecom Services, NJ
Orange Poughkeepsie SMSA LTD Partnership

Orange and Rockland Utilities, Inc.
Orangetown, Town of
PEG Bandwidth, LLC
PISCATAWAY, TOWNSHIP OF
PSEG Services Corporation
Peco Energy Company
Pennsylvania Sports Entertainment Netwo.
Pennsylvania Turnpike Commission
PhillieCo, L.P.
Philly Sports Wireless
Pines Pantry, Inc.
Pitt Power
Port Authority of New York & New Jersey
QUALCOMM INC.
Qoncept Holdings LLC
Rendezvous Communications LLC
Rensselaer County
Rockland, County of
SANOFI PASTEUR
SCHENECTADY COUNTY LAW ENF MOB RADIO
SCHUYLKILL, COUNTY OF
SCS Networks
SCTF NET
SECOM NET
SOMERSET COUNTY
STAMFORD, CITY OF
STATE OF NEW JERSEY - OFFICE OF PUBLIC
SUFFOLK, COUNTY OF
SW Networks
Salem County Information Technology
Shenandoah Personal Communications, LLC
Somerset, County of - Emergency Managem
Southeastern Pennsylvania Transit Auth
Spot On Networks
Sprint Spectrum L.P.
Sprintcom, Inc
Standard Backhaul Communications LLC
State of Maryland, MIEMSS
State of New Jersey
State of New York, Div of State Police
Stevens Institute of Technology
Suffolk, County of
Sussex County Sheriffs Office
T-Mobile License LLC
THE BROOKLYN HOSPITAL CENTER
Telecom Transport Management, Inc
Thacher, Proffitt & Wood LLP
Thought Transmissions, LLC
Towerstream Corp.
Town of Colonie Police Department
Town of Thomaston
Town of Wethersfield
Town of Woodbridge, Police Department
Township of Jackson
Townsquare Media Monmouth-Ocean License
Transcontinental Gas Pipeline Corp.

Turtle Networks 6559
Turtle Networks 6562
Union County New Jersey
Union, County Of
VTel Wireless, Inc.
Valley Rural Electric Cooperative, Inc.
Velox Networks LLC
Verizon New Jersey, Inc.
Verizon Wireless (VAW) LLC - NJ
Verizon Wireless (VAW) LLC-Pennsylvania
WESTCHESTER, COUNTY OF
WHYY, Inc.
Wayne, County of
Wayne, Township of
Weblin Holdings LLC
West Haven, City of
Western PA Internet Access, Inc.
White Rabbit Networks
Wireless Holdings Network, LLC
Wireless Internetwork LLC
World Class Wireless, LLC
Zen Networks, Inc
iSignal

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: 03/30/2015
Job Number: 150204COMSGE02

Administrative Information

Status ENGINEER PROPOSAL
Call Sign E040368
Licensee Code DENALI
Licensee Name Denali 20020, LLC

Site Information

Venue Name **VERNON VALLEY, NJ**
Latitude (NAD 83) 41° 12' 10.0" N
Longitude (NAD 83) 74° 31' 39.0" W
Climate Zone A
Rain Zone 2
Ground Elevation (AMSL) 225.0 m / 738.2 ft

Link Information

Satellite Type Geostationary
Mode TR - Transmit-Receive
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) 13.0 m / 42.7 ft

Antenna Information

| | Receive - FCC32 | Transmit - FCC32 |
|------------------------------------|---------------------------------|--------------------------|
| Manufacturer | ViaSat | ViaSat |
| Model | 8016A | 8016A |
| Gain / Diameter | 60.8 dBi / 11.3 m | 62.3 dBi / 11.3 m |
| 3-dB / 15-dB Beamwidth | 0.50° / 1.00° | 1.00° / 2.00° |
| Max Available RF Power (dBW/4 kHz) | | -14.0 |
| (dBW/MHz) | | 10.0 |
| Maximum EIRP (dBW/4 kHz) | | 48.3 |
| (dBW/MHz) | | 72.3 |
| 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) | 8M00G7W - 36M0G7W / 10950.0 - 11200.0 8M00G7W - 36M0G7W / 11450.0 - 12200.0 | 8M00G7W - 36M0G7W / 14000.0 - 14500.0 |
| Max Great Circle Coordination Distance | 688.1 km / 427.5 mi | 304.6 km / 189.2 mi |
| Precipitation Scatter Contour Radius | 605.8 km / 376.4 mi | 100.0 km / 62.1 mi |

COMSEARCH

Earth Station Data Sheet

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Coordination Values

VERNON VLY, NJ

Licensee Name Denali 20020, LLC
Latitude (NAD 83) 41° 12' 10.0" N
Longitude (NAD 83) 74° 31' 39.0" W
Ground Elevation (AMSL) 225.0 m / 738.2 ft
Antenna Centerline (AGL) 13.0 m / 42.7 ft
Antenna Model ViaSat 11.3 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)

| 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 | 3.95 | 102.41 | -10.00 | 111.14 | -10.00 | 100.00 |
| 5 | 2.77 | 97.41 | -10.00 | 130.15 | -10.00 | 100.00 |
| 10 | 1.66 | 92.41 | -10.00 | 156.96 | -10.00 | 100.00 |
| 15 | 0.75 | 87.42 | -10.00 | 194.55 | -10.00 | 100.00 |
| 20 | 0.79 | 82.43 | -10.00 | 192.71 | -10.00 | 100.00 |
| 25 | 1.88 | 77.43 | -10.00 | 150.21 | -10.00 | 100.00 |
| 30 | 1.94 | 72.44 | -10.00 | 148.38 | -10.00 | 100.00 |
| 35 | 0.98 | 67.48 | -10.00 | 182.89 | -10.00 | 100.00 |
| 40 | 0.00 | 62.53 | -10.00 | 231.37 | -10.00 | 115.80 |
| 45 | 0.00 | 57.56 | -10.00 | 231.37 | -10.00 | 115.80 |
| 50 | 0.00 | 52.59 | -10.00 | 231.37 | -10.00 | 115.80 |
| 55 | 0.00 | 47.62 | -9.95 | 231.61 | -9.95 | 115.94 |
| 60 | 0.00 | 42.66 | -8.75 | 236.91 | -8.75 | 118.92 |
| 65 | 0.00 | 37.71 | -7.41 | 243.07 | -7.41 | 122.30 |
| 70 | 0.00 | 32.77 | -5.89 | 250.45 | -5.89 | 126.18 |
| 75 | 0.43 | 27.78 | -4.09 | 235.94 | -4.09 | 112.63 |
| 80 | 1.32 | 22.72 | -1.91 | 205.81 | -1.91 | 100.00 |
| 85 | 1.57 | 17.76 | 0.76 | 210.98 | 0.76 | 100.00 |
| 90 | 1.57 | 12.90 | 4.23 | 227.72 | 4.23 | 100.00 |
| 95 | 1.99 | 8.05 | 9.36 | 243.71 | 9.36 | 100.00 |
| 100 | 1.95 | 3.99 | 16.99 | 688.12 | 16.99 | 304.57 |
| 105 | 2.13 | 3.96 | 17.06 | 474.90 | 17.06 | 201.42 |
| 110 | 2.06 | 7.61 | 9.96 | 245.58 | 9.96 | 100.00 |
| 115 | 1.91 | 11.29 | 5.68 | 225.63 | 5.68 | 100.00 |
| 120 | 2.26 | 14.53 | 2.94 | 204.42 | 2.94 | 100.00 |
| 125 | 2.08 | 18.06 | 0.58 | 200.02 | 0.58 | 100.00 |
| 130 | 2.39 | 21.10 | -1.11 | 185.08 | -1.11 | 100.00 |
| 135 | 2.62 | 24.06 | -2.53 | 172.18 | -2.53 | 100.00 |
| 140 | 3.26 | 26.50 | -3.58 | 148.06 | -3.58 | 100.00 |
| 145 | 3.16 | 29.30 | -4.67 | 145.00 | -4.67 | 100.00 |
| 150 | 3.15 | 31.78 | -5.55 | 141.02 | -5.55 | 100.00 |
| 155 | 3.62 | 33.54 | -6.14 | 130.85 | -6.14 | 100.00 |
| 160 | 2.74 | 36.18 | -6.96 | 143.34 | -6.96 | 100.00 |
| 165 | 2.48 | 37.92 | -7.47 | 146.87 | -7.47 | 100.00 |
| 170 | 2.27 | 39.22 | -7.84 | 150.08 | -7.84 | 100.00 |
| 175 | 2.73 | 39.44 | -7.90 | 139.47 | -7.90 | 100.00 |
| 180 | 2.07 | 40.32 | -8.14 | 153.73 | -8.14 | 100.00 |
| 185 | 1.87 | 40.29 | -8.13 | 159.61 | -8.13 | 100.00 |

COMSEARCH

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Coordination Values

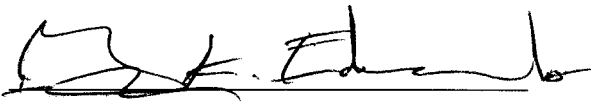
VERNON VLY, NJ

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Short Term -146.0 dBW/MHz 0.01% -128.0 dBW/4 kHz 0.0025%
Max Available RF Power -14.0 (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 | 1.08 | 40.38 | -8.15 | 187.56 | -8.15 | 100.00 |
| 195 | 0.00 | 40.25 | -8.12 | 239.79 | -8.12 | 120.51 |
| 200 | 0.00 | 38.67 | -7.68 | 241.80 | -7.68 | 121.61 |
| 205 | 0.00 | 36.71 | -7.12 | 244.57 | -7.12 | 123.04 |
| 210 | 0.00 | 34.42 | -6.42 | 247.88 | -6.42 | 124.82 |
| 215 | 0.00 | 31.86 | -5.58 | 251.95 | -5.58 | 126.97 |
| 220 | 0.00 | 29.05 | -4.58 | 256.89 | -4.58 | 129.56 |
| 225 | 0.75 | 25.48 | -3.15 | 220.93 | -3.15 | 100.00 |
| 230 | 1.55 | 21.73 | -1.43 | 204.41 | -1.43 | 100.00 |
| 235 | 1.33 | 18.60 | 0.26 | 215.13 | 0.26 | 100.00 |
| 240 | 0.72 | 15.63 | 2.15 | 249.32 | 2.15 | 114.31 |
| 245 | 1.21 | 11.78 | 5.22 | 243.94 | 5.22 | 105.52 |
| 250 | 2.33 | 7.43 | 10.23 | 240.50 | 10.23 | 100.00 |
| 255 | 2.93 | 4.49 | 15.70 | 459.21 | 15.70 | 191.50 |
| 260 | 5.99 | 4.78 | 15.01 | 205.67 | 15.01 | 100.00 |
| 265 | 7.74 | 9.57 | 7.47 | 137.34 | 7.47 | 100.00 |
| 270 | 8.30 | 14.60 | 2.89 | 113.90 | 2.89 | 100.00 |
| 275 | 8.33 | 19.59 | -0.30 | 101.66 | -0.30 | 100.00 |
| 280 | 7.95 | 24.57 | -2.76 | 100.00 | -2.76 | 100.00 |
| 285 | 7.95 | 29.57 | -4.77 | 100.00 | -4.77 | 100.00 |
| 290 | 7.89 | 34.57 | -6.47 | 100.00 | -6.47 | 100.00 |
| 295 | 7.56 | 39.57 | -7.93 | 100.00 | -7.93 | 100.00 |
| 300 | 6.88 | 44.57 | -9.23 | 100.00 | -9.23 | 100.00 |
| 305 | 6.71 | 49.57 | -10.00 | 100.00 | -10.00 | 100.00 |
| 310 | 6.80 | 54.57 | -10.00 | 100.00 | -10.00 | 100.00 |
| 315 | 6.53 | 59.57 | -10.00 | 100.00 | -10.00 | 100.00 |
| 320 | 5.80 | 64.58 | -10.00 | 100.00 | -10.00 | 100.00 |
| 325 | 5.20 | 69.58 | -10.00 | 100.00 | -10.00 | 100.00 |
| 330 | 6.33 | 74.57 | -10.00 | 100.00 | -10.00 | 100.00 |
| 335 | 7.18 | 79.57 | -10.00 | 100.00 | -10.00 | 100.00 |
| 340 | 7.24 | 84.57 | -10.00 | 100.00 | -10.00 | 100.00 |
| 345 | 7.29 | 89.57 | -10.00 | 100.00 | -10.00 | 100.00 |
| 350 | 6.30 | 94.57 | -10.00 | 100.00 | -10.00 | 100.00 |
| 355 | 5.13 | 99.56 | -10.00 | 100.00 | -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
Senior Manager
COMSEARCH
19700 Janelia Farm Boulevard
Ashburn, VA 20147

DATED: March 30, 2015