

# FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for

**Northeast Rural Services  
Vinita, Oklahoma**

**Satellite Earth Station**

Prepared By:

COMSEARCH

19700 Janelia Farm Boulevard

Ashburn, Virginia 20147

February 3, 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.

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 receive-only earth station.

Company

None

No 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 December 4, 2014, and an information-only letter was forwarded on January 21, 2015.

| <u>Company</u> |
|----------------|
|----------------|

|           |
|-----------|
| Comsearch |
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## **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: 02/03/2015  
Job Number: 150121COMSJC03

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**Administrative Information**

Status ENGINEER PROPOSAL  
Call Sign  
Licensee Code NERURA  
Licensee Name NORTHEAST RURAL SERVICES

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**Site Information****VINITA, OKLAHOMA**

Venue Name  
Latitude (NAD 83) 36° 37' 33.0" N  
Longitude (NAD 83) 95° 5' 36.0" W  
Climate Zone A  
Rain Zone 2  
Ground Elevation (AMSL) 220.68 m / 724.0 ft

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**Link Information**

Satellite Type Geostationary  
Mode RO - Receive-Only  
Modulation Analog and Digital  
Satellite Arc 60° W to 143° West Longitude  
Azimuth Range 130.3° to 241.7°  
Corresponding Elevation Angles 33.8° / 24.6°  
Antenna Centerline (AGL) 4.88 m / 16.0 ft

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**Antenna Information****Receive**

Manufacturer Antenna Tech. Corp  
Model Simulsat 5B  
Gain / Diameter 44.5 dBi / 5.0 m  
3-dB / 15-dB Beamwidth 1.00° / 1.90°

Interference Objectives: Long Term -156.0 dBW/MHz 20%  
Short Term -146.0 dBW/MHz 0.01%

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**Frequency Information****Receive 4.0 GHz**

Emission / Frequency Range (MHz) 36M0F8W / 3700.0 - 4200.0  
36M0G7W / 3700.0 - 4200.0

Max Great Circle Coordination Distance 335.5 km / 208.4 mi  
Precipitation Scatter Contour Radius 496.0 km / 308.2 mi

# COMSEARCH

## Earth Station Data Sheet

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### Coordination Values

#### VINITA, OK

Licensee Name NORTHEAST RURAL SERVICES  
Latitude (NAD 83) 36° 37' 33.0" N  
Longitude (NAD 83) 95° 5' 36.0" W  
Ground Elevation (AMSL) 220.68 m / 724.0 ft  
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Antenna Model Antenna Tech. Corp Simulsat 5B  
Antenna Mode Receive 4.0 GHz  
Interference Objectives: Long Term -156.0 dBW/MHz 20%  
Short Term -146.0 dBW/MHz 0.01%

| Azimuth (°) | Horizon<br>Elevation (°) | Antenna<br>Discrimination (°) | Receive 4.0 GHz       |                               |
|-------------|--------------------------|-------------------------------|-----------------------|-------------------------------|
|             |                          |                               | Horizon<br>Gain (dBi) | Coordination<br>Distance (km) |
| 0           | 0.00                     | 115.55                        | -10.00                | 285.28                        |
| 5           | 0.00                     | 118.72                        | -10.00                | 285.28                        |
| 10          | 0.00                     | 114.81                        | -10.00                | 285.28                        |
| 15          | 0.00                     | 110.82                        | -10.00                | 285.28                        |
| 20          | 0.00                     | 106.78                        | -10.00                | 285.28                        |
| 25          | 0.00                     | 102.69                        | -10.00                | 285.28                        |
| 30          | 0.00                     | 98.57                         | -10.00                | 285.28                        |
| 35          | 0.00                     | 94.43                         | -10.00                | 285.28                        |
| 40          | 0.00                     | 90.28                         | -10.00                | 285.28                        |
| 45          | 0.00                     | 86.13                         | -10.00                | 285.28                        |
| 50          | 0.00                     | 81.98                         | -10.00                | 285.28                        |
| 55          | 0.00                     | 77.86                         | -10.00                | 285.28                        |
| 60          | 0.00                     | 73.77                         | -10.00                | 285.28                        |
| 65          | 0.00                     | 69.72                         | -10.00                | 285.28                        |
| 70          | 0.24                     | 65.65                         | -10.00                | 279.76                        |
| 75          | 0.22                     | 61.73                         | -10.00                | 283.20                        |
| 80          | 0.00                     | 57.98                         | -10.00                | 285.28                        |
| 85          | 0.00                     | 54.27                         | -10.00                | 285.28                        |
| 90          | 0.00                     | 50.71                         | -10.00                | 285.28                        |
| 95          | 0.00                     | 47.34                         | -9.88                 | 286.04                        |
| 100         | 0.30                     | 43.99                         | -9.08                 | 278.18                        |
| 105         | 0.34                     | 41.08                         | -8.34                 | 278.00                        |
| 110         | 0.26                     | 38.62                         | -7.67                 | 292.21                        |
| 115         | 0.37                     | 36.43                         | -7.04                 | 283.63                        |
| 120         | 0.25                     | 34.96                         | -6.59                 | 301.65                        |
| 125         | 0.00                     | 34.20                         | -6.35                 | 309.56                        |
| 130         | 0.22                     | 33.61                         | -6.16                 | 308.68                        |
| 135         | 0.20                     | 33.91                         | -6.26                 | 309.74                        |
| 140         | 0.26                     | 34.78                         | -6.53                 | 300.72                        |
| 145         | 0.00                     | 36.52                         | -7.06                 | 304.65                        |
| 150         | 0.00                     | 38.53                         | -7.65                 | 300.70                        |
| 155         | 0.00                     | 40.95                         | -8.31                 | 296.28                        |
| 160         | 0.00                     | 43.19                         | -8.88                 | 292.47                        |
| 165         | 0.00                     | 45.02                         | -9.34                 | 289.54                        |
| 170         | 0.25                     | 46.15                         | -9.60                 | 281.60                        |
| 175         | 0.29                     | 46.94                         | -9.79                 | 275.36                        |
| 180         | 0.23                     | 47.28                         | -9.87                 | 282.08                        |

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## Earth Station Data Sheet

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### Coordination Values

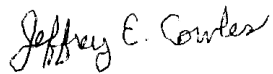
### VINITA, OK

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Short Term -146.0 dBW/MHz 0.01%

| Azimuth (°) | Horizon<br>Elevation (°) | Antenna<br>Discrimination (°) | Receive 4.0 GHz       |                               |
|-------------|--------------------------|-------------------------------|-----------------------|-------------------------------|
|             |                          |                               | Horizon<br>Gain (dBi) | Coordination<br>Distance (km) |
| 185         | 0.24                     | 46.99                         | -9.80                 | 281.74                        |
| 190         | 0.00                     | 46.39                         | -9.66                 | 287.45                        |
| 195         | 0.00                     | 45.02                         | -9.34                 | 289.54                        |
| 200         | 0.00                     | 43.19                         | -8.88                 | 292.47                        |
| 205         | 0.54                     | 40.51                         | -8.19                 | 257.99                        |
| 210         | 0.50                     | 37.98                         | -7.49                 | 265.25                        |
| 215         | 0.43                     | 35.16                         | -6.65                 | 278.29                        |
| 220         | 0.34                     | 32.12                         | -5.67                 | 295.76                        |
| 225         | 0.27                     | 29.25                         | -4.65                 | 313.29                        |
| 230         | 0.00                     | 27.11                         | -3.83                 | 328.07                        |
| 235         | 0.00                     | 25.48                         | -3.15                 | 332.99                        |
| 240         | 0.00                     | 24.70                         | -2.82                 | 335.46                        |
| 245         | 0.00                     | 24.86                         | -2.89                 | 334.96                        |
| 250         | 0.00                     | 25.93                         | -3.35                 | 331.60                        |
| 255         | 0.00                     | 27.82                         | -4.11                 | 326.07                        |
| 260         | 0.00                     | 30.37                         | -5.06                 | 319.26                        |
| 265         | 0.00                     | 33.42                         | -6.10                 | 311.29                        |
| 270         | 0.00                     | 36.86                         | -7.16                 | 303.96                        |
| 275         | 0.00                     | 40.58                         | -8.21                 | 296.93                        |
| 280         | 0.00                     | 44.52                         | -9.21                 | 290.33                        |
| 285         | 0.00                     | 48.61                         | -10.00                | 285.28                        |
| 290         | 0.21                     | 52.75                         | -10.00                | 284.15                        |
| 295         | 0.48                     | 56.98                         | -10.00                | 252.04                        |
| 300         | 0.84                     | 61.29                         | -10.00                | 229.11                        |
| 305         | 0.94                     | 65.73                         | -10.00                | 223.52                        |
| 310         | 0.74                     | 70.27                         | -10.00                | 235.10                        |
| 315         | 0.00                     | 74.88                         | -10.00                | 285.28                        |
| 320         | 0.00                     | 79.40                         | -10.00                | 285.28                        |
| 325         | 0.00                     | 83.93                         | -10.00                | 285.28                        |
| 330         | 0.00                     | 88.48                         | -10.00                | 285.28                        |
| 335         | 0.00                     | 93.02                         | -10.00                | 285.28                        |
| 340         | 0.00                     | 97.56                         | -10.00                | 285.28                        |
| 345         | 0.00                     | 102.09                        | -10.00                | 285.28                        |
| 350         | 0.00                     | 106.60                        | -10.00                | 285.28                        |
| 355         | 0.00                     | 111.09                        | -10.00                | 285.28                        |

## 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.



Jeffrey E. Cowles  
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DATED: February 3, 2015