

FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for

**Nebraska Educational Telecomm Commission
Lincoln, Nebraska**

Satellite Earth Station

Prepared By:
COMSEARCH
19700 Janelia Farm Boulevard
Ashburn, Virginia 20147
May 22, 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, based upon the restrictions noted in the Summary of Results (Section 2).

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 most cases.

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 and frequency separation are considered on the interfering paths, sufficient losses exist to negate harmful interference from occurring with the transmit/receive earth station. Further, the transmit spectrum will be limited to frequencies 5925.0 to 6210.5 MHz, 6243.0 to 6329.0 MHz, and 6362.0 to 6425.0 MHz.

Company

BNSF Railway Company
BorderCOMM Partners LP (XC)
Great Western Communications, LLC
Nebraska Public Power District
NE Colorado Cellular, Inc.
Omaha Public Power District
USCOC Nebraska/Kansas, LLC

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 April 10, 2012.

Company

BNSF Railway Company
BorderCOMM Partners LP (XC)
Cox Communications Kansas LLC
Douglas County Communications Department
EAST RIVER ELECTRIC POWER COOPERATIVE
Great Western Communications, LLC
Jagwire Enterprises
LINCOLN WATER SYSTEM
METROPOLITAN AREA NETWORKS, INC.
Mid Kansas Inc.
MidAmerican Energy Company
Midwest Wireless Communications, LLC
NE Colorado Cellular, Inc.
NEBRASKA PUBLIC POWER DISTRICT
New Cingular Wireless PCS -ND/SD/NE/IA
New Cingular Wireless PCS, LLC - KS/MO
OMAHA PUBLIC POWER DISTRICT
Pottawattamie, County of
RSA 1 Limited Partnership
USCOC Nebraska/Kansas, LLC
USCOC of Greater Iowa, LLC
USCOC of Greater Missouri, LLC
Union Pacific Railroad Company
Verizon Wireless (VAW) LLC (KS,MO,MN,OK)
Verizon Wireless (VAW) LLC (ND,MN,SD,NE)
WOODBURY, COUNTY OF

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: 05/22/2012
Job Number: 120410COMSJC01

Administrative Information

Status ENGINEER PROPOSAL
Call Sign
Licensee Code NEBETC
Licensee Name Nebraska Educational Telecommunications Commission

Site Information LINCOLN, NEBRASKA

Venue Name
Latitude (NAD 83) 40° 49' 53.6" N
Longitude (NAD 83) 96° 40' 17.5" W
Climate Zone A
Rain Zone 2
Ground Elevation (AMSL) 355.7 m / 1167.0 ft

Link Information

Satellite Type Geostationary
Mode TR - Transmit-Receive
Modulation Digital
Satellite Arc 85° W to 105° West Longitude
Azimuth Range 162.5° to 192.6°
Corresponding Elevation Angles 41.3° / 42.0°
Antenna Centerline (AGL) 6.1 m / 20.0 ft

Antenna Information

	Receive	Transmit
Manufacturer	Vertex	Vertex
Model	9 KPC	9 KPC
Gain / Diameter	50.1 dBi / 9.0 m	53.5 dBi / 9.0 m
3-dB / 15-dB Beamwidth	0.54° / 1.00°	0.36° / 0.68°

308KG7W to 36M0G7W

Max Available RF Power	(dBW/4 kHz)	-2.7	-13.0		
	(dBW/MHz)	16.2	11.0		
Maximum EIRP	(dBW/4 kHz)	50.8	40.5		
	(dBW/MHz)	69.7	64.5		
	(dBW)	69.7	80.0		
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%

Frequency Information

	Receive 4.0 GHz	Transmit 6.1 GHz
Emission / Frequency Range (MHz)	308KG7W - 36M0G7W / 3700.0 - 4200.0	308KG7W - 36M0G7W / 5925.0 - 6210.5 308KG7W - 36M0G7W / 6243.0 - 6329.0 308KG7W - 36M0G7W / 6362.0 - 6425.0

Max Great Circle Coordination Distance	293.5 km / 182.4 mi	175.6 km / 109.1 mi
Precipitation Scatter Contour Radius	100.0 km / 62.1 mi	100.0 km / 62.1 mi

COMSEARCH

Earth Station Data Sheet

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(703)726-5500 <http://www.comsearch.com>

Coordination Values

LINCOLN, NE

Licensee Name Nebraska Educational Telecommunications Commission
Latitude (NAD 83) 40° 49' 53.6" N
Longitude (NAD 83) 96° 40' 17.5" W
Ground Elevation (AMSL) 355.7 m / 1167.0 ft
Antenna Centerline (AGL) 6.1 m / 20.0 ft
Antenna Model Vertex 9 KPC
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 -2.7 (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	0.00	135.76	-10.00	285.28	-10.00	170.66
5	0.00	133.95	-10.00	285.28	-10.00	170.66
10	0.00	131.78	-10.00	285.28	-10.00	170.66
15	0.00	129.31	-10.00	285.28	-10.00	170.66
20	0.00	126.57	-10.00	285.28	-10.00	170.66
25	0.00	123.62	-10.00	285.28	-10.00	170.66
30	0.00	120.49	-10.00	285.28	-10.00	170.66
35	0.00	117.20	-10.00	285.28	-10.00	170.66
40	0.00	113.79	-10.00	285.28	-10.00	170.66
45	0.00	110.28	-10.00	285.28	-10.00	170.66
50	0.00	106.69	-10.00	285.28	-10.00	170.66
55	0.00	103.04	-10.00	285.28	-10.00	170.66
60	0.00	99.34	-10.00	285.28	-10.00	170.66
65	0.00	95.61	-10.00	285.28	-10.00	170.66
70	0.00	91.86	-10.00	285.28	-10.00	170.66
75	0.24	88.09	-10.00	279.85	-10.00	164.28
80	0.32	84.32	-10.00	270.19	-10.00	155.94
85	0.32	80.57	-10.00	270.91	-10.00	156.55
90	0.34	76.85	-10.00	267.86	-10.00	153.97
95	0.32	73.18	-10.00	270.12	-10.00	155.88
100	0.35	69.56	-10.00	266.76	-10.00	153.04
105	0.35	66.04	-10.00	267.34	-10.00	153.53
110	0.31	62.62	-10.00	271.19	-10.00	156.79
115	0.26	59.34	-10.00	277.25	-10.00	162.01
120	0.35	56.14	-10.00	266.96	-10.00	153.21
125	0.37	53.15	-10.00	263.98	-10.00	150.72
130	0.43	50.35	-10.00	257.79	-10.00	145.65
135	0.51	47.79	-9.98	249.14	-9.98	138.86
140	0.51	45.60	-9.47	252.35	-9.47	140.59
145	0.52	43.75	-9.02	254.06	-9.02	141.32
150	0.64	42.21	-8.63	248.99	-8.63	136.98
155	0.59	41.27	-8.39	253.58	-8.39	140.08
160	0.48	40.87	-8.29	262.11	-8.29	146.68
165	0.39	40.96	-8.31	272.11	-8.31	154.95
170	0.40	41.46	-8.44	270.98	-8.44	154.20
175	0.33	42.23	-8.64	277.67	-8.64	160.18
180	0.36	42.44	-8.69	273.89	-8.69	157.05

COMSEARCH

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Coordination Values

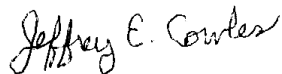
LINCOLN, NE

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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 -2.7 (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)
185	0.39	42.17	-8.62	270.87	-8.62	154.39
190	0.33	41.76	-8.52	278.53	-8.52	160.73
195	0.27	41.81	-8.53	285.52	-8.53	168.44
200	0.00	42.55	-8.72	293.54	-8.72	175.62
205	0.00	43.48	-8.96	291.99	-8.96	174.71
210	0.00	44.85	-9.29	289.81	-9.29	173.40
215	0.00	46.62	-9.71	287.11	-9.71	171.77
220	0.00	48.73	-10.00	285.28	-10.00	170.66
225	0.00	51.15	-10.00	285.28	-10.00	170.66
230	0.00	53.82	-10.00	285.28	-10.00	170.66
235	0.00	56.72	-10.00	285.28	-10.00	170.66
240	0.00	59.80	-10.00	285.28	-10.00	170.66
245	0.00	63.04	-10.00	285.28	-10.00	170.66
250	0.00	66.40	-10.00	285.28	-10.00	170.66
255	0.00	69.86	-10.00	285.28	-10.00	170.66
260	0.00	73.40	-10.00	285.28	-10.00	170.66
265	0.00	77.01	-10.00	285.28	-10.00	170.66
270	0.00	80.66	-10.00	285.28	-10.00	170.66
275	0.00	84.35	-10.00	285.28	-10.00	170.66
280	0.00	88.06	-10.00	285.28	-10.00	170.66
285	0.00	91.77	-10.00	285.28	-10.00	170.66
290	0.24	95.50	-10.00	280.10	-10.00	164.50
295	0.25	99.20	-10.00	279.17	-10.00	163.68
300	0.23	102.87	-10.00	281.41	-10.00	165.65
305	0.25	106.50	-10.00	279.25	-10.00	163.75
310	0.35	110.09	-10.00	266.95	-10.00	153.20
315	0.32	113.57	-10.00	270.51	-10.00	156.22
320	0.35	116.97	-10.00	266.64	-10.00	152.95
325	0.29	120.20	-10.00	274.04	-10.00	159.23
330	0.21	123.26	-10.00	284.33	-10.00	169.83
335	0.21	126.18	-10.00	283.81	-10.00	169.38
340	0.00	128.73	-10.00	285.28	-10.00	170.66
345	0.20	131.32	-10.00	284.77	-10.00	170.21
350	0.00	133.29	-10.00	285.28	-10.00	170.66
355	0.00	135.07	-10.00	285.28	-10.00	170.66

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
Engineer III, Telecommunications
COMSEARCH
19700 Janelia Farm Boulevard
Ashburn, Va. 20147

DATED: May 22, 2012