

FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for
Clear Channel Satellite Services
ENGLEWOOD, CO
(6.1 Meter)
Satellite Earth Station

Prepared By:
COMSEARCH
19700 Janelia Farm Boulevard
Ashburn, VA 20147
October 10, 2011

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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

New Cingular Wireless PCS LLC -Colorado
State of Colorado
Tri State Generation & Transmission
Great Western Communications, 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 09/08/2011.

Company

AT&T COMMUNICATIONS OF MOUNTAIN STATES
AT&T CORP
Adcom 911
AirLife Denver
BASIN ELECTRIC POWER COOPERATIVE
BNSF Railway Company
Boulder, County of
CBS Communications Services
CBS Television Stations
City of Colorado Springs
Colorado Interstate Gas Company
Colorado Springs Utilities
ENTRAVISION HOLDINGS, LLC
FONES WEST DIGITAL SYSTEMS INC.
Gray Television Licensee, Inc. (KKTU)
Great Western Communications, LLC
Intermountain Rural Electric Association
International Communications Group, Inc.
Larimer County Sheriff's Department
METROPOLITAN AREA NETWORKS, INC.
MHO Networks
Multimedia Holdings Corporation
NE Colorado Cellular, Inc.
New Cingular Wireless PCS LLC -Colorado
Open Range Communications
Platte River Power Authority
QWEST CORPORATION
SANGRE DE CRISTO COMMUNICATIONS, INC.
Sprint Communications Company, LP
State of Colorado
Tri State Generation & Transmission
UNITED POWER
Verizon Wireless - Mountain Region
XCEL ENERGY SERVICES INC

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: 10/10/2011
Job Number: 110908COMSGE02

Administrative Information

Status ENGINEER PROPOSAL
Call Sign
Licensee Code CLCSAT
Licensee Name Clear Channel Satellite Services

Site Information ENGLEWOOD, CO

Venue Name
Latitude (NAD 83) 39° 34' 47.0" N
Longitude (NAD 83) 104° 51' 35.0" W
Climate Zone A
Rain Zone 2
Ground Elevation (AMSL) 1751.0 m / 5744.8 ft

Link Information

Satellite Type Geostationary
Mode TR - Transmit-Receive
Modulation Digital
Satellite Arc 60° W to 143° West Longitude
Azimuth Range 122.6° to 230.9°
Corresponding Elevation Angles 25.3° / 29.8°
Antenna Centerline (AGL) 3.66 m / 12.0 ft

Antenna Information

Manufacturer
Model
Gain / Diameter
3-dB / 15-dB Beamwidth

Receive - FCC32

ViaSat
8060
46.0 dBi / 6.1 m
0.85° / 1.70°

Transmit - FCC32

ViaSat
8060
49.8 dBi / 6.1 m
0.56° / 1.20°

Max Available RF Power (dBW/4 kHz)
(dBW/MHz)

-15.8
8.2

Maximum EIRP (dBW/4 kHz)
(dBW/MHz)

34.0
58.0

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

-154.0 dBW/4 kHz 20%
-131.0 dBW/4 kHz 0.0025%

Frequency Information

Emission / Frequency Range (MHz)

Receive 4.0 GHz

11M1G1E - 22M5G7W / 3700.0 - 4200.0

Transmit 6.1 GHz

11M1G1E - 22M5G7W / 5925.0 - 6425.0

Max Great Circle Coordination Distance
Precipitation Scatter Contour Radius

285.3 km / 177.2 mi
495.1 km / 307.6 mi

128.0 km / 79.5 mi
100.0 km / 62.1 mi

COMSEARCH

Earth Station Data Sheet

19700 Janelia Farm Boulevard, Ashburn, VA 20147
(703)726-5500 <http://www.comsearch.com>

Coordination Values

ENGLEWOOD, CO

Licensee Name	Clear Channel Satellite Services		
Latitude (NAD 83)	39° 34' 47.0" N		
Longitude (NAD 83)	104° 51' 35.0" W		
Ground Elevation (AMSL)	1751.0 m / 5744.8 ft		
Antenna Centerline (AGL)	3.66 m / 12.0 ft		
Antenna Model	ViaSat 6.1 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			-15.8 (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	119.19	-10.00	285.28	-10.00	128.03
5	0.00	114.80	-10.00	285.28	-10.00	128.03
10	0.00	110.37	-10.00	285.28	-10.00	128.03
15	0.00	105.90	-10.00	285.28	-10.00	128.03
20	0.00	101.41	-10.00	285.28	-10.00	128.03
25	0.00	96.90	-10.00	285.28	-10.00	128.03
30	0.00	92.38	-10.00	285.28	-10.00	128.03
35	0.00	87.86	-10.00	285.28	-10.00	128.03
40	0.00	83.34	-10.00	285.28	-10.00	128.03
45	0.42	78.79	-10.00	258.37	-10.00	110.02
50	1.21	74.18	-10.00	213.95	-10.00	100.00
55	1.55	69.61	-10.00	204.40	-10.00	100.00
60	1.67	65.08	-10.00	203.52	-10.00	100.00
65	1.94	60.55	-10.00	196.21	-10.00	100.00
70	1.99	56.11	-10.00	194.74	-10.00	100.00
75	2.06	51.73	-10.00	193.17	-10.00	100.00
80	2.07	47.44	-9.90	193.31	-9.90	100.00
85	2.01	43.31	-8.92	199.44	-8.92	100.00
90	1.96	39.33	-7.87	205.46	-7.87	100.00
95	2.07	35.47	-6.75	205.67	-6.75	100.00
100	2.25	31.83	-5.57	207.28	-5.57	100.00
105	1.94	28.93	-4.53	220.14	-4.53	100.00
110	1.96	26.33	-3.51	225.03	-3.51	100.00
115	2.02	24.39	-2.68	228.16	-2.68	100.00
120	1.96	23.43	-2.25	232.50	-2.25	100.00
125	2.18	23.19	-2.13	227.21	-2.13	100.00
130	1.90	24.43	-2.70	231.71	-2.70	100.00
135	1.71	26.43	-3.55	232.70	-3.55	100.00
140	1.40	29.20	-4.64	236.52	-4.64	100.00
145	1.44	32.03	-5.64	229.48	-5.64	100.00
150	1.39	34.70	-6.51	226.35	-6.51	100.00
155	1.31	37.11	-7.24	224.81	-7.24	100.00
160	1.05	39.35	-7.87	229.83	-7.87	100.00
165	0.84	41.17	-8.36	238.01	-8.36	100.00
170	0.99	42.22	-8.64	227.75	-8.64	100.00
175	1.09	42.86	-8.80	223.51	-8.80	100.00
180	0.95	43.24	-8.90	228.50	-8.90	100.00
185	0.94	43.01	-8.84	229.45	-8.84	100.00

COMSEARCH

Earth Station Data Sheet

19700 Janelia Farm Boulevard, Ashburn, VA 20147

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Coordination Values

ENGLEWOOD, CO

Licensee Name	Clear Channel Satellite Services				
Latitude (NAD 83)	39° 34' 47.0" N				
Longitude (NAD 83)	104° 51' 35.0" W				
Ground Elevation (AMSL)	1751.0 m / 5744.8 ft				
Antenna Centerline (AGL)	3.66 m / 12.0 ft				
Antenna Model	ViaSat 6.1 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			-15.8 (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	1.28	41.94	-8.57	218.80	-8.57	100.00
195	1.34	40.70	-8.24	218.66	-8.24	100.00
200	1.33	39.09	-7.80	221.27	-7.80	100.00
205	1.40	37.03	-7.21	222.15	-7.21	100.00
210	1.53	34.59	-6.47	222.11	-6.47	100.00
215	1.67	31.98	-5.62	222.32	-5.62	100.00
220	1.69	29.98	-4.92	225.68	-4.92	100.00
225	1.70	28.65	-4.43	228.08	-4.43	100.00
230	1.56	28.23	-4.27	233.54	-4.27	100.00
235	1.55	28.49	-4.37	233.10	-4.37	100.00
240	1.67	29.42	-4.71	227.45	-4.71	100.00
245	1.75	31.10	-5.32	221.64	-5.32	100.00
250	1.68	33.51	-6.13	219.46	-6.13	100.00
255	1.57	36.41	-7.03	217.84	-7.03	100.00
260	1.60	39.60	-7.94	212.49	-7.94	100.00
265	1.57	43.10	-8.86	208.85	-8.86	100.00
270	1.55	46.83	-9.76	205.46	-9.76	100.00
275	1.23	50.85	-10.00	213.18	-10.00	100.00
280	1.15	54.89	-10.00	215.78	-10.00	100.00
285	1.18	58.98	-10.00	214.68	-10.00	100.00
290	1.24	63.15	-10.00	213.07	-10.00	100.00
295	1.14	67.42	-10.00	215.90	-10.00	100.00
300	1.05	71.73	-10.00	218.61	-10.00	100.00
305	1.03	76.07	-10.00	219.45	-10.00	100.00
310	0.90	80.43	-10.00	225.75	-10.00	100.00
315	0.76	84.81	-10.00	233.83	-10.00	100.00
320	0.65	89.18	-10.00	240.32	-10.00	100.00
325	0.51	93.54	-10.00	249.29	-10.00	103.74
330	0.22	97.87	-10.00	283.21	-10.00	126.69
335	0.29	102.21	-10.00	273.48	-10.00	120.28
340	0.00	106.47	-10.00	285.28	-10.00	128.03
345	0.00	110.72	-10.00	285.28	-10.00	128.03
350	0.00	114.94	-10.00	285.28	-10.00	128.03
355	0.00	119.09	-10.00	285.28	-10.00	128.03

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: October 10, 2011

FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for
Clear Channel Satellite Services
ENGLEWOOD, CO
(3.7 Meter)
Satellite Earth Station

Prepared By:
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Adcom 911
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BASIN ELECTRIC POWER COOPERATIVE
BNSF Railway Company
Boulder, County of
CBS Communications Services
CBS Television Stations
City of Colorado Springs
Colorado Interstate Gas Company
Colorado Springs Utilities
ENTRAVISION HOLDINGS, LLC
FONES WEST DIGITAL SYSTEMS INC.
Gray Television Licensee, Inc. (KKTU)
Great Western Communications, LLC
Intermountain Rural Electric Association
International Communications Group, Inc.
Larimer County Sheriff's Department
METROPOLITAN AREA NETWORKS, INC.
MHO Networks
Multimedia Holdings Corporation
NE Colorado Cellular, Inc.
New Cingular Wireless PCS LLC -Colorado
Open Range Communications
Platte River Power Authority
QWEST CORPORATION
SANGRE DE CRISTO COMMUNICATIONS, INC.
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State of Colorado
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COMSEARCH

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

Date: 10/10/2011
Job Number: 110908COMSGE01

Administrative Information

Status: ENGINEER PROPOSAL
Call Sign:
Licensee Code: CLCSAT
Licensee Name: Clear Channel Satellite Services

Site Information

ENGLEWOOD, CO

Venue Name:
Latitude (NAD 83): 39° 34' 47.0" N
Longitude (NAD 83): 104° 51' 35.0" W
Climate Zone: A
Rain Zone: 2
Ground Elevation (AMSL): 1751.0 m / 5744.8 ft

Link Information

Satellite Type: Geostationary
Mode: TR - Transmit-Receive
Modulation: Digital
Satellite Arc: 60° W to 143° West Longitude
Azimuth Range: 122.6° to 230.9°
Corresponding Elevation Angles: 25.3° / 29.8°
Antenna Centerline (AGL): 2.44 m / 8.0 ft

Antenna Information

Receive - FCC32

Transmit - FCC32

Manufacturer	Suman	Suman
Model	SMT3.7R	SMT3.7R
Gain / Diameter	41.7 dBi / 3.7 m	45.5 dBi / 3.7 m
3-dB / 15-dB Beamwidth	1.40° / 2.70°	0.90° / 1.70°

Max Available RF Power	(dBW/4 kHz)	-17.2
	(dBW/MHz)	6.8

Maximum EIRP	(dBW/4 kHz)	28.3
	(dBW/MHz)	52.3

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)	11M1G1E - 22M5G7W / 3700.0 - 4200.0	11M1G1E - 22M5G7W / 5925.0 - 6425.0
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Max Great Circle Coordination Distance	285.3 km / 177.2 mi	124.3 km / 77.3 mi
Precipitation Scatter Contour Radius	495.1 km / 307.6 mi	100.0 km / 62.1 mi

COMSEARCH

Earth Station Data Sheet

19700 Janelia Farm Boulevard, Ashburn, VA 20147

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Coordination Values

ENGLEWOOD, CO

Licensee Name	Clear Channel Satellite Services				
Latitude (NAD 83)	39° 34' 47.0" N				
Longitude (NAD 83)	104° 51' 35.0" W				
Ground Elevation (AMSL)	1751.0 m / 5744.8 ft				
Antenna Centerline (AGL)	2.44 m / 8.0 ft				
Antenna Model	Suman 3.7 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			-17.2 (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	119.19	-10.00	285.28	-10.00	124.34
5	0.00	114.80	-10.00	285.28	-10.00	124.34
10	0.00	110.37	-10.00	285.28	-10.00	124.34
15	0.00	105.90	-10.00	285.28	-10.00	124.34
20	0.00	101.41	-10.00	285.28	-10.00	124.34
25	0.00	96.90	-10.00	285.28	-10.00	124.34
30	0.00	92.38	-10.00	285.28	-10.00	124.34
35	0.00	87.86	-10.00	285.28	-10.00	124.34
40	0.23	83.33	-10.00	281.81	-10.00	122.09
45	0.59	78.78	-10.00	244.09	-10.00	100.00
50	1.37	74.16	-10.00	209.16	-10.00	100.00
55	1.71	69.58	-10.00	202.35	-10.00	100.00
60	1.83	65.05	-10.00	199.07	-10.00	100.00
65	2.10	60.51	-10.00	192.18	-10.00	100.00
70	2.16	56.06	-10.00	190.96	-10.00	100.00
75	2.22	51.67	-10.00	189.41	-10.00	100.00
80	2.24	47.38	-9.89	189.63	-9.89	100.00
85	2.17	43.24	-8.90	195.86	-8.90	100.00
90	2.08	39.27	-7.85	202.67	-7.85	100.00
95	2.19	35.40	-6.72	205.49	-6.72	100.00
100	2.38	31.75	-5.54	204.76	-5.54	100.00
105	2.06	28.84	-4.50	217.05	-4.50	100.00
110	2.07	26.23	-3.47	222.36	-3.47	100.00
115	2.14	24.27	-2.63	225.34	-2.63	100.00
120	2.20	23.19	-2.13	226.73	-2.13	100.00
125	2.28	23.09	-2.08	225.01	-2.08	100.00
130	1.98	24.35	-2.66	229.34	-2.66	100.00
135	1.79	26.36	-3.52	230.25	-3.52	100.00
140	1.48	29.14	-4.61	233.93	-4.61	100.00
145	1.50	31.98	-5.62	227.59	-5.62	100.00
150	1.44	34.66	-6.50	224.69	-6.50	100.00
155	1.35	37.07	-7.23	223.57	-7.23	100.00
160	1.09	39.31	-7.86	228.52	-7.86	100.00
165	0.86	41.15	-8.36	236.95	-8.36	100.00
170	1.02	42.20	-8.63	226.73	-8.63	100.00
175	1.12	42.83	-8.79	222.67	-8.79	100.00
180	0.96	43.23	-8.90	228.01	-8.90	100.00
185	0.95	43.00	-8.84	228.84	-8.84	100.00

COMSEARCH

Earth Station Data Sheet

19700 Janelia Farm Boulevard, Ashburn, VA 20147

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

Coordination Values

ENGLEWOOD, CO

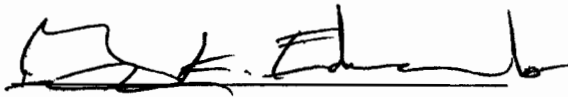
Licensee Name	Clear Channel Satellite Services					
Latitude (NAD 83)	39° 34' 47.0" N					
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Antenna Mode	Receive 4.0 GHz			Transmit 6.1 GHz		
Interference Objectives:	Long Term	-156.0 dBW/MHz	20%	-154.0 dBW/4 kHz	20%	
	Short Term	-146.0 dBW/MHz	0.01%	-131.0 dBW/4 kHz	0.0025%	
Max Available RF Power				-17.2 (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	1.29	41.93	-8.56	218.52	-8.56	100.00
195	1.35	40.69	-8.24	218.35	-8.24	100.00
200	1.42	39.01	-7.78	218.51	-7.78	100.00
205	1.48	36.96	-7.19	219.73	-7.19	100.00
210	1.61	34.52	-6.45	219.72	-6.45	100.00
215	1.75	31.91	-5.60	219.96	-5.60	100.00
220	1.76	29.91	-4.90	223.64	-4.90	100.00
225	1.77	28.58	-4.40	226.03	-4.40	100.00
230	1.64	28.15	-4.24	231.06	-4.24	100.00
235	1.65	28.39	-4.33	230.13	-4.33	100.00
240	1.79	29.30	-4.67	223.87	-4.67	100.00
245	1.87	30.99	-5.28	218.18	-5.28	100.00
250	1.80	33.41	-6.10	215.99	-6.10	100.00
255	1.74	36.29	-7.00	213.22	-7.00	100.00
260	1.76	39.49	-7.91	208.03	-7.91	100.00
265	1.74	43.01	-8.84	204.49	-8.84	100.00
270	1.71	46.75	-9.74	203.51	-9.74	100.00
275	1.30	50.82	-10.00	211.11	-10.00	100.00
280	1.22	54.86	-10.00	213.66	-10.00	100.00
285	1.27	58.95	-10.00	212.24	-10.00	100.00
290	1.32	63.12	-10.00	210.67	-10.00	100.00
295	1.23	67.40	-10.00	213.43	-10.00	100.00
300	1.14	71.72	-10.00	216.07	-10.00	100.00
305	1.11	76.05	-10.00	216.89	-10.00	100.00
310	0.98	80.42	-10.00	221.28	-10.00	100.00
315	0.84	84.80	-10.00	229.07	-10.00	100.00
320	0.73	89.18	-10.00	235.34	-10.00	100.00
325	0.59	93.54	-10.00	244.02	-10.00	100.00
330	0.30	97.88	-10.00	272.97	-10.00	116.28
335	0.37	102.22	-10.00	265.03	-10.00	110.95
340	0.00	106.47	-10.00	285.28	-10.00	124.34
345	0.00	110.72	-10.00	285.28	-10.00	124.34
350	0.00	114.94	-10.00	285.28	-10.00	124.34
355	0.00	119.09	-10.00	285.28	-10.00	124.34

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: October 10, 2011