FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for
GCI Communications Corp.
NUNAM IQUA, AK
Satellite Earth Station

Prepared By:
COMSEARCH
19700 Janelia Farm Boulevard
Ashburn, VA 20147
April 01, 2019

TABLE OF CONTENTS

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 following companies reported potential great circle interference conflicts that did not meet the objectives on a line-of-sight basis. These cases have been resolved by an agreement between United2, LLC and GCI Communications Corp.

Company
United Utilities, Inc.
United2, 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 03/18/2019.

Company
United Utilities, Inc.
United2, 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:	04/01/2019
Job Number:	190318COMSTC08

Administrative Information

Licensee Code	P3203
Licensee Name	GCI Communications Corp.

Site Information — NUNAM IQUA, AK

Latitude (NAD 83)	62° 31' 49.7" N
Longitude (NAD 83)	164° 51' 7.3" W
Climate Zone	B
Rain Zone	2
Ground Elevation (AMSL)	3.6 m / 11.8 ft

Link Information

Satellite Type	Geostationary
Mode	TR - Transmit-Receive
Modulation	Digital
Satellite Arc	107° W to 139° West Longitude
Azimuth Range	119.1° to 151.4°
Corresponding Elevation Angles	5.6° / 16.2°
Antenna Centerline (AGL)	4.57 m / 15.0 ft

Antenna Information

	Receive	Transmit
Manufacturer	Scientific Atlanta	Scientific Atlanta
Model	8136	8136
Gain / Diameter	41.8 dBi / 3.6 m	45.6 dBi / 3.6 m
3-dB / 15-dB Beamwidth	1.00° / 2.00°	0.80° / 1.60°

		Transmit: 45K0G7W - 72M0G7W		Transmit: 60K0D7W - 72M0D7W	
Max Available RF Power	(dBW/4 kHz)	-2.7	-19.54	-2.7	-19.54
	(dBW/MHz)	21.3	4.46	21.3	4.46
Maximum EIRP	(dBW/4 kHz)	42.9	26.06	42.9	26.06
	(dBW/MHz)	42.9	50.06	42.9	50.06
	(dBW)	53.41	68.61	54.66	68.61

		Receive		Transmit	
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)	45K0G7W - 72M0G7W / 3700.0 - 4200.0 60K0D7W - 72M0D7W / 3700.0 - 4200.0	45K0G7W - 72M0G7W / 5925.0 - 6425.0 60K0D7W - 72M0D7W / 5925.0 - 6425.0
Max Great Circle Coordination Distance	819.1 km / 508.9 mi	379.6 km / 235.9 mi
Precipitation Scatter Contour Radius	608.1 km / 377.8 mi	101.2 km / 62.9 mi

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Coordination Values	**NUNAM IQUA, AK**			
Licensee Name	GCI Communications Corp.			
Latitude (NAD 83)	62° 31' 49.7" N			
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Ground Elevation (AMSL)	3.6 m / 11.8 ft			
Antenna Centerline (AGL)	4.57 m / 15.0 ft			
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)	

			Receive 4.0 GHz		Transmit 6.1 GHz	
Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
0	0.00	119.00	-10.00	412.20	-10.00	200.77
5	0.00	114.03	-10.00	412.20	-10.00	200.77
10	0.00	109.05	-10.00	412.20	-10.00	200.77
15	0.00	104.08	-10.00	412.20	-10.00	200.77
20	0.00	99.10	-10.00	412.20	-10.00	200.77
25	0.00	94.13	-10.00	412.20	-10.00	200.77
30	0.00	89.15	-10.00	412.20	-10.00	200.77
35	0.00	84.17	-10.00	412.20	-10.00	200.77
40	0.00	79.20	-10.00	412.20	-10.00	200.77
45	0.00	74.22	-10.00	412.20	-10.00	200.77
50	0.00	69.25	-10.00	412.20	-10.00	200.77
55	0.00	64.28	-10.00	412.20	-10.00	200.77
60	0.00	59.31	-10.00	412.20	-10.00	200.77
65	0.00	54.34	-10.00	412.20	-10.00	200.77
70	0.00	49.38	-10.00	412.20	-10.00	200.77
75	0.00	44.42	-9.19	422.37	-9.19	205.43
80	0.00	39.48	-7.91	439.01	-7.91	212.98
85	0.00	34.54	-6.46	458.62	-6.46	221.78
90	0.00	29.63	-4.79	481.62	-4.79	232.23
95	0.00	24.74	-2.83	510.94	-2.83	244.96
100	0.00	19.91	-0.47	548.60	-0.47	259.35
105	0.00	15.18	2.47	599.11	2.47	281.04
110	0.00	10.69	6.28	669.70	6.28	312.41
115	0.00	6.92	10.99	767.77	10.99	356.01
120	0.00	5.62	13.27	819.12	13.27	379.61
125	0.00	7.40	10.27	752.16	10.27	348.91
130	0.00	9.27	7.83	700.75	7.83	326.27
135	0.00	11.03	5.94	663.06	5.94	309.46
140	0.00	12.64	4.46	634.75	4.46	296.93
145	0.00	14.11	3.26	613.30	3.26	287.23
150	0.00	15.43	2.29	595.94	2.29	279.66
155	0.00	16.57	1.52	582.35	1.52	273.78
160	0.00	18.28	0.45	564.03	0.45	265.92
165	0.00	21.04	-1.08	538.78	-1.08	256.83
170	0.00	24.49	-2.72	512.66	-2.72	245.70
175	0.00	28.38	-4.32	488.47	-4.32	235.23
180	0.00	32.55	-5.81	467.00	-5.81	225.78
185	0.00	36.91	-7.18	448.79	-7.18	217.38

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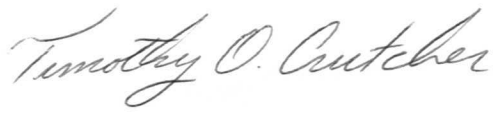
Interference Objectives: Long Term	-156.0 dBW/MHz	20%	-154.0 dBW/4 kHz	20%
Short Term	-146.0 dBW/MHz	0.01%	-131.0 dBW/4 kHz	0.0025%
Max Available RF Power			-2.7 (dBW/4 kHz)	

			Receive 4.0 GHz		Transmit 6.1 GHz	
Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
190	0.00	41.39	-8.42	432.25	-8.42	209.92
195	0.00	45.97	-9.56	417.68	-9.56	203.29
200	0.00	50.60	-10.00	412.20	-10.00	200.77
205	0.00	55.29	-10.00	412.20	-10.00	200.77
210	0.00	60.01	-10.00	412.20	-10.00	200.77
215	0.00	64.76	-10.00	412.20	-10.00	200.77
220	0.00	69.52	-10.00	412.20	-10.00	200.77
225	0.00	74.30	-10.00	412.20	-10.00	200.77
230	0.00	79.09	-10.00	412.20	-10.00	200.77
235	0.00	83.89	-10.00	412.20	-10.00	200.77
240	0.00	88.69	-10.00	412.20	-10.00	200.77
245	0.00	93.49	-10.00	412.20	-10.00	200.77
250	0.00	98.29	-10.00	412.20	-10.00	200.77
255	0.00	103.09	-10.00	412.20	-10.00	200.77
260	0.00	107.87	-10.00	412.20	-10.00	200.77
265	0.00	112.65	-10.00	412.20	-10.00	200.77
270	0.00	117.41	-10.00	412.20	-10.00	200.77
275	0.00	122.14	-10.00	412.20	-10.00	200.77
280	0.00	126.85	-10.00	412.20	-10.00	200.77
285	0.00	131.51	-10.00	412.20	-10.00	200.77
290	0.00	136.12	-10.00	412.20	-10.00	200.77
295	0.00	140.66	-10.00	412.20	-10.00	200.77
300	0.00	145.09	-10.00	412.20	-10.00	200.77
305	0.00	149.38	-10.00	412.20	-10.00	200.77
310	0.00	153.43	-10.00	412.20	-10.00	200.77
315	0.00	157.15	-10.00	412.20	-10.00	200.77
320	0.00	158.45	-10.00	412.20	-10.00	200.77
325	0.00	153.60	-10.00	412.20	-10.00	200.77
330	0.00	148.70	-10.00	412.20	-10.00	200.77
335	0.00	143.78	-10.00	412.20	-10.00	200.77
340	0.00	138.84	-10.00	412.20	-10.00	200.77
345	0.00	133.89	-10.00	412.20	-10.00	200.77
350	0.00	128.93	-10.00	412.20	-10.00	200.77
355	0.00	123.97	-10.00	412.20	-10.00	200.77

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.



Timothy O. Crutcher
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DATED: April 01, 2019