EXHIBIT A – NARRATIVE EXHIBIT & TABLE OF CONTENTS

1.0 - Exhibit Table of Contents

Exhibit	Description	Total Pages
Exhibit A	Narrative Exhibit & Exhibit Table of Contents	3
Exhibit B	Technical Information	2
Exhibit C	Final Coordination Reports	21
Exhibit D	Radiation Hazard Assessments	11

2.0 - Description of Application

Overon America, LLC ("Overon"), pursuant to Section 25.120(b)(3) of the Federal Communications Commission's ("FCC's" or "Commission's") Rules, 47 C.F.R. § 25.120(b)(3), hereby requests Special Temporary Authority ("STA") to operate two C-band antennas that will transmit earth-to-space in the 5925-6425 MHz.[1] Overon seeks STA for a 60-day period beginning not later than April 1, 2021. No public notice is required with respect to the proposed STA given that Overon plans to file a request for regular authority.[2]

Background

Overon is a global leader in the development of new technologies to produce and distribute audiovisual content. Overon's wide portfolio of services cover the end-to-end needs for broadcasters and other companies that need to distribute audiovisual content using television, radio, satellite and terrestrial networks. Overon's expert professionals have developed cutting-edge technologies and our innovative solutions are recognized by the world's leading multimedia companies. While Overon strives to provide tailor-made, state-of-the-art broadcast services to enhance its position as a market leader for content distribution around the world, service quality, reliability and operational process management remain the company's core strengths.

The FCC's proceeding to regroom the lower 300 megahertz of fixed satellite service C-band spectrum (3700-4000 MHz) for mobile broadband service has proven to be an extraordinary catalyst for rapid and widespread change throughout the fixed satellite industry. In particular, as the principal C-band satellite operators that serve the conterminous United States quickly regroom and repack the transponders on their

[1] The instant application for STA seeks authority solely for Earth-to-space communications. Overon operates a receive-only C-band ground station (FCC Call Sign E190755) at its Miami office that will continue to support all downlink operations in the near term.

[2] Overon will promptly seek regular authority for a transmit and receive enabled ground station once the FCC recommences routine processing of C-band license applications.

existing spacecraft to clear the lower 120 megahertz of C-band spectrum in time to meet the FCC's first accelerated relocation date of December 5, 2021, a meaningful number of end users will be required to expeditiously migrate to alternative transponders or spacecraft to free capacity and maximize satellite operator efficiency.

Overon has been affected by this migration because certain video feeds involving Latin American television programming that the company and its customers broadcast[3] over the conterminous U.S. can no longer be accommodated on the same satellite on a non-preemptible basis given the underlying satellite operator's C-band transition plans. Because non-preemptible service is an absolute prerequisite for a heavily viewed television channel enjoyed by a large number of Americans,[4] Overon has decided to assume more direct involvement in the transmission of the affected video feeds and secured alternative non-preemptible transponded C-band capacity.

Accordingly, Overon seeks 60-day STA to operate two ground stations to migrate video feeds between C-band transponders on two distinct satellites. Specifically, Overon seeks authority that will facilitate a dual-illumination migration of several video feeds currently occupying C-band transponders on the Galaxy 23 to transponders on the nearby Eutelsat 117 West A satellite (E117WA).[5] The first proposed antenna will illuminate the Galaxy 23, currently using DVBS/QPSK modulation to uplink video programming currently transmitted to the satellite from an unrelated third party ground station that will mute its communications. Shortly thereafter, the second proposed antenna will concurrently illuminate the E117WA, uplinking the same video feeds with certain improvements in modulation utilizing DVBS2/8PSK to allow for a more efficient use of satellite spectrum and compression technology. After the uplink to the E117WA is thoroughly tested and remote ground stations downlinking the video feeds throughout the conterminous U.S. have similarly made the transition to the new spacecraft, Overon will mute transmissions to the Galaxy 23.

Justification for STA

Consistent with the standards set forth in Section 25.120(b) of the FCC's rules, grant of STA is appropriate in the instant circumstances and serves the public interest.

First, the instant circumstances are extraordinary. Fixed satellite incumbents have less than twelve months from the conclusion of the C-band auction (Auction 107) to

[3] Overon does not at present operate any ground station facilities providing uplink transmission service in the C-band. A third-party ground station presently uplinks transmission services for Overon's U.S.-based operations. The instant STA proposes to recommission two antennas located at Overon's Miami office that are presently offline.

[4] For example, one affected video feed that delivers radio and video programming enjoyed by a large number of Americans is Radio Televisión Española (RTVE), which is akin to the United Kingdom's BBC channel.

[5] The Galaxy 23 is located 121 west longitude orbital slot, and the Eutelsat 117 West A is located at 116.8 west longitude.

migrate out of spectrum in continuous use for fixed satellite service for decades.[6] Such a compressed schedule has placed pressure on satellite operators to fast-track critical decisions, including the rapid launch of new satellites, the implementation of new compression technology and filters, and also how certain transponders are prioritized and protected given the need to free capacity. Such sweeping developments, which reflect a once in a lifetime sea change for the satellite industry, could not be planned for or predicted.

Second, grant of STA serves the public interest by ensuring that the above-proposed transition between spacecraft occurs smoothly and avoids any potential loss of service given the imminent discontinuation of nearly all non-preemptible transponder leases on the Galaxy 23. The underlying content in the video feeds presently using the Galaxy 23 as a transmission medium is popular, and consumed by a large number of Americans. Continuing the uninterrupted delivery of such content, which the proposed STA will ensure by authorizing expedited migration to the less heavily utilized E117WA, serves the public interest.

[6] Longstanding radio service incumbents are generally given several years to migrate after an auction to repurpose a band for mobile service. Most recently, broadcast auxiliary incumbents in the 600 MHz band had a minimum of 39 months to migrate after the conclusion of the relevant forward and reverse auctions.

EXHIBIT B – TECHNICAL INFORMATION

1.0 - Description of Antenna 1

Make & Model	Andrew Corp. / 4.6 meter
Location	25° 50’ 28.0” N 80° 18’ 59.0” W 7291 NW 74th St, Medley, Miami-Dade, FL 33166
Transmit Frequency Limits (MHz)	5925.0 – 5928.0 5992.0 – 6106.0 6170.0 – 6182.0 6242.0 – 6360.0 6420.0 – 6425.0
Receive Frequency Limits (MHz)	Not Applicable; STA Requested Solely for Earth-to-Space Communications
Satellite Arc Limits	18.0° WL (Eastern Limit) 139.0° WL (Western Limit)
Elevation Angles	16.4° (Eastern Limit) 19.7° (Western Limit)
Azimuth Angles	102.9° (Eastern Limit) 255.1° (Western Limit)
Polarization	Vertical and Horizontal
Gain (dBi)	47.3 dBi @ 6.175 GHz
Input Power (Watts @flange)	48.05
Total EIRP (dBW all carriers)	64.1
EIRP Density (dBW/4kHz)	-22.04
Emissions	3M00G7W 36M0G7W

2.0 - Description of Antenna 2

Make & Model	Vertex / 4.8 meter
Location	25° 50’ 28.0” N 80° 18’ 59.0” W 7291 NW 74th St, Medley, Miami-Dade, FL 33166
Transmit Frequency Limits (MHz)	5925.0 – 5928.0 5992.0 – 6106.0 6170.0 – 6182.0 6242.0 – 6360.0 6420.0 – 6425.0
Receive Frequency Limits (MHz)	Not Applicable; STA Requested Solely for Earth-to-Space Communications

Satellite Arc Limits	18.0° WL (Eastern Limit) 139.0° WL (Western Limit)
Elevation Angles	16.4° (Eastern Limit) 19.7° (Western Limit)
Azimuth Angles	102.9° (Eastern Limit) 255.1° (Western Limit)
Polarization	Vertical and Horizontal
Gain (dBi)	48.1 dBi @ 6.175 GHz
Input Power (Watts @flange)	40.3
Total EIRP (dBW all carriers)	64.1
EIRP Density (dBW/4kHz)	-22.04
Emissions	3M00G7W 36M0G7W

Exhibit C

Final Coordination Reports

FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for
Overon America
MEDLEY, FL
Satellite Earth Station

Prepared By:
COMSEARCH
19700 Janelia Farm Boulevard
Ashburn, VA 20147
March 11, 2021

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 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 03/03/2021.

Company
Broward County Board of Commissioners
Broward County Telecommunications Div
COLLIER, COUNTY OF
Computer Office Solutions, Inc.
Embarq Florida, Inc.
Entercom License, LLC
Florida Power and Light Company
Florida State
Florida, State of
HiQ Data Corporation
Miami-Dade County
New Cingular Wireless PCS LLC - N FL
New Cingular Wireless PCS LLC - S FL
Olympic Wireless, LLC
Palm Beach, County of
South Florida Water Management District
T-Mobile License LLC
Verizon Wireless (VAW) LLC - S Florida
Verizon Wireless Personal Comm, LP(S FL)

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:	03/11/2021
Job Number:	210303COMSGE01

Administrative Information

Status	ENGINEER PROPOSAL
Call Sign	
Licensee Code	OVEAME
Licensee Name	Overon America

Site Information — MEDLEY, FL

Venue Name	7291 NW 74 ST
Latitude (NAD 83)	25° 50' 28.0" N
Longitude (NAD 83)	80° 18' 59.0" W
Climate Zone	B
Rain Zone	1
Ground Elevation (AMSL)	1.24 m / 4.1 ft

Link Information

Satellite Type	Geostationary
Mode	TO - Transmit-Only
Modulation	Digital
Satellite Arc	18° W to 139° West Longitude
Azimuth Range	102.9° to 255.1°
Corresponding Elevation Angles	16.4° / 19.7°
Antenna Centerline (AGL)	11.89 m / 39.0 ft

Antenna Information — Transmit - FCC32

Manufacturer		Andrew
Model		4.6 meter
Gain / Diameter		47.3 dBi / 4.6 m
3-dB / 15-dB Beamwidth		0.62° / 1.20°
Max Available RF Power	(dBW/4 kHz)	-23.6
	(dBW/MHz)	0.4
Maximum EIRP	(dBW/4 kHz)	23.7
	(dBW/MHz)	47.7
Interference Objectives:	Long Term	-154.0 dBW/4 kHz 20%
	Short Term	-131.0 dBW/4 kHz 0.0025%

Frequency Information — Transmit 6.1 GHz

Emission / Frequency Range (MHz)

3M00G7W - 36M0G7W / 5925.0 - 5928.0
3M00G7W - 36M0G7W / 5992.0 - 6106.0
3M00G7W - 36M0G7W / 6170.0 - 6182.0
3M00G7W - 36M0G7W / 6242.0 - 6360.0
3M00G7W - 36M0G7W / 6420.0 - 6425.0

Max Great Circle Coordination Distance	153.9 km / 95.6 mi
Precipitation Scatter Contour Radius	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	**MEDLEY, FL**
Licensee Name	Overon America
Latitude (NAD 83)	25° 50' 28.0" N
Longitude (NAD 83)	80° 18' 59.0" W
Ground Elevation (AMSL)	1.24 m / 4.1 ft
Antenna Centerline (AGL)	11.89 m / 39.0 ft
Antenna Model	Andrew 4.6 meter
Antenna Mode	Transmit 6.1 GHz
Interference Objectives: Long Term	-154.0 dBW/4 kHz 20%
Short Term	-131.0 dBW/4 kHz 0.0025%
Max Available RF Power	-23.6 (dBW/4 kHz)

Transmit 6.1 GHz

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Horizon Gain (dBi)	Coordination Distance (km)
0	0.00	102.35	-10.00	117.20
5	0.00	97.56	-10.00	117.20
10	0.00	92.77	-10.00	117.20
15	0.00	87.97	-10.00	117.20
20	0.00	83.17	-10.00	117.20
25	0.00	78.38	-10.00	117.20
30	0.00	73.60	-10.00	117.20
35	0.00	68.82	-10.00	117.20
40	0.00	64.07	-10.00	117.20
45	0.00	59.33	-10.00	117.20
50	0.00	54.62	-10.00	117.20
55	0.00	49.95	-10.00	117.20
60	0.00	45.33	-9.41	116.81
65	0.00	40.78	-8.26	119.87
70	0.00	36.32	-7.00	123.43
75	0.00	32.00	-5.63	127.60
80	0.00	27.88	-4.13	132.47
85	0.00	24.06	-2.53	138.03
90	0.00	20.72	-0.91	144.07
95	0.00	18.13	0.54	149.70
100	0.00	16.62	1.48	153.60
105	0.00	16.51	1.56	153.91
110	0.00	17.81	0.73	150.46
115	0.00	20.27	-0.67	145.00
120	0.00	23.52	-2.28	138.93
125	0.00	27.27	-3.89	133.28
130	0.00	31.35	-5.41	128.30
135	0.00	35.50	-6.76	124.16
140	0.00	39.53	-7.92	120.80
145	0.00	43.40	-8.94	118.04
150	0.00	47.07	-9.82	115.77
155	0.00	50.47	-10.00	117.20
160	0.00	53.52	-10.00	117.20
165	0.00	56.10	-10.00	117.20
170	0.00	58.10	-10.00	117.20
175	0.00	59.36	-10.00	117.20
180	0.00	59.80	-10.00	117.20
185	0.00	59.36	-10.00	117.20

COMSEARCH

Earth Station Data Sheet

19700 Janelia Farm Boulevard, Ashburn, VA 20147
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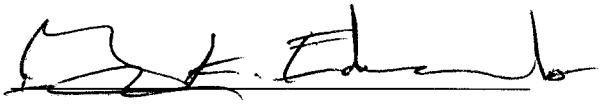
Coordination Values	**MEDLEY, FL**
Licensee Name	Overon America
Latitude (NAD 83)	25° 50' 28.0" N
Longitude (NAD 83)	80° 18' 59.0" W
Ground Elevation (AMSL)	1.24 m / 4.1 ft
Antenna Centerline (AGL)	11.89 m / 39.0 ft
Antenna Model	Andrew 4.6 meter
Antenna Mode	Transmit 6.1 GHz
Interference Objectives: Long Term	-154.0 dBW/4 kHz 20%
Short Term	-131.0 dBW/4 kHz 0.0025%
Max Available RF Power	-23.6 (dBW/4 kHz)

Transmit 6.1 GHz

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Horizon Gain (dBi)	Coordination Distance (km)
190	0.00	58.10	-10.00	117.20
195	0.00	56.10	-10.00	117.20
200	0.00	53.52	-10.00	117.20
205	0.00	50.47	-10.00	117.20
210	0.00	47.07	-9.82	115.77
215	0.00	43.40	-8.94	118.04
220	0.00	39.53	-7.92	120.80
225	0.00	35.50	-6.76	124.16
230	0.00	31.55	-5.47	128.09
235	0.00	27.89	-4.14	132.45
240	0.00	24.67	-2.80	137.06
245	0.00	22.07	-1.60	141.48
250	0.00	20.34	-0.71	144.85
255	0.00	19.71	-0.37	146.20
260	0.00	20.27	-0.67	145.00
265	0.00	21.94	-1.53	141.71
270	0.00	24.50	-2.73	137.33
275	0.00	27.69	-4.06	132.72
280	0.00	31.32	-5.40	128.33
285	0.00	35.26	-6.68	124.38
290	0.00	39.42	-7.89	120.89
295	0.00	43.72	-9.02	117.83
300	0.00	48.13	-10.00	117.20
305	0.00	52.63	-10.00	117.20
310	0.00	57.18	-10.00	117.20
315	0.00	61.78	-10.00	117.20
320	0.00	66.42	-10.00	117.20
325	0.00	71.08	-10.00	117.20
330	0.00	75.76	-10.00	117.20
335	0.00	80.45	-10.00	117.20
340	0.00	85.16	-10.00	117.20
345	0.00	89.86	-10.00	117.20
350	0.00	94.57	-10.00	117.20
355	0.00	99.27	-10.00	117.20

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 11, 2021

FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for
Overon America
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Prepared By:
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19700 Janelia Farm Boulevard
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March 11, 2021

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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.

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Broward County Board of Commissioners
Broward County Telecommunications Div
COLLIER, COUNTY OF
Computer Office Solutions, Inc.
Embarq Florida, Inc.
Entercom License, LLC
Florida Power and Light Company
Florida State
Florida, State of
HiQ Data Corporation
Miami-Dade County
New Cingular Wireless PCS LLC - N FL
New Cingular Wireless PCS LLC - S FL
Olympic Wireless, LLC
Palm Beach, County of
South Florida Water Management District
T-Mobile License LLC
Verizon Wireless (VAW) LLC - S Florida
Verizon Wireless Personal Comm, LP(S FL)

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:	03/09/2021
Job Number:	210303COMSGE02

Administrative Information

Status	ENGINEER PROPOSAL
Call Sign	
Licensee Code	OVEAME
Licensee Name	Overon America

Site Information — MEDLEY, FL

Venue Name	7291 NW 74 ST
Latitude (NAD 83)	25° 50' 28.0" N
Longitude (NAD 83)	80° 18' 59.0" W
Climate Zone	B
Rain Zone	1
Ground Elevation (AMSL)	1.24 m / 4.1 ft

Link Information

Satellite Type	Geostationary
Mode	TO - Transmit-Only
Modulation	Digital
Satellite Arc	18° W to 139° West Longitude
Azimuth Range	102.9° to 255.1°
Corresponding Elevation Angles	16.4° / 19.7°
Antenna Centerline (AGL)	11.89 m / 39.0 ft

Antenna Information — Transmit - FCC32

Manufacturer		Vertex
Model		4.8 meter
Gain / Diameter		48.1 dBi / 4.8 m
3-dB / 15-dB Beamwidth		0.62° / 1.20°
Max Available RF Power	(dBW/4 kHz)	-23.6
	(dBW/MHz)	0.4
Maximum EIRP	(dBW/4 kHz)	24.5
	(dBW/MHz)	48.5
Interference Objectives:	Long Term	-154.0 dBW/4 kHz 20%
	Short Term	-131.0 dBW/4 kHz 0.0025%

Frequency Information — Transmit 6.1 GHz

Emission / Frequency Range (MHz)

3M00G7W - 36M0G7W / 5925.0 - 5928.0
3M00G7W - 36M0G7W / 5992.0 - 6106.0
3M00G7W - 36M0G7W / 6170.0 - 6182.0
3M00G7W - 36M0G7W / 6242.0 - 6360.0
3M00G7W - 36M0G7W / 6420.0 - 6425.0

Max Great Circle Coordination Distance	153.9 km / 95.6 mi
Precipitation Scatter Contour Radius	100.0 km / 62.1 mi

COMSEARCH

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Interference Objectives: Long Term	-154.0 dBW/4 kHz 20%
Short Term	-131.0 dBW/4 kHz 0.0025%
Max Available RF Power	-23.6 (dBW/4 kHz)

Transmit 6.1 GHz

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Horizon Gain (dBi)	Coordination Distance (km)
0	0.00	102.35	-10.00	117.20
5	0.00	97.56	-10.00	117.20
10	0.00	92.77	-10.00	117.20
15	0.00	87.97	-10.00	117.20
20	0.00	83.17	-10.00	117.20
25	0.00	78.38	-10.00	117.20
30	0.00	73.60	-10.00	117.20
35	0.00	68.82	-10.00	117.20
40	0.00	64.07	-10.00	117.20
45	0.00	59.33	-10.00	117.20
50	0.00	54.62	-10.00	117.20
55	0.00	49.95	-10.00	117.20
60	0.00	45.33	-9.41	116.81
65	0.00	40.78	-8.26	119.87
70	0.00	36.32	-7.00	123.43
75	0.00	32.00	-5.63	127.60
80	0.00	27.88	-4.13	132.47
85	0.00	24.06	-2.53	138.03
90	0.00	20.72	-0.91	144.07
95	0.00	18.13	0.54	149.70
100	0.00	16.62	1.48	153.60
105	0.00	16.51	1.56	153.91
110	0.00	17.81	0.73	150.46
115	0.00	20.27	-0.67	145.00
120	0.00	23.52	-2.28	138.93
125	0.00	27.27	-3.89	133.28
130	0.00	31.35	-5.41	128.30
135	0.00	35.50	-6.76	124.16
140	0.00	39.53	-7.92	120.80
145	0.00	43.40	-8.94	118.04
150	0.00	47.07	-9.82	115.77
155	0.00	50.47	-10.00	117.20
160	0.00	53.52	-10.00	117.20
165	0.00	56.10	-10.00	117.20
170	0.00	58.10	-10.00	117.20
175	0.00	59.36	-10.00	117.20
180	0.00	59.80	-10.00	117.20
185	0.00	59.36	-10.00	117.20

COMSEARCH

Earth Station Data Sheet

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

Coordination Values	**MEDLEY, FL**	
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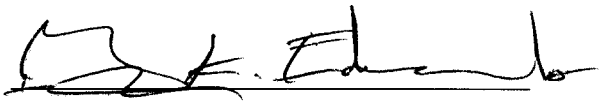
Short Term	-131.0 dBW/4 kHz	0.0025%
Max Available RF Power	-23.6 (dBW/4 kHz)	

Transmit 6.1 GHz

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Horizon Gain (dBi)	Coordination Distance (km)
190	0.00	58.10	-10.00	117.20
195	0.00	56.10	-10.00	117.20
200	0.00	53.52	-10.00	117.20
205	0.00	50.47	-10.00	117.20
210	0.00	47.07	-9.82	115.77
215	0.00	43.40	-8.94	118.04
220	0.00	39.53	-7.92	120.80
225	0.00	35.50	-6.76	124.16
230	0.00	31.55	-5.47	128.09
235	0.00	27.89	-4.14	132.45
240	0.00	24.67	-2.80	137.06
245	0.00	22.07	-1.60	141.48
250	0.00	20.34	-0.71	144.85
255	0.00	19.71	-0.37	146.20
260	0.00	20.27	-0.67	145.00
265	0.00	21.94	-1.53	141.71
270	0.00	24.50	-2.73	137.33
275	0.00	27.69	-4.06	132.72
280	0.00	31.32	-5.40	128.33
285	0.00	35.26	-6.68	124.38
290	0.00	39.42	-7.89	120.89
295	0.00	43.72	-9.02	117.83
300	0.00	48.13	-10.00	117.20
305	0.00	52.63	-10.00	117.20
310	0.00	57.18	-10.00	117.20
315	0.00	61.78	-10.00	117.20
320	0.00	66.42	-10.00	117.20
325	0.00	71.08	-10.00	117.20
330	0.00	75.76	-10.00	117.20
335	0.00	80.45	-10.00	117.20
340	0.00	85.16	-10.00	117.20
345	0.00	89.86	-10.00	117.20
350	0.00	94.57	-10.00	117.20
355	0.00	99.27	-10.00	117.20

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: _ 

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DATED: March 11, 2021

Exhibit D

Radiation Hazard Assessments

Analysis of Non-Ionizing Radiation for a 4.6-Meter Earth Station System

This report analyzes the non-ionizing radiation levels for a 4.6-meter earth station system. The analysis and calculations performed in this report comply with the methods described in the FCC Office of Engineering and Technology Bulletin, No. 65 first published in 1985 and revised in 1997 in Edition 97-01. The radiation safety limits used in the analysis are in conformance with the FCC R&O 96-326. Bulletin No. 65 and the FCC R&O specifies that there are two separate tiers of exposure limits that are dependant on the situation in which the exposure takes place and/or the status of the individuals who are subject to the exposure. The Maximum Permissible Exposure (MPE) limits for persons in a General Population/Uncontrolled environment are shown in Table 1. The General Population/Uncontrolled MPE is a function of transmit frequency and is for an exposure period of thirty minutes or less. The MPE limits for persons in an Occupational/Controlled environment are shown in Table 2. The Occupational MPE is a function of transmit frequency and is for an exposure period of six minutes or less. The purpose of the analysis described in this report is to determine the power flux density levels of the earth station in the far-field, near-field, transition region, between the subreflector or feed and main reflector surface, at the main reflector surface, and between the antenna edge and the ground and to compare these levels to the specified MPEs.

Table 1. Limits for General Population/Uncontrolled Exposure (MPE)

Frequency Range (MHz)	Power Density (mW/cm^2)
30-300	0.2
300-1500	Frequency (MHz)*(0.8/1200)
1500-100,000	1.0

Table 2. Limits for Occupational/Controlled Exposure (MPE)

Frequency Range (MHz)	Power Density (mW/cm^2)
30-300	1.0
300-1500	Frequency (MHz)*(4.0/1200)
1500-100,000	5.0

Table 3. Formulas and Parameters Used for Determining Power Flux Densities

Parameter	Symbol	Formula	Value	Units
Antenna Diameter	D	Input	4.6	m
Antenna Surface Area	$A_{surface}$	$\pi D^2 / 4$	16.62	m^2
Subreflector Diameter	D_{sr}	Input	61.6	cm
Area of Subreflector	A_{sr}	$\pi D_{sr}{}^2/4$	2979.27	cm^2
Frequency	F	Input	6175	MHz
Wavelength	λ	300 / F	0.048583	m
Transmit Power	P	Input	48.05	W
Antenna Gain (dBi)	G_{es}	Input	47.3	dBi
Antenna Gain (factor)	G	$10^{Ges/10}$	53703.2	n/a
Pi	π	Constant	3.1415927	n/a
Antenna Efficiency	η	$G\lambda^2/(\pi^2D^2)$	0.61	n/a

1. Far Field Distance Calculation

The distance to the beginning of the far field can be determined from the following equation:

Distance to the Far Field Region

$$R_{ff} = 0.60\ D^2 / \lambda \quad (1)$$
$$= 261.3\ m$$

The maximum main beam power density in the far field can be determined from the following equation:

On-Axis Power Density in the Far Field

$$S_{ff} = G\ P / (4\ \pi\ R_{ff}^2) \quad (2)$$
$$= 3.007\ W/m^2$$
$$= 0.301\ mW/cm^2$$

2. Near Field Calculation

Power flux density is considered to be at a maximum value throughout the entire length of the defined Near Field region. The region is contained within a cylindrical volume having the same diameter as the antenna. Past the boundary of the Near Field region, the power density from the antenna decreases linearly with respect to increasing distance.

The distance to the end of the Near Field can be determined from the following equation:

Extent of the Near Field

$$R_{nf} = D^2 / (4\ \lambda) \quad (3)$$
$$= 108.9\ m$$

The maximum power density in the Near Field can be determined from the following equation:

Near Field Power Density

$$S_{nf} = 16.0\ \eta\ P / (\pi\ D^2) \quad (4)$$
$$= 7.019\ W/m^2$$
$$= 0.702\ mW/cm^2$$

3. Transition Region Calculation

The Transition region is located between the Near and Far Field regions. The power density begins to decrease linearly with increasing distance in the Transition region. While the power density decreases inversely with distance in the Transition region, the power density decreases inversely with the square of the distance in the Far Field region. The maximum power density in the Transition region will not exceed that calculated for the Near Field region. The power density calculated in Section 1 is the highest power density the antenna can produce in any of the regions away from the antenna. The power density at a distance R_t can be determined from the following equation:

Transition Region Power Density

$$S_t = S_{nf}\ R_{nf} / R_t \quad (5)$$
$$= 0.702\ mW/cm^2$$

4. Region between the Main Reflector and the Subreflector

Transmissions from the feed assembly are directed toward the subreflector surface, and are reflected back toward the main reflector. The most common feed assemblies are waveguide flanges, horns or subreflectors. The energy between the subreflector and the reflector surfaces can be calculated by determining the power density at the subreflector surface. This can be determined from the following equation:

Power Density at the Subreflector

$$S_{sr} = 4000\ P / A_{sr} = 64.512\ mW/cm^2 \quad (6)$$

5. Main Reflector Region

The power density in the main reflector is determined in the same manner as the power density at the subreflector. The area is now the area of the main reflector aperture and can be determined from the following equation:

Power Density at the Main Reflector Surface

$$S_{surface} = 4\ P / A_{surface} = 11.565\ W/m^2 = 1.157\ mW/cm^2 \quad (7)$$

6. Region between the Main Reflector and the Ground

Assuming uniform illumination of the reflector surface, the power density between the antenna and the ground can be determined from the following equation:

Power Density between Reflector and Ground

$$S_g = P / A_{surface} = 2.891\ W/m^2 = 0.289\ mW/cm^2 \quad (8)$$

7. Summary of Calculations

Table 4. Summary of Expected Radiation levels for Uncontrolled Environment

Region		Calculated Maximum Radiation Power Density Level (mW/cm^2)	Hazard Assessment
1. Far Field (R_{ff} = 261.3 m)	S_{ff}	0.301	Satisfies FCC MPE
2. Near Field (R_{nf} = 108.9 m)	S_{nf}	0.702	Satisfies FCC MPE
3. Transition Region ($R_{nf} < R_t < R_{ff}$)	S_t	0.702	Satisfies FCC MPE
4. Between Main Reflector and Subreflector	S_{sr}	64.512	Potential Hazard
5. Main Reflector	$S_{surface}$	1.157	Potential Hazard
6. Between Main Reflector and Ground	S_g	0.289	Satisfies FCC MPE

Table 5. Summary of Expected Radiation levels for Controlled Environment

Region		Calculated Maximum Radiation Power Density Level (mW/cm^2)	Hazard Assessment
1. Far Field (R_{ff} = 261.3 m)	S_{ff}	0.301	Satisfies FCC MPE
2. Near Field (R_{nf} = 108.9 m)	S_{nf}	0.702	Satisfies FCC MPE
3. Transition Region ($R_{nf} < R_t < R_{ff}$)	S_t	0.702	Satisfies FCC MPE
4. Between Main Reflector and Subreflector	S_{sr}	64.512	Potential Hazard
5. Main Reflector	$S_{surface}$	1.157	Satisfies FCC MPE
6. Between Main Reflector and Ground	S_g	0.289	Satisfies FCC MPE

It is the applicant's responsibility to ensure that the public and operational personnel are not exposed to harmful levels of radiation.

8. Conclusions

Based on the above analysis it is concluded that the FCC MPE guidelines have been exceeded (or met) in the regions of Table 4 and 5. The applicant proposes to comply with the MPE limits by one or more of the following methods.

The antenna will be located on a roof. The bottom lip of the dish will be 9.1 meters above ground level. The general public will not have access to areas within ½ diameter from the edge of the antenna.

Since one diameter removed from the main beam of the antenna or ½ diameter removed from the edge of the antenna the RF levels are reduced by a factor of 100 or 20 dB. None of the areas exceeding the MPE levels will be accessible by the general public

Means of Compliance Controlled Areas

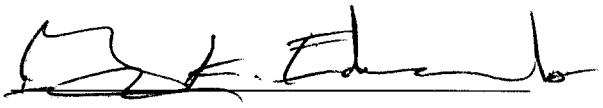
The earth station's operational staff will not have access to the areas that exceed the MPE levels while the earth station is in operation.

The transmitters will be turned off during antenna maintenance

The applicant agrees to abide by the conditions specified in Condition 5208 provided below:

> *Condition 5208 - The licensee shall take all necessary measures to ensure that the antenna does not create potential exposure of humans to radiofrequency radiation in excess of the FCC exposure limits defined in 47 CFR 1.1307(b) and 1.1310 wherever such exposures might occur. Measures must be taken to ensure compliance with limits for both occupational/controlled exposure and for general population/uncontrolled exposure, as defined in these rule sections. Compliance can be accomplished in most cases by appropriate restrictions such as fencing. Requirements for restrictions can be determined by predictions based on calculations, modeling or by field measurements. The FCC's OET Bulletin 65 (available on-line at www.fcc.gov/oet/rfsafety) provides information on predicting exposure levels and on methods for ensuring compliance, including the use of warning and alerting signs and protective equipment for worker.*

I HEREBY CERTIFY THAT I AM THE TECHNICALLY QUALIFIED PERSON RESPONSIBLE FOR THE PREPARATION OF THE RADIATION HAZARD REPORT, AND THAT IT IS COMPLETE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

BY: _ 

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Analysis of Non-Ionizing Radiation for a 4.8-Meter Earth Station System

This report analyzes the non-ionizing radiation levels for a 4.8-meter earth station system. The analysis and calculations performed in this report comply with the methods described in the FCC Office of Engineering and Technology Bulletin, No. 65 first published in 1985 and revised in 1997 in Edition 97-01. The radiation safety limits used in the analysis are in conformance with the FCC R&O 96-326. Bulletin No. 65 and the FCC R&O specifies that there are two separate tiers of exposure limits that are dependant on the situation in which the exposure takes place and/or the status of the individuals who are subject to the exposure. The Maximum Permissible Exposure (MPE) limits for persons in a General Population/Uncontrolled environment are shown in Table 1. The General Population/Uncontrolled MPE is a function of transmit frequency and is for an exposure period of thirty minutes or less. The MPE limits for persons in an Occupational/Controlled environment are shown in Table 2. The Occupational MPE is a function of transmit frequency and is for an exposure period of six minutes or less. The purpose of the analysis described in this report is to determine the power flux density levels of the earth station in the far-field, near-field, transition region, between the subreflector or feed and main reflector surface, at the main reflector surface, and between the antenna edge and the ground and to compare these levels to the specified MPEs.

Table 1. Limits for General Population/Uncontrolled Exposure (MPE)

Frequency Range (MHz)	Power Density (mW/cm^2)
30-300	0.2
300-1500	Frequency (MHz)*(0.8/1200)
1500-100,000	1.0

Table 2. Limits for Occupational/Controlled Exposure (MPE)

Frequency Range (MHz)	Power Density (mW/cm^2)
30-300	1.0
300-1500	Frequency (MHz)*(4.0/1200)
1500-100,000	5.0

Table 3. Formulas and Parameters Used for Determining Power Flux Densities

Parameter	Symbol	Formula	Value	Units
Antenna Diameter	D	Input	4.8	m
Antenna Surface Area	$A_{surface}$	$\pi D^2 / 4$	18.10	m^2
Subreflector Diameter	D_{sr}	Input	35.6	cm
Area of Subreflector	A_{sr}	$\pi D_{sr}{}^2/4$	995.38	cm^2
Frequency	F	Input	6175	MHz
Wavelength	λ	300 / F	0.048583	m
Transmit Power	P	Input	40.30	W
Antenna Gain (dBi)	G_{es}	Input	48.1	dBi
Antenna Gain (factor)	G	$10^{Ges/10}$	64565.4	n/a
Pi	π	Constant	3.1415927	n/a
Antenna Efficiency	η	$G\lambda^2/(\pi^2D^2)$	0.67	n/a

1. Far Field Distance Calculation

The distance to the beginning of the far field can be determined from the following equation:

Distance to the Far Field Region

$$R_{ff} = 0.60\ D^2 / \lambda \quad (1)$$
$$= 284.5\ m$$

The maximum main beam power density in the far field can be determined from the following equation:

On-Axis Power Density in the Far Field

$$S_{ff} = G\ P / (4\ \pi\ R_{ff}^2) \quad (2)$$
$$= 2.557\ W/m^2$$
$$= 0.256\ mW/cm^2$$

2. Near Field Calculation

Power flux density is considered to be at a maximum value throughout the entire length of the defined Near Field region. The region is contained within a cylindrical volume having the same diameter as the antenna. Past the boundary of the Near Field region, the power density from the antenna decreases linearly with respect to increasing distance.

The distance to the end of the Near Field can be determined from the following equation:

Extent of the Near Field

$$R_{nf} = D^2 / (4\ \lambda) \quad (3)$$
$$= 118.6\ m$$

The maximum power density in the Near Field can be determined from the following equation:

Near Field Power Density

$$S_{nf} = 16.0\ \eta\ P / (\pi\ D^2) \quad (4)$$
$$= 5.970\ W/m^2$$
$$= 0.597\ mW/cm^2$$

3. Transition Region Calculation

The Transition region is located between the Near and Far Field regions. The power density begins to decrease linearly with increasing distance in the Transition region. While the power density decreases inversely with distance in the Transition region, the power density decreases inversely with the square of the distance in the Far Field region. The maximum power density in the Transition region will not exceed that calculated for the Near Field region. The power density calculated in Section 1 is the highest power density the antenna can produce in any of the regions away from the antenna. The power density at a distance R_t can be determined from the following equation:

Transition Region Power Density

$$S_t = S_{nf}\ R_{nf} / R_t \quad (5)$$
$$= 0.597\ mW/cm^2$$

4. Region between the Main Reflector and the Subreflector

Transmissions from the feed assembly are directed toward the subreflector surface, and are reflected back toward the main reflector. The most common feed assemblies are waveguide flanges, horns or subreflectors. The energy between the subreflector and the reflector surfaces can be calculated by determining the power density at the subreflector surface. This can be determined from the following equation:

Power Density at the Subreflector

$$S_{sr} = 4000\ P / A_{sr} \quad (6)$$
$$= 161.948\ mW/cm^2$$

5. Main Reflector Region

The power density in the main reflector is determined in the same manner as the power density at the subreflector. The area is now the area of the main reflector aperture and can be determined from the following equation:

Power Density at the Main Reflector Surface

$$S_{surface} = 4\ P / A_{surface} \quad (7)$$
$$= 8.908\ W/m^2$$
$$= 0.891\ mW/cm^2$$

6. Region between the Main Reflector and the Ground

Assuming uniform illumination of the reflector surface, the power density between the antenna and the ground can be determined from the following equation:

Power Density between Reflector and Ground

$$S_g = P / A_{surface} \quad (8)$$
$$= 2.227\ W/m^2$$
$$= 0.223\ mW/cm^2$$

7. Summary of Calculations

Table 4. Summary of Expected Radiation levels for Uncontrolled Environment

Region		Calculated Maximum Radiation Power Density Level (mW/cm^2)	Hazard Assessment
1. Far Field (R_{ff} = 284.5 m)	S_{ff}	0.256	Satisfies FCC MPE
2. Near Field (R_{nf} = 118.6 m)	S_{nf}	0.597	Satisfies FCC MPE
3. Transition Region ($R_{nf} < R_t < R_{ff}$)	S_t	0.597	Satisfies FCC MPE
4. Between Main Reflector and Subreflector	S_{sr}	161.948	Potential Hazard
5. Main Reflector	$S_{surface}$	0.891	Satisfies FCC MPE
6. Between Main Reflector and Ground	S_g	0.223	Satisfies FCC MPE

Table 5. Summary of Expected Radiation levels for Controlled Environment

Region		Calculated Maximum Radiation Power Density Level (mW/cm^2)	Hazard Assessment
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5. Main Reflector	$S_{surface}$	0.891	Satisfies FCC MPE
6. Between Main Reflector and Ground	S_g	0.223	Satisfies FCC MPE

It is the applicant's responsibility to ensure that the public and operational personnel are not exposed to harmful levels of radiation.

8. Conclusions

Based on the above analysis it is concluded that harmful levels of radiation will not exist in regions normally occupied by the public or the earth station's operating personnel. The transmitter will be turned off during antenna maintenance so that the FCC MPE of 5.0 mW/cm2 will be complied with for those regions with close proximity to the reflector that exceed acceptable levels.

The antenna will be located on a roof. The bottom lip of the dish will be 9.1 meters above ground level. The general public will not have access to areas within ½ diameter from the edge of the antenna.

Since one diameter removed from the main beam of the antenna or ½ diameter removed from the edge of the antenna the RF levels are reduced by a factor of 100 or 20 dB. None of the areas exceeding the MPE levels will be accessible by the general public

Means of Compliance Controlled Areas

The earth station's operational staff will not have access to the areas that exceed the MPE levels while the earth station is in operation.

The transmitters will be turned off during antenna maintenance

The applicant agrees to abide by the conditions specified in Condition 5208 provided below:

> *Condition 5208 - The licensee shall take all necessary measures to ensure that the antenna does not create potential exposure of humans to radiofrequency radiation in excess of the FCC exposure limits defined in 47 CFR 1.1307(b) and 1.1310 wherever such exposures might occur. Measures must be taken to ensure compliance with limits for both occupational/controlled exposure and for general population/uncontrolled exposure, as defined in these rule sections. Compliance can be accomplished in most cases by appropriate restrictions such as fencing. Requirements for restrictions can be determined by predictions based on calculations, modeling or by field measurements. The FCC's OET Bulletin 65 (available on-line at www.fcc.gov/oet/rfsafety) provides information on predicting exposure levels and on methods for ensuring compliance, including the use of warning and alerting signs and protective equipment for worker.*

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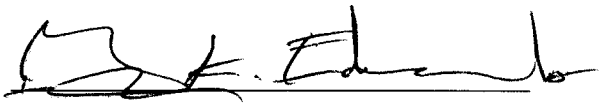
BY: _ 

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