FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORTS
Harris CapRock Communications, Inc.
Call Sign E090167

Harris CapRock Communications, Inc. hereby submits the following Frequency Coordination and Interference Reports for various port locations to support its C-Band ESV Coordination Notification:

- Baltimore, MD (Annex I)
- Boston, MA (Annex II)
- Charleston, SC (Annex III)
- Honolulu, HI (Annex IV)
- Los Angeles, CA (Annex V)
- Miami, FL (Annex VI)
- New Orleans, LA (Annex VII)
- New York, NY (Annex VIII)
- Portland, ME (Annex IX)
- San Francisco, CA (Annex X)
- San Juan, PR (Annex XI)
- Seattle, WA (Annex XII)
- Seward, AK (Annex XIII)
- Sitka, AK (Annex XIV)
- Tampa, FL (Annex XV)

ANNEX I: BALTIMORE

FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for
Harris Caprocks Communication, Inc.
Baltimore, MD
Satellite Earth Station on Vessel (ESV)

Prepared By:
Skjei Telecom, Inc.
7777 Leesburg Pike, Suite 315N
Falls Church, VA 22043
April 18, 2016

Skjei Telecom, Inc.

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. There will be spectrum restrictions 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. The Critical Contour Point method of determining worst case interference from the route and port sites was the interference method used. 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. In those cases were OH losses did not resolve the interference the ESV will mute transmission within an exclusion zone sufficient in size to preclude interference. Also note, that there are no unresolved coordination requests which would result in an exceedance of the maximum 180 megahertz of coordinated spectrum for all ESV operations in the coordination area in the 5925-6425 MHz band.

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-only earth station. The ESV will employ a GPS sensitive ability to cease transmission when traveling in certain exclusion zones. The interference cases and the location of the critical contour point (CCP), around which the exclusion zones exist are detailed in the tables below.

Company

Charles, County of
CHARTER COMMUNICATIONS, LLC
County of Frederick
Delaware Division of Communications
ECW Wireless, LLC
Garden State Transmissions
Licensee
Maryland Public Broadcasting Commission
Norfolk Southern Railway
Prince George's County
St. Mary's County of (MD)
State of Maryland, MIEMSS
Verizon Maryland, Inc.
Washington D.C. SMSA L.P.
Washington Suburban Sanitary Commission

Skjei Telecom, Inc.

Site	Baltimore														
Desired Frequencies (MHz)		6387.003 - 6400	6400 - 6423.003	6067.3785 - 6076.0035	6076.7555 - 6085.3805	6086.3125 - 6095.6875	6096.3125 - 6105.6875								
Into 1															
Case #	Margin(dB)							Frequencies Affected							
161	45.6			Y	Y	Y	Y	5945.2	5974.85	6004.5	6034.15	6063.8	6093.45	6123.1	6152.
929	37.3			Y	Y			6063.8	0	0	0	0	0	0	
703	37.2	Y	Y					6404.79	0	0	0	0	0	0	
646	36.9	Y						6375.14	0	0	0	0	0	0	
283	27.1				Y	Y	Y	6093.45	0	0	0	0	0	0	
408	26.7				Y	Y	Y	6093.45	6152.75	0	0	0	0	0	
786	26.7				Y	Y	Y	6093.45	6152.75	0	0	0	0	0	
571	25.9			Y	Y			6063.8	0	0	0	0	0	0	
623	25.7				Y	Y	Y	6093.45	0	0	0	0	0	0	
107	23.1			Y	Y			6063.8	6123.1	0	0	0	0	0	
950	19.7	Y	Y					6404.79	0	0	0	0	0	0	
695	9.9	Y						6375.14	0	0	0	0	0	0	
273	7.4			Y	Y			6063.8	6123.1	0	0	0	0	0	
397	6.9			Y	Y			6063.8	0	0	0	0	0	0	
772	6.9			Y	Y			6063.8	0	0	0	0	0	0	
268	6.6	Y						6375.14	0	0	0	0	0	0	
34	1.8				Y	Y	Y	6093.45	0	0	0	0	0	0	
Desired Frequencies (MHz)		6387.003 - 6400	6400 - 6423.003	6067.3785 - 6076.0035	6076.7555 - 6085.3805	6086.3125 - 6095.6875	6096.3125 - 6105.6875								
Into 2															
Case #	Margin(dB)							Frequencies Affected							
346	44.0			Y	Y			6063.8	0	0	0	0	0	0	
161	41.4	Y	Y					6197.24	6226.89	6256.54	6286.19	6315.84	6345.49	6375.14	6404.
100	34.7				Y	Y	Y	6093.45	0	0	0	0	0	0	
664	33.4			Y	Y			6063.8	0	0	0	0	0	0	
132	30.5			Y	Y	Y	Y	6078.625	0	0	0	0	0	0	
137	30.5			Y	Y	Y	Y	6078.625	0	0	0	0	0	0	
30	29.0	Y	Y					6197.24	6226.89	6256.54	6286.19	6375.14	6404.79	0	
666	28.7	Y	Y					6404.79	0	0	0	0	0	0	
549	28.2				Y	Y	Y	6093.45	0	0	0	0	0	0	
562	27.7			Y	Y			6063.8	0	0	0	0	0	0	
155	26.8	Y	Y					6197.24	6226.89	6256.54	6286.19	6315.84	6345.49	6375.14	6404.
234	26.7			Y	Y			6063.8	0	0	0	0	0	0	
931	25.7	Y						6315.84	6375.14	0	0	0	0	0	
287	24.9	Y	Y					6197.24	6226.89	6256.54	6286.19	6315.84	6345.49	6375.14	6404.
293	24.5	Y	Y					6197.24	6226.89	6256.54	6286.19	6315.84	6345.49	6404.79	
461	23.7				Y	Y	Y	6093.45	0	0	0	0	0	0	

401	22.5	Y	Y					6404.79	0	0	0	0	0	0	
777	22.5	Y	Y					6404.79	0	0	0	0	0	0	
121	21.9	Y						6375.14	0	0	0	0	0	0	
292	20.8	Y	Y					6197.24	6226.89	6256.54	6286.19	6315.84	6345.49	6375.14	6404.
274	10.9				Y	Y	Y	6034.15	6093.45	0	0	0	0	0	
73	4.2			Y	Y			6063.8	0	0	0	0	0	0	
817	2.8			Y	Y			6063.8	0	0	0	0	0	0	

Table 1 – ESV Interference Cases

Skjei Telecom, Inc.

Interference Zones		Baltimore			
Into 1					
Case #	CCP Latitude (dec.deg)	CCP Longitude (dec.deg.)	Margin (dB)	Victim Rx Site	Licensee
161	39.01451494	76.37502948	45.6	ARNOLD	AT&T COMMUNICATIONS OF MARYLAND INC
929	39.1715361	76.42898395	37.3	NORTH POINT	Baltimore County of Maryland
703	39.05611454	76.38919877	37.2	PAROLE	State of Maryland, MIEMSS
646	38.9624541	76.39151336	36.9	PAROLE	State of Maryland, MIEMSS
283	38.87301281	76.39871341	27.1	DAYTON	Maryland Public Broadcasting Commission
408	38.79880636	76.41703636	26.7	HENSON CREEK	Prince George's County
786	38.79880636	76.41703636	26.7	HENSON CREEK	Prince George's County
571	37.01585496	76.0462389	25.9	SUFFOLK	Norfolk Southern Railway
623	38.07134212	76.21711746	25.7	SANDGATES LN	St. Mary's County of (MD)
107	36.74482269	75.59277343	23.1	SLIGO	Cellco Partnership - North Carolina
950	38.9651106	76.39176664	19.7	GAMBRILL B	County of Frederick
695	38.76386464	76.43033506	9.9	1035680	Appalachia Engineering Services
273	38.55197288	76.43558365	7.4	INDEPENDENT	Washington D.C. SMSA L.P.
397	38.99849359	76.38132225	6.9	TANTALLON	Prince George's County
772	38.99849359	76.38132225	6.9	TANTALLON	Prince George's County
268	38.94718189	76.39005772	6.6	CNTY SHERIFF	Charles, County of
34	38.75329907	76.43191315	1.8	SALISBURY	Maryland Public Broadcasting Commission
Into 2					
Case #	CCP Latitude (dec.deg)	CCP Longitude (dec.deg.)	Margin (dB)	Victim Rx Site	Licensee
346	38.38079343	76.33346985	44.0	WINGATE	Verizon Maryland, Inc.
161	39.01451494	76.37502948	41.4	WYE MILLS	AT&T COMMUNICATIONS OF MARYLAND INC
100	39.08995427	76.3956325	34.7	ATI1037376	Garden State Transmissions
664	38.19489662	76.23561679	33.4	SOM VL LEEPK	St. Mary's County of (MD)
132	38.02066526	76.2091091	30.5	CHINO	CHARTER COMMUNICATIONS, LLC
137	38.02066526	76.2091091	30.5	CHINO	CHARTER COMMUNICATIONS, LLC

Skjei Telecom, Inc.

30	36.8481385	75.81732087	29.0	HICKORY	Cellco Partnership - Southern Virginia
666	38.32349031	76.30509793	28.7	SOM-BETHUNE	St. Mary's County of (MD)
549	38.40666986	76.34629831	28.2	OTH1036610-1	Garden State Transmissions
562	38.96084316	76.39135978	27.7	FALLS CHURCH	ECW Wireless, LLC
155	37.19138452	76.15195862	26.8	MT PLEASANT	AT&T Communications of Virginia, LLC
234	37.89490658	76.15215319	26.7	GLOUCESTER	Cellco Partnership - Southern Virginia
931	39.10361999	76.39563381	25.7	GILROY	Baltimore County of Maryland
287	36.98807193	76.01032852	24.9	BUCKHORN	Cellco Partnership - Southern Virginia
293	37.12914615	76.1389071	24.5	CHARLES CITY	Cellco Partnership - Southern Virginia
461	39.17032877	76.42800421	23.7	GLENMONT	Washington Suburban Sanitary Commission
401	38.37049314	76.32836626	22.5	CAROLE HIGHL	Prince George's County
777	38.37049314	76.32836626	22.5	CAROLE HIGHL	Prince George's County
121	38.36098382	76.32365602	21.9	SAFETY DRIVE	State of Maryland, MIEMSS
292	37.33884143	76.11945657	20.8	HOPEWELL	Cellco Partnership - Southern Virginia
274	39.03630713	76.38142473	10.9	STAFFORD	Washington D.C. SMSA L.P.
73	38.70064929	76.42843069	4.2	MILTON	Delaware Division of Communications
817	38.51438642	76.41217188	2.8	RIDGE VFD	St. Mary's County of (MD)

Table 2 - ESV CCP Locations
See Interference Analysis for Exclusion Zone Details

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 Skjei Telecom, Inc. 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 PCN letter dated 2/9/2016

Company

BAY BROADBAND COMMUNICATIONS LLC
Adams County Department of Emergency Svc
Affiniti PA, LLC
Appalachia Engineering Services
Argos Engineering, LLC
AT&T COMMUNICATIONS OF MARYLAND INC
AT&T Corporation
Atlantic City Electric Company
Baltimore County of Maryland
Baltimore Gas and Electric Company
Believe Wireless, LLC
Berks County Department of Emergency Ser
Capital Communications of America
Caroline County, VA
Carroll, County of
Cellco Partnership - Southern Virginia
Cellco Partnership-WDC/Baltimore
Cellco Prtnrshp - Phil. Tri-State Rgn
Charles, County of
CHARTER COMMUNICATIONS, LLC
Chester, County of
Commonwealth of Pennsylvania-Radio Proj.
Comprehensive Wireless LLC
Conterra Ultra Broadband, LLC
County of Frederick
County of York
DAUPHIN COUNTY EMERGENCY MANAGEMENT
Delaware County (PA) Emergency Services
Delaware Division of Communications
Delmarva Broadcasting Company
Delmarva Power and Light Company

Skjei Telecom, Inc.

Eastern MLG LLC
ECW Wireless, LLC
Enoch Pratt Free Library
Exelon Generation Company, LLC
FELHC, INC
Fundamental Broadcasting LLC
Garden State Transmissions
Gloucester, County of
GREAT SCOTT BROADCASTING
GSB Broadcasting, LLC
Hardy Cellular Telephone Company
iSignal
King and Queen County
Lancaster County-Wide Communications
Loudoun, County of
Maryland Public Broadcasting Commission
Maryland State Highway Administration
Maryland, State of - Dept.of Info & Tech
New Cingular Wireless PCS LLC -NJ
New Cingular Wireless PCS - Maryland
New Cingular Wireless PCS LLC - VA
New Cingular Wireless PCS LLC-DE/NH/RI
New Cingular Wireless PCS, LLC - PA
New Jersey, State of -NJ Transit
Norfolk Southern Railway
PA Communications
Peco Energy Company
PEG Bandwidth
PEG Bandwidth, LLC
Pennsylvania Turnpike Commission
Perseus Technology Holdings USA Inc.
Prince George's County
Prince William, County of
PSEG Services Corporation
Radio One Inc
RAPPAHANNOCK ELECTRIC COOPERATIVE
South Central Task Force (SCTFNET)
Southern Maryland Electric Cooperative I
Spotsylvania, County of
Sprint Spectrum L.P.
Sprintcom, Inc
St. Mary's County of (MD)
Stafford, County of
State of Maryland (MIEMSS)

Skjei Telecom, Inc.

State of Maryland, MIEMSS
Texas Eastern Communications, LLC
Thought Transmissions, LLC
Transcontinental Gas Pipeline Corp.
USCOC of Cumberland, Inc.
Verizon Maryland, Inc.
Verizon Wireless (VAW) LLC - Delaware/NJ
Verizon Wireless (VAW) LLC - Maryland
Verizon Wireless (VAW) LLC - W/B/V Mkts
Verizon Wireless VAW LLC-Southern VA
Virginia Broadband, LLC
Virginia Department of State Police
Virginia Electric & Power Company
Washington D.C. SMSA L.P.
Washington Gas Light Company
Washington Suburban Sanitary Commission
Webline Holdings LLC
Wireless Applications Corporation
WITF Inc.
World Class Wireless, LLC
WV DHHR BPH, Office of EMS, Com. Div.
YAB Mobile

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. The coordination contours include all the area within this route as well as all of the area seaward of this route within 200 km of the baseline of the United States or 200 km from any fixed service offshore installations."

Skjei Telecom, Inc.

Date:	02/09/2016
Job Number:	160209SKJTEL12

Administrative Information

Status	ENGINEER PROPOSAL
Call Sign	
Licensee Code	SPACLK
Licensee Name	Harris CapRock Communications

Site Information	**BALTIMORE, MD**
Venue Name	
Latitude (NAD 83)	39° 17' 5.8" N
Longitude (NAD 83)	76° 36' 38.4" W
Climate Zone	B
Rain Zone	2
Ground Elevation (AMSL)	0.0 m / 0.0 ft

Link Information

Satellite Type	Geostationary
Mode	TO - Transmit-Only
Modulation	Digital
Satellite Arc	89° W to 97° West Longitude
Azimuth Range	199.1° to 210.4°
Corresponding Elevation Angles	42.7° / 39.8°
Antenna Centerline (AGL)	15.54 m / 51.0 ft

Antenna Information		**Transmit - FCC32**
Manufacturer		FCC REFERENCE
Model		32-25LOG(THETA)
Gain / Diameter		41.7 dBi / 2.4 m
3-dB / 15-dB Beamwidth		0.66° / 1.18°
Max Available RF Power	(dBW/4 kHz)	-9.0
	(dBW/MHz)	15.0
Maximum EIRP	(dBW/4 kHz)	32.7
	(dBW/MHz)	56.7
	(dBW)	60.5
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)	3M75G7D - 7M50G7D / 6067.3785 - 6076.0035
	3M75G7D - 7M50G7D / 6076.7555 - 6085.3805
	3M75G7D - 7M50G7D / 6086.3125 - 6095.6875
	3M75G7D - 7M50G7D / 6096.3125 - 6105.6875
	3M75G7D - 7M50G7D / 6387.003 - 6423.003
Max Great Circle Coordination Distance	174.0 km / 108.1 mi
Precipitation Scatter Contour Radius	100.0 km / 62.1 mi

Skjei Telecom, Inc.

Coordination Values	**BALTIMORE, MD**
Licensee Name	Harris CapRock Communications
Latitude (NAD 83)	39° 17' 5.8" N
Longitude (NAD 83)	76° 36' 38.4" W
Ground Elevation (AMSL)	0.0 m / 0.0 ft
Antenna Centerline (AGL)	15.54 m / 51.0 ft
Antenna Model	FCC Reference 32-25LOG(THETA)
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	-9.0 (dBW/4 kHz)

Transmit 6.1 GHz

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Horizon Gain (dBi)	Coordination Distance (km)
0	0.73	132.00	-10.00	117.26
5	0.75	134.51	-10.00	116.35
10	0.70	136.62	-10.00	118.79
15	0.73	137.83	-10.00	117.05
20	0.70	137.96	-10.00	118.48
25	0.65	137.58	-10.00	121.37
30	0.58	136.72	-10.00	125.13
35	0.53	135.44	-10.00	127.91
40	0.55	133.82	-10.00	127.02
45	0.51	131.78	-10.00	129.45
50	0.51	129.47	-10.00	128.99
55	0.50	126.87	-10.00	129.84
60	0.49	124.04	-10.00	131.07
65	0.56	121.07	-10.00	126.20
70	0.55	117.88	-10.00	127.08
75	0.52	114.55	-10.00	128.78
80	0.29	111.05	-10.00	154.70
85	0.26	107.55	-10.00	159.12
90	0.24	103.98	-10.00	161.32
95	0.00	100.33	-10.00	167.52
100	0.00	96.69	-10.00	167.52
105	0.00	93.03	-10.00	167.52
110	0.00	89.36	-10.00	167.52
115	0.00	85.69	-10.00	167.52
120	0.00	82.04	-10.00	167.52
125	0.00	78.41	-10.00	167.52
130	0.00	74.83	-10.00	167.52
135	0.00	71.31	-10.00	167.52
140	0.00	67.86	-10.00	167.52
145	0.00	64.51	-10.00	167.52
150	0.00	61.27	-10.00	167.52
155	0.00	58.18	-10.00	167.52
160	0.00	55.27	-10.00	167.52
165	0.00	52.56	-10.00	167.52
170	0.29	49.86	-10.00	154.43
175	0.32	47.64	-9.95	150.68
180	0.23	45.85	-9.53	164.78
185	0.23	44.36	-9.17	166.45

Skjei Telecom, Inc.

Coordination Values	**BALTIMORE, MD**
Licensee Name	Harris CapRock Communications
Latitude (NAD 83)	39° 17' 5.8" N
Longitude (NAD 83)	76° 36' 38.4" W
Ground Elevation (AMSL)	0.0 m / 0.0 ft
Antenna Centerline (AGL)	15.54 m / 51.0 ft
Antenna Model	FCC Reference 32-25LOG(THETA)
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	-9.0 (dBW/4 kHz)

Transmit 6.1 GHz

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Horizon Gain (dBi)	Coordination Distance (km)
190	0.00	43.50	-8.96	172.50
195	0.00	42.25	-8.65	174.05
200	0.30	40.67	-8.23	161.31
205	0.30	39.85	-8.01	161.76
210	0.28	39.56	-7.93	164.73
215	0.22	39.84	-8.01	173.86
220	0.30	40.51	-8.19	161.48
225	0.29	41.74	-8.51	161.53
230	0.29	43.42	-8.94	159.39
235	0.34	45.44	-9.44	150.21
240	0.44	47.79	-9.98	136.56
245	0.40	50.52	-10.00	140.69
250	0.38	53.49	-10.00	143.15
255	0.41	56.63	-10.00	139.60
260	0.43	59.95	-10.00	137.91
265	0.49	63.38	-10.00	130.44
270	0.58	66.93	-10.00	125.14
275	0.74	70.55	-10.00	116.53
280	0.81	74.28	-10.00	115.39
285	0.80	78.09	-10.00	115.80
290	0.71	81.94	-10.00	117.88
295	0.71	85.81	-10.00	118.36
300	0.76	89.68	-10.00	117.43
305	0.87	93.57	-10.00	112.46
310	0.84	97.44	-10.00	113.74
315	0.89	101.30	-10.00	111.32
320	0.90	105.11	-10.00	111.03
325	0.81	108.86	-10.00	115.39
330	0.75	112.53	-10.00	116.03
335	0.82	116.17	-10.00	114.62
340	0.79	119.66	-10.00	116.06
345	0.76	123.02	-10.00	117.45
350	0.69	126.19	-10.00	119.32
355	0.72	129.22	-10.00	117.58

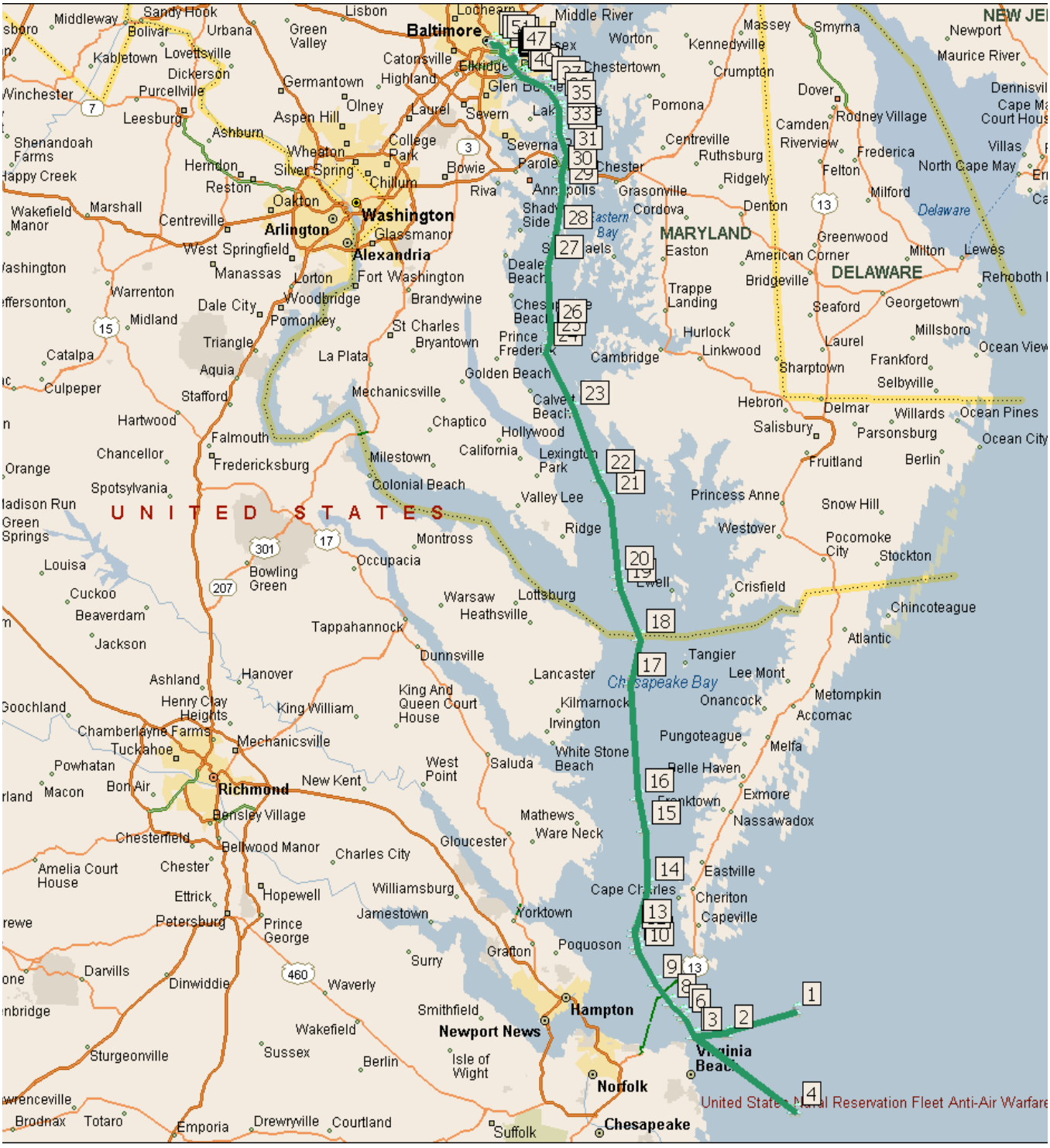
Skjei Telecom, Inc.

Name	Latitude	Longitude
N	37.57511	-73.34568
1	36.99667	-75.66666667
2	36.945	-75.87333333
3	36.93888	-75.96904
S	36.2055	-73.30219
4	36.76167	-75.66668
5	36.94	-75.97666667
6	36.98083	-76.00266667
7	36.99167	-76.01333333
8	37.01667	-76.04666667
9	37.06383	-76.09166667
10	37.13833	-76.145
11	37.15167	-76.15
12	37.18	-76.155
13	37.19167	-76.15166667
14	37.29167	-76.115
15	37.425	-76.12666667
16	37.5	-76.145
17	37.775	-76.17166667
18	37.87833	-76.14333333
19	37.99667	-76.20333333
20	38.02667	-76.21
21	38.205	-76.23666667
22	38.25333	-76.27
23	38.415	-76.35
24	38.55167	-76.435
25	38.57833	-76.42166667
26	38.60667	-76.42166667
27	38.75833	-76.43166667
28	38.82833	-76.405
29	38.935	-76.38833333
30	38.97	-76.39166667
31	39.01667	-76.37333333
32	39.0655	-76.3925
33	39.07417	-76.395
34	39.11667	-76.395
35	39.125	-76.39633333
36	39.14167	-76.40466667
37	39.17083	-76.42833333
38	39.18133	-76.44416667
39	39.19883	-76.50283333

Skjei Telecom, Inc.

40	39.2025	-76.51133333
41	39.20833	-76.51916667
42	39.23417	-76.54633333
43	39.23817	-76.54583333
44	39.2395	-76.54383333
45	39.242	-76.54166667
46	39.248	-76.53833333
47	39.251	-76.5375
48	39.24161	-76.55135
49	39.25544	-76.57477
50	39.27113	-76.57557
51	39.2781	-76.58431
52	39.27758	-76.5988
53	39.28494	-76.610672

Skjei Telecom, Inc.



Skjei Telecom, Inc.

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: 

Ken Ryan, P.E.
Principal Engineer
Skjei Telecom, Inc.
7777 Leesburg Pike, Suite 315N
Falls Church, VA 22043

DATED: April 18, 2016

Skjei Telecom, Inc.

ANNEX II: BOSTON

FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for
Harris Caprocks Communication, Inc.
Boston, MA
Satellite Earth Station on Vessel (ESV)

Prepared By:
Skjei Telecom, Inc.
7777 Leesburg Pike, Suite 315N
Falls Church, VA 22043
April 18, 2016

Skjei Telecom, Inc.

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. There will be spectrum restrictions 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. The Critical Contour Point method of determining worst case interference from the route and port sites was the interference method used. 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. In those cases were OH losses did not resolve the interference the ESV will mute transmission within an exclusion zone sufficient in size to preclude interference. Also note, that there are no unresolved coordination requests which would result in an exceedance of the maximum 180 megahertz of coordinated spectrum for all ESV operations in the coordination area in the 5925-6425 MHz band.

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-only earth station. The ESV will employ a GPS sensitive ability to cease transmission when traveling in certain exclusion zones. The interference cases and the location of the critical contour point (CCP), around which the exclusion zones exist are detailed in the tables below.

Company

Calvary Chapel of Costa Mesa
Coast Community College District
LDM Engineering
Los Angeles SMSA Ltd. Partnership
Metropolitan Water Dist of So California
MHO Networks
New Cingular Wireless PCS LLC -San Diego
Northrop Grumman Systems Corp.
Orange, County of, CA
Pacific Bell Tel Com dba AT&T California
Riverside, County of
San Diego Broadband
San Diego Gas & Electric Company
San Diego, County of
Southern California Edison Company
Turn Wireless, LLC
Verizon California Inc.
Verizon Wireless (VAW) LLC (Southern CA)

Skjei Telecom, Inc.

Site	Boston											
Desired Frequencies (MHz)		6387.003 - 6423.003	6067.3785 - 6076.0035	6076.7555 - 6085.3805	6086.3125 - 6095.6875	6096.3125 - 6105.6875						
Into 1												
							Frequencies Affected					
22.0	29.5			Y	Y	Y	6034.15	6093.45	6123.1	0	0	0
55.0	29.0	Y					6375.14	0	0	0	0	0
128.0	20.3	Y					6197.24	6315.84	6375.14	0	0	0
17.0	8.1		Y	Y			5974.85	6063.8	6123.1	0	0	0
30.0	7.1		Y	Y			6063.8	0	0	0	0	0
264.0	3.4			Y	Y	Y	6093.45	0	0	0	0	0
246.0	2.4		Y	Y			6063.8	0	0	0	0	0
Desired Frequencies (MHz)		6387.003 - 6423.003	6067.3785 - 6076.0035	6076.7555 - 6085.3805	6086.3125 - 6095.6875	6096.3125 - 6105.6875						
Into 2												
Case #	Margin(dB)						Frequencies Affected					
32.0	29.3	Y					6226.89	6315.84	6345.49	6375.14	0	0
118.0	23.3		Y	Y			5974.85	6004.5	6034.15	6063.8	0	0
124.0	8.7		Y	Y			6063.8	0	0	0	0	0
110.0	3.7		Y	Y			6063.8	6123.1	0	0	0	0
117.0	1.8			Y	Y	Y	6093.45	0	0	0	0	0
93.0	0.3			Y	Y	Y	6034.15	6093.45	6123.1	0	0	0

Table 1 – ESV Interference Cases

Skjei Telecom, Inc.

Interference Zones		Boston			
Into 1					
Case #	CCP Latitude (dec.deg)	CCP Longitude (dec.deg.)	Margin (dB)	Victim Rx Site	Licensee
22	42.383813	70.84805794	29.5	KINGSTON	Industrial Tower and Wireless, LLC
55	42.33289972	70.98145748	29.0	BILLERICA	New Cingular Wireless PCS LLC - MA
128	42.35140446	71.03589814	20.3	W BRIDGEWATE	Industrial Tower and Wireless, LLC
17	42.38243627	70.71448438	8.1	TAUNTON	Industrial Tower and Wireless, LLC
30	42.37334557	70.65643318	7.1	TIMBER SWAMP	Eversource Energy Service Company
264	42.35140446	71.03589814	3.4	MENDON SPECT	ECW Wireless, LLC
246	42.35140446	71.03589814	2.4	DOUGLAS SBA	ECW Wireless, LLC
Into 2					
Case #	CCP Latitude (dec.deg)	CCP Longitude (dec.deg.)	Margin (dB)	Victim Rx Site	Licensee
32	42.34250538	70.93958718	29.3	FOXBORO	Industrial Tower and Wireless, LLC
118	42.34196421	70.54555872	23.3	WOONSOCKET	Industrial Tower and Wireless, LLC
124	42.3433033	71.03379745	8.7	ANDOVER	Catholic Media, Inc
110	42.3433033	71.03379745	3.7	PINE HILL	New Cingular Wireless PCS LLC - MA
117	42.30252806	70.40691716	1.8	WEARE	Cellco Partnership - E-MA, NH, RI
93	42.30035158	70.39928777	0.3	PROVIDENCE 2	New Cingular Wireless PCS LLC - MA

Table 2 - ESV CCP Locations
See Interference Analysis for Exclusion Zone Details

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 Skjei Telecom, Inc. 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 PCN letter dated 2/9/2016

Company

ALGONQUIN GAS TRANSMISSION, LLC
BAE Systems Information & Electronic Sys
Catholic Media, Inc
Cellco Partnership - CT, W-MA, VT
Cellco Partnership - E-MA, NH, RI
Central Maine Power Company
Connecticut State Police Department
CUMBERLAND COUNTY, MAINE
EC12:C50CW Wireless, LLC
Eversource Energy Service Company
First Light Power Resources, LLC
Florida Power and Light Company
Greater Boston Police Council
Industrial Tower and Wireless, LLC
ISO New England, Inc.
LCN Division of EG Sawyer Co., Inc.
Maine, State of - MSCommNet Project
Massachusetts Commonwealth of
Massachusetts, Commonwealth of
National Grid USA Service Company, Inc
New Cingular Wireless PCS LLC - CT
New Cingular Wireless PCS LLC - MA
New Cingular Wireless PCS LLC-DE/NH/RI
New Cingular Wireless PCS LLC-Maine
New Cingular Wireless PCS LLC-Vermont
New Cingular Wireless PCS, LLC (NY)
New Hampshire Dept of Transportation
New Hampshire Dept. of Safety
New Hampshire Electric Cooperative
New Hampshire RSA #2 Partnership
NH #1 Rural Cellular, Inc.

Skjei Telecom, Inc.

Norton, Douglas R
NSTAR Electric Company
Pacific and Southern Company, Inc.
Portland Cellular Partnership - Maine
RCC Atlantic Licenses LLC-NE East Ntwk
Rural Cellular Corporation-New England W
SAGA COMMUNICATIONS OF NEW ENGLAND, LLC
SCS Networks
State of Rhode Island
University System of New Hampshire
Verizon New England Inc.
Verizon Wireless - New England East
Vermont RSA #2-B2, Inc.
WHDH-TV

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. The coordination contours include all the area within this route as well as all of the area seaward of this route within 200 km of the baseline of the United States or 200 km from any fixed service offshore installations."

Skjei Telecom, Inc.

Date:	02/09/2016
Job Number:	160209SKJTEL08

Administrative Information

Status	ENGINEER PROPOSAL
Call Sign	
Licensee Code	SPACLK
Licensee Name	Harris CapRock Communications

Site Information	**BOSTON, MA**
Venue Name	
Latitude (NAD 83)	42° 20' 35.9" N
Longitude (NAD 83)	71° 2' 1.3" W
Climate Zone	B
Rain Zone	2
Ground Elevation (AMSL)	0.0 m / 0.0 ft

Link Information

Satellite Type	Geostationary
Mode	TO - Transmit-Only
Modulation	Digital
Satellite Arc	89° W to 97° West Longitude
Azimuth Range	205.7° to 215.9°
Corresponding Elevation Angles	37.8° / 34.5°
Antenna Centerline (AGL)	15.54 m / 51.0 ft

Antenna Information	**Transmit - FCC32**
Manufacturer	FCC REFERENCE
Model	32-25LOG(THETA)
Gain / Diameter	41.7 dBi / 2.4 m
3-dB / 15-dB Beamwidth	0.66° / 1.18°

Max Available RF Power	(dBW/4 kHz)	-9.0
	(dBW/MHz)	15.0
Maximum EIRP	(dBW/4 kHz)	32.7
	(dBW/MHz)	56.7
	(dBW)	60.5
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)	3M75G7D - 7M50G7D / 6067.3785 - 6076.0035
	3M75G7D - 7M50G7D / 6076.7555 - 6085.3805
	3M75G7D - 7M50G7D / 6086.3125 - 6095.6875
	3M75G7D - 7M50G7D / 6096.3125 - 6105.6875
	3M75G7D - 7M50G7D / 6387.003 - 6423.003

Max Great Circle Coordination Distance	182.9 km / 113.7 mi
Precipitation Scatter Contour Radius	100.0 km / 62.1 mi

Skjei Telecom, Inc.

Coordination Values	**BOSTON, MA**
Licensee Name	Harris CapRock Communications
Latitude (NAD 83)	42° 20' 35.9" N
Longitude (NAD 83)	71° 2' 1.3" W
Ground Elevation (AMSL)	0.0 m / 0.0 ft
Antenna Centerline (AGL)	15.54 m / 51.0 ft
Antenna Model	FCC Reference 32-25LOG(THETA)
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	-9.0 (dBW/4 kHz)

Transmit 6.1 GHz

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Horizon Gain (dBi)	Coordination Distance (km)
0	0.00	131.91	-10.00	167.52
5	0.24	135.20	-10.00	161.91
10	0.00	137.88	-10.00	167.52
15	0.00	140.37	-10.00	167.52
20	0.23	142.05	-10.00	163.23
25	0.24	142.42	-10.00	161.27
30	0.00	141.98	-10.00	167.52
35	0.00	141.23	-10.00	167.52
40	0.00	139.96	-10.00	167.52
45	0.00	138.21	-10.00	167.52
50	0.00	136.06	-10.00	167.52
55	0.00	133.55	-10.00	167.52
60	0.00	130.74	-10.00	167.52
65	0.00	127.69	-10.00	167.52
70	0.00	124.43	-10.00	167.52
75	0.00	121.01	-10.00	167.52
80	0.00	117.46	-10.00	167.52
85	0.00	113.79	-10.00	167.52
90	0.00	110.04	-10.00	167.52
95	0.00	106.22	-10.00	167.52
100	0.00	102.35	-10.00	167.52
105	0.00	98.44	-10.00	167.52
110	0.00	94.50	-10.00	167.52
115	0.00	90.56	-10.00	167.52
120	0.00	86.61	-10.00	167.52
125	0.00	82.67	-10.00	167.52
130	0.00	78.75	-10.00	167.52
135	0.00	74.87	-10.00	167.52
140	0.00	71.03	-10.00	167.52
145	0.00	67.26	-10.00	167.52
150	0.00	63.57	-10.00	167.52
155	0.00	59.98	-10.00	167.52
160	0.00	56.52	-10.00	167.52
165	0.00	53.21	-10.00	167.52
170	0.00	50.09	-10.00	167.52
175	0.26	47.03	-9.81	160.22
180	0.23	44.43	-9.19	166.68
185	0.00	42.35	-8.67	173.92

Skjei Telecom, Inc.

Coordination Values	**BOSTON, MA**
Licensee Name	Harris CapRock Communications
Latitude (NAD 83)	42° 20' 35.9" N
Longitude (NAD 83)	71° 2' 1.3" W
Ground Elevation (AMSL)	0.0 m / 0.0 ft
Antenna Centerline (AGL)	15.54 m / 51.0 ft
Antenna Model	FCC Reference 32-25LOG(THETA)
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	-9.0 (dBW/4 kHz)

Transmit 6.1 GHz

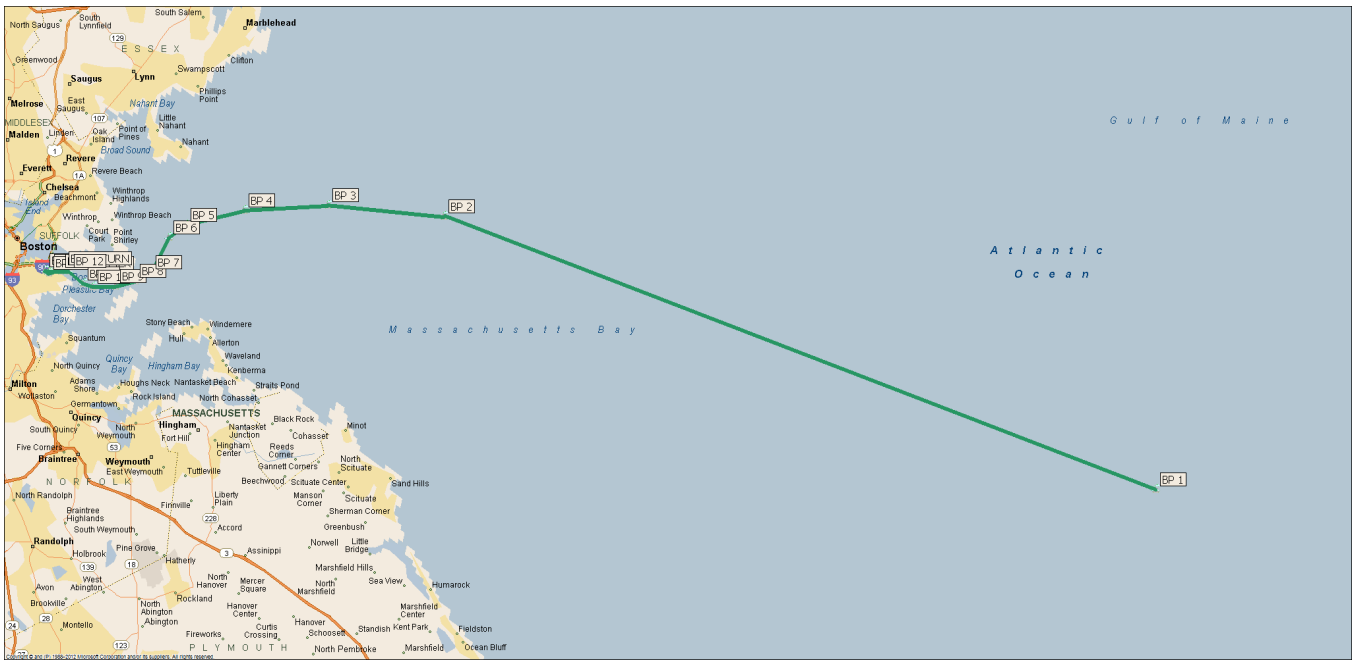
Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Horizon Gain (dBi)	Coordination Distance (km)
190	0.00	40.49	-8.18	176.35
195	0.00	39.06	-7.79	178.31
200	0.23	37.32	-7.30	175.42
205	0.00	35.95	-6.89	182.94
210	0.27	34.66	-6.49	174.42
215	0.48	34.02	-6.29	146.17
220	0.91	33.80	-6.22	118.50
225	0.62	34.93	-6.58	133.97
230	0.35	36.62	-7.09	159.57
235	0.38	38.53	-7.65	153.33
240	0.27	41.00	-8.32	164.90
245	0.00	43.95	-9.07	171.96
250	0.20	46.85	-9.77	168.35
255	0.46	49.99	-10.00	133.85
260	0.00	53.73	-10.00	167.52
265	0.00	57.36	-10.00	167.52
270	0.00	61.12	-10.00	167.52
275	0.00	64.98	-10.00	167.52
280	0.00	68.92	-10.00	167.52
285	0.00	72.93	-10.00	167.52
290	0.00	76.98	-10.00	167.52
295	0.00	81.06	-10.00	167.52
300	0.00	85.17	-10.00	167.52
305	0.22	89.29	-10.00	165.14
310	0.00	93.41	-10.00	167.52
315	0.00	97.52	-10.00	167.52
320	0.00	101.61	-10.00	167.52
325	0.00	105.68	-10.00	167.52
330	0.00	109.70	-10.00	167.52
335	0.00	113.66	-10.00	167.52
340	0.00	117.55	-10.00	167.52
345	0.00	121.35	-10.00	167.52
350	0.00	125.03	-10.00	167.52
355	0.00	128.56	-10.00	167.52

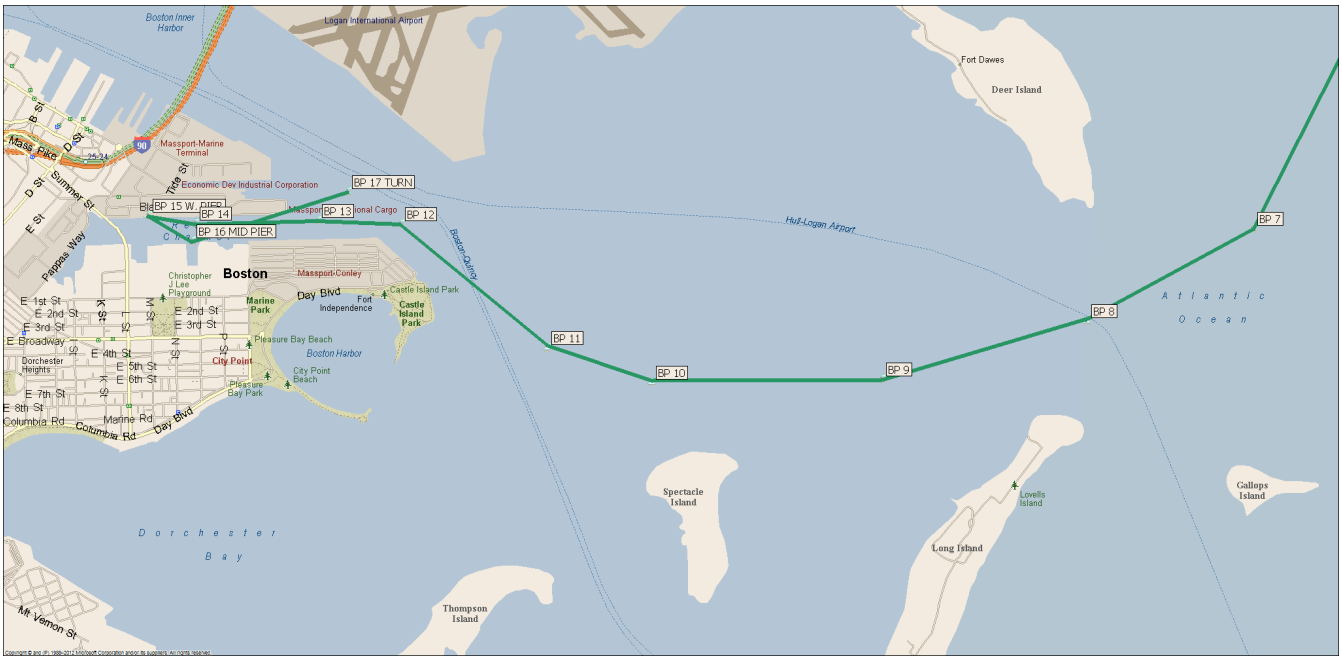
Skjei Telecom, Inc.

Name	Latitude	Longitude
BP 1	42.2	-70.05
BP 2	42.38	-70.68
BP 3	42.3872	-70.7828
BP 4	42.3833	-70.8575
BP 5	42.3737	-70.9087
BP 6	42.3653	-70.9238
BP 7	42.3425	-70.9395
BP 8	42.3367	-70.9537
BP 9	42.333	-70.9712
BP 10	42.3328	-70.9908
BP 11	42.335	-70.9997
BP 12	42.3428	-71.0122
BP 13	42.343	-71.0193
BP 17 TURN	42.3448	-71.0167
BP 14	42.3428	-71.0297
BP 15 W. PIER	42.3433	-71.0337
BP 16 MID PIER	42.3417	-71.03

Table 1 - Boston ESV Break Points

Skjei Telecom, Inc.





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: 

Ken Ryan, P.E.
Principal Engineer
Skjei Telecom, Inc.
7777 Leesburg Pike, Suite 315N
Falls Church, VA 22043

DATED: April 18, 2016

Skjei Telecom, Inc.

ANNEX III: CHARELSTON

FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for
Harris Caprocks Communication, Inc.
Charleston, SC
Satellite Earth Station on Vessel (ESV)

Prepared By:
Skjei Telecom, Inc.
7777 Leesburg Pike, Suite 315N
Falls Church, VA 22043
April 18, 2016

Skjei Telecom, Inc.

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. There will be spectrum restrictions 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. The Critical Contour Point method of determining worst case interference from the route and port sites was the interference method used. 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. In those cases were OH losses did not resolve the interference the ESV will mute transmission within an exclusion zone sufficient in size to preclude interference. Also note, that there are no unresolved coordination requests which would result in an exceedance of the maximum 180 megahertz of coordinated spectrum for all ESV operations in the coordination area in the 5925-6425 MHz band.

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-only earth station. The ESV will employ a GPS sensitive ability to cease transmission when traveling in certain exclusion zones. The interference cases and the location of the critical contour point (CCP), around which the exclusion zones exist are detailed in the tables below.

Company

Jacksonville, City of
New Cingular Wireless PCS LLC-
WV/NC/SC
North Florida Broadband Authority
South Carolina Public Service Authority
Sumter County Board of County
Commission
T-Mobile License LLC
UNIVERSITY OF NORTH CAROLINA
USCOC of North Carolina RSA #7, Inc.
Verizon Wireless (VAW) LLC - S Florida

Skjei Telecom, Inc.

Site Charleston

Desired Frequencies (MHz)		6387.003 - 6423.003	6067.3785 - 6076.0035	6076.7555 - 6085.3805	6086.3125 - 6095.6875	6096.3125 - 6105.6875						
Into 1												
Case #	Margin(dB)						Frequencies Affected					
389	24.8	Y					6226.89	6286.19	6315.84	6345.49	6375.14	6404.79
130	7.4			Y	Y	Y	6093.45	0	0	0	0	0
165	0.6			Y	Y	Y	6093.45	0	0	0	0	0
Desired Frequencies (MHz)		6387.003 - 6423.003	6067.3785 - 6076.0035	6076.7555 - 6085.3805	6086.3125 - 6095.6875	6096.3125 - 6105.6875						
Into 2												
Case #	Margin(dB)						Frequencies Affected					
181	32.9		Y	Y	Y	Y	6063.8	6093.45	0	0	0	0
502	28.1	Y					6375.14	0	0	0	0	0
520	26.3	Y					6375.14	0	0	0	0	0
683	10.3		Y	Y			6063.8	0	0	0	0	0
622	6.3			Y	Y	Y	6093.45	0	0	0	0	0
360	3.5	Y					6375.14	0	0	0	0	0

Table 1 – ESV Interference Cases

Skjei Telecom, Inc.

Interference Zones

Into 1					
Case #	CCP Latitude (dec.deg)	CCP Longitude (dec.deg.)	Margin (dB)	Victim Rx Site	Licensee
389	30.39382039	81.47512155	24.8	ROBBINS HTCH	Verizon Wireless (VAW) LLC - S Florida
130	32.72871283	79.91581826	7.4	KERNAN RD	Jacksonville, City of
165	32.7758143	79.92324868	0.6	2625	North Florida Broadband Authority
Into 2					
Case #	CCP Latitude (dec.deg)	CCP Longitude (dec.deg.)	Margin (dB)	Victim Rx Site	Licensee
181	32.74386761	79.90224412	32.9	9JK0412A	T-Mobile License LLC
502	30.40260658	81.42032269	28.1	CROSS	South Carolina Public Service Authority
520	30.38049216	81.44818242	26.3	ELIZABETHTWN	UNIVERSITY OF NORTH CAROLINA
683	30.40255464	81.57821849	10.3	072-292	New Cingular Wireless PCS LLC- WV/NC/SC
622	30.40800028	81.58199972	6.3	BOLTON	USCOC of North Carolina RSA #7, Inc.
360	30.40800028	81.58199972	3.5	WILDWOOD PD	Sumter County Board of County Commission

Table 2 - ESV CCP Locations
See Interference Analysis for Exclusion Zone Details

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 Skjei Telecom, Inc. 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 PCN letter dated 2/9/2016

Company

APEX Broadcasting, Inc.
AT&T COMMON SYSTEMS
AT&T Common Sys
AT&T Common Sys's
AT&T Common Systems
BRYAN COUNTY SHERIFF'S DEPARTMENT
Beaufort County, South Carolina
Bigbie Electronics, Inc.
Charleston, County of
Duke Energy
Duke Energy Business Svcs LLC
Effingham County Board of County Commiss
Florence, County of
Hargray Telephone Company, Inc.
Liberty County
SANTEE ELECTRIC COOPERATIVE INC.
Savannah, City of
South Carolina Electric & Gas Company
Tri-County Electric Cooperative
UNITED TELECOM COUNCIL
Citicasters Licenses, Inc.
Alltel Communications LLC - Georgia
Bellsouth Telecommunications, Inc.
Clear Channel Broadcasting Licenses, Inc
Conterra Ultra Broadband, LLC
Duke Energy Business Services, LLC.
New Cingular Wireless PCS LLC - Georgia
New Cingular Wireless PCS LLC-WV/NC/SC
New Cingular Wireless PCS, LLC
South Carolina Public Service Authority

Skjei Telecom, Inc.

Sprintcom, Inc
SunCom Wireless Company, LLC
T-Mobile License LLC
USCOC of South Carolina RSA #4, Inc.
Verizon Wireless (VAW) LLC (Georgia)
Verizon Wireless (VAW) LLC-NC&SC Mkts
Verizon Wireless of The East LP - (GA)
Verizon Wireless of the East, LP (SC)
Berkeley Electric Cooperative, Inc.
SunCom Wireless Company, LLC
T-Mobile License LLC
Berkeley Electric Cooperative, 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. The coordination contours include all the area within this route as well as all of the area seaward of this route within 200 km of the baseline of the United States or 200 km from any fixed service offshore installations."

Skjei Telecom, Inc.

Date:	02/09/2016
Job Number:	160209SKJTEL14

Administrative Information	
Status	ENGINEER PROPOSAL
Call Sign	
Licensee Code	SPACLK
Licensee Name	Harris CapRock Communications

Site Information	**CHARLESTON, SC**
Venue Name	
Latitude (NAD 83)	32° 46' 28.6" N
Longitude (NAD 83)	79° 55' 25.0" W
Climate Zone	B
Rain Zone	1
Ground Elevation (AMSL)	0.0 m / 0.0 ft

Link Information	
Satellite Type	Geostationary
Mode	TO - Transmit-Only
Modulation	Digital
Satellite Arc	89° W to 97° West Longitude
Azimuth Range	196.4° to 209.6°
Corresponding Elevation Angles	50.6° / 47.6°
Antenna Centerline (AGL)	15.54 m / 51.0 ft

Antenna Information		**Transmit - FCC32**
Manufacturer		FCC REFERENCE
Model		32-25LOG(THETA)
Gain / Diameter		41.7 dBi / 2.4 m
3-dB / 15-dB Beamwidth		0.66° / 1.18°
Max Available RF Power	(dBW/4 kHz)	-9.0
	(dBW/MHz)	15.0
Maximum EIRP	(dBW/4 kHz)	32.7
	(dBW/MHz)	56.7
	(dBW)	60.5
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)	3M75G7D - 7M50G7D / 6067.3785 - 6076.0035
	3M75G7D - 7M50G7D / 6076.7555 - 6085.3805
	3M75G7D - 7M50G7D / 6086.3125 - 6095.6875
	3M75G7D - 7M50G7D / 6096.3125 - 6105.6875
	3M75G7D - 7M50G7D / 6387.003 - 6423.003

Max Great Circle Coordination Distance	167.8 km / 104.2 mi
Precipitation Scatter Contour Radius	100.0 km / 62.1 mi

Skjei Telecom, Inc.

Coordination Values	**CHARLESTON, SC**
Licensee Name	Harris CapRock Communications
Latitude (NAD 83)	32° 46' 28.6" N
Longitude (NAD 83)	79° 55' 25.0" W
Ground Elevation (AMSL)	0.0 m / 0.0 ft
Antenna Centerline (AGL)	15.54 m / 51.0 ft
Antenna Model	FCC Reference 32-25LOG(THETA)
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	-9.0 (dBW/4 kHz)

			Transmit 6.1 GHz	
Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Horizon Gain (dBi)	Coordination Distance (km)
0	0.00	125.87	-10.00	167.52
5	0.00	127.79	-10.00	167.52
10	0.00	129.08	-10.00	167.52
15	0.00	129.36	-10.00	167.52
20	0.00	129.29	-10.00	167.52
25	0.00	128.86	-10.00	167.52
30	0.00	128.08	-10.00	167.52
35	0.00	126.97	-10.00	167.52
40	0.00	125.56	-10.00	167.52
45	0.00	123.86	-10.00	167.52
50	0.00	121.92	-10.00	167.52
55	0.00	119.74	-10.00	167.52
60	0.00	117.37	-10.00	167.52
65	0.00	114.83	-10.00	167.52
70	0.00	112.14	-10.00	167.52
75	0.00	109.32	-10.00	167.52
80	0.00	106.41	-10.00	167.52
85	0.00	103.41	-10.00	167.52
90	0.00	100.34	-10.00	167.52
95	0.00	97.23	-10.00	167.52
100	0.00	94.08	-10.00	167.52
105	0.00	90.91	-10.00	167.52
110	0.00	87.74	-10.00	167.52
115	0.00	84.58	-10.00	167.52
120	0.00	81.44	-10.00	167.52
125	0.00	78.35	-10.00	167.52
130	0.00	75.31	-10.00	167.52
135	0.00	72.34	-10.00	167.52
140	0.00	69.47	-10.00	167.52
145	0.00	66.70	-10.00	167.52
150	0.00	64.07	-10.00	167.52
155	0.00	61.60	-10.00	167.52
160	0.00	59.31	-10.00	167.52
165	0.00	57.23	-10.00	167.52
170	0.00	55.38	-10.00	167.52
175	0.00	53.81	-10.00	167.52
180	0.00	52.52	-10.00	167.52
185	0.00	51.55	-10.00	167.52

Skjei Telecom, Inc.

Coordination Values	**CHARLESTON, SC**
Licensee Name	Harris CapRock Communications
Latitude (NAD 83)	32° 46' 28.6" N
Longitude (NAD 83)	79° 55' 25.0" W
Ground Elevation (AMSL)	0.0 m / 0.0 ft
Antenna Centerline (AGL)	15.54 m / 51.0 ft
Antenna Model	FCC Reference 32-25LOG(THETA)
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	-9.0 (dBW/4 kHz)

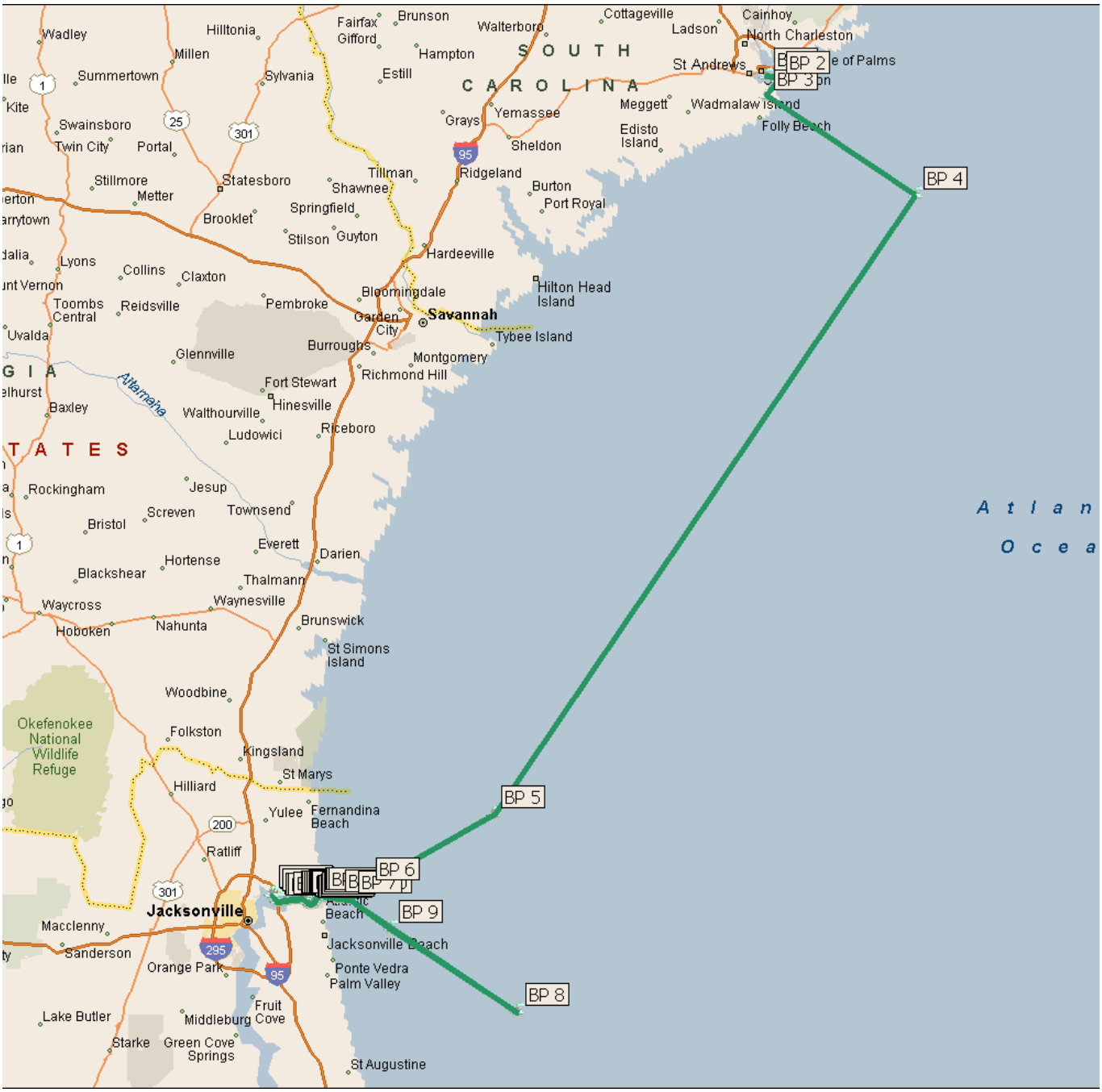
Transmit 6.1 GHz

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Horizon Gain (dBi)	Coordination Distance (km)
190	0.00	50.57	-10.00	167.52
195	0.00	49.30	-10.00	167.52
200	0.00	48.36	-10.00	167.52
205	0.00	47.81	-9.99	167.58
210	0.00	47.64	-9.95	167.75
215	0.00	47.88	-10.00	167.52
220	0.00	48.50	-10.00	167.52
225	0.00	49.50	-10.00	167.52
230	0.00	50.85	-10.00	167.52
235	0.00	52.52	-10.00	167.52
240	0.00	54.48	-10.00	167.52
245	0.00	56.70	-10.00	167.52
250	0.00	59.14	-10.00	167.52
255	0.00	61.78	-10.00	167.52
260	0.00	64.58	-10.00	167.52
265	0.00	67.52	-10.00	167.52
270	0.00	70.58	-10.00	167.52
275	0.00	73.73	-10.00	167.52
280	0.00	76.96	-10.00	167.52
285	0.00	80.24	-10.00	167.52
290	0.00	83.57	-10.00	167.52
295	0.00	86.92	-10.00	167.52
300	0.00	90.29	-10.00	167.52
305	0.00	93.66	-10.00	167.52
310	0.00	97.01	-10.00	167.52
315	0.00	100.33	-10.00	167.52
320	0.00	103.60	-10.00	167.52
325	0.00	106.82	-10.00	167.52
330	0.00	109.95	-10.00	167.52
335	0.00	112.99	-10.00	167.52
340	0.00	115.91	-10.00	167.52
345	0.00	118.68	-10.00	167.52
350	0.00	121.29	-10.00	167.52
355	0.00	123.70	-10.00	167.52

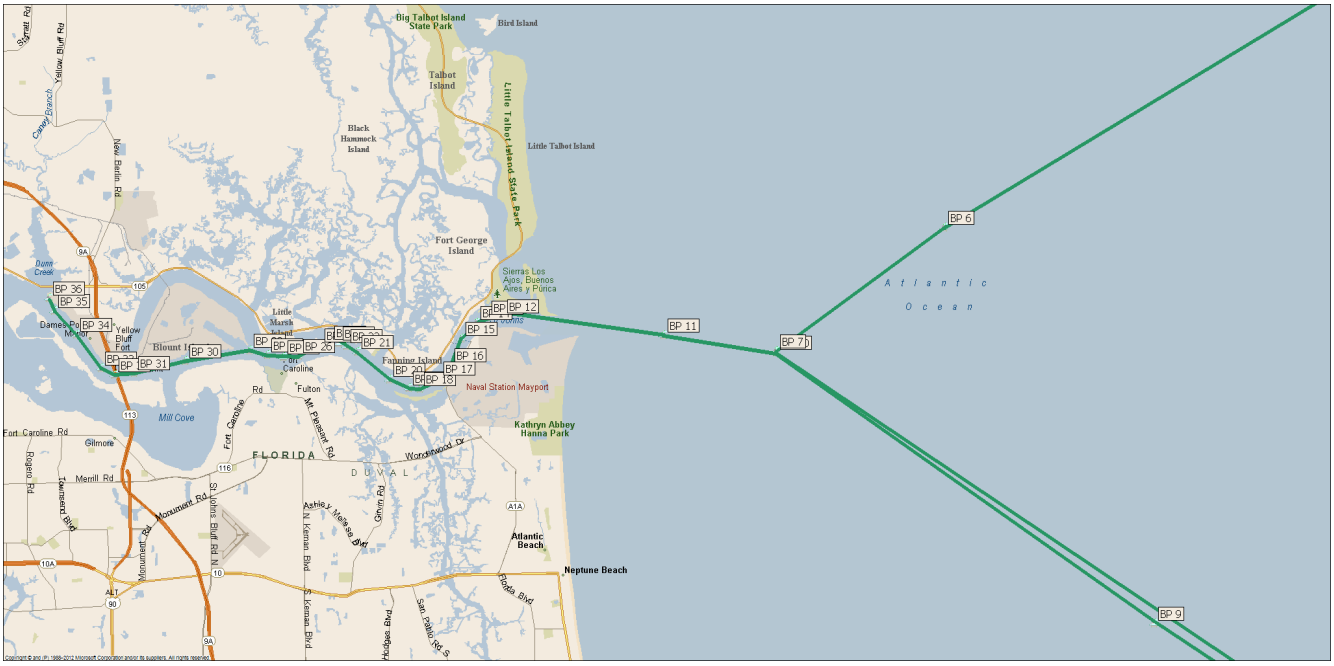
Skjei Telecom, Inc.

Name	Latitude	Longitude
BP 36	30.408	-81.582
BP 35	30.4042	-81.58
BP 34	30.397	-81.5722
BP 33	30.3867	-81.5633
BP 32	30.3847	-81.5583
BP 31	30.3852	-81.5513
BP 30	30.38886	-81.5327889
BP 29	30.3922	-81.5097
BP 28	30.3907	-81.5032
BP 27	30.3902	-81.4975
BP 26	30.3905	-81.4918
BP 25	30.3938	-81.484
BP 24	30.3947	-81.4805
BP 23	30.3945	-81.4775
BP 22	30.3937	-81.4747
BP 21	30.3918	-81.4708
BP 20	30.3833	-81.4592
BP 19	30.3808	-81.4522
BP 18	30.3805	-81.4482
BP 17	30.3837	-81.4413
BP 16	30.3878	-81.4373
BP 15	30.3958	-81.4332
BP 14	30.4007	-81.428
BP 13	30.4023	-81.4238
BP 12	30.4028	-81.4182
BP 11	30.397	-81.3605
BP 10	30.3917	-81.32
BP 9	30.30879	-81.18379
BP 8	30.06922	-80.76151
BP 7	30.39213	-81.32007
BP 6	30.4298	-81.25929
BP 5	30.64204	-80.84249
BP 4	32.42562	-79.41736
BP 3	32.71675	-79.92583
BP 2	32.76541	-79.88221
BP 1	32.7746	-79.9236

Skjei Telecom, Inc.



Skjei Telecom, Inc.



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: 

Ken Ryan, P.E.
Principal Engineer
Skjei Telecom, Inc.
7777 Leesburg Pike, Suite 315N
Falls Church, VA 22043

DATED: April 18, 2016

Skjei Telecom, Inc.

ANNEX IV: HONOLULU

FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for
Harris Caprocks Communication, Inc.
Honolulu, HI
Satellite Earth Station on Vessel (ESV)

Prepared By:
Skjei Telecom, Inc.
7777 Leesburg Pike, Suite 315N
Falls Church, VA 22043
April 18, 2016

Skjei Telecom, Inc.

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. There will be spectrum restrictions 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. The Critical Contour Point method of determining worst case interference from the route and port sites was the interference method used. 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. In those cases were OH losses did not resolve the interference the ESV will mute transmission within an exclusion zone sufficient in size to preclude interference. Also note, that there are no unresolved coordination requests which would result in an exceedance of the maximum 180 megahertz of coordinated spectrum for all ESV operations in the coordination area in the 5925-6425 MHz band.

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-only earth station. The ESV will employ a GPS sensitive ability to cease transmission when traveling in certain exclusion zones. The interference cases and the location of the critical contour point (CCP), around which the exclusion zones exist are detailed in the tables below.

Company

HONOLULU CITY & COUNTY
DEPT OF INFO TECH
Harmer Radio and Electronics,
Inc.
HAWAII COUNTY OF
Hawaii State
Hawaiian Telcom, Inc.
HONOLULU CITY & COUNTY
DEPT OF INFO TECH
LIN License Company, LLC
Maui, County of
New Cingular Wireless PCS LLC
- Hawaii
Oceanic Time Warner Cable
LLC
Servpac, Inc
University of Hawaii

Skjei Telecom, Inc.

Verizon Wireless VAW LLC -
(Hawaii)

Skjei Telecom, Inc.

Site	Honolulu														
Desired Frequencies (MHz)		6347.1 - 6351.6	6356.5 - 6379.788	6067.3785 - 6076.0035	6076.7555 - 6085.3805	6086.3125 - 6095.6875	6096.3125 - 6105.6875								
Into1															
								Frequencies Affected							
50	43.3	Y	Y					6345.49	0	0	0	0	0	0	
54	40.8	Y	Y					6286.19	6315.84	6345.49	6375.14	0	0	0	
55	40.8	Y	Y					6286.19	6315.84	6345.49	6375.14	0	0	0	
156	40.2	Y	Y					6271.365	6330.665	0	0	0	0	0	
35	38.7			Y	Y			6063.8	0	0	0	0	0	0	
173	38.7			Y	Y			6063.8	0	0	0	0	0	0	
69	38.0	Y	Y					6226.89	6286.19	6345.49	6404.79	0	0	0	
148	36.9	Y	Y					6212.065	6330.665	0	0	0	0	0	
127	35.1				Y	Y	Y	6034.15	6093.45	6123.1	6152.75	0	0	0	
25	33.8			Y	Y			6063.8	0	0	0	0	0	0	
77	33.0	Y	Y					6345.49	0	0	0	0	0	0	
158	32.2				Y	Y	Y	6093.45	6123.1	0	0	0	0	0	
53	29.6			Y	Y			6004.5	6063.8	0	0	0	0	0	
13	28.7		Y					6382.5525	0	0	0	0	0	0	
100	24.8	Y	Y					6345.49	0	0	0	0	0	0	
128	18.6	Y	Y					6345.49	0	0	0	0	0	0	
92	15.9	Y	Y					6345.49	6404.79	0	0	0	0	0	
124	15.1			Y	Y			6063.8	0	0	0	0	0	0	
66	9.9			Y	Y			6063.8	0	0	0	0	0	0	
153	7.7		Y					6375.14	0	0	0	0	0	0	
90	5.0		Y					6375.14	0	0	0	0	0	0	
137	5.0		Y					6375.14	0	0	0	0	0	0	
126	3.0				Y	Y	Y	6093.45	6123.1	0	0	0	0	0	
169	1.9		Y					6375.14	0	0	0	0	0	0	
143	1.4			Y	Y			6063.8	0	0	0	0	0	0	
123	0.5			Y	Y			6063.8	0	0	0	0	0	0	
Desired Frequencies (MHz)		6347.1 - 6351.6	6356.5 - 6379.788	6067.3785 - 6076.0035	6076.7555 - 6085.3805	6086.3125 - 6095.6875	6096.3125 - 6105.6875								

Skjei Telecom, Inc.

Into 2															
Case #	Margin(dB)							Frequencies Affected							
148	56.8			Y	Y	Y	Y	5960.025	6078.625	0	0	0	0	0	
54	42.2			Y	Y	Y	Y	6034.15	6063.8	6093.45	6123.1	0	0	0	
55	42.2			Y	Y	Y	Y	6034.15	6063.8	6093.45	6123.1	0	0	0	
156	42.1			Y	Y	Y	Y	6019.325	6078.625	0	0	0	0	0	
127	41.8	Y	Y					6286.19	6345.49	6375.14	6404.79	0	0	0	
24	40.3		Y					6375.14	0	0	0	0	0	0	
158	39.1	Y	Y					6345.49	6375.14	0	0	0	0	0	
4	36.6			Y	Y	Y		5952.6125	6071.2125	0	0	0	0	0	
115	31.2			Y	Y			6063.8	6123.1	0	0	0	0	0	
113	30.5		Y					6375.14	0	0	0	0	0	0	
9	30.0						Y	5997.0875	6115.687	0	0	0	0	0	
79	29.3			Y	Y	Y	Y	6034.15	6063.8	6093.45	6123.1	6152.75	0	0	
96	28.2				Y	Y	Y	6093.45	0	0	0	0	0	0	
10	28.0				Y	Y	Y	6093.45	6152.75	0	0	0	0	0	
36	27.9			Y	Y			6063.8	0	0	0	0	0	0	
130	27.9			Y	Y			6063.8	0	0	0	0	0	0	
1	27.6				Y	Y	Y	6100.8625	0	0	0	0	0	0	
128	27.2				Y	Y	Y	6093.45	0	0	0	0	0	0	
150	27.2			Y	Y			5945.2	6063.8	0	0	0	0	0	
172	27.2			Y	Y			5945.2	6063.8	0	0	0	0	0	
116	24.9			Y	Y			6063.8	0	0	0	0	0	0	
126	22.7	Y	Y					6345.49	6375.14	0	0	0	0	0	
91	15.1				Y	Y	Y	6093.45	6152.75	0	0	0	0	0	
93	14.3			Y	Y	Y	Y	6093.45	6152.75	0	0	0	0	0	
81	7.7			Y	Y			6063.8	0	0	0	0	0	0	
12	0.5		Y					6256.54	6315.84	6375.14	0	0	0	0	
149	0.5	Y	Y					6197.24	6226.89	6256.54	6286.19	6315.84	6345.49	6375.14	6
69	0.4				Y	Y	Y	5974.85	6034.15	6093.45	6152.75	0	0	0	
138	0.1			Y	Y			5974.85	6063.8	0	0	0	0	0	

Table 1 – ESV Interference Cases

Skjei Telecom, Inc.

Interference Zones

Into1 Case #	CCP Latitude (dec.deg)	CCP Longitude (dec.deg.)	Margin (dB)	Victim Rx Site	Licensee
50	21.30139573	157.8637614	43.3	ROUND TOP	HONOLULU CITY & COUNTY DEPT OF INFO TECH
54	20.98641345	156.9567789	40.8	KUALAPUU	Hawaiian Telcom, Inc.
55	20.98641345	156.9567789	40.8	KUALAPUU	Hawaiian Telcom, Inc.
156	21.31206994	157.8670955	40.2	CENTRAL OFC	Servpac, Inc
35	20.7941975	156.6752142	38.7	PUU KILEA	University of Hawaii
173	20.7941975	156.6752142	38.7	PUU KILEA	University of Hawaii
69	20.48138774	156.2053162	38.0	HALEAKALA	Hawaiian Telcom, Inc.
148	21.31006849	157.8630944	36.9	MILLIANI	LIN License Company, LLC
127	20.89973924	156.764653	35.1	LANAI HALE	Oceanic Time Warner Cable LLC
25	20.41440033	155.9678687	33.8	HUEHUE	Hawaiian Telcom, Inc.
77	21.14414697	157.5485165	33.0	KAILUA PS	HONOLULU CITY & COUNTY DEPT OF INFO TECH
158	20.38948642	155.8799053	32.2	HANA	Verizon Wireless VAW LLC - (Hawaii)
53	20.20078146	155.4196897	29.6	PUU ANAHULU	New Cingular Wireless PCS LLC - Hawaii
13	21.31006849	157.8630944	28.7	BISHOP	Hawaiian Telcom, Inc.
100	19.73371755	155.075262	24.8	WAIMEA	New Cingular Wireless PCS LLC - Hawaii
128	20.35491496	155.7581531	18.6	NINOLE	New Cingular Wireless PCS LLC - Hawaii
92	20.50798405	156.2999735	15.9	PUU LUAU P1	Maui, County of
124	20.60193998	156.5001326	15.1	HALEAKALA RP	Oceanic Time Warner Cable LLC
66	19.72820577	155.0549257	9.9	PSB	HAWAII COUNTY OF
153	19.73250647	155.0658068	7.7	HUMUULA	Hawaii State
90	20.95514834	156.8405472	5.0	PUU NANA	Hawaii State
137	20.95514834	156.8405472	5.0	PUU NANA	Hawaii State
126	19.87564168	155.0374525	3.0	KOHALA	Hawaiian Telcom, Inc.
169	19.72820577	155.0549257	1.9	HUMUULA	Hawaii State
143	19.72820577	155.0549257	1.4	KAUPULE ICSD	Hawaii State
123	20.75423134	156.6437662	0.5	HANA AIRPORT	Oceanic Time Warner Cable LLC
Into2 Case #	CCP Latitude (dec.deg)	CCP Longitude (dec.deg.)	Margin (dB)	Victim Rx Site	Licensee
148	21.31006849	157.8630944	56.8	KHON STUDIO	LIN License Company, LLC
54	20.98641345	156.9567789	42.2	PUU KILEA	Hawaiian Telcom, Inc.
55	20.98641345	156.9567789	42.2	PUU KILEA	Hawaiian Telcom, Inc.
156	21.31206994	157.8670955	42.1	FACILITY TWR	Servpac, Inc
127	20.89973924	156.764653	41.8	MAUI	Oceanic Time Warner Cable LLC

Skjei Telecom, Inc.

24	20.41440033	155.9678687	40.3	HANA	Hawaiian Telcom, Inc.
158	20.38948642	155.8799053	39.1	HAWI	Verizon Wireless VAW LLC - (Hawaii)
4	19.73406306	155.0757523	36.6	KULANI CONE	Hawaiian Telcom, Inc.
115	20.86287268	156.6751325	31.2	PUU MAHOE	Maui, County of
113	20.79488015	156.6755893	30.5	MAUI	Harmer Radio and Electronics, Inc.
9	20.22340555	155.4642167	30.0	HUEHUE	Hawaiian Telcom, Inc.
79	21.31206994	157.8670955	29.3	PUU NANA	Hawaiian Telcom, Inc.
96	20.33677613	155.6944153	28.2	KAUPULE ICSD	Hawaii State
10	20.22340555	155.4642167	28.0	HUEHUE	Hawaiian Telcom, Inc.
36	20.47384494	156.1785109	27.9	KAUPULEHU	University of Hawaii
130	20.47395591	156.1789051	27.9	KAUPULE ICSD	University of Hawaii
1	20.20434822	155.4267072	27.6	PAHOA	Hawaiian Telcom, Inc.
128	19.82794677	155.0520556	27.2	OOKALA	New Cingular Wireless PCS LLC - Hawaii
150	20.22422208	155.4658243	27.2	HUALALAI	New Cingular Wireless PCS LLC - Hawaii
172	20.22422208	155.4658243	27.2	HUALALAI	New Cingular Wireless PCS LLC - Hawaii
116	20.33329786	155.6822042	24.9	MOANUIAHEA	Hawaii State
126	20.55129915	156.4546047	22.7	HONOKAA	Hawaiian Telcom, Inc.
91	20.60049562	156.4988335	15.1	PUU LUAU P1	Maui, County of
93	20.75437528	156.6439028	14.3	HANA	Maui, County of
81	21.31206994	157.8670955	7.7	PUU MANAWAHU	HONOLULU CITY & COUNTY DEPT OF INFO TECH
12	20.86804386	156.6853014	0.5	HALEAKALA	Hawaiian Telcom, Inc.
149	20.86804386	156.6853014	0.5	HALEAKALA	Hawaiian Telcom, Inc.
69	20.48138774	156.2053162	0.4	KONA BASE Y	Hawaiian Telcom, Inc.
138	20.95311516	156.8330005	0.1	USCG HALEAKA	Hawaii State

Table 2 - ESV CCP Locations
See Interference Analysis for Exclusion Zone Details

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 Skjei Telecom, Inc. 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 PCN letter dated 2/9/2016

Company

ACD Telecom Inc
CSI Telecommunications, Inc.
Harmer Radio and Electronics, Inc.
Hawaiian Telcom, Inc.
New Cingular Wireless PCS LLC - Hawaii
Sandwich Isles Communications, Inc
Servpac, Inc
Hawaii State
Hawaiian Telcom, Inc.
LIN License Company, LLC
Maui, County of
New Cingular Wireless PCS LLC - Hawaii
Oceanic Time Warner Cable LLC
University of Hawaii
HONOLULU CITY & COUNTY DEPT OF
INFO TECH
AT&T Corporation

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. The coordination contours include all the area within this route as well as all of the area seaward of this route within 200 km of the baseline of the United States or 200 km from any fixed service offshore installations."

Skjei Telecom, Inc.

Date:	02/09/2016
Job Number:	160209SKJTEL09

Administrative Information	
Status	ENGINEER PROPOSAL
Call Sign	
Licensee Code	SPACLK
Licensee Name	Harris CapRock Communications

Site Information	**HONOLULU, HI**
Venue Name	
Latitude (NAD 83)	21° 18' 10.2" N
Longitude (NAD 83)	157° 52' 1.2" W
Climate Zone	B
Rain Zone	4
Ground Elevation (AMSL)	0.0 m / 0.0 ft

Link Information	
Satellite Type	Geostationary
Mode	TO - Transmit-Only
Modulation	Digital
Satellite Arc	97° W to 129° West Longitude
Azimuth Range	101.4° to 123.4°
Corresponding Elevation Angles	18.7° / 49.0°
Antenna Centerline (AGL)	15.54 m / 51.0 ft

Antenna Information		**Transmit - FCC32**
Manufacturer		FCC REFERENCE
Model		32-25LOG(THETA)
Gain / Diameter		41.7 dBi / 2.4 m
3-dB / 15-dB Beamwidth		0.66° / 1.18°
Max Available RF Power	(dBW/4 kHz)	-13.0
	(dBW/MHz)	11.0
Maximum EIRP	(dBW/4 kHz)	28.7
	(dBW/MHz)	52.7
	(dBW)	60.5
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)	3M75G7D - 7M50G7D / 6067.3785 - 6076.0035
	3M75G7D - 7M50G7D / 6076.7555 - 6085.3805
	3M75G7D - 7M50G7D / 6086.3125 - 6095.6875
	3M75G7D - 7M50G7D / 6096.3125 - 6105.6875
	2M50G7D - 7M50G7D / 6347.1 - 6351.6
	2M50G7D - 7M50G7D / 6356.5 - 6379.788
Max Great Circle Coordination Distance	174.2 km / 108.2 mi
Precipitation Scatter Contour Radius	100.0 km / 62.1 mi

Skjei Telecom, Inc.

Coordination Values	**HONOLULU, HI**
Licensee Name	Harris CapRock Communications
Latitude (NAD 83)	21° 18' 10.2" N
Longitude (NAD 83)	157° 52' 1.2" W
Ground Elevation (AMSL)	0.0 m / 0.0 ft
Antenna Centerline (AGL)	15.54 m / 51.0 ft
Antenna Model	FCC Reference 32-25LOG(THETA)
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	-13.0 (dBW/4 kHz)

			Transmit 6.1 GHz	
Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Horizon Gain (dBi)	Coordination Distance (km)
0	2.58	100.99	-10.00	100.00
5	3.30	96.22	-10.00	100.00
10	3.18	91.40	-10.00	100.00
15	2.79	86.59	-10.00	100.00
20	3.37	81.76	-10.00	100.00
25	3.66	76.92	-10.00	100.00
30	4.29	72.06	-10.00	100.00
35	4.02	67.27	-10.00	100.00
40	2.30	62.72	-10.00	100.00
45	3.06	57.85	-10.00	100.00
50	4.23	52.89	-10.00	100.00
55	4.27	48.15	-10.00	100.00
60	4.72	43.35	-8.92	100.00
65	3.90	38.96	-7.77	100.00
70	3.82	34.48	-6.44	100.00
75	3.66	30.17	-4.99	100.00
80	2.41	26.72	-3.67	100.00
85	2.77	22.77	-1.94	100.00
90	2.20	20.02	-0.54	100.00
95	1.61	18.27	0.46	108.79
100	1.03	17.77	0.76	121.69
105	0.47	18.60	0.26	158.00
110	0.33	20.24	-0.65	174.20
115	0.43	22.64	-1.87	153.53
120	0.37	25.88	-3.32	155.05
125	0.65	29.38	-4.70	125.43
130	1.30	33.07	-5.99	100.00
135	0.00	37.89	-7.46	160.79
140	0.00	42.17	-8.63	155.68
145	0.00	46.35	-9.65	151.36
150	0.00	50.36	-10.00	149.93
155	0.00	54.14	-10.00	149.93
160	0.00	57.59	-10.00	149.93
165	0.00	60.59	-10.00	149.93
170	0.00	63.20	-10.00	149.93
175	0.00	65.95	-10.00	149.93
180	0.00	68.83	-10.00	149.93
185	0.00	71.82	-10.00	149.93

Skjei Telecom, Inc.

Coordination Values	**HONOLULU, HI**
Licensee Name	Harris CapRock Communications
Latitude (NAD 83)	21° 18' 10.2" N
Longitude (NAD 83)	157° 52' 1.2" W
Ground Elevation (AMSL)	0.0 m / 0.0 ft
Antenna Centerline (AGL)	15.54 m / 51.0 ft
Antenna Model	FCC Reference 32-25LOG(THETA)
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	-13.0 (dBW/4 kHz)

Transmit 6.1 GHz

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Horizon Gain (dBi)	Coordination Distance (km)
190	0.00	74.90	-10.00	149.93
195	0.00	78.05	-10.00	149.93
200	0.00	81.26	-10.00	149.93
205	0.00	84.51	-10.00	149.93
210	0.00	87.78	-10.00	149.93
215	0.00	91.06	-10.00	149.93
220	0.00	94.33	-10.00	149.93
225	0.00	97.59	-10.00	149.93
230	0.00	100.81	-10.00	149.93
235	0.00	103.99	-10.00	149.93
240	0.00	107.10	-10.00	149.93
245	0.00	110.12	-10.00	149.93
250	0.00	113.04	-10.00	149.93
255	0.00	115.84	-10.00	149.93
260	0.00	118.49	-10.00	149.93
265	0.00	120.96	-10.00	149.93
270	0.00	123.23	-10.00	149.93
275	0.00	125.27	-10.00	149.93
280	0.00	127.04	-10.00	149.93
285	0.00	128.52	-10.00	149.93
290	0.00	129.68	-10.00	149.93
295	0.00	130.49	-10.00	149.93
300	0.00	130.93	-10.00	149.93
305	0.00	131.00	-10.00	149.93
310	0.00	130.69	-10.00	149.93
315	0.32	130.31	-10.00	135.89
320	0.68	129.60	-10.00	111.21
325	0.00	127.60	-10.00	149.93
330	0.60	126.43	-10.00	114.86
335	0.57	124.37	-10.00	116.57
340	0.82	119.76	-10.00	104.25
345	1.30	115.15	-10.00	100.00
350	1.88	110.48	-10.00	100.00
355	2.41	105.77	-10.00	100.00

Skjei Telecom, Inc.

Name	Latitude	Longitude
N1	21.8667	-158.3333
N2	21.9417	-159.1667
N3	21.945	-159.3
N4-Pilot	21.9525	-159.3363
N5	21.9545	-159.3463
N6	21.9543	-159.3482
N7	21.9535	-159.35
N8	21.9523	-159.3518
N9	21.9523	-159.3547
N10-P1P2	21.9547	-159.3547
N11-P3	21.9518	-159.3582
N12	21.953	-159.3515
N13	21.9535	-159.346
N14	21.9545	-159.3423
N15	21.9513	-159.3372
N16	21.9517	-159.2917
N17	22.1333	-159.2383
N18	22.2167	-159.2767
N19	22.2767	-159.3667
N20	22.2833	-159.5
N21	22.27	-159.58
N22	22.1933	-159.6917
N23	22.2083	-159.7617
N24	22.1867	-159.8133
N25	22.1283	-159.845
N26	22.005	-159.845
N27	21.8933	-159.7283
N28	21.8483	-159.6617
N29	21.8183	-159.4533
N30	21.8333	-159.3033
N31	21.3333	-158.3467
Ho32	21.21	-158.13
Ho33	21.23	-157.9043
Ho34	21.28	-157.876
Ho35	21.30133	-157.8677
Ho36-P19	21.30283	-157.867
Ho37	21.3065	-157.8688
Ho38	21.31	-157.8671
Ho39	21.312	-157.8672
Ho40	21.31	-157.8672
Ho41-P10P11	21.30867	-157.865

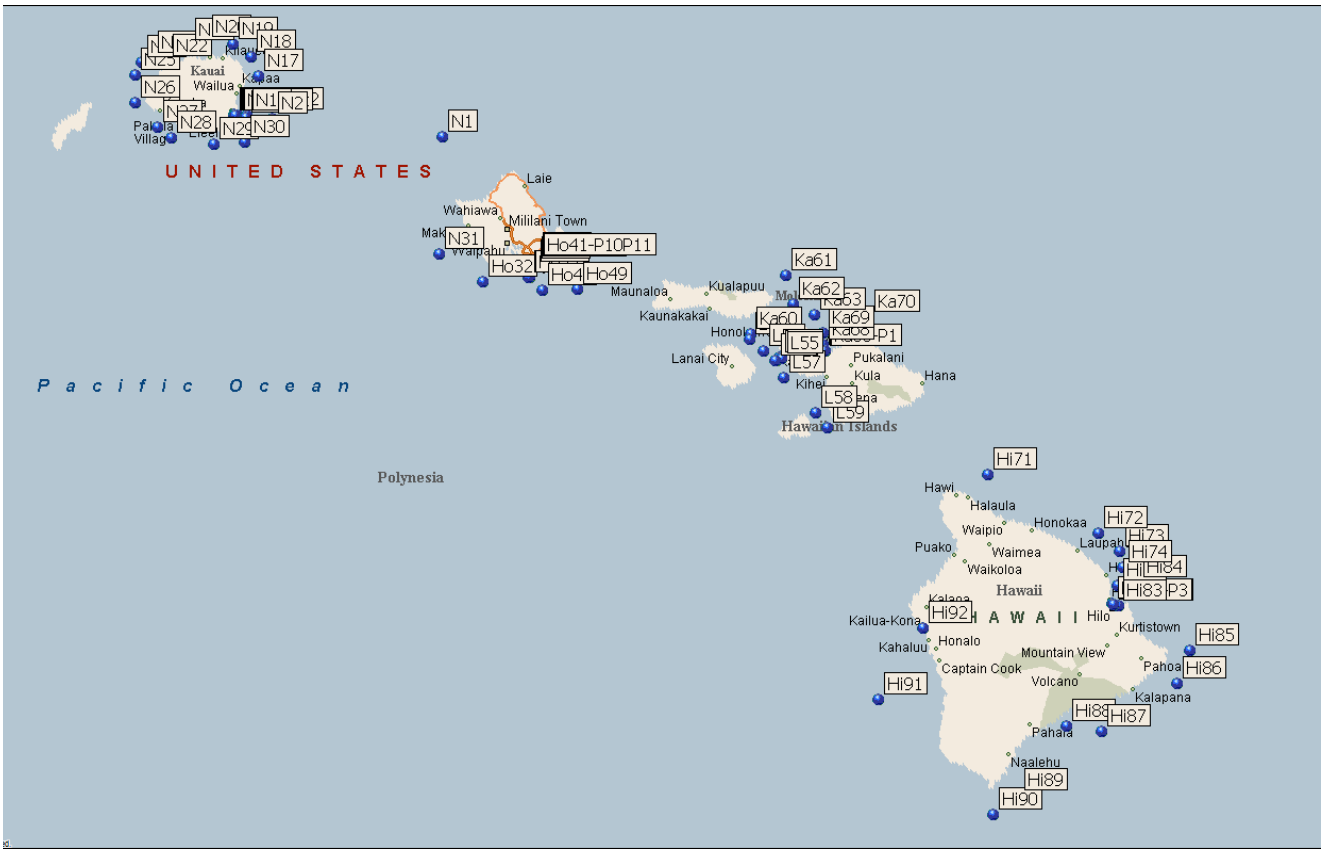
Skjei Telecom, Inc.

Ho42	21.307	-157.868
Ho43-P2	21.3025	-157.865
Ho44	21.30133	-157.8678
Ho45	21.29133	-157.8733
Ho46	21.28	-157.88
Ho47	21.23	-157.9083
Ho48	21.17167	-157.8417
Ho49	21.17667	-157.6717
L50	20.95333	-156.8333
L51	20.9	-156.765
L52	20.855	-156.7048
L53	20.86833	-156.6857
L54	20.87206	-156.6792
L55	20.86317	-156.6755
L56	20.855	-156.7088
L57	20.77833	-156.6667
L58	20.61667	-156.5133
L59	20.55183	-156.455
Ka60	20.97333	-156.8267
Ka61	21.24167	-156.655
Ka62	21.11167	-156.6207
Ka63	21.06167	-156.5183
Ka64	20.897	-156.4713
Ka65-P1	20.897	-156.4672
Ka66	20.8985	-156.4708
Ka67	20.9005	-156.4728
Ka68	20.92867	-156.4738
Ka69	20.9785	-156.477
Ka70	21.05333	-156.25
Hi71	20.33333	-155.68
Hi72	20.06167	-155.145
Hi73	19.97667	-155.0467
Hi74	19.90333	-155.03
Hi75	19.82167	-155.055
Hi76	19.743	-155.0812
Hi77	19.73833	-155.0803
Hi78	19.73517	-155.0758
Hi79	19.73317	-155.0602
Hi80-P1	19.73083	-155.0545
Hi81-P2	19.73017	-155.055
Hi82-P3	19.72967	-155.0555
Hi83	19.73233	-155.0583

Skjei Telecom, Inc.

Hi84	19.83667	-154.9567
Hi85	19.525	-154.7133
Hi86	19.37667	-154.775
Hi87	19.16333	-155.1433
Hi88	19.19	-155.3117
Hi89	18.875	-155.5417
Hi90	18.79	-155.6667
Hi91	19.318	-156.213
Hi92	19.63929	-155.9963

Skjei Telecom, Inc.



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: 

Ken Ryan, P.E.
Principal Engineer
Skjei Telecom, Inc.
7777 Leesburg Pike, Suite 315N
Falls Church, VA 22043

DATED: April 18, 2016

Skjei Telecom, Inc.

ANNEX V: LOS ANGELES

FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for
Harris Caprocks Communication, Inc.
Los Angeles, CA
Satellite Earth Station on Vessel (ESV)

Prepared By:
Skjei Telecom, Inc.
7777 Leesburg Pike, Suite 315N
Falls Church, VA 22043
April 18, 2016

Skjei Telecom, Inc.

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. There will be spectrum restrictions 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. The Critical Contour Point method of determining worst case interference from the route and port sites was the interference method used. 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. In those cases were OH losses did not resolve the interference the ESV will mute transmission within an exclusion zone sufficient in size to preclude interference. Also note, that there are no unresolved coordination requests which would result in an exceedance of the maximum 180 megahertz of coordinated spectrum for all ESV operations in the coordination area in the 5925-6425 MHz band.

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-only earth station. The ESV will employ a GPS sensitive ability to cease transmission when traveling in certain exclusion zones. The interference cases and the location of the critical contour point (CCP), around which the exclusion zones exist are detailed in the tables below.

Company

California, State of
Calvary Chapel of Costa Mesa
Coast Community College District
LDM Engineering
Licensee
Licensee
Los Angeles SMSA Ltd. Partnership
Metropolitan Water Dist of So California
MHO Networks
New Cingular Wireless PCS LLC -San Diego
Northrop Grumman Systems Corp.
Orange, County of, CA
Pacific Bell Tel Com dba AT&T California
Riverside, County of
San Diego Broadband
San Diego Gas & Electric Company
San Diego, County of
Southern California Edison Company
Southern California Gas Company
Southern California Regional Rail Auth.
Turn Wireless, LLC
Verizon California Inc.
Verizon Wireless (VAW) LLC (Southern CA)

Skjei Telecom, Inc.

Site	Los Angeles														
Desired Frequencies (MHz)		6347.1 - 6351.6	6356.5 - 6379.788	6067.3785 - 6076.0035	6076.7555 - 6085.3805	6086.3125 - 6095.6875	6096.3125 - 6105.6875								
Into 1															
Case #	Margin(dB)							Frequencies Affected							
748	36.2			Y	Y			5974.85	6004.5	6063.8	0	0	0	0	
265	35.3		Y					6375.14	0	0	0	0	0	0	
478	35.3	Y	Y					6197.24	6345.49	0	0	0	0	0	
765	35.2				Y	Y	Y	5974.85	6093.45	6123.1	0	0	0	0	
38	34.3		Y					6375.14	0	0	0	0	0	0	
43	34.3	Y	Y					6345.49	0	0	0	0	0	0	
264	30.3	Y	Y					6345.49	0	0	0	0	0	0	
614	30.3	Y	Y					6345.49	0	0	0	0	0	0	
25	29.9	Y	Y					6345.49	0	0	0	0	0	0	
373	29.6			Y	Y			5974.85	6063.8	6123.1	6152.75	0	0	0	
334	29.4				Y	Y	Y	6093.45	0	0	0	0	0	0	
626	29.1			Y	Y			5974.85	6063.8	6123.1	6152.75	0	0	0	
245	28.3	Y	Y					6345.49	0	0	0	0	0	0	
155	28.1			Y	Y			6063.8	0	0	0	0	0	0	
14	26.7		Y					6375.14	0	0	0	0	0	0	
477	26.7	Y	Y					6197.24	6286.19	6345.49	0	0	0	0	
620	26.4				Y	Y	Y	6093.45	0	0	0	0	0	0	
531	26.3	Y	Y					6330.665	0	0	0	0	0	0	
640	26.3	Y	Y					6330.665	0	0	0	0	0	0	
645	26.3		Y					6375.14	0	0	0	0	0	0	
712	26.2		Y					6375.14	0	0	0	0	0	0	
45	26.1			Y	Y			6063.8	0	0	0	0	0	0	
982	24.8	Y	Y					6330.665	0	0	0	0	0	0	
310	24.7				Y	Y	Y	6093.45	0	0	0	0	0	0	
777	23.9		Y					6375.14	6404.79	0	0	0	0	0	
403	23.8				Y	Y	Y	6093.45	0	0	0	0	0	0	
618	23.8				Y	Y	Y	6093.45	0	0	0	0	0	0	

Skjei Telecom, Inc.

516	22.8	Y	Y					6345.49	6404.79	0	0	0	0	0	
653	22.8				Y	Y	Y	6004.5	6093.45	0	0	0	0	0	
575	22.6				Y	Y	Y	6093.45	6152.75	0	0	0	0	0	
553	22.5	Y	Y					6197.24	6345.49	0	0	0	0	0	
400	18.2	Y	Y					6197.24	6226.89	6256.54	6286.19	6315.84	6345.49	6375.14	6404.7
77	11.9				Y	Y	Y	6093.45	0	0	0	0	0	0	
715	9.5				Y	Y	Y	6093.45	0	0	0	0	0	0	
697	9.5				Y	Y	Y	6093.45	0	0	0	0	0	0	
98	5.7			Y	Y			6063.8	0	0	0	0	0	0	
774	1.1				Y	Y	Y	6093.45	0	0	0	0	0	0	
776	1.1			Y	Y			6004.5	6034.15	6063.8	0	0	0	0	
756	1.0	Y	Y					6256.54	6345.49	0	0	0	0	0	
96	0.6				Y	Y	Y	6093.45	0	0	0	0	0	0	
446	0.6				Y	Y	Y	6093.45	0	0	0	0	0	0	
768	0.6				Y	Y	Y	6093.45	0	0	0	0	0	0	
Desired Frequencies (MHz)		6347.1 - 6351.6	6356.5 - 6379.788	6067.3785 - 6076.0035	6076.7555 - 6085.3805	6086.3125 - 6095.6875	6096.3125 - 6105.6875								
Into 2															
Case #	Margin(dB)							Frequencies Affected							
765	37.5	Y	Y					6226.89	6345.49	6375.14	0	0	0	0	
438	33.4			Y	Y			6063.8	0	0	0	0	0	0	
23	32.7			Y	Y			6063.8	0	0	0	0	0	0	
726	30.4		Y					6375.14	0	0	0	0	0	0	
360	30.2			Y	Y			6063.8	0	0	0	0	0	0	
459	28.8			Y	Y			6063.8	0	0	0	0	0	0	
285	27.8				Y	Y	Y	6093.45	0	0	0	0	0	0	
82	27.3				Y	Y	Y	5974.85	6093.45	0	0	0	0	0	
145	26.9			Y	Y	Y	Y	5945.2	6004.5	6034.15	6063.8	6093.45	0	0	
435	26.6				Y	Y	Y	6093.45	0	0	0	0	0	0	
591	26.0		Y					6375.14	0	0	0	0	0	0	
770	25.9			Y	Y			6004.5	6034.15	6063.8	0	0	0	0	
648	25.0				Y	Y	Y	5974.85	6093.45	0	0	0	0	0	

205	24.4		Y					6377.61	0	0	0	0	0	0	
506	24.4		Y					6375.14	0	0	0	0	0	0	
636	23.9	Y	Y					6330.665	0	0	0	0	0	0	
121	23.6				Y	Y	Y	6093.45	0	0	0	0	0	0	
320	23.3	Y	Y					6197.24	6345.49	6375.14	0	0	0	0	
268	23.2		Y					6375.14	0	0	0	0	0	0	
269	23.2		Y					6375.14	0	0	0	0	0	0	
555	22.5	Y	Y					6345.49	0	0	0	0	0	0	
774	16.1	Y	Y					6345.49	0	0	0	0	0	0	
775	16.1		Y					6197.24	6226.89	6375.14	6404.79	0	0	0	
48	9.0			Y	Y			6063.8	0	0	0	0	0	0	
963	7.4		Y					6375.14	0	0	0	0	0	0	
446	6.0	Y	Y					6345.49	0	0	0	0	0	0	
768	5.5	Y	Y					6345.49	0	0	0	0	0	0	
96	5.0	Y	Y					6345.49	0	0	0	0	0	0	
37	4.0			Y	Y			6063.8	0	0	0	0	0	0	
400	2.6			Y	Y	Y	Y	5945.2	5974.85	6004.5	6034.15	6063.8	6093.45	6123.1	6152.7
166	0.9				Y	Y	Y	6093.45	0	0	0	0	0	0	
418	0.4				Y	Y	Y	5945.2	6004.5	6034.15	6093.45	0	0	0	
708	0.4				Y	Y	Y	5945.2	6004.5	6034.15	6093.45	0	0	0	

Table 1 – ESV Interference Cases

Skjei Telecom, Inc.

Interference Zones		Los Angeles			
Into 1					
Case #	CCP Latitude (dec.deg)	CCP Longitude (dec.deg.)	Margin (dB)	Victim Rx Site	Licensee
748	33.67915593	118.2184921	36.2	BLACK JACK	Verizon Wireless (VAW) LLC (Southern CA)
265	32.71666927	117.1749994	35.3	BLACK MTN	Verizon Wireless (VAW) LLC (Southern CA)
478	32.71666927	117.1749994	35.3	BLACK MTN	Verizon Wireless (VAW) LLC (Southern CA)
765	33.34547987	118.3144448	35.2	MT ADA	Verizon Wireless (VAW) LLC (Southern CA)
38	32.71666927	117.1749994	34.3	BLACK MTN	Verizon Wireless (VAW) LLC (Southern CA)
43	32.71666927	117.1749994	34.3	BLACK MTN	Verizon Wireless (VAW) LLC (Southern CA)
264	33.63475753	118.1762693	30.3	DIAMOND BAR	Los Angeles SMSA Ltd. Partnership
614	33.63475753	118.1762693	30.3	DIAMOND BAR	Los Angeles SMSA Ltd. Partnership
25	33.75198696	118.2706815	29.9	LOMA RIDGE	Orange, County of, CA
373	33.74314822	118.1831659	29.6	MT LUKENS	Los Angeles SMSA Ltd. Partnership
334	33.51485314	118.1267718	29.4	SUNSET RIDGE	Southern California Regional Rail Auth.
626	33.74314822	118.1831659	29.1	MT LUKENS	Los Angeles SMSA Ltd. Partnership
245	33.42208064	118.0866691	28.3	BOLERO PEAK	Orange, County of, CA
155	33.74314822	118.1831659	28.1	MT LUKENS	Los Angeles SMSA Ltd. Partnership
14	32.61881007	117.2450071	26.7	LOS PINOS	San Diego, County of
477	33.54888687	118.1415068	26.7	COLTON	Los Angeles SMSA Ltd. Partnership
620	32.90150319	117.9354643	26.4	BOUCHER HILL	California, State of
531	33.39589221	118.0753654	26.3	LA HABRA	Coast Community College District
640	33.39589221	118.0753654	26.3	LA HABRA	Coast Community College District
645	32.61225796	117.2479628	26.3	LOS PINOS	San Diego, County of
712	32.61881007	117.2450071	26.2	LOS PINOS	San Diego, County of
45	33.39043468	118.0730107	26.1	MT WOODSON	San Diego Gas & Electric Company
982	33.7526522	118.1868335	24.8	PLANT 42	Northrop Grumman Systems Corp.
310	32.57006307	117.2669859	24.7	MONUMENT PK	San Diego Gas & Electric Company
777	33.38438146	118.0703994	23.9	LAKE ELSINOR	MHO Networks
403	33.74781866	118.2758489	23.8	FROST PEAK	Southern California Edison Company
618	33.74781866	118.2758489	23.8	FROST PEAK	Southern California Edison Company

Skjei Telecom, Inc.

Case #	CCP Latitude (dec.deg)	CCP Longitude (dec.deg.)	Margin (dB)	Victim Rx Site	Licensee
516	32.84331257	117.8851464	22.8	MT PALOMAR	Verizon Wireless (VAW) LLC (Southern CA)
653	33.02432443	118.0419465	22.8	COWLES MTN	San Diego, County of
575	33.33349445	118.0484624	22.6	SUNSET RIDGE	Los Angeles SMSA Ltd. Partnership
553	32.40535717	117.4521341	22.5	FALLBROOK	Verizon Wireless (VAW) LLC (Southern CA)
400	33.74081578	118.2771822	18.2	DAKIN 2	Pacific Bell Tel Com dba AT&T California
77	33.31333434	118.2940132	11.9	LSMP	San Diego, County of
715	33.31054366	118.291569	9.5	LSMP	San Diego, County of
697	33.31057545	118.2915969	9.5	LSMP	San Diego, County of
98	33.57836913	118.1542814	5.7	LAKE SKIN PR	Metropolitan Water Dist of So California
774	33.73631389	118.2765152	1.1	SAN PEDRO	Pacific Bell Tel Com dba AT&T California
776	33.73631389	118.2765152	1.1	SAN PEDRO	Pacific Bell Tel Com dba AT&T California
756	33.41877927	118.0852438	1.0	IDYLLWILD	Los Angeles SMSA Ltd. Partnership
96	33.73631389	118.2765152	0.6	SAN PEDRO	Los Angeles SMSA Ltd. Partnership
446	33.73631389	118.2765152	0.6	SAN PEDRO	Los Angeles SMSA Ltd. Partnership
768	33.73631389	118.2765152	0.6	SAN PEDRO	Los Angeles SMSA Ltd. Partnership
765	33.51663053	118.127541	37.5	SANTA ANA MT	Los Angeles SMSA Ltd. Partnership
438	32.71851546	117.1852927	33.4	MT WOODSON	San Diego Gas & Electric Company
23	33.75198696	118.2706815	32.7	ANAHEIM	Southern California Gas Company
726	33.73981347	118.1803319	30.4	PLEASANTS PK	MHO Networks
360	33.4446539	118.0964183	30.2	CENTRAL CT	Orange, County of, CA
459	33.68916904	118.2308479	28.8	SANTIAGO PK	Calvary Chapel of Costa Mesa
285	33.69282299	118.2353578	27.8	BOX SPRING N	Riverside, County of
82	32.42253251	117.5092659	27.3	MT WOODSON	San Diego, County of
145	33.74314822	118.1831659	26.9	RUNNING SPGS	Verizon California Inc.
435	32.95516791	117.9819434	26.6	SANTIAGO PK	Southern California Regional Rail Auth.
591	32.69146379	117.7542367	26.0	CUYAMACA PK	California, State of
770	33.49925405	118.1200223	25.9	SQUIRES DAM	Verizon Wireless (VAW) LLC (Southern CA)
648	32.42253251	117.5092659	25.0	MT WOODSON	San Diego, County of
205	32.7682274	117.8203439	24.4	FALBROOK	New Cingular Wireless PCS LLC -San Diego

506	32.97791897	118.00167	24.4	PALOMAR MTN	San Diego Gas & Electric Company
636	32.71840577	117.1904675	23.9	RAINBOW	San Diego Broadband
121	33.02432443	118.0419465	23.6	COWLES MTN	San Diego, County of
320	33.41955584	118.085579	23.3	BLACK MTN	Verizon Wireless (VAW) LLC (Southern CA)
268	33.4346263	118.0920868	23.2	ARC	Turn Wireless, LLC
269	33.4346263	118.0920868	23.2	ARC	Turn Wireless, LLC
555	32.40535717	117.4521341	22.5	FALLBROOK	Verizon Wireless (VAW) LLC (Southern CA)
774	33.74081578	118.2771822	16.1	DAKIN 2	Pacific Bell Tel Com dba AT&T California
775	33.74081578	118.2771822	16.1	DAKIN 2	Pacific Bell Tel Com dba AT&T California
48	33.75198696	118.2706815	9.0	ANAHEIM PAS	Southern California Gas Company
963	33.75198696	118.2706815	7.4	SITE B	LDM Engineering
446	33.74781866	118.2758489	6.0	N DOMINGUEZ	Los Angeles SMSA Ltd. Partnership
768	33.74781866	118.2758489	5.5	N DOMINGUEZ	Los Angeles SMSA Ltd. Partnership
96	33.74781866	118.2758489	5.0	N DOMINGUEZ	Los Angeles SMSA Ltd. Partnership
37	33.74881724	118.1843329	4.0	ANAHEIM	Southern California Gas Company
400	33.73428523	118.2753375	2.6	SAN PEDRO	Pacific Bell Tel Com dba AT&T California
166	33.42761266	118.0890579	0.9	SOUTH MTN	Los Angeles SMSA Ltd. Partnership
418	33.42761266	118.0890579	0.4	SOUTH MTN	Los Angeles SMSA Ltd. Partnership
708	33.42761266	118.0890579	0.4	SOUTH MTN	Los Angeles SMSA Ltd. Partnership

Table 2 - ESV CCP Locations
See Interference Analysis for Exclusion Zone Details

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 Skjei Telecom, Inc. 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 PCN letter dated 2/9/2016

Company

ABC Holding Company Inc.
AirSites2000, LLC
Anaheim City, of
AT&T COMMON SYSTEMS
BNSF Railway Company
California, State of
Calvary Chapel of Costa Mesa
CCO SoCal I, LLC
Cellco Partnership - Southern California
City of Los Angeles Dept Water & Power
City of Montebello
Coast Community College District
CSI Telecommunications, Inc.
DM Ventures, Inc. dba Warp2Biz
Encina Communications Company
Entravision Holdings, LLC
Fresno MSA Limited Partnership
Glendale, City of
Global Telecom & Technology Americas, In
ION Media Los Angeles License, Inc.
KERN COUNTY CALIFORNIA
Kern Ed Telecom Consortium
Kern, County of
KTLA, LLC
LDM Engineering
Lightwave Broadband LLC
Los Angeles City Info Technology Agency
Los Angeles County Dept of Public Works
Los Angeles County FCC Licensing Section
Los Angeles County Metro Transit Auth
Los Angeles SMSA Ltd. Partnership
LOS ANGELES UNIFIED SCHOOL DISTRICT
Metropolitan Water Dist of So California
MHO Networks
MOBILE RELAY ASSOCIATES INC
New Cingular Wireless PCS - Los Angeles
New Cingular Wireless PCS LLC -San Diego
Nextel of California Inc.

Skjei Telecom, Inc.

Norris, Samuel O
Northrop Grumman Systems Corp.
NRJ TV LA License Co, LLC
Olympic Wireless, LLC
Orange, County of, CA
Pacific Bell Tel Com dba AT&T California
Pacific Television Center
QUALCOMM INC.
Regional 3Cs
Riverside, County of
San Bernardino County of California
San Diego Broadband
San Diego County Water Authority
San Diego Gas & Electric Company
San Diego, City of
San Diego, County of
Skyriver Communications
Southern California Edison Company
Southern California Gas Company
Southern California Regional Rail Auth.
Station Venture Operations, LP
T-Mobile License LLC
T-Mobile License LLC
Turn Wireless, LLC
TV MICROWAVES CO
Ultimate Internet Access, Inc
Union Pacific Railroad Company
University of California, HPWREN
Vectus, Inc
Ventura, County of
Verizon California Inc.
Verizon Wireless (VAW) LLC (Southern CA)
Verizon Wireless (VAW) LLC-N CA/NV
Western Technical Services

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. The coordination contours include all the area within this route as well as all of the area seaward of this route within 200 km of the baseline of the United States or 200 km from any fixed service offshore installations."

Skjei Telecom, Inc.

Date:	02/09/2016
Job Number:	160209SKJTEL05

Administrative Information	
Status	ENGINEER PROPOSAL
Call Sign	
Licensee Code	SPACLK
Licensee Name	Harris CapRock Communications

Site Information	**LOS ANGELES, CA**
Venue Name	
Latitude (NAD 83)	33° 43' 45.2" N
Longitude (NAD 83)	118° 15' 43.3" W
Climate Zone	B
Rain Zone	4
Ground Elevation (AMSL)	0.0 m / 0.0 ft

Link Information	
Satellite Type	Geostationary
Mode	TO - Transmit-Only
Modulation	Digital
Satellite Arc	97° W to 129° West Longitude
Azimuth Range	145.0° to 198.9°
Corresponding Elevation Angles	44.6° / 49.1°
Antenna Centerline (AGL)	15.54 m / 51.0 ft

Antenna Information		**Transmit - FCC32**
Manufacturer		FCC REFERENCE
Model		32-25LOG(THETA)
Gain / Diameter		41.7 dBi / 2.4 m
3-dB / 15-dB Beamwidth		0.66° / 1.18°
Max Available RF Power	(dBW/4 kHz)	-13.0
	(dBW/MHz)	11.0
Maximum EIRP	(dBW/4 kHz)	28.7
	(dBW/MHz)	52.7
	(dBW)	60.5
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)	3M75G7D - 7M50G7D / 6067.3785 - 6076.0035
	3M75G7D - 7M50G7D / 6076.7555 - 6085.3805
	3M75G7D - 7M50G7D / 6086.3125 - 6095.6875
	3M75G7D - 7M50G7D / 6096.3125 - 6105.6875
	2M50G7D - 7M50G7D / 6347.1 - 6351.6
	2M50G7D - 7M50G7D / 6356.5 - 6379.788
Max Great Circle Coordination Distance	153.1 km / 95.1 mi
Precipitation Scatter Contour Radius	100.0 km / 62.1 mi

Skjei Telecom, Inc.

Coordination Values	**LOS ANGELES, CA**
Licensee Name	Harris CapRock Communications
Latitude (NAD 83)	33° 43' 45.2" N
Longitude (NAD 83)	118° 15' 43.3" W
Ground Elevation (AMSL)	0.0 m / 0.0 ft
Antenna Centerline (AGL)	15.54 m / 51.0 ft
Antenna Model	FCC Reference 32-25LOG(THETA)
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	-13.0 (dBW/4 kHz)

Transmit 6.1 GHz

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Horizon Gain (dBi)	Coordination Distance (km)
0	0.00	125.65	-10.00	149.93
5	0.00	123.02	-10.00	149.93
10	0.00	120.20	-10.00	149.93
15	0.00	117.21	-10.00	149.93
20	0.00	114.08	-10.00	149.93
25	0.00	110.83	-10.00	149.93
30	0.00	107.49	-10.00	149.93
35	0.00	104.07	-10.00	149.93
40	0.00	100.60	-10.00	149.93
45	0.00	97.08	-10.00	149.93
50	0.00	93.54	-10.00	149.93
55	0.00	89.99	-10.00	149.93
60	0.00	86.43	-10.00	149.93
65	0.00	82.89	-10.00	149.93
70	0.00	79.37	-10.00	149.93
75	0.00	75.90	-10.00	149.93
80	0.00	72.48	-10.00	149.93
85	0.00	69.14	-10.00	149.93
90	0.00	65.90	-10.00	149.93
95	0.00	62.77	-10.00	149.93
100	0.00	59.78	-10.00	149.93
105	0.00	56.96	-10.00	149.93
110	0.00	54.33	-10.00	149.93
115	0.00	51.95	-10.00	149.93
120	0.00	49.83	-10.00	149.93
125	0.00	48.03	-10.00	149.93
130	0.00	46.57	-9.70	151.15
135	0.00	45.50	-9.45	152.19
140	0.00	44.85	-9.29	152.85
145	0.00	44.63	-9.24	153.07
150	0.00	44.86	-9.30	152.84
155	0.00	45.51	-9.45	152.18
160	0.00	46.58	-9.71	151.14
165	0.00	48.04	-10.00	149.93
170	0.00	49.53	-10.00	149.93
175	0.00	50.47	-10.00	149.93
180	0.00	50.79	-10.00	149.93
185	0.00	50.47	-10.00	149.93

Skjei Telecom, Inc.

Coordination Values	**LOS ANGELES, CA**
Licensee Name	Harris CapRock Communications
Latitude (NAD 83)	33° 43' 45.2" N
Longitude (NAD 83)	118° 15' 43.3" W
Ground Elevation (AMSL)	0.0 m / 0.0 ft
Antenna Centerline (AGL)	15.54 m / 51.0 ft
Antenna Model	FCC Reference 32-25LOG(THETA)
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	-13.0 (dBW/4 kHz)

Transmit 6.1 GHz

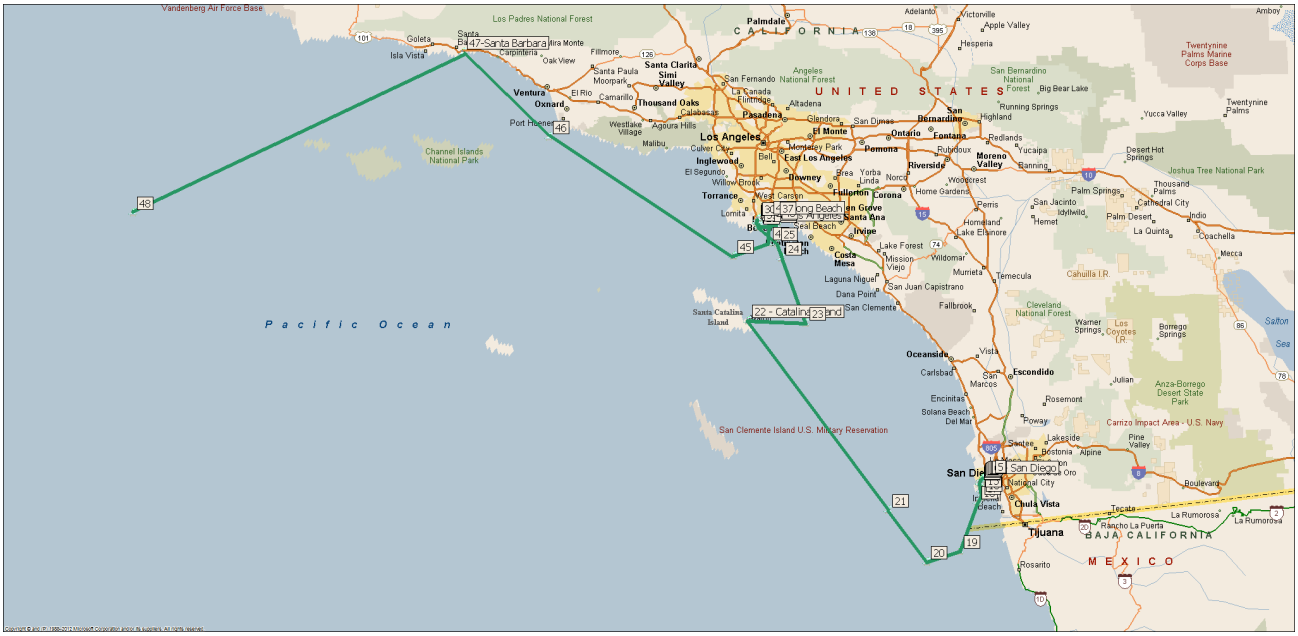
Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Horizon Gain (dBi)	Coordination Distance (km)
190	0.00	49.71	-10.00	149.93
195	0.00	49.23	-10.00	149.93
200	0.00	49.13	-10.00	149.93
205	0.00	49.40	-10.00	149.93
210	0.00	50.05	-10.00	149.93
215	0.00	51.05	-10.00	149.93
220	0.00	52.38	-10.00	149.93
225	0.31	53.76	-10.00	136.72
230	0.46	55.58	-10.00	121.72
235	0.91	57.44	-10.00	100.21
240	1.18	59.70	-10.00	100.00
245	1.12	62.38	-10.00	100.00
250	1.03	65.22	-10.00	100.00
255	1.14	68.11	-10.00	100.00
260	1.35	71.07	-10.00	100.00
265	1.54	74.17	-10.00	100.00
270	1.81	77.34	-10.00	100.00
275	2.29	80.57	-10.00	100.00
280	2.67	83.91	-10.00	100.00
285	3.47	87.31	-10.00	100.00
290	2.90	90.79	-10.00	100.00
295	2.24	94.20	-10.00	100.00
300	1.91	97.55	-10.00	100.00
305	1.24	100.75	-10.00	100.00
310	0.70	103.85	-10.00	110.25
315	0.65	106.99	-10.00	112.33
320	0.53	110.01	-10.00	116.35
325	0.34	112.87	-10.00	133.85
330	0.25	115.65	-10.00	143.13
335	0.00	118.16	-10.00	149.93
340	0.00	120.64	-10.00	149.93
345	0.00	122.93	-10.00	149.93
350	0.00	124.98	-10.00	149.93
355	0.00	126.77	-10.00	149.93

Skjei Telecom, Inc.

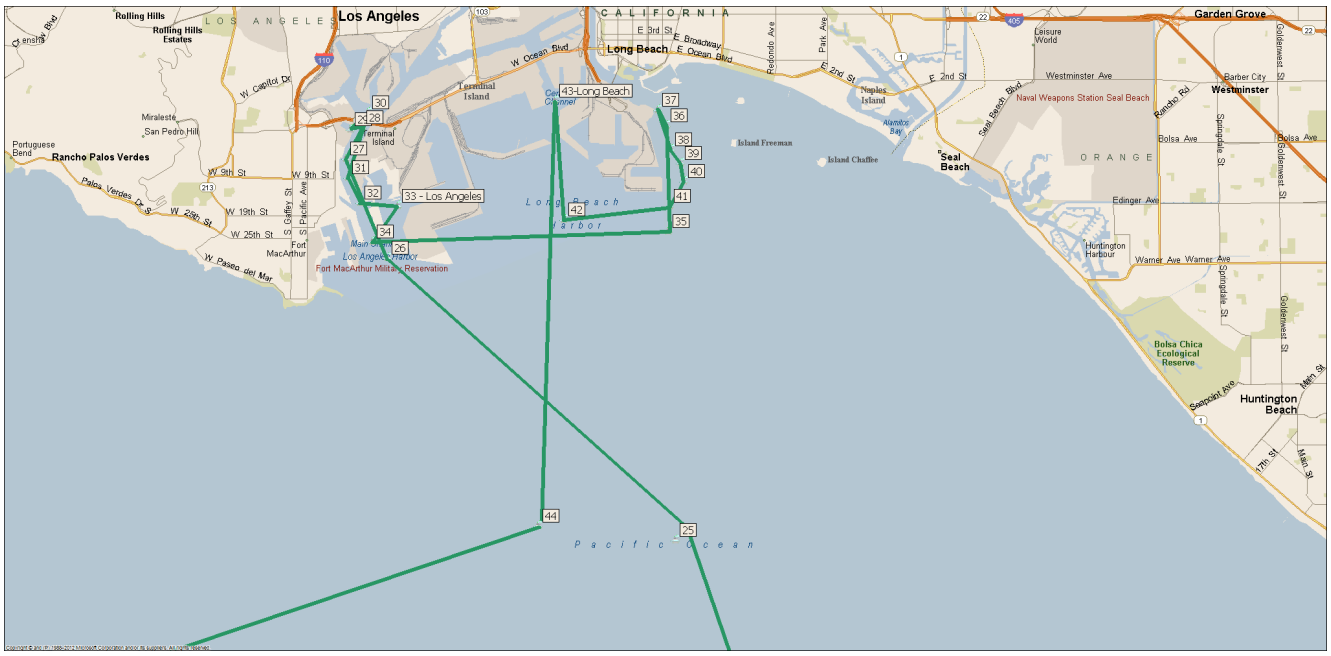
Name	Latitude	Longitude
1	32.7175	-117.18
2- San Diego	32.71667	-117.175
3	32.71633	-117.178
4	32.718	-117.175
5	32.71867	-117.178
6	32.71833	-117.194
7	32.71817	-117.201
8	32.7175	-117.207
9	32.71517	-117.215
10	32.71233	-117.22
11	32.70667	-117.227
12	32.702	-117.23
13	32.69567	-117.232
14	32.69283	-117.232
15	32.66533	-117.228
16	32.64717	-117.225
17	32.63417	-117.232
18	32.61883	-117.245
19	32.42333	-117.333
20	32.38333	-117.488
21	32.59	-117.667
22 - Catalina Island	33.34567	-118.322319
23	33.33333	-118.0483333
24	33.59167	-118.16
25	33.6491	-118.18161
26	33.71667	-118.265
27	33.7405	-118.277
28	33.748	-118.2721667
29	33.7475	-118.2756667
30	33.75167	-118.2705
31	33.736	-118.2763333
32	33.72997	-118.2728333
33 - Los Angeles	33.72923	-118.262017
34	33.72067	-118.2691667
35	33.72317	-118.1836667
36	33.7485	-118.1841667
37	33.75233	-118.1866667
38	33.74283	-118.183
39	33.7395	-118.1801667
40	33.73517	-118.1791667

Skjei Telecom, Inc.

41	33.72917	-118.1833333
42	33.72592	-118.21383
43-Long Beach	33.75446	-118.216406
44	33.6525	-118.2213333
45	33.60167	-118.39
46	34.075	-119.2716667
47-Santa Barbara	34.40798	-119.684775
48	33.75	-121.25



Skjei Telecom, Inc.



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: 

Ken Ryan, P.E.
Principal Engineer
Skjei Telecom, Inc.
7777 Leesburg Pike, Suite 315N
Falls Church, VA 22043

DATED: April 18, 2016

Skjei Telecom, Inc.

ANNEX VI: MIAMI

FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for
Harris Caprocks Communication, Inc.
Miami, FL
Satellite Earth Station on Vessel (ESV)

Prepared By:
Skjei Telecom, Inc.
7777 Leesburg Pike, Suite 315N
Falls Church, VA 22043
April 18, 2016

Skjei Telecom, Inc.

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. There will be spectrum restrictions 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. The Critical Contour Point method of determining worst case interference from the route and port sites was the interference method used. 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. In those cases were OH losses did not resolve the interference the ESV will mute transmission within an exclusion zone sufficient in size to preclude interference. Also note, that there are no unresolved coordination requests which would result in an exceedance of the maximum 180 megahertz of coordinated spectrum for all ESV operations in the coordination area in the 5925-6425 MHz band.

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-only earth station. The ESV will employ a GPS sensitive ability to cease transmission when traveling in certain exclusion zones. The interference cases and the location of the critical contour point (CCP), around which the exclusion zones exist are detailed in the tables below.

Company

Florida Power and Light Company
HiQ Data Corporation
Licensee
Miami-Dade County
T-Mobile License LLC
Verizon Wireless (VAW) LLC - S Florida
Verizon Wireless Personal Comm, LP(S FL)

Skjei Telecom, Inc.

Site	Miami													
Desired Frequencies (MHz)		6387.003 - 6423.003	6067.3785 - 6076.0035	6076.7555 - 6085.3805	6086.3125 - 6095.6875	6096.3125 - 6105.6875								
Into 1							Frequencies Affected							
164	31.1			Y		Y	6093.45	6152.75	0	0	0	0	0	
145	28.8	Y					6345.49	6375.14	0	0	0	0	0	
240	27.4		Y	Y			5945.2	6123.1	0	0	0	0	0	
250	22.6		Y	Y			6123.1	0	0	0	0	0	0	
442	21.4		Y	Y		Y	5945.2	5974.85	6004.5	6034.15	6063.8	6093.45	6123.1	6152.7
475	19.3		Y	Y		Y	5945.2	5974.85	6004.5	6034.15	6063.8	6093.45	6123.1	6152.7
480	17.9		Y	Y		Y	6137.925	0	0	0	0	0	0	
237	7.5	Y					6286.19	6315.84	6404.79	0	0	0	0	
444	5.4		Y	Y		Y	5945.2	6034.15	6063.8	6093.45	6123.1	6152.75	0	
472	5.4		Y	Y		Y	5945.2	6034.15	6063.8	6093.45	6123.1	6152.75	0	
Desired Frequencies (MHz)		6387.003 - 6423.003	6067.3785 - 6076.0035	6076.7555 - 6085.3805	6086.3125 - 6095.6875	6096.3125 - 6105.6875								
Into 2														
Case #	Margin (dB)						Frequencies Affected							
448	38.5	Y					6404.79	0	0	0	0	0	0	
450	31.7		Y	Y			6123.1	0	0	0	0	0	0	
34	29.7	Y					6404.79	0	0	0	0	0	0	
422	29.2			Y		Y	6152.75	0	0	0	0	0	0	
480	28.2	Y					6389.965	0	0	0	0	0	0	
399	9.1	Y					6226.89	6286.19	6315.84	6345.49	6375.14	6404.79	0	

Table 1 – ESV Interference Cases

Skjei Telecom, Inc.

Interference Zones

Into 1

Case #	CCP Latitude (dec.deg)	CCP Longitude (dec.deg.)	Margin (dB)	Victim Rx Site	Licensee
164	27.47501336	80.06571213	31.1	WALTON SERV	Florida Power and Light Company
145	27.23190062	80.014699	28.8	JUPITER	Verizon Wireless Personal Comm, LP(S FL)
240	26.73522178	79.98860783	27.4	SBA IND TWN	Verizon Wireless Personal Comm, LP(S FL)
250	27.573953	80.11657552	22.6	ADAMS RANCH	Verizon Wireless (VAW) LLC - S Florida
442	26.00132032	79.96947934	21.4	ANDY TOWN S	Verizon Wireless Personal Comm, LP(S FL)
475	26.00132032	79.96947934	19.3	ANDY TOWN S	Verizon Wireless Personal Comm, LP(S FL)
480	25.78443459	80.18286236	17.9	AVENTURAL1	HiQ Data Corporation
237	27.57862185	80.11897821	7.5	CRWN IND TWN	Verizon Wireless Personal Comm, LP(S FL)
444	26.09314538	80.10834805	5.4	KROME TOWER	Verizon Wireless Personal Comm, LP(S FL)
472	26.09314538	80.10834805	5.4	KROME TOWER	Verizon Wireless Personal Comm, LP(S FL)
Into 2					
Case #	CCP Latitude (dec.deg)	CCP Longitude (dec.deg.)	Margin (dB)	Victim Rx Site	Licensee
448	25.76840118	80.16827776	38.5	MIA	Miami-Dade County
450	25.7946539	80.02034652	31.7	IC	Miami-Dade County
34	27.23190062	80.014699	29.7	JUPITER	Verizon Wireless Personal Comm, LP(S FL)
422	27.75170169	80.20820841	29.2	A2P0170A	T-Mobile License LLC
480	26.0932938	80.07013753	28.2	MIDTOWN1	HiQ Data Corporation
399	27.46281459	80.05944791	9.1	CYPRESS QTRS	Verizon Wireless Personal Comm, LP(S FL)

Table 2 - ESV CCP Locations
See Interference Analysis for Exclusion Zone Details

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 Skjei Telecom, Inc. 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 PCN letter dated 2/9/2016

Company

Computer Office Solutions, Inc.
GM Consulting Group, Inc.
HiQ Data Corporation
Miami-Dade County
Verizon Wireless (VAW) LLC-South Florida
Verizon Wireless VAW LLC - S Florida
Wireless Applications Corporation
Embarq Florida, Inc.
Florida Power and Light Company
Florida RSA No. 2B (Indian River) LP
New Cingular Wireless PCS LLC - N FL
New Cingular Wireless PCS LLC - S FL
PALM BEACH, COUNTY OF
Palm Beach, County Facilities Dev & Ops
South Florida Water Management District
T-Mobile License LLC
Verizon Wireless (VAW) LLC - S Florida
Verizon Wireless Personal Comm, LP(S FL)
T-Mobile License LLC
Florida Rural Broadband Alliance, LLC
Olympic Wireless, 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. The coordination contours include all the area within this route as well as all of the area seaward of this route within 200 km of the baseline of the United States or 200 km from any fixed service offshore installations."

Skjei Telecom, Inc.

Date:	02/09/2016
Job Number:	160209SKJTEL11

Administrative Information	
Status	ENGINEER PROPOSAL
Call Sign	
Licensee Code	SPACLK
Licensee Name	Harris CapRock Communications

Site Information	**MIAMI, FL**
Venue Name	
Latitude (NAD 83)	25° 46' 34.5" N
Longitude (NAD 83)	80° 10' 40.8" W
Climate Zone	B
Rain Zone	1
Ground Elevation (AMSL)	0.0 m / 0.0 ft

Link Information	
Satellite Type	Geostationary
Mode	TO - Transmit-Only
Modulation	Digital
Satellite Arc	89° W to 97° West Longitude
Azimuth Range	199.6° to 214.8°
Corresponding Elevation Angles	58.3° / 54.5°
Antenna Centerline (AGL)	15.54 m / 51.0 ft

Antenna Information		**Transmit - FCC32**
Manufacturer		FCC REFERENCE
Model		32-25LOG(THETA)
Gain / Diameter		41.7 dBi / 2.4 m
3-dB / 15-dB Beamwidth		0.66° / 1.18°
Max Available RF Power	(dBW/4 kHz)	-9.0
	(dBW/MHz)	15.0
Maximum EIRP	(dBW/4 kHz)	32.7
	(dBW/MHz)	56.7
	(dBW)	60.5
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)	3M75G7D - 7M50G7D / 6067.3785 - 6076.0035
	3M75G7D - 7M50G7D / 6076.7555 - 6085.3805
	3M75G7D - 7M50G7D / 6086.3125 - 6095.6875
	3M75G7D - 7M50G7D / 6096.3125 - 6105.6875
	3M75G7D - 7M50G7D / 6387.003 - 6423.003

Max Great Circle Coordination Distance	167.5 km / 104.1 mi
Precipitation Scatter Contour Radius	100.0 km / 62.1 mi

Skjei Telecom, Inc.

Coordination Values	**MIAMI, FL**
Licensee Name	Harris CapRock Communications
Latitude (NAD 83)	25° 46' 34.5" N
Longitude (NAD 83)	80° 10' 40.8" W
Ground Elevation (AMSL)	0.0 m / 0.0 ft
Antenna Centerline (AGL)	15.54 m / 51.0 ft
Antenna Model	FCC Reference 32-25LOG(THETA)
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	-9.0 (dBW/4 kHz)

			Transmit 6.1 GHz	
Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Horizon Gain (dBi)	Coordination Distance (km)
0	0.00	118.48	-10.00	167.52
5	0.00	120.26	-10.00	167.52
10	0.00	121.20	-10.00	167.52
15	0.00	121.59	-10.00	167.52
20	0.00	121.70	-10.00	167.52
25	0.00	121.55	-10.00	167.52
30	0.00	121.13	-10.00	167.52
35	0.00	120.45	-10.00	167.52
40	0.00	119.52	-10.00	167.52
45	0.00	118.35	-10.00	167.52
50	0.00	116.97	-10.00	167.52
55	0.00	115.38	-10.00	167.52
60	0.00	113.61	-10.00	167.52
65	0.00	111.67	-10.00	167.52
70	0.00	109.59	-10.00	167.52
75	0.00	107.38	-10.00	167.52
80	0.00	105.06	-10.00	167.52
85	0.00	102.66	-10.00	167.52
90	0.00	100.17	-10.00	167.52
95	0.00	97.63	-10.00	167.52
100	0.00	95.05	-10.00	167.52
105	0.00	92.44	-10.00	167.52
110	0.00	89.81	-10.00	167.52
115	0.00	87.19	-10.00	167.52
120	0.00	84.58	-10.00	167.52
125	0.00	82.00	-10.00	167.52
130	0.00	79.46	-10.00	167.52
135	0.00	76.99	-10.00	167.52
140	0.00	74.60	-10.00	167.52
145	0.00	72.29	-10.00	167.52
150	0.00	70.10	-10.00	167.52
155	0.00	68.04	-10.00	167.52
160	0.00	66.13	-10.00	167.52
165	0.00	64.38	-10.00	167.52
170	0.00	62.82	-10.00	167.52
175	0.00	61.47	-10.00	167.52
180	0.00	60.33	-10.00	167.52
185	0.00	59.43	-10.00	167.52

Skjei Telecom, Inc.

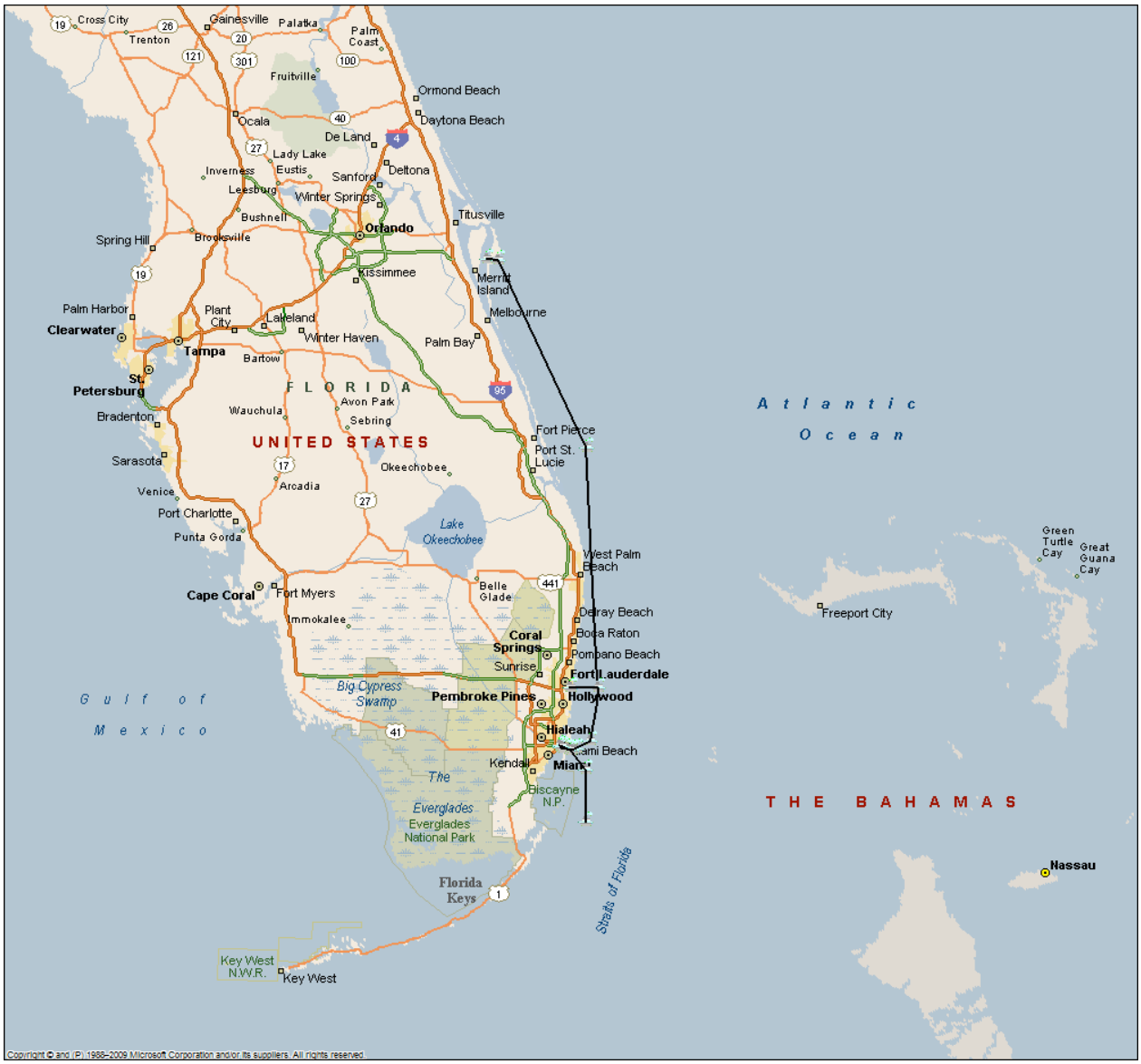
Coordination Values	**MIAMI, FL**
Licensee Name	Harris CapRock Communications
Latitude (NAD 83)	25° 46' 34.5" N
Longitude (NAD 83)	80° 10' 40.8" W
Ground Elevation (AMSL)	0.0 m / 0.0 ft
Antenna Centerline (AGL)	15.54 m / 51.0 ft
Antenna Model	FCC Reference 32-25LOG(THETA)
Antenna Mode	Transmit 6.1 GHz
Interference Objectives: Long Term	-154.0 dBW/4 kHz 20%
Short Term	-131.0 dBW/4 kHz 0.0025%
Max Available RF Power	-9.0 (dBW/4 kHz)

Transmit 6.1 GHz

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Horizon Gain (dBi)	Coordination Distance (km)
190	0.00	58.19	-10.00	167.52
195	0.00	56.88	-10.00	167.52
200	0.00	55.85	-10.00	167.52
205	0.00	55.10	-10.00	167.52
210	0.00	54.64	-10.00	167.52
215	0.00	54.50	-10.00	167.52
220	0.00	54.67	-10.00	167.52
225	0.00	55.14	-10.00	167.52
230	0.00	55.92	-10.00	167.52
235	0.00	56.98	-10.00	167.52
240	0.00	58.30	-10.00	167.52
245	0.00	59.87	-10.00	167.52
250	0.00	61.67	-10.00	167.52
255	0.00	63.67	-10.00	167.52
260	0.00	65.84	-10.00	167.52
265	0.00	68.18	-10.00	167.52
270	0.00	70.64	-10.00	167.52
275	0.00	73.22	-10.00	167.52
280	0.00	75.90	-10.00	167.52
285	0.00	78.65	-10.00	167.52
290	0.00	81.47	-10.00	167.52
295	0.00	84.32	-10.00	167.52
300	0.00	87.21	-10.00	167.52
305	0.00	90.11	-10.00	167.52
310	0.00	93.01	-10.00	167.52
315	0.00	95.90	-10.00	167.52
320	0.00	98.75	-10.00	167.52
325	0.00	101.56	-10.00	167.52
330	0.00	104.31	-10.00	167.52
335	0.00	106.98	-10.00	167.52
340	0.00	109.55	-10.00	167.52
345	0.00	112.01	-10.00	167.52
350	0.00	114.33	-10.00	167.52
355	0.00	116.49	-10.00	167.52

Skjei Telecom, Inc.

Name	Latitude	Longitude
2 Port Canaveral	28.41148	-80.62096
3	28.40676	-80.5488
4	27.3924	-80.0232
5	26.0937	-79.9552
6	26.0937	-80.1147
7 Pt Everglades	26.0969	-80.11831
8	26.0936	-80.1182
9	26.0936	-79.9552
10	25.805	-80
11	25.7667	-80.0783
12	25.7572	-80.1108
13	25.7573	-80.1167
14	25.7603	-80.1253
15	25.7657	-80.1387
16	25.7848	-80.1828
17	25.7827	-80.1798
18	25.7805	-80.178
19	25.7795	-80.1755
20	25.7773	-80.1707
21 Miami	25.77626	-80.16672
22	25.775	-80.1648
23	25.7661	-80.1423
24	25.7656	-80.1609
25	25.7727	-80.1763
26	25.7738	-80.1773
27	25.7647	-80.1608
28	25.7659	-80.1411
29	25.7555	-80.1174
30	25.65	-80.0283
31	25.3667	-80.0283



Skjei Telecom, Inc.

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: 

Ken Ryan, P.E.
Principal Engineer
Skjei Telecom, Inc.
7777 Leesburg Pike, Suite 315N
Falls Church, VA 22043

DATED: April 18, 2016

Skjei Telecom, Inc.

ANNEX VII: NEW ORLEANS

FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for
Harris Caprocks Communication, Inc.
New Orleans, LA
Satellite Earth Station on Vessel (ESV)

Prepared By:
Skjei Telecom, Inc.
7777 Leesburg Pike, Suite 315N
Falls Church, VA 22043
April 18, 2016

Skjei Telecom, Inc.

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. There will be spectrum restrictions 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. The Critical Contour Point method of determining worst case interference from the route and port sites was the interference method used. 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. In those cases were OH losses did not resolve the interference the ESV will mute transmission within an exclusion zone sufficient in size to preclude interference. Also note, that there are no unresolved coordination requests which would result in an exceedance of the maximum 180 megahertz of coordinated spectrum for all ESV operations in the coordination area in the 5925-6425 MHz band.

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-only earth station. The ESV will employ a GPS sensitive ability to cease transmission when traveling in certain exclusion zones. The interference cases and the location of the critical contour point (CCP), around which the exclusion zones exist are detailed in the tables below.

Company

Southern Company Services Inc
San Antonio MTA, L.P. (HGC Mkt)
RigNet SatCom, Inc.
Plaquemines Parish Government
New Cingular Wireless PCS, LLC - LA, GM
Louisiana, State Of
Jefferson Parish Sheriff's Office
GTE Mobilnet of South Texas LTD Partners
Bluebonnet Electric Cooperative

Skjei Telecom, Inc.

Site	Galveston/Houston								
Desired Frequencies (MHz)		6387.003 - 6400.0	6400 - 6423.003	6067.3785 - 6076.0035	6076.7555 - 6085.3805	6086.3125 - 6095.6875	6096.3125 - 6105.6875		
Into 1									
Case #	Margin(dB)							Frequencies Affected	
14	24.9			Y	Y			6063.8	0
6	1.6			Y	Y			6063.8	0
Desired Frequencies (MHz)		6387.003 - 6400.0	6400 - 6423.003	6067.3785 - 6076.0035	6076.7555 - 6085.3805	6086.3125 - 6095.6875	6096.3125 - 6105.6875		
Into 2									
Case #	Margin(dB)							Frequencies Affected	
4	48.3				Y	Y	Y	6093.45	0
132	30.1	Y	Y					6375.14	6404.79
42	10.1		Y					6419.615	0

Site	New Orleans									
Desired Frequencies (MHz)		6387.003 - 6400.0	6400 - 6423.003	6067.3785 - 6076.0035	6076.7555 - 6085.3805	6086.3125 - 6095.6875	6096.3125 - 6105.6875			
Into 1										
Case #	Margin(dB)							Frequencies Affected		
190	43.5	Y	Y					6404.79	0	
67	1.1	Y	Y					6226.89	6256.54	640
Desired Frequencies (MHz)		6387.003 - 6400.0	6400 - 6423.003	6067.3785 - 6076.0035	6076.7555 - 6085.3805	6086.3125 - 6095.6875	6096.3125 - 6105.6875			
Into 2 Case #	Margin(dB)							Frequencies Affected		
51	43.8	Y	Y					6404.79	0	
34	43.8	Y	Y					6404.79	0	

35	35.6	Y	Y					6404.79	0	
52	19.8	Y	Y					6404.79	0	
187	13.3	Y	Y					6404.79	0	
93	12.0	Y	Y					6404.79	0	

Table 1 – ESV Interference Cases

Interference Zones	Galveston/Houston				
Into 1					
Case #	CCP Latitude (dec.deg)	CCP Longitude (dec.deg.)	Margin (dB)	Victim Rx Site	Licensee
14	29.32256408	94.7804824	24.9	ROSENBERG	GTE Mobilnet of South Texas LTD Partners
6	27.99639585	93.72673155	1.6	ANDERSON	San Antonio MTA, L.P. (HGC Mkt)
Into 2					
Case #	CCP Latitude (dec.deg)	CCP Longitude (dec.deg.)	Margin (dB)	Victim Rx Site	Licensee
4	29.27381571	94.69434313	48	MAGNA	GTE Mobilnet of South Texas LTD Partners
132	27.95244963	93.70740791	30	LUCAS	GTE Mobilnet of South Texas LTD Partners
42	28.62398831	94.14615184	10	BURTON RPTR	Bluebonnet Electric Cooperative

Interference Zones	New Orleans				
Into 1					
Case #	CCP Latitude (dec.deg)	CCP Longitude (dec.deg.)	Margin (dB)	Victim Rx Site	Licensee
190	29.69670699	89.97540765	43.5	IRONTON	Plaquemines Parish Government

67	29.94233361	90.06099972	1.1	DRAWBRIDGE	New Cingular Wireless PCS, LLC - LA, GM
Into 2					
Case #	CCP Latitude (dec.deg)	CCP Longitude (dec.deg.)	Margin (dB)	Victim Rx Site	Licensee
51	29.69542136	89.97437914	43.8	IRONTON	Plaquemines Parish Government
34	29.95046462	90.02016116	43.8	NO EAST TWR	Louisiana, State Of
35	29.8379638	89.98966364	35.6	GALLERIA	Jefferson Parish Sheriff's Office
52	29.94548266	90.01111621	19.8	POPLARVILLE	Southern Company Services Inc
187	29.45987381	89.65662268	13.3	VENICE	RigNet SatCom, Inc.
93	29.45987381	89.65662268	12.0	VENICE #2B	RigNet SatCom, Inc.

Table 2 - ESV CCP Locations
See Interference Analysis for Exclusion Zone Details

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 Skjei Telecom, Inc. 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 PCN letter dated 2/9/2016

Company

Acadiana Cellular General Partnership
Alltel Communications LLC - LA/MS/AR/FL
Alltel Communications Wireless of LA, In
Cellular South Licenses, LLC
Cleco Power LLC
Compass Minerals
Dixie Electric Membership Corporation
ENERGY XXI LLC
Entergy Services Inc
Greater Lafourche Port Commission
Hancock County Sheriff's Office
HANCOCK, COUNTY OF
Harrison County Emergency Communications
Jefferson Parish Sheriff's Office
Lafayette MSA Limited Partnership
LOOP LLC
Louisiana Dept of Transportation and Dev
Louisiana Generating, LLC
Louisiana RSA #7 Cell Gen Partnership
Louisiana, State Of
Mississippi Authority for ED TV
MISSISSIPPI STATE DEPT OF TRANSPORTATION
New Cingular Wireless PCS LLC - AL, MS,
New Cingular Wireless PCS, LLC - LA, GM
New Orleans City
NEW ORLEANS CITY POLICE DEPARTMENT
NEW ORLEANS EDUCATIONAL TELECOMM
PEG Bandwidth
PEG Bandwidth, LLC
Plaquemines Parish Government
RigNet SatCom, Inc.
South Missisippi Electric Power Assn

Southern Company Services Inc
Southern Light, LLC
Sprint Spectrum L.P.
Sprint Spectrum LP DBA Sprint PCS
Sprint Spectrum LP Louisiana
St. Tammany Parish Sheriff's Office
STAR TELEPHONE COMPANY
State of Mississippi Wireless Communicat
Tampnet Licensee LLC
Texas Eastern Communications, LLC
TELELINK INC.
T-Mobile License LLC
T-Mobile License LLC
Transcontinental Gas Pipeline Corp.
Verizon Wireless (VAW) / LA
Verizon Wireless (VAW) LLC - Mississippi
Verizon Wireless Louisiana LLC
Verizon Wireless Personal Comm LP-LA/MS
WWL-TV, 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. The coordination contours include all the area within this route as well as all of the area seaward of this route within 200 km of the baseline of the United States or 200 km from any fixed service offshore installations."

Date:	02/09/2016
Job Number:	160209SKJTEL07

Administrative Information

Status	ENGINEER PROPOSAL
Call Sign	
Licensee Code	SPACLK
Licensee Name	Harris CapRock Communications

Site Information	**NEW ORLEANS, LA**
Venue Name	
Latitude (NAD 83)	29° 56' 55.8" N
Longitude (NAD 83)	90° 3' 43.2" W
Climate Zone	B
Rain Zone	1
Ground Elevation (AMSL)	0.0 m / 0.0 ft

Link Information

Satellite Type	Geostationary
Mode	TO - Transmit-Only
Modulation	Digital
Satellite Arc	89° W to 97° West Longitude
Azimuth Range	177.9° to 193.7°
Corresponding Elevation Angles	55.1° / 54.3°
Antenna Centerline (AGL)	15.54 m / 51.0 ft

Antenna Information	**Transmit - FCC32**
Manufacturer	FCC REFERENCE
Model	32-25LOG(THETA)
Gain / Diameter	41.7 dBi / 2.4 m
3-dB / 15-dB Beamwidth	0.66° / 1.18°

Max Available RF Power	(dBW/4 kHz)	-9.0
	(dBW/MHz)	15.0
Maximum EIRP	(dBW/4 kHz)	32.7
	(dBW/MHz)	56.7
	(dBW)	60.5
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)	3M75G7D - 7M50G7D / 6067.3785 - 6076.0035
	3M75G7D - 7M50G7D / 6076.7555 - 6085.3805
	3M75G7D - 7M50G7D / 6086.3125 - 6095.6875
	3M75G7D - 7M50G7D / 6096.3125 - 6105.6875
	3M75G7D - 7M50G7D / 6387.003 - 6423.003

Max Great Circle Coordination Distance	167.5 km / 104.1 mi
Precipitation Scatter Contour Radius	100.0 km / 62.1 mi

Coordination Values	**NEW ORLEANS, LA**
Licensee Name	Harris CapRock Communications
Latitude (NAD 83)	29° 56' 55.8" N
Longitude (NAD 83)	90° 3' 43.2" W
Ground Elevation (AMSL)	0.0 m / 0.0 ft
Antenna Centerline (AGL)	15.54 m / 51.0 ft
Antenna Model	FCC Reference 32-25LOG(THETA)
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	-9.0 (dBW/4 kHz)

Transmit 6.1 GHz

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Horizon Gain (dBi)	Coordination Distance (km)
0	0.00	124.57	-10.00	167.52
5	0.00	124.62	-10.00	167.52
10	0.00	124.04	-10.00	167.52
15	0.00	123.18	-10.00	167.52
20	0.00	122.04	-10.00	167.52
25	0.00	120.64	-10.00	167.52
30	0.00	119.01	-10.00	167.52
35	0.00	117.17	-10.00	167.52
40	0.00	115.13	-10.00	167.52
45	0.00	112.93	-10.00	167.52
50	0.00	110.58	-10.00	167.52
55	0.00	108.11	-10.00	167.52
60	0.00	105.53	-10.00	167.52
65	0.00	102.86	-10.00	167.52
70	0.00	100.12	-10.00	167.52
75	0.00	97.33	-10.00	167.52
80	0.00	94.50	-10.00	167.52
85	0.00	91.65	-10.00	167.52
90	0.00	88.78	-10.00	167.52
95	0.00	85.93	-10.00	167.52
100	0.00	83.09	-10.00	167.52
105	0.00	80.29	-10.00	167.52
110	0.00	77.55	-10.00	167.52
115	0.00	74.87	-10.00	167.52
120	0.00	72.27	-10.00	167.52
125	0.00	69.78	-10.00	167.52
130	0.00	67.41	-10.00	167.52
135	0.00	65.19	-10.00	167.52
140	0.00	63.13	-10.00	167.52
145	0.00	61.26	-10.00	167.52
150	0.00	59.59	-10.00	167.52
155	0.00	58.16	-10.00	167.52
160	0.00	56.98	-10.00	167.52
165	0.00	56.07	-10.00	167.52
170	0.00	55.44	-10.00	167.52
175	0.00	55.12	-10.00	167.52
180	0.00	55.09	-10.00	167.52
185	0.00	54.74	-10.00	167.52

Coordination Values	**NEW ORLEANS, LA**
Licensee Name	Harris CapRock Communications
Latitude (NAD 83)	29° 56' 55.8" N
Longitude (NAD 83)	90° 3' 43.2" W
Ground Elevation (AMSL)	0.0 m / 0.0 ft
Antenna Centerline (AGL)	15.54 m / 51.0 ft
Antenna Model	FCC Reference 32-25LOG(THETA)
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	-9.0 (dBW/4 kHz)

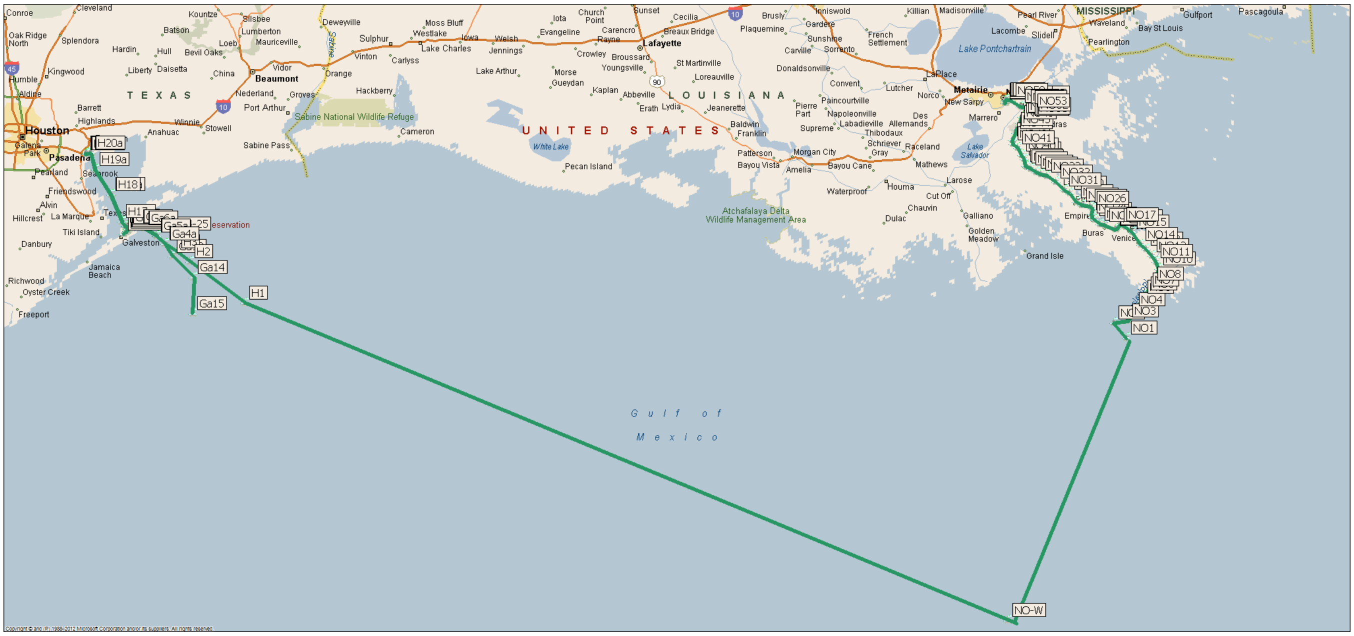
Transmit 6.1 GHz

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Horizon Gain (dBi)	Coordination Distance (km)
190	0.00	54.35	-10.00	167.52
195	0.00	54.28	-10.00	167.52
200	0.00	54.51	-10.00	167.52
205	0.00	55.06	-10.00	167.52
210	0.00	55.91	-10.00	167.52
215	0.00	57.03	-10.00	167.52
220	0.00	58.43	-10.00	167.52
225	0.00	60.07	-10.00	167.52
230	0.00	61.92	-10.00	167.52
235	0.00	63.98	-10.00	167.52
240	0.00	66.20	-10.00	167.52
245	0.00	68.58	-10.00	167.52
250	0.00	71.09	-10.00	167.52
255	0.00	73.71	-10.00	167.52
260	0.00	76.43	-10.00	167.52
265	0.00	79.21	-10.00	167.52
270	0.00	82.05	-10.00	167.52
275	0.00	84.93	-10.00	167.52
280	0.00	87.84	-10.00	167.52
285	0.00	90.76	-10.00	167.52
290	0.00	93.68	-10.00	167.52
295	0.00	96.57	-10.00	167.52
300	0.00	99.44	-10.00	167.52
305	0.00	102.25	-10.00	167.52
310	0.00	105.00	-10.00	167.52
315	0.00	107.67	-10.00	167.52
320	0.00	110.23	-10.00	167.52
325	0.00	112.67	-10.00	167.52
330	0.00	114.98	-10.00	167.52
335	0.00	117.12	-10.00	167.52
340	0.00	119.07	-10.00	167.52
345	0.00	120.82	-10.00	167.52
350	0.00	122.33	-10.00	167.52
355	0.00	123.59	-10.00	167.52

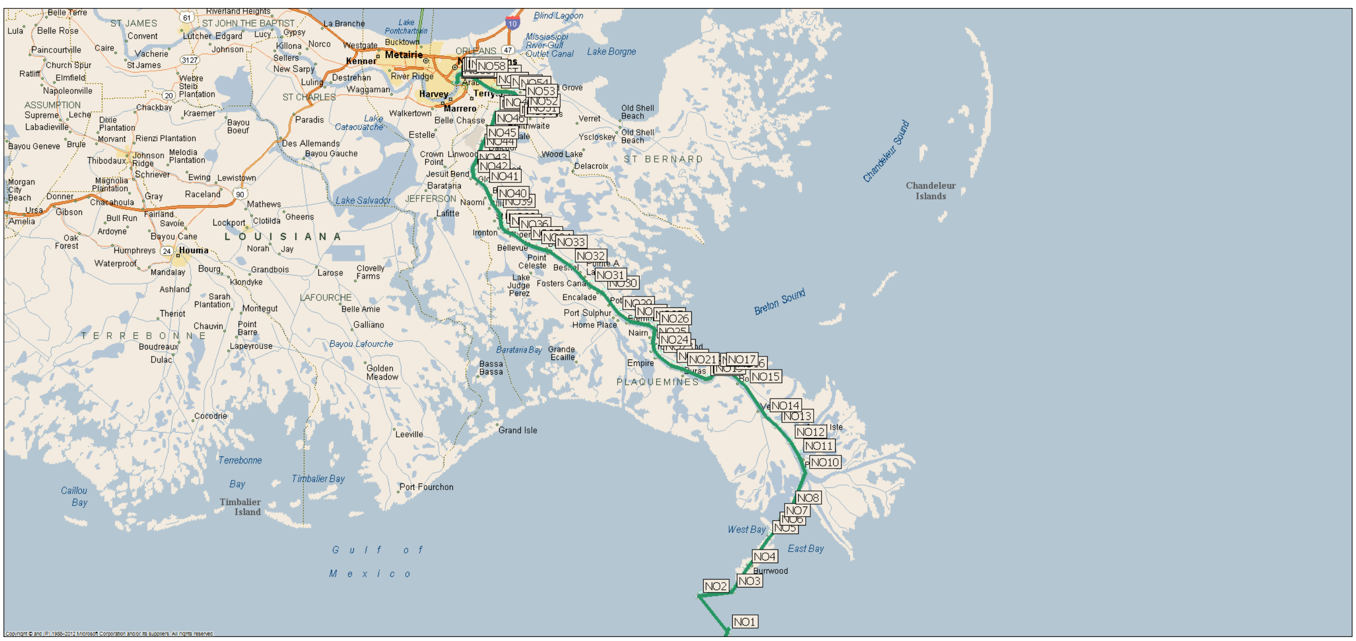
Name	Latitude	Longitude
NO64-JSCT	29.94233333	-90.061
NO65-T	29.94316667	-90.05833
NO63	29.94666667	-90.05917
NO62	29.9555	-90.05883
NO61	29.95833333	-90.05533
NO60	29.95883333	-90.05
NO59	29.958	-90.0425
NO58	29.9545	-90.0275
NO57	29.92833333	-89.98
NO56	29.92333333	-89.96833
NO55	29.92333333	-89.94667
NO54	29.92	-89.92667
NO53	29.905	-89.91167
NO52	29.885	-89.905
NO51	29.87166667	-89.90667
NO50	29.865	-89.915
NO49	29.86666667	-89.925
NO48	29.88166667	-89.96167
NO47	29.87833333	-89.97167
NO46	29.85	-89.98167
NO45	29.82	-90.00167
NO44	29.80333333	-90.00667
NO43	29.77	-90.02333
NO42	29.75166667	-90.02167
NO41	29.73166667	-89.995
NO40	29.69833333	-89.97667
NO39	29.68166667	-89.96333
NO38	29.65	-89.955
NO37	29.64166667	-89.94667
NO36	29.635	-89.92667
NO35	29.61666667	-89.89833
NO34	29.60833333	-89.87333
NO33	29.6	-89.84167
NO32	29.57166667	-89.795
NO31	29.53333333	-89.75
NO30	29.51666667	-89.72
NO29	29.47666667	-89.685
NO28	29.46	-89.65667
NO27	29.45333333	-89.61333
NO26	29.445	-89.6
NO25	29.41833333	-89.605

NO24	29.40333333	-89.60167
NO23	29.39	-89.59
NO22	29.37	-89.56
NO21	29.36333333	-89.535
NO20	29.34333333	-89.48167
NO19	29.345	-89.475
NO18	29.36166667	-89.45833
NO17	29.36333333	-89.445
NO16	29.355	-89.42333
NO15	29.32833333	-89.39
NO14	29.27	-89.345
NO13	29.24833333	-89.31667
NO12	29.21666667	-89.28667
NO11	29.18833333	-89.26667
NO10	29.155	-89.25333
NO8	29.08333333	-89.285
NO7	29.05833333	-89.31167
NO6	29.04	-89.32167
NO5	29.02333333	-89.33833
NO4	28.965	-89.38667
NO3	28.915	-89.42167
NO2	28.905	-89.49833
NO1	28.83333333	-89.43167
NO-W	27.52355	-90.08693
H1	29	-94.13833
H2	29.18666667	-94.43667
H3	29.23333333	-94.50667
H4	29.26833333	-94.57333
H5	29.30416667	-94.62
H6	29.3405	-94.6885
H7	29.34566667	-94.71533
H8	29.3425	-94.76883
H16	29.348	-94.78167
H17	29.36783333	-94.80217
H18	29.49333333	-94.865
H19	29.60716667	-94.9525
H20	29.6835	-94.98167
H21	29.684	-94.98333
H22	29.68133333	-95.00317
H23	29.68233333	-95.00733
H24-P	29.68066667	-95.00883
H23a	29.68233333	-95.00633

H22a	29.68133333	-95.00217
H21a	29.684	-94.98233
H20a	29.6835	-94.98067
H19a	29.60716667	-94.9565
H18a	29.49333333	-94.869
H17a	29.36783333	-94.80617
H16a	29.348	-94.78567
H8a	29.3425	-94.77283
Ga9	29.33466667	-94.775
Ga10	29.32633333	-94.7775
Ga11	29.319	-94.78233
Ga12-P23-24-25	29.309	-94.79733
Ga11a	29.319	-94.78133
Ga10a	29.32633333	-94.7765
Ga9a	29.33466667	-94.774
Ga8a	29.3425	-94.76783
Ga7a	29.34566667	-94.71133
Ga6a	29.3405	-94.6845
Ga5a	29.30416667	-94.616
Ga4a	29.26833333	-94.56933
Ga13	29.21166667	-94.53
Ga14	29.115	-94.41667
Ga15	28.94333333	-94.41667



Houston
Pasadena
Galveston
Beaumont
Port Arthur
Lake Charles
Lafayette
Metairie
T E X A S
L O U I S I A N A
U N I T E D   S T A T E S
MISSISSIPPI
Lake Pontchartrain
Sabine National Wildlife Refuge
Atchafalaya Delta Wildlife Management Area
G u l f   o f
M e x i c o
H20a
H19a
H18
H2
H1
Ga14
Ga15
NO53
NO41
NO31
NO26
NO17
NO14
NO11
NO8
NO4
NO3
NO1
NO-W
Copyright © and (P) 1988-2012 Microsoft Corporation and/or its suppliers. All rights reserved.



Metairie
Kenner
Harvey
Marrero
Houma
L O U I S I A N A
T E R R E B O N N E
LAFOURCHE
JEFFERSON
ST CHARLES
ST JAMES
ST JOHN THE BAPTIST
ASSUMPTION
P L A Q U E M I N E S
S T   B E R N A R D
Lake Borgne
Lake Salvador
Lake Cataouatche
Barataria Bay
Breton Sound
Chandeleur Sound
Chandeleur Islands
Terrebonne Bay
Timbalier Bay
Caillou Bay
West Bay
East Bay
Grand Isle
Port Fourchon
Empire
Buras
G u l f   o f
M e x i c o
NO58
NO53
NO52
NO46
NO45
NO44
NO42
NO41
NO40
NO39
NO36
NO33
NO32
NO31
NO30
NO26
NO25
NO24
NO21
NO17
NO15
NO14
NO13
NO12
NO11
NO10
NO8
NO7
NO5
NO4
NO3
NO2
NO1
Copyright © and (P) 1988-2012 Microsoft Corporation and/or its suppliers. All rights reserved.


H1
H20a
H19a
H18
H17a
Ga8a
Ga6a
Ga5a
Ga4a
H3
Ga13
H2
Ga14
H1
Ga15
Galveston Island
Gulf of Mexico
Galveston Bay
East Bay
West Bay
Oyster Bayou
Armand Bayou
Clear Creek
Dickinson Bayou
Halls Bayou
Austin Bayou
Pasadena
Deer Park
La Porte
Pearland
League City
Friendswood
Alvin
Texas City
Galveston
HARRIS
GALVESTON
BRAZORIA
CHAMBERS
JEFFERSON
TEXAS
LA.

Date:	02/09/2016
Job Number:	160209SKJTEL07

Administrative Information	
Status	ENGINEER PROPOSAL
Call Sign	
Licensee Code	SPACLK
Licensee Name	Harris CapRock Communications

Site Information	**NEW ORLEANS, LA**
Venue Name	
Latitude (NAD 83)	29° 56' 55.8" N
Longitude (NAD 83)	90° 3' 43.2" W
Climate Zone	B
Rain Zone	1
Ground Elevation (AMSL)	0.0 m / 0.0 ft

Link Information	
Satellite Type	Geostationary
Mode	TO - Transmit-Only
Modulation	Digital
Satellite Arc	89° W to 97° West Longitude
Azimuth Range	177.9° to 193.7°
Corresponding Elevation Angles	55.1° / 54.3°
Antenna Centerline (AGL)	15.54 m / 51.0 ft

Antenna Information		**Transmit - FCC32**
Manufacturer		FCC REFERENCE
Model		32-25LOG(THETA)
Gain / Diameter		41.7 dBi / 2.4 m
3-dB / 15-dB Beamwidth		0.66° / 1.18°
Max Available RF Power	(dBW/4 kHz)	-9.0
	(dBW/MHz)	15.0
Maximum EIRP	(dBW/4 kHz)	32.7
	(dBW/MHz)	56.7
	(dBW)	60.5
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)	3M75G7D - 7M50G7D / 6067.3785 - 6076.0035
	3M75G7D - 7M50G7D / 6076.7555 - 6085.3805
	3M75G7D - 7M50G7D / 6086.3125 - 6095.6875
	3M75G7D - 7M50G7D / 6096.3125 - 6105.6875
	3M75G7D - 7M50G7D / 6387.003 - 6423.003
Max Great Circle Coordination Distance	167.5 km / 104.1 mi
Precipitation Scatter Contour Radius	100.0 km / 62.1 mi

Coordination Values	**NEW ORLEANS, LA**
Licensee Name	Harris CapRock Communications
Latitude (NAD 83)	29° 56' 55.8" N
Longitude (NAD 83)	90° 3' 43.2" W
Ground Elevation (AMSL)	0.0 m / 0.0 ft
Antenna Centerline (AGL)	15.54 m / 51.0 ft
Antenna Model	FCC Reference 32-25LOG(THETA)
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	-9.0 (dBW/4 kHz)

Transmit 6.1 GHz

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Horizon Gain (dBi)	Coordination Distance (km)
0	0.00	124.57	-10.00	167.52
5	0.00	124.62	-10.00	167.52
10	0.00	124.04	-10.00	167.52
15	0.00	123.18	-10.00	167.52
20	0.00	122.04	-10.00	167.52
25	0.00	120.64	-10.00	167.52
30	0.00	119.01	-10.00	167.52
35	0.00	117.17	-10.00	167.52
40	0.00	115.13	-10.00	167.52
45	0.00	112.93	-10.00	167.52
50	0.00	110.58	-10.00	167.52
55	0.00	108.11	-10.00	167.52
60	0.00	105.53	-10.00	167.52
65	0.00	102.86	-10.00	167.52
70	0.00	100.12	-10.00	167.52
75	0.00	97.33	-10.00	167.52
80	0.00	94.50	-10.00	167.52
85	0.00	91.65	-10.00	167.52
90	0.00	88.78	-10.00	167.52
95	0.00	85.93	-10.00	167.52
100	0.00	83.09	-10.00	167.52
105	0.00	80.29	-10.00	167.52
110	0.00	77.55	-10.00	167.52
115	0.00	74.87	-10.00	167.52
120	0.00	72.27	-10.00	167.52
125	0.00	69.78	-10.00	167.52
130	0.00	67.41	-10.00	167.52
135	0.00	65.19	-10.00	167.52
140	0.00	63.13	-10.00	167.52
145	0.00	61.26	-10.00	167.52
150	0.00	59.59	-10.00	167.52
155	0.00	58.16	-10.00	167.52
160	0.00	56.98	-10.00	167.52
165	0.00	56.07	-10.00	167.52
170	0.00	55.44	-10.00	167.52
175	0.00	55.12	-10.00	167.52
180	0.00	55.09	-10.00	167.52
185	0.00	54.74	-10.00	167.52

Coordination Values	**NEW ORLEANS, LA**
Licensee Name	Harris CapRock Communications
Latitude (NAD 83)	29° 56' 55.8" N
Longitude (NAD 83)	90° 3' 43.2" W
Ground Elevation (AMSL)	0.0 m / 0.0 ft
Antenna Centerline (AGL)	15.54 m / 51.0 ft
Antenna Model	FCC Reference 32-25LOG(THETA)
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	-9.0 (dBW/4 kHz)

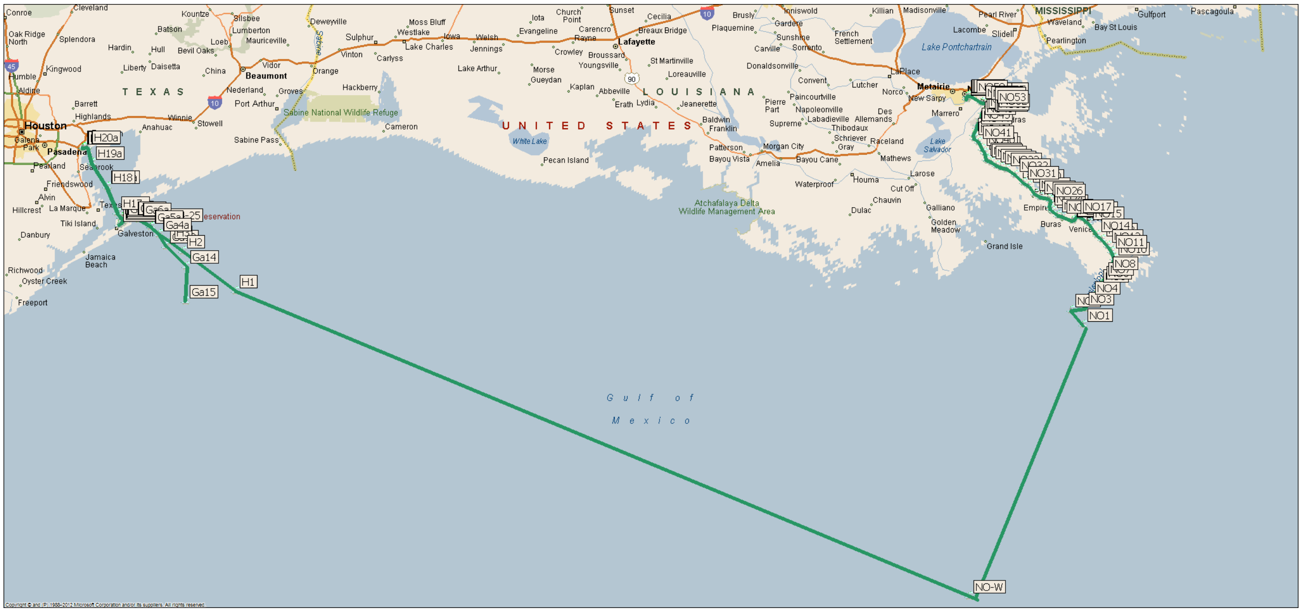
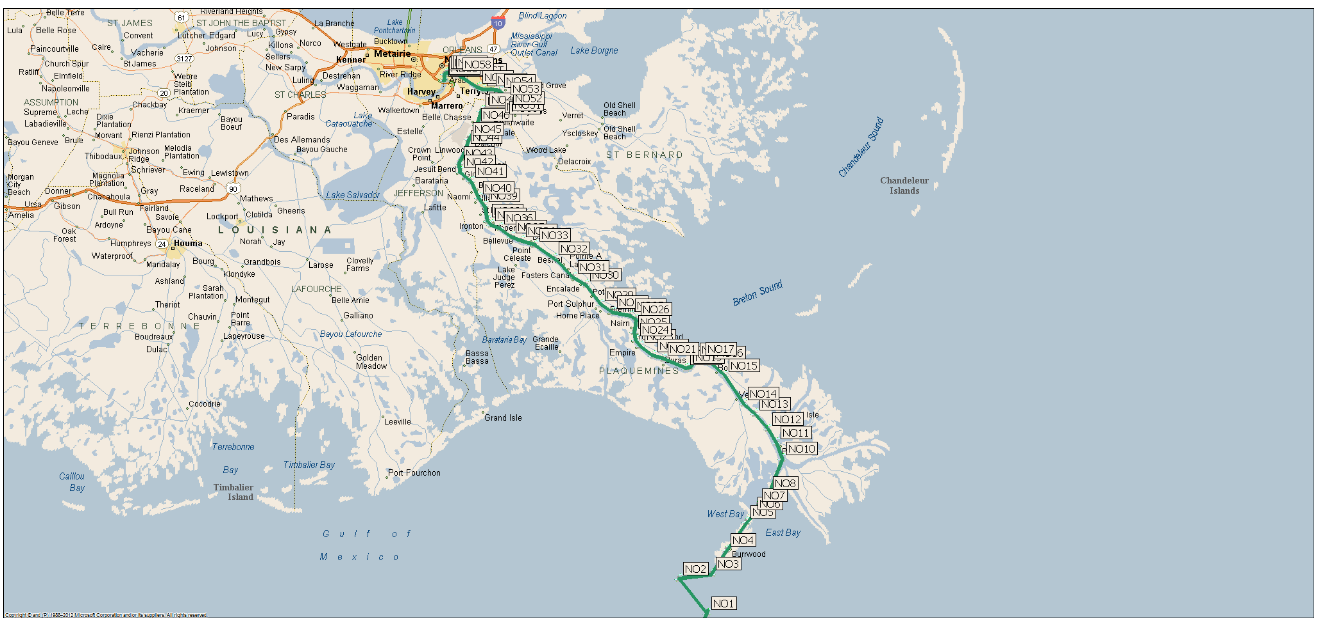
Transmit 6.1 GHz

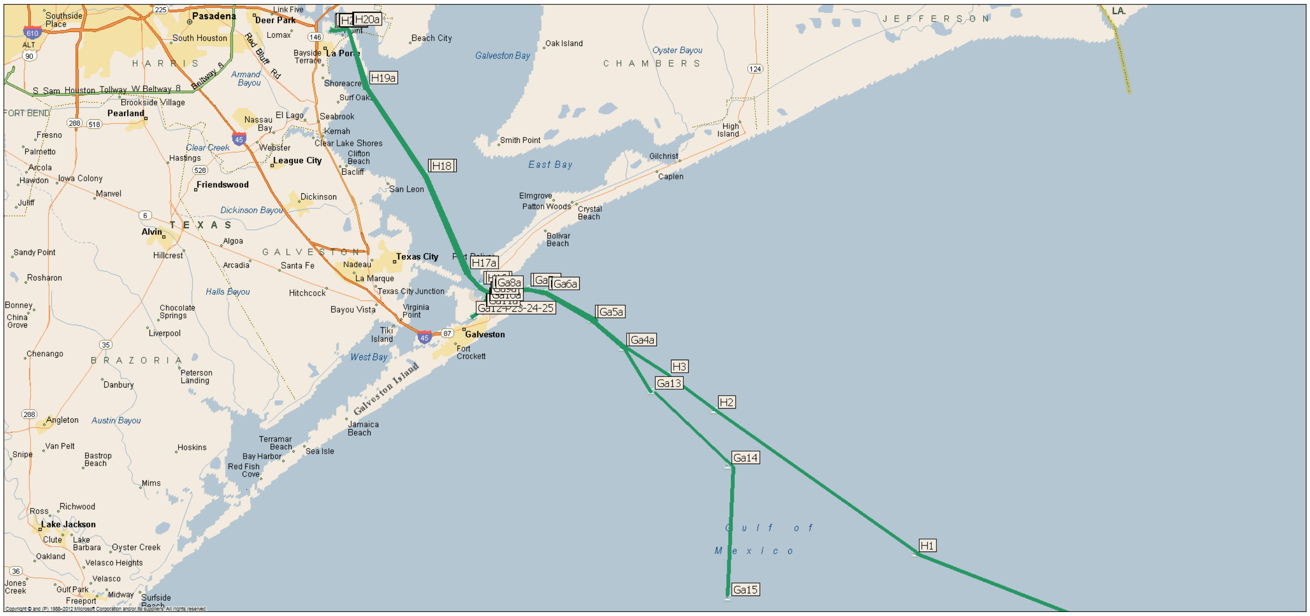
Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Horizon Gain (dBi)	Coordination Distance (km)
190	0.00	54.35	-10.00	167.52
195	0.00	54.28	-10.00	167.52
200	0.00	54.51	-10.00	167.52
205	0.00	55.06	-10.00	167.52
210	0.00	55.91	-10.00	167.52
215	0.00	57.03	-10.00	167.52
220	0.00	58.43	-10.00	167.52
225	0.00	60.07	-10.00	167.52
230	0.00	61.92	-10.00	167.52
235	0.00	63.98	-10.00	167.52
240	0.00	66.20	-10.00	167.52
245	0.00	68.58	-10.00	167.52
250	0.00	71.09	-10.00	167.52
255	0.00	73.71	-10.00	167.52
260	0.00	76.43	-10.00	167.52
265	0.00	79.21	-10.00	167.52
270	0.00	82.05	-10.00	167.52
275	0.00	84.93	-10.00	167.52
280	0.00	87.84	-10.00	167.52
285	0.00	90.76	-10.00	167.52
290	0.00	93.68	-10.00	167.52
295	0.00	96.57	-10.00	167.52
300	0.00	99.44	-10.00	167.52
305	0.00	102.25	-10.00	167.52
310	0.00	105.00	-10.00	167.52
315	0.00	107.67	-10.00	167.52
320	0.00	110.23	-10.00	167.52
325	0.00	112.67	-10.00	167.52
330	0.00	114.98	-10.00	167.52
335	0.00	117.12	-10.00	167.52
340	0.00	119.07	-10.00	167.52
345	0.00	120.82	-10.00	167.52
350	0.00	122.33	-10.00	167.52
355	0.00	123.59	-10.00	167.52

Name	Latitude	Longitude
NO64-JSCT	29.94233333	-90.061
NO65-T	29.94316667	-90.05833
NO63	29.94666667	-90.05917
NO62	29.9555	-90.05883
NO61	29.95833333	-90.05533
NO60	29.95883333	-90.05
NO59	29.958	-90.0425
NO58	29.9545	-90.0275
NO57	29.92833333	-89.98
NO56	29.92333333	-89.96833
NO55	29.92333333	-89.94667
NO54	29.92	-89.92667
NO53	29.905	-89.91167
NO52	29.885	-89.905
NO51	29.87166667	-89.90667
NO50	29.865	-89.915
NO49	29.86666667	-89.925
NO48	29.88166667	-89.96167
NO47	29.87833333	-89.97167
NO46	29.85	-89.98167
NO45	29.82	-90.00167
NO44	29.80333333	-90.00667
NO43	29.77	-90.02333
NO42	29.75166667	-90.02167
NO41	29.73166667	-89.995
NO40	29.69833333	-89.97667
NO39	29.68166667	-89.96333
NO38	29.65	-89.955
NO37	29.64166667	-89.94667
NO36	29.635	-89.92667
NO35	29.61666667	-89.89833
NO34	29.60833333	-89.87333
NO33	29.6	-89.84167
NO32	29.57166667	-89.795
NO31	29.53333333	-89.75
NO30	29.51666667	-89.72
NO29	29.47666667	-89.685
NO28	29.46	-89.65667
NO27	29.45333333	-89.61333
NO26	29.445	-89.6
NO25	29.41833333	-89.605

NO24	29.40333333	-89.60167
NO23	29.39	-89.59
NO22	29.37	-89.56
NO21	29.36333333	-89.535
NO20	29.34333333	-89.48167
NO19	29.345	-89.475
NO18	29.36166667	-89.45833
NO17	29.36333333	-89.445
NO16	29.355	-89.42333
NO15	29.32833333	-89.39
NO14	29.27	-89.345
NO13	29.24833333	-89.31667
NO12	29.21666667	-89.28667
NO11	29.18833333	-89.26667
NO10	29.155	-89.25333
NO8	29.08333333	-89.285
NO7	29.05833333	-89.31167
NO6	29.04	-89.32167
NO5	29.02333333	-89.33833
NO4	28.965	-89.38667
NO3	28.915	-89.42167
NO2	28.905	-89.49833
NO1	28.83333333	-89.43167
NO-W	27.52355	-90.08693
H1	29	-94.13833
H2	29.18666667	-94.43667
H3	29.23333333	-94.50667
H4	29.26833333	-94.57333
H5	29.30416667	-94.62
H6	29.3405	-94.6885
H7	29.34566667	-94.71533
H8	29.3425	-94.76883
H16	29.348	-94.78167
H17	29.36783333	-94.80217
H18	29.49333333	-94.865
H19	29.60716667	-94.9525
H20	29.6835	-94.98167
H21	29.684	-94.98333
H22	29.68133333	-95.00317
H23	29.68233333	-95.00733
H24-P	29.68066667	-95.00883
H23a	29.68233333	-95.00633

H22a	29.68133333	-95.00217
H21a	29.684	-94.98233
H20a	29.6835	-94.98067
H19a	29.60716667	-94.9565
H18a	29.49333333	-94.869
H17a	29.36783333	-94.80617
H16a	29.348	-94.78567
H8a	29.3425	-94.77283
Ga9	29.33466667	-94.775
Ga10	29.32633333	-94.7775
Ga11	29.319	-94.78233
Ga12-P23-24-25	29.309	-94.79733
Ga11a	29.319	-94.78133
Ga10a	29.32633333	-94.7765
Ga9a	29.33466667	-94.774
Ga8a	29.3425	-94.76783
Ga7a	29.34566667	-94.71133
Ga6a	29.3405	-94.6845
Ga5a	29.30416667	-94.616
Ga4a	29.26833333	-94.56933
Ga13	29.21166667	-94.53
Ga14	29.115	-94.41667
Ga15	28.94333333	-94.41667


Houston
Pasadena
Galveston
Beaumont
Port Arthur
Lafayette
Metairie
T E X A S
L O U I S I A N A
U N I T E D S T A T E S
MISSISSIPPI
Lake Pontchartrain
Sabine National Wildlife Refuge
Atchafalaya Delta Wildlife Management Area
G u l f o f
M e x i c o
H20a
H19a
H18
H2
H1
Ga4a
Ga14
Ga15
NO53
NO41
NO31
NO26
NO17
NO14
NO11
NO8
NO4
NO3
NO1
NO-W

Metairie
Kenner
Harvey
Marrero
Houma
L O U I S I A N A
ST BERNARD
PLAQUEMINES
LAFOURCHE
JEFFERSON
T E R R E B O N N E
Lake Borgne
Breton Sound
Chandeleur Sound
Chandeleur Islands
Barataria Bay
Terrebonne Bay
Timbalier Bay
Grand Isle
West Bay
East Bay
G u l f o f
M e x i c o
NO58
NO53
NO52
NO45
NO41
NO40
NO36
NO33
NO32
NO31
NO30
NO26
NO24
NO21
NO17
NO15
NO14
NO13
NO12
NO11
NO10
NO8
NO7
NO4
NO3
NO2
NO1


H20a
H19a
H18
H17a
Ga8a
Ga6a
Ga5a
Ga4a
H3
Ga13
H2
Ga14
H1
Ga15
Galveston Bay
East Bay
West Bay
Gulf of Mexico
Galveston Island
H A R R I S
C H A M B E R S
J E F F E R S O N
G A L V E S T O N
B R A Z O R I A
T E X A S
FORT BEND
LA.
Pasadena
Deer Park
South Houston
La Porte
Beach City
Oak Island
Oyster Bayou
Shoreacres
Seabrook
Kemah
League City
Friendswood
Pearland
Dickinson
San Leon
Smith Point
High Island
Gilchrist
Caplen
Crystal Beach
Bolivar Beach
Texas City
La Marque
Galveston
Alvin
Hitchcock
Santa Fe
Tiki Island
Jamaica Beach
Lake Jackson
Freeport
Angleton
Sea Isle
Fort Crockett
Copyright © and (P) 1988–2012 Microsoft Corporation and/or its suppliers. All rights reserved.

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: 

Ken Ryan, P.E.
Principal Engineer
Skjei Telecom, Inc.
7777 Leesburg Pike, Suite 315N
Falls Church, VA 22043

DATED: April 18, 2016

ANNEX VIII: NEW YORK

FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for
Harris Caprocks Communication, Inc.
New York, NY
Satellite Earth Station on Vessel (ESV)

Prepared By:
Skjei Telecom, Inc.
7777 Leesburg Pike, Suite 315N
Falls Church, VA 22043
April 18, 2016

Skjei Telecom, Inc.

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. There will be spectrum restrictions 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. The Critical Contour Point method of determining worst case interference from the route and port sites was the interference method used. 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. In those cases were OH losses did not resolve the interference the ESV will mute transmission within an exclusion zone sufficient in size to preclude interference. Also note, that there are no unresolved coordination requests which would result in an exceedance of the maximum 180 megahertz of coordinated spectrum for all ESV operations in the coordination area in the 5925-6425 MHz band.

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-only earth station. The ESV will employ a GPS sensitive ability to cease transmission when traveling in certain exclusion zones. The interference cases and the location of the critical contour point (CCP), around which the exclusion zones exist are detailed in the tables below.

Company

Essex County Sheriff's Office (NJ)
Geodesic Networks LLC
Green Line Networks
Jefferson Microwave, LLC
Licensee
Mahwah Communications
Middlesex, County of
MONMOUTH, COUNTY OF
Monroe County Control Center (PA)
National Tower Company LLC
New Jersey Transit Rail Operations, Inc.
New Line Networks, LLC
New York, City of (Police Department)
NeXXCom Wireless LLC
Office of Emergency Telecom Services, NJ
Orange and Rockland Utilities, Inc.
Port Authority of New York & New Jersey
PSEG Services Corporation
SCS Networks
Suffolk County Police Department
SW Networks
Texas Eastern Communications, LLC
WESTCHESTER, COUNTY OF

Skjei Telecom, Inc.

Wireless Internetwork LLC
World Class Wireless, LLC
xWave Engineering LLC
Zen Networks, Inc

Skjei Telecom, Inc.

Site	New York														
Desired Frequencies (MHz)		6387.003 - 6400	6400 - 6423.003	6067.3785 - 6076.0035	6076.7555 - 6085.3805	6086.3125 - 6095.6875	6096.3125 - 6105.6875								
Into 1															
Case #	Margin(dB)							Frequencies Affected							
674	48.4	Y	Y					6404.79	0	0	0	0	0	0	
472	48.4	Y						6375.14	0	0	0	0	0	0	
224	41.2				Y	Y	Y	6093.45	0	0	0	0	0	0	
525	38.2	Y						6375.14	0	0	0	0	0	0	
255	37.3	Y						6375.14	0	0	0	0	0	0	
157	35.5				Y	Y	Y	6093.45	6152.75	0	0	0	0	0	
668	34.8	Y						6256.54	6375.14	0	0	0	0	0	
214	32.7			Y	Y			6063.8	0	0	0	0	0	0	
141	32.5	Y						6375.14	0	0	0	0	0	0	
524	31.6	Y	Y					6404.79	0	0	0	0	0	0	
409	31.4			Y	Y			6063.8	0	0	0	0	0	0	
474	31.1			Y	Y			6063.8	0	0	0	0	0	0	
475	31.1			Y	Y			6063.8	0	0	0	0	0	0	
476	31.1			Y	Y			6063.8	0	0	0	0	0	0	
418	28.9			Y	Y	Y	Y	6063.8	6093.45	0	0	0	0	0	
238	28.8			Y	Y			6063.8	0	0	0	0	0	0	
237	28.7			Y	Y			6063.8	0	0	0	0	0	0	
414	28.5			Y	Y			6063.8	0	0	0	0	0	0	
215	26.6	Y						6375.14	0	0	0	0	0	0	
340	25.8			Y	Y			6063.8	0	0	0	0	0	0	
99	22.8			Y	Y			6063.8	0	0	0	0	0	0	
392	22.7	Y	Y					6404.79	0	0	0	0	0	0	
266	22.4	Y	Y					6404.79	0	0	0	0	0	0	
267	22.4	Y						6345.49	6375.14	0	0	0	0	0	
686	16.4					Y	Y	6093.45	0	0	0	0	0	0	
692	15.1	Y	Y					6315.84	6345.49	6404.79	0	0	0	0	

Skjei Telecom, Inc.

344	10.2	Y						6375.14	0	0	0	0	0	0	
303	9.0				Y	Y	Y	6093.45	0	0	0	0	0	0	
230	8.6	Y						6375.14	0	0	0	0	0	0	
2	7.9				Y	Y	Y	6093.45	0	0	0	0	0	0	
722	6.9	Y	Y					6404.79	0	0	0	0	0	0	
721	5.0	Y	Y					6375.14	6404.79	0	0	0	0	0	
625	5.0	Y						6375.14	0	0	0	0	0	0	
180	3.5			Y	Y			6063.8	0	0	0	0	0	0	
Desired Frequencies (MHz)		6387.003 - 6400	6400 - 6423.003	6067.3785 - 6076.0035	6076.7555 - 6085.3805	6086.3125 - 6095.6875	6096.3125 - 6105.6875								
Into 2															
Case #	Margin(dB)							Frequencies Affected							
541	43.4	Y	Y					6394.91	0	0	0	0	0	0	
542	39.0				Y	Y	Y	6093.45	0	0	0	0	0	0	
42	38.7	Y						6375.14	0	0	0	0	0	0	
111	38.6	Y						6375.14	0	0	0	0	0	0	
585	37.3	Y	Y					6404.79	0	0	0	0	0	0	
483	36.6				Y	Y	Y	6093.45	0	0	0	0	0	0	
550	36.6				Y	Y	Y	6093.45	0	0	0	0	0	0	
118	35.5				Y	Y	Y	6093.45	0	0	0	0	0	0	
540	33.0	Y	Y					6404.79	0	0	0	0	0	0	
520	32.5	Y	Y					6404.79	0	0	0	0	0	0	
405	31.8				Y	Y	Y	6093.45	0	0	0	0	0	0	
527	31.6	Y	Y					6404.79	0	0	0	0	0	0	
24	31.0				Y	Y	Y	6093.45	0	0	0	0	0	0	
518	30.8	Y	Y					6404.79	0	0	0	0	0	0	
33	30.7	Y						6375.14	0	0	0	0	0	0	
83	29.9			Y	Y	Y	Y	5945.2	5974.85	6004.5	6034.15	6063.8	6093.45	6123.1	6152
631	29.4	Y						6375.14	0	0	0	0	0	0	
632	29.4	Y						6375.14	0	0	0	0	0	0	
8	27.9				Y	Y	Y	6093.45	0	0	0	0	0	0	

206	27.7				Y	Y	Y	6093.45	0	0	0	0	0	0	
185	27.4				Y	Y	Y	6093.45	0	0	0	0	0	0	
12	27.0	Y	Y					6404.79	0	0	0	0	0	0	
664	26.9	Y	Y					6389.965	0	0	0	0	0	0	
22	26.2			Y	Y			6063.8	0	0	0	0	0	0	
646	25.1			Y	Y			6063.8	0	0	0	0	0	0	
18	24.3	Y	Y					6404.79	0	0	0	0	0	0	
648	23.4			Y	Y			6063.8	0	0	0	0	0	0	
649	23.4			Y	Y			6063.8	0	0	0	0	0	0	
650	23.4				Y	Y	Y	6093.45	0	0	0	0	0	0	
651	23.4				Y	Y	Y	6093.45	0	0	0	0	0	0	
656	23.0	Y	Y					6404.79	0	0	0	0	0	0	
657	23.0	Y	Y					6404.79	0	0	0	0	0	0	
231	21.1				Y	Y	Y	6093.45	0	0	0	0	0	0	
683	19.5			Y				6063.8	0	0	0	0	0	0	
603	19.0	Y						6315.84	6375.14	0	0	0	0	0	
652	18.6	Y	Y					6404.79	0	0	0	0	0	0	
653	18.6	Y	Y					6404.79	0	0	0	0	0	0	
570	10.9				Y	Y		6083.57	0	0	0	0	0	0	
706	9.2			Y	Y			6063.8	0	0	0	0	0	0	
710	9.2			Y	Y			6063.8	0	0	0	0	0	0	
726	9.2			Y	Y			6063.8	0	0	0	0	0	0	
198	6.1	Y						6375.14	0	0	0	0	0	0	
705	4.8			Y	Y			6063.8	0	0	0	0	0	0	
165	3.4	Y	Y					6375.14	6404.79	0	0	0	0	0	
332	0.6			Y	Y			6063.8	0	0	0	0	0	0	
107	0.3	Y						6375.14	0	0	0	0	0	0	

Table 1 – ESV Interference Cases

Skjei Telecom, Inc.

Interference Zones		New York			
Into 1					
Case #	CCP Latitude (dec.deg)	CCP Longitude (dec.deg.)	Margin (dB)	Victim Rx Site	Licensee
674	40.76191507	74.01078362	48.4	275	Capital Communications of America
472	40.62231727	74.05039763	48.4	ASR1013990	ECW Wireless, LLC
224	40.76453182	74.00861877	41.2	ASR1044537	Wireless Internetwork LLC
525	40.76941694	74.00038861	38.2	1060205	SCS Networks
255	40.76484057	74.00836333	37.3	1060205	CTAB Holdings LLC
157	40.68048571	74.03906965	35.5	QUEENS COLLE	City of New York
668	40.76667181	74.00684819	34.8	1060205	xWave Engineering LLC
214	40.50935305	74.00414142	32.7	FC1224038	Wireless Internetwork LLC
141	40.60165945	74.04525929	32.5	BOUND BROOK	Texas Eastern Communications, LLC
524	40.76977781	74.00427811	31.6	CLI 5	World Class Wireless, LLC
409	40.55806012	74.03125761	31.4	1045121	Zen Networks, Inc
474	40.57009047	74.03557932	31.1	ASR1054661	Wireless Internetwork LLC
475	40.57009047	74.03557932	31.1	ASR1054661	Wireless Internetwork LLC
476	40.57009047	74.03557932	31.1	ASR1054661	Wireless Internetwork LLC
418	40.6708873	74.04460237	28.9	01B	Coralinks
238	40.76042858	74.01201332	28.8	MT FREEDOM	Coralinks
237	40.4752621	73.90516791	28.7	ASR1224038	Wireless Internetwork LLC
414	40.76042858	74.01201332	28.5	MT FREEDOM	Coralinks
215	40.53862661	74.02043343	26.6	GLEN GARDNER	Jefferson Microwave, LLC
340	40.74471113	74.01775734	25.8	NETCONG	Coralinks
99	40.49351705	73.96840628	22.8	BLUE HILL PL	Orange and Rockland Utilities, Inc.
392	40.58769075	74.04097492	22.7	SITE 73	SW Networks
266	40.70419172	74.02759813	22.4	HOPE	Auburn Data Systems, LLC
267	40.70419172	74.02759813	22.4	HOPE	Auburn Data Systems, LLC
686	40.75594306	74.01572354	16.4	MT LAKES	WESTCHESTER, COUNTY OF
692	40.6735723	74.04305486	15.1	TRENTON	PSEG Services Corporation

344	40.44507621	73.38087455	10.2	MAHWAH15	Mahwah Communications
303	40.76977781	74.00427811	9.0	DCNY166 ATC8	World Class Wireless, LLC
230	40.76406057	74.00900866	8.6	ASR1206854	Wireless Internetwork LLC
2	40.57687783	74.03765973	7.9	CAMELBACK MT	Monroe County Control Center (PA)
722	40.76787209	74.00585505	6.9	CCI WIND GAP	New Line Networks, LLC
721	40.76977781	74.00427811	5.0	ATC-PA	New Line Networks, LLC
625	40.44162184	73.40723988	5.0	92869	Eastern MLG LLC
180	40.74323501	74.01802457	3.5	PALMERTON	Coralinks
Into 2 Case #	CCP Latitude (dec.deg)	CCP Longitude (dec.deg.)	Margin (dB)	Victim Rx Site	Licensee
541	40.63952668	74.05392998	43.4	TODT HILL	New York, City of (Police Department)
542	40.70533144	74.02729308	39.0	ELMHURST	New York, City of (Police Department)
42	40.7210532	74.02308394	38.7	ARTHUR KILL	CONSOLIDATED EDISON COMPANY OF NEW YORK
111	40.65794853	74.05205777	38.6	QES	New York, City of (Police Department)
585	40.71322396	74.02518029	37.3	ONE WTC	Port Authority of New York & New Jersey
483	40.76941694	74.00038861	36.6	TIME WARNER	ECW Wireless, LLC
550	40.76941694	74.00038861	36.6	TIME WARNER	ECW Wireless, LLC
118	40.49397424	73.96999207	35.5	BKLYN CO	City of New York
540	40.62408046	74.05075945	33.0	PSAC 2	New York, City of (Police Department)
520	40.76977781	74.00427811	32.5	CLI 5	ECW Wireless, LLC
405	40.68001617	74.03934034	31.8	RAMSEY	ECW Wireless, LLC
527	40.76977781	74.00427811	31.6	CLI 5	World Class Wireless, LLC
24	40.70597521	74.02712076	31.0	CLIP	NeXXCom Wireless LLC
518	40.70589837	74.02714133	30.8	CLI 5	ECW Wireless, LLC
33	40.75383784	74.01610479	30.7	1043280	Capital Communications of America
83	40.47855265	73.91655549	29.9	TOMS RIVER	Direct Broadcast Services, Inc.
631	40.70419172	74.02759813	29.4	HOPE	Green Line Networks
632	40.70419172	74.02759813	29.4	HOPE	Green Line Networks
8	40.45231924	73.82590911	27.9	ALLENWOOD	MONMOUTH, COUNTY OF
206	40.44982727	73.81731493	27.7	ATC88260	ECW Wireless, LLC

185	40.76977781	74.00427811	27.4	RANDOLPH	Essex County Sheriff's Office (NJ)
12	40.76977781	74.00427811	27.0	SOYSSET	ECW Wireless, LLC
664	40.46673412	73.87567857	26.9	BAYARD ST	Middlesex, County of
22	40.73630036	74.01927985	26.2	CLIF	NeXXCom Wireless LLC
646	40.7249358	74.02204415	25.1	COHALAN BLDG	Suffolk County Police Department
18	40.76977781	74.00427811	24.3	CCI 5	ECW Wireless, LLC
648	40.76977781	74.00427811	23.4	HENRY ZACHS	ECW Wireless, LLC
649	40.76977781	74.00427811	23.4	HENRY ZACHS	ECW Wireless, LLC
650	40.76977781	74.00427811	23.4	HENRY ZACHS	ECW Wireless, LLC
651	40.76977781	74.00427811	23.4	HENRY ZACHS	ECW Wireless, LLC
656	40.72658617	74.02160213	23.0	MERIDEN CLEA	ECW Wireless, LLC
657	40.72658617	74.02160213	23.0	MERIDEN CLEA	ECW Wireless, LLC
231	40.65071108	74.05622666	21.1	ASR1049007	Wireless Internetwork LLC
683	40.43550691	73.45379215	19.5	PUTNAM VLY	WESTCHESTER, COUNTY OF
603	40.4068875	73.66967328	19.0	HTC A2 90007	Geodesic Networks LLC
652	40.72658617	74.02160213	18.6	MERIDEN CLEA	ECW Wireless, LLC
653	40.72658617	74.02160213	18.6	MERIDEN CLEA	ECW Wireless, LLC
570	40.64159998	74.05435567	10.9	FLORENCE	County of Burlington, Public Safety Cntr
706	40.76977781	74.00427811	9.2	ATC278151	National Tower Company LLC
710	40.76977781	74.00427811	9.2	ATC278151	National Tower Company LLC
726	40.76977781	74.00427811	9.2	ATC278151	National Tower Company LLC
198	40.72646113	74.02163562	6.1	1274813	Eastern MLG LLC
705	40.76977781	74.00427811	4.8	ATC278151	National Tower Company LLC
165	40.75594306	74.01572354	3.4	D-102	AB Services LLC
332	40.76977781	74.00427811	0.6	EAGLE ROCK	Office of Emergency Telecom Services, NJ
107	40.73809926	74.01895425	0.3	SOUTH AMBOY	New Jersey Transit Rail Operations, Inc.

Table 2 - ESV CCP Locations
See Interference Analysis for Exclusion Zone Details

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 Skjei Telecom, Inc. 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 PCN letter dated 2/9/2016

Company

256Q Networks
AB Services LLC
ALGONQUIN GAS TRANSMISSION, LLC
AT&T Corporation
Atlantic City Electric Company
Atlantic, County of
Auburn Data Systems, LLC
BFI Licenses, LLC
Blueline Communications
Bucks County Dept. of Emergency Comm
Capital Communications of America
Cellco Partnership - CT, W-MA, VT
Cellco Prtnrshp - Phil. Tri-State Rgn
Central Hudson Gas & Electric Corp.
Chester, County of
China Cat Productions LLC
City of New York
Connecticut State Police Department
CONSOLIDATED EDISON COMPANY OF NEW YORK
Converge Towers LLC
Coral Reef Technologies Ltd
Coralinks
County of Burlington, Public Safety Cntr
County of Camden
County of Pike
County of Warren, NJ
CTAB Holdings LLC
Delaware County (PA) Emergency Services
Delmarva Broadcasting Company
Delmarva Power and Light Company
Direct Broadcast Services, Inc.
Eastern MLG LLC
ECW Wireless, LLC
EG Broadcast Newco Corp
Electric Railroad, LLC
Essex County Sheriff's Office (NJ)
Eversource Energy Service Company
Exelon Generation Company, LLC
FELHC, INC
Garden State Transmissions
Geodesic Networks LLC

Skjei Telecom, Inc.

Gloucester, County of
Goosetown Network Services, LLC
Green Line Networks
High Voltage Communications LLC (CFN)
iSignal
Jefferson Microwave, LLC
Kryptick Technologies
Mahwah Communications
Middlesex, County of
MONMOUTH, COUNTY OF
Montgomery County Of
Morris, County of
Nassau County Police Department
National Tower Company LLC
New Cingular Wireless PCS LLC -NJ
New Cingular Wireless PCS LLC-DE/NH/RI
New Cingular Wireless PCS, LLC - PA
New Jersey State Police
New Jersey Transit Rail Operations, Inc.
New Jersey Turnpike Authority-Pkwy Div
New Jersey, State of -NJ Transit
New Line Networks, LLC
New York Communications Co., Inc
New York, City of (Police Department)
NeXXCom Wireless LLC
OCEAN, COUNTY OF
Ocean, County of - Div of Wireless Tech.
Office of Emergency Telecom Services, NJ
Orange and Rockland Utilities, Inc.
Orange County Dept of Emergency Services
Orange Poughkeepsie SMSA LTD Partnership
Peco Energy Company
PEG Bandwidth
PEG Bandwidth, LLC
Pennsylvania Turnpike Commission
Pinnacle Telecom Group LLC
Pitt Power
Port Authority of New York & New Jersey
PSEG Services Corporation
Qoncept Holdings LLC
Rendezvous Communications LLC
SCS Networks
Suffolk County Police Department
Sullivan County DPW
SW Networks
Texas Eastern Communications, LLC
Turtle Networks 6562
ULSTER COUNTY OF
Verizon Wireless (VAW) LLC - Delaware/NJ
Verizon Wireless (VAW) LLC-Pennsylvania
Webline Holdings LLC
WESTCHESTER, COUNTY OF
Wireless Internetwork LLC
World Class Wireless, LLC
xWave Engineering 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. The coordination contours include all the area within this route as well as all of the area seaward of this route within 200 km of the baseline of the United States or 200 km from any fixed service offshore installations."

Skjei Telecom, Inc.

Date:	02/09/2016
Job Number:	160209SKJTEL16

Administrative Information	
Status	ENGINEER PROPOSAL
Call Sign	
Licensee Code	SPACLK
Licensee Name	Harris CapRock Communications

Site Information	**NEW YORK, NY**
Venue Name	
Latitude (NAD 83)	40° 46' 7.8" N
Longitude (NAD 83)	74° 0' 0.0" W
Climate Zone	B
Rain Zone	2
Ground Elevation (AMSL)	0.0 m / 0.0 ft

Link Information	
Satellite Type	Geostationary
Mode	TO - Transmit-Only
Modulation	Digital
Satellite Arc	89° W to 97° West Longitude
Azimuth Range	202.3° to 213.0°
Corresponding Elevation Angles	40.4° / 37.3°
Antenna Centerline (AGL)	15.54 m / 51.0 ft

Antenna Information		**Transmit - FCC32**
Manufacturer		FCC REFERENCE
Model		32-25LOG(THETA)
Gain / Diameter		41.7 dBi / 2.4 m
3-dB / 15-dB Beamwidth		0.66° / 1.18°
Max Available RF Power	(dBW/4 kHz)	-9.0
	(dBW/MHz)	15.0
Maximum EIRP	(dBW/4 kHz)	32.7
	(dBW/MHz)	56.7
	(dBW)	60.5
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)	3M75G7D - 7M50G7D / 6067.3785 - 6076.0035
	3M75G7D - 7M50G7D / 6076.7555 - 6085.3805
	3M75G7D - 7M50G7D / 6086.3125 - 6095.6875
	3M75G7D - 7M50G7D / 6096.3125 - 6105.6875
	3M75G7D - 7M50G7D / 6387.003 - 6423.003

Max Great Circle Coordination Distance	180.8 km / 112.3 mi
Precipitation Scatter Contour Radius	100.0 km / 62.1 mi

Skjei Telecom, Inc.

Coordination Values	**NEW YORK, NY**
Licensee Name	Harris CapRock Communications
Latitude (NAD 83)	40° 46' 7.8" N
Longitude (NAD 83)	74° 0' 0.0" W
Ground Elevation (AMSL)	0.0 m / 0.0 ft
Antenna Centerline (AGL)	15.54 m / 51.0 ft
Antenna Model	FCC Reference 32-25LOG(THETA)
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	-9.0 (dBW/4 kHz)

			Transmit 6.1 GHz	
Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Horizon Gain (dBi)	Coordination Distance (km)
0	0.85	132.42	-10.00	113.35
5	0.76	135.18	-10.00	115.67
10	0.62	137.58	-10.00	123.09
15	0.56	139.60	-10.00	126.49
20	0.00	139.54	-10.00	167.52
25	0.00	139.52	-10.00	167.52
30	0.00	138.99	-10.00	167.52
35	0.26	138.23	-10.00	158.59
40	0.22	136.71	-10.00	164.30
45	0.30	134.88	-10.00	153.15
50	0.33	132.65	-10.00	149.84
55	0.33	130.09	-10.00	148.88
60	0.36	127.28	-10.00	146.11
65	0.33	124.23	-10.00	148.89
70	0.32	120.99	-10.00	151.37
75	0.44	117.68	-10.00	136.74
80	0.44	114.18	-10.00	136.80
85	0.42	110.58	-10.00	138.40
90	0.44	106.91	-10.00	136.28
95	0.44	103.18	-10.00	136.68
100	0.36	99.39	-10.00	145.66
105	0.29	95.58	-10.00	155.19
110	0.23	91.76	-10.00	163.62
115	0.00	87.95	-10.00	167.52
120	0.00	84.15	-10.00	167.52
125	0.00	80.37	-10.00	167.52
130	0.00	76.62	-10.00	167.52
135	0.00	72.92	-10.00	167.52
140	0.00	69.27	-10.00	167.52
145	0.00	65.71	-10.00	167.52
150	0.00	62.25	-10.00	167.52
155	0.00	58.91	-10.00	167.52
160	0.00	55.73	-10.00	167.52
165	0.00	52.72	-10.00	167.52
170	0.00	49.94	-10.00	167.52
175	0.00	47.42	-9.90	168.00
180	0.00	45.21	-9.38	170.47
185	0.00	43.36	-8.93	172.67

Skjei Telecom, Inc.

Coordination Values	**NEW YORK, NY**
Licensee Name	Harris CapRock Communications
Latitude (NAD 83)	40° 46' 7.8" N
Longitude (NAD 83)	74° 0' 0.0" W
Ground Elevation (AMSL)	0.0 m / 0.0 ft
Antenna Centerline (AGL)	15.54 m / 51.0 ft
Antenna Model	FCC Reference 32-25LOG(THETA)
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	-9.0 (dBW/4 kHz)

Transmit 6.1 GHz

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Horizon Gain (dBi)	Coordination Distance (km)
190	0.00	41.93	-8.56	174.46
195	0.00	40.71	-8.24	176.06
200	0.00	39.18	-7.83	178.14
205	0.00	38.02	-7.50	179.81
210	0.00	37.39	-7.32	180.73
215	0.00	37.33	-7.30	180.82
220	0.00	37.84	-7.45	180.07
225	0.00	38.90	-7.75	178.54
230	0.00	40.45	-8.17	176.40
235	0.27	42.23	-8.64	163.20
240	0.43	44.52	-9.21	140.50
245	0.62	47.13	-9.83	123.62
250	0.81	50.03	-10.00	114.98
255	1.02	53.17	-10.00	105.57
260	1.08	56.60	-10.00	104.24
265	1.18	60.16	-10.00	101.95
270	1.31	63.83	-10.00	100.00
275	1.41	67.62	-10.00	100.00
280	1.42	71.52	-10.00	100.00
285	1.50	75.47	-10.00	100.00
290	1.48	79.47	-10.00	100.00
295	1.48	83.50	-10.00	100.00
300	1.42	87.55	-10.00	100.00
305	1.35	91.60	-10.00	100.00
310	1.18	95.63	-10.00	101.92
315	1.24	99.66	-10.00	100.54
320	1.13	103.64	-10.00	103.09
325	1.18	107.60	-10.00	101.97
330	1.01	111.45	-10.00	105.97
335	1.15	115.32	-10.00	102.61
340	1.11	119.05	-10.00	103.47
345	1.09	122.67	-10.00	103.98
350	1.03	126.12	-10.00	105.43
355	1.01	129.42	-10.00	105.98

Skjei Telecom, Inc.

Name	Latitude	Longitude
BP1	40.1666667	-73.82833
BP2	40.3433333	-73.81667
BP3	40.445	-73.80167
BP4	40.4833333	-73.33333
BP5	40.448	-73.80167
BP6	40.4816667	-73.89333
BP7	40.526	-74.01167
BP8	40.5385	-74.02317
BP9	40.5666667	-74.03117
BP10	40.6065	-74.04483
BP11	40.6436667	-74.05717
BP12	40.6561667	-74.0545
BP13	40.6738333	-74.04283
BP14	40.695	-74.02883
BP15	40.7531667	-74.0145
BP16	40.7618333	-74.0105
BP17	40.7676667	-74.00583
BP18	40.7678333	-74.00083
BP19	40.7691667	-74.005
BP20	40.7688333	-74
BP21	40.7663333	-73.999
BP22	40.7676667	-73.998

Table 1 - New York ESV Break Points

Skjei Telecom, Inc.

Skjei Telecom, Inc.

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: 

Ken Ryan, P.E.
Principal Engineer
Skjei Telecom, Inc.
7777 Leesburg Pike, Suite 315N
Falls Church, VA 22043

DATED: April 18, 2016

Skjei Telecom, Inc.

ANNEX IX: PORTLAND

FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for
Harris Caprocks Communication, Inc.
Portland, ME
Satellite Earth Station on Vessel (ESV)

Prepared By:
Skjei Telecom, Inc.
7777 Leesburg Pike, Suite 315N
Falls Church, VA 22043
April 18, 2016

Skjei Telecom, Inc.

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. There will be spectrum restrictions 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. The Critical Contour Point method of determining worst case interference from the route and port sites was the interference method used. 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. In those cases were OH losses did not resolve the interference the ESV will mute transmission within an exclusion zone sufficient in size to preclude interference. Also note, that there are no unresolved coordination requests which would result in an exceedance of the maximum 180 megahertz of coordinated spectrum for all ESV operations in the coordination area in the 5925-6425 MHz band.

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-only earth station. The ESV will employ a GPS sensitive ability to cease transmission when traveling in certain exclusion zones. The interference cases and the location of the critical contour point (CCP), around which the exclusion zones exist are detailed in the tables below.

Company

CUMBERLAND COUNTY, MAINE
Maine, State of - MSCommNet Project
New Cingular Wireless PCS LLC-Maine

Skjei Telecom, Inc.

Site	Portland												
Desired Frequencies (MHz)		6387.003 - 6400	6400 - 6423.004	6067.3785 - 6076.0035	6076.7555 - 6085.3805	6086.3125 - 6095.6875	6096.3125 - 6105.6875						
		Summary						Frequencies Affected					
126	29.6			Y				6063.8	0	0	0	0	0
Desired Frequencies (MHz)		6387.003 - 6400	6400 - 6423.004	6067.3785 - 6076.0035	6076.7555 - 6085.3805	6086.3125 - 6095.6875	6096.3125 - 6105.6875						
Into 2													
Case #	Margin(dB)							Frequencies Affected					
94	25.9				Y	Y	Y	6093.45	0	0	0	0	0
155	0.6			Y	Y			6063.8	0	0	0	0	0

Table 1 – ESV Interference Cases

Skjei Telecom, Inc.

Interference Zones	Portland				
Into 1					
Case #	CCP Latitude (dec.deg)	CCP Longitude (dec.deg.)	Margin (dB)	Victim Rx Site	Licensee
126	43.5403433	69.98484775	29.6	TV 51	New Cingular Wireless PCS LLC-Maine
Into 2					
Case #	CCP Latitude (dec.deg)	CCP Longitude (dec.deg.)	Margin (dB)	Victim Rx Site	Licensee
94	43.65669472	70.24530528	25.9	HARPSWELL	CUMBERLAND COUNTY, MAINE
155	43.65858349	70.22822078	0.6	GRANITE	Maine, State of - MSCommNet Project

Table 2 - ESV CCP Locations
See Interference Analysis for Exclusion Zone Details

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 Skjei Telecom, Inc. 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 PCN letter dated 2/9/2016

Company

ALGONQUIN GAS TRANSMISSION, LLC
BAE Systems Information & Electronic Sys
Bangor Cellular Telephone, L.P.
Catholic Media, Inc
Cellco Partnership - E-MA, NH, RI
Central Maine Power Company
CUMBERLAND COUNTY, MAINE
ECW Wireless, LLC
Eversource Energy Service Company
Florida Power and Light Company
Greater Boston Police Council
Industrial Tower and Wireless, LLC
Island Telephone Company
LCN Division of EG Sawyer Co., Inc.
Maine RSA #1 Inc.
Maine RSA #4 Limited Partnership
Maine, State of - MSCommNet Project
Massachusetts Commonwealth of
Massachusetts, Commonwealth of
National Grid USA Service Company, Inc
New Cingular Wireless PCS LLC - MA
New Cingular Wireless PCS LLC-DE/NH/RI
New Cingular Wireless PCS LLC-Maine
New Hampshire #1 Rural Cellular Inc.
New Hampshire Dept of Transportation
New Hampshire Dept. of Safety
New Hampshire Electric Cooperative
New Hampshire RSA #2 Partnership
NH #1 Rural Cellular, Inc.
Northern New England Telephone Ops LLC
Pacific and Southern Company, Inc.
Portland Cellular Partnership - Maine
RCC Atlantic Licenses LLC-NE East Ntwk
RCC Minnesota, Inc - E-MA,NH, RI, ME
Rural Cellular Corporation-New England W
University System of New Hampshire
Verizon Wireless - New England East
Verizon Wireless (VAW) LLC - Maine
WHDH-TV

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. The coordination contours include all the area within this route as well as all of the area seaward of this route within 200 km of the baseline of the United States or 200 km from any fixed service offshore installations."

Skjei Telecom, Inc.

Date:	02/09/2016
Job Number:	160209SKJTEL02

Administrative Information

Status	ENGINEER PROPOSAL
Call Sign	
Licensee Code	SPACLK
Licensee Name	Harris CapRock Communications

Site Information	**PORTLAND, ME**
Venue Name	
Latitude (NAD 83)	43° 39' 24.1" N
Longitude (NAD 83)	70° 14' 43.1" W
Climate Zone	B
Rain Zone	2
Ground Elevation (AMSL)	0.0 m / 0.0 ft

Link Information

Satellite Type	Geostationary
Mode	TO - Transmit-Only
Modulation	Digital
Satellite Arc	89° W to 97° West Longitude
Azimuth Range	206.2° to 216.1°
Corresponding Elevation Angles	36.2° / 33.0°
Antenna Centerline (AGL)	15.54 m / 51.0 ft

Antenna Information		**Transmit - FCC32**
Manufacturer		FCC REFERENCE
Model		32-25LOG(THETA)
Gain / Diameter		41.7 dBi / 2.4 m
3-dB / 15-dB Beamwidth		0.66° / 1.18°
Max Available RF Power	(dBW/4 kHz)	-9.0
	(dBW/MHz)	15.0
Maximum EIRP	(dBW/4 kHz)	32.7
	(dBW/MHz)	56.7
	(dBW)	60.5
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)	3M75G7D - 7M50G7D / 6067.3785 - 6076.0035
	3M75G7D - 7M50G7D / 6076.7555 - 6085.3805
	3M75G7D - 7M50G7D / 6086.3125 - 6095.6875
	3M75G7D - 7M50G7D / 6096.3125 - 6105.6875
	3M75G7D - 7M50G7D / 6387.003 - 6423.003
Max Great Circle Coordination Distance	187.9 km / 116.8 mi
Precipitation Scatter Contour Radius	100.0 km / 62.1 mi

Skjei Telecom, Inc.

Coordination Values	**PORTLAND, ME**
Licensee Name	Harris CapRock Communications
Latitude (NAD 83)	43° 39' 24.1" N
Longitude (NAD 83)	70° 14' 43.1" W
Ground Elevation (AMSL)	0.0 m / 0.0 ft
Antenna Centerline (AGL)	15.54 m / 51.0 ft
Antenna Model	FCC Reference 32-25LOG(THETA)
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	-9.0 (dBW/4 kHz)

Transmit 6.1 GHz

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Horizon Gain (dBi)	Coordination Distance (km)
0	1.39	133.48	-10.00	100.00
5	1.24	136.73	-10.00	100.49
10	1.08	139.67	-10.00	104.26
15	0.96	142.28	-10.00	108.15
20	0.59	143.89	-10.00	124.52
25	0.00	143.75	-10.00	167.52
30	0.00	143.59	-10.00	167.52
35	0.00	142.85	-10.00	167.52
40	0.00	141.56	-10.00	167.52
45	0.00	139.77	-10.00	167.52
50	0.00	137.56	-10.00	167.52
55	0.00	134.97	-10.00	167.52
60	0.00	132.08	-10.00	167.52
65	0.00	128.94	-10.00	167.52
70	0.00	125.59	-10.00	167.52
75	0.00	122.08	-10.00	167.52
80	0.00	118.44	-10.00	167.52
85	0.00	114.69	-10.00	167.52
90	0.00	110.85	-10.00	167.52
95	0.00	106.95	-10.00	167.52
100	0.00	103.00	-10.00	167.52
105	0.00	99.00	-10.00	167.52
110	0.00	94.99	-10.00	167.52
115	0.00	90.96	-10.00	167.52
120	0.00	86.93	-10.00	167.52
125	0.00	82.90	-10.00	167.52
130	0.00	78.90	-10.00	167.52
135	0.00	74.92	-10.00	167.52
140	0.00	70.99	-10.00	167.52
145	0.00	67.12	-10.00	167.52
150	0.00	63.33	-10.00	167.52
155	0.00	59.63	-10.00	167.52
160	0.25	55.93	-10.00	159.85
165	0.30	52.46	-10.00	153.08
170	0.33	49.18	-10.00	149.27
175	0.34	46.13	-9.60	149.79
180	0.21	43.47	-8.96	171.76
185	0.21	41.06	-8.33	174.42

Skjei Telecom, Inc.

Coordination Values	**PORTLAND, ME**
Licensee Name	Harris CapRock Communications
Latitude (NAD 83)	43° 39' 24.1" N
Longitude (NAD 83)	70° 14' 43.1" W
Ground Elevation (AMSL)	0.0 m / 0.0 ft
Antenna Centerline (AGL)	15.54 m / 51.0 ft
Antenna Model	FCC Reference 32-25LOG(THETA)
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	-9.0 (dBW/4 kHz)

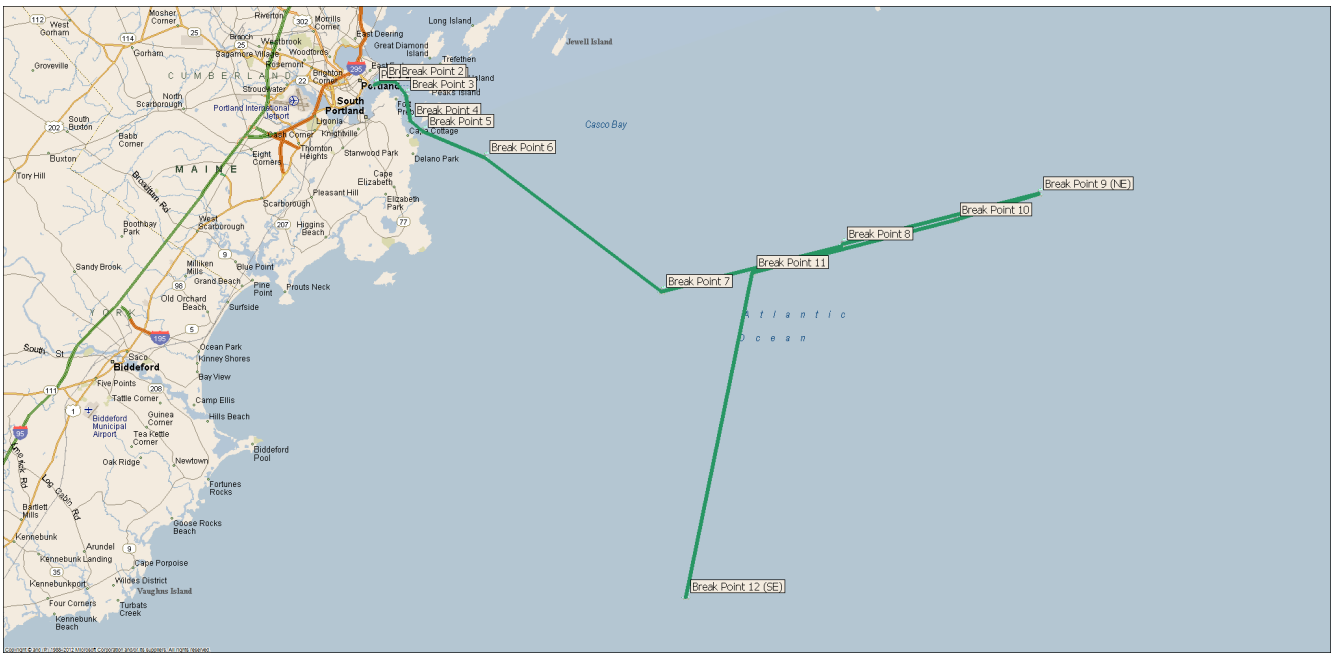
Transmit 6.1 GHz

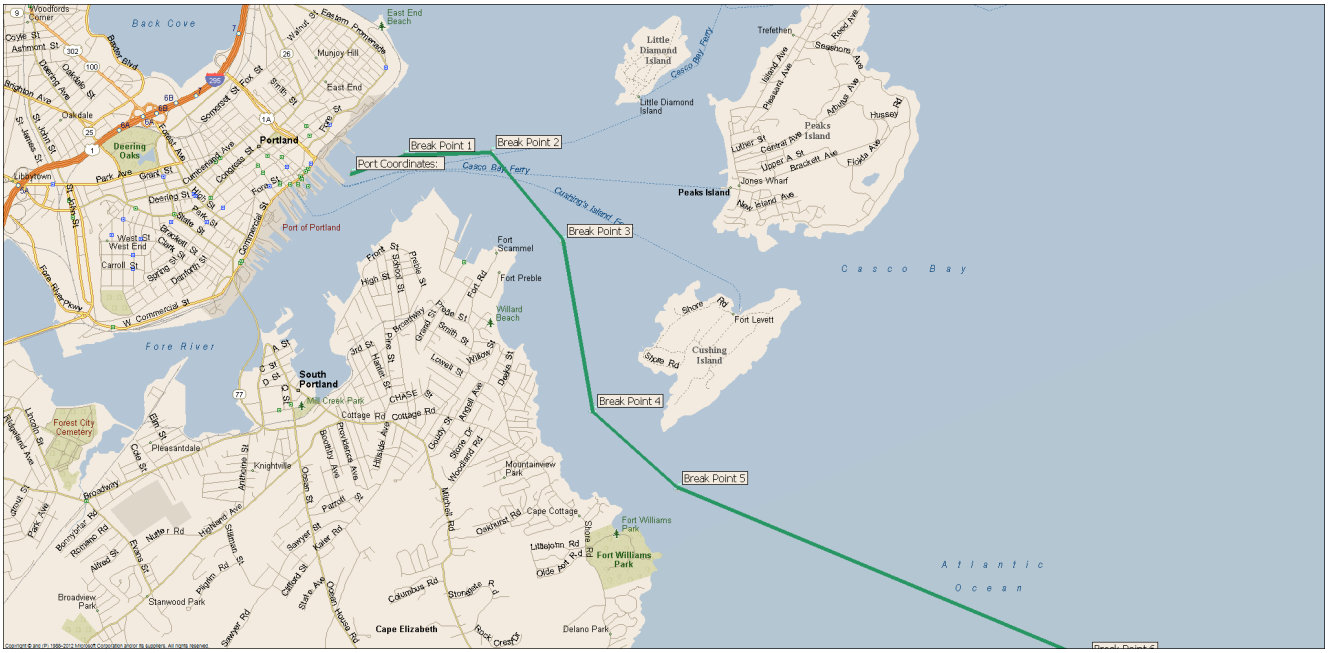
Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Horizon Gain (dBi)	Coordination Distance (km)
190	0.24	39.01	-7.78	171.91
195	0.40	37.31	-7.30	151.27
200	0.33	35.93	-6.89	163.38
205	0.29	34.31	-6.39	171.58
210	0.00	33.46	-6.11	187.06
215	0.00	32.97	-5.95	187.91
220	0.00	33.15	-6.01	187.59
225	0.00	33.99	-6.29	186.14
230	0.00	35.44	-6.74	183.75
235	0.46	37.05	-7.22	144.72
240	0.68	39.36	-7.88	126.10
245	0.75	42.18	-8.63	119.97
250	0.85	45.30	-9.40	114.93
255	0.71	48.81	-10.00	118.07
260	0.69	52.43	-10.00	119.10
265	0.65	56.22	-10.00	121.11
270	0.48	60.16	-10.00	131.61
275	0.34	64.18	-10.00	148.41
280	0.23	68.25	-10.00	162.39
285	0.24	72.34	-10.00	161.77
290	0.31	76.46	-10.00	152.10
295	0.00	80.67	-10.00	167.52
300	0.27	84.84	-10.00	157.49
305	0.27	89.04	-10.00	157.21
310	0.22	93.25	-10.00	163.91
315	0.41	97.46	-10.00	139.60
320	0.38	101.65	-10.00	143.66
325	0.55	105.84	-10.00	126.97
330	0.76	110.02	-10.00	115.88
335	0.94	114.16	-10.00	108.93
340	1.39	118.34	-10.00	100.00
345	1.50	122.36	-10.00	100.00
350	1.57	126.27	-10.00	100.00
355	1.52	129.99	-10.00	100.00

Skjei Telecom, Inc.

Break Points	Lat. (decimal)	Long. (decimal)
Port Coordinates:	43.65669444	-70.24530556
Break Point 1	43.65830556	-70.23883333
Break Point 2	43.65858333	-70.22822222
Break Point 3	43.65075	-70.2195
Break Point 4	43.63575	-70.21580556
Break Point 5	43.62891667	-70.20544444
Break Point 6	43.61386111	-70.15536111
Break Point 7	43.53516667	-70.012
Break Point 8	43.56311111	-69.86536111
Break Point 9 (NE)	43.59227778	-69.70575
Break Point 10	43.57713889	-69.77361111
Break Point 11	43.54647222	-69.93866667
Break Point 12 (SE)	43.35616667	-69.99252778

Skjei Telecom, Inc.





Skjei Telecom, Inc.

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: 

Ken Ryan, P.E.
Principal Engineer
Skjei Telecom, Inc.
7777 Leesburg Pike, Suite 315N
Falls Church, VA 22043

DATED: April 18, 2016

Skjei Telecom, Inc.

ANNEX X: SAN FRANCISCO

FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for
Harris Caprocks Communication, Inc.
San Francisco, CA
Satellite Earth Station on Vessel (ESV)

Prepared By:
Skjei Telecom, Inc.
7777 Leesburg Pike, Suite 315N
Falls Church, VA 22043
April 18, 2016

Skjei Telecom, Inc.

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. There will be spectrum restrictions 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. The Critical Contour Point method of determining worst case interference from the route and port sites was the interference method used. 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. In those cases were OH losses did not resolve the interference the ESV will mute transmission within an exclusion zone sufficient in size to preclude interference. Also note, that there are no unresolved coordination requests which would result in an exceedance of the maximum 180 megahertz of coordinated spectrum for all ESV operations in the coordination area in the 5925-6425 MHz band.

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-only earth station. The ESV will employ a GPS sensitive ability to cease transmission when traveling in certain exclusion zones. The interference cases and the location of the critical contour point (CCP), around which the exclusion zones exist are detailed in the tables below.

Company

California Rural Service Area #1, Inc.
California, State of
GTE Mobilnet of California LTD Partnersh
KDTV License Partnership, G.P.
M.U.T. Licensing, LLC
MENDOCINO COUNTY OF
Monterey, County of
New Cingular Wireless PCS LLC - N CAL
Pacific Bell Tel Com dba AT&T California
Pacific Gas and Electric Company
San Jose, City of
Santa Clara Valley Water District
Santa Clara, County of
Silicon Valley Regional Interop Authorit
Solano County Communications Division
Sonoma County, California
Una Vez Mas San Francisco License LLC

Skjei Telecom, Inc.

Site	San Francisco													
Desired Frequencies (MHz)		6347.1 - 6351.6	6356.5 - 6379.788	6076.7555 - 6085.3805	6086.3125 - 6095.6875	6096.3125 - 6105.6875								
Into 1														
Case #	Margin(dB)						Frequencies Affected							
454	43.3		Y				6286.19	6375.14	0	0	0	0	0	0
403	35.2			Y			6063.8	0	0	0	0	0	0	0
331	33.8				Y	Y	6093.45	0	0	0	0	0	0	0
28	32.7	Y	Y				6197.24	6226.89	6256.54	6286.19	6315.84	6345.49	6375.14	6404.79
75	31.8	Y	Y				6226.89	6345.49	0	0	0	0	0	0
441	31.3	Y	Y				6226.89	6345.49	0	0	0	0	0	0
143	29.8	Y					6345.49	0	0	0	0	0	0	0
487	25.4			Y			6063.8	0	0	0	0	0	0	0
131	24.9	Y	Y				6345.49	0	0	0	0	0	0	0
489	24.2	Y	Y				6345.49	0	0	0	0	0	0	0
99	22.4			Y			6063.8	0	0	0	0	0	0	0
71	5.3	Y	Y				6286.19	6345.49	0	0	0	0	0	0
411	5.3			Y			6063.8	0	0	0	0	0	0	0
Desired Frequencies (MHz)		6347.1 - 6351.6	6356.5 - 6379.788	6076.7555 - 6085.3805	6086.3125 - 6095.6875	6096.3125 - 6105.6875								
Into 2														
Case #	Margin(dB)						Frequencies Affected							
114	29.8			Y			5945.2	6063.8	0	0	0	0	0	0
510	28.7	Y	Y				6315.84	6345.49	0	0	0	0	0	0
511	28.7	Y	Y				6315.84	6345.49	6375.14	0	0	0	0	0
5	28.5			Y	Y	Y	6093.45	6123.1	0	0	0	0	0	0
465	26.9	Y	Y				6345.49	0	0	0	0	0	0	0
302	26.9	Y	Y				6315.84	6345.49	6375.14	0	0	0	0	0
404	26.7	Y	Y				6345.49	0	0	0	0	0	0	0
159	26.3			Y			6063.8	0	0	0	0	0	0	0
125	25.8	Y	Y				6345.49	0	0	0	0	0	0	0
87	24.9	Y	Y				6345.49	0	0	0	0	0	0	0
110	23.3			Y	Y	Y	6093.45	0	0	0	0	0	0	0
330	23.3		Y				6375.14	0	0	0	0	0	0	0
328	23.2			Y			6063.8	0	0	0	0	0	0	0
491	23.1			Y	Y	Y	6093.45	0	0	0	0	0	0	0
25	17.2			Y	Y	Y	5945.2	5974.85	6004.5	6034.15	6063.8	6093.45	6123.1	6152.75

11	13.1			Y			6034.15	6063.8	0	0	0	0	0	0
447	12.5			Y			6063.8	0	0	0	0	0	0	0
181	11.0			Y	Y	Y	6093.45	0	0	0	0	0	0	0
244	9.8			Y			6063.8	0	0	0	0	0	0	0
407	6.0			Y			6063.8	0	0	0	0	0	0	0

Table 1 – ESV Interference Cases

Skjei Telecom, Inc.

Interference Zones		San Francisco			
Into 1					
Case #	CCP Latitude (dec.deg)	CCP Longitude (dec.deg.)	Margin (dB)	Victim Rx Site	Licensee
454	37.80886273	122.4024121	43.3	OAKLAND DOT	California, State of
403	37.81818289	122.4754876	35.2	MT BURDELL	Una Vez Mas San Francisco License LLC
331	37.64152617	122.6616359	33.8	PAINT	California, State of
28	37.73828272	122.6382227	32.7	OAKLAND OKN	M.U.T. Licensing, LLC
75	37.8164232	122.4817759	31.8	MONTEBELLO	Pacific Gas and Electric Company
441	37.8164232	122.4817759	31.3	MONTEBELLO	Pacific Gas and Electric Company
143	37.85625482	122.8654915	29.8	MARTINEZ	New Cingular Wireless PCS LLC - N CAL
487	37.01166595	122.5250381	25.4	CAROL DRIVE	Silicon Valley Regional Interop Authorit
131	37.90459485	122.9589431	24.9	OAKRIDGE	Sonoma County, California
489	36.81780279	122.4528309	24.2	FRAZIER	Silicon Valley Regional Interop Authorit
99	37.82305559	122.4697644	22.4	SEA VIEW	Sonoma County, California
71	38.63429572	123.898501	5.3	ROCKTRE VLY	Pacific Bell Tel Com dba AT&T California
411	38.12532269	123.350741	5.3	CEDR ROGHS1	Pacific Bell Tel Com dba AT&T California
Into 2					
Case #	CCP Latitude (dec.deg)	CCP Longitude (dec.deg.)	Margin (dB)	Victim Rx Site	Licensee
114	37.25827951	122.6174422	29.8	SAN JOSE OF	Pacific Gas and Electric Company
510	37.79362984	122.5357111	28.7	PECADARO	New Cingular Wireless PCS LLC - N CAL
511	37.79362984	122.5357111	28.7	PECADARO	New Cingular Wireless PCS LLC - N CAL
5	37.37357083	122.6616725	28.5	SANTA CLARA	Santa Clara, County of
465	38.60791141	123.8701425	26.9	COLD SPRINGS	California Rural Service Area #1, Inc.
302	36.93586371	122.4967595	26.9	FREMONT PK	Pacific Gas and Electric Company
404	37.78361945	122.568139	26.7	MT ST HELENA	Una Vez Mas San Francisco License LLC
159	37.01166595	122.5250381	26.3	CAROL DRIVE	San Jose, City of
125	38.01891076	123.2242579	25.8	GEYSER PEAK	Sonoma County, California
87	36.70579607	122.4112835	24.9	MT TORO	Monterey, County of
110	37.22523388	122.6050243	23.3	NEW BALD/VOL	California, State of

330	37.816195	122.4822261	23.3	COYOTE PEAK	Santa Clara Valley Water District
328	37.51034946	122.6616561	23.2	HOLIDAY LAKE	Santa Clara Valley Water District
491	37.51034946	122.6616561	23.1	HOLIDAY LAKE	Silicon Valley Regional Interop Authorit
25	37.83035743	122.4152678	17.2	MT ALLISON	M.U.T. Licensing, LLC
11	38.25314037	123.4915446	13.1	MT VACA	Solano County Communications Division
447	37.24726202	122.6133008	12.5	PACHECO PK	GTE Mobilnet of California LTD Partnersh
181	38.60461199	123.8665982	11.0	CAHTO PEAK	MENDOCINO COUNTY OF
244	36.76823081	122.4344275	9.8	HIGHLAND PK	Pacific Gas and Electric Company
407	37.79707511	122.3929927	6.0	MT SUTRO	KDTV License Partnership, G.P.

Table 2 - ESV CCP Locations
See Interference Analysis for Exclusion Zone Details

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 Skjei Telecom, Inc. 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 PCN letter dated 2/9/2016

Company

AT&T COMMON SYSTEMS
Alameda County of California
American Tower, LLC
AT&T Corporation
AT&T Mobility Wireless Operations Hldgs
California RSA NO. 4 Limited Partnership
California, State of
CBS Broadcasting Inc
CBS Communication Services Inc
City & County of San Francisco PUC
CONTRA COSTA COUNTY COMMUNICATIONS DEPT.
County of San Mateo
County of Santa Cruz
CRYSTAL SMR INC.
CSI Telecommunications, Inc.
East Bay Municipal Utility District
Encina Communications Company
Etheric Networks, Inc.
Field, David J
GTE Mobilnet of California LTD Partnersh
ICG Telecom Group, Inc. - Debtor in poss
ION MEDIA SACRAMENTO LICENSE, INC.
KDTV License Partnership, G.P.
KGO Television Inc.
KGO Television, Inc.
KQED INC
KQED INC
KVIE, Inc.
KVIE, Inc.
Lyon, Mike
M.U.T. Licensing, LLC
Marin County of California
MENDOCINO COUNTY OF
MHO Networks
Modesto Irrigation District
Monterey County Superintendent of School
Monterey, County of

Skjei Telecom, Inc.

Morgan Communications LLC
Napa, County of
New Cingular Wireless PCS LLC - N CAL
Northstar San Francisco License LLC
Olympic Wireless, LLC
Pacific Bell Tel Com dba AT&T California
Pacific Coast Wireless Internet
Pacific Gas and Electric Company
Paxson Communications Corporation
Placer, County of
Proxim Wireless Corporation
Razzo Link, Inc
ROMAN CATHOLIC COMMUNICATIONS CORP
Sacramento County
Sacramento Municipal Utility District
Sacramento Municipal Utility District
Sacramento Municipal Utility District
Sacramento Valley Limited Partnership
SAN FRANCISCO CITY & COUNTY CALIFORNIA
SAN FRANCISCO CITY & COUNTY CALIFORNIA
San Joaquin County
San Jose, City of
Santa Clara Valley Water District
Santa Clara, County of
Silicon Valley Regional Interop Authorit
Solano County Communications Division
Sonoma County, California
The Internet Store, Inc.
Union Pacific Railroad Company
Wireless Applications Corporation
Yolo Emergency Communications Agency
Yolo, 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. The coordination contours include all the area within this route as well as all of the area seaward of this route within 200 km of the baseline of the United States or 200 km from any fixed service offshore installations."

Skjei Telecom, Inc.

Date:	02/09/2016
Job Number:	160209SKJTEL13

Administrative Information	
Status	ENGINEER PROPOSAL
Call Sign	
Licensee Code	SPACLK
Licensee Name	Harris CapRock Communications

Site Information	**SAN FRANCISC, CA**
Venue Name	
Latitude (NAD 83)	37° 48' 28.2" N
Longitude (NAD 83)	122° 24' 21.0" W
Climate Zone	B
Rain Zone	4
Ground Elevation (AMSL)	0.0 m / 0.0 ft

Link Information	
Satellite Type	Geostationary
Mode	TO - Transmit-Only
Modulation	Digital
Satellite Arc	97° W to 129° West Longitude
Azimuth Range	142.2° to 190.7°
Corresponding Elevation Angles	38.8° / 45.6°
Antenna Centerline (AGL)	15.54 m / 51.0 ft

Antenna Information		**Transmit - FCC32**
Manufacturer		FCC REFERENCE
Model		32-25LOG(THETA)
Gain / Diameter		41.7 dBi / 2.4 m
3-dB / 15-dB Beamwidth		0.66° / 1.18°
Max Available RF Power	(dBW/4 kHz)	-13.0
	(dBW/MHz)	11.0
Maximum EIRP	(dBW/4 kHz)	28.7
	(dBW/MHz)	52.7
	(dBW)	60.5
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)	3M75G7D - 7M50G7D / 6067.3785 - 6076.0035
	3M75G7D - 7M50G7D / 6076.7555 - 6085.3805
	3M75G7D - 7M50G7D / 6086.3125 - 6095.6875
	3M75G7D - 7M50G7D / 6096.3125 - 6105.6875
	2M50G7D - 7M50G7D / 6347.1 - 6351.6
	2M50G7D - 7M50G7D / 6356.5 - 6379.788

Max Great Circle Coordination Distance	159.6 km / 99.2 mi
Precipitation Scatter Contour Radius	100.0 km / 62.1 mi

Skjei Telecom, Inc.

Coordination Values	**SAN FRANCISC, CA**
Licensee Name	Harris CapRock Communications
Latitude (NAD 83)	37° 48' 28.2" N
Longitude (NAD 83)	122° 24' 21.0" W
Ground Elevation (AMSL)	0.0 m / 0.0 ft
Antenna Centerline (AGL)	15.54 m / 51.0 ft
Antenna Model	FCC Reference 32-25LOG(THETA)
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	-13.0 (dBW/4 kHz)

			Transmit 6.1 GHz	
Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Horizon Gain (dBi)	Coordination Distance (km)
0	0.00	128.05	-10.00	149.93
5	0.00	124.92	-10.00	149.93
10	0.00	121.61	-10.00	149.93
15	0.00	118.15	-10.00	149.93
20	0.00	114.58	-10.00	149.93
25	0.00	110.91	-10.00	149.93
30	0.00	107.16	-10.00	149.93
35	0.00	103.36	-10.00	149.93
40	0.00	99.51	-10.00	149.93
45	0.00	95.64	-10.00	149.93
50	0.00	91.74	-10.00	149.93
55	0.00	87.84	-10.00	149.93
60	0.00	83.95	-10.00	149.93
65	0.00	80.08	-10.00	149.93
70	0.00	76.24	-10.00	149.93
75	0.00	72.44	-10.00	149.93
80	0.00	68.70	-10.00	149.93
85	1.30	64.56	-10.00	100.00
90	0.00	61.47	-10.00	149.93
95	0.00	58.03	-10.00	149.93
100	0.00	54.74	-10.00	149.93
105	0.00	51.62	-10.00	149.93
110	0.00	48.73	-10.00	149.93
115	0.00	46.11	-9.59	151.60
120	0.00	43.80	-9.04	153.93
125	0.00	41.86	-8.55	156.03
130	0.00	40.36	-8.15	157.76
135	0.00	39.33	-7.87	158.99
140	0.00	38.82	-7.73	159.62
145	0.00	38.85	-7.73	159.58
150	0.00	39.41	-7.89	158.89
155	0.29	40.22	-8.11	146.62
160	0.00	42.05	-8.59	155.82
165	3.04	40.99	-8.32	100.00
170	3.72	41.52	-8.46	100.00
175	5.79	40.18	-8.10	100.00
180	7.48	38.70	-7.69	100.00
185	5.74	40.22	-8.11	100.00

Skjei Telecom, Inc.

Coordination Values	**SAN FRANCISC, CA**
Licensee Name	Harris CapRock Communications
Latitude (NAD 83)	37° 48' 28.2" N
Longitude (NAD 83)	122° 24' 21.0" W
Ground Elevation (AMSL)	0.0 m / 0.0 ft
Antenna Centerline (AGL)	15.54 m / 51.0 ft
Antenna Model	FCC Reference 32-25LOG(THETA)
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	-13.0 (dBW/4 kHz)

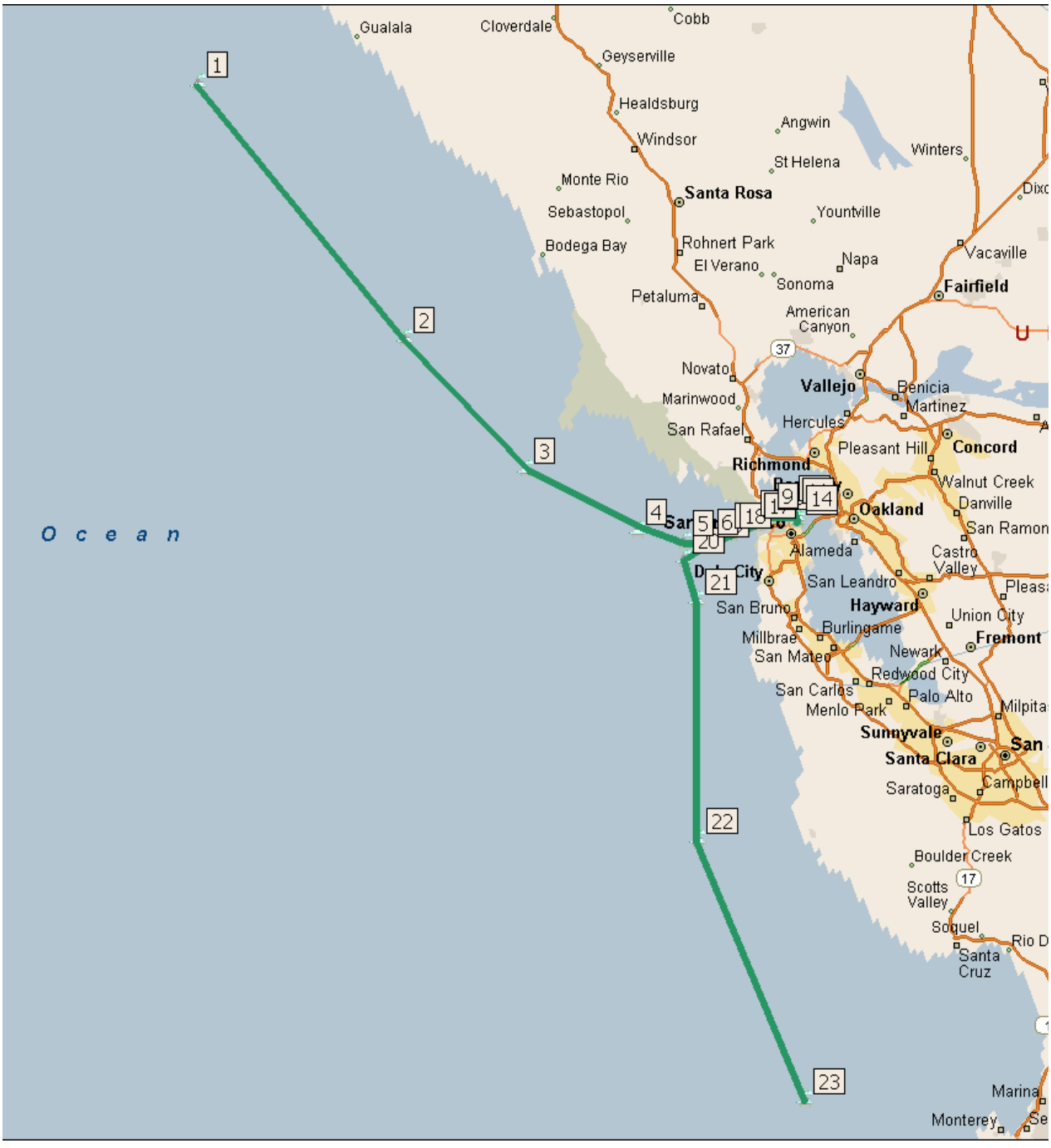
Transmit 6.1 GHz

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Horizon Gain (dBi)	Coordination Distance (km)
190	4.67	40.97	-8.31	100.00
195	4.91	40.91	-8.30	100.00
200	4.37	42.12	-8.61	100.00
205	3.92	43.67	-9.01	100.00
210	3.01	46.02	-9.57	100.00
215	3.28	47.67	-9.96	100.00
220	3.16	49.98	-10.00	100.00
225	2.97	52.61	-10.00	100.00
230	2.83	55.42	-10.00	100.00
235	3.12	58.18	-10.00	100.00
240	3.15	61.27	-10.00	100.00
245	2.91	64.63	-10.00	100.00
250	1.65	68.46	-10.00	100.00
255	0.93	72.06	-10.00	100.00
260	0.69	75.53	-10.00	110.37
265	0.55	79.00	-10.00	117.17
270	0.39	82.50	-10.00	127.61
275	0.00	86.03	-10.00	149.93
280	0.00	89.53	-10.00	149.93
285	0.29	93.04	-10.00	138.72
290	1.38	96.66	-10.00	100.00
295	0.97	100.13	-10.00	100.00
300	1.17	103.66	-10.00	100.00
305	0.00	106.74	-10.00	149.93
310	0.00	110.02	-10.00	149.93
315	0.00	113.22	-10.00	149.93
320	0.00	116.30	-10.00	149.93
325	0.39	119.47	-10.00	128.40
330	0.00	122.02	-10.00	149.93
335	1.04	125.34	-10.00	100.00
340	1.95	128.46	-10.00	100.00
345	0.67	129.62	-10.00	111.41
350	0.00	130.86	-10.00	149.93
355	0.00	130.97	-10.00	149.93

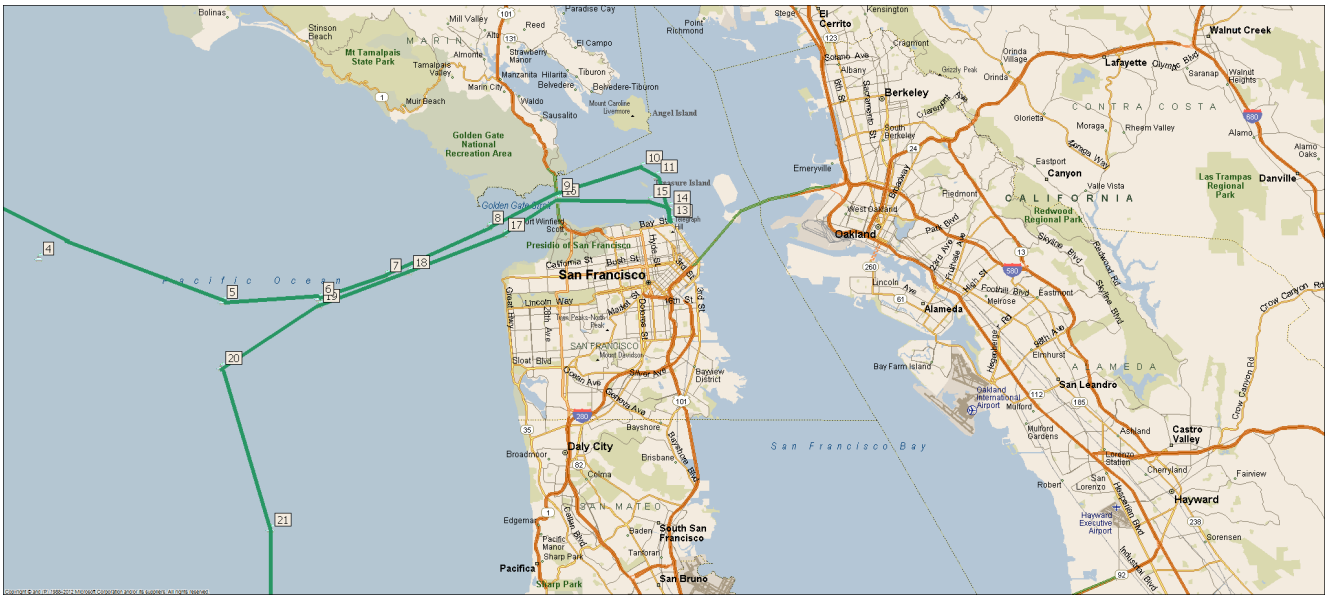
Skjei Telecom, Inc.

Name	Latitude	Longitude
1	38.66667	-123.933
2	38.16667	-123.4
3	37.90833	-123.093
4	37.78833	-122.81
5	37.76667	-122.693
6	37.76833	-122.631
7	37.78033	-122.588
8	37.8045	-122.523
9	37.82083	-122.479
10	37.835	-122.425
11	37.8305	-122.415
12	37.80783	-122.406
13	37.80833	-122.407
14	37.81467	-122.407
15	37.818	-122.42
16	37.81833	-122.478
17	37.80083	-122.513
18	37.782	-122.574
19	37.76467	-122.631
20	37.73333	-122.693
21	37.65167	-122.662
22	37.18	-122.662
23	36.66667	-122.397

Skjei Telecom, Inc.



Skjei Telecom, Inc.



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: 

Ken Ryan, P.E.
Principal Engineer
Skjei Telecom, Inc.
7777 Leesburg Pike, Suite 315N
Falls Church, VA 22043

DATED: April 18, 2016

Skjei Telecom, Inc.

ANNEX XI: SAN JUAN

FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for
Harris Caprocks Communication, Inc.
San Juan, PR
Satellite Earth Station on Vessel (ESV)

Prepared By:
Skjei Telecom, Inc.
7777 Leesburg Pike, Suite 315N
Falls Church, VA 22043
April 18, 2016

Skjei Telecom, Inc.

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. There will be spectrum restrictions 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. The Critical Contour Point method of determining worst case interference from the route and port sites was the interference method used. 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. In those cases were OH losses did not resolve the interference the ESV will mute transmission within an exclusion zone sufficient in size to preclude interference. Also note, that there are no unresolved coordination requests which would result in an exceedance of the maximum 180 megahertz of coordinated spectrum for all ESV operations in the coordination area in the 5925-6425 MHz band.

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-only earth station. The ESV will employ a GPS sensitive ability to cease transmission when traveling in certain exclusion zones. The interference cases and the location of the critical contour point (CCP), around which the exclusion zones exist are detailed in the tables below.

Company

ALL AMERICAN CABLE AND RADIO INC
Atlantic Tele-Network Inc.
Critical Hub Networks, Inc.
EVERTEC, INC
INTERISLAND TELEPHONE CORPORATION
Iniciativa Tecnologica Centro Oriental
Osnet Wireless Corporation
PREPA Networks, LLC.
Puerto Rico Commomwealth
Puerto Rico Commonwealth of State Police
Puerto Rico Electric Power Authority
Puerto Rico Telephone Company, Inc.
Surge Communications LLC
System Development Integration, LLC
UNIVERSITY OF THE VIRGIN ISLANDS

Skjei Telecom, Inc.

Virgin Islands Telephone Corporation
AT&T Mobility Puerto Rico
AT&T Mobility Virgin Islands, Inc.
Broadband Telecommunications
Network
Choice Communications, LLC (VI)
Neptunomedia, Inc.
PR Wireless, Inc.
Sprintcom, Inc
Sprintcom, Inc. Puerto Rico
T-Mobile Puerto Rico LLC
Aeronet Wireless Broadband Corp.
Broadband VI, LLC
T-Mobile Puerto Rico LLC

Skjei Telecom, Inc.

Site San Juan

Desired Frequencies (MHz)		6387.003 - 6423.003	6067.3785 - 6076.0035	6076.7555 - 6085.3805	6086.3125 - 6095.6875	6096.3125 - 6105.6875							
Into 1	Margin(dB)						Frequencies Affected						
244	44.9		Y	Y			5945.2	6004.5	6063.8	0	0	0	
156	37.3	Y					6345.49	6375.14	0	0	0	0	
250	33.6	Y					6375.14	0	0	0	0	0	
272	32.1			Y	Y	Y	6093.45	0	0	0	0	0	
46	32.0			Y	Y	Y	6093.45	0	0	0	0	0	
106	30.1	Y					6375.14	0	0	0	0	0	
96	29.9			Y	Y	Y	5974.85	6034.15	6093.45	0	0	0	
377	28.3		Y	Y			6063.8	0	0	0	0	0	
370	28.3		Y	Y			6063.8	0	0	0	0	0	
60	27.6		Y	Y			5945.2	6063.8	0	0	0	0	
290	27.1			Y	Y	Y	6093.45	6123.1	0	0	0	0	
315	27.1			Y	Y	Y	5974.85	6093.45	6123.1	0	0	0	
199	25.6			Y	Y	Y	6093.45	0	0	0	0	0	
95	25.5		Y	Y	Y	Y	5945.2	5974.85	6004.5	6034.15	6063.8	6093.45	61
260	25.0	Y					6256.54	6375.14	0	0	0	0	
160	24.9			Y	Y	Y	5974.85	6034.15	6093.45	6152.75	0	0	
22	24.7			Y	Y	Y	5974.85	6034.15	6093.45	0	0	0	
100	24.4		Y	Y	Y	Y	5974.85	6004.5	6034.15	6063.8	6093.45	6152.75	
42	22.9			Y	Y	Y	6093.45	0	0	0	0	0	
141	22.8		Y	Y			6063.8	0	0	0	0	0	
45	20.9		Y	Y			5974.85	6063.8	0	0	0	0	
361	3.8			Y	Y	Y	6093.45	0	0	0	0	0	
372	2.9			Y	Y	Y	6093.45	0	0	0	0	0	
Desired Frequencies (MHz)		6387.003 - 6423.003	6067.3785 - 6076.0035	6076.7555 - 6085.3805	6086.3125 - 6095.6875	6096.3125 - 6105.6875							
Into 2													
Case #	Margin(dB)						Frequencies Affected						
286	46.3		Y	Y			6063.8	0	0	0	0	0	
107	41.6			Y	Y	Y	6093.45	0	0	0	0	0	
251	38.7			Y	Y	Y	6093.45	0	0	0	0	0	
162	38.5	Y					6375.14	0	0	0	0	0	
19	37.4		Y	Y	Y	Y	6063.8	6093.45	0	0	0	0	
123	36.6		Y	Y			6063.8	0	0	0	0	0	
347	36.6		Y	Y			6063.8	0	0	0	0	0	
23	34.5	Y					6197.24	6256.54	6315.84	6375.14	0	0	
115	31.7		Y	Y			6063.8	0	0	0	0	0	

316	31.1	Y					6226.89	6286.19	6345.49	6375.14	0	0	
232	30.9			Y	Y	Y	6093.45	0	0	0	0	0	
235	30.7		Y	Y			6004.5	6063.8	0	0	0	0	
234	30.0			Y	Y	Y	5945.2	6093.45	0	0	0	0	
334	29.2			Y	Y	Y	6093.45	0	0	0	0	0	
376	28.5	Y					6375.14	0	0	0	0	0	
239	27.8			Y	Y	Y	6004.5	6093.45	0	0	0	0	
249	27.7			Y	Y	Y	6093.45	0	0	0	0	0	
265	27.7			Y	Y	Y	6093.45	0	0	0	0	0	
2	27.7	Y					6397.3775	0	0	0	0	0	
133	26.5			Y	Y	Y	6093.45	0	0	0	0	0	
306	25.7		Y	Y			5945.2	5974.85	6004.5	6063.8	6152.75	0	
335	25.4		Y	Y			6063.8	0	0	0	0	0	
168	25.1			Y	Y	Y	6093.45	0	0	0	0	0	
348	25.1			Y	Y	Y	6093.45	0	0	0	0	0	
379	24.7	Y					6375.14	0	0	0	0	0	
120	24.3		Y	Y			6063.8	0	0	0	0	0	
79	22.7	Y					6345.49	6375.14	6404.79	0	0	0	
201	22.6		Y	Y			6063.8	0	0	0	0	0	
24	22.5	Y					6375.14	6404.79	0	0	0	0	
281	21.6			Y	Y	Y	5945.2	6093.45	0	0	0	0	
16	21.4		Y	Y			6063.8	0	0	0	0	0	
317	16.2			Y	Y	Y	5945.2	5974.85	6004.5	6034.15	6093.45	6152.75	
131	12.6	Y					6375.14	6404.79	0	0	0	0	
354	8.5			Y	Y	Y	5945.2	6034.15	6093.45	6152.75	0	0	
177	8.4			Y	Y	Y	6093.45	0	0	0	0	0	
361	7.5	Y					6315.84	6375.14	0	0	0	0	
371	5.4	Y					6375.14	0	0	0	0	0	
273	4.8		Y	Y			6063.8	0	0	0	0	0	
294	4.8		Y	Y			6063.8	0	0	0	0	0	
181	4.2	Y					6375.14	0	0	0	0	0	
300	4.0	Y					6226.89	6315.84	6375.14	0	0	0	
39	2.0			Y	Y	Y	5974.85	6034.15	6093.45	6152.75	0	0	

Table 1 – ESV Interference Cases

Skjei Telecom, Inc.

Interference Zones

Into 1					
Case #	CCP Latitude (dec.deg)	CCP Longitude (dec.deg.)	Margin (dB)	Victim Rx Site	Licensee
244	18.29466306	65.08053343	44.9	PR59XC205	Sprintcom, Inc
156	18.46836785	66.07679143	37.3	LA SANTA	Puerto Rico Electric Power Authority
250	18.45881559	66.12073385	33.6	MOROVIS PRTC	Neptuno Media
272	18.34278664	65.13209752	32.1	CEIBA	AT&T Mobility Puerto Rico
46	18.47962469	66.05798412	32.0	AIBONITO	AT&T Mobility Puerto Rico
106	18.34791246	65.13473488	30.1	FAJARDO	AT&T Mobility Puerto Rico
96	18.71697469	66.3851591	29.9	JAYUYA	Puerto Rico Telephone Company, Inc.
377	18.36163398	65.14179574	28.3	SUSANNABERG	AT&T Mobility Virgin Islands, Inc.
370	18.36173695	65.14184873	28.3	SUSANNABERG	AT&T Mobility Virgin Islands, Inc.
60	18.44889646	66.10930915	27.6	BARCELONETA	AT&T Mobility Puerto Rico
290	18.39699494	65.15999746	27.1	LPI011	Iniciativa Tecnologica Centro Oriental
315	18.39699494	65.15999746	27.1	LPI011	Iniciativa Tecnologica Centro Oriental
199	18.76128288	66.58660147	25.6	CERRO GORDO	AT&T Mobility Puerto Rico
95	18.62147841	65.70886569	25.5	JAYUYA	Puerto Rico Telephone Company, Inc.
260	18.78947156	66.48239834	25.0	CERRO DE PUN	PR Wireless, Inc.
160	18.52431809	65.9832543	24.9	VIEQUES PILO	Puerto Rico Telephone Company, Inc.
22	18.63339896	65.50867886	24.7	JAYUYA	Puerto Rico Telephone Company, Inc.
100	18.62426191	65.66246035	24.4	MONTE JAYUYA	Puerto Rico Telephone Company, Inc.
42	18.40284765	65.16301086	22.9	LA MESA	PR Wireless, Inc.
141	18.66428389	66.31082969	22.8	ATALAYA	Puerto Rico Commonwealth of State Police
45	18.69236113	66.35218031	20.9	AGUADILLA	AT&T Mobility Puerto Rico
361	18.31525875	64.96392574	3.8	SIGNAL HILL	AT&T Mobility Virgin Islands, Inc.
372	18.31525875	64.96392574	2.9	SIGNAL HILL	AT&T Mobility Virgin Islands, Inc.
Case #	CCP Latitude (dec.deg)	CCP Longitude (dec.deg.)	Margin (dB)	Victim Rx Site	Licensee
286	18.29466306	65.08053343	46	PR59XC205	Sprintcom, Inc
107	18.34791246	65.13473488	42	SIGNAL HILL	AT&T Mobility Virgin Islands, Inc.

Skjei Telecom, Inc.

251	18.4602366	66.1064744	39	MARQUEZA	Neptuno Media
162	18.4700365	66.0740039	39	CARRAIZO	AT&T Mobility Puerto Rico
19	18.48390265	66.05083519	37	PR03XC504	Sprintcom, Inc. Puerto Rico
123	18.46447879	66.1263477	37	NARANJITO	Neptuno Media
347	18.46447879	66.1263477	37	NARANJITO	Neptuno Media
23	18.61928643	65.74526719	34	HUMACAO	Puerto Rico Telephone Company, Inc.
115	18.62282665	65.68641368	32	CEIBA	AT&T Mobility Puerto Rico
316	18.48658788	66.04634744	31	HUM014	Iniciativa Tecnologica Centro Oriental
232	18.49715441	66.02868462	31	PR000117A	T-Mobile Puerto Rico LLC
235	18.61847102	65.75877685	31	TRANSCARIBE	PR Wireless, Inc.
234	18.62850687	66.16975346	30	PR00118A	T-Mobile Puerto Rico LLC
334	18.71908852	66.38799216	29	PR00420A	T-Mobile Puerto Rico LLC
376	18.312478	65.11284075	28	BORDEAUX	AT&T Mobility Virgin Islands, Inc.
239	18.46319611	66.08543008	28	CONQUISTADOR	PR Wireless, Inc.
249	18.4655756	66.12714491	28	MONTE DEL ES	Critical Hub Networks, Inc.
265	18.53684542	65.96229106	28	CERCADILLO	AT&T Mobility Puerto Rico
2	18.45014894	66.10721801	28	VIEQUES	Puerto Rico Telephone Company, Inc.
133	18.60966281	65.46174961	27	CAGUAS HIMA	Neptuno Media
306	18.50692415	66.01234905	26	FAJARDO	Broadband Telecommunications Network
335	18.50291303	66.01905642	25	HUMACAO	PREPA Networks, LLC.
168	18.80214168	66.50045154	25	MONTE DEL ES	Neptuno Media
348	18.80214168	66.50045154	25	MONTE DEL ES	Neptuno Media
379	18.31525875	64.96392574	25	LTL PRINCESS	Broadband VI, LLC
120	18.62278117	65.68717189	24	YABUCOA	AT&T Mobility Puerto Rico
79	18.75350869	66.58148206	23	PR03XC080	Sprintcom, Inc. Puerto Rico
201	18.28106338	65.05588183	23	WKAQ	AT&T Mobility Puerto Rico
24	18.75350869	66.58148206	22	PR03XC080	Sprintcom, Inc. Puerto Rico
281	18.55600664	65.37800832	22	COCACOLA 104	PR Wireless, Inc.
16	18.62948916	65.57475892	21	LA PLENA	AT&T Mobility Puerto Rico
317	18.52875156	65.97583617	16	VIEQUES PILO	Puerto Rico Telephone Company, Inc.
131	18.60635725	65.45658738	13	CERRO PUNTA	Puerto Rico Electric Power Authority

354	18.31525875	64.96392574	8	CHRISTIANST	Virgin Islands Telephone Corporation
177	18.44889646	66.10930915	8	SANTURCER	Puerto Rico Electric Power Authority
361	18.31525875	64.96392574	7	BLUE MTN	AT&T Mobility Virgin Islands, Inc.
371	18.31525875	64.96392574	5	BLUE MTN	AT&T Mobility Virgin Islands, Inc.
273	18.62744365	65.60916497	5	CPR LTL PRI	AT&T Mobility Puerto Rico
294	18.62744365	65.60916497	5	CPR LTL PRI	AT&T Mobility Puerto Rico
181	18.44889646	66.10930915	4	BC TOWER	PR Wireless, Inc.
300	18.40510739	65.1641744	4	RADIO ORO	Broadband Telecommunications Network
39	18.44889646	66.10930915	2	EL YUNQUE	Puerto Rico Telephone Company, Inc.

Table 2 - ESV CCP Locations
See Interference Analysis for Exclusion Zone Details

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 Skjei Telecom, Inc. 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 PCN letter dated 2/9/2016

Company

AT&T Mobility Puerto Rico
AT&T Mobility Virgin Islands, Inc.
Broadband Telecommunications Network
Broadband VI, LLC
Critical Hub Networks, Inc.
Iniciativa Tecnologica Centro Oriental
Neptuno Media
PR Wireless, Inc.
PREPA Networks, LLC.
Puerto Rico Commonwealth of State Police
Puerto Rico Electric Power Authority
Puerto Rico Telephone Company, Inc.
Sprintcom, Inc
Sprintcom, Inc. Puerto Rico
T-Mobile Puerto Rico LLC
Virgin Islands Telephone Corporation

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. The coordination contours include all the area within this route as well as all of the area seaward of this route within 200 km of the baseline of the United States or 200 km from any fixed service offshore installations."

Skjei Telecom, Inc.

Date:	02/09/2016
Job Number:	160209SKJTEL04

Administrative Information

Status	ENGINEER PROPOSAL
Call Sign	
Licensee Code	SPACLK
Licensee Name	Harris CapRock Communications

Site Information	**SAN JUAN, PR**
Venue Name	
Latitude (NAD 83)	18° 27' 43.9" N
Longitude (NAD 83)	66° 6' 36.7" W
Climate Zone	B
Rain Zone	1
Ground Elevation (AMSL)	0.0 m / 0.0 ft

Link Information

Satellite Type	Geostationary
Mode	TO - Transmit-Only
Modulation	Digital
Satellite Arc	89° W to 97° West Longitude
Azimuth Range	233.1° to 242.1°
Corresponding Elevation Angles	56.1° / 48.8°
Antenna Centerline (AGL)	15.54 m / 51.0 ft

Antenna Information		**Transmit - FCC32**
Manufacturer		FCC REFERENCE
Model		32-25LOG(THETA)
Gain / Diameter		41.7 dBi / 2.4 m
3-dB / 15-dB Beamwidth		0.66° / 1.18°
Max Available RF Power	(dBW/4 kHz)	-9.0
	(dBW/MHz)	15.0
Maximum EIRP	(dBW/4 kHz)	32.7
	(dBW/MHz)	56.7
	(dBW)	60.5
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)	3M75G7D - 7M50G7D / 6067.3785 - 6076.0035
	3M75G7D - 7M50G7D / 6076.7555 - 6085.3805
	3M75G7D - 7M50G7D / 6086.3125 - 6095.6875
	3M75G7D - 7M50G7D / 6096.3125 - 6105.6875
	3M75G7D - 7M50G7D / 6387.003 - 6423.003
Max Great Circle Coordination Distance	167.5 km / 104.1 mi
Precipitation Scatter Contour Radius	100.0 km / 62.1 mi

Skjei Telecom, Inc.

Coordination Values	**SAN JUAN, PR**
Licensee Name	Harris CapRock Communications
Latitude (NAD 83)	18° 27' 43.9" N
Longitude (NAD 83)	66° 6' 36.7" W
Ground Elevation (AMSL)	0.0 m / 0.0 ft
Antenna Centerline (AGL)	15.54 m / 51.0 ft
Antenna Model	FCC Reference 32-25LOG(THETA)
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	-9.0 (dBW/4 kHz)

Transmit 6.1 GHz

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Horizon Gain (dBi)	Coordination Distance (km)
0	1.06	108.35	-10.00	104.74
5	1.06	111.44	-10.00	104.74
10	1.06	114.41	-10.00	104.73
15	0.75	116.60	-10.00	115.93
20	0.75	118.46	-10.00	115.92
25	0.00	119.49	-10.00	167.52
30	0.00	120.89	-10.00	167.52
35	0.00	122.04	-10.00	167.52
40	0.00	122.93	-10.00	167.52
45	0.00	123.55	-10.00	167.52
50	0.00	123.88	-10.00	167.52
55	0.00	123.91	-10.00	167.52
60	0.00	123.66	-10.00	167.52
65	0.00	123.11	-10.00	167.52
70	0.00	122.29	-10.00	167.52
75	0.00	121.20	-10.00	167.52
80	0.00	119.86	-10.00	167.52
85	0.00	118.30	-10.00	167.52
90	0.00	116.52	-10.00	167.52
95	0.00	114.56	-10.00	167.52
100	0.00	112.43	-10.00	167.52
105	0.00	110.16	-10.00	167.52
110	0.00	107.76	-10.00	167.52
115	0.00	105.26	-10.00	167.52
120	0.00	102.66	-10.00	167.52
125	0.00	100.00	-10.00	167.52
130	0.00	97.28	-10.00	167.52
135	0.00	94.53	-10.00	167.52
140	0.00	91.74	-10.00	167.52
145	0.00	88.95	-10.00	167.52
150	0.00	86.17	-10.00	167.52
155	0.00	83.40	-10.00	167.52
160	0.00	80.67	-10.00	167.52
165	0.00	78.00	-10.00	167.52
170	0.25	75.29	-10.00	160.80
175	0.39	72.68	-10.00	141.87
180	0.41	70.21	-10.00	139.68
185	0.36	67.91	-10.00	145.22

Skjei Telecom, Inc.

Coordination Values	**SAN JUAN, PR**
Licensee Name	Harris CapRock Communications
Latitude (NAD 83)	18° 27' 43.9" N
Longitude (NAD 83)	66° 6' 36.7" W
Ground Elevation (AMSL)	0.0 m / 0.0 ft
Antenna Centerline (AGL)	15.54 m / 51.0 ft
Antenna Model	FCC Reference 32-25LOG(THETA)
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	-9.0 (dBW/4 kHz)

Transmit 6.1 GHz

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Horizon Gain (dBi)	Coordination Distance (km)
190	0.30	65.76	-10.00	153.81
195	0.30	63.17	-10.00	153.01
200	0.56	60.37	-10.00	126.52
205	0.30	58.08	-10.00	154.00
210	0.52	55.66	-10.00	128.70
215	0.00	54.07	-10.00	167.52
220	0.00	52.36	-10.00	167.52
225	0.00	50.95	-10.00	167.52
230	0.00	49.87	-10.00	167.52
235	0.00	49.15	-10.00	167.52
240	0.00	48.80	-10.00	167.52
245	0.00	48.83	-10.00	167.52
250	0.00	49.24	-10.00	167.52
255	0.00	50.02	-10.00	167.52
260	0.00	51.15	-10.00	167.52
265	0.00	52.61	-10.00	167.52
270	0.00	54.37	-10.00	167.52
275	0.00	56.40	-10.00	167.52
280	0.00	58.66	-10.00	167.52
285	0.00	61.13	-10.00	167.52
290	0.30	63.61	-10.00	153.54
295	0.86	66.15	-10.00	112.97
300	0.83	69.14	-10.00	114.00
305	1.15	72.11	-10.00	102.49
310	1.18	75.30	-10.00	101.80
315	1.38	78.51	-10.00	100.00
320	0.85	81.92	-10.00	113.44
325	0.60	85.27	-10.00	123.83
330	0.36	88.60	-10.00	145.82
335	0.44	91.93	-10.00	136.29
340	0.47	95.24	-10.00	132.95
345	0.00	98.46	-10.00	167.52
350	0.42	101.78	-10.00	138.59
355	0.75	105.09	-10.00	115.92

Skjei Telecom, Inc.

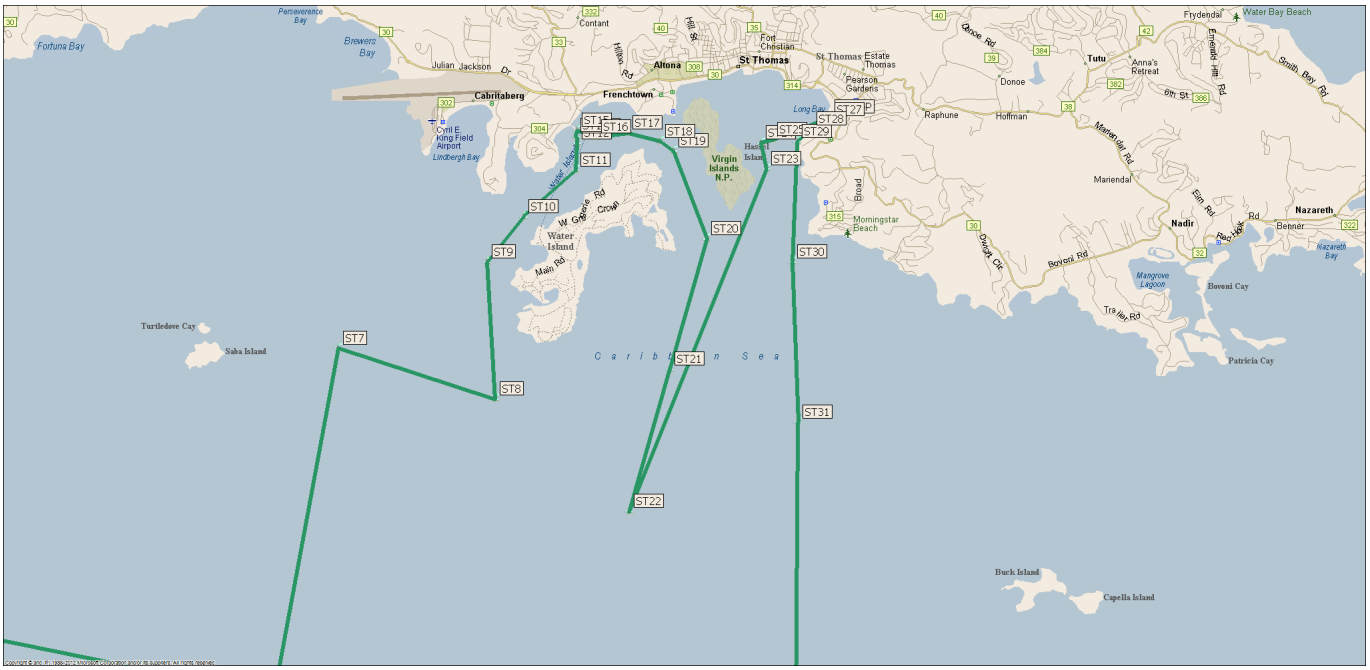
Name	Latitude	Longitude
SH1	19.97478	-67.05431
SH2	18.75333	-66.58333
SH3	18.80333	-66.5
SH4	18.66667	-66.31667
SH9	18.4695	-66.12833
SH29	18.4555	-66.11417
SH30	18.45	-66.1095
SH23	18.46117	-66.10567
SH26	18.4595	-66.09883
SH25	18.45917	-66.09617
SH24	18.4605	-66.10033
SH22	18.46133	-66.10667
SH21	18.46283	-66.10967
SH27	18.46	-66.1085
SH20	18.45917	-66.1105
SH19-P	18.4622	-66.1102
SH18	18.4625	-66.11033
SH17	18.4625	-66.11367
SH16	18.46017	-66.11233
SH28	18.45817	-66.11117
SH15	18.46017	-66.11367
SH14	18.46233	-66.114
SH13	18.45733	-66.11467
SH12	18.4575	-66.118
SH11	18.463	-66.12467
SH10	18.46667	-66.12733
SH9	18.4695	-66.12833
SH8	18.48333	-66.128
SH7	18.51667	-66.12667
SH6	18.555	-66.08333
SH5	18.565	-65.91667
ST1	18.615	-65.83333
ST2	18.635	-65.5
ST3	18.42667	-65.175
ST4	18.31667	-65.11833
ST5	18.27167	-65.03667
ST6	18.26333	-64.99167
ST7	18.30617	-64.98333
ST8	18.3	-64.96333
ST9	18.31667	-64.96433
ST10	18.32217	-64.95967

Skjei Telecom, Inc.

ST11	18.32783	-64.953
ST12	18.33117	-64.95283
ST13	18.33183	-64.95283
ST14-P	18.332	-64.953
ST15	18.33267	-64.95283
ST16	18.33183	-64.95033
ST17	18.33233	-64.94633
ST18	18.33133	-64.94217
ST19	18.33017	-64.9405
ST20	18.3195	-64.93633
ST21	18.30367	-64.941
ST22	18.28633	-64.94617
ST23	18.328	-64.92867
ST24	18.33117	-64.92933
ST25	18.3315	-64.92783
ST26-P	18.3343	-64.9205
ST27	18.334	-64.9205
ST28	18.33283	-64.92283
ST29	18.33133	-64.92467
ST30	18.31667	-64.92533
ST31	18.29717	-64.92467
ST32	18.25	-64.925
ST33	18.17	-64.88167
ST34	18.14333	-64.70167
ST35	18.29167	-64.56
ST36	18.11333	-64.5
ST37	17.985	-64.5

Skjei Telecom, Inc.

Skjei Telecom, Inc.



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: 

Ken Ryan, P.E.
Principal Engineer
Skjei Telecom, Inc.
7777 Leesburg Pike, Suite 315N
Falls Church, VA 22043

DATED: April 18, 2016

Skjei Telecom, Inc.

ANNEX XII: SEATTLE

FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for
Harris Caprocks Communication, Inc.
Seattle, WA
Satellite Earth Station on Vessel (ESV)

Prepared By:
Skjei Telecom, Inc.
7777 Leesburg Pike, Suite 315N
Falls Church, VA 22043
April 18, 2016

Skjei Telecom, Inc.

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. There will be spectrum restrictions 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. The Critical Contour Point method of determining worst case interference from the route and port sites was the interference method used. 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. In those cases were OH losses did not resolve the interference the ESV will mute transmission within an exclusion zone sufficient in size to preclude interference. Also note, that there are no unresolved coordination requests which would result in an exceedance of the maximum 180 megahertz of coordinated spectrum for all ESV operations in the coordination area in the 5925-6425 MHz band.

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-only earth station. The ESV will employ a GPS sensitive ability to cease transmission when traveling in certain exclusion zones. The interference cases and the location of the critical contour point (CCP), around which the exclusion zones exist are detailed in the tables below.

Company

Bearclaw, LLC
Cascade Carriers
Frontier Communications Northwest Inc.
King County DOT Metro Transit Division
New Cingular Wireless PCS LLC-Washington
Noel Communications, Inc
Qwest Corporation
Seattle City Light
Seattle SMSA Limited Partnership
Seattle, City of
Selahv Farms, LLC
Skagit 911
USCOC of Washington 4 Inc.
Verizon Wireless (VAW) LLC - (WA)

Skjei Telecom, Inc.

Washington State Patrol
Whidbey Telephone Co

Skjei Telecom, Inc.

Site	Seattle														
Desired Frequencies (MHz)		6347.1 - 6351.6	6356.5 - 6379.788	6067.3785 - 6076.0035	6076.7555 - 6085.3805	6086.3125 - 6095.6875	6096.3125 - 6105.6875								
Into 1															
Case #	Margin(dB)							Frequencies Affected							
301	38.1				Y	Y	Y	6093.45	6152.75	0	0	0	0	0	
411	32.8		Y					6375.14	0	0	0	0	0	0	
284	31.6			Y	Y			6063.8	0	0	0	0	0	0	
130	30.5	Y	Y					6345.49	0	0	0	0	0	0	
69	30.5	Y	Y					6345.49	0	0	0	0	0	0	
248	30.3	Y	Y					6345.49	0	0	0	0	0	0	
129	27.9			Y	Y			6063.8	0	0	0	0	0	0	
147	27.8	Y	Y					6197.24	6226.89	6256.54	6286.19	6315.84	6345.49	6375.14	6404
385	26.4	Y	Y					6345.49	0	0	0	0	0	0	
249	25.3	Y	Y					6345.49	0	0	0	0	0	0	
405	23.2	Y	Y					6256.54	6345.49	6375.14	0	0	0	0	
Desired Frequencies (MHz)		6347.1 - 6351.6	6356.5 - 6379.788	6067.3785 - 6076.0035	6076.7555 - 6085.3805	6086.3125 - 6095.6875	6096.3125 - 6105.6875								
Into 2															
Case #	Margin(dB)							Frequencies Affected							
358	47.6			Y	Y			6034.15	6063.8	0	0	0	0	0	
120	39.9			Y	Y			6063.8	0	0	0	0	0	0	
306	39.2			Y	Y			6063.8	0	0	0	0	0	0	
119	37.6			Y	Y			6063.8	0	0	0	0	0	0	
301	33.6	Y	Y					6345.49	6404.79	0	0	0	0	0	
591	30.3		Y					6375.14	0	0	0	0	0	0	
383	30.2			Y	Y			6063.8	0	0	0	0	0	0	
709	29.9				Y	Y	Y	6093.45	6123.1	0	0	0	0	0	

589	29.1		Y					6375.14	0	0	0	0	0	0	
518	29.1	Y	Y					6197.24	6256.54	6345.49	0	0	0	0	
288	29.1	Y	Y					6226.89	6345.49	0	0	0	0	0	
414	28.0	Y	Y					6345.49	0	0	0	0	0	0	
20	27.8	Y	Y					6226.89	6345.49	0	0	0	0	0	
405	27.5				Y	Y	Y	6004.5	6093.45	6123.1	0	0	0	0	
393	27.4				Y	Y	Y	6093.45	0	0	0	0	0	0	
546	27.4				Y	Y	Y	6093.45	0	0	0	0	0	0	
203	27.3			Y	Y			6063.8	0	0	0	0	0	0	
541	26.8			Y	Y			6063.8	6152.75	0	0	0	0	0	
404	26.0		Y					6375.14	0	0	0	0	0	0	
593	25.8	Y	Y					6345.49	0	0	0	0	0	0	
648	23.0		Y					6375.14	0	0	0	0	0	0	
617	20.8					Y	Y	6093.45	0	0	0	0	0	0	
88	1.0				Y	Y	Y	6093.45	0	0	0	0	0	0	

Table 1 – ESV Interference Cases

Skjei Telecom, Inc.

Interference Zones
Into 1

Case #	CCP Latitude (dec.deg)	CCP Longitude (dec.deg.)	Margin (dB)	Victim Rx Site	Licensee
301	48.14095962	122.7104089	38.1	BLYN	Qwest Corporation
411	47.75923419	122.4293659	32.8	KING LAKE NO	Selahv Farms, LLC
284	47.69604442	122.464044	31.6	BLYN	Qwest Corporation
130	48.19343382	122.9798949	30.5	GOLD MTN	Washington State Patrol
69	48.07389859	122.6422209	30.5	WA1PORTANGL	Seattle SMSA Limited Partnership
248	47.58360888	122.3429476	30.3	NORWAY HILL	King County DOT Metro Transit Division
129	48.16167729	123.386412	27.9	ELLIS MT	Washington State Patrol
147	47.72538798	122.4385593	27.8	GRASS MTN	Noel Communications, Inc
385	48.15331251	122.7459414	26.4	BREWESTBREM	Seattle SMSA Limited Partnership
249	48.06292224	122.6381921	25.3	LYMAN PEAK	Skagit 911
405	48.2134332	123.3710584	23.2	PORT LUDLOW	Verizon Wireless (VAW) LLC - (WA)
Case #	CCP Latitude (dec.deg)	CCP Longitude (dec.deg.)	Margin (dB)	Victim Rx Site	Licensee
358	47.84743655	122.4736991	47.6	PORT GAMBLE	New Cingular Wireless PCS LLC-Washington
120	47.73445644	122.4360973	39.9	QUEEN ANN	Seattle, City of
306	48.17140679	122.779279	39.2	GARDINER	Washington State Patrol
119	47.7357227	122.4357535	37.6	COLUMBIA TWR	Seattle, City of
301	48.14095962	122.7104089	33.6	DEVILS MTN	Qwest Corporation
591	48.08533618	122.6464207	30.3	SEGELSEN	Seattle City Light
383	47.93303674	122.5019712	30.2	INDEX	New Cingular Wireless PCS LLC-Washington
709	47.62640342	122.4036721	29.9	GOLD BAR	Bearclaw, LLC
589	48.08533618	122.6464207	29.1	SEGELSEN	Seattle City Light
518	48.31996073	124.2247378	29.1	SOUTH FORKS	Verizon Wireless (VAW) LLC - (WA)
288	48.00192778	122.5999809	29.1	LOOKOUT MTN	Whidbey Telephone Co
414	47.84539339	122.473014	28.0	REITER ROAD	Selahv Farms, LLC
20	47.8738937	122.4668447	27.8	LOOKOUT MTN	Whidbey Telephone Co

Skjei Telecom, Inc.

405	47.80501011	122.4594839	27.5	SEQUIM RELO	Seattle SMSA Limited Partnership
393	48.21019836	123.172304	27.4	ALGER2	New Cingular Wireless PCS LLC-Washington
546	48.21019836	123.172304	27.4	ALGER2	New Cingular Wireless PCS LLC-Washington
203	47.77698732	122.4501071	27.3	STEVENS PAS	Frontier Communications Northwest Inc.
541	47.93303674	122.5019712	26.8	INDEX	New Cingular Wireless PCS LLC-Washington
404	48.27846251	124.0918522	26.0	LA PUSH	Verizon Wireless (VAW) LLC - (WA)
593	48.08533618	122.6464207	25.8	SEGELSEN	Seattle City Light
648	47.61299611	122.3755693	23.0	ASR1263146	Cascade Carriers
617	47.62373636	122.424454	20.8	ELMA	USCOC of Washington 4 Inc.
88	48.2134588	123.2156769	1.0	CAPITOL PEAK	Washington State Patrol

Table 2 - ESV CCP Locations
See Interference Analysis for Exclusion Zone Details

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 Skjei Telecom, Inc. 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 PCN letter dated 2/9/2016

Company

Accel Net, Inc.
Aviat U.S., Inc.
CSI Telecommunications, Inc.
DAY MANAGEMENT CORPORATION
Eastside Public Safety Com Agency
GW Networks
Grays Harbor Public Utility District #1
King County DOT Metro Transit Division
King, County of
Kitsap, County of
NeXXCom Wireless LLC
PUYALLUP, CITY OF
Pierce County
Public Util Dist. #1 of Snohomish County
Public Utility Dist #2 of Pacific County
RSN Wireless, LLC
Seattle, City of
Skagit 911
Snohomish County Emergency Radio System
Startouch, Inc.
Tacoma, City of
Thurston 9-1-1 Communications
Tribune Broadcasting Seattle, LLC
Whidbey Telephone Co
Wireless Applications Corporation
CenturyTel of Washington, Inc.
City of Tacoma / Tacoma Public Utilities
Frontier Communications Northwest Inc.
Grays Harbor, County of
McDaniel Cellular Telephone Company

Skjei Telecom, Inc.

New Cingular Wireless PCS LLC-
Washington
Northwest Pipeline GP
Puget Sound Energy
Qwest Corporation
Rendezvous Communications LLC
Seattle City Light
Seattle SMSA Limited Partnership
USCOC of Washington 4 Inc.
Verizon Wireless (VAW) LLC - (WA)
Washington State Patrol
Washington State of Dept of Transportat
COMMUNITY TRANSIT SNOHOMISH
COUNTY PTBA
Noel Communications, Inc
SILKE COMMUNICATIONS, INC
Bearclaw, LLC
Olympic Wireless, LLC
Selahv Farms, 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. The coordination contours include all the area within this route as well as all of the area seaward of this route within 200 km of the baseline of the United States or 200 km from any fixed service offshore installations."

Skjei Telecom, Inc.

Date:	02/09/2016
Job Number:	160209SKJTEL06

Administrative Information	
Status	ENGINEER PROPOSAL
Call Sign	
Licensee Code	SPACLK
Licensee Name	Harris CapRock Communications

Site Information	**SEATTLE, WA**
Venue Name	
Latitude (NAD 83)	47° 36' 39.1" N
Longitude (NAD 83)	122° 21' 1.2" W
Climate Zone	B
Rain Zone	3
Ground Elevation (AMSL)	0.0 m / 0.0 ft

Link Information	
Satellite Type	Geostationary
Mode	TO - Transmit-Only
Modulation	Digital
Satellite Arc	97° W to 129° West Longitude
Azimuth Range	147.3° to 189.0°
Corresponding Elevation Angles	30.0° / 34.9°
Antenna Centerline (AGL)	15.54 m / 51.0 ft

Antenna Information		**Transmit - FCC32**
Manufacturer		FCC REFERENCE
Model		32-25LOG(THETA)
Gain / Diameter		41.7 dBi / 2.4 m
3-dB / 15-dB Beamwidth		0.66° / 1.18°
Max Available RF Power	(dBW/4 kHz)	-13.0
	(dBW/MHz)	11.0
Maximum EIRP	(dBW/4 kHz)	28.7
	(dBW/MHz)	52.7
	(dBW)	60.5
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)	3M75G7D - 7M50G7D / 6067.3785 - 6076.0035
	3M75G7D - 7M50G7D / 6076.7555 - 6085.3805
	3M75G7D - 7M50G7D / 6086.3125 - 6095.6875
	3M75G7D - 7M50G7D / 6096.3125 - 6105.6875
	2M50G7D - 7M50G7D / 6347.1 - 6351.6
	2M50G7D - 7M50G7D / 6356.5 - 6379.788

Skjei Telecom, Inc.

Max Great Circle Coordination Distance	168.8 km / 104.9 mi
Precipitation Scatter Contour Radius	100.0 km / 62.1 mi

Skjei Telecom, Inc.

Coordination Values	**SEATTLE, WA**
Licensee Name	Harris CapRock Communications
Latitude (NAD 83)	47° 36' 39.1" N
Longitude (NAD 83)	122° 21' 1.2" W
Ground Elevation (AMSL)	0.0 m / 0.0 ft
Antenna Centerline (AGL)	15.54 m / 51.0 ft
Antenna Model	FCC Reference 32-25LOG(THETA)
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	-13.0 (dBW/4 kHz)

			Transmit 6.1 GHz	
Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Horizon Gain (dBi)	Coordination Distance (km)
0	2.82	138.48	-10.00	100.00
5	2.13	134.40	-10.00	100.00
10	1.73	130.35	-10.00	100.00
15	2.12	126.52	-10.00	100.00
20	2.17	122.42	-10.00	100.00
25	2.23	118.23	-10.00	100.00
30	2.23	113.96	-10.00	100.00
35	2.45	109.68	-10.00	100.00
40	2.60	105.33	-10.00	100.00
45	2.77	100.94	-10.00	100.00
50	2.76	96.51	-10.00	100.00
55	2.98	92.07	-10.00	100.00
60	3.00	87.62	-10.00	100.00
65	3.06	83.16	-10.00	100.00
70	3.19	78.71	-10.00	100.00
75	3.21	74.28	-10.00	100.00
80	3.08	69.90	-10.00	100.00
85	2.98	65.56	-10.00	100.00
90	2.65	61.35	-10.00	100.00
95	2.61	57.14	-10.00	100.00
100	2.52	53.03	-10.00	100.00
105	2.36	49.09	-10.00	100.00
110	2.25	45.28	-9.40	100.00
115	1.88	41.82	-8.54	100.00
120	1.03	39.00	-7.78	100.92
125	0.76	36.19	-6.96	115.03
130	1.38	33.08	-5.99	100.00
135	1.29	31.05	-5.30	101.17
140	0.99	29.85	-4.87	109.37
145	0.87	29.22	-4.64	115.82
150	0.79	29.33	-4.68	117.80
155	0.53	30.38	-5.06	131.17
160	0.00	32.29	-5.73	168.81
165	0.00	33.59	-6.15	166.79
170	0.00	34.53	-6.46	165.39
175	0.00	35.11	-6.63	164.55
180	0.67	34.63	-6.49	118.69
185	0.53	34.58	-6.47	126.34

Skjei Telecom, Inc.

Coordination Values	**SEATTLE, WA**
Licensee Name	Harris CapRock Communications
Latitude (NAD 83)	47° 36' 39.1" N
Longitude (NAD 83)	122° 21' 1.2" W
Ground Elevation (AMSL)	0.0 m / 0.0 ft
Antenna Centerline (AGL)	15.54 m / 51.0 ft
Antenna Model	FCC Reference 32-25LOG(THETA)
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	-13.0 (dBW/4 kHz)

Transmit 6.1 GHz

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Horizon Gain (dBi)	Coordination Distance (km)
190	0.67	34.26	-6.37	119.18
195	0.88	34.50	-6.45	110.76
200	0.91	35.55	-6.77	108.63
205	1.03	37.07	-7.23	102.16
210	1.30	38.99	-7.77	100.00
215	1.23	41.61	-8.48	100.00
220	1.15	44.57	-9.23	100.00
225	1.10	47.79	-9.98	100.00
230	1.01	51.24	-10.00	100.00
235	0.73	54.95	-10.00	108.49
240	0.00	58.96	-10.00	149.93
245	0.00	62.73	-10.00	149.93
250	0.00	66.60	-10.00	149.93
255	0.00	70.54	-10.00	149.93
260	0.00	74.54	-10.00	149.93
265	0.00	78.58	-10.00	149.93
270	0.00	82.66	-10.00	149.93
275	0.00	86.75	-10.00	149.93
280	0.00	90.85	-10.00	149.93
285	0.00	94.94	-10.00	149.93
290	0.00	99.03	-10.00	149.93
295	0.00	103.09	-10.00	149.93
300	0.00	107.12	-10.00	149.93
305	0.60	111.25	-10.00	114.76
310	0.91	115.30	-10.00	100.18
315	0.94	119.20	-10.00	100.00
320	0.98	123.00	-10.00	100.00
325	1.05	126.70	-10.00	100.00
330	2.10	130.80	-10.00	100.00
335	2.59	134.49	-10.00	100.00
340	2.43	137.56	-10.00	100.00
345	2.41	140.41	-10.00	100.00
350	3.18	143.54	-10.00	100.00
355	3.02	142.11	-10.00	100.00

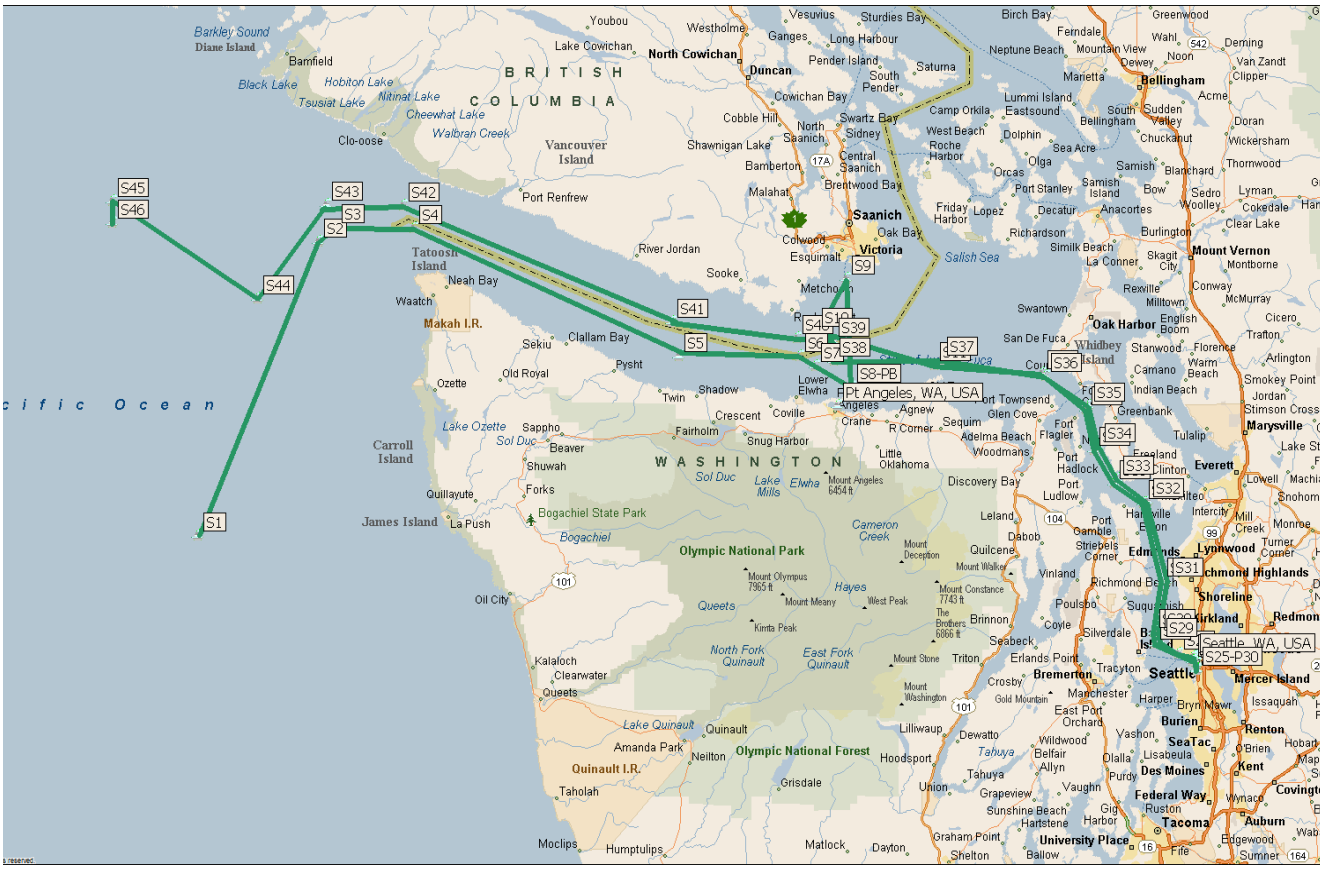
Skjei Telecom, Inc.

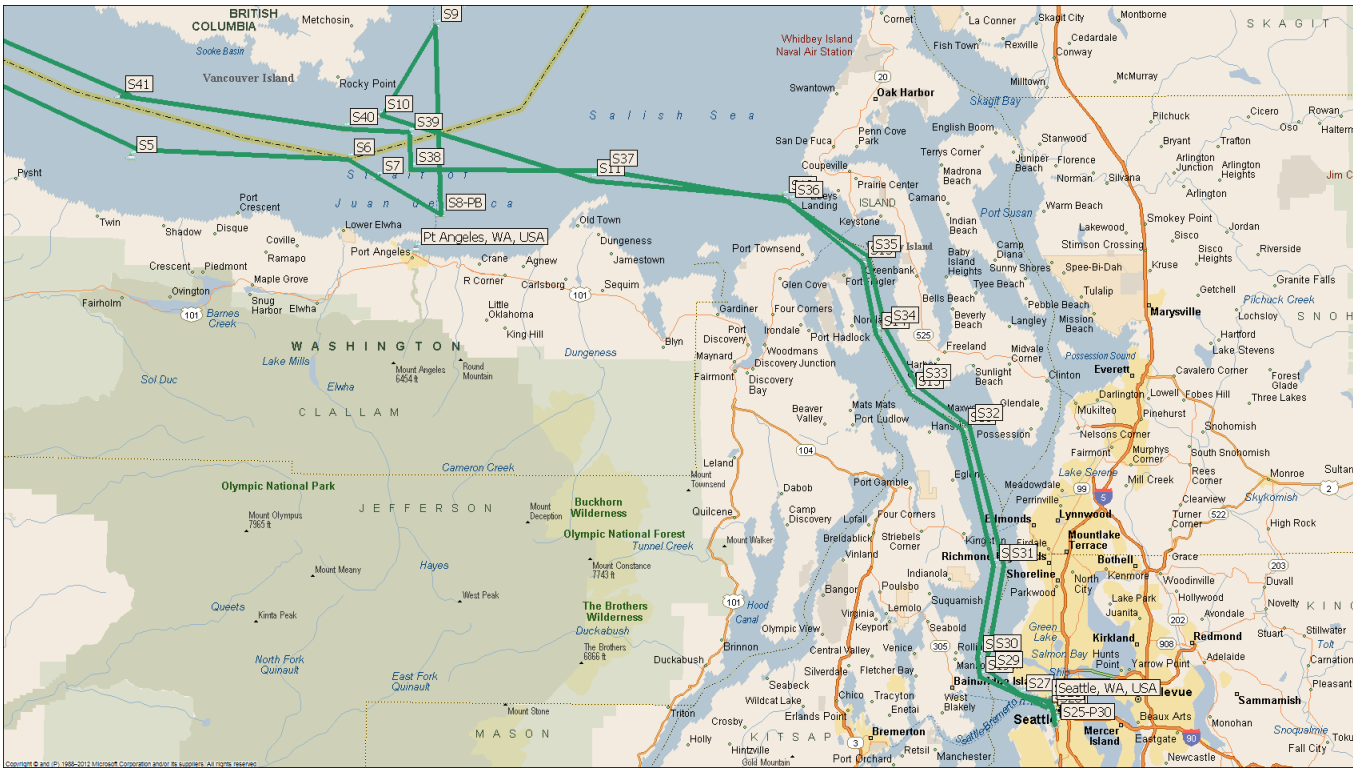
Name	Latitude	Longitude
S1	47.85666667	-125.3833
S2	48.44833333	-125.0267
S3	48.47666667	-124.975
S4	48.47666667	-124.7333
S5	48.22333333	-123.9167
S6	48.22333333	-123.545
S7	48.20333333	-123.495
S8-PB	48.16166667	-123.3867
S9	48.37666667	-123.3983
S10	48.27333333	-123.4917
S11	48.20166667	-123.13
S12	48.18333333	-122.8017
S13	48.11	-122.6667
S14	48.02883333	-122.6442
S15	47.9605	-122.5863
S16	47.91966667	-122.4983
S17	47.76466667	-122.4463
S18	47.66116667	-122.4737
S19	47.63783333	-122.47
S20	47.60333333	-122.358
S21	47.60666667	-122.35
S22-P66	47.61133333	-122.3508
S23	47.59616667	-122.3442
S24	47.58666667	-122.3442
Seattle, WA, USA	47.6108694	-122.3503
S25-P30	47.58383333	-122.3433
S26	47.6	-122.3475
S27	47.61666667	-122.4
S28	47.6105	-122.3572
S29	47.64333333	-122.4528
S30	47.662	-122.4562
S31	47.76466667	-122.4283
S32	47.92416667	-122.4852
S33	47.97	-122.5733
S34	48.035	-122.6283
S35	48.11666667	-122.6583
S36	48.17833333	-122.7917
S37	48.21333333	-123.1083
S38	48.21333333	-123.4383
S39	48.25333333	-123.4417

Skjei Telecom, Inc.

S40	48.25833333	-123.5517
S41	48.29166667	-123.9367
S42	48.52166667	-124.7667
S43	48.52166667	-125.005
S44	48.33333333	-125.2117
S45	48.52166667	-125.6667
S46	48.47833333	-125.6667
Pt Angeles, WA, USA	48.1225194	-123.4292
Astoria, OR, USA	46.1908194	-123.8299

Skjei Telecom, Inc.





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: 

Ken Ryan, P.E.
Principal Engineer
Skjei Telecom, Inc.
7777 Leesburg Pike, Suite 315N
Falls Church, VA 22043

DATED: April 18, 2016

Skjei Telecom, Inc.

ANNEX XIII: SEWARD

FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for
Harris Caprocks Communication, Inc.
Seward, AK
Satellite Earth Station on Vessel (ESV)

Prepared By:
Skjei Telecom, Inc.
7777 Leesburg Pike, Suite 315N
Falls Church, VA 22043
April 18, 2016

Skjei Telecom, Inc.

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. There will be spectrum restrictions 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. The Critical Contour Point method of determining worst case interference from the route and port sites was the interference method used. 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. In those cases were OH losses did not resolve the interference the ESV will mute transmission within an exclusion zone sufficient in size to preclude interference. Also note, that there are no unresolved coordination requests which would result in an exceedance of the maximum 180 megahertz of coordinated spectrum for all ESV operations in the coordination area in the 5925-6425 MHz band.

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-only earth station. The ESV will employ a GPS sensitive ability to cease transmission when traveling in certain exclusion zones. The interference cases and the location of the critical contour point (CCP), around which the exclusion zones exist are detailed in the tables below.

Company

Alascom Inc

Skjei Telecom, Inc.

Site	Seward							
Desired Frequencies (MHz)		6347.1 - 6351.6	6356.5 - 6379.788	6076.7555 - 6085.3805	6086.3125 - 6095.6875	6096.3125 - 6105.6875		
Into 1								
Case #	Margin(dB)	Summary					Frequencies Affected	
20	34.19904			Y	Y	Y	5974.85	6093.45
Desired Frequencies (MHz)		6347.1 - 6351.6	6356.5 - 6379.788	6076.7555 - 6085.3805	6086.3125 - 6095.6875	6096.3125 - 6105.6875		
Into 2								
Case #	Margin(dB)						Frequencies Affected	
20	18.785357		Y				6256.54	6375.14

Table 1 – ESV Interference Cases

Skjei Telecom, Inc.

Interference
Zones

Into 1					
Case #	CCP Latitude (dec.deg)	CCP Longitude (dec.deg.)	Margin (dB)	Victim Rx Site	Licensee
20	60.11789535	149.4270307	34.19903987	NAPTOWNE	Alascom Inc
Case #	CCP Latitude (dec.deg)	CCP Longitude (dec.deg.)	Margin (dB)	Victim Rx Site	Licensee
20	60.11913835	149.4271722	18.78535678	SOLDOTNA	Alascom Inc

Table 2 - ESV CCP Locations
See Interference Analysis for Exclusion Zone Details

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 Skjei Telecom, Inc. 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 PCN letter dated 2/9/2016

Company

Alaska Pipeline Company
ENSTAR NATURAL GAS COMPANY
Homer Electric Association
Micronet Communications, Inc.
Norstar Pipeline Company
State of Alaska
Alaska Public Telecommunications, Inc.
New Cingular Wireless PCS LLC - Alaska
Chugach Electric Association, Inc.
Alascom 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. The coordination contours include all the area within this route as well as all of the area seaward of this route within 200 km of the baseline of the United States or 200 km from any fixed service offshore installations."

Skjei Telecom, Inc.

Date:	02/09/2016
Job Number:	160209SKJTEL10

Administrative Information	
Status	ENGINEER PROPOSAL
Call Sign	
Licensee Code	SPACLK
Licensee Name	Harris CapRock Communications

Site Information	**SEWARD, AK**
Venue Name	
Latitude (NAD 83)	60° 7' 2.6" N
Longitude (NAD 83)	149° 25' 37.2" W
Climate Zone	B
Rain Zone	2
Ground Elevation (AMSL)	0.0 m / 0.0 ft

Link Information	
Satellite Type	Geostationary
Mode	TO - Transmit-Only
Modulation	Digital
Satellite Arc	97° W to 129° West Longitude
Azimuth Range	123.7° to 156.8°
Corresponding Elevation Angles	9.1° / 19.6°
Antenna Centerline (AGL)	15.54 m / 51.0 ft

Antenna Information		**Transmit - FCC32**
Manufacturer		FCC REFERENCE
Model		32-25LOG(THETA)
Gain / Diameter		41.7 dBi / 2.4 m
3-dB / 15-dB Beamwidth		0.66° / 1.18°
Max Available RF Power	(dBW/4 kHz)	-13.0
	(dBW/MHz)	11.0
Maximum EIRP	(dBW/4 kHz)	28.7
	(dBW/MHz)	52.7
	(dBW)	60.5
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)	3M75G7D - 7M50G7D / 6067.3785 - 6076.0035
	3M75G7D - 7M50G7D / 6076.7555 - 6085.3805
	3M75G7D - 7M50G7D / 6086.3125 - 6095.6875
	3M75G7D - 7M50G7D / 6096.3125 - 6105.6875
	2M50G7D - 7M50G7D / 6347.1 - 6351.6
	2M50G7D - 7M50G7D / 6356.5 - 6379.788

Skjei Telecom, Inc.

Max Great Circle Coordination Distance	209.4 km / 130.1 mi
Precipitation Scatter Contour Radius	100.0 km / 62.1 mi

Skjei Telecom, Inc.

Coordination Values	**SEWARD, AK**
Licensee Name	Harris CapRock Communications
Latitude (NAD 83)	60° 7' 2.6" N
Longitude (NAD 83)	149° 25' 37.2" W
Ground Elevation (AMSL)	0.0 m / 0.0 ft
Antenna Centerline (AGL)	15.54 m / 51.0 ft
Antenna Model	FCC Reference 32-25LOG(THETA)
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	-13.0 (dBW/4 kHz)

			Transmit 6.1 GHz	
Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Horizon Gain (dBi)	Coordination Distance (km)
0	2.89	123.48	-10.00	100.00
5	2.15	118.48	-10.00	100.00
10	2.69	113.55	-10.00	100.00
15	0.39	108.49	-10.00	127.74
20	0.66	103.56	-10.00	111.86
25	1.72	98.64	-10.00	100.00
30	2.04	93.68	-10.00	100.00
35	2.03	88.72	-10.00	100.00
40	2.61	83.75	-10.00	100.00
45	3.61	78.76	-10.00	100.00
50	3.14	73.80	-10.00	100.00
55	4.69	68.77	-10.00	100.00
60	6.89	63.73	-10.00	100.00
65	7.33	58.73	-10.00	100.00
70	6.48	53.75	-10.00	100.00
75	8.27	48.71	-10.00	100.00
80	6.98	43.75	-9.02	100.00
85	8.23	38.72	-7.70	100.00
90	7.92	33.73	-6.20	100.00
95	6.42	28.82	-4.49	100.00
100	4.44	24.14	-2.57	100.00
105	3.64	19.46	-0.23	100.00
110	3.92	14.63	2.87	100.00
115	4.60	9.79	7.22	100.00
120	6.44	4.56	15.53	100.00
125	5.28	4.03	16.88	124.42
130	3.46	7.69	9.86	102.89
135	2.46	10.48	6.49	107.58
140	1.84	12.80	4.32	113.67
145	0.00	16.15	1.80	209.45
150	0.00	17.59	0.87	204.03
155	0.00	18.84	0.12	199.75
160	0.00	19.90	-0.47	196.43
165	0.00	21.24	-1.18	192.11
170	0.00	23.54	-2.30	186.08
175	0.00	26.56	-3.61	179.27
180	0.00	30.08	-4.96	172.53
185	0.00	33.93	-6.27	166.27

Skjei Telecom, Inc.

Coordination Values	**SEWARD, AK**
Licensee Name	Harris CapRock Communications
Latitude (NAD 83)	60° 7' 2.6" N
Longitude (NAD 83)	149° 25' 37.2" W
Ground Elevation (AMSL)	0.0 m / 0.0 ft
Antenna Centerline (AGL)	15.54 m / 51.0 ft
Antenna Model	FCC Reference 32-25LOG(THETA)
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	-13.0 (dBW/4 kHz)

Transmit 6.1 GHz

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Horizon Gain (dBi)	Coordination Distance (km)
190	1.31	37.45	-7.34	100.00
195	3.71	40.96	-8.31	100.00
200	5.52	45.05	-9.34	100.00
205	7.91	49.30	-10.00	100.00
210	9.61	53.89	-10.00	100.00
215	10.98	58.65	-10.00	100.00
220	11.15	63.56	-10.00	100.00
225	11.62	68.47	-10.00	100.00
230	9.72	73.50	-10.00	100.00
235	10.06	78.41	-10.00	100.00
240	10.89	83.32	-10.00	100.00
245	13.42	88.25	-10.00	100.00
250	16.40	93.24	-10.00	100.00
255	17.22	98.24	-10.00	100.00
260	16.51	103.22	-10.00	100.00
265	16.99	108.22	-10.00	100.00
270	15.44	113.18	-10.00	100.00
275	13.94	118.09	-10.00	100.00
280	12.34	122.94	-10.00	100.00
285	12.20	127.86	-10.00	100.00
290	11.12	132.65	-10.00	100.00
295	12.11	137.69	-10.00	100.00
300	13.70	142.83	-10.00	100.00
305	15.46	148.00	-10.00	100.00
310	15.72	152.98	-10.00	100.00
315	12.94	157.28	-10.00	100.00
320	10.56	161.00	-10.00	100.00
325	8.21	158.69	-10.00	100.00
330	4.46	153.33	-10.00	100.00
335	7.17	148.66	-10.00	100.00
340	7.61	143.68	-10.00	100.00
345	9.19	138.71	-10.00	100.00
350	6.80	133.66	-10.00	100.00
355	4.04	128.53	-10.00	100.00

Skjei Telecom, Inc.

Name	Latitude	Longitude
S1	59.795	-149.3333
S2	59.80333	-149.43
S3	59.84	-149.4683
S4	59.96667	-149.3683
S5	59.99	-149.3583
S6	60.04667	-149.37
S7	60.113	-149.4262
S8	60.11917	-149.4288
S9	60.11733	-149.4262
S10	60.11917	-149.4272
S11	60.11083	-149.4242
S12	60.05	-149.37
S13	59.986	-149.3583
S14	59.96267	-149.3683
S15	59.836	-149.4683
S16	59.79933	-149.43
S17	59.791	-149.3333

Skjei Telecom, Inc.

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: 

Ken Ryan, P.E.
Principal Engineer
Skjei Telecom, Inc.
7777 Leesburg Pike, Suite 315N
Falls Church, VA 22043

DATED: April 18, 2016

Skjei Telecom, Inc.

ANNEX XIV: SITKA

FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for
Harris Caprocks Communication, Inc.
Sitka, AK
Satellite Earth Station on Vessel (ESV)

Prepared By:
Skjei Telecom, Inc.
7777 Leesburg Pike, Suite 315N
Falls Church, VA 22043
April 18, 2016

Skjei Telecom, Inc.

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. There will be spectrum restrictions 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. The Critical Contour Point method of determining worst case interference from the route and port sites was the interference method used. 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. In those cases were OH losses did not resolve the interference the ESV will mute transmission within an exclusion zone sufficient in size to preclude interference. Also note, that there are no unresolved coordination requests which would result in an exceedance of the maximum 180 megahertz of coordinated spectrum for all ESV operations in the coordination area in the 5925-6425 MHz band.

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-only earth station. The ESV will employ a GPS sensitive ability to cease transmission when traveling in certain exclusion zones. The interference cases and the location of the critical contour point (CCP), around which the exclusion zones exist are detailed in the tables below.

Company

Alascom Inc
Alaska Power & Telephone
City of Ketchikan

Skjei Telecom, Inc.

Site	Sitka										
Desired Frequencies (MHz)		6347.1 - 6351.6	6356.5 - 6379.788	6076.7555 - 6085.3805	6086.3125 - 6095.6875	6096.3125 - 6105.6875					
Into 1	Margin(dB)	Summary					Frequencies Affecte				
43	60.2			Y	Y	Y	6093.45	0	0	0	0
64	56.2			Y	Y	Y	6063.8	6093.45	6123.1	6152.75	0
82	52.4			Y	Y	Y	6063.8	6093.45	0	0	0
19	50.2		Y				6197.24	6256.54	6315.84	6375.14	0
36	50.1	Y	Y				6345.49	0	0	0	0
94	49.8	Y	Y				6226.89	6286.19	6345.49	6404.79	0
75	47.3	Y	Y				6345.49	0	0	0	0
69	47.2		Y				6315.84	6375.14	6404.79	0	0
25	46.1			Y			5945.2	6004.5	6063.8	6123.1	0
95	44.5			Y			6063.8	6123.1	6152.75	0	0
73	44.4		Y				6315.84	6375.14	0	0	0
17	43.8	Y	Y				6226.89	6256.54	6286.19	6345.49	6404.79
62	43.8	Y	Y				6345.49	0	0	0	0
14	43.5			Y			5974.85	6004.5	6034.15	6063.8	0
37	43.1	Y	Y				6345.49	0	0	0	0
72	43.1		Y				6375.14	0	0	0	0
92	40.6			Y			5945.2	6063.8	6123.1	0	0
70	40.2		Y				6197.24	6375.14	6404.79	0	0
29	40.0			Y	Y	Y	6093.45	0	0	0	0
44	40.0			Y			6063.8	0	0	0	0
27	39.3		Y				6256.54	6315.84	6375.14	6404.79	0
58	39.2	Y	Y				6345.49	6375.14	6404.79	0	0
33	37.2		Y				6197.24	6256.54	6315.84	6375.14	0
45	36.7	Y	Y				6315.84	6345.49	6375.14	6404.79	0
18	34.9			Y	Y	Y	5974.85	6034.15	6093.45	6152.75	0
93	34.4			Y			5945.2	6004.5	6063.8	6123.1	0
80	33.3	Y	Y				6315.84	6345.49	6375.14	6404.79	0
56	32.6		Y				6256.54	6375.14	6404.79	0	0
90	29.2		Y				6256.54	6375.14	6404.79	0	0
31	28.3			Y	Y	Y	6093.45	0	0	0	0
79	27.3	Y	Y				6315.84	6345.49	6375.14	6404.79	0
83	25.5	Y	Y				6315.84	6345.49	0	0	0

Skjei Telecom, Inc.

57	25.4			Y			5945.2	6004.5	6063.8	0	0
78	22.2	Y	Y				6315.84	6345.49	0	0	0
65	11.7			Y	Y	Y	6063.8	6093.45	6123.1	6152.75	0
60	7.0			Y			6034.15	6063.8	0	0	0
23	3.3	Y	Y				6315.84	6345.49	6375.14	6404.79	0
47	2.0	Y	Y				6197.24	6226.89	6345.49	6375.14	0
Desired Frequencies (MHz)		6347.1 - 6351.6	6356.5 - 6379.788	6076.7555 - 6085.3805	6086.3125 - 6095.6875	6096.3125 - 6105.6875					
Into 2											
Case #	Margin(dB)						Frequencies Affecte				
45	60			Y	Y	Y	6063.8	6093.45	6123.1	6152.75	0
80	57			Y	Y	Y	6063.8	6093.45	6123.1	6152.75	0
95	52		Y				6315.84	6375.14	6404.79	0	0
9	49			Y			6034.15	6063.8	6152.75	0	0
33	48			Y			5945.2	6004.5	6063.8	6123.1	0
93	47		Y				6197.24	6256.54	6315.84	6375.14	0
18	45	Y	Y				6226.89	6286.19	6345.49	6404.79	0
92	44		Y				6197.24	6315.84	6375.14	0	0
91	44		Y				6197.24	6375.14	6404.79	0	0
37	43			Y	Y	Y	6093.45	0	0	0	0
43	42	Y	Y				6345.49	0	0	0	0
27	42			Y			6004.5	6063.8	6123.1	6152.75	0
36	42			Y	Y	Y	6093.45	0	0	0	0
62	41			Y	Y	Y	6093.45	0	0	0	0
17	40			Y	Y	Y	5974.85	6004.5	6034.15	6093.45	6152.75
29	39	Y	Y				6345.49	0	0	0	0
69	39			Y			6063.8	6123.1	6152.75	0	0
64	37	Y	Y				6315.84	6345.49	6375.14	6404.79	0
25	37		Y				6197.24	6256.54	6315.84	6375.14	0
71	37			Y			5945.2	6063.8	0	0	0
58	36			Y	Y	Y	6093.45	6123.1	6152.75	0	0
82	34	Y	Y				6315.84	6345.49	0	0	0
26	32		Y				6197.24	6256.54	6315.84	6375.14	0
34	32		Y				6197.24	6256.54	6315.84	6375.14	0
73	32			Y			6063.8	6123.1	0	0	0
94	32			Y	Y	Y	5974.85	6034.15	6093.45	6152.75	0
65	31	Y	Y				6315.84	6345.49	6375.14	6404.79	0

19	29			Y			5945.2	6004.5	6063.8	6123.1	0
75	29			Y	Y	Y	6093.45	0	0	0	0
88	28			Y	Y	Y	6034.15	6093.45	6123.1	6152.75	0
12	25	Y	Y				6226.89	6345.49	0	0	0
35	25	Y	Y				6197.24	6226.89	6286.19	6345.49	0
23	25			Y	Y	Y	6063.8	6093.45	6123.1	6152.75	0
67	21		Y				6256.54	6375.14	0	0	0
51	12		Y				6375.14	6404.79	0	0	0
47	10			Y	Y	Y	5945.2	5974.85	6093.45	6123.1	0
28	5	Y	Y				6197.24	6226.89	6345.49	6375.14	0
79	3			Y	Y	Y	6063.8	6093.45	6123.1	6152.75	0

Table 1 – ESV Interference Cases

Skjei Telecom, Inc.

Interference Zones

Into 1					
Case #	CCP Latitude (dec.deg)	CCP Longitude (dec.deg.)	Margin (dB)	Victim Rx Site	Licensee
43	58.38439496	134.7920886	60.2	LENA POINT	Alascom Inc
64	55.36868517	131.7231803	56.2	KETCHIKAN	Alascom Inc
82	55.36868517	131.7231803	52.4	KETCHIKAN	Alascom Inc
19	57.10124907	134.7013069	50.2	MANLEY	Alascom Inc
36	58.29835594	135.0407228	50.1	PT HOWARD	Alascom Inc
94	57.10124907	134.7013069	49.8	MANLEY	Alascom Inc
75	57.10124907	134.7013069	47.3	MANLEY	Alascom Inc
69	58.29835594	135.0407228	47.2	PT HOWARD	Alascom Inc
25	57.46935384	134.7854115	46.1	ANGOON	Alascom Inc
95	58.1929565	134.9456467	44.5	WHEELER CRK	Alascom Inc
73	57.24771624	134.7345579	44.4	MANLEY	Alascom Inc
17	57.65455437	134.8284099	43.8	SO PASSAGE	Alascom Inc
62	57.65455437	134.8284099	43.8	SO PASSAGE	Alascom Inc
14	57.90560412	134.8837907	43.5	WHEELER CRK	Alascom Inc
37	57.90560412	134.8837907	43.1	SO PASSAGE	Alascom Inc
72	57.65457451	134.8284146	43.1	SO PASSAGE	Alascom Inc
92	57.65457451	134.8284146	40.6	ANGOON	Alascom Inc
70	57.90560412	134.8837907	40.2	SO PASSAGE	Alascom Inc
29	55.34941941	131.6835918	40.0	KETCHIKAN	Alascom Inc
44	55.34941941	131.6835918	40.0	KETCHIKAN	Alascom Inc
27	58.76474475	135.1345427	39.3	SULLIVAN RV	Alascom Inc
58	58.65638288	135.1023463	39.2	ENDIMW	Alaska Power & Telephone
33	57.46935384	134.7854115	37.2	RODMAN	Alascom Inc
45	56.22063211	132.9701254	36.7	RATZ MTN	Alascom Inc
18	57.24771624	134.7345579	34.9	ANGOON	Alascom Inc
93	57.25282102	134.7357218	34.4	ANGOON	Alascom Inc

Skjei Telecom, Inc.

80	56.22029097	132.9696425	33.3	RATZ MTN	Alascom Inc
56	55.28033374	131.5407065	32.6	HIGH MTN	City of Ketchikan
90	55.28033374	131.5407065	29.2	HIGH MTN	City of Ketchikan
31	55.89729243	132.5557831	28.3	KLAWOCK	Alascom Inc
79	56.22584619	132.9775074	27.3	DUNCAN CANAL	Alascom Inc
83	57.30742576	134.7481938	25.5	DUNCAN CANAL	Alascom Inc
57	55.26698519	131.503862	25.4	KSMTMW	Alaska Power & Telephone
78	57.30742576	134.7481938	22.2	DUNCAN CANAL	Alascom Inc
65	56.23662526	132.9927766	11.7	KASHEVAROF	Alascom Inc
60	58.29888223	134.4111792	7.0	AUKEMW	Alaska Power & Telephone
23	55.5042739	132.0854149	3.3	RATZ MTN	Alascom Inc
47	59.24699532	135.3710318	2.0	SULLIVAN RV	Alascom Inc
Into 2					
Case #	CCP Latitude (dec.deg)	CCP Longitude (dec.deg.)	Margin (dB)	Victim Rx Site	Licensee
45	56.22063211	132.9701254	60.0	KASHEVAROF	Alascom Inc
80	56.22029097	132.9696425	57.4	KASHEVAROF	Alascom Inc
95	58.29835594	135.0407228	52.0	POINT HOWARD	Alascom Inc
9	59.33838379	135.3953443	48.9	RIPINSKI	Alascom Inc
33	57.46935384	134.7854115	47.9	ANGOON	Alascom Inc
93	57.24771624	134.7345579	46.5	MANLEY	Alascom Inc
18	57.24771624	134.7345579	45.0	MANLEY	Alascom Inc
92	57.65457451	134.8284146	43.8	SO PASSAGE	Alascom Inc
91	57.90564041	134.883798	43.5	SO PASSAGE	Alascom Inc
37	57.90560412	134.8837907	43.5	WHEELER CRK	Alascom Inc
43	58.20748376	135.2404867	42.0	HOONAH MTN	Alascom Inc
27	58.73734564	135.0930365	42.0	BESSIE	Alascom Inc
36	58.1929565	134.9456467	41.6	WHEELER CRK	Alascom Inc
62	57.65455437	134.8284099	40.6	ANGOON	Alascom Inc
17	57.65455437	134.8284099	40.3	ANGOON	Alascom Inc
29	55.34911331	131.682648	39.2	SMUGLERS CV	Alascom Inc

Skjei Telecom, Inc.

69	58.1929565	134.9456467	38.5	WHEELER CRK	Alascom Inc
64	55.5127634	132.0967764	37.5	TOLSTOI MTN	Alascom Inc
25	57.46935384	134.7854115	37.3	RODMAN	Alascom Inc
71	57.65455437	134.8284099	37.3	ANGOON	Alascom Inc
58	58.59775733	135.0150838	36.2	AUKEMW	Alaska Power & Telephone
82	55.5127634	132.0967764	33.7	TOLSTOI MTN	Alascom Inc
26	57.70635087	134.8405191	32.4	MUD BAY	Alascom Inc
34	57.70635087	134.8405191	32.4	MUD BAY	Alascom Inc
73	57.25282102	134.7357218	32.3	ANGOON	Alascom Inc
94	57.10124907	134.7013069	31.6	GUNNUK	Alascom Inc
65	56.22584619	132.9775074	30.6	DUNCAN CANAL	Alascom Inc
19	57.10124907	134.7013069	29.5	GUNNUK	Alascom Inc
75	57.10124907	134.7013069	28.9	GUNNUK	Alascom Inc
88	55.35192935	131.6913316	28.1	SNHYMW	Alaska Power & Telephone
12	56.77565703	134.6148728	25.0	MUD BAY	Alascom Inc
35	56.77565703	134.6148728	24.8	MUD BAY	Alascom Inc
23	56.36369188	133.5688614	24.6	TOLSTOI MTN	Alascom Inc
67	56.77565703	134.6148728	20.8	MUD BAY	Alascom Inc
51	57.44908	134.7807326	11.7	LNDIMW	Alaska Power & Telephone
47	58.1893569	135.1429701	10.2	RIPINSKI	Alascom Inc
28	59.33537466	135.3968718	4.5	SULLIVAN RV	Alascom Inc
79	56.23838797	132.9952746	3.2	KASHEVAROF	Alascom Inc

Table 2 - ESV CCP Locations
See Interference Analysis for Exclusion Zone Details

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 Skjei Telecom, Inc. 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 PCN letter dated 2/9/2016

Company

Alaska Power & Telephone Company
Radyn, Inc.
Alaska Power & Telephone
City of Ketchikan
Alascom 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. The coordination contours include all the area within this route as well as all of the area seaward of this route within 200 km of the baseline of the United States or 200 km from any fixed service offshore installations."

Skjei Telecom, Inc.

Date:	02/09/2016
Job Number:	160209SKJTEL15

Administrative Information	
Status	ENGINEER PROPOSAL
Call Sign	
Licensee Code	SPACLK
Licensee Name	Harris CapRock Communications

Site Information	**SITKA, AK**
Venue Name	
Latitude (NAD 83)	55° 40' 7.6" N
Longitude (NAD 83)	132° 18' 23.9" W
Climate Zone	B
Rain Zone	2
Ground Elevation (AMSL)	0.0 m / 0.0 ft

Link Information	
Satellite Type	Geostationary
Mode	TO - Transmit-Only
Modulation	Digital
Satellite Arc	97° W to 129° West Longitude
Azimuth Range	139.4° to 176.0°
Corresponding Elevation Angles	19.2° / 26.5°
Antenna Centerline (AGL)	15.54 m / 51.0 ft

Antenna Information		**Transmit - FCC32**
Manufacturer		FCC REFERENCE
Model		32-25LOG(THETA)
Gain / Diameter		41.7 dBi / 2.4 m
3-dB / 15-dB Beamwidth		0.66° / 1.18°
Max Available RF Power	(dBW/4 kHz)	-13.0
	(dBW/MHz)	11.0
Maximum EIRP	(dBW/4 kHz)	28.7
	(dBW/MHz)	52.7
	(dBW)	60.5
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)	3M75G7D - 7M50G7D / 6067.3785 - 6076.0035
	3M75G7D - 7M50G7D / 6076.7555 - 6085.3805
	3M75G7D - 7M50G7D / 6086.3125 - 6095.6875
	3M75G7D - 7M50G7D / 6096.3125 - 6105.6875
	2M50G7D - 7M50G7D / 6347.1 - 6351.6
	2M50G7D - 7M50G7D / 6356.5 - 6379.788

Skjei Telecom, Inc.

Max Great Circle Coordination Distance	198.6 km / 123.4 mi
Precipitation Scatter Contour Radius	100.0 km / 62.1 mi

Skjei Telecom, Inc.

Coordination Values	**SITKA, AK**
Licensee Name	Harris CapRock Communications
Latitude (NAD 83)	55° 40' 7.6" N
Longitude (NAD 83)	132° 18' 23.9" W
Ground Elevation (AMSL)	0.0 m / 0.0 ft
Antenna Centerline (AGL)	15.54 m / 51.0 ft
Antenna Model	FCC Reference 32-25LOG(THETA)
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	-13.0 (dBW/4 kHz)

			Transmit 6.1 GHz	
Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Horizon Gain (dBi)	Coordination Distance (km)
0	0.00	135.80	-10.00	149.93
5	0.00	131.35	-10.00	149.93
10	0.00	126.82	-10.00	149.93
15	0.00	122.23	-10.00	149.93
20	0.00	117.61	-10.00	149.93
25	0.33	113.00	-10.00	134.09
30	0.71	108.35	-10.00	109.64
35	0.81	103.64	-10.00	105.09
40	0.84	98.90	-10.00	103.45
45	0.87	94.16	-10.00	101.95
50	1.74	89.41	-10.00	100.00
55	3.32	84.60	-10.00	100.00
60	4.55	79.73	-10.00	100.00
65	4.54	74.91	-10.00	100.00
70	4.84	70.06	-10.00	100.00
75	4.21	65.32	-10.00	100.00
80	4.33	60.51	-10.00	100.00
85	4.63	55.69	-10.00	100.00
90	3.83	51.12	-10.00	100.00
95	2.28	46.86	-9.77	100.00
100	1.10	42.72	-8.77	100.00
105	0.22	38.70	-7.69	157.26
110	0.51	34.37	-6.40	127.76
115	0.56	30.34	-5.05	129.45
120	0.00	27.02	-3.79	178.33
125	0.00	23.82	-2.42	185.41
130	0.00	21.29	-1.20	191.99
135	0.00	19.67	-0.34	197.13
140	0.00	19.20	-0.08	198.60
145	0.00	19.97	-0.51	195.84
150	0.00	21.58	-1.35	191.17
155	0.00	23.05	-2.07	187.30
160	0.00	24.29	-2.63	184.30
165	0.00	25.27	-3.06	182.06
170	0.00	25.98	-3.37	180.49
175	0.00	26.41	-3.55	179.58
180	0.00	26.77	-3.69	178.84
185	0.00	27.87	-4.13	176.63

Skjei Telecom, Inc.

Coordination Values	**SITKA, AK**
Licensee Name	Harris CapRock Communications
Latitude (NAD 83)	55° 40' 7.6" N
Longitude (NAD 83)	132° 18' 23.9" W
Ground Elevation (AMSL)	0.0 m / 0.0 ft
Antenna Centerline (AGL)	15.54 m / 51.0 ft
Antenna Model	FCC Reference 32-25LOG(THETA)
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	-13.0 (dBW/4 kHz)

Transmit 6.1 GHz

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Horizon Gain (dBi)	Coordination Distance (km)
190	0.00	29.72	-4.83	173.16
195	0.00	32.19	-5.69	168.97
200	0.00	35.15	-6.65	164.50
205	1.68	37.45	-7.34	100.00
210	4.16	39.92	-8.03	100.00
215	4.27	43.99	-9.08	100.00
220	4.94	48.00	-10.00	100.00
225	3.86	52.73	-10.00	100.00
230	3.71	57.18	-10.00	100.00
235	4.36	61.50	-10.00	100.00
240	5.46	65.85	-10.00	100.00
245	5.01	70.52	-10.00	100.00
250	4.17	75.23	-10.00	100.00
255	2.97	79.92	-10.00	100.00
260	2.34	84.53	-10.00	100.00
265	1.88	89.09	-10.00	100.00
270	0.47	93.59	-10.00	120.32
275	0.00	98.05	-10.00	149.93
280	0.00	102.50	-10.00	149.93
285	0.00	106.94	-10.00	149.93
290	0.00	111.35	-10.00	149.93
295	0.00	115.72	-10.00	149.93
300	0.00	120.03	-10.00	149.93
305	0.00	124.28	-10.00	149.93
310	0.00	128.44	-10.00	149.93
315	0.00	132.49	-10.00	149.93
320	0.00	136.39	-10.00	149.93
325	0.00	140.10	-10.00	149.93
330	0.00	143.56	-10.00	149.93
335	0.00	146.68	-10.00	149.93
340	0.00	149.36	-10.00	149.93
345	0.00	148.39	-10.00	149.93
350	0.00	144.37	-10.00	149.93
355	0.00	140.15	-10.00	149.93

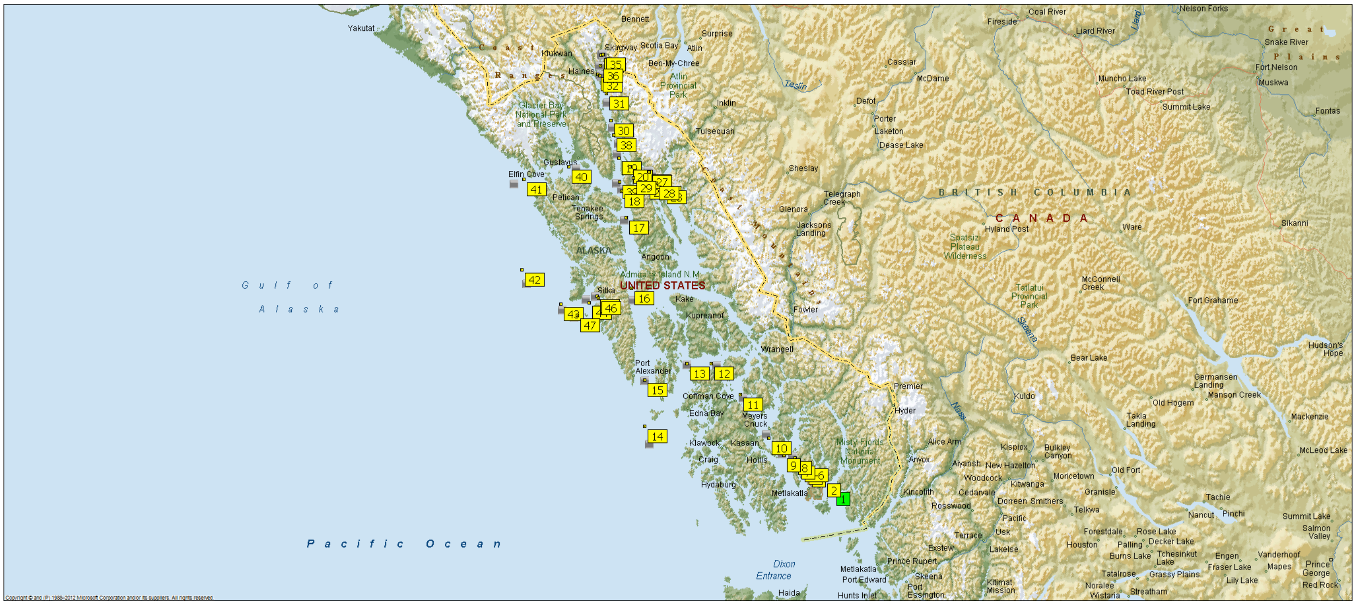
Skjei Telecom, Inc.

Name	Latitude	Longitude
1	55.11218	-131.1669603
2	55.21477	-131.3602513
3	55.28265	-131.5470751
4	55.33608	-131.6424649
5	55.35286	-131.6941663
6	55.43714	-131.848877
7	55.46312	-132.0303576
8	55.66879	-132.3066372
9	56.02993	-132.7018811
10	56.35567	-133.1621936
11	56.36562	-133.7012206
12	55.57624	-134.3637054
13	56.20612	-134.4574338
14	57.00675	-134.6792952
15	57.80074	-134.861985
16	58.11059	-134.9245829
17	58.45759	-135.0112935
18	58.32234	-134.7612317
19	58.20133	-134.5569378
20	58.18383	-134.1977576
21	58.26378	-134.3493
22	58.29499	-134.4226105

Skjei Telecom, Inc.

23	58.29705	-134.4103082
24	58.29123	-134.398865
25	58.28716	-134.4073775
26	58.17162	-134.1979317
27	58.22228	-134.6093522
28	58.55842	-134.9934076
29	58.96598	-135.2225653
30	59.24335	-135.3695226
31	59.44649	-135.3587435
32	59.45055	-135.332907
33	59.44052	-135.3398754
34	59.33159	-135.3953392
35	59.22874	-135.3572254
36	58.71728	-135.1121477
37	58.16393	-135.0170818
38	58.30384	-135.7815461
39	58.1286	-136.9532996
40	57.14134	-136.6397024
41	56.89151	-135.9709093
42	57.00575	-135.532526
43	57.04267	-135.3752573
44	57.03241	-135.361128
45	56.82342	-135.7431121

Skjei Telecom, Inc.



Skjei Telecom, Inc.

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: 

Ken Ryan, P.E.
Principal Engineer
Skjei Telecom, Inc.
7777 Leesburg Pike, Suite 315N
Falls Church, VA 22043

DATED: April 18, 2016

Skjei Telecom, Inc.

ANNEX XV: TAMPA

FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for
Harris Caprocks Communication, Inc.
Tampa, FL
Satellite Earth Station on Vessel (ESV)

Prepared By:
Skjei Telecom, Inc.
7777 Leesburg Pike, Suite 315N
Falls Church, VA 22043
April 18, 2016

Skjei Telecom, Inc.

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. There will be spectrum restrictions 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. The Critical Contour Point method of determining worst case interference from the route and port sites was the interference method used. 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. In those cases were OH losses did not resolve the interference the ESV will mute transmission within an exclusion zone sufficient in size to preclude interference. Also note, that there are no unresolved coordination requests which would result in an exceedance of the maximum 180 megahertz of coordinated spectrum for all ESV operations in the coordination area in the 5925-6425 MHz band.

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-only earth station. The ESV will employ a GPS sensitive ability to cease transmission when traveling in certain exclusion zones. The interference cases and the location of the critical contour point (CCP), around which the exclusion zones exist are detailed in the tables below.

Company

Alltel Communications LLC - S Florida
Harris Corporation - Orlando, FL
Hillsborough County Sheriffs Office
Pinellas, County of
T-Mobile License LLC
Verizon Wireless Personal Comm, LP(S FL)

Skjei Telecom, Inc.

Site Tampa

Desired Frequencies (MHz)		6387.003 - 6423.003	6067.3785 - 6076.0035	6076.7555 - 6085.3805	6086.3125 - 6095.6875	6096.3125 - 6105.6875						
Into 1 Case #	Margin(dB)						Frequencies Affected					
266	6.1				Y	Y	6093.45	0	0	0	0	0
119	0.3			Y	Y	Y	6093.45	0	0	0	0	0
Desired Frequencies (MHz)		6387.003 - 6423.003	6067.3785 - 6076.0035	6076.7555 - 6085.3805	6086.3125 - 6095.6875	6096.3125 - 6105.6875						
Into 2												
Case #	Margin(dB)						Frequencies Affected					
211	39.7			Y	Y	Y	6093.45	0	0	0	0	0
305	39.7		Y	Y			6063.8	0	0	0	0	0
218	29.1	Y					6197.24	6226.89	6286.19	6345.49	6375.14	6404.79
166	28.3			Y	Y	Y	6093.45	0	0	0	0	0
323	26.4			Y	Y	Y	6093.45	0	0	0	0	0
163	20.9	Y					6197.24	6256.54	6315.84	6375.14	0	0

Table 1 – ESV Interference Cases

Skjei Telecom, Inc.

Interference Zones

Into 1

Case #	CCP Latitude (dec.deg)	CCP Longitude (dec.deg.)	Margin (dB)	Victim Rx Site	Licensee
266	27.94583109	82.44545746	6.1	HIMES	Hillsborough County Sheriffs Office
119	27.91814414	82.44434816	0.3	BRANDON MALL	Harris Corporation - Orlando, FL
Into 2					
Case #	CCP Latitude (dec.deg)	CCP Longitude (dec.deg.)	Margin (dB)	Victim Rx Site	Licensee
211	27.62444373	82.65398711	39.7	A2F0762A	T-Mobile License LLC
305	27.62444373	82.65398711	39.7	A2F0762A	T-Mobile License LLC
218	27.91195608	82.44103197	29.1	GREER HILL	Alltel Communications LLC - S Florida
166	27.61110345	82.8230362	28.3	OLD KEYSTONE	Pinellas, County of
323	27.59285302	83.03341587	26.4	HWY MAINTENA	Pinellas, County of
163	27.59285919	83.04595853	20.9	SBA ELFERS	Verizon Wireless Personal Comm, LP(S FL)

Table 2 - ESV CCP Locations
See Interference Analysis for Exclusion Zone Details

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 Skjei Telecom, Inc. 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 PCN letter dated 2/9/2016

Company

Charlotte County Board of County Comm
City of Melbourne
Daystar Communications
Duke Energy
Duke Energy Business Svcs LLC
FL Courts 18th Judicial Circuit
Florida High Speed Internet
Hernando County Board of Co Commissioner
Hillsborough County Sheriffs Office
LEE COUNTY - BOCC
Lake, County of
Manatee, County of
Mosaic Fertilizer LLC
Osceola County Intergovernmental Comm
Pasco, County of
Peace River Electric Cooperative Inc.
Pinellas, County of
Pinellas, County of
Pinellas, County of
Polk, County of
Rapid Systems, Inc
Sarasota, County of
Seminole County Government, BOCC
Sumter Electric Cooperative, Inc.
Sun Broadcasting, Inc.
Tampa Electric Company
Verizon Wireless (VAW) LLC-South Florida
Verizon Wireless VAW LLC - S Florida
Villages Public Saftey
Wireless Applications Corporation
Citicasters Licenses, Inc.

Skjei Telecom, Inc.

Alltel Communications LLC - S Florida
Clear Channel Broadcasting Licenses, Inc
Duke Energy Business Services, LLC.
Embarq Florida, Inc.
Florida RSA No. 2B (Indian River) LP
Harris Corporation - Florida
New Cingular Wireless PCS LLC - N FL
South Florida Water Management District
Sumter County Board of County Commission
T-Mobile License LLC
Verizon Wireless (VAW) LLC - S Florida
Verizon Wireless Personal Comm, LP(S FL)
Central Florida Educational Foundation
Florida Mobile Telecom, Inc.
T-Mobile License LLC
Florida Rural Broadband Alliance, LLC
North Florida Broadband Authority
Olympic Wireless, 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. The coordination contours include all the area within this route as well as all of the area seaward of this route within 200 km of the baseline of the United States or 200 km from any fixed service offshore installations."

Skjei Telecom, Inc.

Date:	02/09/2016
Job Number:	160209SKJTEL03

Administrative Information

Status	ENGINEER PROPOSAL
Call Sign	
Licensee Code	SPACLK
Licensee Name	Harris CapRock Communications

Site Information	**TAMPA, FL**
Venue Name	
Latitude (NAD 83)	27° 56' 32.9" N
Longitude (NAD 83)	82° 26' 41.3" W
Climate Zone	B
Rain Zone	1
Ground Elevation (AMSL)	0.0 m / 0.0 ft

Link Information

Satellite Type	Geostationary
Mode	TO - Transmit-Only
Modulation	Digital
Satellite Arc	89° W to 97° West Longitude
Azimuth Range	193.8° to 209.0°
Corresponding Elevation Angles	56.6° / 53.6°
Antenna Centerline (AGL)	15.54 m / 51.0 ft

Antenna Information		**Transmit - FCC32**
Manufacturer		FCC REFERENCE
Model		32-25LOG(THETA)
Gain / Diameter		41.7 dBi / 2.4 m
3-dB / 15-dB Beamwidth		0.66° / 1.18°
Max Available RF Power	(dBW/4 kHz)	-9.0
	(dBW/MHz)	15.0
Maximum EIRP	(dBW/4 kHz)	32.7
	(dBW/MHz)	56.7
	(dBW)	60.5
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)	3M75G7D - 7M50G7D / 6067.3785 - 6076.0035
	3M75G7D - 7M50G7D / 6076.7555 - 6085.3805
	3M75G7D - 7M50G7D / 6086.3125 - 6095.6875
	3M75G7D - 7M50G7D / 6096.3125 - 6105.6875
	3M75G7D - 7M50G7D / 6387.003 - 6423.003

Max Great Circle Coordination Distance	167.5 km / 104.1 mi
Precipitation Scatter Contour Radius	100.0 km / 62.1 mi

Skjei Telecom, Inc.

Coordination Values	**TAMPA, FL**
Licensee Name	Harris CapRock Communications
Latitude (NAD 83)	27° 56' 32.9" N
Longitude (NAD 83)	82° 26' 41.3" W
Ground Elevation (AMSL)	0.0 m / 0.0 ft
Antenna Centerline (AGL)	15.54 m / 51.0 ft
Antenna Model	FCC Reference 32-25LOG(THETA)
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	-9.0 (dBW/4 kHz)

Transmit 6.1 GHz

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Horizon Gain (dBi)	Coordination Distance (km)
0	0.00	121.25	-10.00	167.52
5	0.00	122.81	-10.00	167.52
10	0.00	123.33	-10.00	167.52
15	0.00	123.41	-10.00	167.52
20	0.00	123.19	-10.00	167.52
25	0.00	122.70	-10.00	167.52
30	0.00	121.92	-10.00	167.52
35	0.00	120.89	-10.00	167.52
40	0.00	119.61	-10.00	167.52
45	0.00	118.10	-10.00	167.52
50	0.00	116.38	-10.00	167.52
55	0.00	114.47	-10.00	167.52
60	0.00	112.40	-10.00	167.52
65	0.00	110.18	-10.00	167.52
70	0.00	107.83	-10.00	167.52
75	0.00	105.37	-10.00	167.52
80	0.00	102.83	-10.00	167.52
85	0.00	100.21	-10.00	167.52
90	0.00	97.54	-10.00	167.52
95	0.00	94.82	-10.00	167.52
100	0.00	92.08	-10.00	167.52
105	0.00	89.33	-10.00	167.52
110	0.00	86.58	-10.00	167.52
115	0.00	83.85	-10.00	167.52
120	0.00	81.15	-10.00	167.52
125	0.00	78.50	-10.00	167.52
130	0.00	75.92	-10.00	167.52
135	0.00	73.41	-10.00	167.52
140	0.00	71.01	-10.00	167.52
145	0.00	68.72	-10.00	167.52
150	0.00	66.57	-10.00	167.52
155	0.00	64.57	-10.00	167.52
160	0.00	62.76	-10.00	167.52
165	0.00	61.14	-10.00	167.52
170	0.00	59.74	-10.00	167.52
175	0.00	58.57	-10.00	167.52
180	0.00	57.66	-10.00	167.52
185	0.00	56.99	-10.00	167.52

Skjei Telecom, Inc.

Coordination Values	**TAMPA, FL**
Licensee Name	Harris CapRock Communications
Latitude (NAD 83)	27° 56' 32.9" N
Longitude (NAD 83)	82° 26' 41.3" W
Ground Elevation (AMSL)	0.0 m / 0.0 ft
Antenna Centerline (AGL)	15.54 m / 51.0 ft
Antenna Model	FCC Reference 32-25LOG(THETA)
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	-9.0 (dBW/4 kHz)

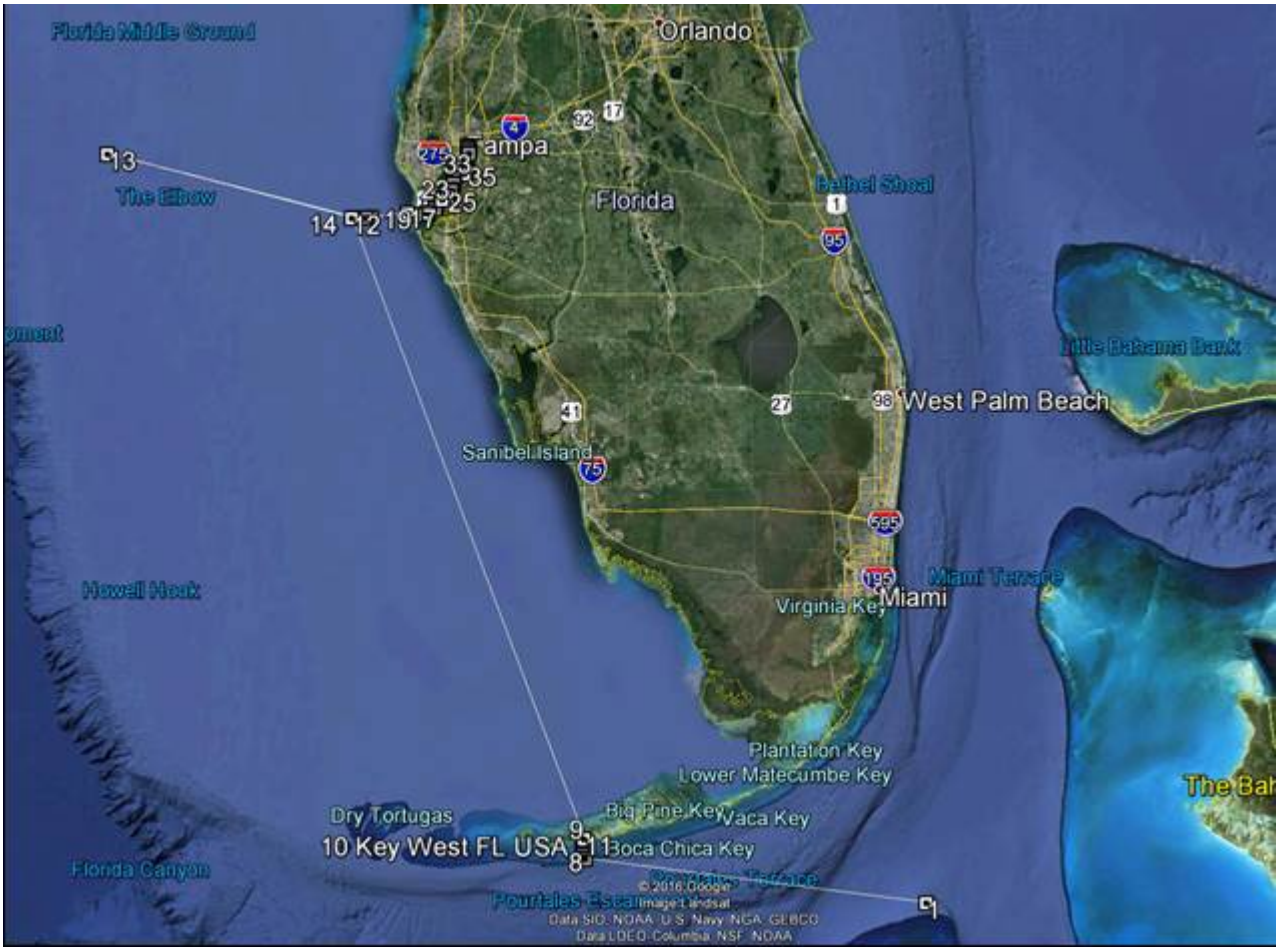
Transmit 6.1 GHz

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Horizon Gain (dBi)	Coordination Distance (km)
190	0.00	55.89	-10.00	167.52
195	0.00	54.86	-10.00	167.52
200	0.00	54.14	-10.00	167.52
205	0.00	53.72	-10.00	167.52
210	0.00	53.63	-10.00	167.52
215	0.00	53.85	-10.00	167.52
220	0.00	54.40	-10.00	167.52
225	0.00	55.24	-10.00	167.52
230	0.00	56.38	-10.00	167.52
235	0.00	57.79	-10.00	167.52
240	0.00	59.45	-10.00	167.52
245	0.00	61.33	-10.00	167.52
250	0.00	63.41	-10.00	167.52
255	0.00	65.67	-10.00	167.52
260	0.00	68.09	-10.00	167.52
265	0.00	70.64	-10.00	167.52
270	0.00	73.30	-10.00	167.52
275	0.00	76.05	-10.00	167.52
280	0.00	78.87	-10.00	167.52
285	0.00	81.76	-10.00	167.52
290	0.00	84.68	-10.00	167.52
295	0.00	87.64	-10.00	167.52
300	0.00	90.60	-10.00	167.52
305	0.00	93.56	-10.00	167.52
310	0.00	96.50	-10.00	167.52
315	0.00	99.42	-10.00	167.52
320	0.00	102.28	-10.00	167.52
325	0.00	105.08	-10.00	167.52
330	0.00	107.79	-10.00	167.52
335	0.00	110.41	-10.00	167.52
340	0.00	112.90	-10.00	167.52
345	0.00	115.26	-10.00	167.52
350	0.00	117.45	-10.00	167.52
355	0.00	119.46	-10.00	167.52

Skjei Telecom, Inc.

Name	Latitude	Longitude
1	24.22467	-79.95413
2	24.46166667	-81.801333
3	24.51466667	-81.804667
4	24.52916667	-81.8155
5	24.53266667	-81.816
6	24.54866667	-81.815167
7	24.55316667	-81.812833
8	24.55416667	-81.811333
9	24.55616667	-81.811333
10 Key West, FL, USA	24.5558889	-81.810078
11	24.5595	-81.808333
12	27.58713	-83.09363
13	27.89597	-84.48703
14	27.58966667	-83.083333
15	27.58966667	-83.012
16	27.59166667	-82.982833
17	27.61216667	-82.780833
18	27.60383333	-82.735333
19	27.6125	-82.676167
20	27.61533333	-82.666667
21	27.63283333	-82.627833
22	27.63666667	-82.623
23	27.67783333	-82.5875
24	27.68166667	-82.582833
25	27.6925	-82.559667
26	27.69633333	-82.555
27	27.72166667	-82.536667
28	27.7275	-82.533467
29	27.755	-82.523833
30	27.76	-82.523167
31	27.78016667	-82.522833
32	27.785	-82.519
33	27.804	-82.465
34	27.8095	-82.453
35	27.8175	-82.447667
36	27.904	-82.438833
37	27.90666667	-82.439333
38	27.92033333	-82.446667
39 Tampa, FL, USA	27.9424639	-82.444814
40	27.93333333	-82.446667
41	27.94116667	-82.4445
42	27.94166667	-82.447

Skjei Telecom, Inc.



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: 

Ken Ryan, P.E.
Principal Engineer
Skjei Telecom, Inc.
7777 Leesburg Pike, Suite 315N
Falls Church, VA 22043

DATED: April 18, 2016