

# FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for  
**TELESAT**  
**MAUNA KEA, HI**  
**Satellite Earth Station**

Prepared By:  
COMSEARCH  
19700 Janelia Farm Boulevard  
Ashburn, VA 20147  
October 30, 2009

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## 1. CONCLUSIONS

An interference study considering all existing, proposed and prior coordinated microwave facilities within the coordination contours of the proposed earth station demonstrates that this site will operate satisfactorily with the common carrier microwave environment. Further, there will be no restrictions of its operation due to interference considerations.

## 2. SUMMARY OF RESULTS

A number of great circle interference cases were identified during the interference study of the proposed earth station. Each of the cases, which exceeded the interference objective on a line-of-sight basis, was profiled and the propagation losses estimated using NBS TN101 (Revised) techniques. The losses were found to be sufficient to reduce the signal levels to acceptable magnitudes in every case.

The following companies reported potential great circle interference conflicts that did not meet the objectives on a line-of-sight basis. When over-the-horizon losses are considered on the interfering paths, sufficient blockage exists to negate harmful interference from occurring with the proposed transmit-receive earth station.

### Company

University of Hawaii  
New Cingular Wireless PCS LLC – Hawaii  
Hawaiian Telcom (debtor-in-possession)  
Hawaii State

No other carriers reported potential interference cases.

### 3. SUPPLEMENTAL SHOWING

Pursuant to Part 25.203(c) of the FCC Rules and Regulations, the satellite earth station proposed in this application was coordinated by Comsearch using computer techniques and in accordance with Part 25 of the FCC Rules and Regulations.

Coordination data for this earth station was sent to the below listed carriers with a letter dated 09/29/2009.

Company

HAWAII COUNTY OF

Hawaii State

Hawaiian Telcom (debtor-in-possession)

New Cingular Wireless PCS LLC - Hawaii

Nextel WIP License Corp.

University of Hawaii

## **4. EARTH STATION COORDINATION DATA**

This section presents the data pertinent to frequency coordination of the proposed earth station that was circulated to all carriers within its coordination contours.

# COMSEARCH

## Earth Station Data Sheet

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

Date: 10/22/2009  
Job Number: 090929COMSGE01

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### Administrative Information

Status ENGINEER PROPOSAL  
Call Sign  
Licensee Code TELEDS  
Licensee Name TELESAT

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### Site Information MAUNA KEA, HI

Venue Name  
Latitude (NAD 83) 19° 45' 38.6" N  
Longitude (NAD 83) 155° 28' 3.6" W  
Climate Zone B  
Rain Zone 4  
Ground Elevation (AMSL) 2733.45 m / 8968.0 ft

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### Link Information

Satellite Type Geostationary  
Mode TR - Transmit-Receive  
Modulation Digital  
Satellite Arc 81° W to 143° West Longitude  
Azimuth Range 95.4° to 146.8°  
Corresponding Elevation Angles 5.9° / 62.8°  
Antenna Centerline (AGL) 3.66 m / 12.0 ft

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### Antenna Information

		Receive - FCC32		Transmit - FCC32	
Manufacturer		Vertex		Vertex	
Model		2.4 Meter SF		2.4 Meter SF	
Gain / Diameter		38.2 dBi / 2.4 m		42.1 dBi / 2.4 m	
3-dB / 15-dB Beamwidth		2.12° / 4.45°		1.37° / 2.88°	
Max Available RF Power	(dBW/4 kHz) (dBW/MHz)			-13.0 11.0	
Maximum EIRP	(dBW/4 kHz) (dBW/MHz)			29.1 53.1	
Interference Objectives:	Long Term	-156.0 dBW/MHz	20%	-154.0 dBW/4 kHz	20%
	Short Term	-146.0 dBW/MHz	0.01%	-131.0 dBW/4 kHz	0.0025%

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### Frequency Information

	Receive 4.0 GHz	Transmit 6.1 GHz
Emission / Frequency Range (MHz)	3M60G7D / 3700.0 - 4200.0	3M60G7D / 5925.0 - 6425.0
Max Great Circle Coordination Distance	471.1 km / 292.7 mi	196.8 km / 122.2 mi
Precipitation Scatter Contour Radius	422.3 km / 262.4 mi	100.0 km / 62.1 mi

# COMSEARCH

## Earth Station Data Sheet

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### Coordination Values

### MAUNA KEA, HI

Licensee Name TELESAT  
Latitude (NAD 83) 19° 45' 38.6" N  
Longitude (NAD 83) 155° 28' 3.6" W  
Ground Elevation (AMSL) 2733.45 m / 8968.0 ft  
Antenna Centerline (AGL) 3.66 m / 12.0 ft  
Antenna Model Vertex 2.4 meter SF  
Antenna Mode Receive 4.0 GHz Transmit 6.1 GHz  
Interference Objectives: Long Term -156.0 dBW/MHz 20% -154.0 dBW/4 kHz 20%  
Short Term -146.0 dBW/MHz 0.01% -131.0 dBW/4 kHz 0.0025%  
Max Available RF Power -13.0 (dBW/4 kHz)

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 4.0 GHz		Transmit 6.1 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
0	17.33	95.26	-10.00	100.00	-10.00	100.00
5	17.79	90.36	-10.00	100.00	-10.00	100.00
10	17.95	85.47	-10.00	100.00	-10.00	100.00
15	18.24	80.59	-10.00	100.00	-10.00	100.00
20	17.92	75.70	-10.00	100.00	-10.00	100.00
25	17.45	70.78	-10.00	100.00	-10.00	100.00
30	17.58	65.91	-10.00	100.00	-10.00	100.00
35	16.72	60.94	-10.00	100.00	-10.00	100.00
40	15.48	55.91	-10.00	100.00	-10.00	100.00
45	14.72	50.92	-10.00	100.00	-10.00	100.00
50	13.67	45.88	-9.54	100.00	-9.54	100.00
55	12.89	40.86	-8.28	106.02	-8.28	100.00
60	12.85	35.95	-6.89	110.38	-6.89	100.00
65	12.60	31.02	-5.29	116.27	-5.29	100.00
70	13.37	26.36	-3.53	118.21	-3.53	100.00
75	15.42	22.35	-1.73	114.67	-1.73	100.00
80	15.25	17.65	0.83	121.26	0.83	100.00
85	14.10	12.60	4.49	140.35	4.49	100.00
90	12.66	7.42	10.23	177.01	10.23	100.00
95	11.89	2.50	22.04	471.08	22.04	196.76
100	10.38	2.73	21.08	268.63	21.08	100.00
105	9.52	7.68	9.87	200.20	9.87	100.00
110	7.61	13.01	4.14	175.82	4.14	100.00
115	5.78	18.31	0.43	166.57	0.43	100.00
120	4.74	23.29	-2.18	168.41	-2.18	100.00
125	4.25	28.03	-4.19	163.83	-4.19	100.00
130	5.63	32.00	-5.63	141.11	-5.63	100.00
135	2.81	37.54	-7.36	184.96	-7.36	100.00
140	1.21	42.54	-8.72	250.73	-8.72	100.00
145	1.87	46.53	-9.69	208.01	-9.69	100.00
150	3.91	49.70	-10.00	142.29	-10.00	100.00
155	5.66	52.59	-10.00	124.45	-10.00	100.00
160	7.89	54.44	-10.00	118.46	-10.00	100.00
165	12.87	52.30	-10.00	100.95	-10.00	100.00
170	13.30	53.35	-10.00	100.00	-10.00	100.00
175	15.04	53.67	-10.00	100.00	-10.00	100.00
180	16.66	54.56	-10.00	100.00	-10.00	100.00
185	18.09	56.04	-10.00	100.00	-10.00	100.00



# COMSEARCH

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### Coordination Values

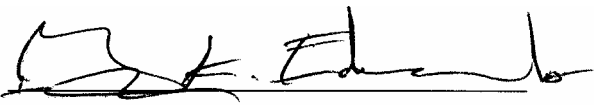
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Ground Elevation (AMSL)	2733.45 m / 8968.0 ft			
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Antenna Model	Vertex 2.4 meter SF			
Antenna Mode	Receive 4.0 GHz		Transmit 6.1 GHz	
Interference Objectives: Long Term	-156.0 dBW/MHz	20%	-154.0 dBW/4 kHz	20%
Short Term	-146.0 dBW/MHz	0.01%	-131.0 dBW/4 kHz	0.0025%
Max Available RF Power			-13.0 (dBW/4 kHz)	

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 4.0 GHz		Transmit 6.1 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
190	19.42	58.00	-10.00	100.00	-10.00	100.00
195	20.33	60.54	-10.00	100.00	-10.00	100.00
200	18.43	64.64	-10.00	100.00	-10.00	100.00
205	18.84	67.70	-10.00	100.00	-10.00	100.00
210	18.83	71.05	-10.00	100.00	-10.00	100.00
215	17.38	74.88	-10.00	100.00	-10.00	100.00
220	17.38	78.28	-10.00	100.00	-10.00	100.00
225	15.86	81.96	-10.00	100.00	-10.00	100.00
230	16.22	85.32	-10.00	100.00	-10.00	100.00
235	13.20	88.82	-10.00	100.00	-10.00	100.00
240	11.34	91.98	-10.00	107.76	-10.00	100.00
245	11.96	95.16	-10.00	105.00	-10.00	100.00
250	9.77	97.88	-10.00	114.27	-10.00	100.00
255	7.71	100.28	-10.00	118.85	-10.00	100.00
260	9.26	103.52	-10.00	115.40	-10.00	100.00
265	9.26	106.30	-10.00	115.39	-10.00	100.00
270	9.24	108.97	-10.00	115.44	-10.00	100.00
275	9.18	111.50	-10.00	115.59	-10.00	100.00
280	8.91	113.78	-10.00	116.19	-10.00	100.00
285	7.46	115.07	-10.00	117.67	-10.00	100.00
290	6.74	116.54	-10.00	119.32	-10.00	100.00
295	6.20	117.89	-10.00	120.57	-10.00	100.00
300	6.09	119.33	-10.00	120.83	-10.00	100.00
305	7.42	121.82	-10.00	117.76	-10.00	100.00
310	8.06	123.54	-10.00	118.06	-10.00	100.00
315	9.67	125.95	-10.00	114.49	-10.00	100.00
320	10.79	127.66	-10.00	110.24	-10.00	100.00
325	11.90	129.07	-10.00	105.29	-10.00	100.00
330	12.60	125.10	-10.00	102.14	-10.00	100.00
335	13.86	120.05	-10.00	100.00	-10.00	100.00
340	14.07	115.10	-10.00	100.00	-10.00	100.00
345	14.79	110.12	-10.00	100.00	-10.00	100.00
350	15.88	105.13	-10.00	100.00	-10.00	100.00
355	16.93	100.18	-10.00	100.00	-10.00	100.00

## 5. CERTIFICATION

I HEREBY CERTIFY THAT I AM THE TECHNICALLY QUALIFIED PERSON RESPONSIBLE FOR THE PREPARATION OF THE FREQUENCY COORDINATION DATA CONTAINED IN THIS APPLICATION, THAT I AM FAMILIAR WITH PARTS 101 AND 25 OF THE FCC RULES AND REGULATIONS, THAT I HAVE EITHER PREPARED OR REVIEWED THE FREQUENCY COORDINATION DATA SUBMITTED WITH THIS APPLICATION, AND THAT IT IS COMPLETE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

BY: 

Gary K. Edwards  
Senior Manager  
COMSEARCH  
19700 Janelia Farm Boulevard  
Ashburn, VA 20147

DATED: October 30, 2009