

FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for
DIRECTV Enterprises, LLC
LONG BEACH, CA
Satellite Earth Station

Prepared By:
COMSEARCH
19700 Janelia Farm Boulevard
Ashburn, VA 20147
July 13, 2012

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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.

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 05/31/2012.

Company

ABC Holding Company Inc.
AERA ENERGY LLC
AIRCELL, LLC - GOGO, LLC
AMERIQUEST MORTGAGE COMPANY
ANACAPA Micro Products, Inc.
AT&T COMMUNICATIONS OF CALIFORNIA, INC.
AT&T COMMUNICATIONS OF MOUNTAIN STATES
AT&T California
AirSites2000, LLC
Airband Communications Inc
Antelecom, Inc.
BNSF Railway Company
Bakersfield, City of
Bay City Television, Inc.
Beta Operating Company LLC
CALIFORNIA WATER SERVICE COMPANY
CARITAS TELECOMMUNICATIONS
CBS Broadcasting Inc
CNG Communications, Inc.
California, State of
Cellco Partnership - California
Chevron USA Inc.
City of Pasadena, California
Clearwire Spectrum Holdings III, LLC
Color BroadBand Inc.
Community Services, Inc.
Cox Communications - San Diego Mkt
DM Ventures, Inc.
DRS Technical Services
Exxon Communications Company
Fireline Network Solutions Inc.
Franklin Technology Systems, Inc.
Fresno MSA Limited Partnership
GILCOMM LLC
GTE Mobilnet of California LTD Partnersh
GTE Mobilnet of Santa Barbara LTD Ptsh
Gila Electronics of Yuma, Inc
Glendale, City of
Goff, Wayne C.
Gogo LLC

IBERDROLA Renewables
ITT Corporation
Imperial Irrigation District
International Communications Network Inc
J G BOSWELL COMPANY
KERN COMMUNITY COLLEGE DISTRICT BAKERSFI
KERN COUNTY SUPERINTENDENT OF SCHOOLS
KERN ED TELECOM CONSORTIUM
KERN SCHOOLS FEDERAL CREDIT UNION
KIMTRON INC
Kern Valley Dispatch
Kern, County of
LOS ANGELES CITY WATER & POWER
LOS ANGELES UNIFIED SCHOOL DISTRICT
LT-WR, LLC
Lightwave Broadband LLC
Lockheed Martin Corp - Baltimore, MD
Long Beach City California
Long Beach City Electronics Div.
Long Beach City Wireless Comm Div
Long Beach City of, CA - Fire Department
Los Angeles City Info Technology Agency
Los Angeles County Dept of Public Works
Los Angeles County FCC Licensing Section
Los Angeles SMSA Ltd. Partnership
Los Angeles, City of
MHO Networks
MONTEBELLO CITY CALIFORNIA
MetroConnect Inc
MetroPCS California, LLC
Metropolitan Water Dist of So California
New Cingular Wireless PCS LLC - AZ
New Cingular Wireless PCS - Los Angeles
New Cingular Wireless PCS LLC - N CAL
New Cingular Wireless PCS LLC -San Diego
Nextel of California Inc.
Nextlink Wireless, LLC
Nextweb Inc
OACYS.COM Incorporated
ORANGE COUNTY TRANSPORTATION AUTHORITY
ORANGE, COUNTY OF, CA
Port of Los Angeles
Providence Health & Services
Regional 3Cs
Riverside, City of
Riverside, County of
SAN DIEGO COUNTY SUPER. OF SCHOOLS
SAN DIEGO, CITY OF
SIERRA SANDS UNIFIED SCHOOL DISTRICT
ST. JOSEPH HEALTH SYSTEM
STATION VENTURE OPERATIONS, LP
San Bernardino Community Col Dis KVCR-TV
San Bernardino County of California
San Diego County
San Diego Gas & Electric Company
Santa Barbara Cellular Systems, Ltd.

Santa Barbara, County of
Skyriver Communications
Southern California Edison Company
Southern California Gas Company
Southern California Regional Rail Auth.
Southern California Telephone Company
Sparkplug Southwest, LLC
Sprint Spectrum, LP
Sprint Telephony PCS, L.P.
T-Mobile License LLC
TV MICROWAVES CO
Thira Solutions, Inc.
Towerstream Corp
Trango Systems, Inc.
Turn Wireless, LLC
Union Pacific Railroad Company
University of California,HPWREN
VENOCO, INC.
VENTURA COUNTY COMMUNITY COLLEGE
VENTURE TECHNOLOGIES GROUP LLC
Vectus, Inc
Ventura County Office of Education
Ventura Regional Sanitation District
Ventura, County of
Verizon California Inc.
Verizon Wireless (VAW) LLC (CA)
Verizon Wireless(VAW) LLC-AZ/CO/NM/NV/UT
WEST COVINA, CITY OF
WT Consulting Group, LLC
WWC License L.L.C. - California
Western Technical Services
enXco Services Corporation
unWired Broadband, Inc

4. EARTH STATION COORDINATION DATA

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

COMSEARCH

Earth Station Data Sheet

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

Date: 07/02/2012
Job Number: 120531COMSGE02

Administrative Information

Status ENGINEER PROPOSAL
Call Sign
Licensee Code ZDIRTV
Licensee Name DIRECTV Enterprises, LLC

Site Information LONG BEACH, CA

Venue Name
Latitude (NAD 83) 33° 49' 45.5" N
Longitude (NAD 83) 118° 12' 39.1" W
Climate Zone B
Rain Zone 4
Ground Elevation (AMSL) 13.7 m / 45.0 ft

Link Information

Satellite Type Geostationary
Mode TR - Transmit-Receive
Modulation Digital
Satellite Arc 58° W to 143° West Longitude
Azimuth Range 107.7° to 219.7°
Corresponding Elevation Angles 16.0° / 42.6°
Antenna Centerline (AGL) 5.49 m / 18.0 ft

Antenna Information

		Receive - FCC32		Transmit - FCC32	
Manufacturer		General Dynamics		General Dynamics	
Model		9.2 Meter		9.2 Meter	
Gain / Diameter		58.5 dBi / 9.2 m		59.9 dBi / 9.2 m	
3-dB / 15-dB Beamwidth		0.20° / 0.38°		0.16° / 0.32°	
Max Available RF Power	(dBW/4 kHz) (dBW/MHz)			-17.2 6.8	
Maximum EIRP	(dBW/4 kHz) (dBW/MHz)			42.7 66.7	
Interference Objectives:	Long Term	-156.0 dBW/MHz	20%	-151.0 dBW/4 kHz	20%
	Short Term	-146.0 dBW/MHz	0.01%	-128.0 dBW/4 kHz	0.0025%

Frequency Information

	Receive 11.0 GHz	Transmit 14.0 GHz
Emission / Frequency Range (MHz)	24M0G7W - 36M0G7W / 10950.0 - 11200.0 24M0G7W - 36M0G7W / 11450.0 - 11700.0	24M0G7W - 36M0G7W / 14000.0 - 14500.0

Max Great Circle Coordination Distance 377.6 km / 234.6 mi 138.3 km / 85.9 mi
Precipitation Scatter Contour Radius 366.8 km / 227.9 mi 100.0 km / 62.1 mi

COMSEARCH

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19700 Janelia Farm Boulevard, Ashburn, VA 20147
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Coordination Values

LONG BEACH, CA

Licensee Name DIRECTV Enterprises, LLC
Latitude (NAD 83) 33° 49' 45.5" N
Longitude (NAD 83) 118° 12' 39.1" W
Ground Elevation (AMSL) 13.7 m / 45.0 ft
Antenna Centerline (AGL) 5.49 m / 18.0 ft
Antenna Model General Dynamics 9.2 meter
Antenna Mode Receive 11.0 GHz Transmit 14.0 GHz
Interference Objectives: Long Term -156.0 dBW/MHz 20% -151.0 dBW/4 kHz 20%
Short Term -146.0 dBW/MHz 0.01% -128.0 dBW/4 kHz 0.0025%
Max Available RF Power -17.2 (dBW/4 kHz)

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 11.0 GHz		Transmit 14.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
0	0.00	106.97	-10.00	307.68	-10.00	115.03
5	0.00	102.18	-10.00	307.68	-10.00	115.03
10	0.00	97.38	-10.00	307.68	-10.00	115.03
15	0.00	92.58	-10.00	307.68	-10.00	115.03
20	0.00	87.77	-10.00	307.68	-10.00	115.03
25	0.00	82.96	-10.00	307.68	-10.00	115.03
30	0.00	78.16	-10.00	307.68	-10.00	115.03
35	0.00	73.37	-10.00	307.68	-10.00	115.03
40	0.00	68.59	-10.00	307.68	-10.00	115.03
45	0.00	63.82	-10.00	307.68	-10.00	115.03
50	0.00	59.08	-10.00	307.68	-10.00	115.03
55	0.34	54.29	-10.00	275.38	-10.00	101.51
60	0.47	49.56	-10.00	252.71	-10.00	100.00
65	0.55	44.88	-9.30	246.57	-9.30	100.00
70	0.67	40.25	-8.12	240.42	-8.12	100.00
75	0.69	35.73	-6.83	247.23	-6.83	100.00
80	0.72	31.33	-5.40	253.31	-5.40	100.00
85	0.68	27.15	-3.84	265.74	-3.84	100.00
90	0.61	23.29	-2.18	286.72	-2.18	103.44
95	0.62	19.85	-0.44	299.05	-0.44	107.80
100	0.61	17.17	1.13	314.09	1.13	113.50
105	0.52	15.72	2.09	335.89	2.09	121.85
110	0.47	15.71	2.10	345.64	2.10	125.64
115	0.32	17.28	1.06	377.63	1.06	138.34
120	0.33	19.85	-0.44	360.15	-0.44	132.32
125	0.84	22.87	-1.98	259.91	-1.98	100.00
130	0.48	26.86	-3.73	292.33	-3.73	106.30
135	0.00	30.81	-5.22	350.02	-5.22	130.33
140	0.00	34.32	-6.39	339.03	-6.39	126.46
145	0.00	37.63	-7.39	330.17	-7.39	123.21
150	0.00	40.71	-8.24	322.63	-8.24	120.49
155	0.00	43.50	-8.96	316.42	-8.96	118.24
160	0.00	45.93	-9.55	311.42	-9.55	116.41
165	0.00	47.93	-10.00	307.68	-10.00	115.03
170	0.00	49.42	-10.00	307.68	-10.00	115.03
175	0.00	50.36	-10.00	307.68	-10.00	115.03
180	0.00	50.67	-10.00	307.68	-10.00	115.03
185	0.00	50.36	-10.00	307.68	-10.00	115.03

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Coordination Values

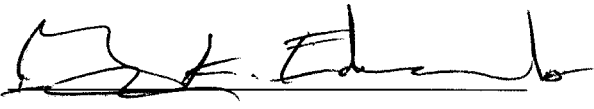
LONG BEACH, CA

Licensee Name	DIRECTV Enterprises, LLC		
Latitude (NAD 83)	33° 49' 45.5" N		
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Antenna Mode	Receive 11.0 GHz	Transmit 14.0 GHz	
Interference Objectives: Long Term	-156.0 dBW/MHz 20%	-151.0 dBW/4 kHz	20%
Short Term	-146.0 dBW/MHz 0.01%	-128.0 dBW/4 kHz	0.0025%
Max Available RF Power		-17.2 (dBW/4 kHz)	

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 11.0 GHz		Transmit 14.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
190	0.00	49.43	-10.00	307.68	-10.00	115.03
195	0.00	47.93	-10.00	307.68	-10.00	115.03
200	0.00	46.08	-9.59	311.10	-9.59	116.29
205	0.00	44.55	-9.22	314.19	-9.22	117.43
210	0.00	43.44	-8.95	316.54	-8.95	118.28
215	0.00	42.76	-8.78	318.00	-8.78	118.81
220	0.00	42.56	-8.72	318.45	-8.72	118.98
225	0.00	42.83	-8.79	317.86	-8.79	118.76
230	0.00	43.56	-8.98	316.29	-8.98	118.19
235	0.00	44.73	-9.27	313.83	-9.27	117.29
240	0.00	46.31	-9.64	310.66	-9.64	116.13
245	0.00	48.25	-10.00	307.68	-10.00	115.03
250	0.00	50.52	-10.00	307.68	-10.00	115.03
255	0.00	53.06	-10.00	307.68	-10.00	115.03
260	0.00	55.83	-10.00	307.68	-10.00	115.03
265	0.00	58.81	-10.00	307.68	-10.00	115.03
270	0.00	61.95	-10.00	307.68	-10.00	115.03
275	0.00	65.22	-10.00	307.68	-10.00	115.03
280	0.00	68.61	-10.00	307.68	-10.00	115.03
285	0.00	72.09	-10.00	307.68	-10.00	115.03
290	0.00	75.64	-10.00	307.68	-10.00	115.03
295	0.00	79.24	-10.00	307.68	-10.00	115.03
300	0.00	82.89	-10.00	307.68	-10.00	115.03
305	0.00	86.56	-10.00	307.68	-10.00	115.03
310	0.00	90.24	-10.00	307.68	-10.00	115.03
315	0.24	93.93	-10.00	298.12	-10.00	110.88
320	0.43	97.64	-10.00	257.52	-10.00	100.00
325	0.52	101.32	-10.00	244.85	-10.00	100.00
330	0.58	104.96	-10.00	238.66	-10.00	100.00
335	0.59	108.54	-10.00	237.47	-10.00	100.00
340	0.62	112.06	-10.00	234.19	-10.00	100.00
345	0.00	115.21	-10.00	307.68	-10.00	115.03
350	0.00	116.52	-10.00	307.68	-10.00	115.03
355	0.00	111.75	-10.00	307.68	-10.00	115.03

5. CERTIFICATION

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

BY: 

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

DATED: July 13, 2012