

# STATE OF CONNECTICUT

## CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051

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Internet: [ct.gov/csc](http://ct.gov/csc)

Daniel F. Caruso

Chairman

March 11, 2009

Jennifer Young Gaudet  
HPC Development LLC  
53 Lake Avenue Ext.  
Danbury, CT 06811

RE: **EM-T-MOBILE-035-090213** - Omnipoint Communications, as subsidiary of T-Mobile USA, Inc., notice of intent to modify an existing telecommunications facility located at 130 Ledge Road, Darien, Connecticut.

Dear Mrs. Gaudet:

The Connecticut Siting Council (Council) hereby acknowledges your notice to modify this existing telecommunications facility, pursuant to Section 16-50j-73 of the Regulations of Connecticut State Agencies.

The proposed modifications are to be implemented as specified here and in your notice received February 13, 2009, including the placement of all necessary equipment and shelters within the tower compound. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility site that would not increase tower height, extend the boundaries of the tower site, increase noise levels at the tower site boundary by six decibels, and increase the total radio frequencies electromagnetic radiation power density measured at the tower site boundary to or above the standard adopted by the State Department of Environmental Protection pursuant to General Statutes § 22a-162. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower.

This decision is under the exclusive jurisdiction of the Council. Please be advised that the validity of this action shall expire one year from the date of this letter. Any additional change to this facility will require explicit notice to this agency pursuant to Regulations of Connecticut State Agencies Section 16-50j-73. Such notice shall include all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65. Any deviation from this format may result in the Council implementing enforcement proceedings pursuant to General Statutes § 16-50u including, without limitation, imposition of expenses resulting from such failure and of civil penalties in an amount not less than one thousand dollars per day for each day of construction or operation in material violation.

Thank you for your attention and cooperation.

Very truly yours,

  
S. Derek Phelps  
Executive Director

SDP/MP/laf

c: The Honorable Evonne M. Klein, First Selectman, Town of Darien  
David J. Keating, Zoning Enforcement Officer, Town of Darien  
Crown Castle USA, Inc.



CONNECTICUT SITING COUNCIL  
Affirmative Action / Equal Opportunity Employer



EM-T-MOBILE-035-090213

VIA OVERNIGHT DELIVERY

Connecticut Siting Council  
10 Franklin Square  
New Britain, Connecticut 06051  
Attn: Mr. S. Derek Phelps, Executive Director



Re: Omnipoint Communications, Inc. – exempt modification  
130 Ledge Road, Darien, Connecticut

Dear Mr. Phelps:

This letter and attachments are submitted on behalf of Omnipoint Communications, Inc. (also referred to herein as “T-Mobile”). T-Mobile is enhancing the capabilities of its wireless system in Connecticut by implementing UMTS technology. In order to do so, T-Mobile will modify antenna and equipment configurations at a number of its existing sites. Please accept this letter and attachments as notification, pursuant to R.C.S.A. Section 16-50j-73, of construction which constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2). In compliance with R.C.S.A. Section 16-50j-73, a copy of this letter and attachments is being sent to the First Selectman of Darien.

T-Mobile plans to modify the existing facility at 130 Ledge Road, Darien (coordinates 41°04’21” N, -73°28’42” W). Attached are a compound plan and elevation depicting the planned changes, and documentation of the structural sufficiency of the tower to accommodate the revised antenna configuration. Also included is a power density calculation reflecting the modification to T-Mobile’s operations at the site.

The changes to the facility do not constitute a modification as defined in Connecticut General Statutes (“C.G.S.”) Section 16-50i(d) because the general physical characteristics of the facility will not be significantly changed. Rather, the planned changes to the facility fall squarely within those activities explicitly provided for in R.C.S.A. Section 16-50j-72(b)(2).

1. The height of the overall structure will be unaffected. Both T-Mobile’s existing and proposed antennas will be located at an approximate center line of 110’ AGL on the approximately 117’ tower. The existing panel antennas will remain and three new TMAs, one each per sector, will replace the three existing TMAs. None of the modifications will extend the height of the tower.
2. The proposed changes will not extend the site boundaries. T-Mobile will install one additional cabinet on the existing concrete pad within the fenced area at the base of the tower. Thus, there will be no effect on the site compound.

3. The proposed changes will not increase the noise level at the existing facility by six decibels or more. The incremental effect of the proposed changes will be negligible.

4. The changes to the facility will not increase the calculated "worst case" power density for the combined operations at the site to a level at or above the applicable standard for uncontrolled environments as calculated for a mixed frequency site. As indicated on the attached power density calculation, T-Mobile's operations at the site will result in a power density of 8.4492%; the combined site operations will result in a total power density of 95.5892%.

Please feel free to call me at (860) 798-7454 with questions concerning this matter.  
Thank you for your consideration.

Respectfully yours,



Jennifer Young Gaudet

cc: Honorable Evonne Klein, First Selectman, Town of Darien  
Town of Darien (underlying property owner)

Attachments

EXISTING 8'-0" HIGH CHAIN LINK FENCE WITH ACCESS GATE

EXISTING EQUIPMENT BUILDING (BY OTHERS)

GAMMA SECTOR  
300° AZIMUTH

EXISTING ±117' MONOPOLE

BETA SECTOR  
185° AZIMUTH

EXISTING EQUIPMENT PAD (BY OTHERS)

EXISTING T-MOBILE PANEL ANTENNA (TYP) - PULL 2 CABLES FROM S12000 FOR RBS 3106, SWAP OUT ALL TMA FOR 1 TWIN PCS & 1 TWIN AWS ON PROPER COAX RUN

ALPHA SECTOR  
60° AZIMUTH



PROPOSED T-MOBILE UMTS EQUIPMENT CABINET (RBS 3106) MOUNTED ON EXISTING CONCRETE PAD

EXISTING COAXIAL CABLES ROUTED INSIDE COVERED CABLE TRAY

EXISTING T-MOBILE EQUIPMENT CABINET (S12000) MOUNTED ON 21'-3"x5'-0" CONCRETE PAD

EXISTING (12) 1 1/4" COAXIAL CABLES ROUTED INSIDE EXISTING CABLE TRAY

EXISTING EQUIPMENT BUILDING (BY OTHERS)

**PROPOSED COMPOUND PLAN**

SCALE: 3/32" = 1'-0"



TITLE: **COMPOUND PLAN**  
 CLIENT: **Omnipoint**  
COMMUNICATIONS, INC.  
 26 TAYLOR BLVD.  
 33 GORETIC ROAD SUITE 200  
 BLOOMFIELD, CT 06032

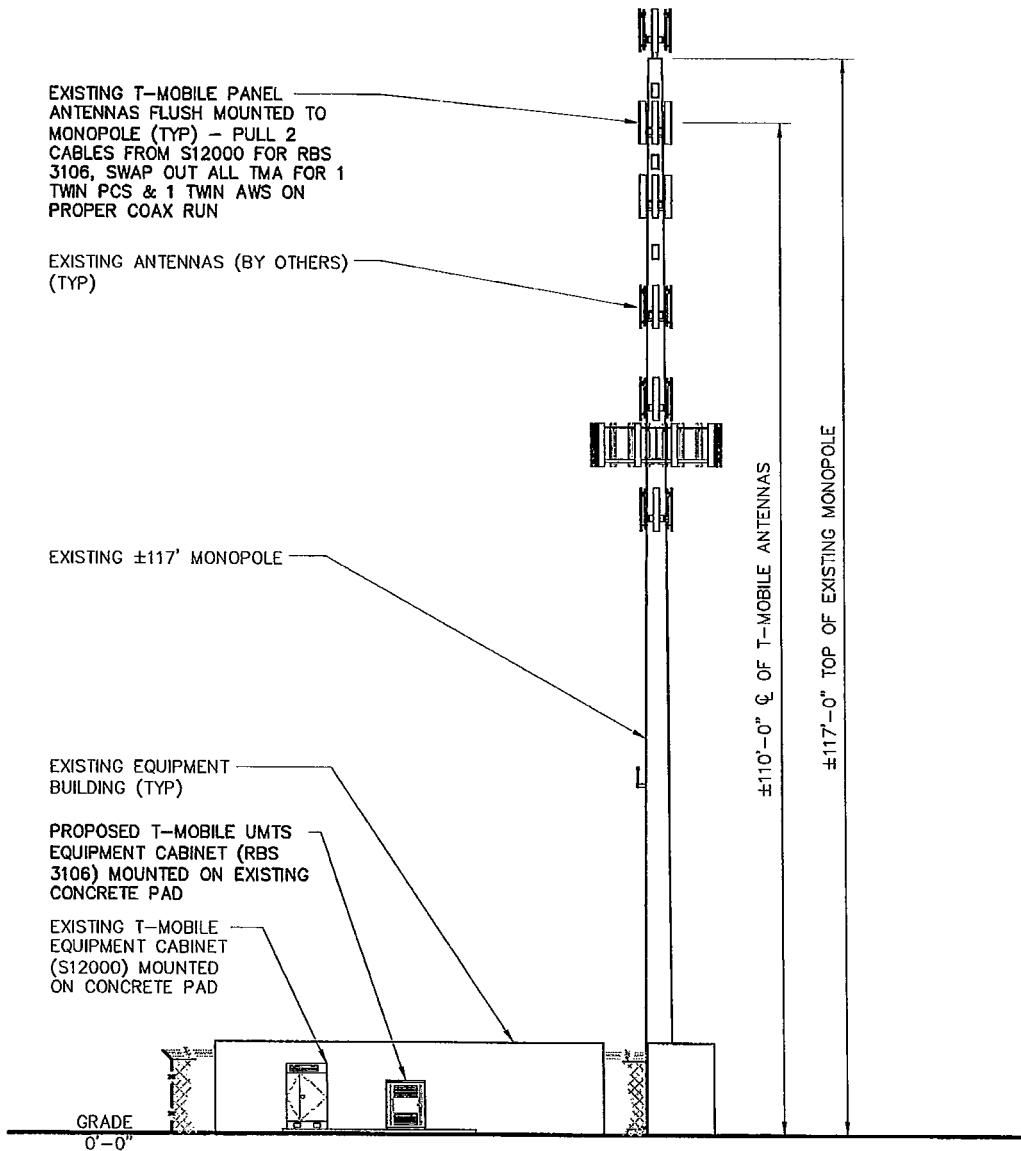
PROJECT: **CROWN MONOPOLE DARIEN**  
 ADDRESS: **130 LEDGE ROAD  
 DARIEN, CT 06820  
 FAIRFIELD COUNTY**

4	2-4-09	JLS
3	12-12-08	JRB
2	12-2-08	MAD
1	11-21-08	JLS
0	11-13-08	JRB

SITE NO: **CT11851C**

KMB NO: **350.0004.015** DRAWN BY: **JRB** CHECKED BY:




**LE2**



**NORTH ELEVATION**

SCALE: 1" = 20'



 <p><b>KMB</b> DESIGN GROUP www.kmbdg.com</p>	<p>TITLE: <b>ELEVATION</b></p>		<p>PROJECT: <b>CROWN MONOPOLE DARIEN</b></p>		4	2-4-09	JLS
	<p>CLIENT:  <b>Omnipoint</b></p> <p><small>COMMUNICATIONS 266 T-MOBILE PL 31 GRIFFIN ROAD MIDDLETOWN, CT 06457</small></p>		<p>ADDRESS: <b>130 LEDGE ROAD DARIEN, CT 06820 FAIRFIELD COUNTY</b></p>		3	12-12-08	JRB
<p>SITE NO: <b>CT11851C</b></p>	<p>KMB NO: <b>350.0004.015</b></p>	<p>DRAWN BY: <b>JRB</b></p>	<p>CHECKED BY: </p>				
				<p>1</p>			
				0	11-13-08	JRB	
				<b>LE3</b>			

Date: **January 14, 2009**

David Eicher  
Crown Castle USA Inc.  
3530 Toringdon Way Suite 300  
Charlotte, NC 28277



**Subject: Structural Analysis Report**

**Carrier Designation:** **T-MOBILE Co-Locate**  
**Carrier Site Number:** CT11851  
**Carrier Site Name:** CT851/Crown Darien\_MP

**Crown Castle Designation:** **Crown Castle BU Number:** 806352  
**Crown Castle Site Name:** BRG 302 943052  
**Crown Castle JDE Job Number:** 112901  
**Crown Castle Work Order Number:** 248419

**Engineering Firm Designation:** **Crown Castle USA Inc. Project Number:** 248419

**Site Data:** **126 Ledge Road, DARIEN, Fairfield County, CT**  
**Latitude 41° 4' 20.75", Longitude -73° 28' 41.4"**  
**117 Foot - Monopole Tower**

Dear Veronica Harris,

Crown Castle USA Inc. is pleased to submit this "Structural Analysis Report" to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 248419, in accordance with application 71801, revision 2.

The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation, under the following load case, to be:

LC1: Existing + Reserved + Proposed Equipment **Sufficient Capacity**  
Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

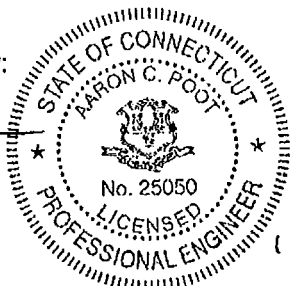
The analysis has been performed in accordance with the TIA/EIA-222-F standard and local code requirements based upon a wind speed of 90 mph fastest mile.

All modifications and equipment proposed in this report shall be installed in accordance with the attached drawings for the determined available structural capacity to be effective.

We at Crown Castle USA Inc. appreciate the opportunity of providing our continuing professional services to you and Crown Castle USA Inc.. If you have any questions or need further assistance on this or any other projects please give us a call.

Respectfully submitted by:

Aaron C. Poot, P.E.  
Engineering Supervisor



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**1) INTRODUCTION**

This tower is a 100 ft Monopole tower designed by VALMONT in May of 1992. A 17 ft extension was added after construction. The tower was originally designed for a wind speed of 90 mph per TIA/EIA-222-E.

**2) ANALYSIS CRITERIA**

The structural analysis was performed for this tower in accordance with the requirements of TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 85 mph with no ice, 74 mph with 0.75 inch ice thickness and 50 mph under service loads.

**Table 1 – Proposed Antenna and Cable Information**

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
110	110	3	andrew	ETW190VS12UB	12	1 1/4	-
		3	rfs celwave	ATMAA1412D-1A20			



**Table 2 – Existing and Reserved Antenna and Cable Information**

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note	
117	120	3	decibel	932LG65VTE-B w/Mount Pipe	7	1 5/8	1	
	117	-	tower mounts	Pipe Mount (3)				
110	110	6	Remec	S200557A-1	12	1 5/8	5	
		3	rfs celwave	APX16PV-16PVL-E w/ Mount Pipe			1	
		-	tower mounts	Pipe Mount (3)			1	
100	102	12	MLA	MLA Antenna	12	1 5/8	6	
		6	decibel	DB948F85T2E-M w/Mount Pipe			1	
		6	swedcom	ALP 9212-N w/Mount Pipe				
	100	-	tower mounts	Platform Mount [LP 702-1]				
87	89	3	generic	Diplxer	12	1 ¼	3	
		6	generic	TMA			1	
		6	powerwave technologies	7770.00 w/ Mount Pipe			4	
		-	-	-			4	
		-	-	-			4	
	87	-	tower mounts	Platform Mount [LP 702-1]	1			
81	81	1	Tower Mounts	Pipe Mount (3)	6	1 5/8	2	
		3	kathrein	800 10504 w/ Mount Pipe				
72	74	3	adam	AM-X-WM-17-65-00T	9	7/8	2	
		6	antel	BXA-80090/4 DIN FP				
		9	decibel	DB844H90E-XY w/Mount Pipe				5
		3	kmw communications	KMDAPS2050000				2
		9	swedcom	ALP-E-9011-DIN w/Mount Pipe				4
	72	-	tower mounts	Platform Mount [LP 702-1]	1			
68	68	3	ems wireless	RV90-17-00DP w/Mount Pipe	6	1 ¼	5	
		3	tower mounts	2'6"x4" Pipe Mount				
40	40	1		GPS	1	½	1	
		1	tower mounts	Pipe Mount				

Notes:

- 1) Existing Equipment
- 2) Reserved Equipment
- 3) SLA equipment is not controlling: was not considered in the analysis
- 4) SLA equipment controlling: was considered in the analysis
- 5) Equipment to be Removed: was not considered in the analysis
- 6) MLA equipment is not controlling: was not considered in the analysis

**Table 3 – Design Antenna and Cable Information**

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
97	97	6	Generic	8RL410C4R105	-	-
		2	Generic	PD100	-	-
84	84	6	Generic	8RL410C4R105	-	-
		2	Generic	PD100	-	-

**3) ANALYSIS PROCEDURE**

**Table 4 – Documents Provided**

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	DR. Clarence Welti, P.E. January 13, 1993	217769	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	SAC, Project# 1993-9, 02/1993	217771	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Valmont, Order# 11109-07 and 10844-92	217772	CCISITES
POST MOD. INSPECTION	GPD, Job# 2007278.24	2218625	CCISITES

**3.1) Analysis Method**

RISATower (version 5.3.1.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

**3.2) Assumptions**

- 1) Tower and structures were built in accordance with the manufacturer's specifications.
- 2) The tower and structures have been maintained in accordance with the manufacturer's specification.
- 3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
- 4) When applicable, transmission cables are considered as structural components for calculating wind loads as allowed by TIA/EIA-222-F.
- 5) Base plate was considered ungrouted.

This analysis may be affected if any assumptions are not valid or have been made in error. Crown Castle USA Inc. should be notified to determine the effect on the structural integrity of the tower.

**4) ANALYSIS RESULTS**

**Table 5 - Section Capacity (Summary)**

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	117 - 110	Pole	TP15.94x14.36x0.1875	1	-0.26	494.43	5.5	Pass
L2	110 - 100	Pole	TP18.2x15.94x0.1875	2	-0.83	565.36	16.6	Pass
L3	100 - 47.417	Pole	TP30.09x18.2x0.25	3	-10.88	1205.42	97.2	Pass
L4	47.417 - 0	Pole	TP40.3x28.5536x0.344	4	-21.26	2300.86	96.2	Pass
							Summary	
						Pole (L3)	97.2	Pass
						<b>RATING =</b>	<b>97.2</b>	<b>Pass</b>

**Table 6 - Tower Component Stresses vs. Capacity - LC1**

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	74.9	Pass
1	Base Plate	0	62.8	Pass
1,2	Base Foundation	0	97.3	Pass
1	Flange	100	24.5	Pass

<b>Structure Rating (max from all components) =</b>	<b>97.3%</b>
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Notes:

- 1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.
- 2) Foundation capacity determined by comparing analysis reactions to original design reactions.

**4.1) Recommendations**

The structure and its foundation are capable of supporting the existing, reserved and proposed loading.

## Technical Memo

To: HPC  
From: Farid Marbough - Radio Frequency Engineer  
cc: Jason Overbey  
Subject: Power Density Report for CT11851C  
Date: January 21, 2009

### 1. Introduction:

This report is the result of an Electromagnetic Field Intensities (EMF - Power Densities) study for the T-Mobile PCS antenna installation on a Monopole at 130 Ledge Road, Darien, CT. This study incorporates the most conservative consideration for determining the practical combined worst case power density levels that would be theoretically encountered from locations surrounding the transmitting location.

### 2. Discussion:

The following assumptions were used in the calculations:

- 1) The emissions from T-Mobile transmitters are in the (1940-1949.8), (2140-2145), (2110-2120)MHz frequency Band.
- 2) The antenna array consists of three sectors, with 1 antennas per sector.
- 3) The model number for GSM antenna is APX16PV-16PVL.
- 3) The model number of the UMTS antenna is APX16PV-16PVL.
- 4) GSM antenna center line height is 110.
- 4) UMTS antenna center line height is 110.
- 5) The maximum transmit power from any GSM sector is 1939.63 Watts Effective Radiated Power (EiRP) assuming 8 channels per sector.
- 5) The maximum transmit power from any UMTS sector is 2225.82 Watts Effective Radiated Power (EiRP) assuming 2 channels per sector.
- 6) All the antennas are simultaneously transmitting and receiving, 24 hours a day.
- 7) Power levels emitting from the antennas are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.
- 8) The average ground level of the studied area does not change significantly with respect to the transmitting location

Equations given in "FCC OET Bulletin 65, Edition 97-01" were then used with the above information to perform the calculations.

### 3. Conclusion:

Based on the above worst case assumptions, the power density calculation from the T-Mobile PCS antenna installation on a Monopole at 130 Ledge Road, Darien, CT, is 0.08449 mW/cm<sup>2</sup>. This value represents 8.449% of the Maximum Permissible Exposure (MPE) standard of 1 milliwatt per square centimeter (mW/cm<sup>2</sup>) set forth in the FCC/ANSI/IEEE C95.1-1991. Furthermore, the proposed antenna location for T-Mobile will not interfere with existing public safety communications, AM or FM radio broadcasts, TV, Police Communications, HAM Radio communications or any other signals in the area. The combined Power Density from other carriers is 87.14%. The combined Power Density for the site is 95.589% of the M.P.E. standard.

# Connecticut Market



## Worst Case Power Density

**Site:** CT11851C  
**Site Address:** 130 Ledge Road  
**Town:** Darien  
**Tower Height:** 117 ft.  
**Tower Style:** Monopole

GSM Data		UMTS Data	
Base Station TX output	20 W	Base Station TX output	40 W
Number of channels	8	Number of channels	2
Antenna Model	APX16PV-16PVL	Antenna Model	APX16PV-16PVL
Cable Size	1 1/4 in.	Cable Size	1 1/4 in.
Cable Length	160 ft.	Cable Length	160 ft.
Antenna Height	110.0 ft.	Antenna Height	110.0 ft.
Ground Reflection	1.6	Ground Reflection	1.6
Frequency	1945.0 MHz	Frequency	2.1 GHz
Jumper & Connector loss	4.50 dB	Jumper & Connector loss	1.50 dB
Antenna Gain	17.8 dBi	Antenna Gain	17.8 dBi
Cable Loss per foot	0.0154 dB	Cable Loss per foot	0.0116 dB
Total Cable Loss	2.4640 dB	Total Cable Loss	1.8560 dB
Total Attenuation	6.9640 dB	Total Attenuation	3.3560 dB
Total EIRP per Channel (In Watts)	53.85 dBm 242.45 W	Total EIRP per Channel (In Watts)	60.46 dBm 1112.91 W
Total EIRP per Sector (In Watts)	62.88 dBm 1939.63 W	Total EIRP per Sector (In Watts)	63.47 dBm 2225.82 W
nsg	10.8360	nsg	14.4440
Power Density (S) = 0.039344 mW/cm <sup>2</sup>		Power Density (S) = 0.045149 mW/cm <sup>2</sup>	
T-Mobile Worst Case % MPE =		8.4492%	
Equation Used : $S = \frac{(1000)(grf)^2 (Power) \cdot 10^{(nsg/10)}}{4\pi (R)^2}$			
Office of Engineering and Technology (OET) Bulletin 65, Edition 97-01, August 1997			

## Co-Location Total

Carrier	% of Standard
Verizon	13.5600 %
Cingular	17.1600 %
Sprint	11.0700 %
AT&T Wireless	
Nextel	13.8900 %
MetroPCS	31.4600 %
Other Antenna Systems	
<b>Total Excluding T-Mobile</b>	<b>87.1400 %</b>
T-Mobile	8.4492
<b>Total % MPE for Site</b>	<b>95.5892%</b>