

**Milestone  
Site ID - Robinson 1  
Site Name – Robinson 1  
Site Compliance Report**

**5035 Sideburn Road  
Fairfax, VA 22032**

Site visit date: July 27, 2012  
Site visit time: 11:30 AM  
Site survey by: Danny Audi

Latitude: N38-48-58.73  
Longitude: W77-18-22.32  
Structure Type: Monopole

Report generated date: August 16, 2012  
Report by: Jerry Audi  
Customer Contact: Christian Winkler

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**Milestone is Compliant Based on FCC Rules and Regulations.**

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# **Milestone Robinson 1 - Robinson 1 Radio Frequency (RF) Site Compliance Report**



**5035 Sideburn Road, Fairfax, VA 22032**



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## 1 Executive Summary

Milestone has contracted with Sitesafe, Inc. (Sitesafe), an independent Radio Frequency (RF) regulatory and engineering consulting firm, to determine whether the communications site, Robinson 1 - Robinson 1, located at 5035 Sideburn Road, Fairfax, VA, is in compliance with Federal Communication Commission (FCC) Rules and Regulations for RF emissions.

Sitesafe's field personnel visited Robinson 1 - Robinson 1 on July 27, 2012. This report contains a detailed summary of the RF environment at the site including:

- site compliance determination;
- photographs of the site;
- diagram of the site;
- inventory of the make / model of all transmitting antennas found on the site (where possible);
- record of any Maximum Permissible Exposure ("MPE") measurements taken on the site, as applicable; and
- theoretical MPE based on modeling.

This report addresses exposure to radio frequency electromagnetic fields in accordance with the FCC Rules and Regulations for all individuals, classified in two groups, "Occupational or Controlled" and "General Public or Uncontrolled." This **site is compliant** with the FCC rules and regulations, as described in OET Bulletin 65.

During our field visit, Sitesafe documented the presence and location of signs and barriers. This document specifically addresses compliance of Milestone's transmitting facilities independently and in relation to all collocated transmitting facilities, which together constitute the RF environment at the site.

If you have any questions regarding RF safety and regulatory compliance, please do not hesitate to contact Sitesafe's Customer Support Department at (703) 276-1100.

## 2 Regulatory Basis

### 2.1 FCC Rules and Regulations

In 1996, the Federal Communication Commission (FCC) adopted regulations for the evaluating of the effects of RF emissions in 47 CFR § 1.1307 and 1.1310. The guideline from the FCC Office of Engineering and Technology is Bulletin 65 ("OET Bulletin 65"), *Evaluating Compliance with FCC Guidelines for Human Exposure to Radio Frequency Electromagnetic Fields*, Edition 97-01, published August 1997. Since 1996 the FCC periodically reviews these rules and regulations as per their congressional mandate.

FCC regulations define two separate tiers of exposure limits: Occupational or "Controlled environment" and General Public or "Uncontrolled environment". The General Public limits are generally five times more conservative or restrictive than the Occupational limit. These limits apply to *accessible* areas where workers or the general public may be exposed to Radio Frequency (RF) electromagnetic fields.

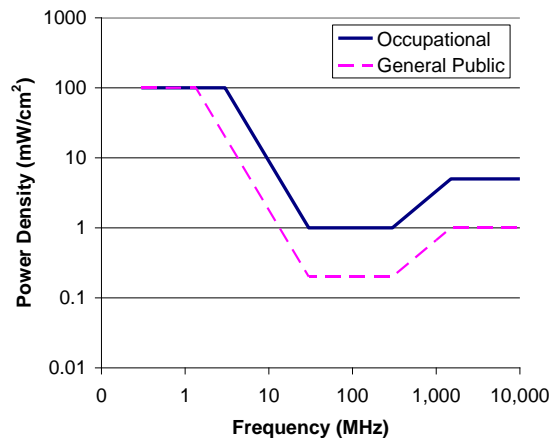
Occupational or Controlled limits apply in situations in which persons are exposed as a consequence of their employment and where those persons exposed have been made fully aware of the potential for exposure and can exercise control over their exposure.

An area is considered a Controlled environment when access is limited to these aware personnel. Typical criteria are restricted access (i.e. locked or alarmed doors, barriers, etc.) to the areas where antennas are located coupled with proper RF warning signage. A site with Controlled environments is evaluated with Occupational limits.

All other areas are considered Uncontrolled environments. If a site has no access controls or no RF warning signage it is evaluated with General Public limits.

The theoretical modeling of the RF electromagnetic fields has been performed in accordance with OET Bulletin 65. The Maximum Permissible Exposure (MPE) limits utilized in this analysis are outlined in the following diagram:

**FCC Limits for Maximum Permissible Exposure (MPE)**  
Plane-wave Equivalent Power Density



**Limits for Occupational/Controlled Exposure (MPE)**

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm <sup>2</sup> )	Averaging Time  E  <sup>2</sup> ,  H  <sup>2</sup> or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	(900/f <sup>2</sup> )*	6
30-300	61.4	0.163	1.0	6
300-1500	--	--	f/300	6
1500-100,000	--	--	5	6

**Limits for General Population/Uncontrolled Exposure (MPE)**

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm <sup>2</sup> )	Averaging Time  E  <sup>2</sup> ,  H  <sup>2</sup> or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f <sup>2</sup> )*	30
30-300	27.5	0.073	0.2	30
300-1500	--	--	f/1500	30
1500-100,000	--	--	1.0	30

f = frequency in MHz      \*Plane-wave equivalent power density

**2.2 OSHA Statement**

The General Duty clause of the OSHA Act (Section 5) outlines the occupational safety and health responsibilities of the employer and employee. The General Duty clause in Section 5 states:

- (a) Each employer –
  - (1) shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees;
  - (2) shall comply with occupational safety and health standards promulgated under this Act.
  
- (b) Each employee shall comply with occupational safety and health standards and all rules, regulations, and orders issued pursuant to this Act which are applicable to his own actions and conduct.

OSHA has defined Radiofrequency and Microwave Radiation safety standards for workers who may enter hazardous RF areas. Regulation Standards 29 CFR § 1910.147 identify a generic Lock Out Tag Out procedure aimed to control the unexpected energization or start up of machines when maintenance or service is being performed.

### 3 Site Compliance

#### 3.1 Site Compliance Statement

Upon evaluation of the cumulative RF emission levels from all operators at this site, and a thorough review of site access procedures, RF hazard signage and visible antenna locations, Sitesafe has determined that:

This **site is compliant** with the FCC rules and regulations, as described in OET Bulletin 65.

The compliance determination is based on General Public MPE levels due to theoretical modeling and/or physical measurements, RF signage placement, and the level of restricted access to the antennas at the site. Measurements have also been performed to validate the assumptions used in our theoretical modeling of this site.

Modeling is used for determining compliance and the percentage of MPE contribution. Measurements provide a view of MPE percentage levels at the site at the time of Sitesafe's visit and are used to validate modeling results.

#### 3.2 Actions for Site Compliance

Based on common industry practice and our understanding of FCC and OSHA requirements, this section provides a statement of recommendations for site compliance. RF alert signage recommendations have been proposed based on existing measurements and theoretical analysis of MPE levels. Sitesafe has documented the locations of any RF signs and barriers that are required for compliance. Barriers can consist of locked doors, fencing, railing, rope, chain, paint striping or tape, combined with RF alert signage.

This site is compliant with the FCC rules and regulations.

## 4 Safety Plan and Procedures

The following items are general safety recommendations that should be administered on a site by site basis as needed by the carrier.

**General Maintenance Work:** Any maintenance personnel required to work immediately in front of antennas and / or in areas indicated as above 100% of the Occupational MPE limits should coordinate with the wireless operators to disable transmitters during their work activities.

**Training and Qualification Verification:** All personnel accessing areas indicated as exceeding the General Population MPE limits should have a basic understanding of EME awareness and RF Safety procedures when working around transmitting antennas. Awareness training increases a workers understanding to potential RF exposure scenarios. Awareness can be achieved in a number of ways (e.g. videos, formal classroom lecture or internet based courses).

**Physical Access Control:** Access restrictions to transmitting antennas locations is the primary element in a site safety plan. Examples of access restrictions are as follows:

- Locked Gate
- Restricted Ladder

**RF Signage:** Everyone should obey all posted signs at all times. RF signs play an important role in properly warning a worker prior to entering into a potential RF Exposure area.

**Assume all antennas are active:** Due to the nature of telecommunications transmissions, an antenna transmits intermittently. Always assume an antenna is transmitting. Never stop in front of an antenna. If you have to pass by an antenna, move through as quickly and safely as possible thereby reducing any exposure to a minimum.

**Maintain a 3 foot clearance from all antennas:** There is a direct correlation between the strength of an EME field and the distance from the transmitting antenna. The further away from an antenna, the lower the corresponding EME field is.

**Site RF Emissions Diagram:** Section 6 of this report contains an RF Diagram that outlines various theoretical Maximum Permissible Exposure (MPE) areas at the site. The modeling is a worst case scenario assuming a duty cycle of 100% for each transmitting antenna at full power. This analysis is based on one of two access control criteria: General Public criteria means the access to the site is uncontrolled and anyone can gain access. Occupational criteria means the access is restricted and only properly trained individuals can gain access to the antenna locations.

## 5 Site Audit

### 5.1 Site Access Procedures

A site visit was conducted on July 27, 2012 at approximately 11:30 AM. The weather conditions were Sunny with a temperature of 85 degrees. At that time, a diagram of the site was verified, obtained or produced containing the locations of all visible antennas, RF signs and access points on site. These antennas were recorded and photographed. The antenna make(s)/model(s) and centerlines were verified where possible.

The following information was gathered regarding site access at the facility.

Site access was locked or restricted at the time of the site visit.

RF Advisory signage was posted at all site access points.



Figure 1: Site Access

## 6 NIR Analysis and Recommendation

### 6.1 NIR Analysis Results

When applying the General Public environment standards, the predicted energy density from the Milestone operation is no more than 2.72 % of the Maximum Permissible Exposure (MPE) limiting any accessible location on the ground. A presentation of this predicted analysis is attached in Section 7. Additionally, measurements were taken on the ground in the vicinity of the site. Measurements show the cumulative RF energy density from all carriers.

### 6.2 Site Measurements Collected

Peak or maximum RF measurements were made over the operating frequencies of the wireless operator's facilities at the base of the tower and at the school. These were measured as a percentage of the General Public exposure level. A measurement of 100% would be at the limit and smaller numbers indicate a percentage of the limit. The factor or number of "Times Below" the limit is also shown.

<b>Measure #</b>	<b>Wireless Operators: % of General Public Limit</b>	<b>Times Below Limit</b>	<b>Notes</b>
1	0.11	871	Tower
2	0.045	2,200	School

RF meters and probes have been calibrated and used according to the manufacturer's specifications. Measurements provide a view of MPE percentage levels at the site at the time of Sitesafe's visit and are used to validate modeling results. Theoretical modeling is used for determining compliance and the percentage of MPE contribution.

A separate diagram has been included in section 6.3 of this document.



**Figure 2: Tower Overview**



**Figure 3: Tower Overview**



**Figure 4: Base Overview**



**Figure 5: Base Overview**

### 6.3 RF Emission Diagram

The diagram below displays RF spatial average measurement locations. Measurement values are referenced from the table above. Predicted Maximum Permissible Exposure levels calculations provided in tabular form in Section 7 below. See the engineering statement for more information on these calculations.

#### Abbreviations used in the RF Emissions Diagrams

PH=##'	Penthouse at ## feet above main roof
M##	Measurement ## taken during a site visit

#### Additional Information in the RF Emissions Diagrams Key

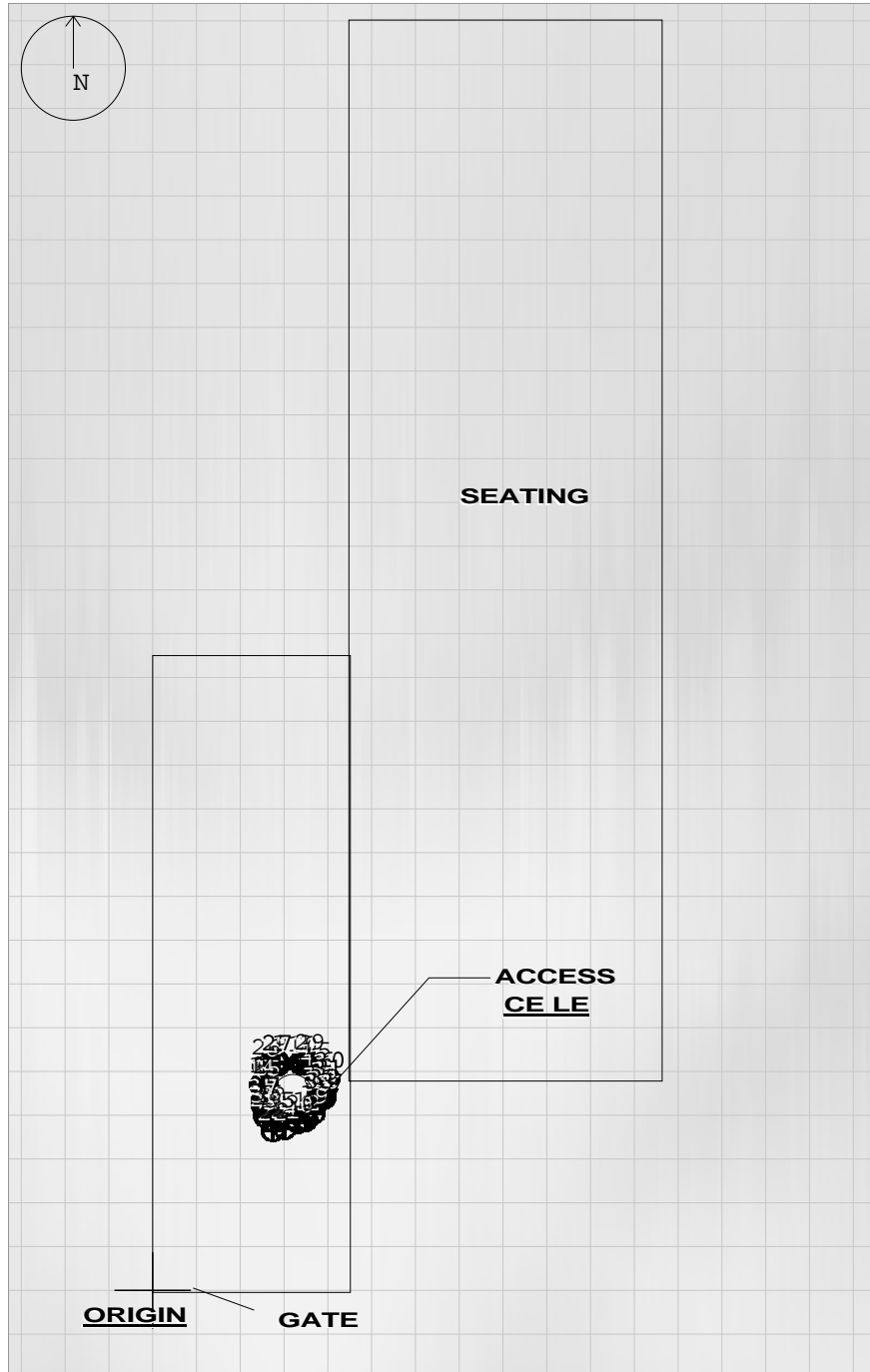
The RF Emission Diagram provides indications of RF signage and locked access points. The table below lists the abbreviations used to indicate locked access points and signs:

Table 2: RF Signage and Barrier Key					
RF Signage			Barriers		
Type	Existing Location	Recommended Location	Type	Existing Location	Recommended Location
Notice	<u>NE</u>	<u>NR</u>	Locked Door	<u>LE</u>	<u>LR</u>
Caution	<u>CE</u>	<u>CR</u>	Fencing	<u>RE</u>	<u>RR</u>
Warning	<u>WE</u>	<u>WR</u>	Rope Chain		
Info Sign	<u>IE</u>		Paint Stripes		

As discussed in Section 6, site measurements collected at the time of Sitesafe's visit have been added to the RF Emission diagrams. While the software modeling represents theoretical MPE levels based on the assumptions detailed above, the site measurement data is a snapshot of MPE levels, and dependent on transmitter duty cycle, system implementation and emissions from other RF sources at nearby antenna sites.

The diagrams below show ground level predictions as well an elevation view that shows predicted levels going up the tower.

# RF Emissions Diagram for: Robinson 1 Ground Level

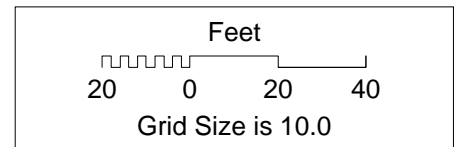


% of FCC Public Exposure Limit  
Average from 0 feet above to 6 feet above origin

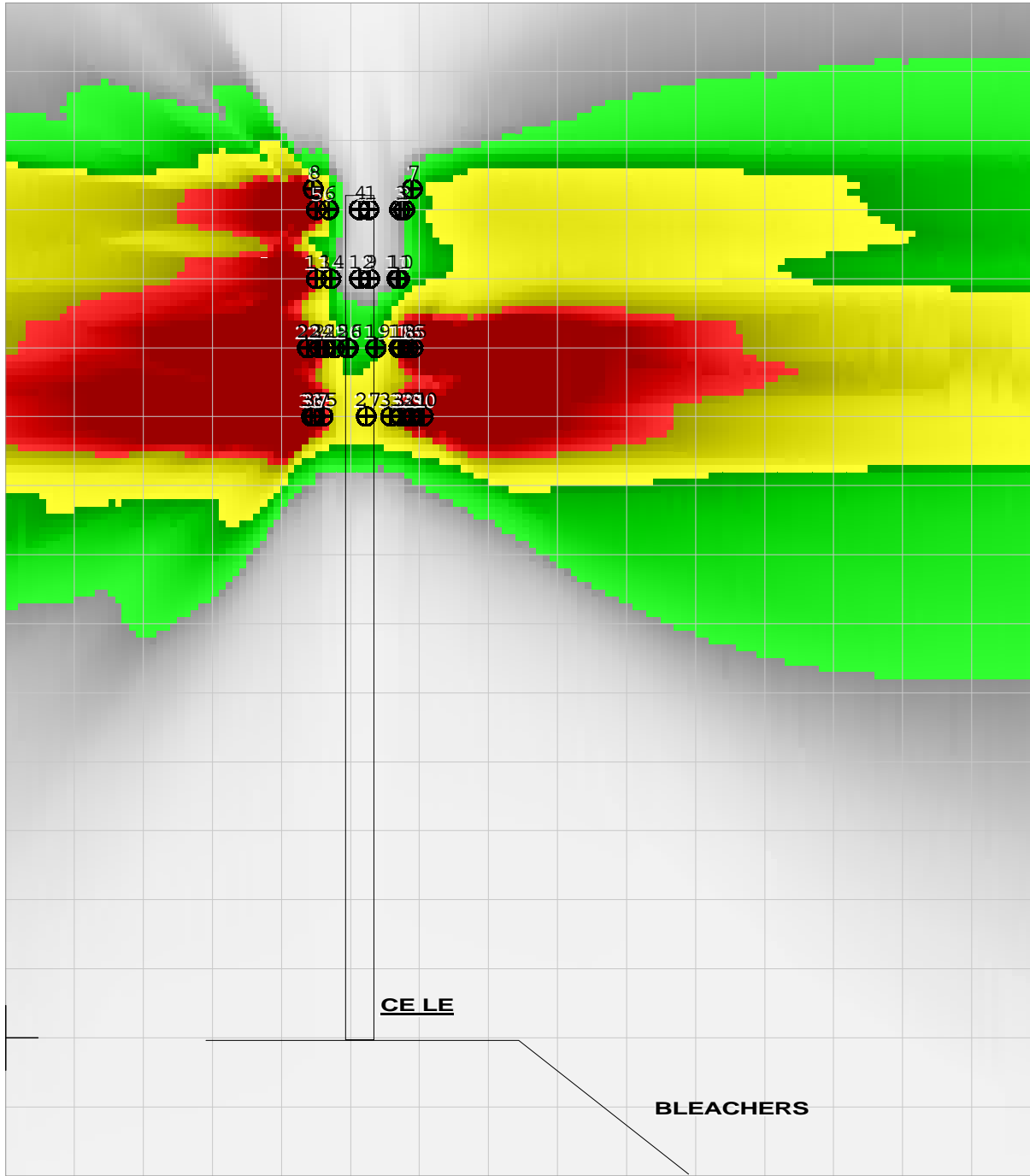
- $100 \leq X$
- $20 \leq X < 100$
- $5 \leq X < 20$
- $X \leq 5$

  
[www.sitesafe.com](http://www.sitesafe.com)  
 Sitesafe ID# 89627  
 Site Name: Robinson 1

Sitesafe Inc. assumes no responsibility for modeling results not verified by Sitesafe personnel.  
 Contact Sitesafe Inc. for modeling assistance (703) 276-1100.  
 SitesafeTC Version 2.01.00  
 6/31/2012



# RF Emissions Diagram for: Robinson 1 Elevation View



% of FCC Public Exposure Limit

Individual Points

- $100 \leq X$
- $20 \leq X < 100$
- $5 \leq X < 20$
- $X \leq 5$

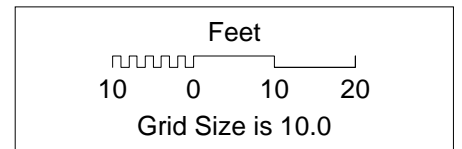


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## 7 Predicted RF Energy Density Calculations

### AT&T Mobility LLC Robinson 1 Site Summary

<b>Carrier</b>	<b>Area Maximum Percentage MPE</b>
AT&T Mobility LLC	0.413 %
AT&T Mobility LLC	0.391 %
AT&T Mobility LLC	0.598 %
Clearwire	0.001 %
Clearwire	0.001 %
Sprint-Nextel	0.073 %
Sprint-Nextel	0.198 %
T-Mobile	0.143 %
T-Mobile	0.143 %
Verizon Wireless	0.254 %
Verizon Wireless	0.153 %
Verizon Wireless	0.354 %
<b>Composite Site MPE:</b>	<b>2.722 %</b>

**AT&T Mobility LLC  
Robinson 1  
Carrier Summary**

Frequency: 750 MHz  
 Maximum Permissible Exposure (MPE): 500  $\mu\text{W}/\text{cm}^2$   
 Maximum power density at ground level: 2.06279  $\mu\text{W}/\text{cm}^2$   
 Highest percentage of Maximum Permissible Exposure: 0.41256 %

Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	On Axis		Area	
					Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE	Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE
Powerwave	P65-17-XLH-RR-0ET	90	0	1000	1.435761	0.287152	1.951618	0.390324
Powerwave	P65-17-XLH-RR-0ET	90	120	1000	1.435761	0.287152	1.951618	0.390324
Powerwave	P65-17-XLH-RR-0ET	90	240	1000	1.418331	0.283666	1.951618	0.390324

**AT&T Mobility LLC  
Robinson 1  
Carrier Summary**

Frequency: 1900 MHz  
 Maximum Permissible Exposure (MPE): 1000  $\mu\text{W}/\text{cm}^2$   
 Maximum power density at ground level: 3.91399  $\mu\text{W}/\text{cm}^2$   
 Highest percentage of Maximum Permissible Exposure: 0.3914 %

Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	On Axis		Area	
					Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE	Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE
Kathrein-Scala	800-10122	90	0	1000	0.602414	0.060241	1.653962	0.165396
Kathrein-Scala	800-10122	90	0	1000	0.602414	0.060241	1.653962	0.165396
Kathrein-Scala	800-10122	90	120	1000	0.600555	0.060056	1.653962	0.165396
Kathrein-Scala	800-10122	90	120	1000	0.600555	0.060056	1.653962	0.165396
Kathrein-Scala	800-10122	90	240	1000	0.602414	0.060241	1.653962	0.165396
Kathrein-Scala	800-10122	90	240	1000	0.602414	0.060241	1.653962	0.165396

**AT&T Mobility LLC  
Robinson 1  
Carrier Summary**

**Frequency:** 850 MHz  
**Maximum Permissible Exposure (MPE):** 566.67  $\mu\text{W}/\text{cm}^2$   
**Maximum power density at ground level:** 3.38597  $\mu\text{W}/\text{cm}^2$   
**Highest percentage of Maximum Permissible Exposure:** 0.59752 %

Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	On Axis		Area	
					Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE	Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE
Kathrein-Scala	800-10122	90	0	1000	0.91649	0.161734	1.348895	0.23804
Kathrein-Scala	800-10122	90	0	1000	0.91649	0.161734	1.348895	0.23804
Kathrein-Scala	800-10122	90	120	1000	0.91649	0.161734	1.348896	0.23804
Kathrein-Scala	800-10122	90	120	1000	0.91649	0.161734	1.348896	0.23804
Kathrein-Scala	800-10122	90	240	1000	0.915475	0.161554	1.348895	0.23804
Kathrein-Scala	800-10122	90	240	1000	0.915475	0.161554	1.348895	0.23804

## Clearwire Robinson 1 Carrier Summary

**Frequency:** 19525 MHz  
**Maximum Permissible Exposure (MPE):** 1000  $\mu\text{W}/\text{cm}^2$   
**Maximum power density at ground level:** 0.00858  $\mu\text{W}/\text{cm}^2$   
**Highest percentage of Maximum Permissible Exposure:** 0.00086 %

Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	On Axis		Area	
					Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE	Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE
ANDREW	VHLP2-18	123	212	113	0.008578	0.000858	0.008578	0.000858

## Clearwire Robinson 1 Carrier Summary

**Frequency:** 19625 MHz  
**Maximum Permissible Exposure (MPE):** 1000  $\mu\text{W}/\text{cm}^2$   
**Maximum power density at ground level:** 0.00623  $\mu\text{W}/\text{cm}^2$   
**Highest percentage of Maximum Permissible Exposure:** 0.00062 %

Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	On Axis		Area	
					Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE	Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE
ANDREW	VHLP2-18	123	354	82	0.006225	0.000623	0.006225	0.000623

## Sprint-Nextel Robinson 1 Carrier Summary

**Frequency:** 2500 MHz  
**Maximum Permissible Exposure (MPE):** 1000  $\mu\text{W}/\text{cm}^2$   
**Maximum power density at ground level:** 0.73191  $\mu\text{W}/\text{cm}^2$   
**Highest percentage of Maximum Permissible Exposure:** 0.07319 %

Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	On Axis		Area	
					Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE	Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE
KMW	AM-X-WM-17-65-00T-000T	120	0	1000	0.326795	0.032679	0.693467	0.069347
KMW	AM-X-WM-17-65-00T-000T	120	120	1000	0.326453	0.032645	0.693467	0.069347
KMW	AM-X-WM-17-65-00T-000T	120	240	1000	0.326795	0.032679	0.693467	0.069347

## Sprint-Nextel Robinson 1 Carrier Summary

**Frequency:** 1900 MHz  
**Maximum Permissible Exposure (MPE):** 1000  $\mu\text{W}/\text{cm}^2$   
**Maximum power density at ground level:** 1.98021  $\mu\text{W}/\text{cm}^2$   
**Highest percentage of Maximum Permissible Exposure:** 0.19802 %

Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	On Axis		Area	
					Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE	Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE
ANDREW	UMWD-09016-XDH-0	120	0	2000	0.599034	0.059903	1.563973	0.156397
ANDREW	UMWD-09016-XDH-0	120	120	2000	0.599034	0.059903	1.563973	0.156397
ANDREW	UMWD-09016-XDH-0	120	240	2000	0.60033	0.060033	1.563973	0.156397

## T-Mobile Robinson 1 Carrier Summary

**Frequency:** 2100 MHz  
**Maximum Permissible Exposure (MPE):** 1000  $\mu\text{W}/\text{cm}^2$   
**Maximum power density at ground level:** 1.42971  $\mu\text{W}/\text{cm}^2$   
**Highest percentage of Maximum Permissible Exposure:** 0.14297 %

Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	On Axis		Area	
					Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE	Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE
Ericsson	AIR21 B2A/AIR21 B4A	110	0	1000	0.992106	0.099211	1.414758	0.141476
Ericsson	AIR21 B2A/AIR21 B4A	110	120	1000	0.997972	0.099797	1.414758	0.141476
Ericsson	AIR21 B2A/AIR21 B4A	110	240	1000	0.992106	0.099211	1.414758	0.141476

## T-Mobile Robinson 1 Carrier Summary

**Frequency:** 1900 MHz  
**Maximum Permissible Exposure (MPE):** 1000  $\mu\text{W}/\text{cm}^2$   
**Maximum power density at ground level:** 1.42975  $\mu\text{W}/\text{cm}^2$   
**Highest percentage of Maximum Permissible Exposure:** 0.14298 %

Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	On Axis		Area	
					Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE	Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE
Ericsson	AIR21 B2A/AIR21 B4A	110	0	1000	0.992106	0.099211	1.414758	0.141476
Ericsson	AIR21 B2A/AIR21 B4A	110	120	1000	0.997972	0.099797	1.414758	0.141476
Ericsson	AIR21 B2A/AIR21 B4A	110	240	1000	0.992106	0.099211	1.414758	0.141476

## Verizon Wireless Robinson 1 Carrier Summary

**Frequency:** 750 MHz  
**Maximum Permissible Exposure (MPE):** 500  $\mu\text{W}/\text{cm}^2$   
**Maximum power density at ground level:** 1.2712  $\mu\text{W}/\text{cm}^2$   
**Highest percentage of Maximum Permissible Exposure:** 0.25424 %

Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	On Axis		Area	
					Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE	Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE
Antel	BXA-70063-6CF-0ET	100	30	1000	0.864749	0.17295	1.03152	0.206304
Antel	BXA-70063-6CF-0ET	100	180	1000	0.864749	0.17295	1.03152	0.206304
Antel	BXA-70063-6CF-0ET	100	270	1000	0.864749	0.17295	1.03152	0.206304

## Verizon Wireless Robinson 1 Carrier Summary

**Frequency:** 1900 MHz  
**Maximum Permissible Exposure (MPE):** 1000  $\mu\text{W}/\text{cm}^2$   
**Maximum power density at ground level:** 1.53492  $\mu\text{W}/\text{cm}^2$   
**Highest percentage of Maximum Permissible Exposure:** 0.15349 %

Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	On Axis		Area	
					Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE	Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE
Antel	BXA-185063-8CF-0ET	100	30	2000	1.106156	0.110616	1.230351	0.123035
Antel	BXA-185063-8CF-0ET	100	180	2000	1.106156	0.110616	1.230351	0.123035
Antel	BXA-185063-8CF-0ET	100	270	2000	1.106156	0.110616	1.230351	0.123035

## Verizon Wireless Robinson 1 Carrier Summary

**Frequency:** 850 MHz  
**Maximum Permissible Exposure (MPE):** 566.67  $\mu\text{W}/\text{cm}^2$   
**Maximum power density at ground level:** 2.00744  $\mu\text{W}/\text{cm}^2$   
**Highest percentage of Maximum Permissible Exposure:** 0.35425 %

Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	On Axis		Area	
					Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE	Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE
Antel	LPA-80063-6CF-0ET	100	30	1000	0.718821	0.126851	0.739325	0.130469
Antel	LPA-80063-6CF-0ET	100	30	1000	0.718821	0.126851	0.739325	0.130469
Antel	LPA-80063-6CF-0ET	100	180	1000	0.718821	0.126851	0.739325	0.130469
Antel	LPA-80063-6CF-0ET	100	180	1000	0.718821	0.126851	0.739325	0.130469
Antel	LPA-80063-6CF-0ET	100	270	1000	0.718821	0.126851	0.739325	0.130469
Antel	LPA-80063-6CF-0ET	100	270	1000	0.718821	0.126851	0.739325	0.130469

## 8 Field Technician Certification

I, Danny Audi, state:

That I am an employee of Sitesafe, Inc., in Arlington, Virginia, which provides RF compliance services to clients in the wireless communications industry; and

That I have successfully completed RF Safety Awareness training, am aware of the hazards and, therefore, can be exposed to RF fields classified for "Occupational" exposure;

That I am familiar with the Rules and Regulations of the Federal Communications Commission (FCC) as well as the regulations of the Occupational Safety and Health Administration (OSHA), both in general and specifically as they apply to the FCC Guidelines for Human Exposure to Radio-frequency Radiation; and

That I have been trained in the proper use of measurement equipment, and have successfully completed Sitesafe training in policy, procedure and proper site measurement and modeling; and

That I performed survey measurements of the RF environment at the site identified as Robinson 1 - Robinson 1 on July 27, 2012 at 11:30 AM in order to determine where there might be electromagnetic energy that is in excess of both the Controlled Environment and Uncontrolled Environment levels; and

That the survey measurements were performed with measurement equipment, model Narda 8718B field intensity meter (serial number 1907) and model A8742D field intensity probe, (serial number 02110) calibrated on 1/26/2010; and

That I have prepared this Site Compliance Report and believe it to be true and accurate to the best of my knowledge and based on data gathered.

By: Danny Audi

## 9 Engineer Certification

The engineering indicated on the cover of this report hereby certifies and affirm that:

That I am registered as a Professional Engineer in the jurisdiction indicated; and

That I have extensive professional experience in the wireless communications engineering industry; and

That I am an employee of Sitesafe, Inc. in Arlington, Virginia; and

That I am thoroughly familiar with the Rules and Regulations of the Federal Communications Commission ("the FCC" and "the FCC Rules") both in general and specifically as they apply to the FCC's Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; and

That the technical information serving as the basis for this report was supplied by Milestone (See attached Site Summary and Carrier documents), and that Milestone's installations involve communications equipment, antennas and associated technical equipment at a location referred to as the "Robinson 1 - Robinson 1" ("the site"); and

That Milestone proposes to operate at the site with transmit antennas listed in the carrier summary and with a maximum effective radiated power as specified by Milestone and shown on the worksheet, and that worst-case 100% duty cycle have been assumed; and

That in addition to the emitters specified in the worksheet, there are additional collocated point-to-point microwave facilities on this structure and, the antennas used are highly directional oriented at angles at or just below the horizontal and, that the energy present at ground level is typically so low as to be considered insignificant and have not been included in this analysis; and

That this analysis has been performed with the assumption that the ground immediately surrounding the tower is primarily flat or falling; and

That at this time, the FCC requires that certain licensees address specific levels of radio-frequency energy to which workers or members of the public might possibly be exposed (at §1.1307(b) of the FCC Rules); and

That such consideration of possible exposure of humans to radio-frequency radiation must utilize the standards set by the FCC, which is the Federal Agency having jurisdiction over communications facilities; and

That the FCC rules define two tiers of permissible exposure guidelines: 1) "uncontrolled environments," defined as situations in which persons may not be aware of (the "general public"), or may not be able to control their exposure to a transmission facility; and (2) "controlled environments," which defines situations in which persons are aware of their potential for exposure (industry personnel); and

That this statement specifically addresses the uncontrolled environment (which is more conservative than the controlled environment) and the limit set forth in the FCC rules for licensees of Milestone's operating frequency as shown on the attached antenna worksheet; and

That it is understood per FCC Guidelines and OET Bulletin 65 Appendix A, that regardless of the existent radio-frequency environment, only those licenses whose contributions exceed five percent of the exposure limit pertinent to their operation(s) bear any responsibility for bringing any non-compliant area(s) into compliance; and

That when applying the uncontrolled environment standards, the cumulative predicted energy density from the proposed operation is no more than 2.722% of the maximum in any accessible area up to two meters above the ground per OET Bulletin 65; and

That the calculations provided in this report are based on data provided by the client and antenna pattern data supplied by the antenna manufacturer, in accordance with FCC guidelines listed in OET Bulletin 65. Horizontal and vertical antenna patterns are combined for modeling purposes to accurately reflect the energy two meters above ground level where on-axis energy refers to maximum energy two meters above the ground along the azimuth of the antenna and where area energy refers to the maximum energy anywhere two meters above the ground regardless of the antenna azimuth, accounting for cumulative energy from multiple antennas for the carrier and frequency range indicated; and

That the Occupational Safety and Health Administration has policies in place which address worker safety in and around communications sites, thus individual companies will be responsible for their employees' training regarding Radio Frequency Safety.

In summary, it is stated here that the proposed operation at the site would not result in exposure of the Public to excessive levels of radio-frequency energy as defined in the FCC Rules and Regulations, specifically 47 CFR 1.1307 and that Milestone's proposed operation is completely compliant.

Finally, it is stated that access to the tower should be restricted to communication industry professionals, and approved contractor personnel trained in radio-frequency safety; and that the instant analysis addresses exposure levels at two meters above ground level and does not address exposure levels on the tower, or in the immediate proximity of the antennas.

August 16, 2012

## Appendix A – Statement of Limiting Conditions

Sitesafe field personnel visited the site and collected data with regard to the RF environment. Sitesafe will not be responsible for matters of a legal nature that affect the site or property. The property was visited under the premise that it is under responsible ownership and management and our client has the legal right to conduct business at this facility.

Due to the complexity of some wireless sites, Sitesafe performed this visit and created this report utilizing best industry practices and due diligence. Sitesafe cannot be held accountable or responsible for anomalies or discrepancies due to actual site conditions (i.e., mislabeling of antennas or equipment, inaccessible cable runs, inaccessible antennas or equipment, etc.) or information or data supplied by Milestone, the site manager, or their affiliates, subcontractors or assigns.

Sitesafe has provided computer generated model(s) in this Site Compliance Report to show approximate dimensions of the site, and the model is included to assist the reader of the compliance report to visualize the site area, and to provide supporting documentation for Sitesafe's recommendations.

Sitesafe may note in the Site Compliance Report any adverse physical conditions, such as needed repairs, observed during the survey of the subject property or that Sitesafe became aware of during the normal research involved in performing this survey. Sitesafe will not be responsible for any such conditions that do exist or for any engineering or testing that might be required to discover whether such conditions exist. Because Sitesafe is not an expert in the field of mechanical engineering or building maintenance, the Site Compliance Report must not be considered a structural or physical engineering report.

Sitesafe obtained information used in this Site Compliance Report from sources that Sitesafe considers reliable and believes them to be true and correct. Sitesafe does not assume any responsibility for the accuracy of such items that were furnished by other parties. When conflicts in information occur between data provided by a second party and physical data collected by Sitesafe, the physical data will be used.

## Appendix B – Assumptions and Definitions

### General Model Assumptions

In this site compliance report, it is assumed that all antennas are operating at **full power at all times**. Software modeling was performed for all transmitting antennas located on the site. Sitesafe has further assumed a 100% duty cycle and maximum radiated power.

The site has been modeled with these assumptions to show the maximum RF energy density. Sitesafe believes this to be a *worst-case* analysis, based on best available data. Areas modeled to predict emissions greater than 100% of the applicable MPE level may not actually occur, but are shown as a *worst-case* prediction that could be realized real time. Sitesafe believes these areas to be safe for entry by occupationally trained personnel utilizing appropriate personal protective equipment (in most cases, a personal monitor).

Thus, at any time, if power density measurements were made, we believe the real-time measurements would indicate levels below those depicted in the RF emission diagram(s) in this report. By modeling in this way, Sitesafe has conservatively shown exclusion areas – areas that should not be entered without the use of a personal monitor, carriers reducing power, or performing real-time measurements to indicate real-time exposure levels.

### Use of Generic Antennas

For the purposes of this report, the use of “Generic” as an antenna model, or “Unknown” for an operator means the information about a carrier, their FCC license and/or antenna information was not provided and could not be obtained while on site. In the event of unknown information, Sitesafe will use our industry specific knowledge of equipment, antenna models, and transmit power to model the site. If more specific information can be obtained for the unknown measurement criteria, Sitesafe recommends remodeling of the site utilizing the more complete and accurate data. Information about similar facilities is used when the service is identified and associated with a particular antenna. If no information is available regarding the transmitting service associated with an unidentified antenna, using the antenna manufacturer's published data regarding the antenna's physical characteristics makes more conservative assumptions.

Where the frequency is unknown, Sitesafe uses the closest frequency in the antenna's range that corresponds to the highest Maximum Permissible Exposure (MPE), resulting in a conservative analysis.

## Definitions

**5% Rule** – The rules adopted by the FCC specify that, in general, at multiple transmitter sites actions necessary to bring the area into compliance with the guidelines are the shared responsibility of all licensees whose transmitters produce field strengths or power density levels at the area in question in excess of 5% of the exposure limits. In other words, any wireless operator that contributes 5% or greater of the MPE limit in an area that is identified to be greater than 100% of the MPE limit is responsible taking corrective actions to bring the site into compliance.

**Compliance** – The determination of whether a site is safe or not with regards to Human Exposure to Radio Frequency Radiation from transmitting antennas.

**Decibel (dB)** – A unit for measuring power or strength of a signal.

**Duty Cycle** – The percent of pulse duration to the pulse period of a periodic pulse train. Also, may be a measure of the temporal transmission characteristic of an intermittently transmitting RF source such as a paging antenna by dividing average transmission duration by the average period for transmission. A duty cycle of 100% corresponds to continuous operation.

**Effective (or Equivalent) Isotropic Radiated Power (EIRP)** – The product of the power supplied to the antenna and the antenna gain in a given direction relative to an isotropic antenna.

**Effective Radiated Power (ERP)** – In a given direction, the relative gain of a transmitting antenna with respect to the maximum directivity of a half wave dipole multiplied by the net power accepted by the antenna from the connecting transmitter.

**Gain (of an antenna)** – The ratio of the maximum intensity in a given direction to the maximum radiation in the same direction from an isotropic radiator. Gain is a measure of the relative efficiency of a directional antennas as compared to an omni directional antenna.

**General Population/Uncontrolled Environment** – Defined by the FCC, as an area where RFR exposure may occur to persons who are **unaware** of the potential for exposure and who have no control of their exposure. General Population is also referenced as General Public.

**Generic Antenna** – For the purposes of this report, the use of “Generic” as an antenna model means the antenna information was not provided and could not be obtained while on site. In the event of unknown information, Sitesafe will use our industry specific knowledge of antenna models to select a worst case scenario antenna to model the site.

**Isotropic Antenna** – An antenna that is completely non-directional. In other words, an antenna that radiates energy equally in all directions.

**Maximum Measurement** – This measurement represents the single largest measurement recorded when performing a spatial average measurement.

**Maximum Permissible Exposure (MPE)** – The rms and peak electric and magnetic field strength, their squares, or the plane-wave equivalent power densities associated with these fields to which a person may be exposed without harmful effect and with acceptable safety factor.

**Occupational/Controlled Environment** – Defined by the FCC, as an area where Radio Frequency Radiation (RFR) exposure may occur to persons who are **aware** of the potential for exposure as a condition of employment or specific activity and can exercise control over their exposure.

**OET Bulletin 65** – Technical guideline developed by the FCC's Office of Engineering and Technology to determine the impact of Radio Frequency radiation on Humans. The guideline was published in August 1997.

**OSHA (Occupational Safety and Health Administration)** – Under the Occupational Safety and Health Act of 1970, employers are responsible for providing a safe and healthy workplace for their employees. OSHA's role is to promote the safety and health of America's working men and women by setting and enforcing standards; providing training, outreach and education; establishing partnerships; and encouraging continual process improvement in workplace safety and health. For more information, visit [www.osha.gov](http://www.osha.gov).

**Radio Frequency Radiation** – Electromagnetic waves that are propagated from antennas through space.

**Spatial Average Measurement** – A technique used to average a minimum of ten (10) measurements taken in a ten (10) second interval from zero (0) to six (6) feet. This measurement is intended to model the average energy an average sized human body will absorb while present in an electromagnetic field of energy.

**Transmitter Power Output (TPO)** – The radio frequency output power of a transmitter's final radio frequency stage as measured at the output terminal while connected to a load.

## Appendix C – Rules & Regulations

### Explanation of Applicable Rules and Regulations

The FCC has set forth guidelines in OET Bulletin 65 for human exposure to radio frequency electromagnetic fields. Specific regulations regarding this topic are listed in Part 1, Subpart I, of Title 47 in the Code of Federal Regulations. Currently, there are two different levels of MPE - General Public MPE and Occupational MPE. An individual classified as Occupational can be defined as an individual who has received appropriate RF training and meets the conditions outlined below. General Public is defined as anyone who does not meet the conditions of being Occupational. FCC and OSHA Rules and Regulations define compliance in terms of total exposure to total RF energy, regardless of location of or proximity to the sources of energy.

It is the responsibility of all licensees to ensure these guidelines are maintained at all times. It is the ongoing responsibility of all licensees composing the site to maintain ongoing compliance with FCC rules and regulations. Individual licensees that contribute less than 5% MPE to any total area out of compliance are not responsible for corrective actions.

OSHA has adopted and enforces the FCC's exposure guidelines. A building owner or site manager can use this report as part of an overall RF Health and Safety Policy. It is important for building owners/site managers to identify areas in excess of the General Population MPE and ensure that only persons qualified as Occupational are granted access to those areas.

### Occupational Environment Explained

The FCC definition of Occupational exposure limits apply to persons who:

- are exposed to RF energy as a consequence of their employment;
- have been made aware of the possibility of exposure; and
- can exercise control over their exposure.

OSHA guidelines go further to state that persons must complete RF Safety Awareness training and must be trained in the use of appropriate personal protective equipment.

In order to consider this site an Occupational Environment, the site must be controlled to prevent access by any individuals classified as the General Public. Compliance is also maintained when any non-occupational individuals (the General Public) are prevented from accessing areas indicated as Red or Yellow in the attached RF Emissions diagram. In addition, a person must be aware of the RF environment into which they are entering. This can be accomplished by an RF Safety Awareness class, and by appropriate written documentation such as this Site Compliance Report.

All Milestone employees who require access to this site must complete RF Safety Awareness training and must be trained in the use of appropriate personal protective equipment.

## Appendix D – General Safety Recommendations

The following are *general recommendations* appropriate for any site with accessible areas in excess of 100% General Public MPE. These recommendations are not specific to this site. These are safety recommendations appropriate for typical site management, building management, and other tenant operations.

1. All individuals needing access to the main site (or the area indicated to be in excess of General Public MPE) should wear a personal RF Exposure monitor, successfully complete proper RF Safety Awareness training, and have and be trained in the use of appropriate personal protective equipment.

2. All individuals needing access to the main site should be instructed to read and obey all posted placards and signs.

3. The site should be routinely inspected and this or similar report updated with the addition of any antennas or upon any changes to the RF environment including:

- adding new antennas that may have been located on the site
- removing of any existing antennas
- changes in the radiating power or number of RF emitters

4. Post the appropriate **NOTICE**, **CAUTION**, or **WARNING** sign at the main site access point(s) and other locations as required. Note: Please refer to RF Exposure Diagrams in Section 6, to inform everyone who has access to this site that beyond posted signs there may be levels in excess of the limits prescribed by the FCC. The signs below are examples of signs meeting FCC guidelines.



5. Ensure that the site door remains locked (or appropriately controlled) to deny access to the general public if deemed as policy by the building/site owner.

6. For a General Public environment the four color levels identified in this analysis can be interpreted in the following manner:

- Areas indicated as Gray are at 5% of the General Public MPE limits or below. This level is safe for a worker to be in at any time.
- Green represents areas predicted to be between 5% and 20% of the General Public MPE limits. This level is safe for a worker to be in at any time.

- Yellow represents areas predicted to be between 20% and 100% of the General Public MPE limits. This level is safe for a worker to be in at any time.
- Red areas indicated predicted levels greater than 100% of the General Public MPE limits. This level is not safe for the General Public to be in.

7. For an Occupational environment the four color levels identified in this analysis can be interpreted in the following manner:

- Areas indicated as Gray are at 5% of the Occupational MPE limits or below. This level is safe for a worker to be in at any time.
- Green represents areas predicted to be between 5% and 20% of the Occupational MPE limits. This level is safe for a worker to be in at any time.
- Yellow represents areas predicted to be between 20% and 100% of the Occupational MPE limits. Only individuals that have been properly trained in RF Health and Safety should be allowed to work in this area. This is not an area that is suitable for the General Public to be in.
- Red areas indicated predicted levels greater than 100% of the Occupational MPE limits. This level is not safe for the Occupational worker to be in for prolonged periods of time. Special procedures must be adhered to such as lock out tag out procedures to minimize the workers exposure to EME.

8. Use of a Personal Protective Monitor: When working around antennas, Sitesafe strongly recommends the use of a Personal Protective Monitor (PPM). Wearing a PPM will properly forewarn the individual prior to entering an RF exposure area.

Keep a copy of this report available for all persons who must access the site. They should read this report and be aware of the potential hazards with regards to RF and MPE limits.

### **Additional Information**

Additional RF information is available by visiting both [www.Sitesafe.com](http://www.Sitesafe.com) and [www.fcc.gov/oet/rfsafety](http://www.fcc.gov/oet/rfsafety). OSHA has additional information available at: <http://www.osha-slc.gov/SLTC/radiofrequencyradiation>.