verizon

Radio Frequency Exposure
FCC Compliance Assessment

☒ Pre-Activation ☐ Post-Activation

SITE-SPECIFIC-INFORMATION			
Site Name	**Luna Bonita**	**Multi-Licensee Facility**	**☒ YES ☐ NO**
Street Address	**West of El Conejo Park**	**Is Verizon a Significant Contributor to Co-Locator Areas Requiring Mitigation?**	**☐ YES ☒ NO ☐ N/A**
City, State, Zip	**Laguna Hills, CA, 92653**		
Verizon's Max % MPE (Measured - Occupational)	**N/A**	**Verizon's Max % MPE (Predictive - Occupational)**	**5.6%**
Structure Type	**Utility Tower**	**Assessment Date**	**N/A**
Broadcast (AM/FM/TV) Co-Locators	**☐ YES ☒ NO**	**Assessment Purpose**	**NEW SITE**
Total Access Points	**N/A**	**Total Report Revisions**	**1**
Original Report Date	**05/05/2016**	**Report Revision Date**	**05/09/2016**
Compliance Status	**☒ COMPLIANT AS DESIGNED** **☐ COMPLIANT PER RF SAFETY PLAN SUBMISSION** **☐ MITIGATION IS REQUIRED**		

VERIZON'S WORST-CASE RF EMISSIONS IN ACCESSIBLE AREAS AT THIS FACILITY	
☒	BELOW the General Population MPE limit
☐	ABOVE the General Population MPE limit and BELOW the Occupational MPE limit
☐	ABOVE the Occupational MPE limit and BELOW 10x the Occupational MPE limit
☐	ABOVE 10x the Occupational MPE limit

Final Compliant Configuration							
	GUIDELINES	**NOTICE**	**CAUTION**	**WARNING**	**NOC INFO**	**BARRIER/MARKER**	
Access Point(s)	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐	dimensions
Alpha	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐	dimensions
Beta	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐	dimensions
Gamma	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐	dimensions

NOTE: The table above represents EVERY compliance item that MUST be implemented at this location; also in Sec. 4 (B)

Additional Compliance Requirements(s):			
N/A			
Consultant Legal Name	Telnet Inc.	**Phone/Fax**	301-840-7110
Address	7630 Standish Place, Rockville, MD 20855		

Contents

1. Introduction

Verizon Wireless has contracted with Telnet Inc., an independent Radio Frequency consulting firm, to conduct a **Radio Frequency Exposure (RFE) FCC Compliance Assessment** of the Luna Bonita cell site. The following report contains a detailed summary of the Radio Frequency environment as it relates to Federal Communications Commission (FCC) and Occupational Safety & Health Administration (OSHA) Rules and Regulations for all individuals.

The **Verizon Wireless antenna data** was provided by:

Name	Maree Hoeger
Title	Zoning Manager
Date	4/26/2016
Sub-Market	CA

This compliance assessment and report has been **prepared** and **reviewed** by:

	Preparer	**Reviewer**
Name	Huda Alasadi	Muhammad Siddiki
Title	RF Engineer	RF Engineer
Date	05/05/2016	05/09/2016

This report utilizes the following **for predictive modeling of the ambient RF environment**:
MPE Modeling Program: Roofview 4.15
Required Modeling Assumptions: 100% Duty Cycle and Maximum Total Power Output.

Additional Modeling Assumptions:

General Model Assumptions

In this 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. Telnet, Inc. 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. Telnet Inc. believes this to be a worst case analysis, based on best available data.

If at any time power density measurements were to be made, Telnet Inc. believes the real time measurements would indicate levels below those shown in this report. By modeling in this way, we have conservatively shown exclusion areas (areas not to be entered without a personal RF monitor, carriers reducing power or performing real time measurements to show 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 a wireless carrier, means that the information about the 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, Telnet 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, remodeling of the site is recommended. 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

2. Existing Site Characteristics

a. Structure

Physical Description	Tower
Single-Family Home	☐ **YES** ☒ **NO**
Latitude (NAD 83)	33°35'25.4"N
Longitude (NAD 83)	117°41'24.8"W
Total Analyzed Elevations (Roof Levels)	#1 (Ground Level)

b. Accessibility

Did the property owner or agent of the property owner (e.g. a security guard) grant you access to the rooftop?	**N/A**
If not - were you required to be escorted by Verizon personnel in order to gain access?	**N/A**
Were you required to provide any proof of identity to gain access?	**N/A**
What specific documents were required in order to gain access?	**N/A**
All access points locked at time of assessment?	**N/A**
All access points alarmed at time of assessment?	**N/A**
Were there any broken locks or inoperable alarms on any of the access points to the rooftop?	**N/A**
Were there any access issues caused by either the property owner or agent of the property owner?	**N/A**
Additional Notes: N/A	

c. Existing Verizon Observations

Existing Observations							
	GUIDELINES	NOTICE	CAUTION	WARNING	NOC INFO	BARRIER/MARKER	
Access Point(s)	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐	dimensions
Alpha	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐	dimensions
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Gamma	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐	dimensions

NOTE: The table above represents EXISTING compliance items implemented at this location.

Are Verizon signs posted on the front, back and sides of antenna arrays where possible?	N/A
Are Verizon signs visible from all areas of approach?	N/A
Are there any broken, damaged or illegible Verizon signs?	N/A
Are there any broken or damaged Verizon physical barriers?	N/A
Are there any Verizon indicative markers in need of repair or replacement?	N/A

d. Antenna Inventory

Z-height represents the distance from the nearest walking surface to the _62’_ of the antenna.	☒ **Bottom** ☐ **Centerline** ☐ **Top**
NON-Verizon Co-Locator Data	☒ **Estimates** ☐ **Actual Data**

Antenna Number	Operator	Type	TX Freq (MHz)	Input Power (Watts)	Gain (dBd)	Manufacturer	Model	Azimuth (deg.)	Aperture (ft)	Horizontal Beam width (deg.)	X (ft)	Y (ft)	Z Ground (ft)
1	Verizon	Panel	746	120	12.8	ComScore	SBNH-1D6565B	90	6	65	61	76	63
2	Verizon	Panel	2100	120	15.9	Ericsson	AIR 21	90	8	63	66	63	62
3	Verizon	Panel	1900	160	16.05	ComScore	SBNH-1D6565B	90	8	57	68	57	63
3	Verizon	Panel	850	144	13	ComScore	SBNH-1D6565B	90	6	65	68	57	63
4	Verizon	Panel	746	120	12.8	ComScore	SBNH-1D6565B	210	6	65	72	38	63
5	Verizon	Panel	2100	120	15.9	Ericsson	AIR 21	210	8	63	59	36	62
6	Verizon	Panel	1900	160	16.05	ComScore	SBNH-1D6565B	210	8	63	53	35	63
6	Verizon	Panel	850	144	13	ComScore	SBNH-1D6565B	210	6	65	53	35	63
7	Verizon	Panel	746	120	12.8	ComScore	SBNH-1D6565B	320	6	65	26	62	63
8	Verizon	Panel	2100	120	16.05	Ericsson	AIR 21	320	8	63	38	70	62
9	Verizon	Panel	1900	160	15.9	ComScore	SBNH-1D6565B	320	8	63	42	73	63
9	Verizon	Panel	850	144	13	ComScore	SBNH-1D6565B	320	6	65	42	73	63
10	Microwave	Panel	5000	0.8	32	Unknown	Unknown	320	3	65	29	71	54

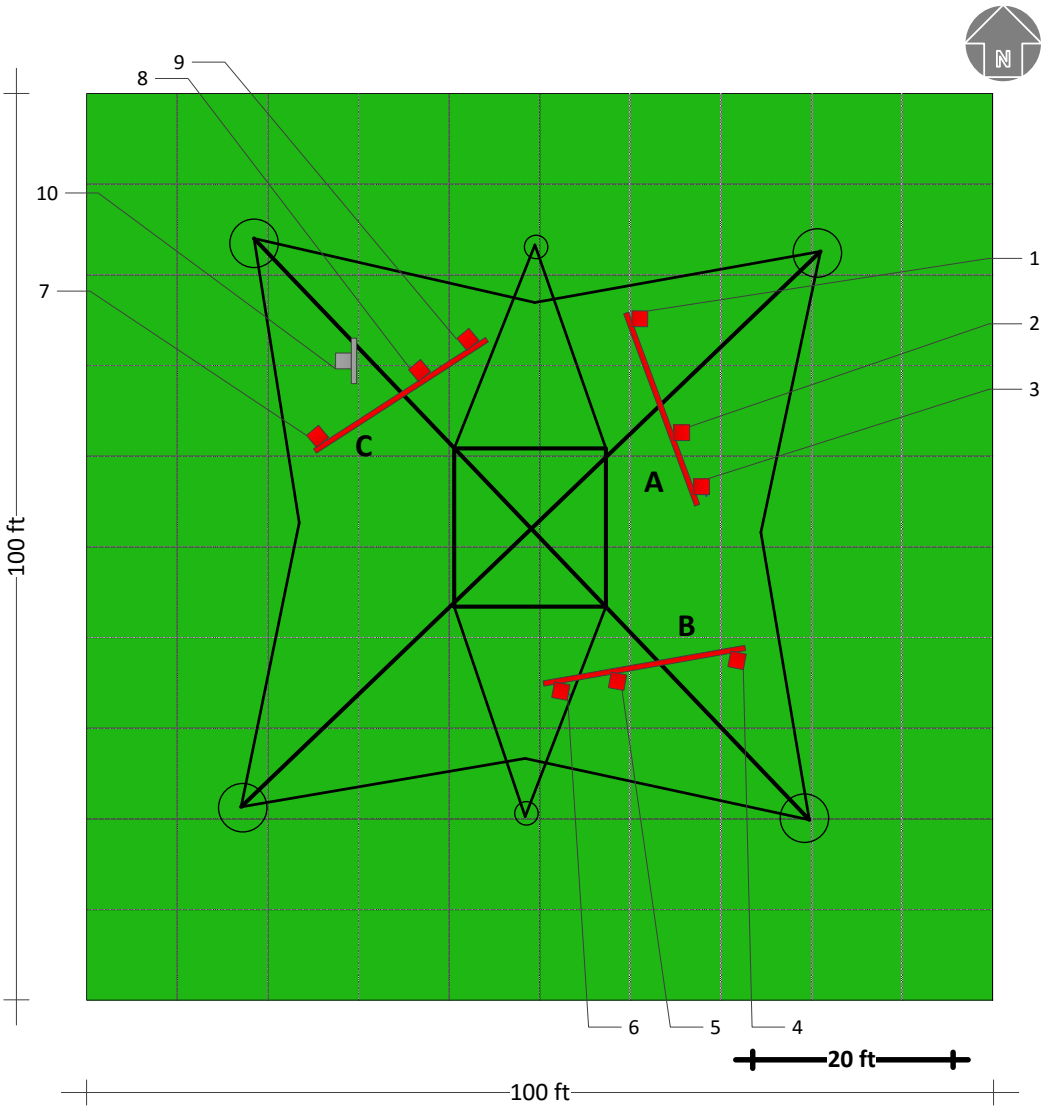
3. Analysis

Could field measurements be taken in areas with Verizon antennas?	N/A
Describe why measurements could not be taken - if applicable.	N/A
Adjacent Structure(s)	☐ **Touching** ☐ **Potential Concern** ☒ **No Concern**
If the structure is a Single-Family Residential Home, were measurements taken inside the residence?	N/A
Field Measurement Equipment	☒ **Broadband** ☐ **Narrowband**
Field Measurement Start Time	N/A
Field Measurement End Time	N/A
Location Broadband Equipment Zeroed	N/A

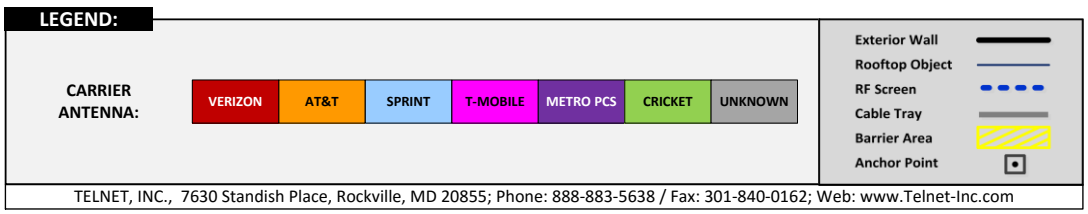
a. Predictive Model: All Transmitters

Is the area being modeled completely INACCESSIBLE to members of the general population (including untrained maintenance workers)?	**☐ YES ☒ NO**

Reference Plane: Ground level



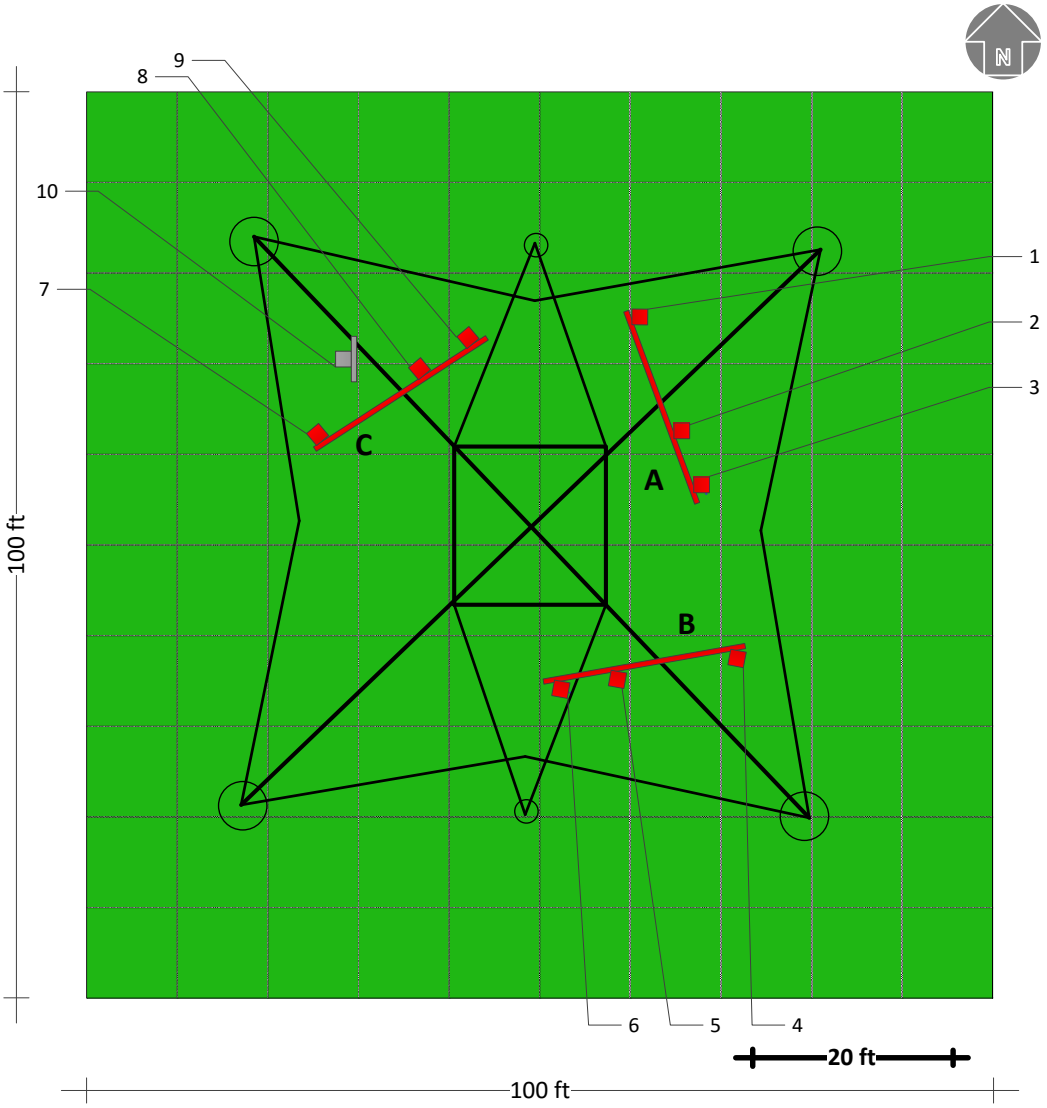
Max Simulation Level 5.6%



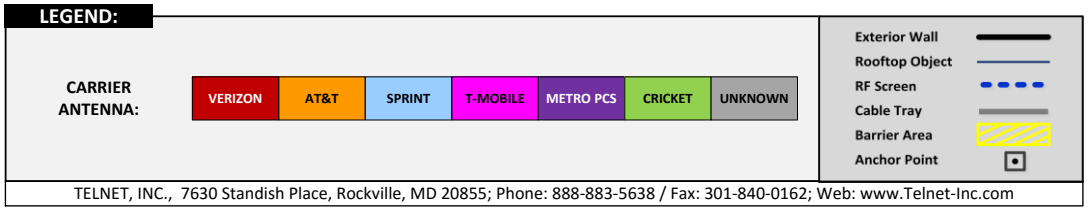
☐ **0% - 20% Occ. MPE** ☐ **20% - 100% Occ. MPE** ☐ **≥ 100% Occ. MPE** ☐ **≥ 1000% Occ. MPE**

b. Predictive Model: Verizon Transmitters

Reference Plane: Ground level



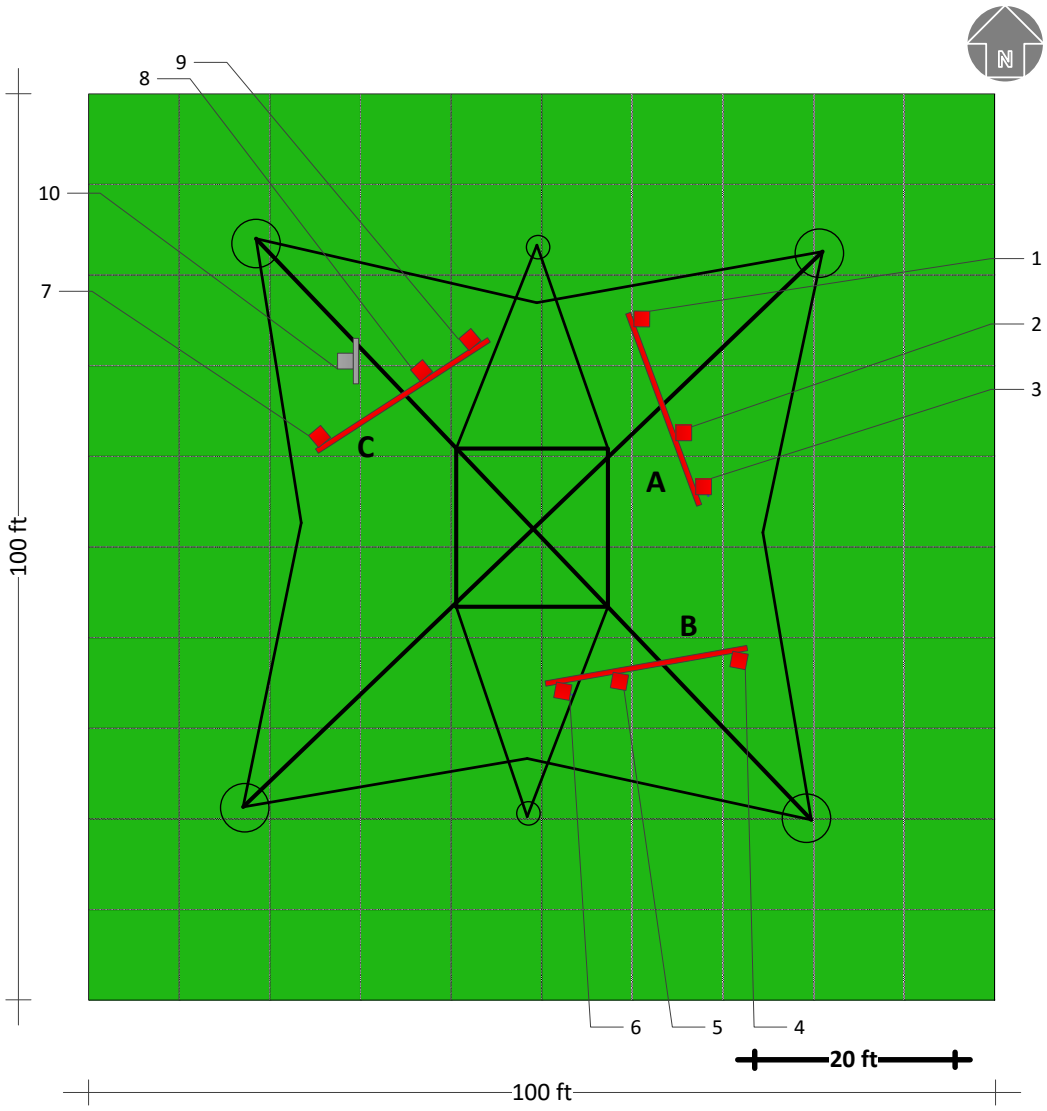
Max Verizon Simulation Level 5.6%



☐ 0% - 20% Occ. MPE ☐ 20% - 100% Occ. MPE ☐ ≥ 100% Occ. MPE ☐ ≥ 1000% Occ. MPE

c. Predictive Model: Significant Contribution of Verizon

Reference Plane: Ground level



Max Verizon Simulation Level 5.6%

LEGEND:

CARRIER ANTENNA: VERIZON | AT&T | SPRINT | T-MOBILE | METRO PCS | CRICKET | UNKNOWN

Exterior Wall
Rooftop Object
RF Screen
Cable Tray
Barrier Area
Anchor Point

TELNET, INC., 7630 Standish Place, Rockville, MD 20855; Phone: 888-883-5638 / Fax: 301-840-0162; Web: www.Telnet-Inc.com

0% - 1% Occ. MPE **≥ 1% Occ. MPE**

4. Conclusion
a. Conclusion Narrative

Description of MPE-Limit Exceeding Areas (Ground Level):

VZW Alpha sector is not exceeding 20 % Occupational limits
VZW Beta sector is not exceeding 20 % Occupational limits
VZW Gamma sector is not exceeding 20 % Occupational limits

Verizon Significant Contribution Areas (Ground Level):

VZW Alpha sector is exceeding 1% Occupational limit
VZW Beta sector is exceeding 1% Occupational limit
VZW Gamma sector is exceeding 1% Occupational limit

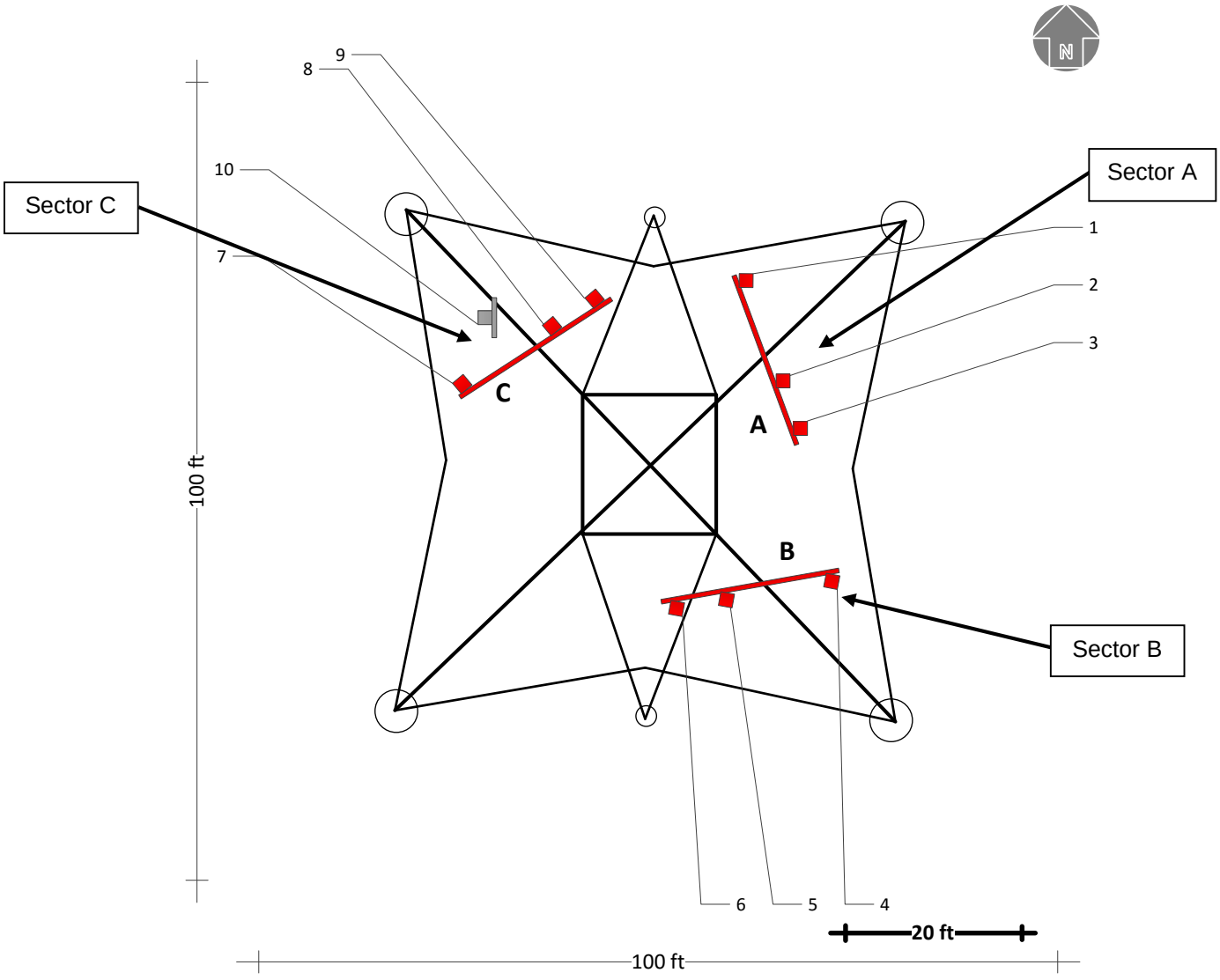
Co-locator Significant Contribution Areas (Ground Level):

Microwave #10 is not exceeding 1% Occupational limit

Potentially Non-Compliant Co-Locator Areas: Verizon Responsibility
The following table represents potentially non-compliant co-locators for which Verizon is a 5% General Population MPE (1% Occupational MPE) contributor.

AT&T	T-Mobile	Sprint	US Cellular	Unknown	Microwave
☐	☐	☐	☐	☐	☐

b. Signage/Barrier Diagram



LEGEND:

CARRIER ANTENNA: VERIZON | AT&T | SPRINT | T-MOBILE | METRO PCS | CRICKET | UNKNOWN

Exterior Wall
Rooftop Object
RF Screen
Cable Tray
Barrier Area
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Final Compliant Configuration							
	GUIDELINES	**NOTICE**	**CAUTION**	**WARNING**	**NOC INFO**	**BARRIER/MARKER**	
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Gamma	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐	dimensions

NOTE: The table above represents EVERY compliance item that MUST be implemented at this location.

c. Signage/Barrier Installation Detail

Mitigation Actions Required/Taken												
	GUIDELINES		**NOTICE**		**CAUTION**		**WARNING**		**NOC INFO**		**BARRIER/MARKER**	
Access Point(s)	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐	dimensions
Alpha	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐	dimensions
Beta	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐	dimensions
Gamma	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐	dimensions
	ADD	**REM**	**ADD**	**REM**	**ADD**	**REM**	**ADD**	**REM**	**ADD**	**REM**	**ADD ONLY**	

NOTE: The table represents either the signage/barriers installed / removed OR items required by the market (if mitigation is not installed by consultant/vendor).

5. Appendix C: RF Consultant Certifications

a. Preparer Certification

I, Huda Alasadi, the preparer of this report, am fully aware of and familiar with the Rules and Regulations of both the Federal Communications Commissions (FCC) and the Occupational Safety and Health Administration (OSHA) with regard to Human Exposure to Radio Frequency Radiation. I am also fully aware of and familiar with the Verizon Wireless Signage & Demarcation Policy. I have reviewed this Radio Frequency Exposure Assessment report and believe it to be both true and accurate to the best of my knowledge.

Huda Alasadi

b. Reviewer Certification

I, Muhammad Siddiki, the reviewer and approved of this report, am fully aware of and familiar with the Rules and Regulations of both the Federal Communications Commissions (FCC) and the Occupational Safety and Health Administration (OSHA) with regard to Human Exposure to Radio Frequency Radiation. I am also fully aware of and familiar with the Verizon Wireless Signage & Demarcation Policy. I have reviewed this Radio Frequency Exposure Assessment report and believe it to be both true and accurate to the best of my knowledge.

Muhammad Siddiki

6. Appendix D: Reference Information

a. FCC Rules & Regulations

The Federal Communications Commission (FCC) has established safety guidelines relating to RF exposure from cell sites. The FCC developed those standards, known as Maximum Permissible Exposure (MPE) limits, in consultation with numerous other federal agencies, including the Environmental Protection Agency, the Food and Drug Administration, and the Occupational Safety and Health Administration. The standards were developed by expert scientists and engineers after extensive reviews of the scientific literature related to RF biological effects. The FCC explains that its standards "incorporate prudent margins of safety." The following represents explanations of the most applicable information:

Two Classifications for Exposure Limits

Occupational – Applies to situations in which persons are "exposed as a consequence of their *employment*" and are "*fully aware* of the potential for exposure and can *exercise control* over their exposure".	General Population – Applies to situations in which persons are "exposed as a consequence of their employment *may not be made fully aware* of the potential for exposure or *cannot exercise control* over their exposure". Generally speaking, those without significant and documented RF Safety & Awareness training would be in the General Population classification.

Environment Classification

Controlled – Applies to environments that are restricted or "controlled" in order to prevent access from members of the General Population classification.	Uncontrolled – Applies to environments that are unrestricted or "uncontrolled" that allow access from members of the General Population classification.

Limits for Occupational/Controlled Exposure		
Frequency Range (MHz)	**Power Density (S) (mW/cm^2)**	**Averaging Time $\|E\|^2$, $\|H\|^2$, or S (minutes)**
300-1500	f/300	6
1500-100,000	5	6
Limits for General Population/Uncontrolled Exposure		
Frequency Range (MHz)	**Power Density (S) (mW/cm^2)**	**Averaging Time $\|E\|^2$, $\|H\|^2$, or S (minutes)**
300-1500	f/1500	30
1500-100,000	1	30
f = frequency in MHz		

Significant Contribution to the RF Environment

Any carrier contributing an aggregate MPE percentage of 5 or more (to the applicable RF Environment Classification) is defined as a significant contributor. This means that if any area is determined to be out of compliance with FCC rules, all significant contributors are jointly responsible for correcting any deficiencies.

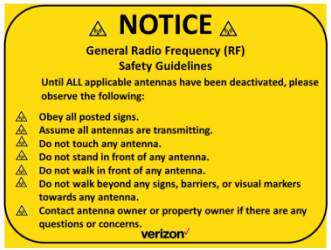
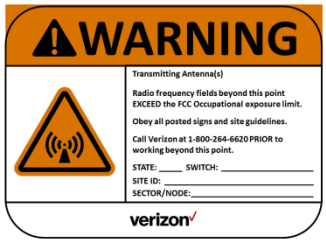
b. Occupational Safety and Health Administration (OSHA) Requirements

A formal adopter of FCC Standards, OSHA stipulates that those in the Occupational classification must complete training in the following: RF Safety, RF Awareness, and Utilization of Personal Protective Equipment. OSHA also provides options for Hazard Prevention and Control:

Hazard Prevention	Control
• Utilization of good equipment • Enact control of hazard areas • Limit exposures • Employ medical surveillance and accident response	• Employ Lockout/Tag out • Utilize personal alarms & protective clothing • Prevent access to hazardous locations • Develop or operate an administrative control program

c. RF Signage

Areas or portions of any transmitter site may be susceptible to high power densities that could cause personnel exposures in excess of the FCC guidelines. These areas must be demarcated by conspicuously posted signage that identifies the potential exposure. Signage MUST be viewable regardless of the viewer's position.

GUIDELINES	NOTICE	CAUTION	WARNING
This sign will inform anyone of the basic precautions to follow when entering an area with transmitting radiofrequency equipment.	This sign indicates that RF emissions may exceed the FCC General Population MPE limit.	This sign indicates that RF emissions may exceed the FCC Occupational MPE limit.	This sign indicates that RF emissions may exceed at least 10x the FCC Occupational MPE limit.
			

NOC INFORMATION	
Information signs are used as a means to provide contact information for any questions or concerns. They will include specific cell site identification information and the Verizon Wireless Network Operations Center phone number.	

d. Physical Barriers

Physical barriers are control measures that require awareness and participation of personnel. Physical barriers are employed as an additional administration control to complement RF signage and physically demarcate an area in which RF exposure levels may exceed the FCC General Population limit. **Example**: chain-connected stanchions

e. Indicative Markers

Indicative markers are visible control measures that require awareness and participation of personnel, as they cannot physically prevent someone from entering an area of potential concern. Indicative markers are employed as an additional administration control to complement RF signage and visually demarcate an area in which RF exposure levels may exceed the FCC General Population limit. **Example**: paint stripes