



**HAMMETT & EDISON, INC.**  
CONSULTING ENGINEERS  
BROADCAST & WIRELESS

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## REPORT TRANSMITTAL

August 21, 2019

To: Maria MacGunigal MMACGUNIGAL@CITYOFSACRAMENTO.ORG

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Project ID: City of Sacramento Small Cells

### Description of attachment:

- RF Exposure Study
- Interference Study (IMD)
- Acoustic Noise Study
- Revised Study
  - RF Exposure
  - Interference Study (IMD)
  - Acoustic Noise Study
- Revised Regulatory Compliance Report (28 sites)
  - RF Exposure Measurements
  - Acoustic Noise Measurements
- Protection Study (of Nearby AM Stations)

We appreciate the opportunity to be of service and would welcome any questions on this material. Please let us know if we may be of additional assistance.

Hammett & Edison, Inc.

**– City of Sacramento –  
Radio Frequency Compliance Measurements  
Verizon Wireless Small Cells on Light Poles**

**Statement of Hammett & Edison, Inc., Consulting Engineers**

The firm of Hammett & Edison, Inc., Consulting Engineers, has been retained by the City of Sacramento to evaluate certain of the small cell base stations located in Sacramento, California, for compliance with appropriate guidelines limiting human exposure to radio frequency (“RF”) electromagnetic fields.

**Executive Summary**

Verizon Wireless has installed small cell base stations on municipal light poles at numerous locations in Sacramento. RF exposure levels under the existing conditions for anyone in publicly accessible areas near twenty-eight of these small cells were well below the federal standard.

**Prevailing Exposure Standards**

The U.S. Congress requires that the Federal Communications Commission (“FCC”) evaluate its actions for possible significant impact on the environment. A summary of the FCC’s exposure limits is shown in Figure 1. These limits apply for continuous exposures and are intended to provide a prudent margin of safety for all persons, regardless of age, gender, size, or health. The most restrictive limit for exposures of unlimited duration at wireless service bands available to Verizon are as follows:

Wireless Service Band	Transmit Frequency	“Uncontrolled” Public Limit	Occupational Limit (5 times Public)
Microwave (point-to-point)	1–80 GHz	1.0 mW/cm <sup>2</sup>	5.0 mW/cm <sup>2</sup>
Millimeter-wave	24–47	1.0	5.0
Part 15 (WiFi & other unlicensed)	2–6	1.0	5.0
BRS (Broadband Radio)	2,490 MHz	1.0	5.0
WCS (Wireless Communication)	2,305	1.0	5.0
AWS (Advanced Wireless)	2,110	1.0	5.0
PCS (Personal Communication)	1,930	1.0	5.0
Cellular	869	0.58	2.9
SMR (Specialized Mobile Radio)	854	0.57	2.85
700 MHz	716	0.48	2.4
[most restrictive frequency range]	30–300	0.20	1.0

**General Facility Requirements**

Small cells typically consist of two distinct parts: the electronic transceivers (also called “radios” or “channels”) that are connected to the traditional wired telephone lines, and the passive antennas that send the wireless signals created by the radios out to be received by individual subscriber units. The radios are typically mounted on the support pole or placed in a cabinet at ground level, and they are



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connected to the antennas by coaxial cables. Because of the short wavelength of the frequencies assigned by the FCC for wireless services, the antennas require line-of-sight paths for their signals to propagate well and so are installed at some height above ground. The antennas are designed to concentrate their energy toward the horizon, with very little energy wasted toward the sky or the ground. This means that it is generally not possible for exposure conditions to approach the maximum permissible exposure limits without being physically very near the antennas.

**Site Description**

Verizon had installed antennas high on municipal light poles in public rights-of-way at twenty-eight locations within the City of Sacramento, as listed in Figure 2. The sites were visited by Mr. Scott Walthard, a qualified field technician employed by Hammett & Edison, Inc., on August 5, 6, and 8, 2019. At twenty of the sites, the antenna was a Samsung Model SFG-AA100AC, mounted just below the light-arm; these are designed to operate in the “5G” millimeter-wave band. At the other eight sites, the antenna was a cylindrical, 2-foot model, mounted on top of the pole; the shroud covering the base of the antenna did not allow identification of the model(s), but these antennas cannot accommodate millimeter-wave frequencies. There were observed no other wireless telecommunications base stations located at any of these sites.

**Measurement Methodology and Technique**

The measurement equipment used was a Wandel & Goltermann Type EMR-300 Radiation Meter with Type 18 and 25 Isotropic Electric Field Probes (Serial Nos. C-0010 and E-0001, respectively). The meter and probes were under current calibration by the manufacturer. Power density measurements at each site were taken using a bucket-truck and the Type 25 probe at the antenna and at the street light fixture, and measurements were also made for a person at ground nearby, using the Type 25 probe for the “millimeter-wave” sites, due to its higher frequency range (up to 40 GHz) and the Type 18 probe for the other sites due to its better sensitivity. For the measurements at the antenna, the maximum distance to the FCC public and occupational limits was obtained by locating the direction(s) of maximum emission and then moving the probe outward from the antenna to determine the extent of the occupational and public limits. The measurements at ground level were performed in accessible areas around the poles with the probe at heights up to 2 meters above ground. If possible, measurements at ground were made in areas and directions where, based on the bucket-truck measurements at the antenna, higher levels would likely occur. Conservatively, all reported measurements are spatial-peaks, that is, they are the maximum values observed and have not been spatially-averaged.



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**Measurement Results**

Separate one-page exhibits accompany this report, summarizing the measurements at each site; one of the small cells (see Exhibit REV18-0435) appeared not to be in service.

- For the twenty sites with the Samsung antennas, measured exposure conditions did not exceed the FCC occupational limit. Measured levels did not exceed the FCC public limit beyond 6 inches from the antenna. Levels at the light fixtures were all less than 1.5% of the public limit (that is, below the sensitivity of the meter), and the maximum power density level observed for a person at ground near any of these twenty sites was also less than 1.5% of the applicable public limit.
- For the eight sites with cylindrical antennas, exposure levels were less than the applicable occupational limit beyond 1 foot from the antenna, and levels were less than the public limit beyond 4 feet from the antenna. The highest measured level at a street light fixture was 23% of the public limit, and the highest measured level for a person at ground near the site was 0.60% of the public limit. Explanatory signs\* were observed on the pole below the antenna at each of these sites.

**Recommended Compliance Measures**

Due to their mounting locations and height, the antennas at these twenty-eight sites were not accessible to unauthorized persons, and so no measures are necessary to comply with the FCC public exposure guidelines.

- For the eight sites with a cylindrical antenna, in addition to the signage already in place, it is recommended that appropriate RF safety training be provided to all workers who have access the antenna. No access within 1 foot, such as might occur during certain maintenance activities directly at the antenna, should be allowed while it is in operation, unless other measures can be demonstrated to ensure that occupational protection requirements are met.
- The other twenty sites, with a Samsung antenna, can be considered intrinsically compliant with FCC exposure guidelines, and so no compliance measures are required.

**Conclusion**

Based on the information and analysis above, it is the undersigned's professional opinion that these twenty-eight Verizon Wireless small cells in Sacramento, California, as installed and operating at the time of the visits, comply with the FCC guidelines limiting public exposure to radio frequency energy and, therefore, do not for this reason cause a significant impact on the environment. The highest measured level in publicly accessible areas was much less than the prevailing standards allow for

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\* Signs complied with OET-65 color and symbol recommendations.



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exposures of unlimited duration. Training of authorized workers is recommended at some of the sites to ensure compliance with the FCC occupational exposure guidelines.

**Authorship**

This Compliance Certification has been prepared by the undersigned qualified Professional Engineer, holding California Registration Nos. E-13026 and M-20676, which expire on June 30, 2021. This work has been carried out under his direction, and all statements are true and correct of his own knowledge except, where noted, when data has been supplied by others, which data he believes to be correct.



*William F. Hammett*

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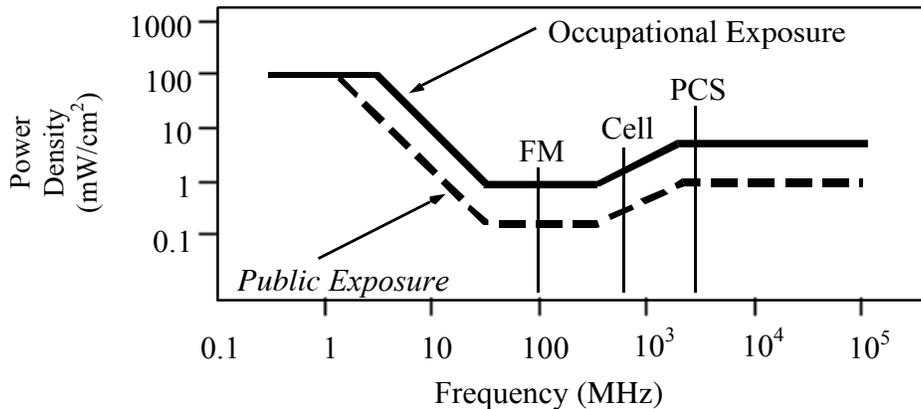
August 21, 2019

## FCC Radio Frequency Protection Guide

The U.S. Congress required (1996 Telecom Act) the Federal Communications Commission (“FCC”) to adopt a nationwide human exposure standard to ensure that its licensees do not, cumulatively, have a significant impact on the environment. The FCC adopted the limits from Report No. 86, “Biological Effects and Exposure Criteria for Radiofrequency Electromagnetic Fields,” published in 1986 by the Congressionally chartered National Council on Radiation Protection and Measurements (“NCRP”). Separate limits apply for occupational and public exposure conditions, with the latter limits generally five times more restrictive. The more recent standard, developed by the Institute of Electrical and Electronics Engineers and approved as American National Standard ANSI/IEEE C95.1-2006, “Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz,” includes similar limits. These limits apply for continuous exposures from all sources and are intended to provide a prudent margin of safety for all persons, regardless of age, gender, size, or health.

As shown in the table and chart below, separate limits apply for occupational and public exposure conditions, with the latter limits (in *italics* and/or dashed) up to five times more restrictive:

Frequency Applicable Range (MHz)	Electromagnetic Fields (f is frequency of emission in MHz)					
	Electric Field Strength (V/m)		Magnetic Field Strength (A/m)		Equivalent Far-Field Power Density (mW/cm <sup>2</sup> )	
0.3 – 1.34	614	<i>614</i>	1.63	<i>1.63</i>	100	<i>100</i>
1.34 – 3.0	614	<i>823.8/f</i>	1.63	<i>2.19/f</i>	100	<i>180/f<sup>2</sup></i>
3.0 – 30	1842/f	<i>823.8/f</i>	4.89/f	<i>2.19/f</i>	900/f <sup>2</sup>	<i>180/f<sup>2</sup></i>
30 – 300	61.4	<i>27.5</i>	0.163	<i>0.0729</i>	1.0	<i>0.2</i>
300 – 1,500	3.54√f	<i>1.59√f</i>	√f/106	<i>√f/238</i>	f/300	<i>f/1500</i>
1,500 – 100,000	137	<i>61.4</i>	0.364	<i>0.163</i>	5.0	<i>1.0</i>



Higher levels are allowed for short periods of time, such that total exposure levels averaged over six or thirty minutes, for occupational or public settings, respectively, do not exceed the limits, and higher levels also are allowed for exposures to small areas, such that the spatially averaged levels do not exceed the limits. However, neither of these allowances is incorporated in the conservative calculation formulas in the FCC Office of Engineering and Technology Bulletin No. 65 (August 1997) for projecting field levels. Hammett & Edison has built those formulas into a proprietary program that calculates, at each location on an arbitrary rectangular grid, the total expected power density from any number of individual radio sources. The program allows for the description of buildings and uneven terrain, if required to obtain more accurate projections.



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**Small Cell Site List**

<u>Permit Number</u>	<u>Verizon Small Cell #</u>	<u>Approximate Site Address</u>
REV18-0045	483703 “Pocket_5G292”	7701 Rush River Drive
REV18-0047	483690 “Pocket_5G303”	8018 Linda Isle Lane
REV18-0065	485569 “Pocket_5G029”	784 Clipper Way
REV18-0067	483568 “Pocket_5G192”	7537 Windbridge Drive
REV18-0068	483695 “Pocket_5G301”	7715 Pocket Road
REV18-0070	483699 “Pocket_5G194”	1070 Lake Front Drive
REV18-0083	483689 “Pocket_5G341”	7704 Silva Ranch Way
REV18-0084	483787 “Pocket_5G119”	7790 Elena Marie Drive
REV18-0085	483693 “Pocket_5G197”	11 Walnut Bay Court
REV18-0088	483700 “Pocket_5G180”	7548 Greenhaven Drive
REV18-0118	484746 “Pocket_5G020”	11 Capri Court
REV18-0123	483694 “Pocket_5G178”	8081 Lido Isle Lane
REV18-0125	485573 “Pocket_5G030”	6162 Riverside Boulevard
REV18-0148	483723 “Pocket_5G299”	880 Florin Road
REV18-0164	483729 “Pocket_5G285”	6633 Gloria Drive
REV18-0171	483698 “Pocket_5G302”	7653 Windbridge Drive
REV18-0197	483716 “Pocket_5G343”	7300 Greenhaven Drive
REV18-0223	483719 “Pocket_5G298”	7236 Greenhaven Drive
REV18-0276	483696 “Pocket_5G283”	7760 Roberts River Way
REV18-0323	483727 “Pocket_5G288”	660 Florin Road
REV18-0423	437805 “South Sacramento 007”	8 Genoa Court
REV18-0431	437800 “South Sacramento 002”	6058 Riverside Boulevard
REV18-0435*	437802 “South Sacramento 004”	23 Ridgemark Court
REV18-0439	437804 “South Sacramento 006”	7986 Pocket Road
REV18-0527	437803 “South Sacramento 005”	7597 Pocket Road
REV18-0530	437810 “South Sacramento 012”	7410 Greenhaven Road
REV18-0532	437799 “South Sacramento 001”	960 Florin Road
REV18-0616	471437 “South Sacramento 041”	7707 Rush River Drive

\* This site appears to be inactive.



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<b>Carrier ID</b> 483703 “Pocket_5G292”	<b>City Permit</b> REV18-0045
<b>Approximate Site Address</b> 7701 Rush River Drive	

**Carrier** Verizon Wireless

**Visit Date** August 5, 2019      **Visit Time** 3:40 pm

**Field Technician** Mr. Scott Walthard, a qualified employee of Hammett & Edison, Inc.

**Meter** Wandel & Goltermann Type EMR-300 Radiation Meter with  
Type 25 Isotropic Electric Field Probe (Serial No. E-0001)  
Calibration current, next due May 8, 2021

**Antenna Location** below light arm

**Measurement Results**

<u>Distance to Occupational Limit</u>	<u>Distance to Public Limit</u>	<u>Exposure Level at Light Fixture</u>	<u>Maximum Exposure at Ground Level</u>
limit never reached	less than 3 inches	below 1.5% Public	below 1.5% Public

**Conclusion** Based upon the information and analysis above, it is the undersigned’s professional opinion that this wireless telecommunications facility, as installed and operating at the time of the measurements, complies with the FCC guidelines limiting public exposure to radio frequency energy and, therefore, does not for this reason cause a significant impact on the environment

**Authorship** This Compliance Certification has been prepared by the undersigned Professional Engineer, holding California Registration Nos. E-13026 and M-20676, which expire on June 30, 2021. This work has been carried out under his direction, and all statements are true and correct of his own knowledge except, where noted, when data has been supplied by others, which data he believes to be correct.



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August 21, 2019



**– City of Sacramento –  
Radio Frequency Compliance Measurements**

**Carrier ID** 483690 “Pocket\_5G303”

**City Permit** REV18-0047

**Approximate Site Address** 8018 Linda Isle Lane

**Carrier** Verizon Wireless

**Visit Date** August 5, 2019

**Visit Time** 10:30 am

**Field Technician** Mr. Scott Walthard, a qualified employee of Hammett & Edison, Inc.

**Meter** Wandel & Goltermann Type EMR-300 Radiation Meter with  
Type 25 Isotropic Electric Field Probe (Serial No. E-0001)  
Calibration current, next due May 8, 2021

**Antenna Location** below light arm

**Measurement Results**

<u>Distance to Occupational Limit</u>	<u>Distance to Public Limit</u>	<u>Exposure Level at Light Fixture</u>	<u>Maximum Exposure at Ground Level</u>
limit never reached	less than 4 inches	below 1.5% Public	below 1.5% Public

**Conclusion** Based upon the information and analysis above, it is the undersigned’s professional opinion that this wireless telecommunications facility, as installed and operating at the time of the measurements, complies with the FCC guidelines limiting public exposure to radio frequency energy and, therefore, does not for this reason cause a significant impact on the environment

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**– City of Sacramento –  
Radio Frequency Compliance Measurements**

**Carrier ID** 485569 “Pocket\_5G029”  
**Approximate Site Address** 784 Clipper Way

**City Permit** REV18-0065

**Carrier** Verizon Wireless

**Visit Date** August 6, 2019      **Visit Time** 1:15 pm

**Field Technician** Mr. Scott Walthard, a qualified employee of Hammett & Edison, Inc.

**Meter** Wandel & Goltermann Type EMR-300 Radiation Meter with  
Type 25 Isotropic Electric Field Probe (Serial No. E-0001)  
Calibration current, next due May 8, 2021

**Antenna Location** below light arm

**Measurement Results**

Distance to Occupational Limit	Distance to Public Limit	Exposure Level at Light Fixture	Maximum Exposure at Ground Level
limit never reached	less than 4 inches	below 1.5% Public	below 1.5% Public

**Conclusion** Based upon the information and analysis above, it is the undersigned’s professional opinion that this wireless telecommunications facility, as installed and operating at the time of the measurements, complies with the FCC guidelines limiting public exposure to radio frequency energy and, therefore, does not for this reason cause a significant impact on the environment

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**– City of Sacramento –  
Radio Frequency Compliance Measurements**

<b>Carrier ID</b> 483568 “Pocket_5G192”	<b>City Permit</b> REV18-0067
<b>Approximate Site Address</b> 7537 Windbridge Drive	

**Carrier** Verizon Wireless

**Visit Date** August 5, 2019      **Visit Time** 3:15 pm

**Field Technician** Mr. Scott Walthard, a qualified employee of Hammett & Edison, Inc.

**Meter** Wandel & Goltermann Type EMR-300 Radiation Meter with  
Type 25 Isotropic Electric Field Probe (Serial No. E-0001)  
Calibration current, next due May 8, 2021

**Antenna Location** below light arm

**Measurement Results**

Distance to Occupational Limit	Distance to Public Limit	Exposure Level at Light Fixture	Maximum Exposure at Ground Level
limit never reached	less than 3 inches	not measured	below 1.5% Public

**Conclusion** Based upon the information and analysis above, it is the undersigned’s professional opinion that this wireless telecommunications facility, as installed and operating at the time of the measurements, complies with the FCC guidelines limiting public exposure to radio frequency energy and, therefore, does not for this reason cause a significant impact on the environment

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<b>Carrier ID</b> 483695 “Pocket_5G301”	<b>City Permit</b> REV18-0068
<b>Approximate Site Address</b> 7715 Pocket Road	

**Carrier** Verizon Wireless

**Visit Date** August 5, 2019      **Visit Time** 11:30 am

**Field Technician** Mr. Scott Walthard, a qualified employee of Hammett & Edison, Inc.

**Meter** Wandel & Goltermann Type EMR-300 Radiation Meter with  
Type 25 Isotropic Electric Field Probe (Serial No. E-0001)  
Calibration current, next due May 8, 2021

**Antenna Location** below light arm

**Measurement Results**

<u>Distance to Occupational Limit</u>	<u>Distance to Public Limit</u>	<u>Exposure Level at Light Fixture</u>	<u>Maximum Exposure at Ground Level</u>
limit never reached	less than 4 inches	below 1.5% Public	below 1.5% Public

**Conclusion** Based upon the information and analysis above, it is the undersigned’s professional opinion that this wireless telecommunications facility, as installed and operating at the time of the measurements, complies with the FCC guidelines limiting public exposure to radio frequency energy and, therefore, does not for this reason cause a significant impact on the environment

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**– City of Sacramento –  
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<b>Carrier ID</b> 483699 “Pocket_5G194”	<b>City Permit</b> REV18-0070
<b>Approximate Site Address</b> 1070 Lake Front Drive	

**Carrier** Verizon Wireless

**Visit Date** August 5, 2019      **Visit Time** 4:20 pm

**Field Technician** Mr. Scott Walthard, a qualified employee of Hammett & Edison, Inc.

**Meter** Wandel & Goltermann Type EMR-300 Radiation Meter with  
Type 25 Isotropic Electric Field Probe (Serial No. E-0001)  
Calibration current, next due May 8, 2021

**Antenna Location** below light arm

**Measurement Results**

<u>Distance to Occupational Limit</u>	<u>Distance to Public Limit</u>	<u>Exposure Level at Light Fixture</u>	<u>Maximum Exposure at Ground Level</u>
limit never reached	less than 3 inches	below 1.5% Public	below 1.5% Public

**Conclusion** Based upon the information and analysis above, it is the undersigned’s professional opinion that this wireless telecommunications facility, as installed and operating at the time of the measurements, complies with the FCC guidelines limiting public exposure to radio frequency energy and, therefore, does not for this reason cause a significant impact on the environment

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**– City of Sacramento –  
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**Carrier ID** 483689 “Pocket\_5G341”

**City Permit** REV18-0083

**Approximate Site Address** 7704 Silva Ranch Way on Pocket Road

**Carrier** Verizon Wireless

**Visit Date** August 5, 2019

**Visit Time** 9:50 am

**Field Technician** Mr. Scott Walthard, a qualified employee of Hammett & Edison, Inc.

**Meter** Wandel & Goltermann Type EMR-300 Radiation Meter with  
Type 25 Isotropic Electric Field Probe (Serial No. E-0001)  
Calibration current, next due May 8, 2021

**Antenna Location** below light arm

**Measurement Results**

<u>Distance to Occupational Limit</u>	<u>Distance to Public Limit</u>	<u>Exposure Level at Light Fixture</u>	<u>Maximum Exposure at Ground Level</u>
limit never reached	less than 4 inches	below 1.5% Public	below 1.5% Public

**Conclusion** Based upon the information and analysis above, it is the undersigned’s professional opinion that this wireless telecommunications facility, as installed and operating at the time of the measurements, complies with the FCC guidelines limiting public exposure to radio frequency energy and, therefore, does not for this reason cause a significant impact on the environment

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**Carrier ID** 483787 “Pocket\_5G119”

**City Permit** REV18-0084

**Approximate Site Address** 7790 Elena Marie Drive

**Carrier** Verizon Wireless

**Visit Date** August 5, 2019

**Visit Time** 1:45 pm

**Field Technician** Mr. Scott Walthard, a qualified employee of Hammett & Edison, Inc.

**Meter** Wandel & Goltermann Type EMR-300 Radiation Meter with  
Type 25 Isotropic Electric Field Probe (Serial No. E-0001)  
Calibration current, next due May 8, 2021

**Antenna Location** below light arm

**Measurement Results**

<u>Distance to Occupational Limit</u>	<u>Distance to Public Limit</u>	<u>Exposure Level at Light Fixture</u>	<u>Maximum Exposure at Ground Level</u>
limit never reached	less than 6 inches	below 1.5% Public	below 1.5% Public

**Conclusion** Based upon the information and analysis above, it is the undersigned’s professional opinion that this wireless telecommunications facility, as installed and operating at the time of the measurements, complies with the FCC guidelines limiting public exposure to radio frequency energy and, therefore, does not for this reason cause a significant impact on the environment

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**– City of Sacramento –  
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<b>Carrier ID</b> 483693 “Pocket_5G197”	<b>City Permit</b> REV18-0085
<b>Approximate Site Address</b> 11 Walnut Bay Court	

**Carrier** Verizon Wireless

**Visit Date** August 5, 2019      **Visit Time** 11:00 am

**Field Technician** Mr. Scott Walthard, a qualified employee of Hammett & Edison, Inc.

**Meter** Wandel & Goltermann Type EMR-300 Radiation Meter with  
Type 25 Isotropic Electric Field Probe (Serial No. E-0001)  
Calibration current, next due May 8, 2021

**Antenna Location** below light arm

**Measurement Results**

<u>Distance to Occupational Limit</u>	<u>Distance to Public Limit</u>	<u>Exposure Level at Light Fixture</u>	<u>Maximum Exposure at Ground Level</u>
limit never reached	less than 4 inches	below 1.5% Public	below 1.5% Public

**Conclusion** Based upon the information and analysis above, it is the undersigned’s professional opinion that this wireless telecommunications facility, as installed and operating at the time of the measurements, complies with the FCC guidelines limiting public exposure to radio frequency energy and, therefore, does not for this reason cause a significant impact on the environment

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August 21, 2019



**– City of Sacramento –  
Radio Frequency Compliance Measurements**

<b>Carrier ID</b> 483700 “Pocket_5G180”	<b>City Permit</b> REV18-0088
<b>Approximate Site Address</b> 7548 Greenhaven Drive	

**Carrier** Verizon Wireless

**Visit Date** August 5, 2019      **Visit Time** 4:50 pm

**Field Technician** Mr. Scott Walthard, a qualified employee of Hammett & Edison, Inc.

**Meter** Wandel & Goltermann Type EMR-300 Radiation Meter with  
Type 25 Isotropic Electric Field Probe (Serial No. E-0001)  
Calibration current, next due May 8, 2021

**Antenna Location** below light arm

**Measurement Results**

<u>Distance to Occupational Limit</u>	<u>Distance to Public Limit</u>	<u>Exposure Level at Light Fixture</u>	<u>Maximum Exposure at Ground Level</u>
limit never reached	less than 4 inches	below 1.5% Public	below 1.5% Public

**Conclusion** Based upon the information and analysis above, it is the undersigned’s professional opinion that this wireless telecommunications facility, as installed and operating at the time of the measurements, complies with the FCC guidelines limiting public exposure to radio frequency energy and, therefore, does not for this reason cause a significant impact on the environment

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August 21, 2019



**– City of Sacramento –  
Radio Frequency Compliance Measurements**

<b>Carrier ID</b> 484746 “Pocket_5G020”	<b>City Permit</b> REV18-0118
<b>Approximate Site Address</b> 11 Capri Court	

**Carrier** Verizon Wireless

**Visit Date** August 5, 2019      **Visit Time** 8:20 am

**Field Technician** Mr. Scott Walthard, a qualified employee of Hammett & Edison, Inc.

**Meter** Wandel & Goltermann Type EMR-300 Radiation Meter with  
Type 25 Isotropic Electric Field Probe (Serial No. E-0001)  
Calibration current, next due May 8, 2021

**Antenna Location** below light arm

**Measurement Results**

<u>Distance to Occupational Limit</u>	<u>Distance to Public Limit</u>	<u>Exposure Level at Light Fixture</u>	<u>Maximum Exposure at Ground Level</u>
limit never reached	less than 4 inches	below 1.5% Public	below 1.5% Public

**Conclusion** Based upon the information and analysis above, it is the undersigned’s professional opinion that this wireless telecommunications facility, as installed and operating at the time of the measurements, complies with the FCC guidelines limiting public exposure to radio frequency energy and, therefore, does not for this reason cause a significant impact on the environment

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August 21, 2019



**– City of Sacramento –  
Radio Frequency Compliance Measurements**

<b>Carrier ID</b> 483694 “Pocket_5G178”	<b>City Permit</b> REV18-0123
<b>Approximate Site Address</b> 8081 Lido Isle Lane	

**Carrier** Verizon Wireless

**Visit Date** August 5, 2019      **Visit Time** 9:10 am

**Field Technician** Mr. Scott Walthard, a qualified employee of Hammett & Edison, Inc.

**Meter** Wandel & Goltermann Type EMR-300 Radiation Meter with  
Type 25 Isotropic Electric Field Probe (Serial No. E-0001)  
Calibration current, next due May 8, 2021

**Antenna Location** below light arm

**Measurement Results**

Distance to Occupational Limit	Distance to Public Limit	Exposure Level at Light Fixture	Maximum Exposure at Ground Level
limit never reached	less than 4 inches	below 1.5% Public	below 1.5% Public

**Conclusion** Based upon the information and analysis above, it is the undersigned’s professional opinion that this wireless telecommunications facility, as installed and operating at the time of the measurements, complies with the FCC guidelines limiting public exposure to radio frequency energy and, therefore, does not for this reason cause a significant impact on the environment

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August 21, 2019



**– City of Sacramento –  
Radio Frequency Compliance Measurements**

<b>Carrier ID</b> 485573 “Pocket_5G030”	<b>City Permit</b> REV18-0125
<b>Approximate Site Address</b> 6162 Riverside Boulevard	

**Carrier** Verizon Wireless

**Visit Date** August 6, 2019      **Visit Time** 12:45 pm

**Field Technician** Mr. Scott Walthard, a qualified employee of Hammett & Edison, Inc.

**Meter** Wandel & Goltermann Type EMR-300 Radiation Meter with  
Type 25 Isotropic Electric Field Probe (Serial No. E-0001)  
Calibration current, next due May 8, 2021

**Antenna Location** below light arm

**Measurement Results**

<u>Distance to Occupational Limit</u>	<u>Distance to Public Limit</u>	<u>Exposure Level at Light Fixture</u>	<u>Maximum Exposure at Ground Level</u>
limit never reached	less than 4 inches	below 1.5% Public	below 1.5% Public

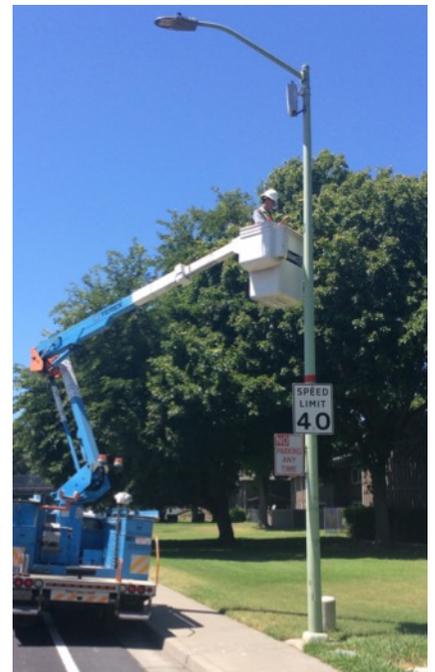
**Conclusion** Based upon the information and analysis above, it is the undersigned’s professional opinion that this wireless telecommunications facility, as installed and operating at the time of the measurements, complies with the FCC guidelines limiting public exposure to radio frequency energy and, therefore, does not for this reason cause a significant impact on the environment

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August 21, 2019



**– City of Sacramento –  
Radio Frequency Compliance Measurements**

<b>Carrier ID</b> 483723 “Pocket_5G299”	<b>City Permit</b> REV18-0148
<b>Approximate Site Address</b> 880 Florin Road	

**Carrier** Verizon Wireless

**Visit Date** August 6, 2019      **Visit Time** 11:05 am

**Field Technician** Mr. Scott Walthard, a qualified employee of Hammett & Edison, Inc.

**Meter** Wandel & Goltermann Type EMR-300 Radiation Meter with  
Type 25 Isotropic Electric Field Probe (Serial No. E-0001)  
Calibration current, next due May 8, 2021

**Antenna Location** below light arm

**Measurement Results**

<u>Distance to Occupational Limit</u>	<u>Distance to Public Limit</u>	<u>Exposure Level at Light Fixture</u>	<u>Maximum Exposure at Ground Level</u>
limit never reached	less than 4 inches	below 1.5% Public	below 1.5% Public

**Conclusion** Based upon the information and analysis above, it is the undersigned’s professional opinion that this wireless telecommunications facility, as installed and operating at the time of the measurements, complies with the FCC guidelines limiting public exposure to radio frequency energy and, therefore, does not for this reason cause a significant impact on the environment

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August 21, 2019



**– City of Sacramento –  
Radio Frequency Compliance Measurements**

<b>Carrier ID</b> 483729 “Pocket_5G285”	<b>City Permit</b> REV18-0164
<b>Approximate Site Address</b> 6633 Gloria Drive	

**Carrier** Verizon Wireless

**Visit Date** August 6, 2019      **Visit Time** 12:20 pm

**Field Technician** Mr. Scott Walthard, a qualified employee of Hammett & Edison, Inc.

**Meter** Wandel & Goltermann Type EMR-300 Radiation Meter with  
Type 25 Isotropic Electric Field Probe (Serial No. E-0001)  
Calibration current, next due May 8, 2021

**Antenna Location** below light arm

**Measurement Results**

<u>Distance to Occupational Limit</u>	<u>Distance to Public Limit</u>	<u>Exposure Level at Light Fixture</u>	<u>Maximum Exposure at Ground Level</u>
limit never reached	less than 2 inches	below 1.5% Public	below 1.5% Public

**Conclusion** Based upon the information and analysis above, it is the undersigned’s professional opinion that this wireless telecommunications facility, as installed and operating at the time of the measurements, complies with the FCC guidelines limiting public exposure to radio frequency energy and, therefore, does not for this reason cause a significant impact on the environment

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August 21, 2019



**– City of Sacramento –  
Radio Frequency Compliance Measurements**

<b>Carrier ID</b> 483698 “Pocket_5G302”	<b>City Permit</b> REV18-0171
<b>Approximate Site Address</b> 7653 Windbridge Drive	

**Carrier** Verizon Wireless

**Visit Date** August 5, 2019      **Visit Time** 2:30 pm

**Field Technician** Mr. Scott Walthard, a qualified employee of Hammett & Edison, Inc.

**Meter** Wandel & Goltermann Type EMR-300 Radiation Meter with  
Type 25 Isotropic Electric Field Probe (Serial No. E-0001)  
Calibration current, next due May 8, 2021

**Antenna Location** below light arm

**Measurement Results**

Distance to Occupational Limit	Distance to Public Limit	Exposure Level at Light Fixture	Maximum Exposure at Ground Level
limit never reached	less than 4 inches	below 1.5% Public	below 1.5% Public

**Conclusion** Based upon the information and analysis above, it is the undersigned’s professional opinion that this wireless telecommunications facility, as installed and operating at the time of the measurements, complies with the FCC guidelines limiting public exposure to radio frequency energy and, therefore, does not for this reason cause a significant impact on the environment

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August 21, 2019



**– City of Sacramento –  
Radio Frequency Compliance Measurements**

<b>Carrier ID</b> 483716 “Pocket_5G343”	<b>City Permit</b> REV18-0197
<b>Approximate Site Address</b> 7300 Greenhaven Drive	

**Carrier** Verizon Wireless

**Visit Date** August 6, 2019      **Visit Time** 9:30 am

**Field Technician** Mr. Scott Walthard, a qualified employee of Hammett & Edison, Inc.

**Meter** Wandel & Goltermann Type EMR-300 Radiation Meter with  
Type 25 Isotropic Electric Field Probe (Serial No. E-0001)  
Calibration current, next due May 8, 2021

**Antenna Location** below light arm

**Measurement Results**

<u>Distance to Occupational Limit</u>	<u>Distance to Public Limit</u>	<u>Exposure Level at Light Fixture</u>	<u>Maximum Exposure at Ground Level</u>
limit never reached	less than 4 inches	below 1.5% Public	below 1.5% Public

**Conclusion** Based upon the information and analysis above, it is the undersigned’s professional opinion that this wireless telecommunications facility, as installed and operating at the time of the measurements, complies with the FCC guidelines limiting public exposure to radio frequency energy and, therefore, does not for this reason cause a significant impact on the environment

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August 21, 2019



**– City of Sacramento –  
Radio Frequency Compliance Measurements**

<b>Carrier ID</b> 483719 “Pocket_5G298”	<b>City Permit</b> REV18-0223
<b>Approximate Site Address</b> 7236 Greenhaven Drive	

**Carrier** Verizon Wireless

**Visit Date** August 6, 2019      **Visit Time** 8:35 am

**Field Technician** Mr. Scott Walthard, a qualified employee of Hammett & Edison, Inc.

**Meter** Wandel & Goltermann Type EMR-300 Radiation Meter with  
Type 25 Isotropic Electric Field Probe (Serial No. E-0001)  
Calibration current, next due May 8, 2021

**Antenna Location** below light arm

**Measurement Results**

Distance to Occupational Limit	Distance to Public Limit	Exposure Level at Light Fixture	Maximum Exposure at Ground Level
limit never reached	less than 6 inches	below 1.5% Public	below 1.5% Public

**Conclusion** Based upon the information and analysis above, it is the undersigned’s professional opinion that this wireless telecommunications facility, as installed and operating at the time of the measurements, complies with the FCC guidelines limiting public exposure to radio frequency energy and, therefore, does not for this reason cause a significant impact on the environment

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August 21, 2019



**– City of Sacramento –  
Radio Frequency Compliance Measurements**

<b>Carrier ID</b> 483696 “Pocket_5G283”	<b>City Permit</b> REV18-0276
<b>Approximate Site Address</b> 7760 Roberts River Way	

**Carrier** Verizon Wireless

**Visit Date** August 5, 2019      **Visit Time** 12:00 pm

**Field Technician** Mr. Scott Walthard, a qualified employee of Hammett & Edison, Inc.

**Meter** Wandel & Goltermann Type EMR-300 Radiation Meter with  
Type 25 Isotropic Electric Field Probe (Serial No. E-0001)  
Calibration current, next due May 8, 2021

**Antenna Location** below light arm

**Measurement Results**

Distance to Occupational Limit	Distance to Public Limit	Exposure Level at Light Fixture	Maximum Exposure at Ground Level
limit never reached	less than 4 inches	below 1.5% Public	below 1.5% Public

**Conclusion** Based upon the information and analysis above, it is the undersigned’s professional opinion that this wireless telecommunications facility, as installed and operating at the time of the measurements, complies with the FCC guidelines limiting public exposure to radio frequency energy and, therefore, does not for this reason cause a significant impact on the environment

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August 21, 2019



**– City of Sacramento –  
Radio Frequency Compliance Measurements**

<b>Carrier ID</b> 483727 “Pocket_5G288”	<b>City Permit</b> REV18-0323
<b>Approximate Site Address</b> 660 Florin Road	

**Carrier** Verizon Wireless

**Visit Date** August 6, 2019      **Visit Time** 11:40 am

**Field Technician** Mr. Scott Walthard, a qualified employee of Hammett & Edison, Inc.

**Meter** Wandel & Goltermann Type EMR-300 Radiation Meter with  
Type 25 Isotropic Electric Field Probe (Serial No. E-0001)  
Calibration current, next due May 8, 2021

**Antenna Location** below light arm

**Measurement Results**

Distance to Occupational Limit	Distance to Public Limit	Exposure Level at Light Fixture	Maximum Exposure at Ground Level
limit never reached	less than 4 inches	below 1.5% Public	below 1.5% Public

**Conclusion** Based upon the information and analysis above, it is the undersigned’s professional opinion that this wireless telecommunications facility, as installed and operating at the time of the measurements, complies with the FCC guidelines limiting public exposure to radio frequency energy and, therefore, does not for this reason cause a significant impact on the environment

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August 21, 2019



**– City of Sacramento –  
Radio Frequency Compliance Measurements**

<b>Carrier ID</b> 437805 “South Sacramento 007”	<b>City Permit</b> REV18-0423
<b>Approximate Site Address</b> 8 Genoa Court	

**Carrier** Verizon Wireless

**Visit Date** August 8, 2019      **Visit Time** 1:15 pm

**Field Technician** Mr. Scott Walthard, a qualified employee of Hammett & Edison, Inc.

**Meter** Wandel & Goltermann Type EMR-300 Radiation Meter with  
Type 18 and 25 Isotropic Electric Field Probes (Serial Nos. C-0010 and E-0001)  
Calibration current, next due May 8, 2021

**Antenna Location** on top of light pole

**Measurement Results**

<u>Distance to Occupational Limit</u>	<u>Distance to Public Limit</u>	<u>Exposure Level at Light Fixture</u>	<u>Maximum Exposure at Ground Level</u>
1 foot	3 feet	18% Public	0.39% Public*

**Conclusion** Based upon the information and analysis above, it is the undersigned’s professional opinion that this wireless telecommunications facility, as installed and operating at the time of the measurements, complies with the FCC guidelines limiting public exposure to radio frequency energy and, therefore, does not for this reason cause a significant impact on the environment

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August 21, 2019



\* Assessed against 0.2 mW/cm<sup>2</sup>, most restrictive FCC limit.



**– City of Sacramento –  
Radio Frequency Compliance Measurements**

<b>Carrier ID</b> 437800 “South Sacramento 002”	<b>City Permit</b> REV18-0431
<b>Approximate Site Address</b> 6058 Riverside Boulevard	

**Carrier** Verizon Wireless

**Visit Date** August 8, 2019      **Visit Time** 8:00 am

**Field Technician** Mr. Scott Walthard, a qualified employee of Hammett & Edison, Inc.

**Meter** Wandel & Goltermann Type EMR-300 Radiation Meter with  
Type 18 and 25 Isotropic Electric Field Probes (Serial Nos. C-0010 and E-0001)  
Calibration current, next due May 8, 2021

**Antenna Location** on top of light pole

**Measurement Results**

<u>Distance to Occupational Limit</u>	<u>Distance to Public Limit</u>	<u>Exposure Level at Light Fixture</u>	<u>Maximum Exposure at Ground Level</u>
1 foot	3 feet	3.4% Public	0.48% Public*

**Conclusion** Based upon the information and analysis above, it is the undersigned’s professional opinion that this wireless telecommunications facility, as installed and operating at the time of the measurements, complies with the FCC guidelines limiting public exposure to radio frequency energy and, therefore, does not for this reason cause a significant impact on the environment

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August 21, 2019



\* Assessed against 0.2 mW/cm<sup>2</sup>, most restrictive FCC limit.



**– City of Sacramento –  
Radio Frequency Compliance Measurements**

**Carrier ID** 437802 “South Sacramento 004”  
**Approximate Site Address** 23 Ridgemark Court

**City Permit** REV18-0435

**Carrier** Verizon Wireless

**Visit Date** August 8, 2019      **Visit Time** 3:00 pm

**Field Technician** Mr. Scott Walthard, a qualified employee of Hammett & Edison, Inc.

**Meter** Wandel & Goltermann Type EMR-300 Radiation Meter with  
Type 18 and 25 Isotropic Electric Field Probes (Serial Nos. C-0010 and E-0001)  
Calibration current, next due May 8, 2021

**Antenna Location** on top of light pole

**Measurement Results**

<u>Distance to Occupational Limit</u>	<u>Distance to Public Limit</u>	<u>Exposure Level at Light Fixture</u>	<u>Maximum Exposure at Ground Level</u>
limit never reached	limit never reached	0.18% Public	0.022% Public*

**Conclusion**

**Authorship**



\* Assessed against 0.2 mW/cm<sup>2</sup>, most restrictive FCC limit.



**– City of Sacramento –  
Radio Frequency Compliance Measurements**

<b>Carrier ID</b> 437804 “South Sacramento 006”	<b>City Permit</b> REV18-0439
<b>Approximate Site Address</b> 7986 Pocket Road	

**Carrier** Verizon Wireless

**Visit Date** August 85, 2019      **Visit Time** 10:00 am

**Field Technician** Mr. Scott Walthard, a qualified employee of Hammett & Edison, Inc.

**Meter** Wandel & Goltermann Type EMR-300 Radiation Meter with  
Type 18 and 25 Isotropic Electric Field Probes (Serial Nos. C-0010 and E-0001)  
Calibration current, next due May 8, 2021

**Antenna Location** on top of light pole

**Measurement Results**

<u>Distance to Occupational Limit</u>	<u>Distance to Public Limit</u>	<u>Exposure Level at Light Fixture</u>	<u>Maximum Exposure at Ground Level</u>
1 foot	4 feet	11% Public	0.27% Public*

**Conclusion** Based upon the information and analysis above, it is the undersigned’s professional opinion that this wireless telecommunications facility, as installed and operating at the time of the measurements, complies with the FCC guidelines limiting public exposure to radio frequency energy and, therefore, does not for this reason cause a significant impact on the environment

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August 21, 2019



\* Assessed against 0.2 mW/cm<sup>2</sup>, most restrictive FCC limit.



**– City of Sacramento –  
Radio Frequency Compliance Measurements**

**Carrier ID** 437803 “South Sacramento 005”

**City Permit** REV18-0527

**Approximate Site Address** 7597 Pocket Road

**Carrier** Verizon Wireless

**Visit Date** August 8, 2019

**Visit Time** 9:00 am

**Field Technician** Mr. Scott Walthard, a qualified employee of Hammett & Edison, Inc.

**Meter** Wandel & Goltermann Type EMR-300 Radiation Meter with  
Type 18 and 25 Isotropic Electric Field Probes (Serial Nos. C-0010 and E-0001)  
Calibration current, next due May 8, 2021

**Antenna Location** on top of light pole

**Measurement Results**

<u>Distance to Occupational Limit</u>	<u>Distance to Public Limit</u>	<u>Exposure Level at Light Fixture</u>	<u>Maximum Exposure at Ground Level</u>
1 foot	3 feet	12% Public	0.25% Public*

**Conclusion** Based upon the information and analysis above, it is the undersigned’s professional opinion that this wireless telecommunications facility, as installed and operating at the time of the measurements, complies with the FCC guidelines limiting public exposure to radio frequency energy and, therefore, does not for this reason cause a significant impact on the environment

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August 21, 2019



\* Assessed against 0.2 mW/cm<sup>2</sup>, most restrictive FCC limit.



**– City of Sacramento –  
Radio Frequency Compliance Measurements**

<b>Carrier ID</b> 437810 “South Sacramento 012”	<b>City Permit</b> REV18-0530
<b>Approximate Site Address</b> 7410 Greenhaven Road	

**Carrier** Verizon Wireless

**Visit Date** August 8, 2019      **Visit Time** 12:20 pm

**Field Technician** Mr. Scott Walthard, a qualified employee of Hammett & Edison, Inc.

**Meter** Wandel & Goltermann Type EMR-300 Radiation Meter with  
Type 18 and 25 Isotropic Electric Field Probes (Serial Nos. C-0010 and E-0001)  
Calibration current, next due May 8, 2021

**Antenna Location** on top of light pole

**Measurement Results**

<u>Distance to Occupational Limit</u>	<u>Distance to Public Limit</u>	<u>Exposure Level at Light Fixture</u>	<u>Maximum Exposure at Ground Level</u>
1 foot	3 feet	23% Public	0.60% Public*

**Conclusion** Based upon the information and analysis above, it is the undersigned’s professional opinion that this wireless telecommunications facility, as installed and operating at the time of the measurements, complies with the FCC guidelines limiting public exposure to radio frequency energy and, therefore, does not for this reason cause a significant impact on the environment

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August 21, 2019



\* Assessed against 0.2 mW/cm<sup>2</sup>, most restrictive FCC limit.



**– City of Sacramento –  
Radio Frequency Compliance Measurements**

<b>Carrier ID</b> 437799 “South Sacramento 001”	<b>City Permit</b> REV18-0532
<b>Approximate Site Address</b> 960 Florin Road	

**Carrier** Verizon Wireless

**Visit Date** August 8, 2019      **Visit Time** 10:50 am

**Field Technician** Mr. Scott Walthard, a qualified employee of Hammett & Edison, Inc.

**Meter** Wandel & Goltermann Type EMR-300 Radiation Meter with  
Type 18 and 25 Isotropic Electric Field Probes (Serial Nos. C-0010 and E-0001)  
Calibration current, next due May 8, 2021

**Antenna Location** on top of light pole

**Measurement Results**

<u>Distance to Occupational Limit</u>	<u>Distance to Public Limit</u>	<u>Exposure Level at Light Fixture</u>	<u>Maximum Exposure at Ground Level</u>
1 foot	3 feet	17% Public	0.29% Public*

**Conclusion** Based upon the information and analysis above, it is the undersigned’s professional opinion that this wireless telecommunications facility, as installed and operating at the time of the measurements, complies with the FCC guidelines limiting public exposure to radio frequency energy and, therefore, does not for this reason cause a significant impact on the environment

**Authorship** This Compliance Certification has been prepared by the undersigned Professional Engineer, holding California Registration Nos. E-13026 and M-20676, which expire on June 30, 2021. This work has been carried out under his direction, and all statements are true and correct of his own knowledge except, where noted, when data has been supplied by others, which data he believes to be correct.



*William F. Hammett*  
\_\_\_\_\_  
William F. Hammett, P.E.  
707/996-5200

August 21, 2019



\* Assessed against 0.2 mW/cm<sup>2</sup>, most restrictive FCC limit.



**– City of Sacramento –  
Radio Frequency Compliance Measurements**

<b>Carrier ID</b> 471437 “South Sacramento 041”	<b>City Permit</b> REV18-0616
<b>Approximate Site Address</b> 7707 Rush River Drive	

**Carrier** Verizon Wireless

**Visit Date** August 8, 2019      **Visit Time** 2:00 pm

**Field Technician** Mr. Scott Walthard, a qualified employee of Hammett & Edison, Inc.

**Meter** Wandel & Goltermann Type EMR-300 Radiation Meter with  
Type 18 and 25 Isotropic Electric Field Probes (Serial Nos. C-0010 and E-0001)  
Calibration current, next due May 8, 2021

**Antenna Location** on top of light pole

**Measurement Results**

<u>Distance to Occupational Limit</u>	<u>Distance to Public Limit</u>	<u>Exposure Level at Light Fixture</u>	<u>Maximum Exposure at Ground Level</u>
1 foot	4 feet	13% Public	0.22% Public*

**Conclusion** Based upon the information and analysis above, it is the undersigned’s professional opinion that this wireless telecommunications facility, as installed and operating at the time of the measurements, complies with the FCC guidelines limiting public exposure to radio frequency energy and, therefore, does not for this reason cause a significant impact on the environment

**Authorship** This Compliance Certification has been prepared by the undersigned Professional Engineer, holding California Registration Nos. E-13026 and M-20676, which expire on June 30, 2021. This work has been carried out under his direction, and all statements are true and correct of his own knowledge except, where noted, when data has been supplied by others, which data he believes to be correct.



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