

WILLIAM F. HAMMETT, P.E. Rajat Mathur, P.E. Robert P. Smith, Jr. Brian F. Palmer Manas S. Reddy, P.E. S. Chris Xu

Robert L. Hammett, P.E. 1920-2002 Edward Edison, P.E. 1920-2009

DANE E. ERICKSEN, P.E. Consultant

# **REPORT TRANSMITTAL**

#### October 11, 2022

To: Adam Hendel

Cc: Michael Cloonan

Location: Santa Barbara

Description of attachment:

Regulatory RF Compliance Report (6 nodes)

Node No.

Site 1 – CC State-05M1 Site 2 – AT CRAN\_RLOS\_STBR1\_009 Site 3 – CC State-02

<u>Node No.</u> Site 4 – VW 295307 "East Mesa SC2" Site 5 – CC ATTSBE14m1 Site 6 – CC State-07

AHENDEL@SANTABARBARACA.GOV

MCLOONAN@SANTABARBARACA.GOV

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 Santa Barbara – Crown Castle NG West LLC • Node No. State-05M1 1201 State Street • Santa Barbara, California

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

The firm of Hammett & Edison, Inc., Consulting Engineers, has been retained by the City of Santa Barbara to evaluate the Crown Castle node (Site No. State-05M1) located at 1201 State Street in Santa Barbara, California, for compliance with appropriate guidelines limiting human exposure to radio frequency ("RF") electromagnetic fields.

# **Executive Summary**

Crown Castle had installed a cylindrical antenna on a decorative pole located at 1201 State Street in Santa Barbara. All exposure levels under the existing conditions for anyone in publicly accessible areas nearby were well below the federal standard.

# **Prevailing Exposure Standard**

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 FCC limit for exposures of unlimited duration to radio frequency energy for several wireless services are as follows:

	Transmit	"Uncontrolled"	Occupational Limit
Wireless Service Band	Frequency	Public Limit	(5 times Public)
Microwave (point-to-point)	1–80 GHz	$1.0 \text{ mW/cm}^2$	$5.0 \text{ mW/cm}^2$
Millimeter-wave	24–47	1.0	5.0
Part 15 (WiFi & other unlicensed)	2–6	1.0	5.0
C-Band	3,700 MHz	1.0	5.0
CBRS (Citizens Broadband Radio)	3,550	1.0	5.0
BRS (Broadband Radio)	2,490	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
600 MHz	617	0.41	2.05
[most restrictive frequency range]	30-300	0.20	1.0



# City of Santa Barbara – Crown Castle NG West LLC • Node No. State-05M1 1201 State Street • Santa Barbara, California

### **General Facility Requirements**

Antennas for base station use are designed to concentrate their energy toward the horizon, with very little energy wasted toward the sky or the ground. Since the antennas need an unobstructed area in front of them, it is generally not possible for exposure conditions to approach the FCC limits without being physically very near the antennas.

# **Site Description**

The site in Santa Barbara was visited by Mr. David Kelly, a qualified field technician employed by Hammett & Edison, Inc., during normal business hours on September 15, 2022, a non-holiday weekday. Crown Castle had installed a cylindrical antenna, for use by Verizon Wireless, on top of the decorative pole sited in the public right-of-way on the southwest side of State Street, in front of the single-story commercial building located at 1201 State Street. Access to the antenna was restricted by its mounting location and height. Explanatory signs had been posted on the pole below the antenna. There were observed no other wireless telecommunications base stations located at this site or nearby.

#### **Measurement Results**

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. Measurements were made from a bucket-truck in front of the antenna and at ground near the site. At each test point, the measurement results were compared with applicable FCC standards. The principal direction of the antenna was northeast, across State Street. The maximum power density level observed beyond 10 feet from the antenna was less than the applicable public limit. The maximum power density level observed for a person at ground near the site was 0.0042 mW/cm<sup>2</sup>, which is 2.1% of the most restrictive public limit.

#### **No Recommended Mitigation Measures**

Due to its mounting location and height, the antenna was not accessible to the general public, and so no additional mitigation measures are necessary to comply with the FCC public exposure guidelines. It is presumed that Crown Castle and Verizon take adequate precautions to ensure that their employees or contractors comply with FCC occupational exposure guidelines whenever work is required near the antenna.



# City of Santa Barbara – Crown Castle NG West LLC • Node No. State-05M1 1201 State Street • Santa Barbara, California

# Conclusion

Based on the information and analysis above, it is the undersigned's professional opinion that the Crown Castle node located at 1201 State Street in Santa Barbara, as installed and operating at the time of the visit, 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

The undersigned author of this statement is a qualified Professional Engineer, holding California Registration Nos. E-13026 and M-20676, which expire on June 30, 2023. 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 <u>others</u>, which data he believes to be correct.



October 11, 2022





X9WD-1 Page 3 of 3

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 IEEE C95.1-2019, "Safety Levels with Respect to Human Exposure to Electric, Magnetic, and Electromagnetic Fields, 0 Hz 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:



10 Frequency (MHz)

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. Hammett & Edison has incorporated conservative calculation formulas FCC Office in the of Engineering and Technology Bulletin No. 65 (August 1997) for projecting field levels in a computer program capable of calculating, at thousands of locations on an arbitrary grid, the total expected power density from any number of individual radio frequency sources. The program allows for the inclusion of uneven terrain in the vicinity, as well as any number of nearby buildings of varying heights, to obtain more accurate projections.



HAMMETT & EDISON, INC. CONSULTING ENGINEERS SAN FRANCISCO ©2022

# City of Santa Barbara – AT&T Mobility • Node No. CRAN\_RLOS\_STBR1\_009 210 West Cota Street • Santa Barbara, California

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

The firm of Hammett & Edison, Inc., Consulting Engineers, has been retained by the City of Santa Barbara to evaluate the AT&T Mobility node (Site No. CRAN\_RLOS\_STBR1\_009) located near 210 West Cota Street in Santa Barbara, California, for compliance with appropriate guidelines limiting human exposure to radio frequency ("RF") electromagnetic fields.

# **Executive Summary**

AT&T had installed a cylindrical antenna on a utility pole located near 210 West Cota Street in Santa Barbara. All exposure levels under the existing conditions for anyone in publicly accessible areas nearby were well below the federal standard.

# Prevailing Exposure Standard

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 FCC limit for exposures of unlimited duration to radio frequency energy for several wireless services are as follows:

	Transmit	"Uncontrolled"	Occupational Limit
Wireless Service Band	Frequency	Public Limit	(5 times Public)
Microwave (point-to-point)	1–80 GHz	$1.0 \text{ mW/cm}^2$	$5.0 \text{ mW/cm}^2$
Millimeter-wave	24–47	1.0	5.0
Part 15 (WiFi & other unlicensed)	2–6	1.0	5.0
C-Band	3,700 MHz	1.0	5.0
CBRS (Citizens Broadband Radio)	3,550	1.0	5.0
BRS (Broadband Radio)	2,490	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
600 MHz	617	0.41	2.05
[most restrictive frequency range]	30-300	0.20	1.0

Power line frequencies (60 Hz) are well below the applicable range of these standards, and there is considered to be no compounding effect from simultaneous exposure to power line and radio frequency fields.



# City of Santa Barbara – AT&T Mobility • Node No. CRAN\_RLOS\_STBR1\_009 210 West Cota Street • Santa Barbara, California

### **General Facility Requirements**

Antennas for base station use are designed to concentrate their energy toward the horizon, with very little energy wasted toward the sky or the ground. Since the antennas need an unobstructed area in front of them, it is generally not possible for exposure conditions to approach the FCC limits without being physically very near the antennas.

# **Site Description**

The site in Santa Barbara was visited by Mr. David Kelly, a qualified field technician employed by Hammett & Edison, Inc., during normal business hours on September 15, 2022, a non-holiday weekday. AT&T had installed a cylindrical antenna on top of the utility pole sited in the public right-of-way in the northwest side of West Cota Street, in front of the single-story residence located at 210 West Cota Street. Access to the antenna was restricted by its mounting location and height. Explanatory signs had been posted on the antenna and on the pole below the antenna. There were observed no other wireless telecommunications base stations located at this site or nearby.

#### **Measurement Results**

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. Measurements were made from a bucket-truck in front of the antenna and at ground near the site. At each test point, the measurement results were compared with applicable FCC standards. The maximum power density level observed beyond 1 foot from the antenna was less than the applicable public limit. The maximum power density level observed for a person at ground near the site was 0.00018 mW/cm<sup>2</sup>, which is 0.090% of the most restrictive public limit.

#### **No Recommended Mitigation Measures**

Due to its mounting location and height, the AT&T antenna was not accessible to the general public, and so no additional mitigation measures are necessary to comply with the FCC public exposure guidelines. It is presumed that AT&T, as an FCC licensee, takes adequate precautions to ensure that its employees or contractors comply with FCC occupational exposure guidelines whenever work is required near the antenna.



# City of Santa Barbara – AT&T Mobility • Node No. CRAN\_RLOS\_STBR1\_009 210 West Cota Street • Santa Barbara, California

### Conclusion

Based on the information and analysis above, it is the undersigned's professional opinion that the AT&T Mobility node located near 210 West Cota Street in Santa Barbara, as installed and operating at the time of the visit, 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

The undersigned author of this statement is a qualified Professional Engineer, holding California Registration Nos. E-13026 and M-20676, which expire on June 30, 2023. 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 <u>others</u>, which data he believes to be correct.

William F. Hammett, P.E. 6-30-2023 707/996-5200

October 11, 2022





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 IEEE C95.1-2019, "Safety Levels with Respect to Human Exposure to Electric, Magnetic, and Electromagnetic Fields, 0 Hz 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:



10 Frequency (MHz)

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. Hammett & Edison has incorporated conservative calculation formulas FCC Office in the of Engineering and Technology Bulletin No. 65 (August 1997) for projecting field levels in a computer program capable of calculating, at thousands of locations on an arbitrary grid, the total expected power density from any number of individual radio frequency sources. The program allows for the inclusion of uneven terrain in the vicinity, as well as any number of nearby buildings of varying heights, to obtain more accurate projections.



HAMMETT & EDISON, INC. CONSULTING ENGINEERS SAN FRANCISCO ©2022

# – City of Santa Barbara – Crown Castle NG West LLC • Node No. State-02 30 East Ortega Street • Santa Barbara, California

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

The firm of Hammett & Edison, Inc., Consulting Engineers, has been retained by the City of Santa Barbara to evaluate the Crown Castle node (Site No. State-02) located at 30 East Ortega Street in Santa Barbara, California, for compliance with appropriate guidelines limiting human exposure to radio frequency ("RF") electromagnetic fields.

# **Executive Summary**

Crown Castle had installed a cylindrical antenna on the light pole located at 30 East Ortega Street in Santa Barbara. All exposure levels under the existing conditions for anyone in publicly accessible areas nearby were well below the federal standard.

# Prevailing Exposure Standard

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 FCC limit for exposures of unlimited duration to radio frequency energy for several wireless services are as follows:

	Transmit	"Uncontrolled"	Occupational Limit
Wireless Service Band	Frequency	Public Limit	(5 times Public)
Microwave (point-to-point)	1–80 GHz	$1.0 \text{ mW/cm}^2$	$5.0 \text{ mW/cm}^2$
Millimeter-wave	24–47	1.0	5.0
Part 15 (WiFi & other unlicensed)	2–6	1.0	5.0
C-Band	3,700 MHz	1.0	5.0
CBRS (Citizens Broadband Radio)	3,550	1.0	5.0
BRS (Broadband Radio)	2,490	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
600 MHz	617	0.41	2.05
[most restrictive frequency range]	30-300	0.20	1.0



# – City of Santa Barbara – Crown Castle NG West LLC • Node No. State-02 30 East Ortega Street • Santa Barbara, California

### **General Facility Requirements**

Antennas for base station use are designed to concentrate their energy toward the horizon, with very little energy wasted toward the sky or the ground. Since the antennas need an unobstructed area in front of them, it is generally not possible for exposure conditions to approach the FCC limits without being physically very near the antennas.

#### **Site Description**

The site in Santa Barbara was visited by Mr. David Kelly, a qualified field technician employed by Hammett & Edison, Inc., during normal business hours on September 15, 2022, a non-holiday weekday. Crown Castle had installed a cylindrical antenna, for use by Verizon Wireless, on top of the light pole sited in the public right-of-way at the south corner of the intersection between East Ortega and Anacapa Streets in Santa Barbara, in front of the restaurant located at 30 East Ortega Street. Access to the antenna was restricted by its mounting location and height. Explanatory signs had been posted on the pole below the antenna. There were observed no other wireless telecommunications base stations located at this site or nearby.

#### **Measurement Results**

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. Measurements were made from a bucket-truck in front of the antenna and at ground near the site. At each test point, the measurement results were compared with applicable FCC standards. The maximum power density level observed beyond 3 feet from the antenna was less than the applicable public limit. The maximum power density level observed for a person at ground near the site was 0.0026 mW/cm<sup>2</sup>, which is 1.3% of the most restrictive public limit.

#### **No Recommended Mitigation Measures**

Due to its mounting location and height, the antenna was not accessible to the general public, and so no additional mitigation measures are necessary to comply with the FCC public exposure guidelines. It is presumed that Crown Castle and Verizon take adequate precautions to ensure that their employees or contractors comply with FCC occupational exposure guidelines whenever work is required near the antenna.



# – City of Santa Barbara – Crown Castle NG West LLC • Node No. State-02 30 East Ortega Street • Santa Barbara, California

### Conclusion

Based on the information and analysis above, it is the undersigned's professional opinion that the Crown Castle node located at 30 East Ortega Street in Santa Barbara, as installed and operating at the time of the visit, 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

The undersigned author of this statement is a qualified Professional Engineer, holding California Registration Nos. E-13026 and M-20676, which expire on June 30, 2023. 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, P.E. 6-30-2023 707/996-5200

October 11, 2022





X9WD-3 Page 3 of 3

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 IEEE C95.1-2019, "Safety Levels with Respect to Human Exposure to Electric, Magnetic, and Electromagnetic Fields, 0 Hz 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:



10 Frequency (MHz)

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. Hammett & Edison has incorporated conservative calculation formulas FCC Office in the of Engineering and Technology Bulletin No. 65 (August 1997) for projecting field levels in a computer program capable of calculating, at thousands of locations on an arbitrary grid, the total expected power density from any number of individual radio frequency sources. The program allows for the inclusion of uneven terrain in the vicinity, as well as any number of nearby buildings of varying heights, to obtain more accurate projections.



HAMMETT & EDISON, INC. CONSULTING ENGINEERS SAN FRANCISCO ©2022

# – City of Santa Barbara – Verizon Wireless • Node No. 295307 "East Mesa SC2" 1618 Cliff Drive • Santa Barbara, California

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

The firm of Hammett & Edison, Inc., Consulting Engineers, has been retained by the City of Santa Barbara to evaluate the Verizon Wireless node (Site No. 295307 "East Mesa SC2") located near 1618 Cliff Drive in Santa Barbara, California, for compliance with appropriate guidelines limiting human exposure to radio frequency ("RF") electromagnetic fields.

# **Executive Summary**

Verizon had installed an cylindrical antenna on a wood utility pole located across the street from 1618 Cliff Drive in Santa Barbara. All exposure levels under the existing conditions for anyone in publicly accessible areas nearby were well below the federal standard.

# **Prevailing Exposure Standard**

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 FCC limit for exposures of unlimited duration to radio frequency energy for several wireless services are as follows:

	Transmit	"Uncontrolled"	Occupational Limit
Wireless Service Band	Frequency	Public Limit	(5 times Public)
Microwave (point-to-point)	1–80 GHz	$1.0 \text{ mW/cm}^2$	$5.0 \text{ mW/cm}^2$
Millimeter-wave	24–47	1.0	5.0
Part 15 (WiFi & other unlicensed)	2–6	1.0	5.0
C-Band	3,700 MHz	1.0	5.0
CBRS (Citizens Broadband Radio)	3,550	1.0	5.0
BRS (Broadband Radio)	2,490	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
600 MHz	617	0.41	2.05
[most restrictive frequency range]	30-300	0.20	1.0

Power line frequencies (60 Hz) are well below the applicable range of these standards, and there is considered to be no compounding effect from simultaneous exposure to power line and radio frequency fields.



# – City of Santa Barbara – Verizon Wireless • Node No. 295307 "East Mesa SC2" 1618 Cliff Drive • Santa Barbara, California

# **General Facility Requirements**

Antennas for base station use are designed to concentrate their energy toward the horizon, with very little energy wasted toward the sky or the ground. Since the antennas need an unobstructed area in front of them, it is generally not possible for exposure conditions to approach the FCC limits without being physically very near the antennas.

# **Site Description**

The site in Santa Barbara was visited by Mr. David Kelly, a qualified field technician employed by Hammett & Edison, Inc., during normal business hours on September 15, 2022, a non-holiday weekday. Verizon had installed a tri-directional cylindrical antenna<sup>\*</sup> on the side of a utility pole sited in the public right-of-way on the south side of Cliff Drive, across the street from 1618 Cliff Drive (also known as 1618 Miramesa Drive) and behind the single-story residence located at 1614 Payeras Street. Access to the antenna was restricted by its mounting location and height. An explanatory sign had been posted on the pole below the antenna. There were observed no other wireless telecommunications base stations located at this site or nearby.

#### **Measurement Results**

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. Measurements were made from a bucket-truck in front of the antenna and at ground near the site. At each test point, the measurement results were compared with applicable FCC standards. The maximum power density level observed beyond 10 feet from the antenna was less than the applicable public limit. The maximum power density level observed for a person at ground near the site was 0.0038 mW/cm<sup>2</sup>, which is 1.9% of the most restrictive public limit.

#### **No Recommended Mitigation Measures**

Due to its mounting location and height, the Verizon antenna was not accessible to the general public, and so no additional mitigation measures are necessary to comply with the FCC public exposure guidelines. It is presumed that Verizon, as an FCC licensee, takes adequate precautions to ensure that its employees or contractors comply with FCC occupational exposure guidelines whenever work is required near the antenna.

Two directions were active, oriented generally east and southwest.

# – City of Santa Barbara – Verizon Wireless • Node No. 295307 "East Mesa SC2" 1618 Cliff Drive • Santa Barbara, California

### Conclusion

Based on the information and analysis above, it is the undersigned's professional opinion that the Verizon Wireless node located near 1618 Cliff Drive in Santa Barbara, as installed and operating at the time of the visit, 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

The undersigned author of this statement is a qualified Professional Engineer, holding California Registration Nos. E-13026 and M-20676, which expire on June 30, 2023. 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 <u>others</u>, which data he believes to be correct.

William F. Hammett, P.E. 6-30-2023 707/996-5200

October 11, 2022



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 IEEE C95.1-2019, "Safety Levels with Respect to Human Exposure to Electric, Magnetic, and Electromagnetic Fields, 0 Hz 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:



10 Frequency (MHz)

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. Hammett & Edison has incorporated conservative calculation formulas FCC Office in the of Engineering and Technology Bulletin No. 65 (August 1997) for projecting field levels in a computer program capable of calculating, at thousands of locations on an arbitrary grid, the total expected power density from any number of individual radio frequency sources. The program allows for the inclusion of uneven terrain in the vicinity, as well as any number of nearby buildings of varying heights, to obtain more accurate projections.



HAMMETT & EDISON, INC. CONSULTING ENGINEERS SAN FRANCISCO ©2022

# City of Santa Barbara – Crown Castle NG West LLC • Node No. ATTSBE14m1 401 Santa Fe Place • Santa Barbara, California

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

The firm of Hammett & Edison, Inc., Consulting Engineers, has been retained by the City of Santa Barbara to evaluate the Crown Castle node (Site No. ATTSBE14m1) located near 401 Santa Fe Place in Santa Barbara, California, for compliance with appropriate guidelines limiting human exposure to radio frequency ("RF") electromagnetic fields.

# **Executive Summary**

Crown Castle had installed a cylindrical antenna at a utility pole located near 401 Santa Fe Place in Santa Barbara. All exposure levels under the existing conditions for anyone in publicly accessible areas nearby were well below the federal standard.

# **Prevailing Exposure Standard**

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 FCC limit for exposures of unlimited duration to radio frequency energy for several wireless services are as follows:

	Transmit	"Uncontrolled"	Occupational Limit
Wireless Service Band	Frequency	Public Limit	(5 times Public)
Microwave (point-to-point)	1–80 GHz	$1.0 \text{ mW/cm}^2$	$5.0 \text{ mW/cm}^2$
Millimeter-wave	24–47	1.0	5.0
Part 15 (WiFi & other unlicensed)	2–6	1.0	5.0
C-Band	3,700 MHz	1.0	5.0
CBRS (Citizens Broadband Radio)	3,550	1.0	5.0
BRS (Broadband Radio)	2,490	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
600 MHz	617	0.41	2.05
[most restrictive frequency range]	30-300	0.20	1.0

Power line frequencies (60 Hz) are well below the applicable range of these standards, and there is considered to be no compounding effect from simultaneous exposure to power line and radio frequency fields.



# City of Santa Barbara – Crown Castle NG West LLC • Node No. ATTSBE14m1 401 Santa Fe Place • Santa Barbara, California

### **General Facility Requirements**

Antennas for base station use are designed to concentrate their energy toward the horizon, with very little energy wasted toward the sky or the ground. Since the antennas need an unobstructed area in front of them, it is generally not possible for exposure conditions to approach the FCC limits without being physically very near the antennas.

#### **Site Description**

The site in Santa Barbara was visited by Mr. David Kelly, a qualified field technician employed by Hammett & Edison, Inc., during normal business hours on September 15, 2022, a non-holiday weekday. Crown Castle had installed a cylindrical antenna, for use by AT&T Mobility, on a communications cable at the utility pole in the public right-of-way at the northwest corner of the intersection between Santa Fe Place and Cliff Drive, behind the apartment building located at 401 Santa Fe Place. Access to the antenna was restricted by its mounting location and height. Explanatory signs had been posted on the antenna and on the pole below the antenna. There were observed no other wireless telecommunications base stations located at this site or nearby.

#### **Measurement Results**

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. Measurements were made from a bucket-truck in front of the antenna and at ground near the site. At each test point, the measurement results were compared with applicable FCC standards. The maximum power density level observed beyond 1 foot from the antenna was less than the applicable public limit. The maximum power density level observed for a person at ground near the site was 0.00015 mW/cm<sup>2</sup>, which is 0.075% of the most restrictive public limit.

#### **No Recommended Mitigation Measures**

Due to its mounting location and height, the antenna were not accessible to the general public, and so no additional mitigation measures are necessary to comply with the FCC public exposure guidelines. It is presumed that Crown Castle and AT&T take adequate precautions to ensure that their employees or contractors comply with FCC occupational exposure guidelines whenever work is required near the antenna.



# City of Santa Barbara – Crown Castle NG West LLC • Node No. ATTSBE14m1 401 Santa Fe Place • Santa Barbara, California

### Conclusion

Based on the information and analysis above, it is the undersigned's professional opinion that the Crown Castle node located near 401 Santa Fe Place in Santa Barbara, as installed and operating at the time of the visit, 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

The undersigned author of this statement is a qualified Professional Engineer, holding California Registration Nos. E-13026 and M-20676, which expire on June 30, 2023. 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 <u>others</u>, which data he believes to be correct.

20676 William F. Hammett, P.E. 6-30-2023 707/996-5200

October 11, 2022





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 IEEE C95.1-2019, "Safety Levels with Respect to Human Exposure to Electric, Magnetic, and Electromagnetic Fields, 0 Hz 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:



10 Frequency (MHz)

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. Hammett & Edison has incorporated conservative calculation formulas FCC Office in the of Engineering and Technology Bulletin No. 65 (August 1997) for projecting field levels in a computer program capable of calculating, at thousands of locations on an arbitrary grid, the total expected power density from any number of individual radio frequency sources. The program allows for the inclusion of uneven terrain in the vicinity, as well as any number of nearby buildings of varying heights, to obtain more accurate projections.



HAMMETT & EDISON, INC. CONSULTING ENGINEERS SAN FRANCISCO ©2022

# – City of Santa Barbara – Crown Castle NG West LLC • Node No. State-07 120 Chapala Street • Santa Barbara, California

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

The firm of Hammett & Edison, Inc., Consulting Engineers, has been retained by the City of Santa Barbara to evaluate the Crown Castle node (Site No. State-07) located at 120 Chapala Street in Santa Barbara, California, for compliance with appropriate guidelines limiting human exposure to radio frequency ("RF") electromagnetic fields.

# **Executive Summary**

Crown Castle had installed a cylindrical antenna on a decorative pole at 120 Chapala Street in Santa Barbara. All exposure levels under the existing conditions for anyone in publicly accessible areas nearby were well below the federal standard.

# **Prevailing Exposure Standard**

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 FCC limit for exposures of unlimited duration to radio frequency energy for several wireless services are as follows:

	Transmit	"Uncontrolled"	Occupational Limit
Wireless Service Band	Frequency	Public Limit	(5 times Public)
Microwave (point-to-point)	1–80 GHz	$1.0 \text{ mW/cm}^2$	$5.0 \text{ mW/cm}^2$
Millimeter-wave	24–47	1.0	5.0
Part 15 (WiFi & other unlicensed)	2–6	1.0	5.0
C-Band	3,700 MHz	1.0	5.0
CBRS (Citizens Broadband Radio)	3,550	1.0	5.0
BRS (Broadband Radio)	2,490	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
600 MHz	617	0.41	2.05
[most restrictive frequency range]	30-300	0.20	1.0



# City of Santa Barbara – Crown Castle NG West LLC • Node No. State-07 120 Chapala Street • Santa Barbara, California

### **General Facility Requirements**

Antennas for base station use are designed to concentrate their energy toward the horizon, with very little energy wasted toward the sky or the ground. Since the antennas need an unobstructed area in front of them, it is generally not possible for exposure conditions to approach the FCC limits without being physically very near the antennas.

# **Site Description**

The site in Santa Barbara was visited by Mr. David Kelly, a qualified field technician employed by Hammett & Edison, Inc., during normal business hours on September 15, 2022, a non-holiday weekday. Crown Castle had installed a cylindrical antenna, for use by Verizon Wireless, on top of the decorative steel pole sited in the public right-of-way on the northeast side of Chapala Street, near the west corner of the two-story residence located at 120 Chapala Street. Access to the antenna was restricted by its mounting location and height. Explanatory signs had been posted on the pole below the antenna. There were observed no other wireless telecommunications base stations located at this site or nearby.

#### **Measurement Results**

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. Measurements were made from a bucket-truck in front of the antenna and at ground near the site. At each test point, the measurement results were compared with applicable FCC standards. The maximum power density level observed beyond 3 feet from the antenna was less than the applicable public limit. The maximum power density level observed for a person at ground near the site was 0.00090 mW/cm<sup>2</sup>, which is 0.45% of the most restrictive public limit.

#### **No Recommended Mitigation Measures**

Due to its mounting location and height, the antenna were not accessible to the general public, and so no additional mitigation measures are necessary to comply with the FCC public exposure guidelines. It is presumed that Crown Castle and Verizon take adequate precautions to ensure that their employees or contractors comply with FCC occupational exposure guidelines whenever work is required near the antenna.



# – City of Santa Barbara – Crown Castle NG West LLC • Node No. State-07 120 Chapala Street • Santa Barbara, California

### Conclusion

Based on the information and analysis above, it is the undersigned's professional opinion that the Crown Castle node located at 120 Chapala Street in Santa Barbara, as installed and operating at the time of the visit, 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

The undersigned author of this statement is a qualified Professional Engineer, holding California Registration Nos. E-13026 and M-20676, which expire on June 30, 2023. 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, P.E. 6-30-2023 707/996-5200

October 11, 2022





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 IEEE C95.1-2019, "Safety Levels with Respect to Human Exposure to Electric, Magnetic, and Electromagnetic Fields, 0 Hz 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:



10 Frequency (MHz)

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. Hammett & Edison has incorporated conservative calculation formulas FCC Office in the of Engineering and Technology Bulletin No. 65 (August 1997) for projecting field levels in a computer program capable of calculating, at thousands of locations on an arbitrary grid, the total expected power density from any number of individual radio frequency sources. The program allows for the inclusion of uneven terrain in the vicinity, as well as any number of nearby buildings of varying heights, to obtain more accurate projections.



HAMMETT & EDISON, INC. CONSULTING ENGINEERS SAN FRANCISCO ©2022