



City and County of San Francisco  
**DEPARTMENT OF PUBLIC HEALTH**  
**ENVIRONMENTAL HEALTH SECTION**

Edwin Lee, Mayor  
 Barbara A. Garcia, MPA, Director of Health  
 Richard Lee, MPH, CIH, REHS, Director of EH

February 18, 2015

**TO:** Rassendyll Dennis, Dept. of Public Works, Bureau of Street Use and Mapping  
**FROM:** Patrick Fosdahl, Dept. Of Public Health, Environmental Health Services *PF*  
**RE:** ExteNet Pole Mounted Amphenol CWS070X06F, CWB070X06F, CWT360X06F

<u>Location:</u>	<u>DPW Application:</u>	<u>Node#</u>
935 Filbert St	TBD	144B
1348 Columbus Ave	14WR-0104	76B
1379 Vallejo St	14WR-0115	157
2414 Jones St	TBD	125B
1116 Greenwich St	14WR-0110	136B
2565 Larkin St	14WR-0112	141C
2147 Mason St	14WR-0106	86B
999 Lombard St	14WR-0113	91B
848 Battery St	14WR-0117	63
1950 Kearny St	14WR-0119	67
1487 Greenwich St	14WR-0120	139
1848 Mason St	TBD	145B
742 Green St	TBD	147
99 Aladdin Terrace	TBD	148
2363 Van Ness Av	14WR-0124	156
1267 Green St	14WR-0125	202
1435 Larkin St	14WR-0126	214
751 Lombard St	14WR-0128	92
1050 Filbert St	TBD	199

As requested, I have reviewed the documentation that you and ExteNet have provided to me regarding the proposed installation of an Amphenol antenna (CWS070X06F, CWB070X06F or CST360X06F) on a utility pole or similar structures located at the above listed locations in the City and County of San Francisco.

This review included the November 12, 2014 radio frequency energy report prepared by Hammett and Edison Inc. The report states that one Amphenol antenna (CWS070X06F, CWB070X06F or CST360X06F) will be mounted on a utility pole near the locations listed above. The antenna will be at least 24 feet above the ground level. Due to the mounting location, the antenna would not be accessible to the general public. It was also indicated in the report that no building will be located within seven feet and 8 inches of the face of the antennas.

The maximum effective radiated power from these antennas is estimated to be 61 watts.

The maximum calculated exposure level at the ground level for any of the listed locations will not exceed 0.0019 mW/cm<sup>2</sup> which is .19% of the FCC public exposure standard. The three dimensional perimeter of the radio frequency (RF) levels equal to the public exposure limit is calculated to extend a maximum of 3 feet from the face of the antenna and does not reach any publicly accessible areas. The maximum

calculated level of radio frequency energy for any of the nearby residences (1848 Mason Street, located at 7 feet and 8 inches away) is 0.19 mW/cm<sup>2</sup> or 19% of the public exposure standard.

Based on the information provided in the Hammett and Edison report, I would confirm that these ExteNet, Amphenol antenna, utility pole installations would be in compliance with the FCC standards and would not produce exposures exceeding the FCC public exposure limits.

In addition, a noise evaluation was done on the combination of equipment to be installed at these locations by Hammett and Edison, Inc. dated May 21, 2014. This evaluation found that none of the equipment being installed will produce noise. My understanding is that this is the same equipment to be installed at these locations. As such, the installation of the equipment would be in compliance with the noise standards as outlined in the DPW Code, Article 25.

#### **Approval Conditions:**

- Ensure that any equipment associated with the pole installation of these antennas does not produce a noise in excess of 45 dBA as measured at three (3) feet from the nearest residential building façade.
- Ensure that there are no publicly occupied areas within three (3) feet of any antenna.
- Once the antennas are installed, ExteNet must take RF power density measurements with the antennas operating at full power to verify the level reported in the Hammett and Edison report and to ensure that the FCC public exposure level is not exceeded in any publicly accessible area. This measurement must be taken again at the time of the permit renewal.
- ExteNet should be aware that the general public may have concerns about the antennas and potential RF source near their dwellings. ExteNet should have in place a mechanism for taking RF power density levels in nearby dwellings when requested by the members of the general public.
- In accordance with the San Francisco Public Works Code, Art. 25, Sec. 1527 (a)(2)(C) Extenet is responsible for paying a fee of \$181.00 to the San Francisco Department of Public Health for this review.

Please note that this approval and any conditions apply only to the equipment and installation as described. If any changes in the equipment or any increase in the effective radiated power described above are made, a new review by the Department of Public Health must be conducted.



**ExteNet Systems CA, LLC • Proposed DAS Nodes  
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**Statement of Hammett & Edison, Inc., Consulting Engineers**

The firm of Hammett & Edison, Inc., Consulting Engineers, has been retained on behalf of ExteNet Systems CA, LLC, a wireless telecommunications service provider, to evaluate the addition of nine new nodes to be added to the ExteNet distributed antenna system (“DAS”) in San Francisco, California, for compliance with appropriate guidelines limiting human exposure to radio frequency (“RF”) electromagnetic fields.

**Background**

The San Francisco Department of Public Health has adopted a 10-point checklist for determining compliance of proposed Wireless Telecommunication Service (“WTS”) facilities or proposed modifications to such facilities with prevailing safety standards. The acceptable limits set by the FCC for exposures of unlimited duration are:

Wireless Service	Frequency Band	Occupational Limit	Public Limit
Microwave (Point-to-Point)	5–80 GHz	5.00 mW/cm <sup>2</sup>	1.00 mW/cm <sup>2</sup>
Wi-Fi	2.4–5	5.00	1.00
BRS (Broadband Radio)	2.6	5.00	1.00
AWS (Advanced Wireless)	2.1	5.00	1.00
PCS (Personal Communication)	1.9	5.00	1.00
Cellular	870 MHz	2.90	0.58
SMR (Specialized Mobile Radio)	855	2.85	0.57
700 MHz	700	2.40	0.48
[most restrictive frequency range]	30–300	1.00	0.20

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.

Reference has been made to zoning drawings by Prescott Communications, Inc., dated between July 3, 2014, and October 31, 2014, and to additional information provided by ExteNet.

**Checklist**

*1. The location of all existing antennas and facilities at site. Existing RF levels.*

There are reported no wireless base stations presently installed at these sites. Existing RF levels at ground near utility poles in residential areas of San Francisco are typically less than 1% of the most restrictive public exposure limit.



**ExteNet Systems CA, LLC • Proposed DAS Nodes  
Nineteen Joint Pole Locations • San Francisco, California**

2. The location of all approved (but not installed) antennas and facilities. Expected RF levels from approved antennas.

There were reported no wireless base stations approved but not installed at these sites.

3. The number and types of WTS within 100 feet of proposed site and estimates of additive EMR emissions at proposed site.

While there may be other WTS antennas within 100 feet of some of these nodes, the additional EMR emissions from the proposed operations would not be significant in terms of compliance with the prevailing standard.

4. Location (and number) of Applicant's antennas and back-up facilities per building and location (and number) of other WTS at site.

ExteNet proposes to install one Amphenol Model CWS070X06F or CWB070X06F directional panel antenna or one Amphenol Model CWT360X06F omnidirectional antenna at effective heights of at least 24 feet above ground\* at each of the new DAS nodes on the utility poles at the approximate addresses shown below, along with the distance from the antenna at each location to the nearest building:

Node #	Approximate Address	Distance from Antenna to Nearest Residence	Effective Height of Antenna
63	848 Battery Street	14' 0"	31' 0"
67	1950 Kearny Street	12' 0"	35' 0"
76B	1348 Columbus Avenue	18' 0"	29' 0"
86B	2147 Mason Street	15' 0"	33' 6"
91B	999 Lombard Street	20' 0"	33' 0"
92	751 Lombard Street	14' 0"	34' 0"
125B	2414 Jones Street	15' 3"	32' 0"
136B	1116 Greenwich Street	14' 0"	37' 0"
139	1487 Greenwich Street	14' 0"	33' 0"
141C	2565 Larkin Street	14' 0"	32' 0"
144B	935 Filbert Street	10' 0"	30' 6"
145B	1848 Mason Street	7' 8"	36' 2"
147	742 Green Street	14' 0"	27' 8"
148	99 Aladdin Terrace	14' 0"	31' 0"
156	2363 Van Ness Avenue	13' 0"	33' 0"
157	1379 Vallejo Street	14' 0"	24' 0"
199	1050 Filbert Street	14' 0"	26' 6"
202	1267 Green Street	14' 0"	33' 0"
214	1435 Larkin Street	14' 0"	34' 0"

*Table 1. ExteNet Nodes*

\* Node 157 is the lowest, at 24 feet.



**ExteNet Systems CA, LLC • Proposed DAS Nodes  
Nineteen Joint Pole Locations • San Francisco, California**

5. Power rating (maximum and expected operating power) for all existing and proposed backup equipment subject to application.

The expected operating power of the carrier's transmitters is reflected in the resulting effective radiated power given in Item 6 below; the transmitters may operate at a power below their maximum rating.

6. Total number of watts per installation and total number of watts for all installations at site.

The maximum effective radiated power proposed by Verizon Wireless at each of the nodes is 61 watts in the PCS/AWS bands, with reduced levels above and below the antennas. There are no other carriers presently proposing to use these ExteNet nodes.

7. Plot or roof plan showing method of attachment of antennas, directionality of antennas, and height above roof level. Discuss nearby inhabited buildings.

The drawings show the proposed antennas to be installed as described in Item 4 above. As shown in Table 1 above, the nearest buildings are located at least 7½ feet from the proposed antennas.

8. Estimated ambient RF levels for proposed site and identify three-dimensional perimeter where exposure standards are exceeded.

For a person anywhere at ground, the maximum ambient RF exposure level due to the proposed ExteNet operations is calculated to be 0.0019 mW/cm<sup>2</sup>, which is 0.19% of the applicable public exposure limit. The maximum calculated level on any floor of any nearby building<sup>†</sup> (located at least 7½ feet away) is 0.19 mW/cm<sup>2</sup>, which is 19% of the public exposure limit.

The three-dimensional perimeter of RF levels equal to the public exposure limit is calculated to extend less than 3 feet out from the antennas and to lesser distances above and below; this does not reach any nearby building or other publicly accessible area.

9. Describe proposed signage at site.

Due to their mounting locations, the ExteNet antennas would not be accessible to unauthorized personnel, and so no mitigation measures are necessary to comply with the FCC public exposure guidelines. Because the FCC occupational limit is calculated to extend only 16 inches directly in front of the antennas, the proposed operations can be considered intrinsically compliant with FCC occupational exposure guidelines, and so no mitigation measures are required for direct access by those authorized personnel. It is recommended that small explanatory signs<sup>‡</sup> be posted on the antennas, to comply with City of San Francisco directives.

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<sup>†</sup> Node 145B is the closest to any building, at 7' 8".

<sup>‡</sup> The San Francisco Department of Public Health has accepted the use of diamond signs in English at 2 inches on a side. Signage may also need to comply with the requirements of California PUC General Order No 95.

**ExteNet Systems CA, LLC • Proposed DAS Nodes  
Nineteen Joint Pole Locations • San Francisco, California**

*10. Statement of authorship.*

The undersigned author of this statement is a qualified Professional Engineer, holding California Registration No. E-20309, which expires on March 31, 2015. This work has been carried out under her direction, and all statements are true and correct of her own knowledge except, where noted, when data has been supplied by others, which data she believes to be correct.

**Conclusion**

Based on the information and analysis above, it is the undersigned's professional opinion that the proposed operation of the ExteNet Systems CA, LLC nodes at the identified locations in San Francisco, California, will comply with the prevailing standards for limiting public exposure to radio frequency energy and, therefore, will not for this reason cause a significant impact on the environment. The highest calculated level in publicly accessible areas is much less than the prevailing standards allow for exposures of unlimited duration. This finding is consistent with measurements of actual exposure conditions taken at other operating nodes. No mitigation measures are required to meet the FCC public and occupational exposure guidelines.

November 12, 2014



*Andrea L. Bright*  
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