



05/11/2021

**City of Grand Rapids**

**Small and Micro Cell Wireless Facilities Sites**

**Radio Frequency (RF) Power Density Measurements for the Year 2021**

**Executive Summary:**

Geotech, Inc. performed broadband power density measurements of existing small and micro cell sites to determine compliance or non-compliance with the existing requirements for the general public as set by the Federal Communications Commission (FCC) and other international agencies. As of May 7th, 2021, seventy-nine (79) sites were tested, and the measurements of the maximum power density were less than four and one-half (4.5) percent of the Maximum Permissible Exposure (MPE) limit as set by the FCC.

**Objective:**

Perform small and micro cell radio frequency testing to determine compliance or non-compliance of the Maximum Permissible Exposure (MPE) power densities with the applicable requirements as set by the Federal Communications Commission (FCC) and other international agencies.

Testing shall be performed for existing installations, and repeated every 3-years. New installation shall be tested on a yearly basis and repeated every 3-years.

**Background Information:**

1. Number of cell sites: As of this date, there are 479 existing and proposed sites. 79 sites were active and tested, since last year's testing.
2. Several types of radio/antenna/pole installations have been installed and/or are proposed. The known radio frequencies of the small/micro cells range from 800 megahertz (MHz) to 6 gigahertz (GHz).
3. The following service providers have, or propose to have small/micro cells within the City limits: Verizon & AT&T (These sites are operated by ACD, Mobilitie, and Zayo).
4. The Federal Communications Commission (FCC) regulates and allocates the radio frequencies. The Institute of Electrical and Electronic Engineers (IEEE) has developed Standard 95.1; which was adopted by the FCC. Similar standards were developed by other agencies; which included the International Commission on Non-Ionizing Radiation

Protection (ICNIRP) and Canada Code 6. These standards define the limits for Maximum Permissible Exposure (MPE) Power Densities (in Watts/Meter Squared) as follows:

	<u>FCC</u> <u>(1.5-100GHz)</u>	<u>INCIRP</u> <u>(2-300GHz)</u>	<u>Canada</u> <u>(6-150GHz)</u>
Occupational	50	50	50
Non-Occupational (General Public)	10	10	10

5. Because the atmosphere is flooded with nearly unlimited radio transmissions from various sources, it may in some cases be difficult to distinguish between existing radiation levels and new small/micro cell radiation levels. Based on these factors, it was decided to perform broadband power density measurements to account for the frequencies ranging from 300KHz to 50GHz; which includes the operating frequencies for the small/micro cells. These measurements identify the existing power densities, and determine compliance or non-compliance with the FCC standards.
6. Ground level Safety: Radio frequency emissions from antennae used for cellular transmissions result in exposure levels on the ground that are typically below the safety limits which were adopted by the FCC based on the recommendations of expert organizations, and endorsed by agencies of the Federal Government responsible for health and safety.

**Testing Procedures and Parameters:**

1. Test Instrument: Narda NBM-550-S with FCC probe #EA5091
2. Measurements were made at Six (6) feet above ground at distances of 10 feet, 50 feet and 100 feet away from the pole/cell base
3. Measurements were broadband base and account for radio frequencies ranging from 300KHz to 50GHz
4. Measurements recorded the maximum readings as a percentage of the Maximum Permissible Exposure (MPE) power densities for occupational permissible limit. These measurements were converted to non-occupational (general public) power densities, and were compared with its MPE limit. Note: the MPE for non-occupational (general public) permissible limit is lower by a factor of 5 in comparison with the occupational permissible limit.

**Testing Results:** Refer to:

1. Attachment #1 – Summary of Radio Frequency (RF) Power Density Testing – Non-Occupational
2. Attachment #2 – Radio Frequency (RF) Power Density Testing - Non-Occupational
3. Attachment #3 – Radio Frequency (RF) Power Density Testing - Occupational and Non-Occupational

**Conclusions:**

1. The exposure of the general public to radio frequency power densities at six (6) feet above ground is less than four and one-half (4.5) percent of the Maximum Permissible Exposure set by the FCC.

### Attachment #1 - Summary of Radio Frequency (RF) Power Density Testing - Non-Occupational

#### City of Grand Rapids/Small and Micro Cell Radio Frequency (RF) Power Density Testing - Non-Occupational

Count	Small Cell	Approved Date	Address	Results as Percentage (%) of Maximum Permissible Exposure (MPE) for FCC Non-Occupational Limits							
				Measurements at 6 feet above Ground							
				Direction	Distance from Pole			Direction	Distance from Pole		
					10 ft.	50 ft.	100 ft.		10 ft.	50 ft.	100 ft.
1	AT&T	9/3/2019	332 Barclay Ave. NE	N	0.2010	0.4095	0.3130	S	0.1340	0.1790	0.4025
2	AT&T	9/3/2019	309 Fulton St. W	W	0.9950	0.8190	0.8780	E	1.2580	1.6385	0.9950
3	AT&T	9/13/2019	1516 Wealthy St. SE	W	0.2460	0.1565	0.2925	E	0.1115	0.2680	0.3350
4	AT&T	8/31/2020	176 Campaue Ave. N	N	1.7875	1.1120	0.5560	S	4.4475	0.9950	1.4630
5	ACD	9/1/2017	2 Bartlett St. SW	W	1.5215	0.4245	0.4025	E	0.3130	2.2530	0.3130
6	ACD	5/24/2019	1143 Wealthy St. SE	W	0.4915	0.5365	0.4915	E	0.5365	1.5125	1.8550
7	ACD	5/24/2019	236 Grandville Ave. SW	N	0.7020	0.6730	0.6435	S	0.3510	0.4245	0.3800
8	ACD	5/29/2019	49 Ionia Ave. NW	N	1.3750	2.2235	0.3130	S	1.3460	0.8485	1.4920
9	AT&T	10/23/2018	200 Cherry St. SE	W	2.0775	0.9070	1.5800	E	0.2235	0.2925	0.8190
10	Verizon	6/9/2020	1404 Hall St. SE	W	0.1140	0.1715	0.2855	E	0.2570	0.2855	0.0855
11	Verizon	6/9/2020	313 Griggs St. SE	W	0.2460	0.4245	0.3800	E	0.2680	0.3350	0.2680
12	Verizon	6/9/2020	1966 Madison Ave. SE	N	0.2235	0.3800	0.5365	S	0.2905	0.4245	0.5810
13	Verizon	6/9/2020	1640 Margaret Ave. SE	N	0.1465	0.8780	0.1170	S	0.2050	0.4680	0.5560
14	Verizon	6/9/2020	2153 McKee Ave. SW	N	0.3130	0.6035	0.6705	S	0.5140	0.8495	0.7600
15	Verizon	6/9/2020	2364 Nelson Ave. SE	W	0.3350	0.5365	0.5365	E	0.7600	0.7155	0.8045
16	Verizon	6/9/2020	1802 Century Ave. SW	N	0.3095	0.2680	0.3130	S	0.3130	0.5055	0.5540
17	Verizon	6/9/2020	929 Ardmore St. SE	W	0.5140	0.3350	0.4025	E	0.4025	0.3130	0.4245
18	Verizon	6/9/2020	1020 Merrifield St. SE	W	0.2680	0.3575	0.3130	E	0.2460	0.2905	0.4245
19	Verizon	6/9/2020	563 Monroe Ave. NW	N	0.1340	2.0100	0.5590	S	0.1565	0.3130	0.1790
20	Verizon	6/9/2020	506 Vries St. SW	N	0.6035	0.8940	0.6260	S	0.6035	0.6480	0.5810
21	Verizon	6/9/2020	1704 Boston St. SE	W	0.2010	0.2460	0.3800	E	0.1565	0.2010	0.1565
22	Verizon	6/9/2020	2917 Burton St. SE	W	0.5365	0.6035	0.6705	E	0.3220	0.4025	0.5590
23	Verizon	6/9/2020	928 Adams St. SE	W	0.2905	0.2235	0.2680	E	0.4470	0.4025	0.3800
24	Verizon	6/9/2020	1845 Darwin Ave. SW	N	0.2010	0.2460	0.4245	S	0.2235	0.2680	0.2010
25	Verizon	6/9/2020	2927 Hampshire Blvd. SE	W	0.1340	0.2925	0.4390	E	0.3130	0.3350	0.2010
26	Verizon	6/19/2020	553 Giddings Ave. SE	N	0.8485	0.3805	0.8780	S	1.2875	1.1120	1.1705
27	Verizon	6/19/2020	2144 Madison Ave. SE	N	0.8950	0.0670	0.1790	S	0.3740	0.1565	0.1140
28	Verizon	6/19/2020	2522 Eastern Ave. SE	N	0.2235	0.3350	0.5140	S	0.6035	0.6480	0.7375
29	Verizon	6/19/2020	445 Grandville Ave. SW	N	0.3800	0.5625	0.5590	S	0.4975	0.5560	0.6435
30	Verizon	6/19/2020	725 Union Ave. SE	N	0.5365	0.7375	0.8270	S	0.9390	0.8720	0.8495
31	Verizon	6/19/2020	646 Ethel Ave. SE	N	0.0295	3.5695	0.0945	S	0.2925	0.1170	0.1115
32	Verizon	6/22/2020	616 Oakdale St. SE	W	0.0895	0.1115	0.0670	E	0.0895	0.2905	0.3130
33	Verizon	6/24/2020	2342 Onekama Dr. SE	W	0.2680	1.4915	1.3800	E	0.3800	0.3265	0.4915
34	Verizon	6/24/2020	3073 Burton St. SE	W	0.5365	0.6260	0.4915	E	0.4025	0.2905	0.4695
35	Verizon	6/24/2020	1751 Morningside Dr. SE	N	0.4025	0.5140	0.3575	S	0.8270	0.6260	0.6035
36	Verizon	6/25/2020	1420 Eastern Ave. SE	N	0.3350	0.4915	0.3575	S	0.3800	0.4695	0.4245
37	Verizon	6/25/2020	1541 Mackinaw Rd. SE	W	0.4915	0.4245	0.4470	E	0.3350	3.3500	0.2905
38	Verizon	6/30/2020	603 Burton St. SE	W	0.3800	0.4470	0.4915	E	0.4470	0.5365	0.4695
39	Verizon	7/2/2020	1740 Burton St. SE	W	0.0670	0.2235	0.1115	E	0.1565	0.2680	0.1565
40	Verizon	7/2/2020	453 Pleasant St. SW	W	0.5140	0.6480	0.5620	E	0.5140	0.4025	0.4695
41	Verizon	7/2/2020	632 Lafayette Ave. SE	N	0.6480	0.7155	0.8495	S	0.6930	0.5140	0.5810
42	Verizon	7/2/2020	921 Sherman St. SE	W	0.5140	0.4245	0.7155	E	0.8270	0.6035	0.5810
43	Verizon	7/2/2020	1848 Rosemont Ave. SE	W	0.0570	0.2000	0.1425	E	0.1425	0.1425	0.3140
44	Verizon	7/2/2020	1032 Worden St. SE	W	2.0000	0.3425	0.4285	E	0.4570	0.2570	0.2570
45	Verizon	7/2/2020	112 Putnam St. SW	W	0.6480	1.9395	0.6480	E	0.6705	0.4025	0.3800
46	Verizon	7/2/2020	221 Hall St. SW	W	0.1115	0.1565	0.2010	E	0.1115	0.4915	0.3130
47	Verizon	9/24/2020	2 Baylis St. SW	N	0.0570	0.0570	0.1870	W	0.1425	0.2285	0.0570
48	Verizon	9/24/2020	1704 Madison Ave. SE	N	1.0090	0.1140	0.3130	S	0.4470	0.3130	0.4915
49	Verizon	9/25/2020	1100 Kalamazoo Ave. SE	N	0.9710	0.4570	0.2570	S	0.2000	0.2855	0.2285
50	Verizon	9/25/2020	921 Bates St SE	W	0.7780	0.6565	0.5995	E	2.4295	0.6280	0.7425
51	Verizon	9/25/2020	939 Kalamazoo Ave.	N	0.6855	2.2425	1.1995	S	0.4285	0.7995	0.6855
52	Verizon	9/25/2020	1102 Madison Ave. SE	N	0.4245	0.3800	0.2680	S	0.2010	0.2905	0.1790
53	Verizon	9/28/2020	873 Griggs St. SE	W	0.1715	0.3140	0.1715	E	0.5140	0.3710	0.2285
54	Verizon	9/30/2020	706 Winchell	W	0.1715	0.4285	0.6565	E	0.5995	0.5710	0.3710
55	Verizon	9/30/2020	601 Wealthy St SE	W	1.0090	0.6280	0.6855	E	3.4760	0.8225	0.9720
56	Verizon	10/9/2020	158 Corinne SW	N	0.1870	0.7100	0.2285	S	0.4570	0.5995	0.6280
57	Verizon	10/9/2020	1700 Francis Ave. SE	W	0.0285	0.0855	0.1715	E	0.1425	0.2615	0.0285
58	Verizon	10/9/2020	1936 Eastern Ave. SE	N	0.0570	0.4855	0.2000	S	0.1495	0.2000	0.2615
59	Verizon	12/16/2020	1747 College Ave. SE	N	0.1425	0.0285	1.1200	S	0.2000	0.0285	0.0570
60	Verizon	12/16/2020	1406 Adams St. SE	W	0.0570	0.1425	0.3425	E	0.1425	0.3425	0.1715
61	Verizon	12/16/2020	1629 College Ave. SE	N	0.0570	0.1140	0.0285	S	0.5140	0.1425	0.0855
62	Verizon	12/16/2020	1607 Chamberlain Ave. SE	N	0.2000	0.2855	0.2285	S	0.1140	0.3140	0.1140
63	Verizon	12/16/2020	2356 Burton St. SE	W	0.2285	0.2000	0.1140	E	0.0285	0.4285	0.2855
64	Verizon	12/16/2020	3000 Alger St. SE	W	0.4855	0.3140	0.4570	E	0.2000	0.4285	0.3995
65	Verizon	12/16/2020	803 Watkins St. SE	W	0.1425	0.2570	0.4570	E	0.2570	0.1715	0.2570
66	Verizon	12/16/2020	844 Giddings Ave. SE	N	0.1425	0.4855	0.0855	S	0.2000	0.3140	0.5140
67	Verizon	12/16/2020	664 Wealthy St. SE	W	0.3710	0.3710	0.5425	E	0.1715	0.6565	0.3425
68	Verizon	12/16/2020	1026 Burton St. SE	W	0.3710	0.1140	0.3140	E	0.3140	0.2285	0.0855
69	Verizon	12/16/2020	902 S Othillia St. SE	W	0.4570	0.6855	0.6855	E	0.0855	0.2570	0.3995
70	Verizon	12/16/2020	1601 Philadelphia Ave. SE	W	0.0570	0.0570	0.1425	E	0.1140	0.0855	0.2000
71	Verizon	12/22/2020	1251 Edna St. SE	W	0.7425	0.5140	0.3710	E	0.2000	0.0570	0.3140
72	Verizon	12/23/2020	1125 Cooper Ave. SE	N	0.2070	0.3995	0.5140	S	0.0855	0.2570	0.8280
73	Verizon	12/23/2020	2544 Ardmore St. SE	N	0.1715	0.2855	0.5710	S	0.3425	0.4855	0.3140
74	Verizon	12/23/2020	1208 Kalamazoo Ave. SE	W	1.1135	0.7425	0.9425	E	0.7995	0.9425	0.8280
75	Verizon	12/23/2020	1450 Marshall Ave. SE	N	0.2000	0.2000	0.2285	S	0.3140	0.6565	0.6280
76	Verizon	12/23/2020	840 Burton St. SE	W	0.1140	0.2570	0.2285	E	0.4860	0.1425	0.1715
77	Verizon	12/23/2020	1448 Colorado Ave. SE	N	0.0855	0.2285	0.3140	S	0.2285	0.5710	0.5140
78	Verizon	3/2/2021	602 Union Ave. SE	N	0.1425	0.3425	0.2855	S	0.1425	0.2000	0.2570
79	Verizon		1834 Newton Ave. SE	N	0.5140	0.5425	0.5995	S	0.5140	0.5140	0.3995

#### Summary of Radio Frequency (RF) Power Density Testing - Non-Occupational

Max	2.0775	3.5695	1.5800	4.4475	3.3500	1.8550
Min	0.0285	0.0285	0.0285	0.0285	0.0285	0.0285
Median	0.3095	0.4095	0.4025	0.3140	0.4025	0.3995
Average	0.4493	0.5477	0.4583	0.4970	0.5088	0.4627

#### Notes

- For a complete description of testing procedures, parameters and results - see Full Report
- All values presented as a percentage of 10 watt/meter squared for non-occupational maximum permissible exposure
- Direction refers to measurement parallel to street direction
- Measurement at 6 feet above ground represents pedestrian height
- Above measurements are for active sites as of 5-7-21

**Attachment #2 - Radio Frequency (RF) Power Density Testing - Non-Occupational**  
**City of Grand Rapids/Small and Micro Cell Radio Frequency (RF) Power Density Testing - Non-Occupational**

Count	OBJECT ID	Small Cell	Pole Owner	Site ID	Site Status	Approved Date	Address	Results as Percentage (%) of Maximum Permissible Exposure (MPE) for FCC Non-Occupational Limits							
								Measurements at 6 feet above Ground							
								Direction	Distance from Pole			Direction	Distance from Pole		
									10 ft.	50 ft.	100 ft.		10 ft.	50 ft.	100 ft.
1	919	AT&T	Grand Rapids	GRRPD 005	Installation Complete	9/3/2019	332 Barclay Ave. NE	N	0.2010	0.4095	0.3130	S	0.1340	0.1790	0.4025
2	921	AT&T	Grand Rapids	GRRPD 029	Installation Complete	9/3/2019	309 Fulton St. W	W	0.9950	0.8190	0.8780	E	1.2580	1.6385	0.9950
3	918	AT&T	Grand Rapids	GRRPD 015	Installation Complete	9/13/2019	1516 Wealthy St. SE	W	0.2460	0.1565	0.2925	E	0.1115	0.2680	0.3350
4	913	AT&T	Grand Rapids	GRRPD 020	Installation Complete	8/31/2020	176 Campau Ave. N	N	1.7875	1.1120	0.5560	S	4.4475	0.9950	1.4630
5	474	ACD	Grand Rapids	10009	Installation Complete	9/1/2017	2 Bartlett St. SW	W	1.5215	0.4245	0.4025	E	0.3130	2.2530	0.3130
6	889	ACD	Grand Rapids	14353	Installation Complete	5/24/2019	1143 Wealthy St. SE	W	0.4915	0.5365	0.4915	E	0.5365	1.5125	1.8550
7	890	ACD	Grand Rapids	10011	Installation Complete	5/24/2019	236 Grandville Ave. SW	N	0.7020	0.6730	0.6435	S	0.3510	0.4245	0.3800
8	895	ACD	Grand Rapids	10017	Installation Complete	5/29/2019	49 Ionia Ave. NW	N	1.3750	2.2235	0.3130	S	1.3460	0.8485	1.4920
9	902	AT&T	Grand Rapids	GRRPD 026	Installation Complete	10/23/2018	200 Cherry St. SE	W	2.0775	0.9070	1.5800	E	0.2235	0.2925	0.8190
10	2960	Verizon	CE	40731	Installation Complete	6/9/2020	1404 Hall St. SE	W	0.1140	0.1715	0.2855	E	0.2570	0.2855	0.0855
11	2961	Verizon	CE	40760	Installation Complete	6/9/2020	313 Griggs St. SE	W	0.2460	0.4245	0.3800	E	0.2680	0.3350	0.2680
12	2963	Verizon	CE	40770	Installation Complete	6/9/2020	1966 Madison Ave. SE	N	0.2235	0.3800	0.5365	S	0.2905	0.4245	0.5810
13	2965	Verizon	CE	40781	Installation Complete	6/9/2020	1640 Margaret Ave. SE	N	0.1465	0.8780	0.1170	S	0.2050	0.4680	0.5560
14	2971	Verizon	CE	41116	Installation Complete	6/9/2020	2153 McKee Ave. SW	N	0.3130	0.6035	0.6705	S	0.5140	0.8495	0.7600
15	2974	Verizon	CE	40576	Installation Complete	6/9/2020	2364 Nelson Ave. SE	W	0.3350	0.5365	0.5365	E	0.7600	0.7155	0.8045
16	3371	Verizon	CE	40763	Installation Complete	6/9/2020	1802 Century Ave. SW	N	0.3095	0.2680	0.3130	S	0.3130	0.5055	0.5540
17	3379	Verizon	CE	40772	Installation Complete	6/9/2020	929 Ardmore St. SE	W	0.5140	0.3350	0.4025	E	0.4025	0.3130	0.4245
18	3774	Verizon	AT&T	40561	Installation Complete	6/9/2020	1020 Merrifield St. SE	W	0.2680	0.3575	0.3130	E	0.2460	0.2905	0.4245
19	3781	Verizon	CE	40336	Installation Complete	6/9/2020	563 Monroe Ave. NW	N	0.1340	2.0100	0.5590	S	0.1565	0.3130	0.1790
20	3788	Verizon	CE	40745	Installation Complete	6/9/2020	506 Vries St. SW	N	0.6035	0.8940	0.6260	S	0.6035	0.6480	0.5810
21	4189	Verizon	CE	40791	Installation Complete	6/9/2020	1704 Boston St. SE	W	0.2010	0.2460	0.3800	E	0.1565	0.2010	0.1565
22	4192	Verizon	CE	40867	Installation Complete	6/9/2020	2917 Burton St. SE	W	0.5365	0.6035	0.6705	E	0.3220	0.4025	0.5590
23	4205	Verizon	CE	40738	Installation Complete	6/9/2020	928 Adams St. SE	W	0.2905	0.2235	0.2680	E	0.4470	0.4025	0.3800
24	4209	Verizon	CE	40766	Installation Complete	6/9/2020	1845 Darwin Ave. SW	N	0.2010	0.2460	0.4245	S	0.2235	0.2680	0.2010
25	4213	Verizon	CE	40869	Installation Complete	6/9/2020	2927 Hampshire Blvd. SE	W	0.1340	0.2925	0.4390	E	0.3130	0.3350	0.2010
26	3383	Verizon	CE	40509	Installation Complete	6/19/2020	553 Giddings Ave. SE	N	0.8485	0.3805	0.8780	S	1.2875	1.1120	1.1705
27	3776	Verizon	CE	40562	Installation Complete	6/19/2020	2144 Madison Ave. SE	N	0.8950	0.0670	0.1790	S	0.3740	0.1565	0.1140
28	3779	Verizon	AT&T	40579	Installation Complete	6/19/2020	2522 Eastern Ave. SE	N	0.2235	0.3350	0.5140	S	0.6035	0.6480	0.7375
29	3783	Verizon	CE	40698	Installation Complete	6/19/2020	445 Grandville Ave. SW	N	0.3800	0.5625	0.5590	S	0.4975	0.5560	0.6435
30	4187	Verizon	CE	40515	Installation Complete	6/19/2020	725 Union Ave. SE	N	0.5365	0.7375	0.8270	S	0.9390	0.8720	0.8495
31	5818	Verizon	CE	40506	Installation Complete	6/19/2020	646 Ethel Ave. SE	N	0.0295	3.5695	0.0945	S	0.2925	0.1170	0.1115
32	3789	Verizon	CE	40743	Installation Complete	6/22/2020	616 Oakdale St. SE	W	0.0895	0.1115	0.0670	E	0.0895	0.2905	0.3130
33	4211	Verizon	CE	40837	Installation Complete	6/24/2020	2342 Onekama Dr. SE	W	0.2680	1.4915	1.3800	E	0.3800	0.3265	0.4915
34	4214	Verizon	CE	40875	Installation Complete	6/24/2020	3073 Burton St. SE	W	0.5365	0.6260	0.4915	E	0.4025	0.2905	0.4695
35	5013	Verizon	CE	40876	Installation Complete	6/24/2020	1751 Morningside Dr. SE	N	0.4025	0.5140	0.3575	S	0.8270	0.6260	0.6035
36	4207	Verizon	CE	40742	Installation Complete	6/25/2020	1420 Eastern Ave. SE	N	0.3350	0.4915	0.3575	S	0.3800	0.4695	0.4245
37	5414	Verizon	CE	40788	Installation Complete	6/25/2020	1541 Mackinaw Rd. SE	W	0.4915	0.4245	0.4470	E	0.3350	3.3500	0.2905
38	3771	Verizon	CE	40553	Installation Complete	6/30/2020	603 Burton St. SE	W	0.3800	0.4470	0.4915	E	0.4470	0.5365	0.4695
39	2984	Verizon	CE	40799	Installation Complete	7/2/2020	1740 Burton St. SE	W	0.0670	0.2235	0.1115	E	0.1565	0.2680	0.1565
40	3372	Verizon	CE	40707	Installation Complete	7/2/2020	453 Pleasant St. SW	W	0.5140	0.6480	0.5620	E	0.5140	0.4025	0.4695
41	3376	Verizon	CE	40503	Installation Complete	7/2/2020	632 Lafayette Ave. SE	N	0.6480	0.7155	0.8495	S	0.6930	0.5140	0.5810
42	3784	Verizon	CE	40703	Installation Complete	7/2/2020	921 Sherman St. SE	W	0.5140	0.4245	0.7155	E	0.8270	0.6035	0.5810
43	4191	Verizon	CE	40842	Installation Complete	7/2/2020	1848 Rosemont Ave. SE	W	0.0570	0.2000	0.1425	E	0.1425	0.1425	0.3140
44	4201	Verizon	CE	40715	Installation Complete	7/2/2020	1032 Worden St. SE	W	2.0000	0.3425	0.4285	E	0.4570	0.2570	0.2570
45	4202	Verizon	CE	40720	Installation Complete	7/2/2020	112 Putnam St. SW	W	0.6480	1.9395	0.6480	E	0.6705	0.4025	0.3800
46	4204	Verizon	CE	40727	Installation Complete	7/2/2020	221 Hall St. SW	W	0.1115	0.1565	0.2010	E	0.1115	0.4915	0.3130
47	8287	Verizon	CE	40609	Installation Complete	9/24/2020	2 Baylis St. SW	N	0.0570	0.0570	0.1870	W	0.1425	0.2285	0.0570
48	8289	Verizon	CE	40604	Installation Complete	9/24/2020	1704 Madison Ave. SE	N	1.0090	0.1140	0.3130	S	0.4470	0.3130	0.4915
49	1340	Verizon	CE	40534	Installation Complete	9/25/2020	1100 Kalamazoo Ave. SE	N	0.9710	0.4570	0.2570	S	0.2000	0.2855	0.2285
50	1343	Verizon	Unk	40514	Installation Complete	9/25/2020	921 Bates St SE	W	0.7780	0.6565	0.5995	E	2.4295	0.6280	0.7425
51	1345	Verizon	CE	40526	Installation Complete	9/25/2020	939 Kalamazoo Ave.	N	0.6855	2.2425	1.1995	S	0.4285	0.7995	0.6855
52	1346	Verizon	CE	40531	Installation Complete	9/25/2020	1102 Madison Ave. SE	N	0.4245	0.3800	0.2680	S	0.2010	0.2905	0.1790
53	1339	Verizon	CE	40548	Installation Complete	9/28/2020	873 Griggs St. SE	W	0.1715	0.3140	0.1715	E	0.5140	0.3710	0.2285
54	1328	Verizon	CE	40560	Installation Complete	9/30/2020	706 Winchell	W	0.1715	0.4285	0.6565	E	0.5995	0.5710	0.3710
55	2969	Verizon	CE	40443	Installation Complete	9/30/2020	601 Wealthy St SE	W	1.0090	0.6280	0.6855	E	3.4760	0.8225	0.9720
56	1336	Verizon	CE	40613	Installation Complete	10/9/2020	158 Corinne SW	N	0.1870	0.7100	0.2285	S	0.4570	0.5995	0.6280
57	1337	Verizon	CE	40607	Installation Complete	10/9/2020	1700 Francis Ave. SE	W	0.0285	0.0855	0.1715	E	0.1425	0.2615	0.0285
58	1338	Verizon	CE	40600	Installation Complete	10/9/2020	1936 Eastern Ave. SE	N	0.0570	0.4855	0.2000	S	0.1495	0.2000	0.2615
59	6657	Verizon	Verizon	40603	Installation Complete	12/16/2020	1747 College Ave. SE	N	0.1425	0.0285	1.1200	S	0.2000	0.0285	0.0570
60	7873	Verizon	Verizon	40740	Installation Complete	12/16/2020	1406 Adams St. SE	W	0.0570	0.1425	0.3425	E	0.1425	0.3425	0.1715
61	7874	Verizon	Verizon	40751	Installation Complete	12/16/2020	1629 College Ave. SE	N	0.0570	0.1140	0.0285	S	0.5140	0.1425	0.0855
62	8683	Verizon	Verizon	40807	Installation Complete	12/16/2020	1607 Chamberlain Ave. SE	N	0.2000	0.2855	0.2285	S	0.1140	0.3140	0.1140
63	8686	Verizon	Verizon	40835	Installation Complete	12/16/2020	2356 Burton St. SE	W	0.2285	0.2000	0.1140	E	0.0285	0.4285	0.2855
64	8690	Verizon	Verizon	40872	Installation Complete	12/16/2020	3000 Alger St. SE	W	0.4855	0.3140	0.4570	E	0.2000	0.4285	0.3995
65	8692	Verizon	Verizon	40719	Installation Complete	12/16/2020	803 Watkins St. SE	W	0.1425	0.2570	0.4570	E	0.2570	0.1715	0.2570
66	9091	Verizon	AT&T	40529	Installation Complete	12/16/2020	844 Giddings Ave. SE	N	0.1425	0.4855	0.0855	S	0.2000	0.3140	0.5140
67	9092	Verizon	CE	40446	Installation Complete	12/16/2020	664 Wealthy St. SE	W	0.3710	0.3710	0.5425	E	0.1715	0.6565	0.3425
68	9491	Verizon	Verizon	40552	Installation Complete	12/16/2020	1026 Burton St. SE	W	0.3710	0.1140	0.3140	E	0.3140	0.2285	0.0855
69	9492	Verizon	Verizon	40563	Installation Complete	12/16/2020	902 S Ottilia St. SE	W	0.4570	0.6855	0.6855	E	0.0855	0.2570	0.3995
70	9493	Verizon	Verizon	40786	Installation Complete	12/16/2020	1601 Philadelphia Ave. SE	W	0.0570	0.0570	0.1425	E	0.1140	0.0855	0.2000
71	7477	Verizon	Verizon	40568	Installation Complete	12/22/2020	1251 Edna St. SE	W	0.7425	0.5140	0.3710	E	0.2000	0.0570	0.3140
72	5017	Verizon	AT&T	40724	Installation Complete	12/23/2020	1125 Cooper Ave. SE	N	0.2070	0.3995	0.5140	S	0.0855	0.2570	0.8280
73	6660	Verizon	CE	40846	Installation Complete	12/23/2020	2544 Ardmore St. SE	N	0.1715	0.2855	0.5710	S	0.3425	0.4855	0.3140
74	7877	Verizon	AT&T	40538	Installation Complete	12/23/2020	1208 Kalamazoo Ave. SE	W	1.1135	0.7425	0.9425	E	0.7995	0.9425	0.8280
75	10294	Verizon	CE	40744	Installation Complete	12/23/2020	1450 Marshall Ave. SE	N	0.2000	0.2000	0.2285	S	0.3140	0.6565	0.6280
76	10295	Verizon	CE	40776	Installation Complete	12/23/2020	840 Burton St. SE	W	0.1140	0.2570	0.2285	E	0.4860	0.1425	0.1715
77	10296	Verizon	AT&T	40780	Installation Complete	12/23/2020	1448 Colorado Ave. SE	N	0.0855	0.2285	0.3140	S	0.2285	0.5710	0.5140

Attachment #3 - Radio Frequency (RF) Power Density Testing - Occupational & Non-Occupational															
City of Grand Rapids/Small and Micro Cell Radio Frequency (RF) Power Density Testing - Occupational & Non-Occupational															
Count	OBJECT ID	Small Cell	Pole Owner	Site ID	Site Status	Approved Date	Address	Results as Percentage (%) of Maximum Permissible Exposure (MPE) for FCC Occupational Limits							
								Measurements at 6 feet above Ground							
								Direction	Distance from Pole			Direction	Distance from Pole		
									10 ft.	50 ft.	100 ft.		10 ft.	50 ft.	100 ft.
1	919	AT&T	Grand Rapids	GRRPD 005	Installation Complete	9/3/2019	332 Barclay Ave. NE	N	0.0402	0.0819	0.0626	S	0.0268	0.0358	0.0805
2	921	AT&T	Grand Rapids	GRRPD 029	Installation Complete	9/3/2019	309 Fulton St. W	W	0.1990	0.1638	0.1756	E	0.2516	0.3277	0.1990
3	918	AT&T	Grand Rapids	GRRPD 015	Installation Complete	9/13/2019	1516 Wealthy St. SE	W	0.0492	0.0313	0.0585	E	0.0223	0.0536	0.0670
4	913	AT&T	Grand Rapids	GRRPD 020	Installation Complete	8/31/2020	176 Campaue Ave. N	N	0.3575	0.2224	0.1112	S	0.8895	0.1990	0.2926
5	474	ACD	Grand Rapids	10009	Installation Complete	9/1/2017	2 Bartlett St. SW	W	0.3043	0.0849	0.0805	E	0.0626	0.4506	0.0626
6	889	ACD	Grand Rapids	14353	Installation Complete	5/24/2019	1143 Wealthy St. SE	W	0.0983	0.1073	0.0983	E	0.1073	0.3025	0.3710
7	890	ACD	Grand Rapids	10011	Installation Complete	5/24/2019	236 Grandville Ave. SW	N	0.1404	0.1346	0.1287	S	0.0702	0.0849	0.0760
8	895	ACD	Grand Rapids	10017	Installation Complete	5/29/2019	49 Ionia Ave. NW	N	0.2750	0.4447	0.0626	S	0.2692	0.1697	0.2984
9	902	AT&T	Grand Rapids	GRRPD 026	Installation Complete	10/23/2018	200 Cherry St. SE	W	0.4155	0.1814	0.3160	E	0.0447	0.0585	0.1638
10	2960	Verizon	CE	40731	Installation Complete	6/9/2020	1404 Hall St. SE	W	0.0228	0.0343	0.0571	E	0.0514	0.0571	0.0171
11	2961	Verizon	CE	40760	Installation Complete	6/9/2020	313 Griggs St. SE	W	0.0492	0.0849	0.0760	E	0.0536	0.0670	0.0536
12	2963	Verizon	CE	40770	Installation Complete	6/9/2020	1966 Madison Ave. SE	N	0.0447	0.0760	0.1073	S	0.0581	0.0849	0.1162
13	2965	Verizon	CE	40781	Installation Complete	6/9/2020	1640 Margaret Ave. SE	N	0.0293	0.1756	0.0234	S	0.0410	0.0936	0.1112
14	2971	Verizon	CE	41116	Installation Complete	6/9/2020	2153 McKee Ave. SW	N	0.0626	0.1207	0.1341	S	0.1028	0.1699	0.1520
15	2974	Verizon	CE	40576	Installation Complete	6/9/2020	2364 Nelson Ave. SE	W	0.0670	0.1073	0.1073	E	0.1520	0.1431	0.1609
16	3371	Verizon	CE	40763	Installation Complete	6/9/2020	1802 Century Ave. SW	N	0.0619	0.0536	0.0626	S	0.0626	0.1011	0.1108
17	3379	Verizon	CE	40772	Installation Complete	6/9/2020	929 Ardmore St. SE	W	0.1028	0.0670	0.0805	E	0.0805	0.0626	0.0849
18	3774	Verizon	AT&T	40561	Installation Complete	6/9/2020	1020 Merrifield St. SE	W	0.0536	0.0715	0.0626	E	0.0492	0.0581	0.0849
19	3781	Verizon	CE	40336	Installation Complete	6/9/2020	563 Monroe Ave. NW	N	0.0268	0.4020	0.1118	S	0.0313	0.0626	0.0358
20	3788	Verizon	CE	40745	Installation Complete	6/9/2020	506 Vries St. SW	N	0.1207	0.1788	0.1252	S	0.1207	0.1296	0.1162
21	4189	Verizon	CE	40791	Installation Complete	6/9/2020	1704 Boston St. SE	W	0.0402	0.0492	0.0760	E	0.0313	0.0402	0.0313
22	4192	Verizon	CE	40867	Installation Complete	6/9/2020	2917 Burton St. SE	W	0.1073	0.1207	0.1341	E	0.0644	0.0805	0.1118
23	4205	Verizon	CE	40738	Installation Complete	6/9/2020	928 Adams St. SE	W	0.0581	0.0447	0.0536	E	0.0894	0.0805	0.0760
24	4209	Verizon	CE	40766	Installation Complete	6/9/2020	1845 Darwin Ave. SW	N	0.0402	0.0492	0.0849	S	0.0447	0.0536	0.0402
25	4213	Verizon	CE	40869	Installation Complete	6/9/2020	2927 Hampshire Blvd. SE	W	0.0268	0.0585	0.0878	E	0.0626	0.0670	0.0402
26	3383	Verizon	CE	40509	Installation Complete	6/19/2020	553 Giddings Ave. SE	N	0.1697	0.0761	0.1756	S	0.2575	0.2224	0.2341
27	3776	Verizon	CE	40562	Installation Complete	6/19/2020	2144 Madison Ave. SE	N	0.1790	0.0134	0.0358	S	0.0748	0.0313	0.0228
28	3779	Verizon	AT&T	40579	Installation Complete	6/19/2020	2522 Eastern Ave. SE	N	0.0447	0.0670	0.1028	S	0.1207	0.1296	0.1475
29	3783	Verizon	CE	40698	Installation Complete	6/19/2020	445 Grandville Ave. SW	N	0.0760	0.1125	0.1118	S	0.0995	0.1112	0.1287
30	4187	Verizon	CE	40515	Installation Complete	6/19/2020	725 Union Ave. SE	N	0.1073	0.1475	0.1654	S	0.1878	0.1744	0.1699
31	5818	Verizon	CE	40506	Installation Complete	6/19/2020	646 Ethel Ave. SE	N	0.0059	0.7139	0.0189	S	0.0585	0.0234	0.0223
32	3789	Verizon	CE	40743	Installation Complete	6/22/2020	616 Oakdale St. SE	W	0.0179	0.0223	0.0134	E	0.0179	0.0581	0.0626
33	4211	Verizon	CE	40837	Installation Complete	6/24/2020	2342 Onkama Dr. SE	W	0.0536	0.2983	0.2760	E	0.0760	0.0653	0.0983
34	4214	Verizon	CE	40875	Installation Complete	6/24/2020	3073 Burton St. SE	W	0.1073	0.1252	0.0983	E	0.0805	0.0581	0.0939
35	5013	Verizon	CE	40876	Installation Complete	6/24/2020	1751 Morningside Dr. SE	N	0.0805	0.1028	0.0715	S	0.1654	0.1252	0.1207
36	4207	Verizon	CE	40742	Installation Complete	6/25/2020	1420 Eastern Ave. SE	N	0.0670	0.0983	0.0715	S	0.0760	0.0939	0.0849
37	5414	Verizon	CE	40788	Installation Complete	6/25/2020	1541 Mackinaw Rd. SE	W	0.0983	0.0849	0.0894	E	0.0670	0.6700	0.0581
38	3771	Verizon	CE	40553	Installation Complete	6/30/2020	603 Burton St. SE	W	0.0760	0.0894	0.0983	E	0.0894	0.1073	0.0939
39	2984	Verizon	CE	40799	Installation Complete	7/2/2020	1740 Burton St. SE	W	0.0134	0.0447	0.0223	E	0.0313	0.0536	0.0313
40	3372	Verizon	CE	40707	Installation Complete	7/2/2020	453 Pleasant St. SW	W	0.1028	0.1296	0.1124	E	0.1028	0.0805	0.0939

RF Power Density Testing at Small Cell Wireless Facilities

41	3376	Verizon	CE	40503	Installation Complete	7/2/2020	632 Lafayette Ave. SE	N	0.1296	0.1431	0.1699	S	0.1386	0.1028	0.1162
42	3784	Verizon	CE	40703	Installation Complete	7/2/2020	921 Sherman St. SE	W	0.1028	0.0849	0.1431	E	0.1654	0.1207	0.1162
43	4191	Verizon	CE	40842	Installation Complete	7/2/2020	1848 Rosemont Ave. SE	W	0.0114	0.0400	0.0285	E	0.0285	0.0285	0.0628
44	4201	Verizon	CE	40715	Installation Complete	7/2/2020	1032 Worden St. SE	W	0.4000	0.0685	0.0857	E	0.0914	0.0514	0.0514
45	4202	Verizon	CE	40720	Installation Complete	7/2/2020	112 Putnam St. SW	W	0.1296	0.3879	0.1296	E	0.1341	0.0805	0.0760
46	4204	Verizon	CE	40727	Installation Complete	7/2/2020	221 Hall St. SW	W	0.0223	0.0313	0.0402	E	0.0223	0.0983	0.0626
47	8287	Verizon	CE	40609	Installation Complete	9/24/2020	2 Baylis St. SW	N	0.0114	0.0114	0.0374	W	0.0285	0.0457	0.0114
48	8289	Verizon	CE	40604	Installation Complete	9/24/2020	1704 Madison Ave. SE	N	0.2018	0.0228	0.0626	S	0.0894	0.0626	0.0983
49	1340	Verizon	CE	40534	Installation Complete	9/25/2020	1100 Kalamazoo Ave. SE	N	0.1942	0.0914	0.0514	S	0.0400	0.0571	0.0457
50	1343	Verizon	Unk	40514	Installation Complete	9/25/2020	921 Bates St SE	W	0.1556	0.1313	0.1199	E	0.4859	0.1256	0.1485
51	1345	Verizon	CE	40526	Installation Complete	9/25/2020	939 Kalamazoo Ave.	N	0.1371	0.4485	0.2399	S	0.0857	0.1599	0.1371
52	1346	Verizon	CE	40531	Installation Complete	9/25/2020	1102 Madison Ave. SE	N	0.0849	0.0760	0.0536	S	0.0402	0.0581	0.0358
53	1339	Verizon	CE	40548	Installation Complete	9/28/2020	873 Griggs St. SE	W	0.0343	0.0628	0.0343	E	0.1028	0.0742	0.0457
54	1328	Verizon	CE	40560	Installation Complete	9/30/2020	706 Winchell	W	0.0343	0.0857	0.1313	E	0.1199	0.1142	0.0742
55	2969	Verizon	CE	40443	Installation Complete	9/30/2020	601 Wealthy St SE	W	0.2018	0.1256	0.1371	E	0.6952	0.1645	0.1944
56	1336	Verizon	CE	40613	Installation Complete	10/9/2020	158 Corinne SW	N	0.0374	0.1420	0.0457	S	0.0914	0.1199	0.1256
57	1337	Verizon	CE	40607	Installation Complete	10/9/2020	1700 Francis Ave. SE	W	0.0057	0.0171	0.0343	E	0.0285	0.0523	0.0057
58	1338	Verizon	CE	40600	Installation Complete	10/9/2020	1936 Eastern Ave. SE	N	0.0114	0.0971	0.0400	S	0.0299	0.0400	0.0523
59	6657	Verizon	Verizon	40603	Installation Complete	12/16/2020	1747 College Ave. SE	N	0.0285	0.0057	0.2240	S	0.0400	0.0057	0.0114
60	7873	Verizon	Verizon	40740	Installation Complete	12/16/2020	1406 Adams St. SE	W	0.0114	0.0285	0.0685	E	0.0285	0.0685	0.0343
61	7874	Verizon	Verizon	40751	Installation Complete	12/16/2020	1629 College Ave. SE	N	0.0114	0.0228	0.0057	S	0.1028	0.0285	0.0171
62	8683	Verizon	Verizon	40807	Installation Complete	12/16/2020	1607 Chamberlain Ave. SE	N	0.0400	0.0571	0.0457	S	0.0228	0.0628	0.0228
63	8686	Verizon	Verizon	40835	Installation Complete	12/16/2020	2356 Burton St. SE	W	0.0457	0.0400	0.0228	E	0.0057	0.0857	0.0571
64	8690	Verizon	Verizon	40872	Installation Complete	12/16/2020	3000 Alger St. SE	W	0.0971	0.0628	0.0914	E	0.0400	0.0857	0.0799
65	8692	Verizon	Verizon	40719	Installation Complete	12/16/2020	803 Watkins St. SE	W	0.0285	0.0514	0.0914	E	0.0514	0.0343	0.0514
66	9091	Verizon	AT&T	40529	Installation Complete	12/16/2020	844 Giddings Ave. SE	N	0.0285	0.0971	0.0171	S	0.0400	0.0628	0.1028
67	9092	Verizon	CE	40446	Installation Complete	12/16/2020	664 Wealthy St. SE	W	0.0742	0.0742	0.1085	E	0.0343	0.1313	0.0685
68	9491	Verizon	Verizon	40552	Installation Complete	12/16/2020	1026 Burton St. SE	W	0.0742	0.0228	0.0628	E	0.0628	0.0457	0.0171
69	9492	Verizon	Verizon	40563	Installation Complete	12/16/2020	902 S Ottilia St. SE	W	0.0914	0.1371	0.1371	E	0.0171	0.0514	0.0799
70	9493	Verizon	Verizon	40786	Installation Complete	12/16/2020	1601 Philadelphia Ave. SE	W	0.0114	0.0114	0.0285	E	0.0228	0.0171	0.0400
71	7477	Verizon	Verizon	40568	Installation Complete	12/22/2020	1251 Edna St. SE	W	0.1485	0.1028	0.0742	E	0.0400	0.0114	0.0628
72	5017	Verizon	AT&T	40724	Installation Complete	12/23/2020	1125 Cooper Ave. SE	N	0.0414	0.0799	0.1028	S	0.0171	0.0514	0.1656
73	6660	Verizon	CE	40846	Installation Complete	12/23/2020	2544 Ardmore St. SE	N	0.0343	0.0571	0.1142	S	0.0685	0.0971	0.0628
74	7877	Verizon	AT&T	40538	Installation Complete	12/23/2020	1208 Kalamazoo Ave. SE	W	0.2227	0.1485	0.1885	E	0.1599	0.1885	0.1656
75	10294	Verizon	CE	40744	Installation Complete	12/23/2020	1450 Marshall Ave. SE	N	0.0400	0.0400	0.0457	S	0.0628	0.1313	0.1256
76	10295	Verizon	CE	40776	Installation Complete	12/23/2020	840 Burton St. SE	W	0.0228	0.0514	0.0457	E	0.0972	0.0285	0.0343
77	10296	Verizon	AT&T	40780	Installation Complete	12/23/2020	1448 Colorado Ave. SE	N	0.0171	0.0457	0.0628	S	0.0457	0.1142	0.1028
78	3373	Verizon	CE	40708	Installation Complete	3/2/2021	602 Union Ave. SE	N	0.0285	0.0685	0.0571	S	0.0285	0.0400	0.0514
79	6666	Verizon	CE	40819	Installation Complete		1834 Newton Ave. SE	N	0.1028	0.1085	0.1199	S	0.1028	0.1028	0.0799

**Radio Frequency (RF) Power Density Testing - Occupational**

Max	0.4155	0.7139	0.3160	0.8895	0.6700	0.3710
Min	0.0057	0.0057	0.0057	0.0057	0.0057	0.0057
Median	0.0619	0.0819	0.0805	0.0628	0.0805	0.0799
Average	0.0899	0.1095	0.0917	0.0994	0.1018	0.0925

**Notes**

1. All values presented as a percentage of 50 watt/meter squared for occupational maximum permissible exposure and 10 watt/meter squared for non-occupational maximum permissible exposure
2. Direction refers to measurement parallel to street direction
3. Measurement at 6 feet above ground represents pedestrian height
4. Above measurements are for active sites as of 5-7-21

**Attachment #3 - Radio Frequency (RF) Power Density Testing - Occupational & Non-Occupational**

**City of Grand Rapids/Small and Micro Cell Radio Frequency (RF) Power Density Testing - Occupational & Non-Occupational**

Count	OBJECT ID	Small Cell	Pole Owner	Site ID	Power Density Measurement Conversions (mW/Cm2) for Non-Occupational						Results as Percentage (%) of Maximum Permissible Exposure (MPE) for FCC Non-Occupational Limits									
					Measurements at 6 feet above Ground						Measurements at 6 feet above Ground									
					Direction	Distance from Pole			Direction	Distance from Pole			Direction	Distance from Pole			Direction	Distance from Pole		
						10 ft.	50 ft.	100 ft.		10 ft.	50 ft.	100 ft.		10 ft.	50 ft.	100 ft.				
1	919	AT&T	Grand Rapids	GRRPD 005	N	0.0020	0.0041	0.0031	S	0.0013	0.0018	0.0040	N	0.2010	0.4095	0.3130	S	0.1340	0.1790	0.4025
2	921	AT&T	Grand Rapids	GRRPD 029	W	0.0100	0.0082	0.0088	E	0.0126	0.0164	0.0100	W	0.9950	0.8190	0.8780	E	1.2580	1.6385	0.9950
3	918	AT&T	Grand Rapids	GRRPD 015	W	0.0025	0.0016	0.0029	E	0.0011	0.0027	0.0034	W	0.2460	0.1565	0.2925	E	0.1115	0.2680	0.3350
4	913	AT&T	Grand Rapids	GRRPD 020	N	0.0179	0.0111	0.0056	S	0.0445	0.0100	0.0146	N	1.7875	1.1120	0.5560	S	4.4475	0.9950	1.4630
5	474	ACD	Grand Rapids	10009	W	0.0152	0.0042	0.0040	E	0.0031	0.0225	0.0031	W	1.5215	0.4245	0.4025	E	0.3130	2.2530	0.3130
6	889	ACD	Grand Rapids	14353	W	0.0049	0.0054	0.0049	E	0.0054	0.0151	0.0186	W	0.4915	0.5365	0.4915	E	0.5365	1.5125	1.8550
7	890	ACD	Grand Rapids	10011	N	0.0070	0.0067	0.0064	S	0.0035	0.0042	0.0038	N	0.7020	0.6730	0.6435	S	0.3510	0.4245	0.3800
8	895	ACD	Grand Rapids	10017	N	0.0138	0.0222	0.0031	S	0.0135	0.0085	0.0149	N	1.3750	2.2235	0.3130	S	1.3460	0.8485	1.4920
9	902	AT&T	Grand Rapids	GRRPD 026	W	0.0208	0.0091	0.0158	E	0.0022	0.0029	0.0082	W	2.0775	0.9070	1.5800	E	0.2235	0.2925	0.8190
10	2960	Verizon	CE	40731	W	0.0011	0.0017	0.0029	E	0.0026	0.0029	0.0009	W	0.1140	0.1715	0.2855	E	0.2570	0.2855	0.0855
11	2961	Verizon	CE	40760	W	0.0025	0.0042	0.0038	E	0.0027	0.0034	0.0027	W	0.2460	0.4245	0.3800	E	0.2680	0.3350	0.2680
12	2963	Verizon	CE	40770	N	0.0022	0.0038	0.0054	S	0.0029	0.0042	0.0058	N	0.2235	0.3800	0.5365	S	0.2905	0.4245	0.5810
13	2965	Verizon	CE	40781	N	0.0015	0.0088	0.0012	S	0.0021	0.0047	0.0056	N	0.1465	0.8780	0.1170	S	0.2050	0.4680	0.5560
14	2971	Verizon	CE	41116	N	0.0031	0.0060	0.0067	S	0.0051	0.0085	0.0076	N	0.3130	0.6035	0.6705	S	0.5140	0.8495	0.7600
15	2974	Verizon	CE	40576	W	0.0034	0.0054	0.0054	E	0.0076	0.0072	0.0080	W	0.3350	0.5365	0.5365	E	0.7600	0.7155	0.8045
16	3371	Verizon	CE	40763	N	0.0031	0.0027	0.0031	S	0.0031	0.0051	0.0055	N	0.3095	0.2680	0.3130	S	0.3130	0.5055	0.5540
17	3379	Verizon	CE	40772	W	0.0051	0.0034	0.0040	E	0.0040	0.0031	0.0042	W	0.5140	0.3350	0.4025	E	0.4025	0.3130	0.4245
18	3774	Verizon	AT&T	40561	W	0.0027	0.0036	0.0031	E	0.0025	0.0029	0.0042	W	0.2680	0.3575	0.3130	E	0.2460	0.2905	0.4245
19	3781	Verizon	CE	40336	N	0.0013	0.0201	0.0056	S	0.0016	0.0031	0.0018	N	0.1340	2.0100	0.5590	S	0.1565	0.3130	0.1790
20	3788	Verizon	CE	40745	N	0.0060	0.0089	0.0063	S	0.0060	0.0065	0.0058	N	0.6035	0.8940	0.6260	S	0.6035	0.6480	0.5810
21	4189	Verizon	CE	40791	W	0.0020	0.0025	0.0038	E	0.0016	0.0020	0.0016	W	0.2010	0.2460	0.3800	E	0.1565	0.2010	0.1565
22	4192	Verizon	CE	40867	W	0.0054	0.0060	0.0067	E	0.0032	0.0040	0.0056	W	0.5365	0.6035	0.6705	E	0.3220	0.4025	0.5590
23	4205	Verizon	CE	40738	W	0.0029	0.0022	0.0027	E	0.0045	0.0040	0.0038	W	0.2905	0.2235	0.2680	E	0.4470	0.4025	0.3800
24	4209	Verizon	CE	40766	N	0.0020	0.0025	0.0042	S	0.0022	0.0027	0.0020	N	0.2010	0.2460	0.4245	S	0.2235	0.2680	0.2010
25	4213	Verizon	CE	40869	W	0.0013	0.0029	0.0044	E	0.0031	0.0034	0.0020	W	0.1340	0.2925	0.4390	E	0.3130	0.3350	0.2010
26	3383	Verizon	CE	40509	N	0.0085	0.0038	0.0088	S	0.0129	0.0111	0.0117	N	0.8485	0.3805	0.8780	S	1.2875	1.1120	1.1705
27	3776	Verizon	CE	40562	N	0.0090	0.0007	0.0018	S	0.0037	0.0016	0.0011	N	0.8950	0.0670	0.1790	S	0.3740	0.1565	0.1140
28	3779	Verizon	AT&T	40579	N	0.0022	0.0034	0.0051	S	0.0060	0.0065	0.0074	N	0.2235	0.3350	0.5140	S	0.6035	0.6480	0.7375
29	3783	Verizon	CE	40698	N	0.0038	0.0056	0.0056	S	0.0050	0.0056	0.0064	N	0.3800	0.5625	0.5590	S	0.4975	0.5560	0.6435
30	4187	Verizon	CE	40515	N	0.0054	0.0074	0.0083	S	0.0094	0.0087	0.0085	N	0.5365	0.7375	0.8270	S	0.9390	0.8720	0.8495
31	5818	Verizon	CE	40506	N	0.0003	0.0357	0.0009	S	0.0029	0.0012	0.0011	N	0.0295	3.5695	0.0945	S	0.2925	0.1170	0.1115
32	3789	Verizon	CE	40743	W	0.0009	0.0011	0.0007	E	0.0009	0.0029	0.0031	W	0.0895	0.1115	0.0670	E	0.0895	0.2905	0.3130
33	4211	Verizon	CE	40837	W	0.0027	0.0149	0.0138	E	0.0038	0.0033	0.0049	W	0.2680	1.4915	1.3800	E	0.3800	0.3265	0.4915
34	4214	Verizon	CE	40875	W	0.0054	0.0063	0.0049	E	0.0040	0.0029	0.0047	W	0.5365	0.6260	0.4915	E	0.4025	0.2905	0.4695
35	5013	Verizon	CE	40876	N	0.0040	0.0051	0.0036	S	0.0083	0.0063	0.0060	N	0.4025	0.5140	0.3575	S	0.8270	0.6260	0.6035
36	4207	Verizon	CE	40742	N	0.0034	0.0049	0.0036	S	0.0038	0.0047	0.0042	N	0.3350	0.4915	0.3575	S	0.3800	0.4695	0.4245
37	5414	Verizon	CE	40788	W	0.0049	0.0042	0.0045	E	0.0034	0.0335	0.0029	W	0.4915	0.4245	0.4470	E	0.3350	3.3500	0.2905
38	3771	Verizon	CE	40553	W	0.0038	0.0045	0.0049	E	0.0045	0.0054	0.0047	W	0.3800	0.4470	0.4915	E	0.4470	0.5365	0.4695
39	2984	Verizon	CE	40799	W	0.0007	0.0022	0.0011	E	0.0016	0.0027	0.0016	W	0.0670	0.2235	0.1115	E	0.1565	0.2680	0.1565
40	3372	Verizon	CE	40707	W	0.0051	0.0065	0.0056	E	0.0051	0.0040	0.0047	W	0.5140	0.6480	0.5620	E	0.5140	0.4025	0.4695

RF Power Density Testing at Small Cell Wireless Facilities

41	3376	Verizon	CE	40503	N	0.0065	0.0072	0.0085	S	0.0069	0.0051	0.0058	N	0.6480	0.7155	0.8495	S	0.6930	0.5140	0.5810						
42	3784	Verizon	CE	40703	W	0.0051	0.0042	0.0072	E	0.0083	0.0060	0.0058	W	0.5140	0.4245	0.7155	E	0.8270	0.6035	0.5810						
43	4191	Verizon	CE	40842	W	0.0006	0.0020	0.0014	E	0.0014	0.0014	0.0031	W	0.0570	0.2000	0.1425	E	0.1425	0.1425	0.3140						
44	4201	Verizon	CE	40715	W	0.0200	0.0034	0.0043	E	0.0046	0.0026	0.0026	W	2.0000	0.3425	0.4285	E	0.4570	0.2570	0.2570						
45	4202	Verizon	CE	40720	W	0.0065	0.0194	0.0065	E	0.0067	0.0040	0.0038	W	0.6480	1.9395	0.6480	E	0.6705	0.4025	0.3800						
46	4204	Verizon	CE	40727	W	0.0011	0.0016	0.0020	E	0.0011	0.0049	0.0031	W	0.1115	0.1565	0.2010	E	0.1115	0.4915	0.3130						
47	8287	Verizon	CE	40609	N	0.0006	0.0006	0.0019	W	0.0014	0.0023	0.0006	N	0.0570	0.0570	0.1870	W	0.1425	0.2285	0.0570						
48	8289	Verizon	CE	40604	N	0.0101	0.0011	0.0031	S	0.0045	0.0031	0.0049	N	1.0090	0.1140	0.3130	S	0.4470	0.3130	0.4915						
49	1340	Verizon	CE	40534	N	0.0097	0.0046	0.0026	S	0.0020	0.0029	0.0023	N	0.9710	0.4570	0.2570	S	0.2000	0.2855	0.2285						
50	1343	Verizon	Unk	40514	W	0.0078	0.0066	0.0060	E	0.0243	0.0063	0.0074	W	0.7780	0.6565	0.5995	E	2.4295	0.6280	0.7425						
51	1345	Verizon	CE	40526	N	0.0069	0.0224	0.0120	S	0.0043	0.0080	0.0069	N	0.6855	2.2425	1.1995	S	0.4285	0.7995	0.6855						
52	1346	Verizon	CE	40531	N	0.0042	0.0038	0.0027	S	0.0020	0.0029	0.0018	N	0.4245	0.3800	0.2680	S	0.2010	0.2905	0.1790						
53	1339	Verizon	CE	40548	W	0.0017	0.0031	0.0017	E	0.0051	0.0037	0.0023	W	0.1715	0.3140	0.1715	E	0.5140	0.3710	0.2285						
54	1328	Verizon	CE	40560	W	0.0017	0.0043	0.0066	E	0.0060	0.0057	0.0037	W	0.1715	0.4285	0.6565	E	0.5995	0.5710	0.3710						
55	2969	Verizon	CE	40443	W	0.0101	0.0063	0.0069	E	0.0348	0.0082	0.0097	W	1.0090	0.6280	0.6855	E	3.4760	0.8225	0.9720						
56	1336	Verizon	CE	40613	N	0.0019	0.0071	0.0023	S	0.0046	0.0060	0.0063	N	0.1870	0.7100	0.2285	S	0.4570	0.5995	0.6280						
57	1337	Verizon	CE	40607	W	0.0003	0.0009	0.0017	E	0.0014	0.0026	0.0003	W	0.0285	0.0855	0.1715	E	0.1425	0.2615	0.0285						
58	1338	Verizon	CE	40600	N	0.0006	0.0049	0.0020	S	0.0015	0.0020	0.0026	N	0.0570	0.4855	0.2000	S	0.1495	0.2000	0.2615						
59	6657	Verizon	Verizon	40603	N	0.0014	0.0003	0.0112	S	0.0020	0.0003	0.0006	N	0.1425	0.0285	1.1200	S	0.2000	0.0285	0.0570						
60	7873	Verizon	Verizon	40740	W	0.0006	0.0014	0.0034	E	0.0014	0.0034	0.0017	W	0.0570	0.1425	0.3425	E	0.1425	0.3425	0.1715						
61	7874	Verizon	Verizon	40751	N	0.0006	0.0011	0.0003	S	0.0051	0.0014	0.0009	N	0.0570	0.1140	0.0285	S	0.5140	0.1425	0.0855						
62	8683	Verizon	Verizon	40807	N	0.0020	0.0029	0.0023	S	0.0011	0.0031	0.0011	N	0.2000	0.2855	0.2285	S	0.1140	0.3140	0.1140						
63	8686	Verizon	Verizon	40835	W	0.0023	0.0020	0.0011	E	0.0003	0.0043	0.0029	W	0.2285	0.2000	0.1140	E	0.0285	0.4285	0.2855						
64	8690	Verizon	Verizon	40872	W	0.0049	0.0031	0.0046	E	0.0020	0.0043	0.0040	W	0.4855	0.3140	0.4570	E	0.2000	0.4285	0.3995						
65	8692	Verizon	Verizon	40719	W	0.0014	0.0026	0.0046	E	0.0026	0.0017	0.0026	W	0.1425	0.2570	0.4570	E	0.2570	0.1715	0.2570						
66	9091	Verizon	AT&T	40529	N	0.0014	0.0049	0.0009	S	0.0020	0.0031	0.0051	N	0.1425	0.4855	0.0855	S	0.2000	0.3140	0.5140						
67	9092	Verizon	CE	40446	W	0.0037	0.0037	0.0054	E	0.0017	0.0066	0.0034	W	0.3710	0.3710	0.5425	E	0.1715	0.6565	0.3425						
68	9491	Verizon	Verizon	40552	W	0.0037	0.0011	0.0031	E	0.0031	0.0023	0.0009	W	0.3710	0.1140	0.3140	E	0.3140	0.2285	0.0855						
69	9492	Verizon	Verizon	40563	W	0.0046	0.0069	0.0069	E	0.0009	0.0026	0.0040	W	0.4570	0.6855	0.6855	E	0.0855	0.2570	0.3995						
70	9493	Verizon	Verizon	40786	W	0.0006	0.0006	0.0014	E	0.0011	0.0009	0.0020	W	0.0570	0.0570	0.1425	E	0.1140	0.0855	0.2000						
71	7477	Verizon	Verizon	40568	W	0.0074	0.0051	0.0037	E	0.0020	0.0006	0.0031	W	0.7425	0.5140	0.3710	E	0.2000	0.0570	0.3140						
72	5017	Verizon	AT&T	40724	N	0.0021	0.0040	0.0051	S	0.0009	0.0026	0.0083	N	0.2070	0.3995	0.5140	S	0.0855	0.2570	0.8280						
73	6660	Verizon	CE	40846	N	0.0017	0.0029	0.0057	S	0.0034	0.0049	0.0031	N	0.1715	0.2855	0.5710	S	0.3425	0.4855	0.3140						
74	7877	Verizon	AT&T	40538	W	0.0111	0.0074	0.0094	E	0.0080	0.0094	0.0083	W	1.1135	0.7425	0.9425	E	0.7995	0.9425	0.8280						
75	10294	Verizon	CE	40744	N	0.0020	0.0020	0.0023	S	0.0031	0.0066	0.0063	N	0.2000	0.2000	0.2285	S	0.3140	0.6565	0.6280						
76	10295	Verizon	CE	40776	W	0.0011	0.0026	0.0023	E	0.0049	0.0014	0.0017	W	0.1140	0.2570	0.2285	E	0.4860	0.1425	0.1715						
77	10296	Verizon	AT&T	40780	N	0.0009	0.0023	0.0031	S	0.0023	0.0057	0.0051	N	0.0855	0.2285	0.3140	S	0.2285	0.5710	0.5140						
78	3373	Verizon	CE	40708	N	0.0014	0.0034	0.0029	S	0.0014	0.0020	0.0026	N	0.1425	0.3425	0.2855	S	0.1425	0.2000	0.2570						
79	6666	Verizon	CE	40819	N	0.0051	0.0054	0.0060	S	0.0051	0.0051	0.0040	N	0.5140	0.5425	0.5995	S	0.5140	0.5140	0.3995						
<b>Radio Frequency (RF) Power Density Testing - Non-Occupational</b>																										
Max						0.0208	0.0357	0.0158				0.0445	0.0335	0.0186				2.0775	3.5695	1.5800				4.4475	3.3500	1.8550
Min						0.0003	0.0003	0.0003				0.0003	0.0003	0.0003				0.0285	0.0285	0.0285				0.0285	0.0285	0.0285
Median						0.0031	0.0041	0.0040				0.0031	0.0040	0.0040				0.3095	0.4095	0.4025				0.3140	0.4025	0.3995
Average						0.0045	0.0055	0.0046				0.0050	0.0051	0.0046				0.4493	0.5477	0.4583				0.4970	0.5088	0.4627

Comparison of Maximum Permissible Limits (MPE) vs. Maximum Actual Measurements				
FCC Limits for MPE vs. Actual Measurements	Canada Limits for MPE vs. Actual Measurements			
Occupational Permissible Limit	5	mW/Cm2	50	W/M2
General Public Permissible Limit	1	mW/Cm2	10	W/M2
Max Measurement at 6 Feet Above Ground	0.0445	mW/Cm2	0.4448	W/M2

Measurement Parameters			
Instrument: Narda NBM-550-S with FCC probe #EA5091			
Measurements made at 6 feet above ground at 10 feet, 50 feet and 100 feet from the pole/cell base			
Measurements are broadband base and account for radio frequencies ranging from 300KHz to 50GHz			
Maximum Permissible Exposure (MPE) Power Densities in Watts/Meter Squared			
	FCC (1.5-100GHz)	INCRP (2-300GHz)	Canada (6-150GHz)
Occupational	50	50	50
General Public	10	10	10