RF EMISSIONS COMPLIANCE REPORT

Crown Castle on behalf of T-Mobile

Crown Castle Site Name: HWY 101 – LAKEVILLE Crown Castle Site BU Number: 856199
T-Mobile Site ID: BA20403A
Application ID: 578187
1 Casa Grande Road
Petaluma, CA
11/23/2021

Report Status:

T-Mobile is Compliant

Michael Fischer, P.E.
Registered Professional Engineer (Electrical)
California License Number 22921
Expires September 30, 2023

Signed 23 November 2021

Prepared By:

Site Safe, LLC

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Engineering Statement in Re:
Electromagnetic Energy Analysis
Crown Castle
Petaluma, CA

My signature on the cover of this document indicates:

That I am registered as a Professional Engineer in the jurisdiction indicated; and

That I have extensive professional experience in the wireless communications engineering industry; and

That I am an employee of Site Safe, LLC in Vienna, Virginia; and

That I am thoroughly familiar with the Rules and Regulations of the Federal Communications Commission ("the FCC" and "the FCC Rules") both in general and specifically as they apply to the FCC's Guidelines for Human Exposure to Radio Frequency Electromagnetic Fields; and

That the technical information serving as the basis for this report was supplied by Crown Castle on behalf of T-Mobile (see attached Site Summary and Carrier documents) and that T-Mobile's installation involves communications equipment, antennas and associated technical equipment at a location referred to as "HWY 101 - LAKEVILLE" ("the site"); and

That T-Mobile proposes to operate at the site with transmit antennas listed in the carrier summary and with a maximum effective radiated power as specified by T-Mobile and shown on the worksheet and that worst-case 100% duty cycle has been assumed; and

That this analysis has been performed with the assumption that the ground immediately surrounding the tower is primarily flat or falling; and

That at this time, the FCC requires that certain licensees address specific levels of radio frequency energy to which workers or members of the public might possibly be exposed (at §1.1307(b) of the FCC Rules); and

That such consideration of possible exposure of humans to radio frequency energy must utilize the standards set by the FCC, which is the federal agency having jurisdiction over communications facilities; and

That the FCC rules define two tiers of permissible exposure guidelines: 1) "uncontrolled environments," which defines situations in which persons may not be aware of (the "general public"), or may not be able to control their exposure to a transmission facility; and 2) "controlled environments," which defines situations in which persons are aware of their potential for exposure (industry personnel); and

That this statement specifically addresses the uncontrolled environment (which is more conservative than the controlled environment) and the limit set forth in the FCC rules for licensees of T-Mobile's operating frequencies as shown on the attached antenna worksheet; and

That when applying the uncontrolled environment standards, the predicted Maximum Power Density at two meters above ground level from the proposed T-Mobile operation is no more than 45.577% of the maximum permissible exposure limits in any accessible area on the ground; and

That it is understood per FCC Guidelines and OET 65 Appendix A, that regardless of the existent radio frequency environment, only those licensees whose contributions exceed 5% of the exposure limit pertinent to their operation(s) bear any responsibility for bringing any non-compliant area(s) into compliance; and

That when applying the uncontrolled environment standards, the cumulative predicted energy density from the proposed operation is no more than 58.141% of the maximum in any accessible area up to two meters above the ground per OET 65; and

That the calculations provided in this report are based on data provided by the client and antenna pattern data supplied by the antenna manufacturer, in accordance with FCC guidelines listed in OET 65. Horizontal and vertical antenna patterns are combined for modeling purposes to accurately reflect the energy two meters above ground level where on-axis energy refers to maximum energy two meters above the ground along the azimuth of the antenna and where area energy refers to the maximum energy anywhere two meters above the ground regardless of the antenna azimuth, accounting for cumulative energy from multiple antennas for the carrier(s) and frequency range(s) indicated; and

That the Occupational Safety and Health Administration has policies in place which address worker safety in and around communications sites, thus individual companies will be responsible for their employees' training regarding radio frequency safety; and

In summary, it is stated here that the proposed operation at the site will not result in exposure of the public to excessive levels of radio frequency energy as defined in the FCC Rules and Regulations, specifically 47 CFR 1.1307(b), and that T-Mobile's proposed operation is completely compliant.

Finally, it is stated that access to the tower should be restricted to communication industry professionals and approved contractor personnel trained in radio frequency safety and that this instant analysis addresses exposure levels at two meters above ground level and does not address exposure levels on the tower or in the immediate proximity of the antennas.

Crown Castle
HWY 101 - LAKEVILLE
Site Summary

Carrier	Area Maximum Percentage MPE
AT&T Mobility, LLC	3.204 %
AT&T Mobility, LLC	1.305 %
AT&T Mobility, LLC	1.779 %
AT&T Mobility, LLC	0.939 %
AT&T Mobility, LLC	2.915 %
AT&T Mobility, LLC	2.422 %
T-Mobile	4.217 %
T-Mobile	5.752 %
T-Mobile	4.815 %
T-Mobile	6.261 %
T-Mobile (Proposed)	24.532 %

Composite Site MPE: 58.141 %

AT&T Mobility, LLC
HWY 101 - LAKEVILLE
Carrier Summary

Frequency:	2100	MHz
Maximum Permissible Exposure (MPE):	1000	$\mu W/cm^2$
Maximum power density at ground level:	32.04396	$\mu W/cm^2$
Highest percentage of Maximum Permissible Exposure:	3.20440	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density ($\mu W/cm^2$)**	**Percent of MPE**	**Max Power Density ($\mu W/cm^2$)**	**Percent of MPE**
Commscope	JAHH-65A-R3B	65	30	7713	18.694916	1.869491	29.544983	2.954498
Commscope	JAHH-65A-R3B	65	290	7713	18.694916	1.869491	29.544983	2.954498
Commscope	JAHH-65A-R3B	65	170	7713	18.694916	1.869491	29.544983	2.954498

AT&T Mobility, LLC
HWY 101 - LAKEVILLE
Carrier Summary

Frequency:	1900	MHz
Maximum Permissible Exposure (MPE):	1000	$\mu W/cm^2$
Maximum power density at ground level:	13.04645	$\mu W/cm^2$
Highest percentage of Maximum Permissible Exposure:	1.30465	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density ($\mu W/cm^2$)**	**Percent of MPE**	**Max Power Density ($\mu W/cm^2$)**	**Percent of MPE**
Commscope	NNHH-65A-R4	70	30	5522	5.398686	0.539869	12.288117	1.228812
Commscope	NNHH-65A-R4	70	290	5522	5.398686	0.539869	12.288117	1.228812
Commscope	NNHH-65A-R4	70	170	5522	5.398686	0.539869	12.288117	1.228812

AT&T Mobility, LLC
HWY 101 - LAKEVILLE
Carrier Summary

Frequency:	763	MHz
Maximum Permissible Exposure (MPE):	508.67	$\mu W/cm^2$
Maximum power density at ground level:	9.04682	$\mu W/cm^2$
Highest percentage of Maximum Permissible Exposure:	1.77854	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density ($\mu W/cm^2$)**	**Percent of MPE**	**Max Power Density ($\mu W/cm^2$)**	**Percent of MPE**
Commscope	NNHH-65A-R4	70	30	2042	4.702738	0.924523	5.053623	0.993504
Commscope	NNHH-65A-R4	70	290	2042	4.702738	0.924523	5.053623	0.993504
Commscope	NNHH-65A-R4	70	170	2042	4.702738	0.924523	5.053623	0.993504

AT&T Mobility, LLC
HWY 101 - LAKEVILLE
Carrier Summary

Frequency:	2300	MHz
Maximum Permissible Exposure (MPE):	1000	$\mu W/cm^2$
Maximum power density at ground level:	9.38921	$\mu W/cm^2$
Highest percentage of Maximum Permissible Exposure:	0.93892	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density ($\mu W/cm^2$)**	**Percent of MPE**	**Max Power Density ($\mu W/cm^2$)**	**Percent of MPE**
Commscope	JAHH-65A-R3B	75	30	3133	4.943028	0.494303	8.836059	0.883606
Commscope	JAHH-65A-R3B	75	290	3133	4.943028	0.494303	8.836059	0.883606
Commscope	JAHH-65A-R3B	75	170	3133	4.943028	0.494303	8.836059	0.883606

AT&T Mobility, LLC
HWY 101 - LAKEVILLE
Carrier Summary

Frequency:	850	MHz
Maximum Permissible Exposure (MPE):	566.67	$\mu W/cm^2$
Maximum power density at ground level:	16.52084	$\mu W/cm^2$
Highest percentage of Maximum Permissible Exposure:	2.91544	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density ($\mu W/cm^2$)**	**Percent of MPE**	**Max Power Density ($\mu W/cm^2$)**	**Percent of MPE**
Commscope	JAHH-65A-R3B	75	30	2100	10.322788	1.821668	11.991903	2.116218
Commscope	JAHH-65A-R3B	65	30	525	3.580195	0.631799	4.114395	0.726070
Commscope	JAHH-65A-R3B	75	290	2100	10.322788	1.821668	11.991903	2.116218
Commscope	JAHH-65A-R3B	65	290	525	3.580195	0.631799	4.114395	0.726070
Commscope	JAHH-65A-R3B	75	170	2100	10.322788	1.821668	11.991903	2.116218
Commscope	JAHH-65A-R3B	65	170	525	3.580195	0.631799	4.114395	0.726070

AT&T Mobility, LLC
HWY 101 - LAKEVILLE
Carrier Summary

Frequency:	737	MHz
Maximum Permissible Exposure (MPE):	491.33	$\mu W/cm^2$
Maximum power density at ground level:	11.89978	$\mu W/cm^2$
Highest percentage of Maximum Permissible Exposure:	2.42194	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density ($\mu W/cm^2$)**	**Percent of MPE**	**Max Power Density ($\mu W/cm^2$)**	**Percent of MPE**
Commscope	JAHH-65A-R3B	75	30	904	4.338775	0.883061	4.982287	1.014034
Commscope	JAHH-65A-R3B	65	30	678	4.444771	0.904635	5.126128	1.043310
Commscope	JAHH-65A-R3B	75	290	904	4.338775	0.883061	4.982287	1.014034
Commscope	JAHH-65A-R3B	65	290	678	4.444771	0.904635	5.126128	1.043310
Commscope	JAHH-65A-R3B	75	170	904	4.338775	0.883061	4.982287	1.014034
Commscope	JAHH-65A-R3B	65	170	678	4.444771	0.904635	5.126128	1.043310

T-Mobile
HWY 101 - LAKEVILLE
Carrier Summary

Frequency:	2100	MHz
Maximum Permissible Exposure (MPE):	1000	$\mu W/cm^2$
Maximum power density at ground level:	42.17070	$\mu W/cm^2$
Highest percentage of Maximum Permissible Exposure:	4.21707	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density ($\mu W/cm^2$)**	**Percent of MPE**	**Max Power Density ($\mu W/cm^2$)**	**Percent of MPE**
RFS	APXVAARR24_43-U-NA20	50	60	12948	24.199078	2.419908	34.785538	3.478554
RFS	APXVAARR24_43-U-NA20	50	240	12948	24.199078	2.419908	34.785538	3.478554
RFS	APXVAARR24_43-U-NA20	50	340	12948	24.199078	2.419908	34.785538	3.478554

T-Mobile
HWY 101 - LAKEVILLE
Carrier Summary

Frequency:	1900	MHz
Maximum Permissible Exposure (MPE):	1000	$\mu W/cm^2$
Maximum power density at ground level:	57.52269	$\mu W/cm^2$
Highest percentage of Maximum Permissible Exposure:	5.75227	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density ($\mu W/cm^2$)**	**Percent of MPE**	**Max Power Density ($\mu W/cm^2$)**	**Percent of MPE**
RFS	APXVAARR24_43-U-NA20	50	60	1236	4.310934	0.431093	5.961219	0.596122
RFS	APXVAARR24_43-U-NA20	50	60	1236	4.310934	0.431093	5.961219	0.596122
RFS	APXVAARR24_43-U-NA20	50	60	7417	25.865599	2.586560	35.767315	3.576731
RFS	APXVAARR24_43-U-NA20	50	240	1236	4.310934	0.431093	5.961219	0.596122
RFS	APXVAARR24_43-U-NA20	50	240	1236	4.310934	0.431093	5.961219	0.596122
RFS	APXVAARR24_43-U-NA20	50	240	7417	25.865599	2.586560	35.767315	3.576731
RFS	APXVAARR24_43-U-NA20	50	340	1236	4.310934	0.431093	5.961219	0.596122
RFS	APXVAARR24_43-U-NA20	50	340	1236	4.310934	0.431093	5.961219	0.596122
RFS	APXVAARR24_43-U-NA20	50	340	7417	25.865599	2.586560	35.767315	3.576731

T-Mobile
HWY 101 - LAKEVILLE
Carrier Summary

Frequency:	700	MHz
Maximum Permissible Exposure (MPE):	466.67	$\mu W/cm^2$
Maximum power density at ground level:	22.46885	$\mu W/cm^2$
Highest percentage of Maximum Permissible Exposure:	4.81475	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density ($\mu W/cm^2$)**	**Percent of MPE**	**Max Power Density ($\mu W/cm^2$)**	**Percent of MPE**
RFS	APXVAARR24_43-U-NA20	50	60	3484	6.294682	1.348860	11.352098	2.432592
RFS	APXVAARR24_43-U-NA20	50	240	3484	6.294682	1.348860	11.352098	2.432592
RFS	APXVAARR24_43-U-NA20	50	340	3484	6.294682	1.348860	11.352098	2.432592

T-Mobile
HWY 101 - LAKEVILLE
Carrier Summary

Frequency:	600	MHz
Maximum Permissible Exposure (MPE):	400	$\mu W/cm^2$
Maximum power density at ground level:	25.04540	$\mu W/cm^2$
Highest percentage of Maximum Permissible Exposure:	6.26135	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density ($\mu W/cm^2$)**	**Percent of MPE**	**Max Power Density ($\mu W/cm^2$)**	**Percent of MPE**
RFS	APXVAARR24_43-U-NA20	50	60	2501	4.947424	1.236856	7.518660	1.879665
RFS	APXVAARR24_43-U-NA20	50	60	2501	4.947424	1.236856	7.518660	1.879665
RFS	APXVAARR24_43-U-NA20	50	240	2501	4.947424	1.236856	7.518660	1.879665
RFS	APXVAARR24_43-U-NA20	50	240	2501	4.947424	1.236856	7.518660	1.879665
RFS	APXVAARR24_43-U-NA20	50	340	2501	4.947424	1.236856	7.518660	1.879665
RFS	APXVAARR24_43-U-NA20	50	340	2501	4.947424	1.236856	7.518660	1.879665

T-Mobile (Proposed)
HWY 101 - LAKEVILLE
Carrier Summary

Frequency:	2500	MHz
Maximum Permissible Exposure (MPE):	1000	$\mu W/cm^2$
Maximum power density at ground level:	245.32329	$\mu W/cm^2$
Highest percentage of Maximum Permissible Exposure:	24.53233	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density ($\mu W/cm^2$)**	**Percent of MPE**	**Max Power Density ($\mu W/cm^2$)**	**Percent of MPE**
Ericsson	AIR6449	50	60	27612	36.230198	3.623020	61.299793	6.129979
Ericsson	AIR6449	50	60	27612	36.230198	3.623020	61.299793	6.129979
Ericsson	AIR6449	50	240	27612	36.230198	3.623020	61.299793	6.129979
Ericsson	AIR6449	50	240	27612	36.230198	3.623020	61.299793	6.129979
Ericsson	AIR6449	50	340	27612	36.230198	3.623020	61.299793	6.129979
Ericsson	AIR6449	50	340	27612	36.230198	3.623020	61.299793	6.129979