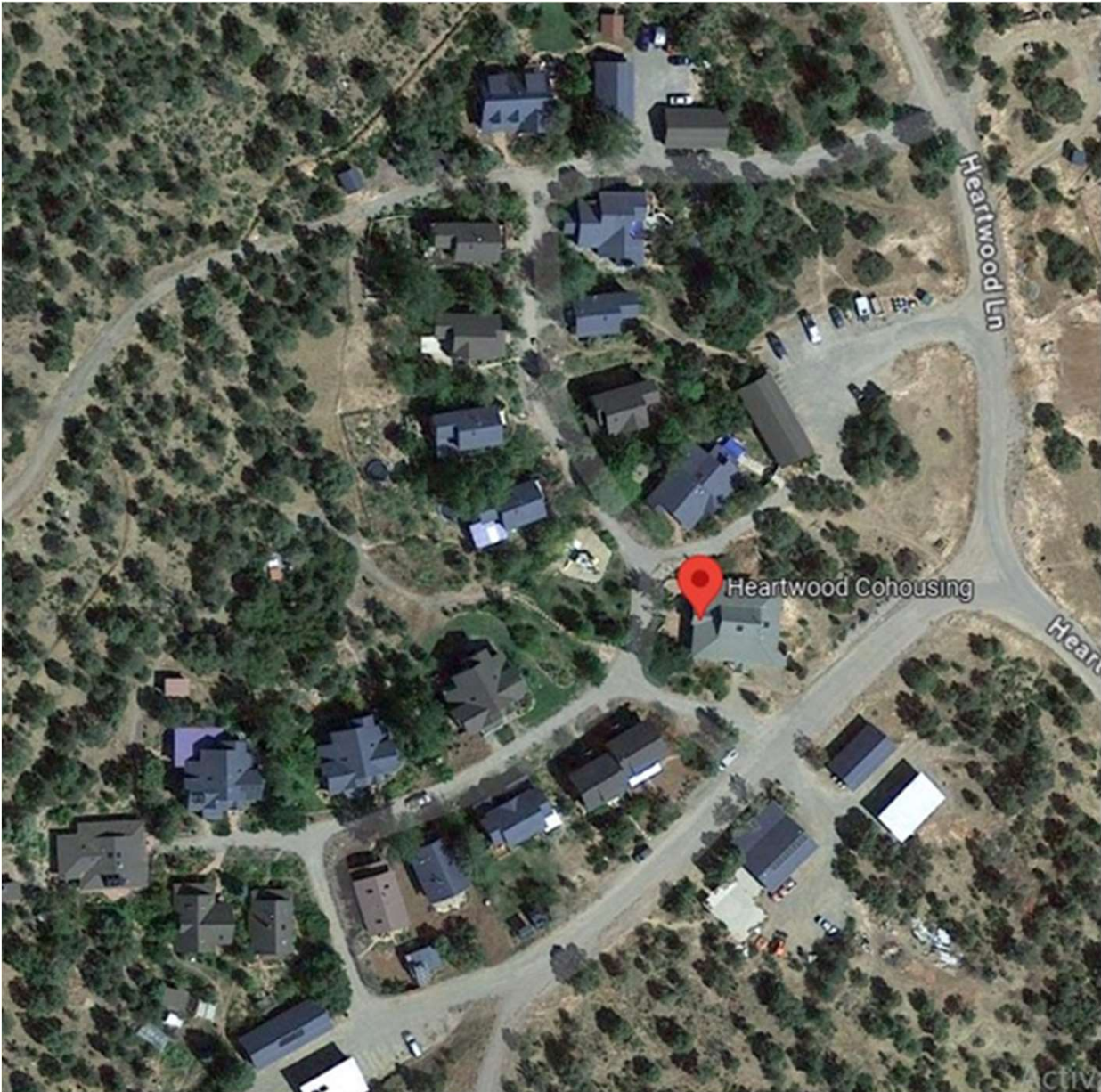


Radio Frequency Exposure Assessment Heartwood Cohousing Phase 1 & Phase 2



Location: Heartwood Cohousing
800 Heartwood Ln, Bayfield, CO 81122

Date/Time: August 7, 2024/ ~8am-11am

Radio Frequency Exposure Assessment Heartwood Cohousing



Cell Towers

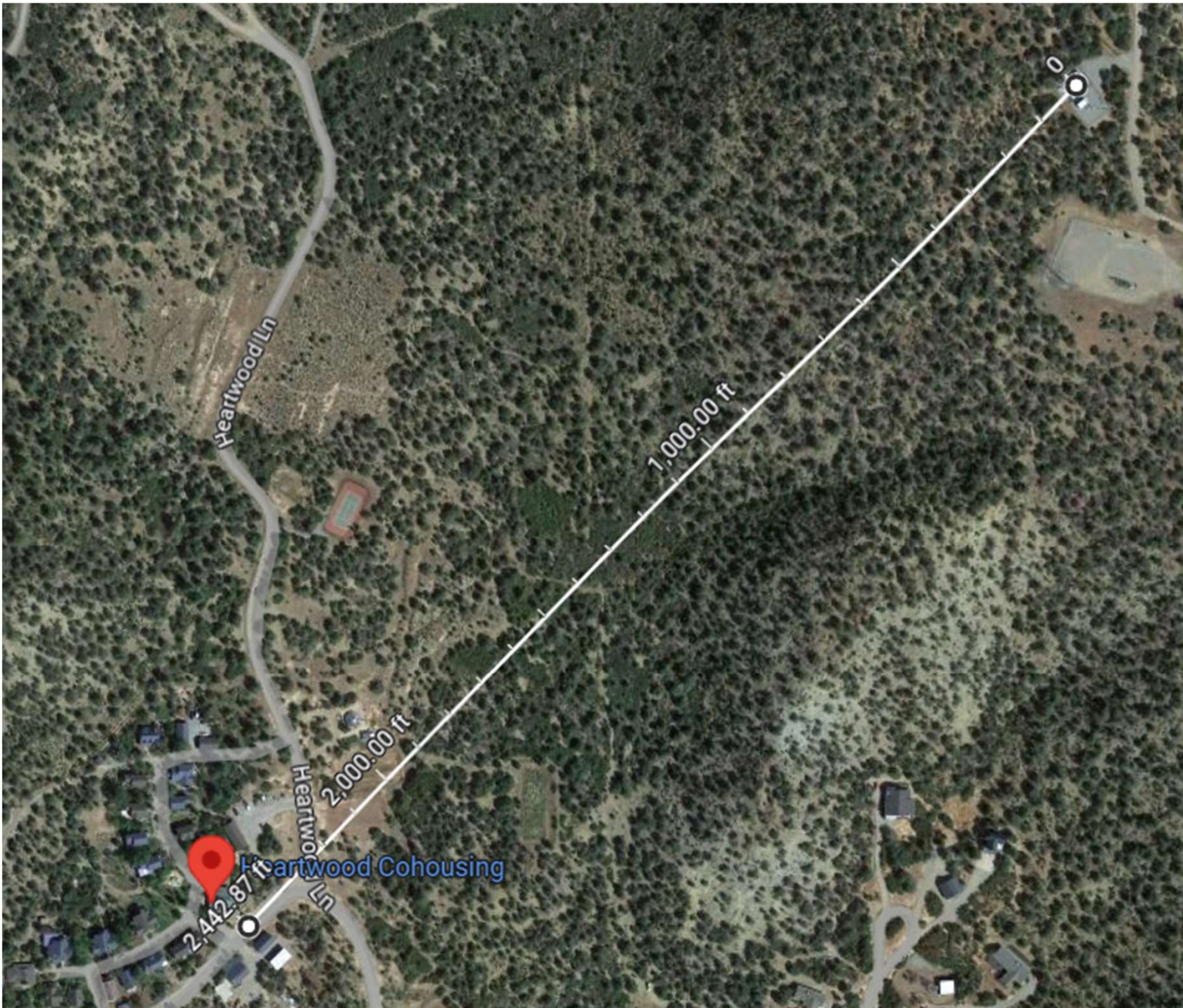


Cellular Providers

Single Antennas

ID	Carrier/Owner	Distance
9	Verizon	0.4 mi
10	Bayfield Sanitation District	0.4 mi
11	Verizon	0.4 mi
12	AT&T	0.4 mi
13	AT&T	0.4 mi
14	T-mobile	0.4 mi
15	T-mobile	0.4 mi
16	AT&T	0.4 mi
17	Sprint Nextel	0.4 mi
18	Sprint Nextel	0.4 mi
19	AT&T	0.4 mi

Radio Frequency Exposure Assessment Heartwood Cohousing



Approximate distances / angles relative to tower station:

Tennis Courts 1685ft / 60deg

P2 Site #3 1780ft / 53 deg

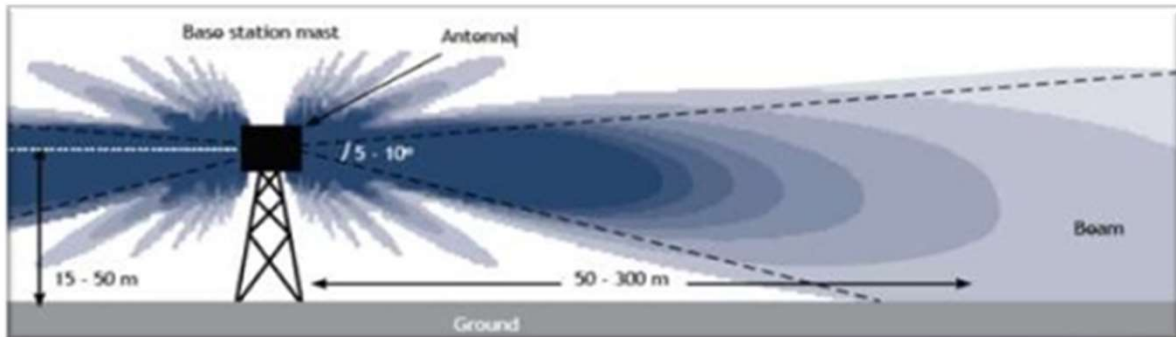
Common House 2440ft / 46deg (angle of main road past Common House

P2 Site #11 2020ft / 45deg

P1 Site # 8 2810ft / 49 deg

Radio Frequency Exposure Assessment Heartwood Cohousing

Radiation Pattern of a Cell Tower Antenna



Propagation of "main beam" from antenna mounted on a tower or roof top

- The illustration above depicts the intensity plume or greater power density associated with the antenna broadcast and decline with distance (inverse square law – every doubling of distance reduces power density four times)
- People living within 165 – 1000 ft radius are in the high radiation zone (dark blue) and are more prone to ill-effects of electromagnetic radiation.
- Given there are multiple towers and multiple antennas at this installation the risk of ill effects is considerably higher - the generalization made in the previous point has many variables and factors that influence exposure and risk such as:
 - Antenna telemetry / orientation or direction of antennas
 - Structures obstructing direct line of sight to attenuate the signal strength such as trees (especially coniferous), buildings and building materials. This factor has a significant influence on exposure levels. Namely, buildings shielded/protected by other buildings or multiple structures including trees whereas some existing building sites and bedrooms have direct line of sight exposure.
 - The number of antennas present as well as the range of different broadcasting frequencies present (ie. 3G, 4G, 5G and possibly broadband wireless). This site has all sources mentioned.
- People with a proportionately greater amount of exposure influencing the sleeping areas of a home. For example, if home and specifically bedrooms are in direct line of sight of the cell tower, causing sleep disruption or quality of sleep.

Radio Frequency Exposure Assessment Heartwood Cohousing

EXPOSURE GUIDELINES / RESEARCH

1. Neural Vitality Networks standard literature reference for exposure guidelines is the [Building Biology Institute EMF Exposure Guidelines for Sleeping Areas](#). Additional reference is also considered with the [EUROPAEM EMF Guidelines](#) as well as the [Austrian Medical Association EMF Guidelines](#). All references are very much aligned and consistent with each other. Differentiation of signal type is categorized by the EUROPAEM Guidelines. A summary is tabled below – please review carefully.
2. Based on these medical documents/guidelines and the fact that wave types such as 4G LTE and 5G are “high crest” type waves, there can be significant variability to the “peaks” or crests. This variability can be seen with tabled measurements shown. It IS these peaks that are what generate greater biologically impact and concern. As a result, a reasonable **precautionary target is to sustain exposures levels as close to 10μW/m2 within sleeping areas and to ensure high use daytime areas do not exceed 1000μW/m2 if possible. These levels may need to be lower depending on health and individual sensitivity.**

	No Concern	Slight Concern	Severe Concern	Extreme Concern
Building Biology Institute	<0.1μW/m2	0.1-10.0	10-1000	>1000

	Daytime Exposure	Nighttime Exposure	Sensitive Populations
EUROPAEM (4G LTE)	<100μW/m2	<10.0	<1.0
(WiFi)	<10μW/m2	<1.0	<0.1
5G Low Band	Standards Not Yet Determined (Likely similar to WiFi)		

	Within Normal Limits	Slightly Above Normal	Far Above Normal	Very Far Above Normal
Austrian Med Assoc	<1μW/m2	1-10.0	10-1000	>1000

Radio Frequency Exposure Assessment Heartwood Cohousing

Equipment Utilized:

With reference to the tabled results illustrated in the following pages, 3 different meters were utilized to quantify radio frequency radiation levels at the stations shown on the maps provided for both Phase 1 (P1) and Phase 2 (P2) of the Heartwood property.

“**RF1**” : GigaHertz Solutions HFE59B equipped with an Ultra Broadband "Quasi" Isotropic, 360°, (27 MHz to 3.3 GHz) (UBB27)

Detects 4G and Low Band 5G

“**RF2**” : GigaHertz Solutions HFW59D equipped with a 360 degree Omni-Directional Antenna, (2.4 GHz to 10 GHz) (UBB2410)

Detects Low Band 5G and Broadband Wireless and a good representation of the proportion of Low Band 5G that is present

“**RF3**” : Safe and Sound Pro II effective measurement range of 200 MHz to 8 GHz, true response detection range 400 MHz to 7.2 GHz, bi directional antenna

Aggregate or summation of both RF1 and RF2 and is most representative of overall

RF1 (4G & 5G)



RF2 (5G, WiFi & Broadband Wireless)

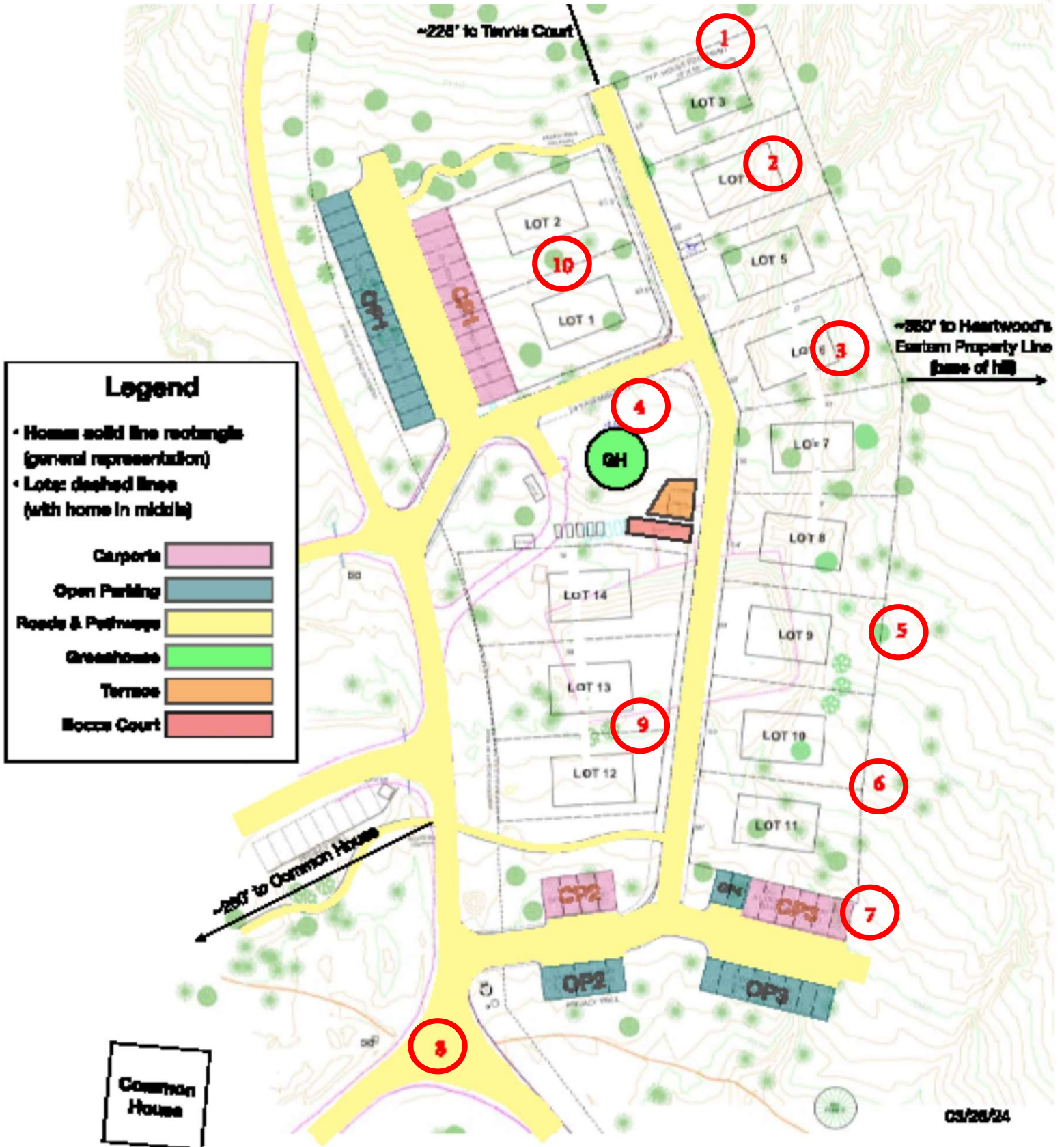


RF3 (RF1 + RF2)



Radio Frequency Exposure Assessment Heartwood Cohousing

Heartwood Phase 2 Radio Frequency Measurement Stations



Radio Frequency Exposure Assessment Heartwood Cohousing

Heartwood Phase 2 Radio Frequency Measurement Stations

Station #	RF 1 27MHz - 3300MHz	RF2 2400MHz - 10,000MHz	RF3 400MHz - 7200MHz	Comment
1	1000	220	400	Lot 3
2	500	155	1070	Lot 4
3	330	360	685	Lot 6
4	320	920	2600	Front of Greenhouse
5	370	700	1750	Lot 9
6	250	1000	1650	Lot 10 & 11
7	65	55	65	SE Corner Lot 11 (Trees Obstructing)
8	440	9600	8700	Y Intersection of main road ~2270ft to cell tower (open sightline)
9	200	1100	2700	Lot 12 & 13
10	710	3100	3400	Lot 1 & 2
11	1200	7000	8300	Road next to Common House (CH) ~2440ft to cell tower (open sightline)

Refer to P2 map for location of Stations, also referenced in Comment column

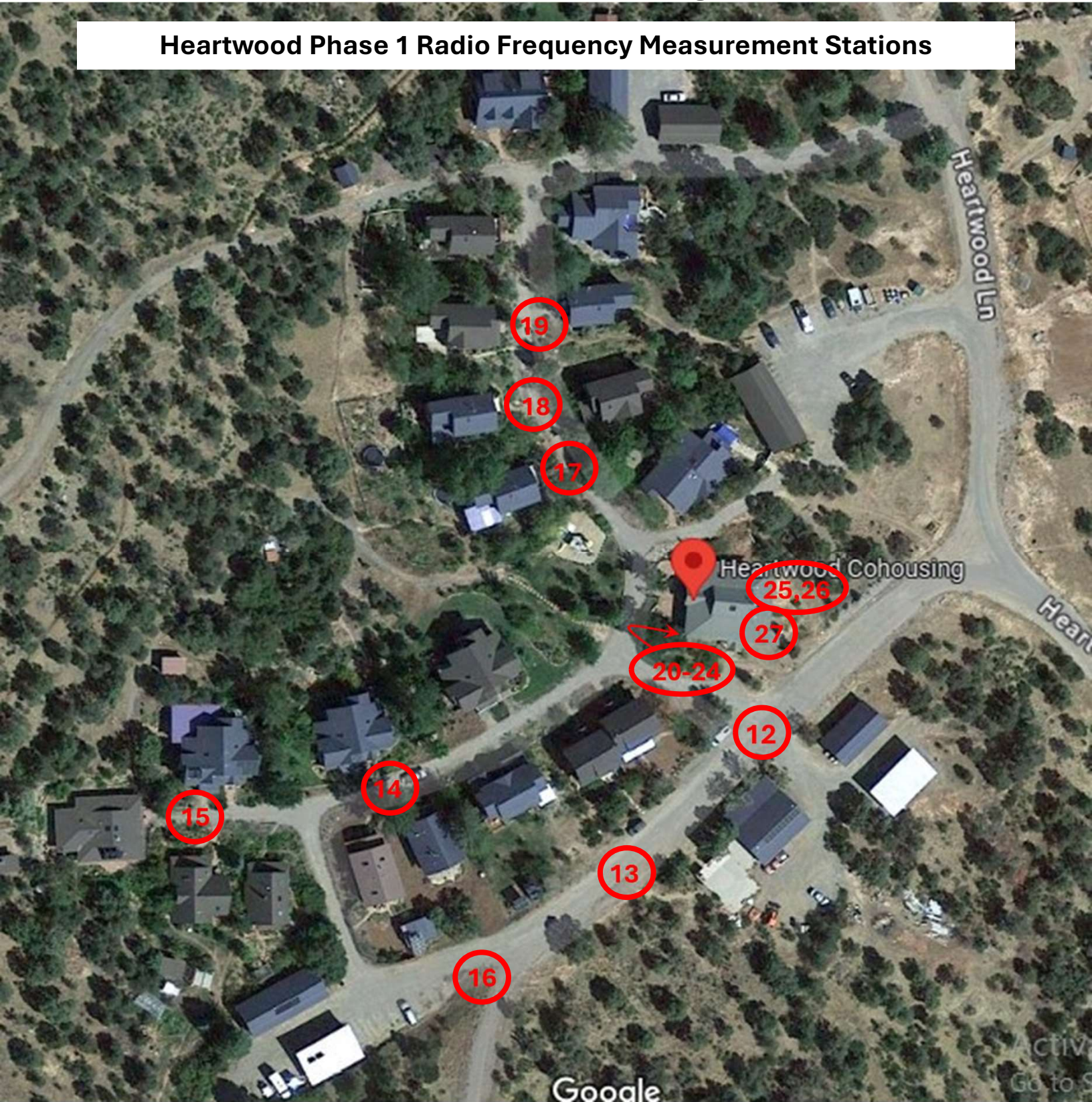
RF1 - can detect 4G and Low Band 5G

RF2 - can detect Low Band 5G and Broadband Wireless and a good representation of the proportion of Low Band 5G that is present

RF3 - is an aggregate and will be most representative of overall exposure

Radio Frequency Exposure Assessment Heartwood Cohousing

Heartwood Phase 1 Radio Frequency Measurement Stations



Numbers plotted ## above refer to station points for radio frequency power density measurements recorded August 7, 2024. Refer to table for measurements recorded at various locations on P1 and proposed Lots pertaining to P2.

Radio Frequency Exposure Assessment Heartwood Cohousing

Heartwood Phase 1 Radio Frequency Measurement Stations

Station #	RF 1 27MHz - 3300MHz	RF2 2400MHz - 10,000MHz	RF3 400MHz - 7200MHz	Comment
12	1300	3300	3900	Road next to CH (open sightline)
13	1500	1800	6000	Same as above but past CH (open sightline)
14	450	630	1150	Adjacent to Unit #13 on housing path
15	67	48	290	In front of Unit #8 ~2840ft to cell tower
16	2400	6300	8300	Y on road ~2750ft cell tower (open sightline)
17			515	In front of Unit #16
18			6960	In front of Unit #17 (open sightline)
19			190	In front of Unit #18
20		6000		Common House Wifi @10ft
21		20000		Common House Wifi @5ft
22	For reference and objective comparison		120000	Common House Wifi @2ft
23			75,000	Cell Phone idle @2ft
24			150000	Cell Phone receive call@2ft
25			2000	CH Kitchen Window Open
26			75	CH Kitchen Window Closed
27	300	200	1800	CH Fireplace Room east wall

Refer to P2 map for location of Stations, also referenced in Comment column

RF1 - can detect 4G and Low Band 5G

RF2 - can detect Low Band 5G and Broadband Wireless and a good representation of the proportion of Low Band 5G that is present

RF3 - is an aggregate and will be most representative of overall exposure

Radio Frequency Exposure Assessment Heartwood Cohousing

Observations / Summary of Data

- Station #18 clearly indicates exposure levels are significantly elevated because of direct line of sight telemetry. This data point is relevant to all homes that have similar geographic alignment. This is important to consider because these exposure levels are far above what is recommended.
- It is important to consider that all data points are proportionate to line of sight. Measurements taken within areas with denser vegetation are not likely to be representative in future if trees are cleared for construction and two-story homes will of course be elevated which will increase exposure. In other words, if you have line of sight, you will have elevated exposure levels and may want to consider preventative steps to mitigate at least for sleeping areas.
- It is always important to mention that radio frequency sources and the resulting exposure is almost invariably a result of technologies within the home more so than outside the home. In other words, to exercise remediations due to cell tower radiation exposure without addressing the sources within the home is incomplete and definitely inadequate to affect your biology and overall health.
- The critical exposure measurement is always the sleeping areas. Biologically speaking that is the most important room in the home to ensure levels are as close as possible to the guidelines which have been stated earlier in this document.
- It can be clearly seen that the measurements taken within phase one (P1) of Heartwood readily identify areas that are either naturally shielded by vegetation or more commonly by other homes or the Common House. P1 homes west of the Common House are aligned to the same vector direction as the cell towers and thus there is multi walled protection inherent with the arrangement of the homes. Consider this alignment versus P2 where all homes will have line of sight to the towers and thus exterior remediations/shielding is a more critical consideration for all homes.

Radio Frequency Exposure Assessment Heartwood Cohousing

Observations / Summary of Data

- The highlighted data within the tables emphasizes the significance of line-of-sight readings. More importantly however, is the fact that RF2 measurements are consistently higher than RF1 measurements. This is a very clear indication that 5G has a higher allocation of transmission power. It is important to understand that of course this is intentional by the industry to increase data speeds; however, this also allows the cellular providers to offer internet services to line of sight homes because of the signal strength and penetration into the home. Having achieved sufficient 5G penetration inside the home ATT, Verizon or T-Mobile can now rent Wi-Fi routers which convert the 5G signal to Wi-Fi.
- Further to the previous point stated, it is important to understand that if the radiation level is sufficiently high to be able to receive that signal within a home and rebroadcast it as Wi-Fi, what that means is that the level of radio frequency exposure is already significantly elevated. This has been a change that has been experienced at Heartwood with the transition from 4G to 5G. It is important to also understand that what this means is that your exposure has increased and that not only that, but as well, the frequency of the transmissions being received has also increased. As frequency increases, so does the energy level you're exposed to. In other words, the radiofrequency landscape has changed in recent years which should be a consideration for all residents.
- Reference to broadband wireless has been made throughout this report. This type of radiation was introduced initially to enable a method to broadcasting internet to rural and/or difficult to access locations. Think of it like internet sent by a wireless high frequency "beam". In terms of biological impact it is easily equivalent to or greater than Wi-Fi if exposed. The frequency of the beam must be high to provide sufficient internet speed AND as well, the signal is propagated from one home to the next by a technology called point to point. Broadband refers to the width if you will – of the beam and defines its capability to support greater speeds. Envision then a beam transmitting from one point or house to the next point or house and so on and so on. A network of beams strung throughout the valley. There is a variation or more recent development of the technology defined as point to multipoint. In this configuration a strong beam is sent to a point and then dispersed to multiple users (multi-point). In this configuration the density of beams can be significantly increased. With this type of internet its very important to consider antenna placement to avoid being exposed to the beam.

Radio Frequency Exposure Assessment Heartwood Cohousing

Observations / Summary of Data

- Further note on broadband wireless about antenna (transponder) placement and P1 residents. Often these are positioned near front door entrance – ideally this is NOT where you'd want to locate two-way high frequency beam. There is obvious risk of direct exposure if in the plane of the beam in addition to possible risk of penetration into the home by radiation that is not fully captured by the antenna. More common placement is on the roof especially if roof is metal OR locate at a neutral position off of the home and away from any potential exposure. If relocation is considered this would be coordinated with the broadband provider.
- Stations 20 through 24 were provided to illustrate radiation strength of sources common to most households, namely wi-fi router and cell phones. These of course are technologies you can control and minimize, isolate or disable as you choose. In contrast however, cell tower radiation is ubiquitous and 24/7, pervasive. You can however see, based on distance of these station measurements the amount of radiation that is emitted, and this was provided for you to have at least some point of reference to understand this report and the physics of these measurements. It is important to consider as well, that Wi-Fi is probably the single most harmful radiation source due to its higher frequency and pulsed high crest nature. Thus, distance is a critical consideration however, it's difficult to distance yourself because whatever device you're using is typically creating the greatest radiation. In other words, a laptop placed in front of you is constantly in a 2-way wireless communication with your Wi-Fi router and thus the radiation from the laptop is in most cases the more significant source of exposure unless of course you are directly or immediately adjacent to your Wi-Fi router. The cell phone data shown in stations 23 and 24 is an example of this phenomenon and the distance relationship that exists.
- To reference or research in greater depth the biological effects of radio frequency radiation exposure, please visit the BioInitiative Report Website <https://bioinitiative.org/> this is the largest repository of scientific and medical research on the biological effects of electromagnetic fields. The following charts summarize studies you'll find within this website. The charts are arranged from lowest to highest power density exposure levels and their effects studied. **The first two pages are most relevant to Heartwood exposures.**

Radio Frequency Exposure Assessment Heartwood Cohousing

Observations / Summary of Data

Reported Biological Effects from Radiofrequency Radiation at Low-Intensity Exposure (Cell Tower, Wi-Fi, Wireless Laptop and 'Smart' Meter RF Intensities)

Heartwood site measurements are reported in **microwatts/m2** and ranged from **65 – 8300 uW/m2**, the chart shown below is in **microwatts/cm2**. To convert values below, multiply x10000.

The following chart ranges from 0.00000000000000100 – 1100 uW/m2.

Power Density (Microwatts/centimeter2 - uW/cm2)		Reference
As low as (10 ⁻¹³) or 100 femtowatts/cm2	Super-low intensity RFR effects at MW resonant frequencies resulted in changes in genes; problems with chromatin conformation (DNA)	Belyaev, 1997
5 picowatts/cm2 (10 ⁻¹²)	Changed growth rates in yeast cells	Grundler, 1992
0.1 nanowatt/cm2 (10 ⁻¹⁰) or 100 picowatts/cm2	Super-low intensity RFR effects at MW resonant frequencies resulted in changes in genes; problems with chromatin condensation (DNA) intensities comparable to base stations	Belyaev, 1997
0.00034 uW/cm2	Chronic exposure to mobile phone pulsed RF significantly reduced sperm count,	Behari, 2006
0.0005 uW/cm2	RFR decreased cell proliferation at 960 MHz GSM 217 Hz for 30-min exposure	Velizarov, 1999
0.0006 - 0.0128 uW/cm2	Fatigue, depressive tendency, sleeping disorders, concentration difficulties, cardio-vascular problems reported with exposure to GSM 900/1800 MHz cell phone signal at base station level exposures.	Oberfeld, 2004
0.003 - 0.02 uW/cm2	In children and adolescents (8-17 yrs) short-term exposure caused headache, irritation, concentration difficulties in school.	Heinrich, 2010
0.003 to 0.05 uW/cm2	In children and adolescents (8-17 yrs) short-term exposure caused conduct problems in school (behavioral problems)	Thomas, 2010
0.005 uW/cm2	In adults (30-60 yrs) chronic exposure caused sleep disturbances, (but not significantly increased across the entire population)	Mohler, 2010
0.005 - 0.04 uW/cm2	Adults exposed to short-term cell phone radiation reported headaches, concentration difficulties (differences not significant, but elevated)	Thomas, 2008
0.006 - 0.01 uW/cm2	Chronic exposure to base station RF (whole-body) in humans showed increased stress hormones; dopamine levels substantially decreased; higher levels of adrenaline and nor-adrenaline; dose-response seen; produced chronic physiological stress in cells even after 1.5 years.	Buchner, 2012
0.01 - 0.11 uW/cm2	RFR from cell towers caused fatigue, headaches, sleeping problems	Navarro, 2003

Stress proteins, HSP, disrupted immune function	Brain tumors and blood-brain barrier
Reproduction/fertility effects	Sleep, neuron firing rate, EEG, memory, learning, behavior
Oxidative damage/ROS/DNA damage/DNA repair failure	Cancer (other than brain), cell proliferation
Disrupted calcium metabolism	Cardiac, heart muscle, blood-pressure, vascular effects

Radio Frequency Exposure Assessment Heartwood Cohousing

Observations / Summary of Data

Reported Biological Effects from Radiofrequency Radiation at Low-Intensity Exposure (Cell Tower, Wi-Fi, Wireless Laptop and 'Smart' Meter RF Intensities)

Heartwood site measurements are reported in **microwatts/m²** and ranged from **65 – 8300 uW/m²**, the chart shown below is in **microwatts/cm²**. To convert values below, multiply x10000.

The following chart ranges from 50 – 12800 uW/m².

Power Density (Microwatts/centimeter ² - uW/cm ²)		Reference
0.01 - 0.05 uW/cm ²	Adults (18-91 yrs) with short-term exposure to GSM cell phone radiation reported headache, neurological problems, sleep and concentration problems.	Hutter, 2006
0.005 - 0.04 uW/cm ²	Adults exposed to short-term cell phone radiation reported headaches, concentration difficulties (differences not significant, but elevated)	Thomas, 2008
0.015 - 0.21 uW/cm ²	Adults exposed to short-term GSM 900 radiation reported changes in mental state (e.g., calmness) but limitations of study on language descriptors prevented refined word choices (stupified, zoned-out)	Augner, 2009
0.05 - 0.1 uW/cm ²	RFR linked to adverse neurological, cardio symptoms and cancer risk	Khurana, 2010
0.05 - 0.1 uW/cm ²	RFR related to headache, concentration and sleeping problems, fatigue	Kundi, 2009
0.07 - 0.1 uW/cm ²	Sperm head abnormalities in mice exposed for 6-months to base station level RF/MW. Sperm head abnormalities occurred in 39% to 46% exposed mice (only 2% in controls) abnormalities was also found to be dose dependent. The implications of the pin-head and banana-shaped sperm head. The occurrence of sperm head observed increase occurrence of sperm head abnormalities on the reproductive health of humans living in close proximity to GSM base stations were discussed."	Otitolaju, 2010
0.38 uW/cm ²	RFR affected calcium metabolism in heart cells	Schwartz, 1990
0.8 - 10 uW/cm ²	RFR caused emotional behavior changes, free-radical damage by super-weak MWs	Akoev, 2002
0.13 uW/cm ²	RFR from 3G cell towers decreased cognition, well-being	Zwamborn, 2003
0.16 uW/cm ²	Motor function, memory and attention of school children affected (Latvia)	Kolodynski, 1996
0.168 - 1.053 uW/cm ²	Irreversible infertility in mice after 5 generations of exposure to RFR from an 'antenna park'	Magras & Zenos, 1997
0.2 - 8 uW/cm ²	RFR caused a two-fold increase in leukemia in children	Hocking, 1996
0.2 - 8 uW/cm ²	RFR decreased survival in children with leukemia	Hocking, 2000
0.21 - 1.28 uW/cm ²	Adolescents and adults exposed only 45 min to UMTS cell phone radiation reported increases In headaches.	Riddervold, 2008

Stress proteins, HSP, disrupted immune function	Brain tumors and blood-brain barrier
Reproduction/fertility effects	Sleep, neuron firing rate, EEG, memory, learning, behavior
Oxidative damage/ROS/DNA damage/DNA repair failure	Cancer (other than brain), cell proliferation
Disrupted calcium metabolism	Cardiac, heart muscle, blood-pressure, vascular effects

Radio Frequency Exposure Assessment Heartwood Cohousing

Observations / Summary of Data

Reported Biological Effects from Radiofrequency Radiation at Low-Intensity Exposure (Cell Tower, Wi-Fi, Wireless Laptop and 'Smart' Meter RF Intensities)

Heartwood site measurements are reported in **microwatts/m2** and ranged from **65 – 8300 uW/m2**, the chart shown below is in **microwatts/cm2**. To convert values below, multiply x10000.

The following chart ranges from 5000 – 60000 uW/m2.

Power Density (Microwatts/centimeter2 - uW/cm2)		Reference
0.5 uW/cm2	Significant degeneration of seminiferous epithelium in mice at 2.45 GHz, 30-40 min.	Saunders, 1981
0.5 - 1.0 uW/cm2	Wi-Fi level laptop exposure for 4-hr resulted in decrease in sperm viability, DNA fragmentation with sperm samples placed in petri dishes under a laptop connected via WI-FI to the internet.	Avendano, 2012
1.0 uW/cm2	RFR induced pathological leakage of the blood-brain barrier	Persson, 1997
1.0 uW/cm2	RFR caused significant effect on immune function in mice	Fesenko, 1999
1.0 uW/cm2	RFR affected function of the immune system	Novoselova, 1999
1.0 uW/cm2	Short-term (50 min) exposure in electrosensitive patients, caused loss of well-being after GSM and especially UMTS cell phone radiation exposure	Eltiti, 2007
1.3 - 5.7 uW/cm2	RFR associated with a doubling of leukemia in adults	Dolk, 1997
1.25 uW/cm2	RFR exposure affected kidney development in rats (in-utero exposure)	Pyrpasopoulou, 2004
1.5 uW/cm2	RFR reduced memory function in rats	Nittby, 2007
2 uW/cm2	RFR induced double-strand DNA damage in rat brain cells	Kesari, 2008
2.5 uW/cm2	RFR affected calcium concentrations in heart muscle cells	Wolke, 1996
2 - 4 uW/cm2	Altered cell membranes; acetylcholine-induced ion channel disruption	D'Inzeo, 1988
4 uW/cm2	RFR caused changes in hippocampus (brain memory and learning)	Tattersall, 2001
4 - 15 uW/cm2	Memory impairment, slowed motor skills and retarded learning in children	Chiang, 1989
5 uW/cm2	RFR caused drop in NK lymphocytes (immune function decreased)	Boscolo, 2001
5.25 uW/cm2	20 minutes of RFR at cell tower frequencies induced cell stress response	Kwee, 2001
5 - 10 uW/cm2	RFR caused impaired nervous system activity	Dumansky, 1974
6 uW/cm2	RFR induced DNA damage in cells	Phillips, 1998

Stress proteins, HSP, disrupted immune function	Brain tumors and blood-brain barrier
Reproduction/fertility effects	Sleep, neuron firing rate, EEG, memory, learning, behavior
Oxidative damage/ROS/DNA damage/DNA repair failure	Cancer (other than brain), cell proliferation
Disrupted calcium metabolism	Cardiac, heart muscle, blood-pressure, vascular effects

Radio Frequency Exposure Assessment Heartwood Cohousing

Observations / Summary of Data

Reported Biological Effects from Radiofrequency Radiation at Low-Intensity Exposure (Cell Tower, Wi-Fi, Wireless Laptop and 'Smart' Meter RF Intensities)

Heartwood site measurements are reported in **microwatts/m²** and ranged from **65 – 8300 uW/m²**, the chart shown below is in microwatts/cm². To convert values below, multiply x10000.

The following chart ranges from 87500 – 1200000 uW/m².

Power Density (Microwatts/centimeter ² - uW/cm ²)		Reference
8.75 uW/cm ²	RFR at 900 MHz for 2-12 hours caused DNA breaks in leukemia cells	Marinelli, 2004
10 uW/cm ²	Changes in behavior (avoidance) after 0.5 hour exposure to pulsed RFR	Navakatikian, 1994
10 - 100 uW/cm ²	Increased risk in radar operators of cancer; very short latency period; dose response to exposure level of RFR reported.	Richter, 2000
12.5 uW/cm ²	RFR caused calcium efflux in cells - can affect many critical cell functions	Dutta, 1989
13.5 uW/cm ²	RFR affected human lymphocytes - induced stress response in cells	Sarimov, 2004
20 uW/cm ²	Increase in serum cortisol (a stress hormone)	Mann, 1998
28.2 uW/cm ²	RFR increased free radical production in rat cells	Yurekli, 2006
37.5 uW/cm ²	Immune system effects - elevation of PFC count (antibody producing cells)	Veyret, 1991
45 uW/cm ²	Pulsed RFR affected serum testosterone levels in mice	Forgacs, 2006
50 uW/cm ²	Cell phone RFR caused a pathological leakage of the blood-brain barrier in 1 hour	Salford, 2003
50 uW/cm ²	An 18% reduction in REM sleep (important to memory and learning functions)	Mann, 1996
60 uW/cm ²	RFR caused structural changes in cells of mouse embryos	Somozy, 1991
60 uW/cm ²	Pulsed RFR affected immune function in white blood cells	Stankiewicz, 2006
60 uW/cm ²	Cortex of the brain was activated by 15 minutes of 902 MHz cell phone	Lebedeva, 2000
65 uW/cm ²	RFR affected genes related to cancer	Ivaschuk, 1999
92.5 uW/cm ²	RFR caused genetic changes in human white blood cells	Belyaev, 2005
100 uW/cm ²	Changes in immune function	Elekes, 1996
100 uW/cm ²	A 24.3% drop in testosterone after 6 hours of CW RFR exposure	Navakatikian, 1994
120 uW/cm ²	A pathological leakage in the blood-brain barrier with 915 MHz cell RF	Salford, 1994

Stress proteins, HSP, disrupted immune function	Brain tumors and blood-brain barrier
Reproduction/fertility effects	Sleep, neuron firing rate, EEG, memory, learning, behavior
Oxidative damage/ROS/DNA damage/DNA repair failure	Cancer (other than brain), cell proliferation
Disrupted calcium metabolism	Cardiac, heart muscle, blood-pressure, vascular effects

Radio Frequency Exposure Assessment Heartwood Cohousing

Observations / Summary of Data

Reported Biological Effects from Radiofrequency Radiation at Low-Intensity Exposure (Cell Tower, Wi-Fi, Wireless Laptop and 'Smart' Meter RF Intensities)

Heartwood site measurements are reported in **microwatts/m2** and ranged from **65 – 8300 uW/m2**, the chart shown below is in **microwatts/cm2**. To convert values below, multiply x10000.

The following chart data point is 5,000,000 uW/m2.

Power Density (Microwatts/centimeter2 - uW/cm2)		Reference
500 uW/cm2	Intestinal epithelial cells exposed to 2.45 GHz pulsed at 16 Hz showed changes in intercellular calcium.	Somozy, 1993
500 uW/cm2	A 24.6% drop in testosterone and 23.2% drop in insulin after 12 hrs of pulsed RFR exposure.	Navakatikian, 1994
STANDARDS		
530 - 600 uW/cm2	Limit for uncontrolled public exposure to 800-900 MHz	ANSI/IEEE and FCC
1000 uW/cm2	PCS STANDARD for public exposure (as of September 1,1997)	FCC, 1996
5000 uW/cm2	PCS STANDARD for occupational exposure (as of September 1, 1997)	FCC, 1996
BACKGROUND LEVELS		
0.003 uW/cm2	Background RF levels in US cities and suburbs in the 1990s	Mantiply, 1997
0.05 uW/cm2	Median ambient power density in cities in Sweden (30-2000 MHz)	Hamnerius, 2000
0.1 - 10 uW/cm2	Ambient power density within 100-200' of cell site in US (data from 2000)	Sage, 2000

Stress proteins, HSP, disrupted immune function	Brain tumors and blood-brain barrier
Reproduction/fertility effects	Sleep, neuron firing rate, EEG, memory, learning, behavior
Oxidative damage/ROS/DNA damage/DNA repair failure	Cancer (other than brain), cell proliferation
Disrupted calcium metabolism	Cardiac, heart muscle, blood-pressure, vascular effects

The typical clientele of Neural Vitality Networks is comprised of 50 % referrals from doctors to assess their patients place of residence.

What has been commonly observed, is that individuals affected experience a subtle and gradual decline of immune function and thus the onset of symptoms or sensations is not felt or recognized until pathology has occurred.

A precautionary approach is strongly advised which would include management of technology within the home and if necessary, consider RF shielding of bedrooms to ensure nighttime exposure is compliant with regulatory guidelines. As stated earlier, the recommended level for sleeping is **as close to 10µW/m2 within sleeping areas and to ensure high use daytime areas do not exceed 1000µW/m2 if possible. These levels may need to be lower depending on health and individual sensitivity.**

Radio Frequency Exposure Assessment Heartwood Cohousing

Conclusions / Recommendations:

- For P2 considerations, once landscaping has been completed, any proposed site which has direct line of sight visibility to the cell towers should consider exterior shielding.
- For all existing P1 dwellings which also have direct line of sight exposure, and especially so for bedrooms on those exposed walls, shielding is also advised. Measurement may be a consideration to verify degree of radio frequency power density present from the cell towers across the surface of the sleeping area/ bed surface.
- The scope of this investigation did not entail measurements within existing homes. There is a strong likelihood that Wi-Fi within existing homes is sufficiently strong enough to penetrate adjacent homes. For individuals and homes where health concerns have already arisen or are present Wi-Fi exposure is strongly advised to be mitigated. Consideration is advised for all existing dwellings and certainly for P2 newly constructed homes, to apply wired/ethernet connectivity throughout the home where needed to reduce radio frequency radiation and eliminate Wi-Fi entirely.
- There are a variety of shielding materials and options available for either new construction or existing dwellings. These include shielding paint which may be applied both interior or exterior. There are fabrics which may be applied to the interior walls, or they are available already prefabricated for use as bed canopies. For exterior walls on new construction, and for stucco exteriors, aluminum shielding mesh may be applied beneath stucco wire to provide a very effective attenuation or shielding barrier. Given that any shielding material must be electrically conductive, any metal siding will provide effective shielding, and this of course includes the metal roofs which are already present.
- Shielding products are readily found through a variety of retailers. For further information contact Neural Vitality Networks for recommendations on suitable materials for specific application considerations or recommended meters to quantify exposure levels in bedrooms or common use areas.

Radio Frequency Exposure Assessment Heartwood Cohousing

Riun Ashlie EMRS

Riun Ashlie is a Certified Electromagnetic Radiation Assessment Specialist (EMRS) through the Building Biology Institute.

Neural Vitality Networks (NVN) specializes in EMF assessment and remediation of fields/frequencies including AC magnetic, AC electric, radio frequency (RF) and dirty electricity (DE) in addition to geopathic stress mitigation for homes, offices, farms, businesses and schools.

My path of learning has deeply informed an understanding of the nervous system, health, and the body's ability to repair, restore and sustain harmony. The electromagnetic fields that most of us are now exposed to run counter to the requisite conditions that are essential to our biology and health.



Neural Vitality Networks may best be described as services at very edge where health and environment and ones being converge.

