

Home Electromagnetic Radiation Inspection

Prepared for: [REDACTED]

Prepared by: Shane Reilly, Building Biologist

Testing Location: [REDACTED]

Testing Date: January 12, 2024

Testing Time: 9:00 AM - 2:00 PM

INTRODUCTION

Optimal Dwelling Spaces LLC's (ODS) EMF Inspection identifies internal and external sources of electromagnetic radiation hazards through strategic, analytical measurements of the field strength of electric fields, magnetic fields, radio-frequency waves, and other EMF pollution in the indoor living environment. This compilation of the test results provides an overview of electromagnetic contamination of the space as well as safety recommendations. The Inspector uses a variety of tests to record data points that create a snapshot of the overall exposure level, sources, and most appropriate remediation steps.

Steps of assessment:

- Obtain pre-assessment information
- Research nearby areas of concern
- Conduct home testing
- Identify sources of electromagnetic radiation
- Risk assessment
- Mitigation recommendations
- Technical support consultation

TEST TYPE AND EQUIPMENT USED

Alternating Current (AC) Electric Fields – AC Electric Fields are produced by the presence of electricity. Their strength is determined by voltage; the higher the voltage or number of sources, the stronger the field. AC Electric Fields are generated by live electrical wires and generally radiate outward 6-8 feet from the source, but in some cases further. An electric field will exist even when a plugged-in electric device is not in use (turned off). In other words, anything plugged in produces a continual emission. AC Electric Fields have a natural attraction to ground and are considered low frequency electromagnetic radiation (5 Hz – 400,000 Hz).

Equipment Used

Gigahertz Solutions - NFA1000 3D EMF Meter / GaussMeter

Body Voltage – Airborne AC Electric Fields are always looking for a way to ground. Our bodies are excellent conductors and will serve as a conduit for these active fields. Body Voltage is a valuable body stress test that identifies the AC voltage present on a human body in a particular area. It also helps indicate the presence and intensity of AC Electric Fields.

Equipment Used

Fluke 189 Digital Multimeter True RMS/Frequency Counter

Voltcraft VC840 Digital Multimeter True RMS/Frequency Counter

AC Magnetic Fields – AC Magnetic Fields are produced by electrical current flow. Any device or appliance that consumes electricity will produce an AC Magnetic Field. A more powerful device will produce a higher magnetic field. These fields usually radiate out 2-3 feet from their source, but can radiate out several hundred feet in the case of high voltage power lines. AC Magnetic Fields are considered low-frequency electromagnetic radiation (5 Hz – 400,000 Hz).

Equipment Used

Gigahertz Solutions - NFA1000 3D EMF Meter/GaussMeter

Radio Frequency (RF) - RF waves are used to convey information from one place to another through the air. They are used in mobile communication, radio and television broadcasts, radar, satellite navigation and homeland security. They are a core component of our wireless communication infrastructure. These high-energy airborne waves are capable of traveling miles. RF waves are considered high frequency electromagnetic radiation (27 MHz -8 GHz + 29&40GHz 5G mmWave).

Equipment Used

HF59B Radio Frequency Analyzer (800 MHz – 3.3 GHz)

UBB 27 Broadband Antenna 27MHz – 3.3 GHz

Logarithmic Periodic Antenna 800MHz – 3.0GHz

HF59D Radio Frequency Analyzer 2.4GHz - 10GHz

Directional Logarithmic Period "LogPer" 2.4 - 10 GHz 45°

UBB2410 Ultra Broadband Omni-directional 360° 2.4 - 10 GHz

VF4 Variable Frequency Filter

Safe and Sound Pro II (200 MHz to 8 GHz)

RF Explorer Spectrum Analyzer 6G+ (50KHz - 6.1GHz)

BUILDING BIOLOGY EVALUATION GUIDELINES FOR SLEEPING AREAS & AREAS OF EXTENDED USE

The Building Biology Evaluation Guidelines are based on the precautionary principle. They are specifically designed for sleeping areas associated with long-term risks and a most sensitive window of opportunity for regeneration. They are based on the experience and knowledge of the building biology community and focus on achievability. In addition, scientific studies and other recommendations are also consulted. With its professional approach, building biology testing methods help identify, minimize and avoid environmental risk factors within an individual's framework of possibility. It is the Standard's goal to identify, locate and assess potential sources of risk by considering all subcategories in a holistic manner and implementing the best possible diagnostic tools available with analytic expertise in order to create indoor living environments that are as exposure-free and natural as practicable.

No Concern - This category provides the highest degree of precaution. It reflects the unexposed natural conditions or the common and nearly inevitable background level of our modern living environment.

Slight Concern - As a precaution and especially with regard to sensitive and ill people, remediation should be carried out whenever it is possible.

Severe Concern - Values in this category are not acceptable from a building biology point of view, and call for action. Remediation should be carried out soon. In addition to numerous case histories, scientific studies indicate biological effects and health problems within this reference range.

Extreme Concern - These values call for immediate and rigorous action. In this category international guidelines and recommendations for public and occupational exposures may be reached or even exceeded.

If several sources of risk are identified within a single subcategory or for different subcategories, one should be more critical in the final assessment.

Building Biology SBM 2015 Exposure Guideline Interpretation

- No Concern – Lowest reasonably achievable level
- Slight Concern – Possibly biologically active, but no immediate risk for healthy people with an intact immune system. (Remediate if unhealthy)
- Severe Concern - Unacceptable biological risk for all people especially if multiple stress factors are acting together. (Remediate as soon as possible)
- Extreme Concern - A critical biological risk to all people. (Remediate immediately)

Guiding Principle:

Any risk reduction is worth aiming at. Guideline values are meant as a guide. Nature is the ultimate standard. The small print below each subcategory of the Building Biology Standard on the next page is meant as a comparative guide, e.g. legally binding exposure limits or other guidelines, recommendations and research results or natural background levels.

INTERNATIONAL INSTITUTE FOR BUILDING BIOLOGY EXPOSURE GUIDELINES FOR SLEEPING AREAS AND AREAS OF EXTENDED USE (SBM-2015)

	No Concern	Slight Concern	Severe Concern	Extreme Concern
AC Electric Field - Potential Free Unit - Volts per meter	< 0.3 V/m	0.3-1.5 V/m	1.5-10 V/m	> 10 V/m
Body Voltage Unit - milliVolts	10 mV	10 – 100 mV	100 – 1000 mV	> 1000 mV
Values apply up to and around 50 (60) Hz, higher frequencies and predominant harmonics should be assessed more critically. ACGIH occupational TLV: 25000 V/m; DIN/VDE: occupational 20000 V/m, public 7000 V/m; ICNIRP: 5000 V/m; TCO: 10 V/m; US Congress / EPA: 10 V/m; BUND: 0.5 V/m; studies on oxidative stress, free radicals, melatonin and childhood leukemia: 10-20 V/m; nature: < 0.0001 V/m				
AC Magnetic Fields Unit - milliGauss	< 0.2 mG	0.2 – 1.0 mG	1.0 – 5.0 mG	> 5.0 mG
Values apply up to and around 50 (60) Hz, higher frequencies and predominant harmonics should be assessed more critically. DIN/VDE: occupational 5000000 nT, public 400000 nT; ACGIH occupational TLV: 200000 nT; ICNIRP: 100000 nT; Switzerland 1000 nT; WHO: 300-400 nT “possibly carcinogenic”; TCO: 200 nT; US Congress / EPA: 200 nT; Bio Initiative: 100 nT; BUND: 10 nT; nature: < 0.0002 nT				
Radio frequency Radiation (RFR) Unit – microwatts per square meter	<0.1 µW/m²	0.1 - 10 µW/m²	10-1000 µW/m²	>1000 µW/m²
Values apply to single RF sources, e.g. GSM, UMTS, TETRA, LTE, WiMAX, Radio, TV, WLAN, DECT, Bluetooth..., and refer to peak measurements. They do not apply to rotating-antenna radar. More critical RF sources like pulsed or periodic signals (GSM, TETRA, DECT, WLAN, digital broadcasting...) and broadband technologies with pulsed signals/patterns (UMTS, LTE...) should be assessed more seriously, especially at higher levels, and less critical RF sources like non-pulsed and non-periodic signals (FM, short, medium, long wave, analog broadcasting...) should be assessed more generously, especially at lower levels. DIN/VDE: occupational up to 100,000,000 µW/m², public up to 10,000,000 µW/m²; ICNIRP: up to 10,000,000 µW/m²; Salzburg Resolution / Viena Medical Association: 1000 µW/m²; Bio Initiative 2007: 1000 µW/m² outdoor; EU-Parliament STOA: 100 µW/m²; Salzburg: 10 µW/m² outdoor, 1 µW/m² indoor; EEG / immune effects: 1000 µW/m²; sensitivity threshold of mobile phones: < 0.001 µW/m²; nature < 0.000 001 µW/m²				
Dirty Electricity Unit - milliAmps	<60 mA	60-500 mA	500-1000 mA	>1000 mA

These guidelines are for reference when considering your inspection results listed throughout the report

PRELIMINARY HOME INSPECTION DATA

Description of Home

Manufactured home, ~1,300 sq ft.

Client's Main Concerns

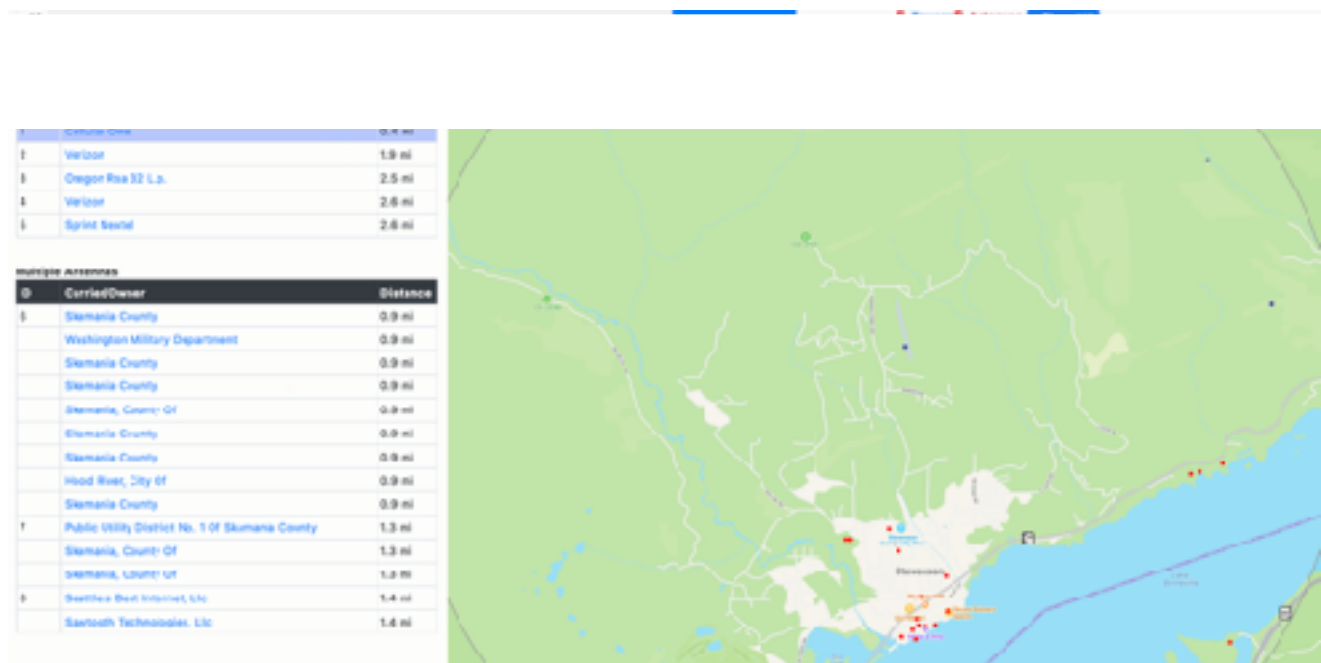
Understanding the electromagnetic radiation profile of the space as well as remediation possibilities. Particular concern over recent poor health symptoms and children in the house.

Line-Of-Sight External Sources of Exposure

Above ground, transitioning to below ground, power lines run along the road on the side of the street as the home.

Nearby Cellular/Radio Tower Profile

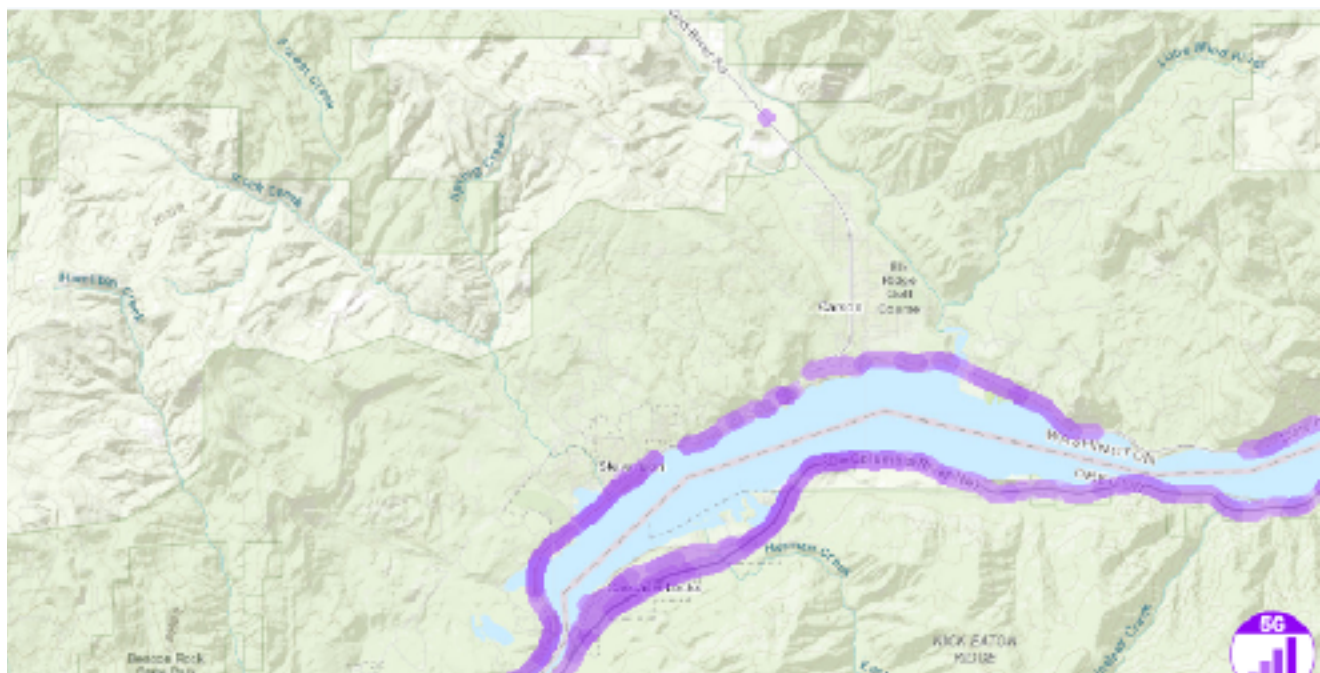
According to www.antennasearch.com, there are 6 cell towers and 53 radio antennas within a 3-mile radius. The closest tower is 0.4 miles to the northeast.



www.antennasearch.com results



Map of nearby 4G/5G signal strength



User reported data for 5G availability

INSPECTION DATA AND FINDINGS

SUMMARY

Ultimately, the best option for someone experiencing electrosensitivity would be to build on a new rural lot, designing the home from the ground up to mitigate EMF exposures. This would incorporate a number of non-traditional building materials and techniques, making such an endeavor very expensive.

Many people choose to remediate their current home, and incorporating this with other positive health practices such as quality medical care, time spent outdoors, nutrition, exercise, meditation etc. In doing this, they can find improvement in their condition and move towards recovery. This option has cost associated with it, but much less than the first option.

In my professional opinion, your current home is a viable option, and does have good bones to remediate on top of.

A number of excellent low-EMF practices are already incorporated in the home such as eliminating all wireless devices, and avoiding unhealthy artificial light sources, and we can build off of those to speed the client's recovery.

The most pressing issue is the exposure to external AC magnetic fields from the overhead, and underground power lines.

I have shared some data from your home with Charles Keen, EMF Services LLC. He is the creator of active cancellation systems that are very effective for power line AC magnetic fields. Based on what I have provided, he feels your home may be a good candidate for such a system. You can learn more about his systems [here](#). He did recommend fixing the suspected internal wiring error in the ceiling prior to considering install of his system.

The report will contain a handful of other important remediations, but the primary one is the power line shielding. Once the remediations are finished, you will want to evaluate how you are feeling after 4-6 weeks. Further remediation may be needed at that point, including indoor air quality.

Once you have received your Home Inspection Report, we offer a 30 minute phone consultation with an EMF inspector to answer any questions you may have. It is important to us that you understand the information we have provided, and that our mitigation recommendations are accessible to you and your family. Please schedule your follow-up consult [here](#).

Additionally, ODS LLC is pleased to offer you unlimited contact for 3 months from the date of the inspection, as you begin to work through the remediation plan. After that, consulting will be on a paid basis.

POINTS OF INTEREST

PROPERTY LOCATION IMAGE REDACTED
FOR PUBLIC SUBMISSION

EXTERNAL FINDINGS

Power System EMF		
Location	Field Type	Field Strength
North	AC magnetic (mG)	0.66
	AC Electric (V/m)	0.40
East	AC magnetic (mG)	1.30
	AC Electric (V/m)	0.10
South	AC magnetic (mG)	0.94
	AC Electric (V/m)	0.50
West	AC magnetic (mG)	0.50
	AC Electric (V/m)	0.00

Notes

Elevated magnetic on the east side of property, potentially nearby transmission lines, potentially electrical service, or propane line

Radiofrequency EMF (Unit – microwatts per square meter, $\mu\text{W}/\text{m}^2$)			
	GS HF59B 27MHz-3.3GHz	SSPII 200 MHz to 8 GHz	
Location	Full	Full	Dominant Frequencies/Sound
East	7.06	6.00	744@-69, 633@-80, 2.4@-80, 5.5@-74
West	7.10	8.00	744@-64, 635@-68, 2.4@-80, 5.57@-75

Notes

Low levels of RF noted, no distinct sound signature on the meters. The large lots and tree cover plus a more rural setting make for fewer RF exposures.

ELECTRICAL SYSTEM AUDIT

Current Clamp Measurements & System Details

	Normal Load	Power Off	Reference Load
L1	1.65		
L2	0.2		
N	1.5		
GEC	0.04		
SE Cable	0.12		
Water Pipe (entry)	0		
SubPanel Feeder	NA		
Cable TV	0		
Neutral-Earth Voltage	NA		
Grounding Electrode Resistance	5.7, 7.7		
Electrical Service Type and Size	200 amp underground pole mount meter main		
Overhead Drop Visible Condition	NA		
Water Meter Location	Well pump		
Water Line Type	Well		
Grounding Electrode System Type	Rod		

Utility Meter Type

Electric- Analog

Gas- Analog, propane

Water- Analog, well

INTERNAL FINDINGS

Radiofrequency EMF (Unit – microwatts per square meter, $\mu\text{W}/\text{m}^2$)		
	Wireless Devices ON	
	SSPII 200 MHz - 8 GHz	
Location	Full	Dominant Frequencies/Sound
Kitchen	0.5	Non-descript
Living	0.5	Non-descript
Dining	0.5	Non-descript
Play	1.2	Non-descript
East BR	1.2	Non-descript
SW BR	0.7	Non-descript

Notes

Extremely low RF profile

INTERNAL FINDINGS

Power System EMF							
		Lights ON			Lights OFF	MEP (Dirty Electricity)	
Location	Field Type	Floor	Middle	Ceiling	Middle	Lights ON	Lights OFF
Kitchen	AC magnetic (mG)	0.70	0.98	1.30	0.98	1,470	1,498
	AC Electric (V/m)	27.00	5.70	8.00	3.20		
Living Room	AC magnetic (mG)	0.61	0.74	1.03	0.68	1,520	1,530
	AC Electric (V/m)	1.70	1.00	1.50	1.50		
Dining	AC magnetic (mG)	0.61	0.63	1.10	0.61	93	91
	AC Electric (V/m)	3.70	6.30	8.60	4.80		
Playroom	AC magnetic (mG)	0.55	0.83	1.10	0.70	1,450	1,480
	AC Electric (V/m)	9.50	7.50	29.70	2.70		
Bedroom SW	AC magnetic (mG)	0.77	0.78	1.15	0.66	1,500	1,500
	AC Electric (V/m)	3.00	1.20	10.50	1.10		
Bedroom East	AC magnetic (mG)	0.52	0.80	1.00	0.67	49	53
	AC Electric (V/m)	4.60	2.30	23.00	2.90		

Notes

Ceiling can lights disconnected

Hall bath free of wiring errors

Master bath .6 (lights off), 1 w fan on

"Mom's" Desktop computer producing high DE. 1 GW filter brought it down to 100. This computer also has some RFI (27 μ W/m²)

Other computer producing 200 DE, but no RF sound signature.

Run cords away behind desk, not out to side. Create foil cage around computer components, ground it. Leave printer unplugged. Shielded extension cord. Red lights

Circuit 3a gets bedroom under 0.3 v/m

Cpap

Bed Mapping

Identifying and disabling circuits around the bed areas is an extremely effective way to produce a low-EMF sleeping environment for power system EMFs. The circuit on the electrical panel with the blue arrow (#3a) can be turned off at night to achieve AC electric of <0.3 V/m. I would not recommend the client be the one to touch the breaker switch directly. _____ can do this, or you can use a wooden dowel/spoon to insulate yourself from the panel. Please note, the CPAP machine represents very high EMF exposure. My recommended resource for getting off of CPAP is here: <https://sleepapnea.petkusmd.com/explore/>



Microsurge Electric Pollution

This is colloquially referred to as dirty electricity (DE), describing high frequency voltage transients, or 'noise' injected onto the electrical wiring that radiates out into each room on the AC electric & magnetic fields. DE is created through variable speed drives/pumps, switch mode power supplies, LED bulbs, dimmer switches, and others.

The DE in your home was high, but all coming from one device, the household member's desktop computer. It was producing approximately 1500 Graham-Stetzer units in most rooms of the house. 1 Greenwave plug-in brought it down to 100.

Vehicle Inspection

Type: 2014 VW Jetta TDi

RF: minimal, no distinct sound signatures coming from the car

AC Magnetic: 1-5 mG in driver/passenger front seats, <1 in the rear seats. Removing carpet and trim to access direct measurement of electrical wires for potential rewiring would be required to reduce this exposure.

REMEDATION PLAN

There are two ways to handle the remediation process.

Option A- You can order and manage all of the steps below. I'll be available for complimentary remote consulting for three months. After that, we would move to a paid consulting model.

Option B- I can order products, and deal with all vendors on installation. I'll be on site and remote, managing the various vendors and remediation.

If you would like option B, let me know and I will put together a bid for you.

1. AC Magnetic Field Remediation

1. Have an electrician investigate the ceiling light circuits. You mentioned they had been disconnected, or was this just the kitchen GFCI plugs?
 1. The electrician should perform a continuity test for all branch circuits between neutral and ground. There should not be any continuity between separate branch circuit neutrals or grounds, so we want to find those and fix.
2. Once point #1 is completed and fixed, contact Charles Keen for consultation about his cancellation system. contact@emfservices.com // 845-276-9500
3. AC Electric Exposures: Have someone get under the house and investigate the electrical wiring, primarily in the kitchen, but as long as someone is down there, take a look at the other areas. Take pictures and send to me. Then we can build a map of where the wires go and develop a plan for shielding.

2. Computing

1. Give this article a read, it contains excellent info on low-EMF computing, written by someone who has electrosensitivity.
2. Find one of the laptops in the article on sale and give it a try with the low EMI keyboard, also mentioned in the article. A laptop gives you two major advantages to a desktop:
 1. You can use it on battery power to drastically reduce wired EMF.
 2. You can control the light and flicker on the screen (unlike an external monitor) with Iris Screen Software. This will be better for you, and your kids when they watch TV on the screen.
3. If that isn't in the budget right now, you can line the inside of the desk with foil on all sides, overlapping the seams, and move the desktop, and any other computing hardware inside, then close it up. Keyboard and mouse will stick out, but the cords should go out the backside.
 1. Ground the foil with this grounding adapter alligator clip.

3. Lighting

1. Incandescent bulbs are best and can be purchased here. Low-wattage red/orange are best for after sunset. Battery powered lights with red LEDs are a good option as well: <https://amzn.to/48CGPDn>
<https://amzn.to/4aUsCDs> <https://amzn.to/3HmHxJ4>

Technical Support

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Privacy

The information in this report is confidential and will not be shared with anyone except the Client. The results relate only to the items tested.

Disclaimer / Legal

Though we hope the included recommendations will lead to a healthier life, Optimal Dwelling Spaces LLC, and its representatives shall have no liability with respect to the recommendations made, actions taken or courses of conduct implemented based on the results. Optimal Dwelling Spaces LLC, shall not be liable with respect to the test results for incidental or consequential damages, lost profits or revenues to the fullest extent such liability may be disclaimed by law. In no event shall Optimal Dwelling Spaces, LLC liability exceed the amount paid to Optimal Dwelling spaces, LLC, by the client. The results relate only to the items tested. Our inspectors will record a variety of data points and distill the data into patterns, likely sources, and remediation recommendations. The discussions in this report are based only on single (one time) results and may not be repeatable if conditions in the home change or if the results are collected during a different period of time.

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