



Eric Windheim, BA, BBEC, EMRS
 Certified Building Biology Environmental Consultant & Certified Electromagnetic Radiation Specialist
e.windheim@comcast.net <http://www.windheimEMFsolutions.com>
 Sacramento, Ca. 916-395-7336

EMF Assessment, Observations & Recommendations

For

XXXX XXXXXXX

XXXX XX Street, Sacramento, CA 95811

Friday July 7, 2017 4 pm to 8:30 pm. Clear and Hot 100-109°F

Please read and circle items for discussion in your 30-minute pre-paid phone follow up

Introduction

There are three source classes of EMF exposure:

- A. Internal Sources under control of occupants: electronic devices brought into the home which can be turned off, replaced, repositioned or the usage of them reduced.
- B. Internal Sources related to the building structure such as wire code violations or electric current on the water service supply pipe (WSSP) or gas pipes. These problems can be fixed by a qualified and EMF experienced electrician or plumber.
- C. External Sources to the building and the occupant's control such as WiFi hot spots, cell, TV & radio towers, **power lines**, radar stations, solar inverters or variable speed electric motors nearby. Shielding or filtering may be a possible remedy for the inside of the building envelope. It is difficult, expensive and sometimes impossible to reduce exposure to External Sources.

I. Client Objectives

- A. The **primary client concern stated was powerful magnetic fields** from the SMUD distribution lines. As the assessment progressed other EMFs and sources were discovered.
- B. Determine what are the sources of EMF at the house and exposure hazard if any.
- C. Determine to what degree the SMUD distribution lines are involved if at all.
- D. Determine if EMF levels can be reduced or eliminated and if so by what means and costs.
- E. Provide a report of findings and proposed solutions.

II. Building Site Description

- A. Two story wood frame, 2,629-sq/ft house with basement. Built in 1906.
- B. Some Knob & Tube (K&T) wiring remains and some modern, recently installed romex cable.
- C. New electric circuit panels and grounded outlets in most locations.

III. Executive Summary

- A. **Magnetic fields are your biggest hazard** and are well above the Building Biology Extreme Concern level, which is anything higher than 5 mG.
- B. **Largest continuous source of magnetic fields is from the SMUD distribution line(s)** on the east side of 20th street. Peak recorded levels were 8 mG on the pillows and the client recorded 9 mG on a separate day with the SMUD EMDEX SNAP loaner meter: call SMUD to borrow it. The distribution lines on the poles are much more of the cause than the buried SMUD lines. This is an External Source created and controlled by others. It is difficult, expensive, time consuming or impossible to remediate.
- C. Wire code violations create an intermittent source
 - 1. Under the kitchen floor from the new heavy romex cable attached to the basement ceiling: produced 20 mG on the kitchen floor. There is a 4.6 amp net current on this conductor and it should be 0.0 amp.
 - 2. Front door light switch: produced 19.6 mG on pillow of master bed when switch is on. This indicates K&T wiring or an illegal neutral-to-neutral or neutral to ground connection.
 - 3. A detailed troubleshooting inspection by my recommended electrician accompanied by myself will usually discover more of them. We fix them as we go.
- D. Electric fields on the master bed are above the Extreme Concern level and will require special grounded paint, grounded field shield under the mattress, grounded bed canopy or circuit cut-offs to reduce. This is an Internal Source and is under the control of the occupants. It can be remediated.
- E. Microwave Radiation was mostly from inside the house due to WiFi, laptops and smart phones. This is an Internal Source under the control of the occupants. The SMUD smart meter is less than 20 feet from the master bed. This can be replaced with the safe Analog meter that never transmits microwave radiation.
- F. Dirty electricity (DE) sources were both internal and external. Lowest readings were 110 GS units at 7 am and highest readings of 430 GS were at 9-11pm. Any measurement above 50 GS is a Biohazard. This can be filtered at the main panel and DE producing electronics replaced with clean devices or spot filtered at that device location.
- G. First priority would be to have SMUD move and reconfigure the poles and cables. If this can't be done all the rest of the remediation may have only a minor effect for health improvement and it will be costly to you.
- H. **I suggest that you live elsewhere until then.**

IV. Microwave & Radio Frequency Radiation (RFR) Assessment

Modern man-made RFR is now pulsed and digitized, making it much more damaging than older analog (continuous wave) RFR radiation from AM & FM radio towers. All wireless devices transmit this radiation (commonly called RFR). Until cell phones were invented in 1983 there was little residential exposure except for TV, Radio and Radar transmissions that came from a few transmitters. Today the RFR power density saturation levels are increasing very rapidly because wireless communication has such a low installation and operational cost, because it is so convenient. Consumers are addicted to the convenience of wireless communication of which they are demanding more every day. Wireless devices and services generate hundreds of billions in sales for corporations upon which the government levies taxes. The trend is that everyday RFR radiation power density levels will get much, much higher before common sense about health hazards catches up or prevails. Prudent avoidance and pro-active self-defense are the best protection at this time and it is best to do this before health damage is detected or non-recoverable.



A. Main RFR sources found

1. Most of the RFR was internally created by the WiFi, laptops and smart phones.
2. RFR levels ranges from 86 $\mu\text{W}/\text{M}^2$ in the kitchen to over 20,000 $\mu\text{W}/\text{M}^2$ in Mark's office and 4,000 in the master bedroom.
3. RFR levels over 1,000 $\mu\text{W}/\text{M}^2$ are an Extreme Concern.
4. The SMUD smart meter is only 20 feet from your master bed and kitchen area. It transmits powerful bursts of RF radiation 13,381 times, on average, per day according to SMUD. I have seen people's lives destroyed by these smart meters and they were further away from their beds than yours is.

B. RFR Solutions:

1. Avoid wireless connectivity in the house: use Ethernet connection. See videos:
https://www.youtube.com/results?search_query=how+to+connect+ethernet+to+ipad
2. Cell phones can be forwarded to landlines while you are at home.
3. Turn all wireless devices OFF at bedtime.
4. Remove the SMUD smart meter and replace it with the Analog meter: this is something you should and can do today. Call SMUD at 1-888-742-7683.

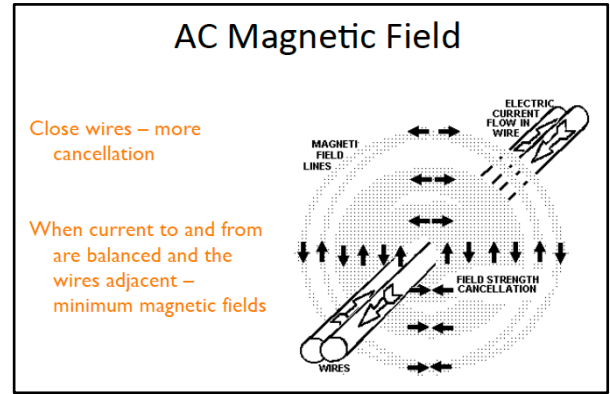
- C. Overall assessment: Extreme Concern from owner devices.** Low RF exposure except near WiFi, smart phones and smart meter where the RF level is Extreme. Solutions will be low cost and able to be installed or enacted by occupants. If you have questions please email me or call me about them.

Many of my clients get much better sleep or have sudden elimination/reduction of anxiety, agitation, irritability, ringing in the ears, brain fog or heart palpitations when they turn off the WiFi, Bluetooth, laptop, tablet, cordless phones, cell phone and remove the smart meter.

V. Magnetic fields (mG) Assessment

Magnetic field (mG) observations. All lights were on for testing to create current in order to reveal measurable magnetic fields created by possible wiring code violations.

Magnetic fields occur when there is unbalanced current on a circuit that usually indicates a wiring error in the building or from an electric motor or transformer or an undesirable current on a water or gas pipe. Magnetic fields travel through the human body and create “Eddy Currents” that interfere with cell division (Cancer) and child development (Autism).



Some of my clients state that physical pain and suffering stops immediately when we reduce the magnetic fields by fixing wiring code violations. See success stories of Lori Milas and Karis Chromartie: <http://www.windheimemfsolutions.com/success-stories/>

Magnetic Fields in homes & buildings are most common where supply and return conductors of a given circuit are separated. We find this error in 1 of 4 assessments.

If the neutral wire return lines of two separate circuits are illegally joined outside of the point of origin, at the electric panel, then the electric current has two separate return paths. This is a code violation of National Electric Code, NEC 300-3 (B), creates a fire, shock and magnetic field health hazard even though the lights and plugs may still function. This magnetic field can cover a very large portion of the house or building. We locate and fix these code violations:

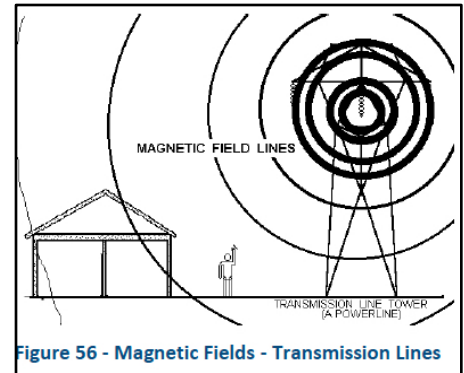


Figure 56 - Magnetic Fields - Transmission Lines

<https://www.youtube.com/watch?v=n0YyYhwIQ30>



A Comparison of Electric and Magnetic Fields

| Electric Fields | Magnetic Fields |
|--|--|
| <ul style="list-style-type: none"> Produced by voltage. <p style="text-align: center;">Lamp plugged in but turned off. Voltage produces an electric field.</p> <ul style="list-style-type: none"> Measured in volts per meter (V/m) or in kilovolts per meter (kV/m). Easily shielded (weakened) by conducting objects such as trees and buildings. Strength decreases rapidly with increasing distance from the source. | <ul style="list-style-type: none"> Produced by current. <p style="text-align: center;">Lamp plugged in and turned on. Current now produces a magnetic field also.</p> <ul style="list-style-type: none"> Measured in gauss (G) or tesla (T). Not easily shielded (weakened) by most material. Strength decreases rapidly with increasing distance from the source. |

High current utility distribution and transmission lines are a common source of powerful magnetic fields over large areas and can adversely affect hundreds or thousands of people. The widely spaced phase wires on utility pole crossbars are too far apart to provide effective field cancellation. The magnetic field is directly proportional to the current flowing on the lines.

A. Main magnetic field sources found

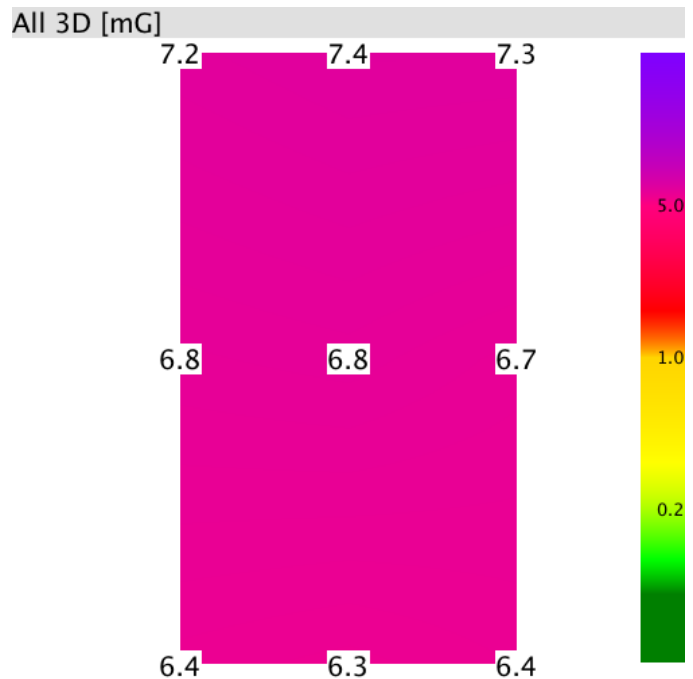
1. SMUD overhead distribution lines and to a much, much lesser degree, SMUD underground distribution lines. To an even smaller degree there may be some stray current on the telecom cables that could cause a very small magnetic field.
 - a. 4.5 mG at waist level in front of house on 20th street.
 - b. 7.5-9.0 mG on bed pillows in the second story master bedroom.
 - c. 1 mG at 105 feet to the East or West of SMUD distribution lines on G Street.
2. Internal wire code violations and/or K&T wiring created intermittent and powerful magnetic fields of up to 20 mG in living areas when certain electric loads or switches were in use.

3. Magnetic Field Heat maps of Master bed.
 Highest at pillow which is closest to the SMUD overhead distribution lines. Taken at 5pm on July 7th, 2017. All Lights in house are OFF.

Notice the very uniform decrease in the mG field as you move away from the SMUD lines which are closest to the pillow at the west end of the bed. Pillow is top and feet are at the bottom of the heat map.

All of these measurements are above the Extreme Concern level for sleeping areas.

The client measured as high as 9.0 mG on a previous date with the SMUD EMDEX SNAP loaner mG meter.



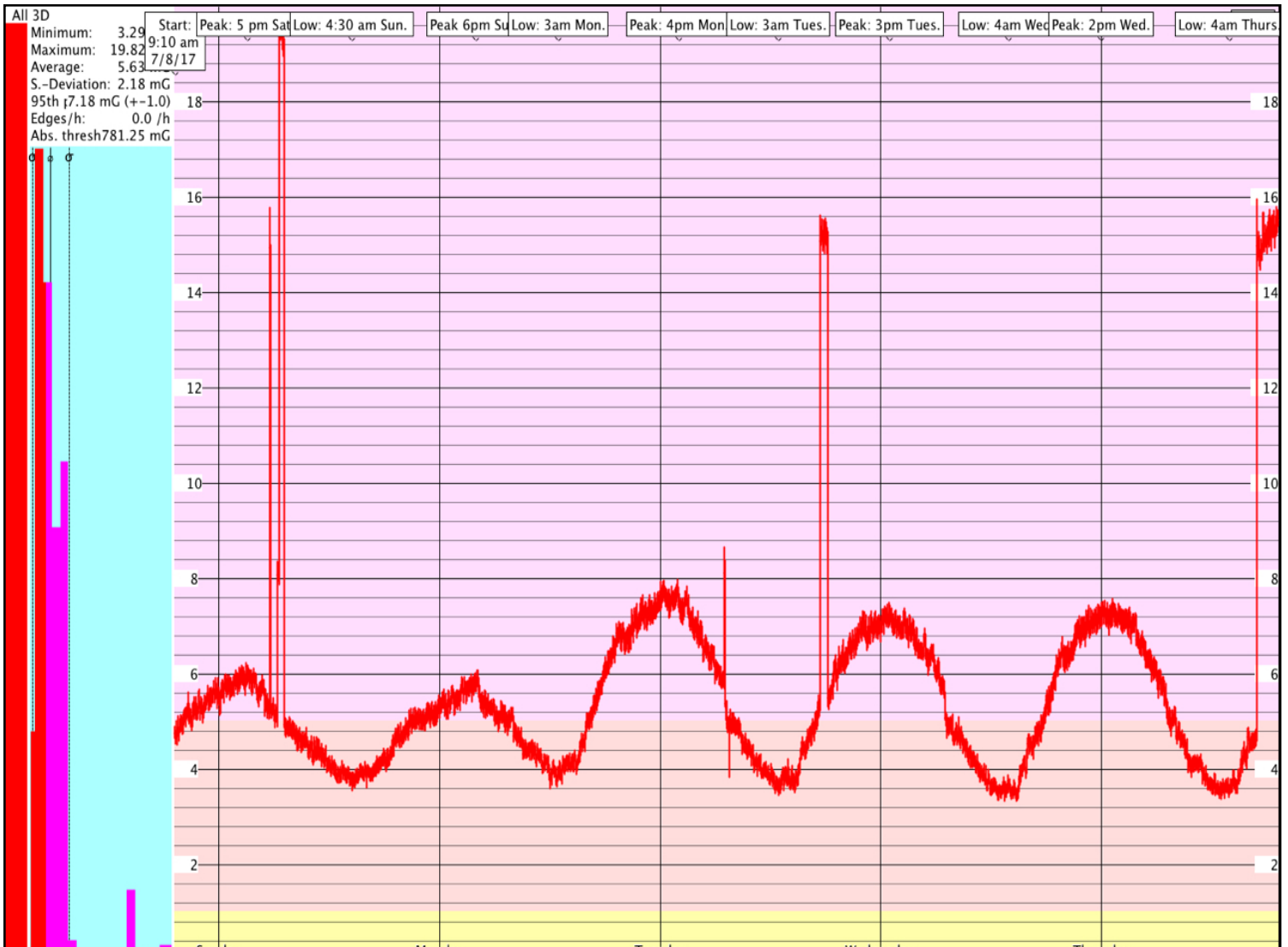
AC MAGNETIC & AC ELECTRIC FIELD EXPOSURE GUIDELINES

(Low Frequency Electromagnetic Fields ELF, VLF)

1> BUILDING BIOLOGY EVALUATION GUIDELINES (SBM-2008) For Sleeping Areas

| AC Magnetic - Flux Density | No Concern | Slight Concern | Severe Concern | Extreme Concern |
|----------------------------|------------|----------------|----------------|-----------------|
| in nanotesla nT | < 20 | 20-100 | 100 - 500 | > 500 |
| in milligauss mG | < 0.2 | 0.2-1 | 1-5 | > 5 |

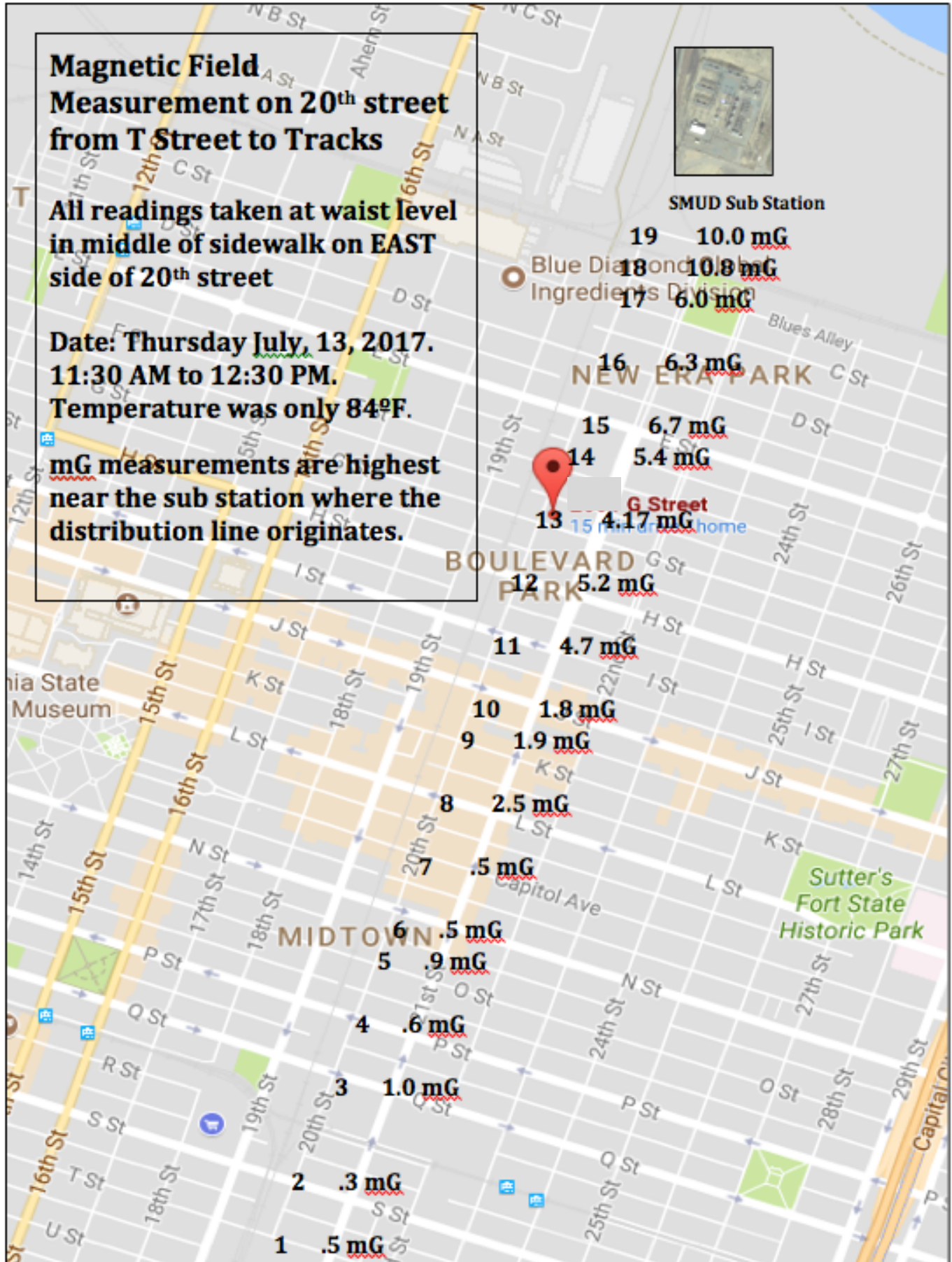
4. **Data log of magnetic field at pillow of master bed** for five days starting July 13th, 2017. Electric current /demand and magnetic fields are highest in late afternoon and early evening.
- Daily High is 7.5-8.0 mG at about 2-5 pm above the pink, Extreme Concern level
 - Nightly low is 3.8 mG at about 3-4 am in the tan, upper Severe Concern level.
 - Short term Spikes up to 19.8 mG are due to wiring code violations associated with certain switches and circuits.
 - Upper Severe Concern mG levels are as **low** as it gets on this bed: day or night, weekday or weekend. This is too high for healthy people much less those in recovery from a serious illness.
 - The **yellow** part of the chart is the Slight Concern range of .2 to 1.0 mG.



I will comment here: The Building Biology profession realizes that you can't stay well, much less, get well in a sick house. People that are chronically ill need to be in the No Concern level .2 mG of less in order to speed recovery and certainly no higher than the 1 mg level, which is the start of the Severe Concern level. Please see Appendix F, below, for supporting studies.

In order to be below 1 mg you must be more than **105 feet to away (east or west) from this SMUD Distribution line at your location on G Street.**

- 5. North of I Street mG levels are in the Severe to Extreme Concern level at waist level on east side of 20th street sidewalk. Second story rooms will be much higher as they are closer to the SMUD cables. South of L street is in the Slight Concern Range.



6. A 20 mG field on the kitchen floor is due to 4.6 amps of Net Current on large romex conductor in ceiling of basement indicate a wiring code violation.



7. 11 mG on bath toilet likely due to wire code violation or K&T wiring. Magnetic fields in the bathrooms and several other areas of the house shot up greatly when certain light switches were on and this indicates wiring code violations. It is not believed that these increases in mG field are due to K&T wiring as those are usually much smaller than this. You may be able to get satisfaction from your remodeling contractor with the aid of your local building inspection official.



8. .72 amp of current on the Internet cable grounding wire indicates a small unbalanced current on the telecom cables on the poles. These are the lower and very thick cables. While this would create a little magnetic field is not thought to a significant contributor to the Extreme level mG fields found in your master bedroom. It is also not believed to be a contributor to the huge day to night variation in mG fields from 4.8 mG to 8 mg. This is a minor problem and it can be stopped with a \$30 High Pass filter if needed.



9. 0.0 amps of current on your grounding electrode indicates that it is either not bonded to your service entrance neutral-ground bus or that your house loads are balanced and the SMUD service neutral is securely connected and has low impedance as it should.



10. VIDEO:**“Power line EMF Hazard: Extreme Magnetic Fields in Homes from SMUD Primary Distribution lines: 20th street, Sacramento CA.”**

Filmed on July 7th at about 5:30 pm.

This video clearly shows:

- Houses on the east side of 20th Street have Severe to Extreme Concern level magnetic field exposure from overhead.
- mG levels at the sidewalk ranged from 4 to 6 mG.
- Second story rooms have much higher exposure levels up to 7.5 mG
- mG levels get higher as you get closer to the overhead SMUD primary distribution cables on wooden poles.
- mG levels decline to the south and increase to the north.
- This means many homes are exposed to this hazard on this block and adjacent blocks.



<https://www.youtube.com/watch?v=8v1GRC7Hfk0>

B. Magnetic Field Solutions

1. **Relocate the SMUD poles & overhead distribution** lines to the west side to of 20th street. Based on my measurements on both side of 20th Street this may reduce mG levels on the east side (your side) of 20th Street by 40% to 50%. In your case this would still not be a large enough reduction and you could still have mG fields on your bed of 2.9 mG to 4.8 mG depending on the time of day during the long, hot Sacramento summers when electric demand is highest.
2. **Reconfigure the SMUD overhead distribution lines** with closer phase wire spacing such as a Hendrix or Delta configuration as per this industry report:

**Electric and Magnetic Fields (EMF)
 RAPID Program Engineering
 Project 8: FINAL REPORT**

Evaluation of Field Reduction Technologies

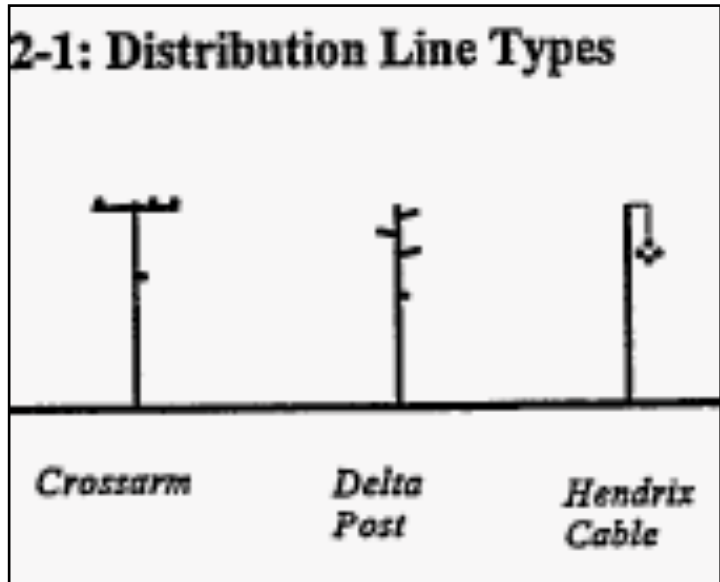
**Volume 1 (Report)
 Volume 2 (Appendices)**

Prepared for:
 Oak Ridge National Laboratory
 EMF Research Program
 1 Bethel Valley Road
 Building 3147, MS-6070
 Oak Ridge, Tennessee 37831-6070

Prepared by:
 IIT Research Institute
 10 West 35th Street
 Chicago, Illinois 60616-3799
 and
 Commonwealth Associates, Inc.
 P.O. Box 11124
 Jackson, Michigan 49204-1124

August 1997

The use of Hendrix or Delta cable configuration yields as much as a **SEVEN (7) fold reduction in Bmax mG field strength in a balanced current case**. If the current is balanced it could mean an additional 85% reduction in mG fields. If this is done in conjunction with moving the lines across the street, you may have mG fields on your bed of only .4 mg to .7 mG. This would be in the Slight Concern range and may be acceptable for recovery from serious illness assuming you remediate EMF problems in your house such as the RF transmitters and wiring code violations that also create magnetic fields.



It also could be an additional reduction as small as 33% if there is a 20% current imbalanced.

In this case you may have mG fields on your bed of 1.9 mG to 3.2 mG, which would be an improvement, but still in the Severe Concern range. This is not acceptable for a person with a serious illness.

The cost per mile for these Delta or Hendrix low Bmax configurations is only 13% to 32% greater than the existing, and cheapest, Cross-Arm cable configuration.

If SMUD can be convinced to move the poles to the west side of 20th Street the additional cost of switching to the Hendrix or Delta configurations would be very small relative to the entire project of moving the poles and lines.

Here are three key things that must be done for maximum reduction of mG at your bedroom and all those on your side of 20th Street:

- Move SMUD poles and cables to West side of 20th street
- Reconfigure cables to Hendrix or Delta configurations
- Balance current if possible

Please notice the reductions in Bmax fields of Delta and Hendrix compared to Cross-Arm.

Table 3.2-3B: 13.2 kV (13.7 MVA) Suburban Distribution Lines

| | Balanced Current Cases | | | 20% Unbalanced Cases | | | Project Costs \$x1000 per Mile | Life Cycle Costs \$x1000 per Mile |
|----------------------------------|------------------------|----------------------------|--------------------------|----------------------|----------------------------|--------------------------|--------------------------------------|---|
| | Bmax (mG) | E _{max} (kV/m) | ROW for 5 mG (Ft.) | B max (mG) | E _{max} (kV/m) | ROW for 5 mG (Ft.) | | |
| Cross-Arm | 35.284 | 0.063 | 134 | 44.622 | 0.069 | 286 | 194 | 363 |
| Delta | 16.347 | 0.026 | 90 | 31.809 | 0.027 | 230 | 214 | 396 |
| Hendrix Cable | 5.194 | 0.030 | N/A | 31.197 | 0.038 | 222 | 224 | 411 |
| Split-6 Cross-Arm | 8.403 | 0.043 | 48 | 20.561 | 0.052 | 226 | 229 | 429 |
| Split-6 Hendrix | 1.765 | 0.046 | N/A | 27.599 | 0.058 | 214 | 261 | 480 |
| 34.5 kV (13.74 MVA) Cross-Arm | 17.499 | 0.180 | 88 | 21.162 | 0.194 | 144 | 173 | 293 |
| Split-5 | 7.610 | 0.087 | 38 | 17.937 | 0.097 | 218 | 232 | 431 |
| UG 4-Duct | 71.216 | 0.000 | 54 | 127.945 | 0.000 | 226 | 630 | 1,059 |
| UG 1-Duct | 18.559 | 0.000 | 24 | 88.464 | 0.000 | 218 | 576 | 956 |
| UG Direct Bury | 22.468 | 0.000 | 24 | 98.835 | 0.000 | 218 | 203 | 380 |

It would be wise to have SMUD test the overhead circuit for balance and also determine how much, if any, of the mG field is due to stray current on the telecom cables. SMUD also has the engineering expertise to evaluate this entire proposal to determine how much reduction of mG fields on your bed and the other houses along 20th street will be if this project is enacted.

SMUD is one of the very top public utilities in the USA according to JD Power & Associates. SMUD is also a very innovative utility and has a skill for getting grants for special projects. SMUD spend millions each year on research to find out what its customers want. SMUD is very image conscious and is very concerned about public perception. SMUD considers itself to be very "Green and Friendly" to the environment. SMUD may be willing to do this project if you join with others on the East side of 20th Street and present a very simple clear and unified request to the SMUD Board of Directors at a Public Meeting.

3. Do both 1 & 2 above for best results.
4. Locate and fix wiring code violations in the house.
5. If Knob & Tube wiring is the cause of the intermittent mG fields replace it with romex cable.

C. Overall assessment: Extreme Concern.

1. **Take protective avoidance action immediately to avoid Extreme Concern exposure** until effective remediation is put in place and re-measured for results.

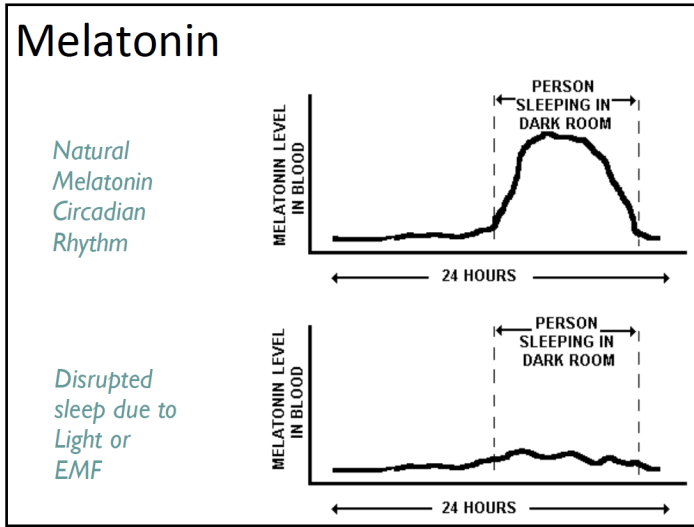
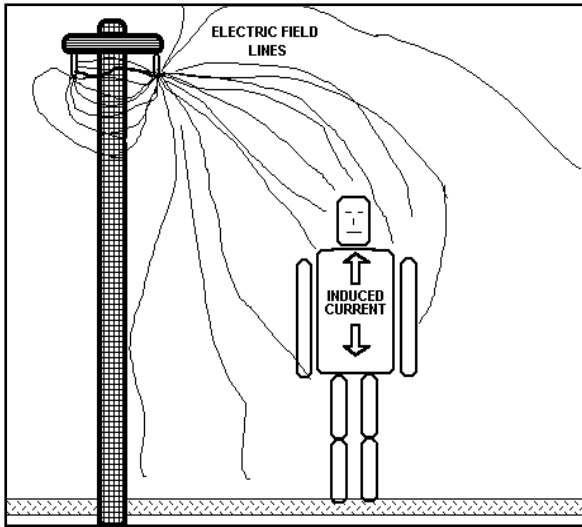
2. Keep in mind that even at the most eastern part of your outdoor porch, which is furthest from the SMUD lines measured at 3.46 mG, which is in the upper Severe Concern range. The eastern part of your basement may offer more distance from the lines, and thus, a lower mG measurement. This measurement was taken about 6:30 pm on July 7th, 2017 so it was past the heat of the day, businesses are closed and peak electric current demand is declining.



VI. Electric Fields (EF) Assessment

Electric Fields, (EFs) project like rays from any energized wire in your house unless encased in grounded metallic conduit: at household voltage this can be 7-10 feet. If you could see all of the wires in your walls it would appear that they surround you like a cage. These wires put an

electric charge on the body that inhibits good, deep sleep, rest and repair by suppressing the release of melatonin, your body's master anti-oxidant which is required for healing, rest and repair. EFs also carry DE to your body, creating additional health hazards and risks. Reduction of voltage on the body usually allows people with sleeping problems to get better sleep, rest and bodily repair due to better melatonin release. Melatonin is an onco-static agent.



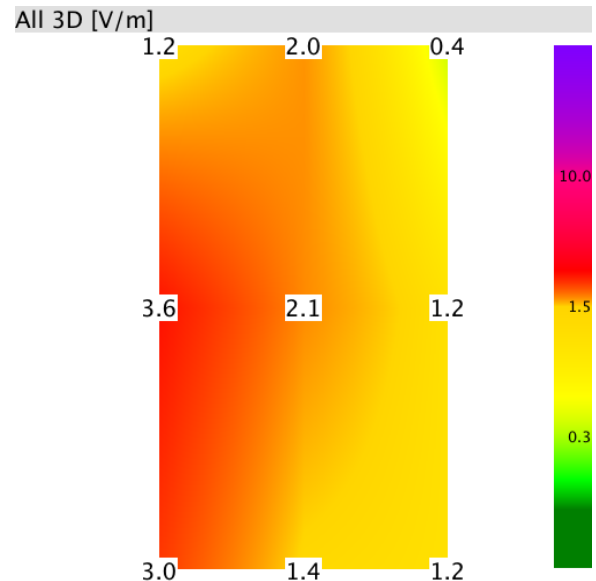
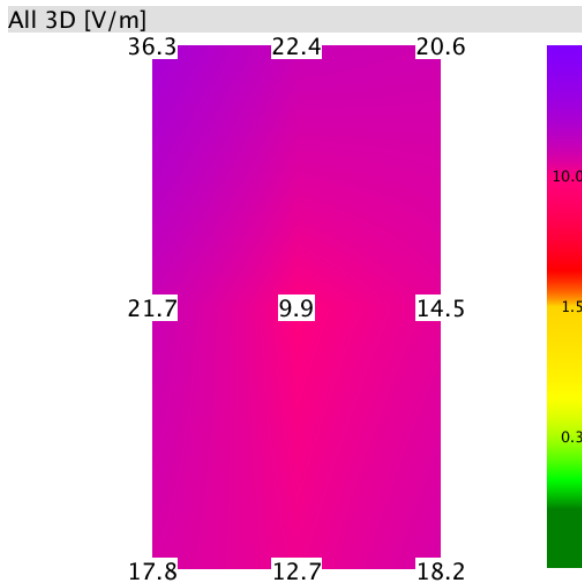
- Below on the left is the electric field heat map of your master bed.
- Extreme Anomaly range is above 10 Volts/meter potential free (V/m pf)
- Severe Anomaly is 1.5-10 Volts/meter potential free
- Slight Anomaly is .3-1.5 Volts/meter potential free
- No Anomaly is less than .3 Volts/meter potential free

As measured with breakers ON

As measured with breakers OFF

These heat maps were taken on 2/21/18

With all breakers off your master bed is still in the Severe Concern range most likely due to the nearby SMUD 21 kV lines just outside your bedroom window.



A. The master bed in your house on G Street ranged from 9.9 to 36.3 V/m pf which is up to 3.6X above the Extreme Concern level of 10 V/m pf. DE rides along on the EF and this reduces the body's ability to release melatonin, rest and repair itself.

Solutions: Paint and ground the walls: <http://www.slt.co/Products/RFSshieldingPaint/>. My clients have done this with great results. This can protect the entire room and will be the lowest cost. This will stop all electric fields and DE.

A grounded Field Shield placed between the box spring and mattress and also behind the bed headboard works very well and takes about an hour to install. Materials are about \$50. We need to have access to a grounded outlet near the bed.



A bed canopy of proper material can be grounded and make a very significant reduction in electric fields on the bed. Make sure the foil under the mattress is grounded too. Here is a ready made product from a colleague I trust:
http://greenandhealthyhomes.net/index.php?option=com_content&view=article&id=131&Itemid=71

A bed canopy is not cheap but it is portable for future use at other locations. Cost is as listed on the above website depending on the size of the bed. This one will stop all electric fields, DE and RF. This is a lifetime investment in safe sleeping for protection rest & repair so get a canopy that is big enough for future needs. It does not stop magnetic fields.



A third option is to install a remote cut off switch (RCOS) for the circuits related to the master bedroom. This allows push button control of all circuits from a hand held remote. Cost is about \$950-\$1,350 installed. I have a discount code you can use <http://www.slt.co/Products/DemandSwitches/RemoteCutOffSwitch.aspx>

While breakers can be turned off/on manually NOTICE that they are not designed to be switches and will wear out. Beware of these symptoms:

- Mushy feel
- Warm to the touch
- Burnt plastic smell
- Won't stay on

If any of the above happens have them replaced by a qualified electrician ASAP.

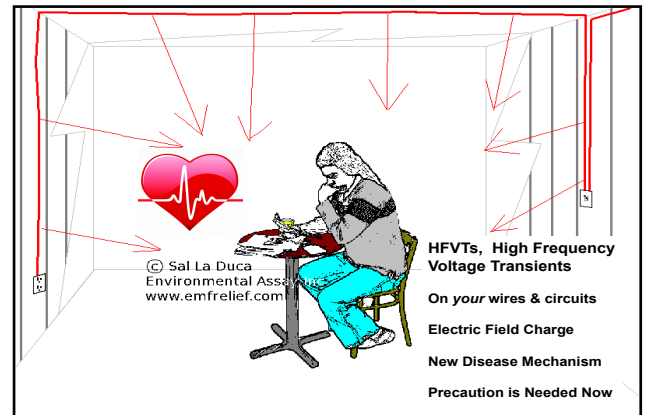
This photo shows the RCOS installed on the outside of the house immediately adjacent to the main electric panel. The metal box is about 18"x18" in size: it would be mounted on the exterior of the house adjacent to the related electric panel.



This will stop all electric fields and DE relative cause by up to 4 circuits per remote channel. One channel with remote is standard and a second channel & remote can be added for other bedrooms or parts of the house. It will not stop magnetic fields from power lines.

VII. Dirty electricity (DE) Assessment

Dirty Electricity, (DE), also known as, High Frequency Voltage Transients (HFVT) on wiring circuits. DE travels on and radiates from all energized wires that are not in grounded metal conduits into the rooms and onto the occupants on the electric field in the form of RFR radiation in the 2-150,000 KHz range. DE is created by all modern electronics and energy saving devices (CFL, HID & most LED bulbs) that use a switch mode power supply (SMPS). Energy efficient, variable speed HVAC, pool and well pumps are also huge producers of DE. Solar electric systems use inverters that can be extremely big DE producers.



DE radiates off all energized wires in your house as low frequency RFR radiation and couples, without wires, to your body. DE can come into your house on the utility feed due to dirty devices in nearby homes that share the same utility transformer/secondary circuit. Some of my clients state that physical pain and suffering stops immediately when we reduce or eliminate the DE level to below 50 GS units. See this link for more information: watch the two videos.

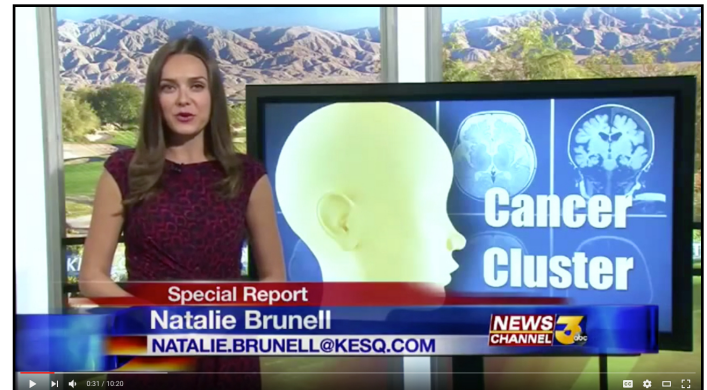
<http://www.windheimemfsolutions.com/emf-dangers/dirty-electricity/>

A. Main sources found.

1. Dimmer switches, HID lighting and CFL bulbs. Replace all dimmers with on off switch: get clean LED bulbs. Test the bulbs for DE with a Stetzer meter.
2. DE is coming in on the utility feed most likely caused by dirty devices on nearby properties.
3. Electronic devices in the home.

B. Watch this news video about an ongoing cancer cluster at a school near Palm Springs CA. Dirty electricity is the prime suspect.

<https://www.youtube.com/watch?v=Ys0-mlTimQ&feature=youtu.be>



C. **Dirty Electricity Coming In On The Utility Feed (typical house)**

This video demonstrates that 600 GS units of DE are coming into a house on the utility feed. DE producing devices on properties that share the same utility transformer/secondary utility circuit creates this DE.

<https://www.youtube.com/watch?v=RXuaK60Q14s>



So you can have every single device in your house OFF and still be subjected to other people's DE (OPDE) coming in on the utility feed to your house.

Fixing all of this can lead to a healthier house to live in. It is very tragic that our regulators have allowed such dirty and toxic devices to be sold into the market under the guise of being Green, good for the earth or energy saving. These dirty devices do not save enough money to pay for the health damage they can cause.

C. Overall assessment: Severe to Extreme Concern.

1. You have stated that your health declines while at home and that you recover when you are away. This in itself is a clear sign that you should avoid residence here until the magnetic field exposure is reduced to much lower levels.
2. Sleep time is the most critical time period to avoid this exposure.

D. Solutions

1. Have SMUD reduce the magnetic fields. This is the most important step.
2. Fix wire code violations.
3. Keep wireless devices off at night and move to wired connections for daytime use.
4. Change dimmer switches to on/off type.
5. Filter DE as necessary at main panel or at locations of dirty electronics.

VIII. Risk Assessment

A. Please see attached Building Biology Precautionary Guideline tables & charts in the appendix below and compare to the above readings and table of readings.

1. RFR in the main house is a Slight Concern to Extreme concern depending on proximity to or use of wireless devices listed in the above report
2. Magnetic fields are all in the Severe to Extreme Concern range for the entire house. Avoidance is strongly suggested.
3. Electric fields on beds were in the 3X Extreme Concern range and are a prime contributor of insomnia and lack of bodily repair. This can be remediated quite well.
4. For DE, anything over 50 GS Units needs reduction and below 25 is ideal for sensitive people. Your base DE level goes up and down from 110-450 GS with nothing on in the house as it is coming from the utility feed.
<http://www.windheimemfsolutions.com/wp-content/uploads/2014/08/Cancer-California-School-Milham-Morgan-2008.pdf>
5. Even your relatively low levels have caused pain and suffering for my clients. I have some clients that would leave you house as fast as they entered due to your DE levels.
6. You have several overlapping EMF toxins, which create a synergy of biological harm. All of them need to be reduced with magnetic fields being the most powerful and well-documented threat. Second would be RFR exposure. Third would be electric field and DE exposure.

IX. Recommended Mitigation Options

- A. See the solutions listed above

- B. Retest building - Any mitigations need before/after assessments. Our motto is: detect, protect and verify.

X. General Follow-Up

- A. Read this report on a computer so you can access the links and videos.
- B. Print this report and circle any and all items of interest for our discussion.
- C. Please review this report carefully and write out of any questions you have for follow up.
- D. IMPORTANT: your paid EMF assessment includes 30 minutes of phone or email follow up. Please compile your questions into an email to me so I can prepare before we speak on the phone. Eric Windheim is available for a group presentation, conference call and Q & A about this assessment and report or other EMF topics.
- E. Call Eric Windheim to review your options and select what you want to do first.
- F. We are available to supervise and assist other specialists you may bring in on this project: since we are not a general contractor you must hire them directly. Many clients want us to retest after the EMF electrician is done on the same day or after DE filters are installed etc.
- G. Before you purchase any solutions we invite you to contact us to see if it the best choice for you. We will discuss, review and prioritize options.
- H. Please discuss your choice of remediation with us prior to making any purchases to insure the final action plan is consistent with suggestions and findings in this report.
- I. We provide an extra layer of quality control as part of our service.

“Every thing you can do to reduce EMF exposure is a worthwhile effort”

It is easier and less costly to avoid EMF exposure than to fight disease

I enjoy hearing from clients about their progress and results.

See Appendices and disclaimer below.

XI. Appendices

Appendix A. Professional and personal position

- A. The International Institute for Building Biology and Ecology, (BB), <http://hbelc.org>, independently funded scientists and I agree that current FCC guidelines protect against thermal heating damage of body tissue for a 30 minute period. We also realize the FCC, other government agencies, industry funded study groups and regulatory agencies populated with individuals tied to the industry and military, ignore or discredit the thousands of peer-reviewed reports reaching back many decades showing there is biological damage to living cells, tissues, organs and organisms from wireless radio frequency radiation (RFR) at levels that are 10, 100, 1,000, 10,000, 100,000 and even 1,000,000 times lower than FCC, 30 minute, thermal guidelines particularly when long term, chronic and dose related exposure is studied.
- B. Find out why the FCC is a “Captured Agency” controlled by industry: http://ethics.harvard.edu/files/center-for-ethics/files/capturedagency_alster.pdf
- C. The overriding guideline of BB is to use “Nature as the Model” for the built environment and to make it safe for those living and working in it. Of BB’s twenty-five principles, #20 seeks to “Minimize man-made power system and radio frequency radiation exposure generated from within the building and from outside sources”. <http://hbelc.org/pdf/standards/25Principles.pdf>
- D. While 80% of my clients realize they are already symptomatic in their house or building and feel better away from it, a smaller group prescient and precautionary client seek to avoid EMF exposure before health symptoms manifest. Some of my precautionary clients experience an immediate improvement in daily well being, particularly better sleep, when I identify and reduce EMF levels in their house, building or sleeping area. Previous to my assessment and enacted solutions many of these clients were not aware that they were being impaired by EMF. I have four client examples below regarding microwave, RF, radiation.
1. Sheila Reavill (and her dogs) of Lodi CA could not sleep in the bedroom, that had only 90 $\mu\text{W}/\text{m}^2$ coming from a cell tower one mile away without pain, discomfort and insomnia. I advised her to shield the ceiling and walls with RFR reflecting foil and paint and she now is overjoyed about how well she and her dogs feel and sleep.
 2. Susan C. of Davis CA could not sleep with 10 $\mu\text{W}/\text{m}^2$ of RFR exposure until she invested \$800 in a special bed canopy that reflected RFR and reduced the level to $<.1 \mu\text{W}/\text{m}^2$.
 3. Brian S. of Vallejo CA: his son Ben was pulled from school and required to seek help from a behavioral physiologist until I advised him to remove the WiFi router from under his son’s bed. Ben was being exposed to $>20,000 \mu\text{W}/\text{m}^2$ all night. Now that the WiFi router is gone all of Ben’s problems are also gone and he is back in school: avoiding RFR exposure was the key.
 4. Diane C. of Sacramento CA was training to run marathons in 2012 when she suddenly became so symptomatic to RFR radiation that she must wear a very restrictive and equally costly full body radiation suit whenever she steps outside. A so-called smart meter installed by the electric utility that transmits RFR 13,381 times per day triggered this: when it was removed Diane experienced a partial recovery but remains damaged to

this day. This smart meter produced RFR pulses of $>20,000 \mu\text{W}/\text{m}^2$ measured at 20 feet: the utility believes this is harmless.

E. My position is that we must be proactive and avoid exposure to escape becoming acutely symptomatic or chronically and irreparably damaged. Waiting for government to protect us will be very disappointing. Cell antennas and all wireless devices are documented health hazards. Use every RFR avoidance method available.

F. The well-documented hazards of magnetic fields and Dirty Electricity are being ignored by agencies that are tasked to protect us. This is accomplished by setting legal limits of exposure that are astronomically high so they will seldom, if ever, be exceeded by military, industry or commerce.

Appendix B. Methodology of Measurements

A. Meters:

The Gigahertz Solutions RFR meters and magnetic field meters used in this report are state of the art, in calibration period and designed to detect, measure the RFR radiation down to very low levels in the biological injury range and up to FCC Maximum Permissible Exposure limits (MPE). I used these meters with the appropriate antennas:

- <http://slt.co/Products/RFMeters/RFMeter-HFE59B.aspx>
- <http://slt.co/Products/RFMeters/HFEW59DRFMeterKit.aspx>

1. <http://slt.co/Products/EMFMeters/NFA1000.aspx>RFR Method of measurement:

- a. RFR is simply a process of broadcasting electricity though the air by encoding data on a specific carrier wavelength. For example, antennas encode data by altering the shape of a smooth-sine wave (on 6.5-inch wavelengths for the 1800 MHz frequency, for example) and then broadcasting this data in a strobe light-like manner: a short powerful burst, followed a period of nothing, and repeated indefinitely. The mobile device receives this stream of RFR and decodes the data, displaying the image or video on the screen.
- b. Total RFR exposure over time, defined as Peak RFR x duration of pulse x number of pulses per day is what really matters to one's health: total cumulative exposure over time (dose).
- c. Total RFR is expressed as peak power density x hours of exposure ($\mu\text{W-hours/m}^2$).
- d. Sunlight is another form of non-ionizing RFR: 30 minutes in mid-day sun yields a sun tan, but 8-10 hours in mid-day sun yields a sun burn. Repeated exposure like this, without healing or rest, can cause skin cancer. It is self-evident to all of us that duration of exposure matters with RFR from the sun. RFR exposures from cell phone antennas operate in the same way. Your body *may* be able to repair if it gets excellent sleep, rest and repair every day.
- e. Peak RFR power density is the most accurate metric for the actual rate of RFR exposure ($\mu\text{W/m}^2$), but this rate of exposure still needs to be multiplied by the total time of exposure to understand the total dose of this biologically toxic agent. Peak RFR is typically 50-250X higher than Average RFR.
- f. Average RFR power density is an FCC specified method that is much less precise as it averages in periods of low or zero exposure. It purposely averages down peak levels and does not address total RFR delivered over time (dose).
- g. Typical RF Engineers, Inc who, are hired by AT&T, T-Mobile, Sprint, Verizon etc., for compliance reports are instructed to follow FCC-specified procedures that to date, effectively protect from corporate liability under current FCC guidelines and, unfortunately, hide the actual RFR peak levels. They only compute, predict, extrapolate or measure Average RFR power density, which is often called root-mean-square (RMS), which averages voltage amplitude readings and hides peak readings.
- h. Certified Building Biologists & Electromagnetic Radiation Specialists meter throughout a 3D space and set their meters to Peak-hold and measure**

reflections and hotspots in order to capture the highest actual RFR exposure level during any nominal capture time-period. Building Biologists then multiply this peak level by ten, per the Gigahertz Solutions HF59B meter instruction manual excerpt below, in recognition that it is very difficult to capture the full height of the needle-like peaks of microsecond bursts of RFR power. The Peak Intensity of the needle-like peaks does the greatest damage.

i. Explanation of the 10X multiplier from the HF59B manual excerpt with my **emphasis**

“CDMA, UMTS/3G, LTE/4G, WiMAX, DVB, Wireless LAN during full data transmission:

The modulation of these high-speed services includes high, **needle-like peaks** compared to the average power transmitted. Such signals are referred to as “**high crest factor**” signals.

Measure these signals for 1 or 2 minutes (with peak hold) by slightly panning the meter pointing to the direction of the main source. For the assessment of the peak values of such signals (including the crest factors) keep the standard setting “Peak hold” and “VBW standard” (default in the HF58B).

For the compensation of the crest factor multiply the displayed reading by a correction factor. A flat factor of 10 offers a good approximation.

Often you will find different telecommunication services being present at the same time. With the help of the audio analysis, you will be able to estimate how much of the total value shown is caused by such high crest factor signals.

Depending on the proportion to the total signal, please apply the following “rules of thumb”:

- _ Slightly audible portion of “high crest factor signals”: multiply display reading by 2.
- _ “Fifty-fifty”-ratio: multiply display reading by 5
- _ Dominating “high crest factor signals”: **multiply display reading by 10.**

This adjusted measurement value can now be recorded or compared directly to the building biology recommendations. Taking into account the multiple external factors of measurement uncertainty, this approach is perfectly adequate for an assessment of the total pollution.”

- b. Once one has identified the highest peak reading, one then calculates Peak RFR x duration of pulse x number of pulses per day to understand the actual, cumulative RFR exposure over a day, a month or a year. The RFR dose is additive, cumulative and a very serious matter. Long-term chronic exposure while your body is trying to sleep, rest and repair is your biggest health hazard. Creating a safe haven in a toxic electromagnetic world is vital. Without excellent sleep you get accelerated aging at the very least.

2. Magnetic & Electric field method of measurement.

- a. A calibrated, 3-axis, NFA1000 meter was used on RMS setting for both spot readings and data logging.

Appendix C. Recorded RFR & EMF Measurement Tables

| Location | Magnetic Fields MilliGauss mG NFA1000 meter <.2 No Concern .2-1 Slight 1-5 Severe >5 Extreme | RFR Radiation $\mu\text{W}/\text{m}^2$ Micro Watts/Square Meter As Measured HF59B meter HF59D meter <0.1 No Concern .1-10 Slight 10-1,000 Severe >1,000 Extreme | Dirty Electricity GS units Stetzer Meter < 25 Good >50 Undesirable | Electric Fields Volts/meter V/m pf NFA1000 meter <.3 No Concern .3-1.5 Slight 1.5-10 Severe >10 Extreme | | | | | | | | | | | | | | | | | | | | | | | | |
|----------------------------|---|---|---|---|--------|-----|-----|-------|-----|-----|------|-----|-----|------------|--|--|--|------|-------|--------|------|-----|-------|------|-----|------|-----|------|
| Master Bed | <table border="1"> <thead> <tr> <th></th> <th>Left</th> <th>Right</th> </tr> </thead> <tbody> <tr> <td>Pillow</td> <td>7.7</td> <td>7.5</td> </tr> <tr> <td>Waist</td> <td>6.9</td> <td>6.9</td> </tr> <tr> <td>Foot</td> <td>6.5</td> <td>6.4</td> </tr> </tbody> </table> | | Left | Right | Pillow | 7.7 | 7.5 | Waist | 6.9 | 6.9 | Foot | 6.5 | 6.4 | 4,000 WiFi | | <table border="1"> <thead> <tr> <th></th> <th>Left</th> <th>Right</th> </tr> </thead> <tbody> <tr> <td>Pillow</td> <td>32.6</td> <td>8.6</td> </tr> <tr> <td>Waist</td> <td>15.0</td> <td>3.6</td> </tr> <tr> <td>Foot</td> <td>5.0</td> <td>20.0</td> </tr> </tbody> </table> | | Left | Right | Pillow | 32.6 | 8.6 | Waist | 15.0 | 3.6 | Foot | 5.0 | 20.0 |
| | Left | Right | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pillow | 7.7 | 7.5 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Waist | 6.9 | 6.9 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Foot | 6.5 | 6.4 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Left | Right | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pillow | 32.6 | 8.6 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Waist | 15.0 | 3.6 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Foot | 5.0 | 20.0 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Master bed west wall | 18.0 with front door light switch on | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Master bath toilet | 11.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Master bath sink wall | 40.0 when lights on | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Guest Bath Toilet Tank Lid | 34.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Basement | 6.94 @ laundry | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Basement Ceiling | 24.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Kitchen Island | 3.3 | 86 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| South Kitchen Counter | | | 110-450 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Kitchen floor | 20.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Kitchen Sink | 3.8 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Microwave Alcove | 18.3 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Dining room | 7.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Living Room | 10.8 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Leather couch in LR | 10.6 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Front Door | 3.3 light switch off 16.0 light switch on | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Top of stairs | 6.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Marks office | 5.5 | >20,000 WiFi | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Tea Room | 5.8 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sun Room Porch west wall | 29.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sun Room Porch east window | 3.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Appendix D. Limitations of this assessment and report

EMF assessments detect and measure electromagnetic fields and radiation in and around a building or house. Measurements will be recorded and compared to Building Biology Precautionary Guidelines (SBM 2015) and other guidelines as well. Risk assessment levels will be discussed and a plan of action for remediation will be offered based on Building Biology and other effective protocols.

This is a confidential report and no personal information will be shared except with the client or with others working on this project.

This assessment and report is not a structural, mechanical, pest or building code inspection. All measurements are a one time “snap shot” and measurements may be different on other days or at other times of the day.

We can't make any claims about the presence or absence of pollutants other than the specific issues we tested for and measurements within the limits of our equipment nor can we make assumptions about conditions in areas of the building that were not tested. Due to the limited scope of this survey, results may not be suitable for litigation purposes.

Absolutely no warranties or guarantees are provided whatsoever. By acceptance of this report the client or other readers hereby release Eric Windheim, Windheim EMF Solutions and any recommended solution providers from any and all liability.

Sincerely,



Eric Windheim BA, EMRS, BBEC
Certified Electromagnetic Radiation Specialist
Certified Building Biologist
Windheim EMF Solutions

Disclaimer

Though we hope the included recommendations will lead to a healthier life, no statement or information provided by this report or linked to this website, is intended for use in the diagnosis, cure, mitigation, treatment or prevention of disease or any other medical condition. The reader, viewer or listener is advised to discuss the information provided here with an authorized healthcare practitioner. Windheim EMF Solutions shall not be liable for any health effects arising due to recommendations made or not made by the Assessment. The measurements requiring physical connection to building wiring are conducted according to the best electrical practices. Windheim EMF Solutions is not responsible for any physical damage to electrical outlets or house power distribution system arising from loose, defective or brittle receptacles or improper wiring. The results relate only to the items tested. 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.

Most of the inspection techniques, testing protocols and environmental criteria evaluated in this report were developed by the International Institute for Building Biology and Ecology based on established practices in Germany. We use top of line certified and calibrated instruments specifically designed for Building Biologists.

While relatively holistic in nature these protocols can't cover every possible health hazard on any given property. There may be hidden hazards that were not exposed or tested for in this assessment.

We can't make any claims about the presence or absence of pollutants or toxins other than what we tested for this report.

Due to the limited scope of this assessment and report it may not be suitable for litigation purposes.

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Important links and reference documents:

<http://www.bioinitiative.org>

<http://www.sammilham.com/http://www.anticelltowerlawyers.com>

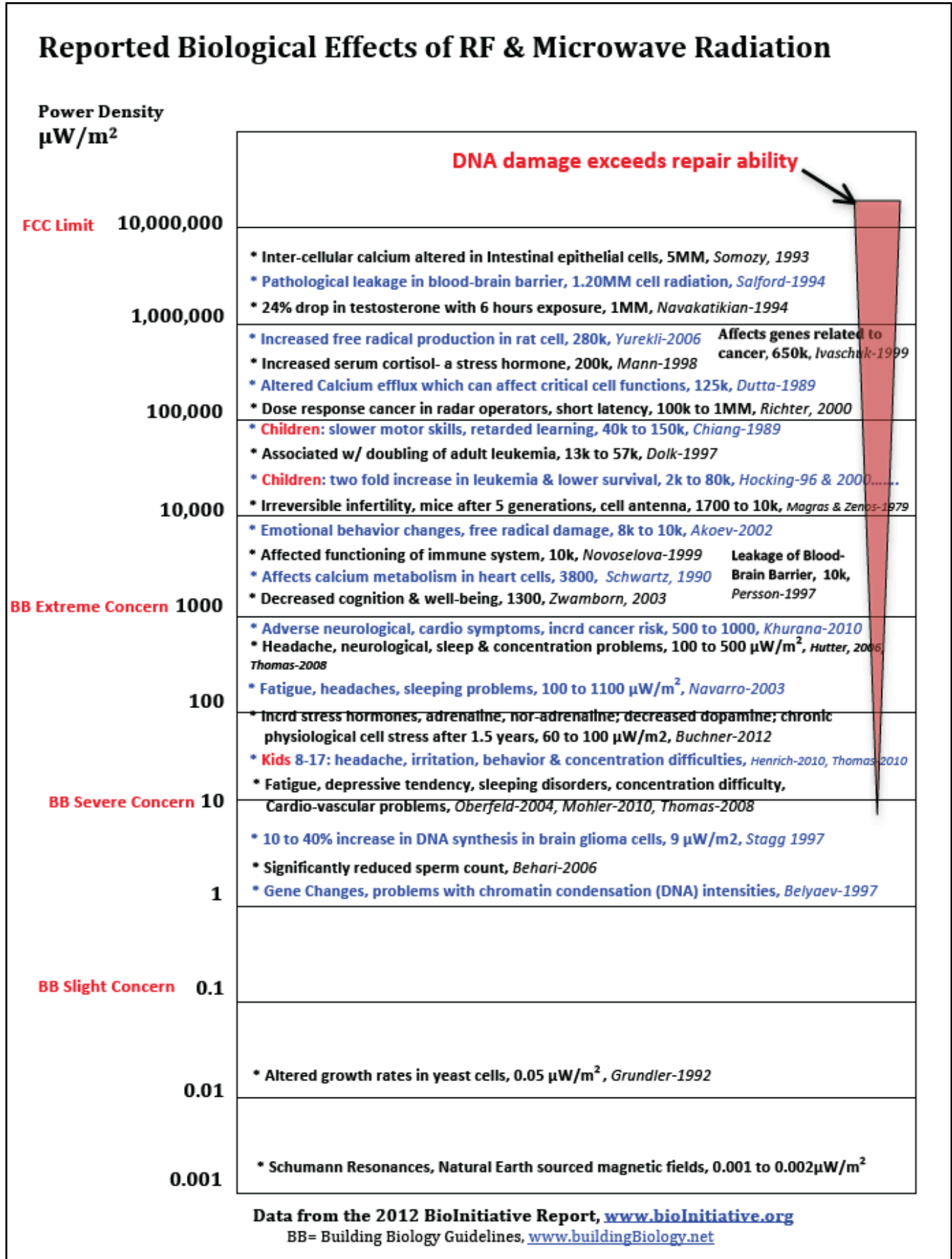
<http://www.magdahavas.com/>

<http://www.stetzerelectric.com/>

<http://WiFiFacts.com>

<http://windheimemfsolutions.com>

Appendix E. Reference Tables



Supplement to the Standard of Building Biology Testing Methods SBM-2015

BUILDING BIOLOGY EVALUATION GUIDELINES

FOR SLEEPING AREAS

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

Severe Anomaly Values in this category are not acceptable from a building biology point of view, they 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 Anomaly 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.

Guiding Principle:

Any risk reduction is worth aiming at. Guideline values are meant as a guide. Nature is the ultimate standard.

The small print at the end of each subcategory of the Building Biology Standard is meant as a comparative guide, e.g. legally binding exposure limits or other guidelines, recommendations and research results or natural background levels.

Building Biology Evaluation Guidelines for Sleeping Areas
SBM-2015, Page 1

| No Anomaly | Slight Anomaly | Severe Anomaly | Extreme Anomaly |
|------------|----------------|----------------|-----------------|
|------------|----------------|----------------|-----------------|

A FIELDS, WAVES, RADIATION

1 AC ELECTRIC FIELDS (Low Frequency, ELF/VLF)

| | V/m | < 1 | 1 - 5 | 5 - 50 | > 50 |
|--|-----|-------|-----------|------------|--------|
| Field strength with ground potential in volt per meter | mV | < 10 | 10 - 100 | 100 - 1000 | > 1000 |
| Body voltage with ground potential in millivolt | V/m | < 0.3 | 0.3 - 1.5 | 1.5 - 10 | > 10 |
| Field strength potential-free in volt per meter | | | | | |

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

2 AC MAGNETIC FIELDS (Low Frequency, ELF/VLF)

| | nT | < 20 | 20 - 100 | 100 - 500 | > 500 |
|---------------------------|----|-------|----------|-----------|-------|
| Flux density in nanotesla | mG | < 0.2 | 0.2 - 1 | 1 - 5 | > 5 |
| in milligauss | | | | | |

Values apply to frequencies up to and around 50 (60) Hz, higher frequencies and predominant harmonics should be assessed more critically. Line current (50-60 Hz) and traction current (16.7 Hz) are recorded separately.

In the case of intense and frequent temporal magnetic field fluctuations, the 95th percentile of the data logging records, especially those from nighttime logging, shall be used for the assessment.

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; BioInitiative: 100 nT; BUND: 10 nT; nature: < 0.0002 nT

3 RADIO-FREQUENCY RADIATION (High Frequency, Electromagnetic Waves)

| | µW/m² | < 0.1 | 0.1 - 10 | 10 - 1000 | > 1000 |
|---|-------|-------|----------|-----------|--------|
| Power density in microwatt per square meter | | | | | |

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.

Former Building Biology Evaluation Guidelines for RF radiation / HF electromagnetic waves (SBM-2003): pulsed fields < 0.1 no, 0.1-5 slight, 5-

Please note the astronomical levels that some governments use as 30-minute thermal guidelines



Creating Healthy Living Spaces

PO Box 72, Morriston, ON, Canada N0B 2C0 › Tel 519.240.8735 Fax 519.821.5724
support@slt.co › www.slt.co

International Radio Frequency "RF" Exposure Limits for 1800 MHz Range

(Cell Phone, WiFi, Smart Meters, etc)

| Location | Reference | Exposure time | Limit Based On | Lower by | $\mu\text{W}/\text{m}^2$ | V/m |
|---|---|-------------------|----------------------------|----------------------|--------------------------|-----------------|
| Canada | Safety Code 6, Table 5 | 6 minutes | Thermal / Heating | - | 10,000,000 | 61.4 |
| USA | (FCC) IEEE C95.1-1999 and ICNIRP | 30 minutes | Thermal / Heating | - | 10,000,000 | 61.4 |
| Most of Western Europe | IEEE C95.1-1999 and ICNIRP | 30 minutes | Thermal / Heating | - | 10,000,000 | 61.4 |
| Russia | Sanitary Norms and Regulations 2.2.4/2.1.8.055-96 | 3 hours + | Biological Effects | 100 x | 100,000 | 6.14 |
| China | UDC 614.898.5 GB 9175 -88 | 3 hours + | Biological Effects | 100 x | 100,000 | 6.14 |
| Italy | Sanitary Norms and Regulations 2.2.4/2.1.8.055-96 | 3 hours + | Biological Effects | 100 x | 100,000 | 6.14 |
| Most of Eastern Europe | Sanitary Norms and Regulations 2.2.4/2.1.8.055-96 | 3 hours + | Biological Effects | 100 x | 100,000 | 6.14 |
| Switzerland | Ordinance on Protection from Non-ionising Radiation (NISV) | Long Term | Precautionary | 100 x | 100,000 | 6.14 |
| Toronto Board of Health, Canada | Proposed 1999 | Long Term | Precautionary | 100 x | 100,000 | 6.14 |
| Bio-Initiative Report recommendation | Bio-Initiative Report 2007 | Long Term | Biological / Precautionary | 10,000 x | 1,000 | 0.614 |
| Salzburg Resolution on Mobile Telecommunication | Preventive public health protection, Salzburg, June 7-8, 2000 | Long Term | Precautionary | 10,000 x | 1,000 | 0.614 |
| European Parliament | Resolution 1815, Strasbourg, May 27, 2011 | Long Term | Precautionary | 10,000 x | 106 | 0.2 |
| Building Biology Guidelines Germany (Sleeping Areas) | SBM2008 - Level of No Biological Concern | Long Term | Precautionary | 100,000,000 x | 0.1 | 0.006,14 |
| Cell Phone Operational Requirements | | | | 10,000,000,000 x | 0.001 | 0.000,061,4 |
| Natural Cosmic Radiation | MAES 2000 | Long Term | Natural Exposure | 10,000,000,000,000 x | 0.000,001 | 0.000,000,061,4 |
| Average Indoor Urban Exposure Toronto, Canada | Safe Living Technologies Inc. 2011 | Long Term | | | 200 - 5000 | 0.3 - 1.4 |

Please note the astronomical levels that some governments use as guidelines



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International EMF Exposure Limits for AC Electric and AC Magnetic Fields

50/60z (High Voltage Power Lines, Home Electrical Wiring, Power Cords, Appliances)

| Location | Reference | Limit Based On | AC Magnetic Field mG | AC Electric Field V/m |
|---|---|-------------------------------------|----------------------|-----------------------|
| Canada | ICNIRP 1998 | Nerve and Muscle Stimulation | 833 | 5,000 |
| USA | ACGHI 1998 | Nerve and Muscle Stimulation | 1,000 | 25,000 |
| Germany | DIN/VDE | Nerve and Muscle Stimulation | 50,000 | 20,000 |
| Sweden | MRP | Biological / Precautionary | 3 | 25 |
| Sweden | TCO | Biological / Precautionary | 2 | 10 |
| Switzerland | | Biological / Precautionary | 10 | |
| WHO "possibly carcinogenic" | | Biological / Precautionary | 3-4 | |
| Bio-Initiative Report recommendation | Bio-Initiative Report 2007 | Biological / Precautionary | 1 | |
| US Congress | Recommendation 1996 | Biological / Precautionary | 2 | 10 |
| Building Biology Guidelines Germany (Sleeping Areas) | SBM2008 - Level of No Biological Concern | Biological / Precautionary | 0.2 | 0.3 |
| Natural Radiation | MAES 2008 | Natural Exposure | 0.0002 | 0.0001 |
| Average Indoor Urban Exposure Toronto, Canada | Safe Living Technologies Inc. 2011 | | 0.4 to 2.0 | 5 to 25 |

For better sleep and better health, follow these 5 easy steps starting today!



Creating a Sleeping Sanctuary

5 Easy Steps to Create a Sleeping Sanctuary

- 1 Use battery clocks near bed.**
Research has shown exposure to high magnetic fields while sleeping can cause severe long-term illness. Many electric clocks produce high magnetic fields.
- 2 Turn off bedroom-affecting circuits**
A restful sleep is necessary for health and a strong immune system. Electric fields affect you bio-communications, keeping you from sleeping soundly.
- 3 Eliminate or shield from RF.**
Radio frequency (RF) signals from portable phones, cell phones, and wireless devices have been shown to interfere with the body's immune system.
- 4 Use beds without metal.**
Metal frames and metal box springs can amplify and distort the earth's natural magnetic field, which can lead to a non-restful sleep. Use natural materials.
- 5 Make sure there are no elevated magnetic fields.**
Magnetic fields from appliances and building wiring can penetrate walls into a bedroom and disrupt the body's communication system.

For more information:

Institute for Building-Biology® & Ecology

Reference: *Sleeping Sanctuary* ~ v4

Why do we need a sleeping sanctuary?

It's about Stress – and “de-stressing”

The human body is an amazing, self-rejuvenating entity that has the ability to repair itself while it sleeps. This is accomplished with its own, internal electrical system that functions with very weak electrical impulses. Electrical impulses are generated by the brain and are used for intercellular communication. This is possible because the body is composed mainly of water with a high mineral content making it highly electrically conductive.

Cells know when to divide by vibrating. Brain cells, nerve cells, bone cells, all vibrate at different rates in order to communicate with one another. Unfortunately, our bodies act like tuning forks. When you vibrate a tuning fork (external electrical influence), any tuning fork (like our body) in its vicinity will start vibrating at the same frequency or rate, and therefore will be confused as to how fast to grow.¹

In the typical sleeping area, electrical exposure from external sources (live electrical wiring in ceilings, walls and floors) is thousands of times stronger than the body's own electrical system. Long-term exposure to these high level electric fields can impair the body's ability to communicate within itself and impact health. The average person spends approximately 1/3 of their life sleeping. Doesn't it make sense to reduce exposure to electric fields in our sleeping areas?

Some people develop symptoms when they experience long-term exposure, especially at night, to elevated levels of electricity, such as: headaches, hyperactivity, nightmares, depression, fatigue, eyestrain, and muscle cramps.

Biological problems associated with electromagnetic stressors fall into two major categories²:

1. Brain (behavioral abnormalities, learning disabilities, altered bio-cycles and stress responses)
2. Growing tissue (embryos, genetics and cancer)

Research has shown that for a body to properly detoxify during sleep it must be alkaline, and high electromagnetic fields lead to acidity. This is especially true for heavy metal detoxification.³

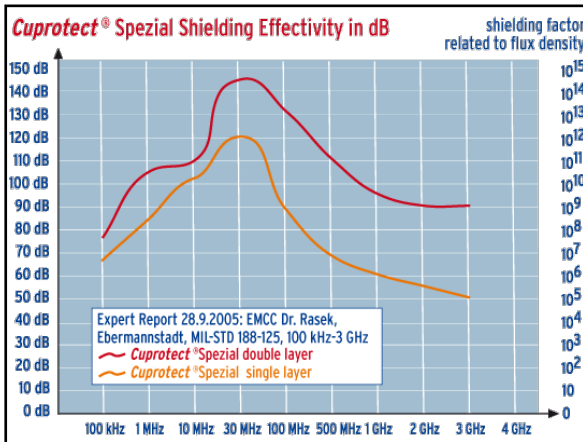
¹ Oschman, James. *Energy Medicine*. London: Churchill Livingstone, 2000.

² Becker, Robert O. *Cross Currents*. New York: Penguin Group (USA) Inc., 1990.

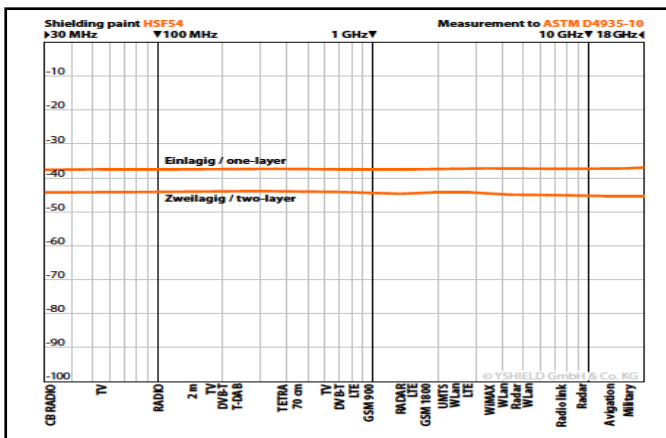
³ <http://www.klinghardt.org/docs/Heavy%20Metal%20Detox%20Clinical%20Pearls.pdf> [cited Feb 2007]

Appendix F. Shielding Materials & Filters

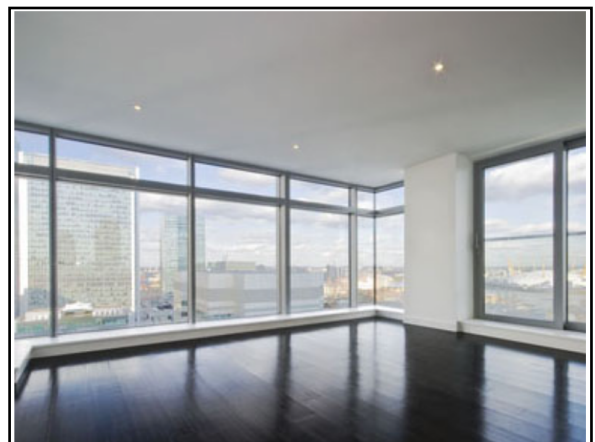
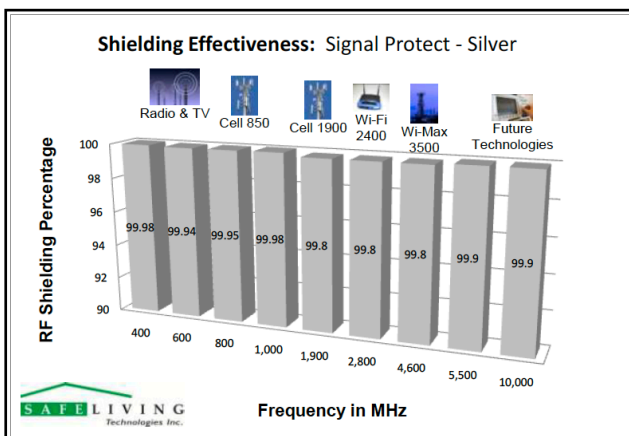
- I. Cuproprotect® shielding systems provide up to 99.99999999% RFR reduction at 30 MHz with one layer: <http://www.emfrf.com/shielding/>



- II. Yshield paint provides up to 99.97% RFR and electric field reduction with one coat: <http://slt.co/Products/RFShieldingPaint/ShieldingPaint-YShield-HSF54.aspx> I have a discount code you can use here.



- III. Signal Protect window shielding film provides up to 99.98% RFR reduction: <http://slt.co/Products/RFShieldingWindowFilm/> I have a discount code you can use here.



IV. Stetzer DE Filter Box mounted at main electric panel. One duplex outlet per phase wired as close to the sub panel bus bar as possible. Cost is about \$350-\$410 installed filters included. This filters DE very well but does not protect appliances from voltage spikes.



V. Specialty panel mount DE filter and surge suppressor at sub panel: about \$1100 installed. This filters DE as well as the Stetzer filter box but also protects all appliances and electronics from electric surges and spikes: providing more complete protection. Call for current recommendation on size and model. These units can handle an entire house. Price depends on size of unit based on Amp service size of sub panel and the type of breakers your panel will require.



VI. DNA Line Filter: Dissipative Noise Attenuation Line Filter

DNA Line Filter Mechanical Information

DNA Line Filters: M30, M100a, M100b
 M30 = 27 lbs, M100a = M100b = 90 lbs.



The DNA Line Filter requires the installation to be accomplished by a professional electrician.

The DNA product line is designed to reduce the Dirty Electricity (DE) that is commonly found on AC power lines. This DE is sometimes referred-to by engineers as, “noise”.

DE is energy (voltages and currents) flowing on the AC power lines that is of a higher frequency than the 50 or 60 Hz power frequency. DE is found, from, 100’s of Hz to the MHz range.

These DE voltages and currents (flowing on the AC power lines) generate electric and magnetic fields that radiate into the spaces around the power wiring. It is these fields that people have reported sensitivity-to. Therefore by using devices like the DNA products, the voltages and currents of the DE, that are riding on the AC power lines, are reduced. This, then, brings about a reduction the DE fields that the DE voltages and currents produce.

These units are very expensive costing \$5400 and up plus tax, shipping and installation: call me before purchase.

VII. Other DE Filters and devices that protect from high frequency voltage transients.

Depending on the application and onsite testing results, other filters may be applicable, effective and be reasonably priced.

Appendix G. Studies and Citations supporting evidence of harm from Magnetic Fields.

A. BioInitiative 2007

Summary for the Public (Chapter 1)

"ELF limits should be set below those exposure levels that have been linked in childhood leukemia studies to increased risk of disease, plus an additional safety factor. It is no longer acceptable to build new power lines and electrical facilities that place people in ELF environments that have been determined to be risky. These levels are in the 2 to 4 milligauss (mG) range, not in the 10s of mG or 100s of mG."*

"1. Childhood Leukemia

The evidence that power lines and other sources of ELF are consistently associated with higher rates of childhood leukemia has resulted in the International Agency for Cancer Research (an arm of the World Health Organization) to classify ELF as a Possible Human Carcinogen (in the Group 2B carcinogen list). Leukemia is the most common type of cancer in children.

There is little doubt that exposure to ELF causes childhood leukemia.

"The exposure levels for increased risk are quite low – just above background or ambient levels and much lower than current exposure limits. The existing ICNIRP limit is 1000 mG (904 mG in the US) for ELF. Increased risk for childhood leukemia starts at levels almost one thousand times below the safety standard. Leukemia risks for young boys are reported in one study to double at only 1.4 mG and above (7) Most other studies combine older children with younger children (0 to 16 years) so that risk levels do not reach statistical significance until exposure levels reach 2 mG or 3 mG. Although some reviews have combined studies of childhood leukemia in ways that indicate the risk level starts at 4 mG and above; this does not reflect many of the studies reporting elevated risks at the lower exposure levels of 2 mG and 3 mG."

Children who have leukemia and are in recovery have poorer survival rates if their ELF exposure at home (or where they are recovering) is between 1mG and 2 mG in one study; over 3 mG in another study.

"Several recent studies provide even stronger evidence that ELF is a risk factor for childhood leukemia and cancers later in life. In the first study (9), children who were recovering in high-ELF environments had poorer survival rates (a 450% increased risk of dying if the ELF fields were 3 mG and above). In the second study, children who were recovering in 2 mG and above ELF environments were 300% more likely to die than children exposed to 1 mG and below. In this second study, children recovering in ELF environments between 1 and 2 mG also had poorer survival rates, where the increased risk of dying was 280%. (10) These two studies give powerful new information that ELF exposures in children can be harmful at levels above even 1 mG. The third study looked what risks for cancer a child would have later in life, if that child was raised in a home within 300 meters of a high-voltage electric power line. (11) For children who were raised for their first five years of life within 300 meters, they have a life-time risk that is 500% higher for developing some kinds of cancers."

Source: Chapter 1: Summary for the Public in BioInitiative Working Group, Cindy Sage and David O. Carpenter, Editors. BioInitiative Report: A Rationale for a Biologically-based Public Exposure Standard for Electromagnetic Fields (ELF and RF) at www.bioinitiative.org, August 31, 2007.

B. Studies and Citations for Childhood Leukemia related to Magnetic Fields & EMF

- | | | |
|--|---|---|
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C. Appendix 20-A Average Residential Exposures to ELF (Power Frequency Fields)

What are Ambient ELF and RF Levels?

A nation-wide survey in the United States by Zaffanella et al (1993) collected engineering data on sources and levels of 60 Hz electric power magnetic fields that exist inside residences in the United States.

Approximately 1000 residences were randomly selected for the survey. The goals were to 1) identify all significant sources of magnetic field, 2) estimate for each source the percentage of residences where magnetic fields exceeded specified levels, 3) to determine the relation between magnetic field and sources and 4) to characterize the field variations in time.

The median field was identified as 0.5 mG and the average field was 0.9 mG. Thus, this confirms that average residential magnetic fields based on the 1000-home study is less than 1 mG.

Appliances produce magnetic fields but these diminish rapidly with distance (at $1/R^3$),

Power lines generally produce the largest average residential magnetic field when the entire living space of a residence and a 24-hour period are considered. Power line magnetic field exceeds 1 mG in 17%, exceed 2.5 mG in 9.5% and **exceed 5 mG in 0.3% of all the residences surveyed.**

Zaffanella (1998) conducted measurements to characterize typical EMF exposure levels in persons living in the United States - a study called the 1000-Person Study. Table A-S.2 shows that about half of all people in the US have EMF exposures at home under 0.75 mG; in bed are 0.48 mg; at school 0.60 mG; at work 0.99 mG; and 0.87 mG is the median EMF exposure for an average 24-hour day.

Zaffanella LE, Kalton GW. 1998. Survey of Personal Magnetic Field Exposure Phase II: 1000-Person Survey. EMFRapid Program Engineering Project No.6 Lee MA: Enertech Consultants.
<http://www.emf-data.org/rapid6-report.html>.

Table A-S.2

In Sweden, Mild et al (1996) report that overall mean residential ELF exposures are 0.4 mG, and in

Norway are 0.13 mG.

Hansson Mild et al. 1996. Measured 50 Hz Electric and Magnetic Fields in Swedish and Norwegian Residential Buildings. IEEE Transactions on Instrumentation and Measurement. 45(3): 710-714.

SECTION 20

Average Occupational Exposures to ELF

Average occupational exposures in commercial office buildings are 1-2 mG or less and have been reported fairly consistently across numerous studies of exposure assessment (Table 1). Powerline and electrical workers have higher average occupational exposures from 10 mG to 16.6 mG.

Table A-2: Average Occupational Exposures to ELF

EMF RAPID Program – Questions and Answers, NIEHS, June 2002

| | |
|---------------------------|--------|
| Office buildings (median) | 0.6 mG |
| Support staff | 0.5 mG |
| Professional staff | 0.6 mG |
| Maintenance staff | 0.6 mG |
| Visitors | 0.6 mG |

EMF RAPID Program Engineering Project #3 Executive Summary, May 1996

| | |
|---------------------------|--------|
| Office building (average) | 0.7 mG |
| Office building (median) | 0.4 mG |

Electric and Magnetic Field Fundamentals (EPRI Resource Paper, March 1994)

| | |
|------------------------------------|----------|
| Typical magnetic fields in offices | 1 – 2 mG |
| Power line workers | 10 mG |

Occupational EMF Exposure Assessment (EPRI Resource Paper, February 1994)

| | |
|--|--------|
| Office Worker Comparison Group | 1.6 mG |
| All Occupationally Exposed Utility Workers | 6.6 mG |

| | |
|-------------------------------|--------------|
| Table 7 – Other Studies Cited | |
| Bracken Study (1990) | 1.0 mG |
| Deadman Study (1988) | 1.6 mG |
| Bowman Study (1992) | 0.9 – 1.8 mG |

Limits on Operation of Sensitive Electronic Equipment

Companies that manufacture or use equipment in nanotechnology and biotechnology and found 1.0 mG is generally the limit for proper operation of electron beam devices (mass spectrometers, scanning electron microscopes, lithography, etc) used in these technologies. Ten (10) milligauss (mG) is the EMF limit for normal computers – above 10 mG can introduce “computer jitter” and other problems.

What are Ambient Radiofrequency Radiation/Microwave Levels?

Prior to the rapid development of wireless communications for personal and business usage, RF power density levels were primarily related to AM, FM and television broadcasting signal in both urban and rural areas of the United States. Microwave frequencies used for wireless communications were negligible.

Original extra-planetary sources of microwave radiation were infinitesimally small, on the order of a billionth of a microwatt per centimeter squared (10^{-12} uW/cm²). Human evolution took place without any appreciable exposure to microwave radiation from background sources. The human body has no evolutionary protection against microwave radiation, as it does for ultraviolet radiation from the sun (Johansson, 2000). Wireless voice and communications have introduced unprecedented levels of public exposure in the last decade.

Mantiply (1997) measured and reported common sources and levels of RF in the environment. He identified areas near cellular base stations on the ground near towers to be from 0.003 to 0.3 μ W/cm². Background level ambient RF exposures in cities and suburbs in the 1990's were generally reported to be below 0.003 μ W/cm².

Hamnerius (2000) reported that ambient RF power density measurements in twelve (12) large cities in Sweden were roughly ten times higher than in the United States for equivalent measurement locations by Mantiply in 1978 (when no cellular phone service existed in the US). He reported a total mean value of 26 measured sites in the study was 0.05 μ W/cm² and the median value was 40 μ W/cm². An office location with a base station nearby at about 300 feet distance tested 150 μ W/cm². A train station with antennas mounted indoors tested at about 3 μ W/cm². Both indoor and outdoor ambient RF power density measurements showed high variability depending on proximity to transmitting antennas.

Sage Associates reported on microwave frequency RF power density levels at outdoor locations both near and far from wireless antenna sites in the United States (Sage, 2000). Within the first 100-300 feet, power density levels have been measured at 0.01 to 3.0 μ W/cm². Elevated RF power density levels from a major wireless antenna site can often be detected at 1000 feet or more. Power density levels away from wireless antenna sites measure between 0.001 μ W/cm² to 0.000001 μ W/cm². Vegetation often reduces signal (and therefore the reach of elevated RF exposures) but dry building materials used to visually screen wireless sites do not appreciably diminish signal transmission. Therefore, many sites that are "out-of-sight" because of stealth design can still produce elevated RF levels in nearby areas where people live,

work and go to school. For purposes of this evaluation, a 10 dB attenuation has been incorporated to take building material shielding effects into account.

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APPENDIX 20-B

STANDARDS OF EVIDENCE FOR DECISIONMAKING DIFFERS AMONG PROFESSIONS

There is a large difference between what constitutes causal evidence for purposes of achieving scientific consensus, what constitutes sufficient evidence for purposes of interim public health policy, and what constitutes "a more likely than not" case. A central confusion in this debate is whether prudent policy and public health decisions necessarily require conclusive scientific evidence first. This is not the case. The state of the science needs to be presented in an understandable and scientifically accurate manner, but prudent public health actions do not and should not require 100% proof of harm. In fact, precautionary and preventative actions are specifically justified at a point in time before scientific proof is established. If the growing weight of evidence is positive (although all studies need not report positive effects) then it may be essential to take preventative actions and implement policies that are protective of public health,

safety and welfare rather than wait for absolute certainty. The following discussion is presented to highlight some of the main differences in professional approach and traditional ways of viewing and interpreting scientific evidence. In reality, the basis for taking action (preventative or precautionary action) is a continuum – there are no hard and fast rules. The bar for Public Health Policy may be higher or lower than shown in Figure 2; based on many factors, including how widespread the risk, how dread the disease, the cost of inaction (doing nothing until there is proof, but many may be harmed), etc.

A. Scientific Standard of Evidence

There are several levels of proof for adverse effects of environmental exposures. The most rigorous is a scientific standard, where virtual proof of causation is typically required by scientists to arrive at consensus about an effect. This approach works best in physics and chemistry. In biological systems this is rarely possible.

In this case, the ‘scientific standard’ refers to the overall evidence that the science community typically requires before rendering opinions on the strength of evidence, and what evidence they believe is necessary to establish a causal link (proof).

Figure 1 shows Standards of Evidence that are routinely employed by various interest groups in the EMF debate (Sage, 1997). It can be used to focus on various accepted standards for evidence that are legitimately used by scientific and professional groups to determine when an action is appropriate. The varying levels of certainty about an outcome will dictate different decision-making among different groups that may all be appropriate given their professional charge. Even though the evidence required to make a scientific determination about causality has a far higher standard than a legal determination on the ‘weight of the evidence’ or ‘preponderance of evidence’ (a legal standard), neither negates the correctness of the other in its proper jurisdiction. Scientists typically want all possible evidence (animal, cell and epidemiological studies, with replications) showing a high degree of consistency. This can generally be described as a 95% to 99% degree of certainty before drawing conclusions (it does not refer to the 95% confidence interval in epidemiology, except as a part of the overall proof).

Figure 1 Variable Standards of Evidence (By Profession)

B. Legal Standard of Evidence

The second level of proof is the standard applied in legal proceedings, which is ‘more likely than not’ or ‘preponderance of the evidence’ (Figure 1). This is to say if there is a 50%+ likelihood of harm, this is taken as evidence for a relationship (Sage, 1997). At least this level of evidence is reached for the studies of adult cancer and neurodegenerative diseases and 50/60 Hz magnetic field exposures. As with childhood leukemia, while we have documented associations, this does not necessarily indicate causation. Failure to meet either the scientific or the legal standard of proof does not mean that there is no relationship between exposure and disease. In the case of EMF exposure, where everyone is exposed, the societal implications may be huge if there is a real risk whose magnitude has simply just not yet been clarified. Public policies are needed to address this issue of decision-making in the face of this scientific uncertainty.

C. Environmental Protection Standard of Evidence

National and state environmental quality acts (The National Environmental Policy Act) and various state

environmental quality acts (SEQA) require that assessments use a standard of “potential for a significant impact on the environment which is a relatively low level of certainty (10% to 30%). The potential for a significant impact requires that mitigation strategies be developed, i.e, require precautionary or preventative actions when only the potential for risk is present (Figure 1).

For example, the potential for risk to humans from building on an active earthquake fault will require a finding of potentially significant impact, and will require mitigative action; even when there is no certainty (no causal evidence) that the fault will rupture and cause damage within the design lifetime of the building. Proof of harm is not a pre-condition for taking action, and the level of certainty is low in comparison to a scientific or legal standard of certainty. Nonetheless, each standard has validity, and will have a different level of evidence required to take action. What decision-makers need to address is what standard of evidence is appropriate now to guide them with respect to EMF exposures that are clearly of environmental and public health concern.

D. Public Health Standard of Evidence

The prudent approach from a public health point of view is to take preventive actions as if causation had been proven, while at the same time to continue to search for mechanisms of action. In the case of childhood leukemia and ELF exposure there is a consistent and statistically significant association in most studies, while for many of the other diseases the results are less consistent although strong associations are found in some studies (Figure 2). This bar graph should be considered illustrative only, since the level of certainty may be higher or lower (above or below 50%) depending on the circumstances of the potential risk, and costs of those risks to society.

Whether magnetic fields actually cause childhood leukemia and the other cancers and neurological diseases documented in this Report; or whether it is some other component in the electromagnetic environment that is responsible for the association is a subject of debate within the scientific community, but from a public health point of view it doesn't matter. The fact that there are unknowns does not negate or override the ultimate public health responsibility, which is to protect the population from exposures, which cause disease. Those who make public health decisions, as well as policymakers who rely on them and who approve construction of new schools and homes near power lines, those who provide insurance or financing of new construction, those who must choose siting routes for new electrical facilities all face making decisions with some uncertainty about the potential health risks from EMF exposure. Important social issues must often be decided on the basis of incomplete or uncertain scientific information.

Figure 2 Public Health Standard of Evidence for Decisions

Appendix H. Studies and Citations on RFR health damage. Read them carefully so you can stand confident when others tell you there are no possibilities of any harm.

See Link: <http://rfemf.com>

Microwave Radiation Sickness Studies: State of Public Health in the United States

Listed below are published studies, mainly from medical and scientific sources, which document the dramatic health effects of cancer-delivery antennas sited close to public and residential places. These reports describe mainly the bio-effects of the older broadcast, **radar** and 2G/3G antenna technologies. No one yet has a clear understanding of how the newer 4G/LTE multiple beam technologies and the new 3D beam-forming matrix systems and the upcoming 5G millimeter wave technologies can maim and exterminate. But at least, these preliminary studies provide primitive data about microwave sickness, in all of its ugly manifestations. Be assured that since the mid-1980s, millions of people in every state USA have been suffering the horrific fallout of antenna radiation, as documented below. If anyone cared enough to research your radiation-drenched neighborhood, here is what they would find (and more):

Lester and Moore (1982)

This study of 92 active Air Force bases operational between 1950-1969 found that counties with an active base had significantly higher incidences of cancer mortality compared to counties without. The authors hypothesized that the chronic, low intensity microwave exposure to peak pulse patterns characteristic of **radar** (microwave radiation) at the bases could damage immunity and account for the high cancer mortality in military counties. [34] Numerous other reports of community sickness from **radar** installations have come to light in the last thirty years. Recent reports include: an epidemic of sickness and mental retardation suffered by people in Taiwan who live close to Doppler weather **radar** stations [35] and an ongoing investigation of a childhood cancer cluster near eight military-grade **radar** towers in Herkimer County, New York State. [36] In addition to police, weather and military **radar** pollution, which blankets the US, the upcoming V2V and driverless car/truck systems are slated to additionally smother the population with new and universal systems of ground-level **radar** pollution. Ask John Krafcik, CEO of Google's self-driving car division, or Elon Musk of Tesla Motors if they give a hoot!

Kolodynski & Kolodynska (1996)

This study found that school children living near a radio location station in Latvia suffered reduced motor function, memory and attention span. [37]

Magras et al. (1997)

Researchers reported a decrease in reproductive function of mice exposed to cell

tower radiation and irreversible sterility was documented in fifth generation offspring. [38]

Hecht & Balzer (1997)

A review of hundreds of Soviet Russian studies documented a vast array of health effects, including insomnia, brainwave aberrations, cardiovascular problems and increased susceptibility to infections in people who lived or worked near RF/microwave antenna transmission sites. [39]

Colorado Department of Health

Audits of Lookout Mountain Broadcast Towers near Golden, Colorado: State audits conducted in 1999 and 2004 found a statistically significant brain tumor incidence in populations living closest to and in direct line-of-sight to TV/FM radio towers on Lookout Mountain. Some affected populations were irradiated with broadcast radiation at levels 100 times or more lower than the FCC's non-ionizing radiation limits. [40]

Santini et al. (2002)

530 people living near mobile phone masts in France reported headaches, sleep disturbance, discomfort, irritability, depression, memory loss and concentration problems. These effects were more pronounced the closer people lived to the mast. The researchers concluded that the minimal distance of people from cell tower antennas should not be less than 300 meters. However, this recommended minimal distance pertains only to the antennas affecting people in this particular study and does not necessarily pertain to other antenna installations, which may be more far-reaching due to power density, or more acutely bio-intensive due to various frequencies emitted. [41]

Santini et al.(2003)

This was the second part of the above Santini study, and it confirmed results of the 2002 study. It additionally showed that people irradiated for five years or more suffered significantly increased irritability, compared to those exposed to a shorter duration. Also, older people were documented to be more sensitive to the radiation. Homes that faced antennas, particularly within 100 meters, were documented to be the worst locations for certain debilitating symptoms. [42]

Navarro EA et al. (2003)

This study, conducted in Spain, found that the greater the power density of microwaves in the home, the more severe were *complaints of depression, fatigue, sleeping disorders, concentration problems, headaches, irritability, memory problems, loss of appetite, nausea, audio and visual dysfunction, dizziness and cardiovascular problems*. The researchers concluded: "There is a large and coherent body of evidence of biological mechanisms that support the conclusion of a plausible, logical and causal relationship between RF exposure and neurological disease. Hence, it is probable that cell sites are causing many adverse health effects. Public health surveys of people living in the vicinity of cell site should be being carried out now, and continued progressively over the next two decades. This is because prompt effects such as miscarriage, cardiac

disruption, sleep disturbance and chronic fatigue could well be early indicators of the adverse health effects." [43] **Roosli (2004)**

This Swiss survey study reported that out of 429 questionnaires returned, 394 people reported symptoms from cell tower exposure. Fifty eight percent of these symptomatic people suffered headaches, 19% nervous stress, 18% fatigue, while concentration difficulties were the most common complaint. "Two thirds of complainants had taken some action to reduce their symptoms. The most common measure was to avoid exposure if possible." [44]

Eger et al. (2004)

This study, commissioned by the German Federal Agency for Radiation Protection, compiled medical histories between 1994-2004 of people living in Naila, Germany. The study found a threefold increase in malignant tumors for people exposed for five years or more to cell tower antennas within 400 meters, compared to people living further away from the antennas. [45]

Wolf and Wolf (2004)

A Tel Aviv University study of 622 people living in Netanya, Israel, revealed an overall four-fold increase in the incidence of cancer among residents living within 350 meters of a mobile phone mast for a time period of between three and seven years. Among women in the 350-meter group, the increase in cancer was 10 times the norm, compared to people living in other areas of the city: "The study indicates an association between increased incidence of cancer and living in proximity to a cell phone transmitter station." [46]

Bortkiewicz et al. (2004)

This Polish study confirmed that residents living close to mobile phone masts reported "various complaints mostly of the circulatory system, but also of sleep disturbances, irritability, depression, blurred vision, concentration difficulties, nausea, lack of appetite, headache and vertigo. The performed studies showed the relationship between the incidence of individual symptoms, the level of exposure, and the distance between a residential area and a base station. This association was observed in both groups of persons, those who linked their complaints with the presence of the base station and those who did not notice such a relation." [47]

California study (2004)

A pilot medical study, conducted by Dr. Gunnar Heuser of Agoura Hills, California, focused on neurological symptoms of six firefighters who had been working for up to five years in stations with cell towers on premises. Their symptoms included: slowed reaction time, lack of focus, lack of impulse control, severe headaches, anesthesia-like sleep, depression, tremors and toxic encephalopathy, involving brain damage to frontal and temporal lobes, as confirmed by SPECT brain scans. In 2004, citing this study, the US and Canadian membership of the International Association of Fire Fighters (IAFF) passed a resolution opposing the siting of cell tower antennas on or adjacent to fire stations. [48]

Waldman-Salsam et al. (2004)

Medical doctors in Oberfranken, Germany, evaluated the medical complaints of 356 people exposed to cell tower radiation and in-home wireless devices. This irradiated population reported these symptoms: sleep disturbances, tiredness, forgetfulness, nose bleeds, vision and hearing problems, frequent infections, blood pressure abnormalities, hormonal and heart disturbances, nausea and night-time sweats. This information was presented to the German prime minister in a now-famous document known as the Bamberg Appeal, signed by 114 German physicians. [49]

Hutter et al. (2005)

365 people living near 10 different mobile phone masts in both urban and rural areas of Austria were studied. Reported symptoms of antenna radiation included: headache, vertigo, tremors, cold hands and feet, loss of energy, exhaustion, difficulty concentrating, feelings of strain and the urge for sleep. These people were irradiated at levels of 0.2 to 0.4 volts per meter, which is hundreds of times lower than legal US exposure standards of 47 to 61 volts per meter. The higher the voltage exposure, the higher the percentage of health complaints. The researchers concluded: "The results of this study indicate that effects of very low but long lasting exposures to emissions from mobile telephone base stations on well-being and health cannot be ruled out." [50]

Citizens Initiative Kempton West (2006-2007)

Anticipating the installation of a T-Mobile transmitter station in a neighborhood, 25 participating residents living between 15 to 300 meters from the new cell tower volunteered for blood sampling before the antennas were turned on. These volunteers removed all DECT phones and Wi-Fi systems from their homes for the test period. This study was part of a German-wide medical investigation into the effects of cell tower radiation on human health, led by Dr. Hans Scheiner in Munich. The study focused mainly on blood levels of the mood hormone serotonin and the sleep hormone melatonin, both created by the pineal gland. A healthy person creates serotonin by day for alertness and energy, melatonin by night for deep restorative sleep and protection from DNA damage. After the antennas were turned on, follow-up blood tests revealed this:

- X. Fifty-six percent of volunteers suffered a fairly steep reduction of night time melatonin and 28 percent showed a more gradual decline, leading to considerable sleep disturbances, daytime exhaustion and immune deficiencies due to sleep deprivation.
 - XI. Eighty-four percent of volunteers suffered a steep decrease in day time serotonin levels, resulting in depressive mood disturbances, lethargy, appetite abnormalities, agitation and general reduction of quality of life.
- Signed by three medical doctors this study concluded: "Since the medically conducted tests carried out on residents living in the vicinity of the....mast prove a dramatically increased health risk, immediate action by political and regulatory authorities...are demanded." [51]

Abdel-Rassoul, et al. (2006)

Residents living beneath or adjacent to a long-established mobile phone mast with numerous antennas in Egypt reported significantly higher occurrences of headaches, memory changes, dizziness, tremors, depressive symptoms and sleep disturbance than did a control group. [52]

Oberfeld et al. (2008)

The Austrian Department of Health uncovered a higher risk of cancer among people living 80-200 meters from a mobile phone antenna tower which operated for a car phone service between 1984 and 1997. The study concluded that the cancer risk increased with the length of exposure, reaching 8.5 times the norm for people most highly exposed. The study reported: "The incidence [of cancer] was particularly pronounced for breast and brain tumors." [53]

Eger et al. (2009)

The Bavarian town of Selbitz conducted a health survey of 251 residents exposed to cell tower radiation at no more than 1 volt per meter. The study found a significant correlation, depending on dose exposure, for: insomnia, depression, cerebral symptoms, joint illnesses, infections, skin changes, heart and circulation disorders, disorders of vision/ hearing and problems of the gastrointestinal tract. [54]

Balmori et al. (2009)

Researchers exposed tadpoles of the common frog to cell tower radiation from several antenna installations 140 meters from the study site. Control tadpoles were protected from the radiation by a shielded Faraday cage. The irradiated tadpoles were exposed for two months and suffered low coordination of movements, asynchronous growth (abnormally large and small tadpoles) plus a 90% mortality rate. The non-irradiated controls developed normally and suffered only a 4.2% mortality rate. The report concluded: "This research may have huge implications for the natural world, which is now exposed to high microwave radiation levels from a multitude of phones masts." [55]

Dode et al. (2011)

University and municipality officials cooperated to document a striking connection between cell tower antennas and cancer deaths in Brazil's third largest city, Belo Horizonte. The study looked at 7191 deaths by cancer in the city between 1996 and 2006. The highest rate of deaths from cancer was found among those who had lived within 500 meters of cell phone antenna towers. The highest rates of cancer were also found in the central-southern area of the city, which had the most cell towers. There were high rates of prostate, breast, lung, kidney and liver cancer among the victims living closest to tower antennas. [56]

Buchner et al. (2011)

In this study conducted in Bavaria, Germany, urine samples of 60 study participants were analyzed for their adrenaline, noradrenaline, dopamine, and phenylethylamine (PEA) levels before and after the activation of a new GSM cell tower. After the activation of the antennas, the stress hormone levels increased

significantly during the first six months while dopamine and PEA levels decreased substantially. Even after one and a half years, the initial normal hormone levels were not restored. Sleep problems, headaches, allergies, dizziness, and concentration problems were common. The highest exposure group was only 100 $\mu\text{W}/\text{m}^2$, and only 60 $\mu\text{W}/\text{m}^2$ for the lowest exposure group. (These power density readings equate to .1 volts per meter squared to .2 volts per meter squared.) This study indicates that radio frequency transmitters induce radical changes in human stress hormones and set up the classic stress syndrome of adaptation followed by biological exhaustion, as established by Hans Selye in the 1950s. The researchers stated that the effects of cell tower radiation "showed a dose-response relationship and occurred well below current limits for technical RF radiation exposures. Chronic dysregulation of the catecholamine system has great relevance for health and is well known to damage human health in the long run." [57]

Yakymenko et al. (2011)

A team of Ukrainian scientists titled their overview of cell tower radiation "Long-term Exposure to Microwave Radiation Provokes Cancer Growth: Evidences from **Radars** and Mobile Communication Systems." These researchers concluded: "It is now becoming increasingly evident that assessment of biological effects of non-ionizing radiation based on physical (thermal) approach used in recommendations of current regulatory bodies...requires urgent reevaluation....We also emphasize that the everyday exposure of both occupational and general public to MW radiation should be regulated based on precautionary principles which imply maximum restriction of excessive exposure." [58]

Christopher Anthony and Daniel Chen (2011)

As part of a science curriculum project, these two fourteen-year-olds conducted a survey study at their school in Johannesburg, South Africa, regarding the health effects of a cell tower on their school campus. They additionally enrolled students at two other schools, also with cell towers on those campuses. Students who participated in the questionnaire study reported 21 different symptoms including: skin rash, muscular pains, heart palpitations, extreme fatigue, stomach problems, swollen lymph nodes, tinnitus, allergic reactions and metallic taste in the mouth. Seventy-nine percent of the students who participated reported some of these symptoms, thirty percent reported more than four symptoms, five percent suffered more than 10 symptoms and one percent suffered from up to 14 symptoms on the list. School officials at the boys' school reportedly initiated proceedings to have the cell tower removed from their particular campus. [59]

Eskander, et al. (2012)

This study followed volunteers who were exposed to microwave radiation from either mobile phones or cell tower antennas over a time period of six years. Blood tests were used for assessment. The study showed a significant decrease in volunteers' ACTH, cortisol, thyroid hormones, prolactin for young females, and

testosterone levels. Researchers concluded that "high RFR (radio frequency radiation) significantly affects the pituitary-adrenal axis." [60]

Hassig et al. (2012)

Scientists documented eye abnormalities in calves exposed to cell tower radiation: "We examined and monitored a dairy farm in which a large number of calves were born with nuclear cataracts after a mobile phone base station had been erected in the vicinity of the barn. Calves showed a 3.5 times higher risk for heavy cataract if born there compared to Swiss average. All usual causes such as infection or poisoning common in Switzerland could be excluded." [61]

Cy et al. (2012)

This Taiwanese study focused on childhood neoplasms (tumors) in relation to RF exposure from cell towers erected between 1998 and 2007. Researchers calculated the annual power emitted by all 71,185 cell towers in Taiwan and compared the calculated exposure of populations in each irradiated township: "This study noted a significantly increased risk of all neoplasms [tumors] in children with higher-than-median RF exposure to MPBS [mobile phone base stations]." [62]

Gomez-Peretta et al. (2013)

This study in Spain was a re-analysis of the data collected for the Navarro study (2003). The researchers reported that pathological symptoms reported by irradiated people were validated once again. Exposure levels suffered by study participants were reported at only .2 volts to 0.6 volts per meter [compared to US maximum public exposure limit of 61 volts per meter]. [63]

Shahbazi et al. (2014)

This Iranian study was conducted on 250 randomly-selected people living near cell towers. Statistically significant symptoms included: nausea, headache, dizziness, irritability, discomfort, nervousness, depression, sleep disturbances, memory loss and lack of libido among people living within 300 meters of the cell tower antennas, compared to those living further away. [64]

Ghandi et al. (2014)

This case-control study evaluated genetic damage in individuals living in the vicinity of cell towers. The blood of irradiated subjects showed significantly elevated DNA damage compared to non-irradiated control subjects matched for gender, age and other factors. Especially affected by cell tower DNA damage were females. The researchers warned: "The genetic damage evident in the participants in this study needs to be addressed against future disease-risk, which in addition to neurodegenerative disorders, may lead to cancer." [65]

Shiniyo et al. (2014)

This Japanese study, peer-reviewed by a German medical team, documents the myriad serious health effects suffered by condominium inhabitants living under rooftop antennas in Japan. This study is important because it documents a long list of illnesses suffered by the condo inhabitants during their years of exposure and compares the improved health status of survivors after the antennas were

deactivated. The symptoms ascribed to microwave radiation by this study include: numerous and painful neurological dysfunctions, eye damage, severe fatigue and tumors. [66]

Cammaerts Tricot et al. (2015)

Two renowned European scientists conducting this study found that water cress seeds would not germinate in a room infiltrated with cell tower radiation from two antennas about 200 meters outside the windows of the room. Measurements showed that the antennas were propagating 900 megahertz and 1.8 gigahertz directly into the room. The power density of the radiation impacting the seed trays was only .1 volts per meter². This is a power density hundreds of times lower than that approved for US public exposure to microwave radiation in the gigahertz range. Identical but radiation-protected seed trays in the same room germinated normally: "When removed from the electromagnetic fields, seeds germinated normally. The radiation was, thus, most likely the cause of the non-occurrence of the seeds' imbibition and germination." [67]

Sultan Ayoub Meo et al. (2015)

This study recruited students in Saudi Arabia for blood testing (ages 12 to 17) attending two comparable schools. Students in the school infused with the highest cell tower radiation suffered a higher rate of diabetes than the students less irradiated: "It is concluded that exposure to high RF-EMRF generated by mobile phone base stations is associated with elevated levels of HbA1c and risk of type 2 diabetes mellitus." [68]

Waldmann-Selsam (2016)

Using mathematical calculations of microwave power flux density, this field-monitoring study examined the effects of cell tower radiation on trees in two German cities: "Statistical analysis demonstrate that electromagnetic radiation from mobile phone masts is harmful for trees. These results are consistent with the fact that damage afflicted on trees by mobile phone towers usually starts on one side, extending to the whole tree over time." [69]

Golati et al. (2016)

The objective of this study was to evaluate human genetic damage caused by radiation from mobile tower antennas and to ascertain whether that damage might be dependent upon the aberrant GSTM1 and GSTT1 genes. Scientists studied 116 persons exposed to radiation from mobile towers and 106 control subjects. All were genotyped for polymorphisms in the GSTM1 and GSTT1 genes by the multiplex polymerase chain reaction method. The researchers looked for DNA damage in peripheral blood lymphocytes using alkaline comet assay and micronucleus assay in buccal (mouth tissues) cells. They found no evidence that the two particular genes were involved in promoting that DNA damage among the subjects. But they did find significant DNA damage among cell tower subjects as compared to the non-irradiated control group: The report states: "...There was a significant increase in BMN [micronucleus assay in buccal cells] frequency and TM [tail moment] value in exposed subjects (3.65 ± 2.44 and 6.63 ± 2.32)

compared with control subjects (1.23 ± 0.97 and 0.26 ± 0.27)..." [70] **Siersma et al. (2016)**

As a pilot run for future and larger studies, medical scientists from Denmark and Sweden launched an electronic questionnaire posted to special interest websites. The questionnaire requested feedback on symptoms suffered by people exposed to cell phones, Wi-Fi, occupational radiation, energy-saving light bulbs and cell towers. Of sixty respondents, significant associations were noted for both chronic exposure to Wi-Fi and for cell tower exposure. Symptoms associated with tower antennas included: cognitive, head, eye, body and skin problems. The report noted: "Mobile phone towers seem to be the most problematic of the various EMF exposures." [71]

Conclusion: Say "No Thanks" To Avoid the Wireless Trainwreck

Since the Microwave Age began three decades ago, the radiation-sick and the radiation-wise have avoided antenna hotspots whenever possible and have wisely sought safer places.

What the Wireless Radiation Industry calls "dead zones" have long been Nirvana to those who prefer to preserve the integrity of natural life and skip the gruesome experiences of Wireless cancer. Now, the industry's foremost goal is to completely eliminate the existence of "dead zones" so that every "connected" thing in the human anthrosphere can be watched, manipulated and controlled by Central Authority. While concerned bio-scientists ride a stage coach to assess damage from the older and tamer ray technologies, the great and powerful Techno-Beast rides an F-16 in its inexhaustible quest for new ways to radiation-rape the planet and deconstruct every living thing upon it.

Well-funded armies of radiation elves, most of them young males (the demographic reportedly best able to withstand chronic electromagnetic abuse), work relentlessly to churn out new experimental devices and propagation systems for the Internet of Things (IoT) and for 5G millimeter wave technologies. These upcoming weapons of mass destruction require millions of tiny, new antennas that will submerge all living creatures in yet another raging tsunami of wave carcinogen. For the USA, already blighted with the highest rates of cancer on this earth, there are only four words out of the wireless train wreck ahead: "Thanks, but no thanks!"

- No thanks to unsafe, hand-held mobile devices that damage DNA
- No thanks to microwave-infused buildings that make people weak and ill
- No thanks to decadent mobile entertainment for babies and grade schoolers
- No thanks to the unregulated Wi-Fi assault of fetuses and kindergartners
- No thanks to microcells hung on office walls and hidden under stadium seats
- No thanks to "smart" meters and appliances that induce and stimulate tumors

- No thanks to consumer gadgets and vehicles that beam Wi-Fi/Bluetooth
- No thanks to cell towers and DAS antennas on lamp & telephone poles
- No thanks to bizarre mass experiments with millimeter wave technologies

A nation unable to say "no thanks" to its own destruction surely has a hard road down. Human history indicates that all deadly mass manias eventually reach their limit, but usually only after millions of people have suffered and died tragically. The question remains: how far will America's Wireless holocaust progress before survivors finally comprehend the appalling price of unsafe Wireless radiation technologies?

- 1 Camilla Rees speaking at the New York City Forum: Drunk on Wireless: Public Health Consequences of Cell Phone and Wireless Technologies are Begging for Society's Attention, May 22, 2016.
- 2 BioInitiative Report 2012 (2014). This report, based on 1800 published studies, was prepared by 29 authors from ten countries, ten holding medical degrees (MDs), 21 PhDs, and three MsC, MA or MPHs. Among the authors are three former presidents of the Bioelectromagnetics Society, and five full members of BEMS.
- 3 Belyaev et. al., EUROPAEM EMF Guidline 2015 for the Prevention, Diagnosis and Treatment of EMF-Related Health Problems and Illnesses, Reviews on Environmental Health 2015; 30(4):337-371. EUROPAEM stands for European Academy of Environmental Medicine. EUROPAEM is an international organization of thirteen prestigious European Universities, representing ten nations. These groups have united to advance education, academic conferences and research, with a working group organized to study electrohypersensitivity [EHS].
- 4 "Radiofrequency Radiation at Stockholm Central Railway Station in Sweden and Some Medical Aspects on Public Exposure to RF Fields," Hardell et al., International Journal of Oncology, July 27, 2016.
- 5 "Increasing Incidence of Thyroid Cancer in the Nordic Countries with the Main Focus on Swedish Data," Carlberg et al., BCM Cancer, July 2016. Thyroid cancer has fairly exploded in Sweden, especially since 2008, when Apple introduced the multiple-antenna iPhone there. Most smart phones feature antennas at the bottom of the phone closest to the thyroid when the phone is held against the head and jaw: "The incidence of thyroid cancer is increasing in many countries, especially the papillary type that is the most radiosensitive type."
- 6 Cellular Telephone Russian Roulette, Robert C. Kane, Vantage Press, 2001, p. 96.
- 7 This is 2016 information from UK radio engineer Alasdair Philips in a personal letter to colleagues. Philips is the genius inventor of the Acoustimeter, a broadband audio microwave detector used to identify ambient RF signals.

- 8 "Are Third Generation Cellphones with Lower Radiated Power More Carcinogenic than Second Generation Cellphones?: An Exploration of Recent Data," Morgan et al., 2016.
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- 11 Evidence for Genotoxic Effects, Dr. Henry Lai, Department of Bioengineering, University of Washington, page 11. Prepared for the BioInitiative Working Group, July 2007, BioInitiative Report 2007.
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- 13 Mobile Phone Masts and Wireless Computing, Alasdair and Jean Philips, PowerWatch, UK, 2009. [LINK](#)
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- 15 "The Use of Signal-Transduction and Metabolic Pathways to Predict Human Disease Targets from Electric and Magnetic Fields Using in Vitro Data in Human Cell Lines," Parham et al., Frontiers in Public Health, Sept. 2016, Volume 4, Article 193.
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Final Note:

Feel free to share this document with others in any manner as long as it is not altered or used out of context. This information needs to get into the hands of public officials that are supposed to be protecting us. *Your* health is in *your* hands so take protective action and pass the knowledge forward. Do not expect others to protect you. Be forewarned that most people will not take you seriously or may mock you but do not let that deter you from protecting yourself and your loved ones.

Let me know how I can be of further assistance to you or others you care for.

Sincerely,



Eric Windheim BA, EMRS, BBEC
Certified Electromagnetic Radiation Specialist
Certified Building Biologist
Windheim EMF Solutions