

March 20, 2015

California Public Utilities Commission
RE: SOCRE Project
c/o Ecology and Environment, Inc.
505 Sansome Street, Suite 300
San Francisco, CA 94111

RE: SUPPORT - South Orange County Electrical Reliability Enhancement (SOCRE) by San Diego Gas & Electric (SDG&E)

Reliable electric power is critical to the movement of water and wastewater throughout South Orange County. To that end, Moulton Niguel Water District is strongly supportive of San Diego Gas & Electric's (SDG&E) South Orange County Reliability Enhancement (SOCRE) project.

The California Public Utilities Commission (CPUC) staff has identified "no project" as a preferred alternative, yet that does not address the issue of the danger of having only one substation that serves as the lone gatekeeper for the entirety of our region. If anything were to happen to the Talega substation, which currently serves as the lone 230kV substation for the region, everyone in South Orange County would lose power.

In the water industry, we understand the importance of redundancy in our systems. We have back up power generators to be used in an emergency. However, we also believe that proper investment in our infrastructure is necessary and the concept of "shedding load" or routinely shutting off our power in South Orange County to reduce the need for a second 230kV substation is irresponsible.

In addition to the need for power to pump water, power is also required for our wastewater system and power outages in other nearby communities has resulted in wastewater spills and environmental hazards. We have the opportunity to prevent such issues before they occur through responsible planning.

Moulton Niguel Water District encourages the CPUC commissioners to approve the SDG&E SOCRE project as proposed.

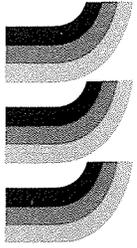
Sincerely,

Joone Lopez
General Manager

A public agency

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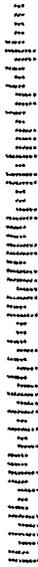
CPUC

c/o Ecology & Environment, Inc

505 SW 30th St, Suite 300

San Francisco, CA 94111

941169155





CITY OF LAGUNA HILLS

City Council

MAYOR
Dore J. Gilbert, M.D.
MAYOR PRO TEMPORE
Barbara Kogerman

March 30, 2015

COUNCIL MEMBERS
Andrew Blount
Melody Carruth
Don Sedgwick

Mr. Andrew Barnsdale
California Public Utilities Commission
RE: SOCRE Project
c/o Ecology and Environment, Inc.
505 Sansome Street, Suite 300
San Francisco, CA 94111

SUBJECT: SOUTH ORANGE COUNTY RELIABILITY ENHANCEMENT PROJECT
APPLICATION 1205020

Dear Mr. Barnsdale,

As proposed by San Diego Gas & Electric (SDG&E), the South Orange County Reliability Enhancement (SOCRE) project will strengthen the electric reliability for the region by upgrading outdated infrastructure and providing a redundant and thus more reliable transmission system. For these reasons, we support the SDG&E project as proposed and encourage the California Public Utilities Commission (CPUC) to approve the project so we may realize these benefits of electric reliability.

The SOCRE project will rebuild the San Juan Capistrano substation to modern technological and environmental standards. The SOCRE project will replace one set of 138kV lines with a set of 230kV lines. These lines will not only provide more power to the region, but by this second set of lines bypassing the Talega substation and connecting directly with the renovated San Juan Capistrano substation, the residents and businesses of Laguna Hills and South Orange County can be ensured of additional reliability through a redundant system. This type of electrical reliability is needed and long overdue.

Thank you for considering the comments of our City and I encourage you to support the project to ensure continued reliable power to Laguna Hills.

Sincerely,

Dore J. Gilbert, M.D.
Mayor



CITY OF LAGUNA HILLS

24035 El Toro Road
Laguna Hills, California 92653

CITY
OF
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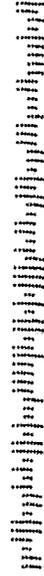
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Mr. Andrew Barnsdale
California Public Utilities Commission
RE: SOCRE Project
c/o Ecology and Environment, Inc.
505 Sansome Street, Suite 300
San Francisco, CA 94111

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April 1, 2015

California Public Utilities Commission

RE: SCORE Project

c/o Ecology and Environment Inc.

505 Sansome Street

San Francisco, CA 94111

RE: Opposition of the expansion of the Capo Substation

To Whom This May Concern:

My husband and I have lived on Via Santo Tomas in San Juan Capistrano for the past 15 years. Our home is across the street from the current Substation (we are 5 houses up from the end of the cul-de-sac). After hearing of different cases of cancer such as prostate, breast, and brain) Alzheimer's, Parkinson's and other Neurological diseases, my husband and I decided to invest in a meter that measures the EMF's. After researching the internet, we decided to go with the Trifield Meter: Model X100XE, since this is one of the oldest and most accurate for readings according to experts in this field.

We had learned by researching the internet from various governments and utility documentation that **SAFE** EMF levels for humans is 0.5 mG – 1mG (milligauss).

We took the meter and started walking behind us up the street at the corner of Calle Bonita and Via El Rosario, the home of the O'Brien's (directly across from the current substation) who have a small child Mattie that has been fighting brain cancer the past two years. We were floored as we stood outside their home and watched the meter jump up to 15mG at their front gate, then we started walking closer and crossed the street and it registered 70 (20 yards from the substation property fence). We could not believe this! So, we did a walk up Calle Bonita and Via El Rosario and it got worse (see the enclosed numbers). The park that is directly across the street where people walk and dogs play the reading was 70-100mG. The homes directly up the street from the O'Brien's were 70 and 80 at their front gates. This is criminal and unbelievable and the purposed substation hasn't even been erected. How could this be?

So, needless to say, **we strongly oppose the proposed substation** that is being considered in our back yards. We do not understand how such a huge project would even be considered with the dense population and people's lives being at risk with this kind of saturation! No one has ever warned anyone about these high numbers being put out in this community.

Yes, many people say and argue there is no scientific proof of how EMF's affect the body, really?? What about microwaves? What about cell phones now? There are plenty of warnings on those subjects.

Back in 1990 EPA had recommended EMF's be classified as Class B carcinogen. After the EPA draft report was released, utility, military and computer lobbyists came down on EPA's final revision and said do not classify EMF's as a carcinogen because "the biological process leading to cancer is not understood".

So who sets the standards for these companies?? Who determines what number is safe for human beings or our animals?

If one is still in support of this new substation, go to the park across from the current substation and have a picnic, spend your weekends there or better yet, go stand outside your "Smart meter" you have on the outside of your home (that SDGE also came up with) and let your kids/grandkids play right next to it day in and day out since EMF's are "harmless". Or you check it out for yourself, Google the word Smart Meters and lawsuits/health, it turns out they aren't so "smart" after all, many people have been hurt and damaged by these "safe" meters.

This is not a joke, this is harming our health in this community and not only that, if this monster project is built, one can only imagine the EMF force that would be flying through our bodies. Our home values will decrease no doubt, that is..... if we are even around long enough to enjoy them.

We want this project taken away from this community and out somewhere that is safe for everyone, this is terrible and disgusting. Our community will fight for justice!! Thank you for your attention in this matter.

Sincerely,



Joe and Dawn Fusco

31092 Via Santo Tomas

San Juan Capistrano, CA 92675

Enclosures

Joe & Dawn Fusco

Subject:

FW: Meter Readings on 3/30

METER READINGS ON 3/30
Trifold Meter: Model X100XE

31088 VIA EL ROSARIO

4 (FRONT DOOR) 4 1/2 (END OF DRIVEWAY)

31094 VIA EL ROSARIO

3 1/2 (FRONT GATE)

31092 VIA EL ROSARIO

3 1/2 (FRONT DOOR)

31086 VIA EL ROSARIO

5 (FRONT GATE)

31084 VIA EL ROSARIO

5 1/2 (FRONT GATE)

31082 VIA EL ROSARIO

4 (FRONT GATE)

31080 VIA EL ROSARIO

7 1/2 (FRONT GATE)

(30 ON SIDEWALK FACING SUBSTATION PROPERTY)

31071 VIA EL ROSARIO

9 (FRONT GATE)

31061 VIA EL ROSARIO

15 (FRONT GATE)

**CORNER OF VIA EL ROSARIO AND CALLE BONITA
70 (20 YARDS FROM SUBSTATION PROPERTY FENCE)**

**28667 CALLE BONITA
20 - 27 (FRONT GATE & CURBSIDE)**

**26672 CALLE BONITA
32 (FRONT GATE)**

**26882 CALLE BONITA
70 (FRONT GATE)**

**26692 CALLE BONITA
85 (FRONT GATE)**

**31062 CALLE SANTA ROSALIA
50 (FRONT GATE)**

**31066 CALLE SANTA ROSALIA
25 (FRONT GATE)**

**PARK ON CALLE SANTA ROSALIA
70 - 100**



Press Resources

PUBLICATION DATE: January 7, 2013

WHERE: The BioInitiative 2012 Report will be published at www.bioinitiative.org. Free download.

WHAT IS IT: A report by 29 independent scientists and health experts from around the world* about possible risks from wireless technologies and electromagnetic fields. It updates the BioInitiative 2007 Report.

WHAT IT COVERS: The science, public health, public policy and global response) to the growing health issue of chronic exposure to electromagnetic fields and radiofrequency radiation in the daily life of billions of people around the world. Covers brain tumor risks from cell phones, damage to DNA and genes, effects on memory, learning, behavior, attention; sleep disruption and cancer and neurological diseases like Alzheimer's disease. Effects on sperm and miscarriage (fertility and reproduction), effects of wireless on the brain development of the fetus and infant, and effects of wireless classrooms on children and adolescents is addressed. Mechanisms for biological action and public health responses in other countries are discussed. Therapeutic use of very low intensity EMF and RFR are addressed.

WHAT IS NEW: This update covers about 1800 new studies reporting bioeffects and adverse health effects of electromagnetic fields (powerlines, electrical wiring, appliances and hand-held devices) – and wireless technologies (cell and cordless phones, cell towers, WI-FI, wireless laptops, wireless routers, baby monitors, surveillance systems, wireless utility meters ('smart meters'), etc.

The BioInitiative 2012 Report has been 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. One distinguished author is the Chair of the Russian National Committee on Non-Ionizing Radiation. Another is a Senior Advisor to the European Environmental Agency. Full titles and affiliations of authors is in Section 25 – List of Participants

Each year, about 100,000 people visit the site. In the five years since it's publication, the BioInitiative website has been accessed over 10.5 million times, or four times every minute. Every five minutes on the average, a person somewhere in the world has logged on. More than 5.2 million files and 1 million pages of information has been downloaded. That is equivalent to more than 93,000 full copies of the 650+ page report (288.5 million kbytes).

* Sweden (6), USA (10), India (2), Italy (2), Greece (2), Canada (2), Denmark (1), Austria (2), Slovak Republic (1), Russia (1)



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- CONTACT

- EMF LITERATURE REVIEW
- CURRENT PROJECTS

EMF Literature Review

After an exhaustive study of national newspapers, magazines and studies, the most definitive conclusion on the Electro-Magnetic Field (EMF) and cancer link is that there is no definite conclusion.

For years the scientific community has researched this issue. For as many studies that support the claim that EMFs are dangerous, there are studies that claim that they are not. In the early 1990s, law professionals, citing scientific studies negating the EMF and cancer link, predicted that EMFs would not become the next asbestos litigation monster as litigation lawyers were hoping it would be. Though it is extremely difficult to win a case where EMFs are the sole cause of injury, a 2002 study by the California Health Department has given greater credence to the EMF-cancer link. With the study's findings, the fear of EMFs becomes more accepted.

While the court seldom acknowledges an EMF-cancer link, it often does recognize the loss of property value as a result of the fear of EMFs. In this case, as with other stigma cases, fear is compensable.

Unlike gas pipelines, power lines have a long history of controversy. In 1979, Dr. Nancy Wertheimer studied the high amount of childhood leukemia in the Denver area and found that most of the cases clustered along a high-voltage power line. Since then, the scientific community has spent years and millions of dollars researching the validity of the EMF-cancer link. This interest is far more than simple curiosity. By its own admissions, the utilities fear that if a link was ever found, they would lose billions of dollars to litigation suits and governmental regulations.

The following articles are a sampling of our exhaustive, six-volume power-lines / EMF research.

The California EMF Project Findings

In 2002, the California Department of Health Services concluded its eight-year study on EMFs. They found that:

- EMFs likely cause childhood and adult leukemia, adult brain cancer, spontaneous abortions and ALS.
- EMFs possibly cause childhood brain cancer, female and male breast cancer, Alzheimer's disease, suicide, and heart problems.
- EMFs are unlikely to universally impact all types of cancer or reproductive failures other than spontaneous abortions.
- There is insufficient information to determine if magnetic fields cause clinical depression.
- EMFs at low intensities have profound effects on selective animal organisms.
- The report finds that, with respect to the diseases possibly or likely caused by EMF "even a slight additional lifetime risk could be of concern to regulators, who already regulate other environmental concerns that convey even lower risks."

The report notes a full mechanistic understanding does not now exist to explain why EMFs could cause serious disease. The report goes on to note, however, "The lack of mechanistic understanding is initially common in harmful agents."

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Excerpt From CNN Lou Dobbs Moneyline. Aired on August 15, 2002.

Transcript of CNN coverage on The California Health Department's report on EMF risks. The study took eight years and the authors "are inclined to believe that power line radiation increases the risk for childhood leukemia, adult brain cancer, Lou Gehrig's disease and miscarriages."

The report lists health risk odds as well. They found a 54% to 95% greater chance of childhood leukemia; 51% to 80% greater risk of adult brain cancer; 51% to 59% greater chance of miscarriage; and 52% to 55% greater risk of Lou Gehrig's disease.

Moneyline conducted a poll that night on whether or not their viewers think there are health risks associated with living near power lines. 71% said yes and 29% said no.

"Policy Options in the Face of Possible Risk from Power Frequency Electric and Magnetic Fields" by the California EMF Program (division of the California Department of Health Services). Presented in June 2002.

Stakeholders of a utility were interviewed to see how they felt about the utility spending more money to protect citizens against the supposed EMF threat. The study found that the stakeholders responded in one of four ways. Some opted for a "utilitarian" response that aims at the most good for the most people at the least cost. Others opted for a "social justice" response that aims at protecting the most vulnerable regardless of cost. Others chose the "virtual-certainty-required" avenue that requires certainty of a problem before acting on it. The remainder chose the "non-interventionist" approach that prefers non-governmental approaches to environmental risk regardless of the degree of confidence that there is a problem.

Upon further questioning, most of the stakeholders agreed that EMF reducing expenditures could be justified from a cost-benefit approach without 100% confidence that EMFs cause disease.

They came to the conclusion that, in order to economically justify safety measures, 100 to 1,500 deaths over the 35-year life of a power-line need to be saved. They estimate the value of each life at \$5 million. Without this range, safety measures would be deemed unpractical according to the cost-benefit model.

Possible Health Effects of Exposure to Residential Electric and Magnetic Fields by the National Research Council. E-book published by the National Academy Press in 1997.

"The conclusion of the committee is that the current body of evidence does not show that exposure to these fields presents a human-health hazard. Specifically, no conclusive and consistent evidence shows that exposures to residential electric and magnetic fields produce cancer, adverse neurobehavioral effects, or reproductive and developmental effects."

NIEHS Report on Health Effects from Exposure to Power-Line Frequency Electric and Magnetic Fields. Released by the National Institute of Environmental Health Sciences on May 4, 1999.

They concluded that the evidence is weak linking EMFs to health risks. However, they did find that the most common health risk was leukemia (mostly appearing in children). They also admit that there is a fairly consistent pattern of a small, increased risk of childhood leukemia with increasing exposure. 19 of the 28 voting members of the panel voted that EMF is a possible human carcinogen.

In conclusion, they stated that ELF-EMF exposure cannot be recognized as entirely safe because of weak scientific evidence.

Currents of Fear transcript - PBS program by Jon Palfreman. Aired on June 13, 1995.

EMF supporters and attackers square off on the health effects of EMFs. This transcript

begins with a mother's find that, not only does her child have leukemia, but also so does eleven other children along the same power line. The story launches from there to include opinions from Paul Brodeur (author of *Currents of Death*), industry officials, government officials, health experts, scientists, engineers and other parents of cancerous children.

Electric Powerlines: Health and Public Policy Implications - Oversight Hearing before the Subcommittee on General Oversight and Investigations of the Committee on Interior and Insular Affairs House of Representatives, 101st Congress, second session on electric powerlines: health and public policy implications. March 8, 1990.

Back in 1990, the EMF debate was so prevalent that members of Congress took it upon themselves to pass a bill that would limit the public's exposure to EMFs.

"Overhead Power Lines Impact Residential Sales" by *author unknown*. Appeared on the Real Estate Center website on February 1999.

The author cites a then recent study that found that the presence of power lines played in a part in half of the surveyed homeowners purchase. The researchers found an average 4.1% negative impact on property near power lines.

"Largest study finds evidence of association between EMFs and exposed worker suicide" by David Williamson. Appeared in the UNC-CH News Services on March 15, 2000.

A University of North Carolina study found that electricians working for five U.S. power companies faced twice the expected risk of suicide. Linemen faced 1½ times the expected risk.

"Study: No power lines, cancer link" by the Associated Press. Appeared on MSNBC News on June 25, 2003.

"A study that sought to explain the high rate of breast cancer on Long Island found no evidence to support fears that living near power lines causes the disease."

"No Adverse Health Effects Seen From Residential Exposure to Electromagnetic Fields" by Dan Quinn and Shannon Flannery for the National Research Council on October 31, 1996.

"No clear, convincing evidence exists to show that residential exposures to electric and magnetic fields are a threat to human health, a committee of the National Research Council has concluded in a new report. After examining more than 500 studies spanning 17 years of research, the committee said there is no conclusive evidence that electromagnetic fields play a role in the development of cancer, reproductive and developmental abnormalities, or learning and behavioral problems."

"New Sparks Fly Over Manassas School Site: Councilman Wants Substation Moved" by Michele Clock. Appeared in The Washington Post on May 30, 2004.

"Worried about the safety of future students at Manassas' planned intermediate school, a City Council member said that an electrical substation must be moved from the site."

"Parent Lobby Derails School" by Bill Mah. Appeared in the Edmonton Journal on October 26, 2002.

A group of city parents halted the construction of a school because they convinced the school board that the school site was too close to high-voltage power lines and posed an unnecessary health risk to their children.

"Coping with the Risk of Cancer in Children Living Near Power Lines" by Eileen N. Abt for the Franklin Pierce Law Center.

Covers the reported risks of living near EMFs and the results of sensationalism in the

media on this topic. The author cites two articles in Time and Popular Science that both told readers to, if at all possible, avoid living near high-power lines. Also, the author cites numerous studies both here and in Europe that found a tenuous link between EMF exposure and cancer.

"Concerns linger about electromagnetic fields" by Becky Gillette. Appeared in The Environmental Magazine on April 18, 2002.

EMF fears generate study after study. Utilities vehemently fought the release of the 2002 California EMF study, and the only way it was released to the public was when the California First Amendment Coalition filed a lawsuit for its release.

The National Council on Radiation Protection and Measurements' 1995 study was blocked by the utilities so it was "leaked" to the public shortly after. In this report, "significant scientific evidence suggests even very low exposure to EMFs has subtle, long-term effects on human health." Also, the study recommends that no new power lines be built near existing homes.

The National Institute of Environmental Health Services "convened an international body of scientists, then rejected its conclusions after it said that the [EMF health] risk was real." After the rejection, the NIEHS falsified the report to say that there was no risk.

If you wish to learn more about EMFs, [contact us](#) for more information on what EMFs are, how they can affect people, human health studies, biological studies and government actions.



Forensic Appraisal Group, Ltd.
116 E. Bell St.
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EMF Pollution from Living Near Power Lines - Solved?

What is EMF?

EMF Health Effects

KNOW YOUR EMF HEALTH RISKS

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Wireless Routers Emit EMF

Cell Towers Are EMF to the Extreme

Computers & Monitor EMF

Geopathic Stress & EMF Fields

Appliances Emit EMF

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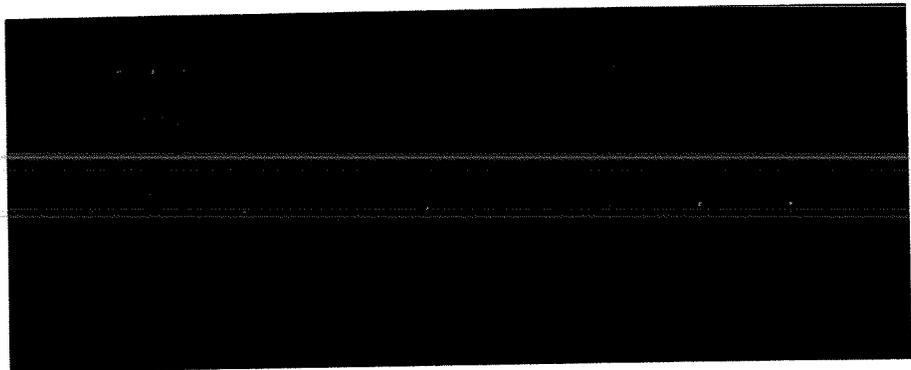
Healthy Tips

Power lines and electrical poles have become so common on the landscape, they are virtually invisible. But it's worth taking a hard look at them. **Are you living near power lines?** What is that barrel-shaped device on the electric pole and is it harmful? Did you grow up near a high-voltage power line?

Is there a safe living distance from or to power lines?

Experts say as far as possible ... Hundreds of studies worldwide have shown that living next to high voltage power lines and other parts of the power transmission network increases your risk of cancer and other health problems.

We'll examine those risks below, and the recommended SafeSpace solutions designed to minimize and eliminate the health risks.



Safe Living Distance To Power Lines?

Is It Harmful To Sit Under Power Lines?

Absolutely possible. It depends on how powerful are the EMFs coming from your neighborhood power lines? The electrical power grid uses a "step down" system of distribution, highest near the generating station and substations, lowest at the end. The closer you are the more you are bombarded with dangerous EMFs.

Living Under Power Lines? Some Facts You Should Know

High voltage transmission lines (those towering metal power lines you often see usually along highways and across rural landscapes. Some folks, unfortunately are under them.):

- Use high voltage direct current (HVDC) to transmit large amounts of power from the generating station over long distances
- Voltage varies from 138kV to 765kV
- Radiate powerful electromagnetic fields (EMFs)
- Linked to diseases in animals and humans
- There is growing speculation that the values of homes near major power lines will soon begin to decrease because of this threat

Transmission substations, (which often look like a fenced-in thicket of metal structures. Maybe you see one near your home, school or office.):

- Contain circuit breakers, switches and transformers
- Decrease the voltage coming from high voltage transmission lines
- Connect to local, lower voltage distribution lines.
- Reroute power to lines that serve local markets
- Suspected cause of cancer clusters for nearby residents

EMF Pollution from Living Near Power Lines - Solved?

Lower voltage distribution lines, (or local power poles, which are everywhere):

- Are smaller than the huge high voltage lines
- More likely to be seen in residential areas
- Sometimes buried
- Risk varies with strength of voltage

Transformers, (those barrel-like metal trashcans mounted on power poles are EMF factories.):

- Reduces the voltage to the 120-/240 current needed by the nearby homes
- The typical power line feeding the transformer is carrying 4000 to 13,000 volts
- Creates a strong field extending up to a 1/4 of a mile
- The strength of this field decreases significantly with distance (the further away you are the better, even if you are still within a quarter mile)
- Health risk depends on strength of incoming power line

Buried lines and transformers (Recognizable by a metal box located on the ground near the street.):

- Some people contend that burying power lines can mitigate EMF dangers.
- Other experts note that while burying power lines will shield the electric component of the electromagnetic field (EMF), the magnetic component can still pass through the earth—and walls and human bodies.

Electric Fields, Magnetic Fields & Power Lines are a Health Hazard!

There is no question that power transmission apparatus emit electromagnetic fields (EMFs).

An EMF is not just one thing, but two kinds of fields:

- **Electrical field:** the part of the EMF that can easily be shielded.
- **Magnetic field:** part of the EMF that can penetrate stone, steel and human flesh. In fact, when it comes to magnetic fields, human flesh and bone has the same penetrability as air!
- **Both fields are invisible and perfectly silent:** if you live in an area with electric power, cell phone service, water pipes and more, some level of artificial EMF is surrounding you.

Living Close to Power Lines and How EMFs Harm Human Health

Your body acts like an energy wave broadcaster and receiver, incorporating and responding to EMFs. In fact, scientific research has demonstrated that every cell in your body may have its own EMF, helping to regulate important functions and keep you healthy.

Strong, artificial EMFs like those from power lines can scramble and interfere with your body's natural EMF, harming everything from your sleep cycles and stress levels to your immune response and DNA!

Studies Show Living Next To Power Lines Increases The Risk Of Cancer

After hundreds of international studies, the evidence linking EMFs to cancers and other health problems is loud and clear. High Voltage power lines are the most obvious and dangerous culprits, but the same EMFs exist in gradually decreasing levels all along the grid, from substations to transformers to homes.

From the British Medical Journal, June, 2005:

Researchers found that children living within 650 feet of power lines had a 70% greater risk for leukemia than children living 2,000 feet away or more.

From Epidemiology, 2003 Jul;14(4):413-9:

"Several studies have identified occupational exposure to extremely low-frequency electromagnetic fields (EMF) as a potential risk factor for neurodegenerative disease."

From Epidemiology, 2002 Jan;13(1):9-20

There is "strong prospective evidence that prenatal maximum magnetic field exposure above a certain level (possibly around 16 mG) may be associated with miscarriage risk."

EMF Pollution from Living Near Power Lines - Solved?

From the Internal Medicine Journal, 2007

In a study of 850 lymphoma, leukemia and related conditions, researchers from the University of Tasmania and Britain's Bristol University found that living for a prolonged period near high-voltage power lines increased the risk for these conditions later in life.

- People who lived within 328 yards of a power line up to age 5 were five times more likely to develop cancer as an adult.
- People who lived within 328 yards of a power line at any point up to age 15 years were three times more likely to develop cancer as an adult.

Dr. David Carpenter, Dean of the School of Public Health (SUNY), believes that up to 30% of all childhood cancers come from exposure to high voltage power lines.

Even the Environmental Protection Agency (EPA) cautions citizens that "There is reason for concern" and advises "prudent avoidance" of high voltage power lines.

The California Department of Health concluded that EMFs were responsible for an increase in childhood leukemia, adult brain cancer, Lou Gehrig's disease and miscarriage in the 2002 report, "An Evaluation of the Possible Risks From Electric and Magnetic Fields (EMFs) From Power Lines, Internal Wiring, Electrical Occupations and Appliances."

The studies cited above and dozens of other epidemiological studies specifically link high voltage power lines with:

- Brain tumors
- Leukemia
- Birth defects
- Lymphoma

Electromagnetic Radiation and Power Lines. It's a Problem.

According to research and publications put out by the World Health Organization (WHO), EMF such as those from power lines, can also cause:

- Headaches
- Fatigue
- Anxiety
- Insomnia
- Prickling and/or burning skin
- Rashes
- Muscle pain

You Need EMF Shielding From Electrical Power Lines & Transformers!

High voltage power lines, and radiation are something that can affect urban and rural communities alike. In truth, few residential areas escape this threat. For now, it's critical to understand your risk of living close to power lines and how protect the area around you.

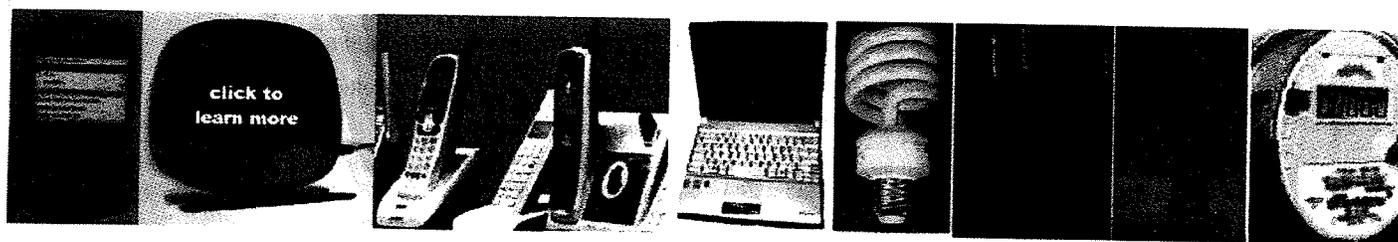
SafeSpace: Technologies To Treat And Transform Harmful EMFs

Over years of research and testing, we've developed proven technologies specifically developed to interact with and transform even the more powerful EMFs. (See independent laboratory testing.)

Our devices are imprinted with proprietary patterns (coded information) that literally influence artificial electromagnetic fields. When this information is added to a harmful wavelength, that wavelength is transformed to a benign, even positive influence on biological life it surrounds.

Frequently Asked Questions About This Section

Read our Frequently Asked Questions about these Products.



Home

Precautions

Awareness

Distance

Science

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About

Blog

Potential Wireless Health Effects

See also: [Science Overview](#) | [Urban Legend?](#)

The following sections discuss the scientific and epidemiological studies.

-
- **Infertility**
 - **Cancer**
 - **Sleep Disruption/Insomnia**
 - **Calcium Efflux**
 - **Arrhythmia and other Cardiac Problems**
 - **Neurological Problems**
 - **ADHD**
 - **Immune System Changes**
 - **Allergy, Asthma**
 - **Autism**
 - **Mercury**
 - **Plants**
 - **Animals**

For more on the mechanisms that may explain the biological/health effects, refer to the [Science Overview](#).

Infertility

Wireless technologies may increase the risk of infertility, by impacting human sperm count, motility, and normal morphology.¹ Five countries have now shown that cell phone use among men had negative effects upon sperm. Relevant studies were done in Ohio, Wisconsin, as well as Australia, Hungary, Poland, and Turkey.² Occupational exposure of Danish personnel to radar may also have resulted in lower sperm counts.³ In animals, microwaves also affect rat sperm motility,⁴ reduce the average number of fruit fly offspring (*Drosophila melanogaster*),⁵ result in irreversible infertility in mice⁶. Female rats' ovaries are affected as well,⁷ which is alarming because females, unlike males, have only one set of eggs from birth, and the genetic damage that accumulates before they give birth may affect posterity.

Power line frequencies, in addition to microwave frequencies, have similarly been linked to infertility or miscarriage, suggesting that this is not necessarily a thermal effect, and that power line and microwave frequencies may be working under similar mechanisms. Read more on powerline magnetic fields [here](#).

Genotoxic Effects and Cancer

Genetic changes resulting from microwaves, including DNA strand breaks, double-stranded breaks, and effects on gene expression, is another interesting area of research. There is both scientific evidence for this as well as epidemiological evidence for the increase of cancer as a result of wireless exposure.

Scientific Evidence

One of the first studies to show DNA breaks from microwaves was conducted by Henry Lai and Narendra Singh of the University of Washington.⁸ Despite the industry's attempts to attack this study, this finding was later confirmed by the 7-nation European REFLEX project and a study by the University of Vienna. There are now in total at least 11 studies showing DNA breaks.⁹ In addition to studies on DNA breaks, there are also now studies showing effects upon gene expression.¹⁰ Not all studies found significant increases in DNA damage, but it's important to note that not all cell types may be equally

sensitive. A paper by Phillips, Singh, and Lai further notes that the comet assay method is very sensitive and that some researchers with little prior experience made specific methodological errors, or developed versions with different detection sensitivities.¹¹

The exact mechanism behind DNA breaks is under speculation. The following have been raised as possibilities:

- **Direct Interaction with Electrons:** Local charging of DNA caused by displacement of electrons in DNA can result in its disaggregation, and thereby impact protein synthesis.¹²
- **Free Radicals:** Radiation-induced increase in oxidative and nitrosative free radicals may result in DNA damage as well as hinder the repair process. There are at least 24 papers on increased free radical activity from microwaves since 1997. Researchers found that antioxidants could reduce the EMF-induced DNA damage.¹³
- **Electrical:** DNA happens to be a good conductor of electricity, and electrical charge transfer may be linked to DNA breaks.¹⁴ For example, Swiss scientists at University of Basel found that DNA conducts electricity like a semiconductor. An electrical charge added to the DNA may cause a charge transfer to travel the DNA until it encounters guanine, which it oxidizes, causing strand breaks that may lead to genetic mutations.
- **DNA as an antenna:** Since DNA is a good conductor of electricity, it can act like an antenna, with different coil sizes responding to many EMF frequencies, according to Martin Blank, Columbia University.
- **Calcium Efflux:** Another mechanism proposed for DNA damage is related to the leakage of DNAase through the membranes of lysosomes, due to the calcium efflux effect (see section on calcium efflux below).¹⁵
- To read more about these and other potential mechanisms, see the **Science Overview**

Note that genotoxic effects were found for both power line (alternating current) 50/60Hz frequencies in addition to radio/microwave frequencies. Because power lines and microwaves may have different power/frequency levels, it suggests that it is not related to the thermal effect.¹⁶

When the rate of repair cannot keep up with the rate of DNA breaks, then there is greater likelihood of retaining mutations, which may lead to cancer. If the mutation is too great, cell death may occur, which is a partially protective mechanism, because it prevents the propagation of errors. However, at the same time, it can be dangerous for cells in the brain, heart, and ova which are less likely to be regenerated through mitotic activity, and where cell death can possibly lead to conditions like Alzheimer's, Parkinson's, and infertility.

Corresponding Epidemiological Evidence

Given that microwaves cause damage to DNA, we might expect to see cancer increases in epidemiological studies. Indeed, cancer has been potentially linked not only to mobile phones, but also to cordless phones¹⁷, radio towers, and TV towers (Australia, Great Britain, Rome, and San Francisco, and Lookout Mountain, Colorado).¹⁸ Some have argued that radio and TV towers have been around for a long time and are safe, and therefore the same should be true about mobile phone masts. Nevertheless, the premise itself appears false, given the many epidemiological studies on radio and TV towers, which indicate a correlation with cancer. Although the Radio and TV transmitters are more powerful, they are also tightly regulated and so are likely to be spaced further apart than cell towers.

Cell towers and mobile phone masts, as well as cordless phones, in contrast, are now quite ubiquitous, and a lot of people are now exposed to high levels. Sometimes these masts are placed right on residential buildings, right outside of people's apartments. There appear to be multiple cancer clusters in close proximity to mobile phone masts, for example, in Israel, in Naila, Germany, in the UK, in Perez, Spain, in Taman Subang in Kelana Jaya, Malaysia, in Taiwan, and Bayville, NY (see footnotes for more information).¹⁹ Eileen O' Connor, of the EM Radiation Research Trust, is one example of a **breast cancer** survivor who was in a cancer cluster near a mobile phone mast.²⁰ The high breast cancer rates of Marin County, California, were also suspected by some to be related to wireless radiation.²¹ In Canada, telecommunications workers had increased rates of **melanomas (skin cancer)**²², a cancer which is increasing in several countries.²³ **Leukemia** is another form of cancer that has been noticed with nonthermal microwave radiation, e.g., as a result of the Russian's secretly irradiating the U.S. Embassy in Moscow.

In the large Interphone multinational study on mobile phones and **brain cancer**, a link between mobile phones and cancer was found for multiple nations. The correlation was found despite poor study design that would actually grossly underestimate the risk of mobile phones. For more information on Interphone's weaknesses, including its definition of "regular user," the exclusion of children and business users, and more, see **Cellphones and Brain Tumors: 15 Reasons for Concern: Science, Spin and the Truth Behind Interphone**.

In the US Congressional hearing in 2008, one of the debated issues was whether the evidence points to a causal relation between wireless technologies such as mobile phones and cancer. The wireless industry representative claimed that the overall cancer statistics have not been getting worse.

1. Looking at the overall statistics is not completely appropriate in this case, without considering the individual trends that are a part of this overall statistics. For example, the overall statistics includes statistics for lung cancer, one of the most prevalent cancers, whose incidence has been decreasing due to increased awareness of the dangers of smoking.²⁴ Instead of looking at overall statistics, it may be more instructive to look at a particular type of cancer. For example, brain cancer has been on the rise for young adults, e.g., 20-29 year olds.²⁵ It is also instructive to look at salivary gland tumors among younger users.
2. There is approximately a **20-year time lag** between the rise of smoking and the consequent rise of lung cancer deaths and between the decrease in smoking and the consequent decrease in lung cancer deaths. The population that began using cell phones 20 years ago is much smaller than the population using cell phones today, and these users were generally not as heavy users as today. It is possible that we will see a similar or even shorter time lag between wireless technology use

and its long-term consequences. Personal home and office wireless technologies have only been around for a few decades, starting around the 1980s, with the newer and possibly more dangerous technologies like Wi-Fi and digital (as opposed to analog) cordless phone systems getting greater adoption and popularity in the *late 1990s*. They have not been studied for long enough to establish their safety. Also, we have the difficulty of factoring in "second-hand" radiation, especially since people are not fully aware of their level of exposure, unlike with smoke.

- Furthermore, the cancer statistics also suffer from omissions, e.g., the omissions of Veterans Administration cancer statistics from state registries since late 2004.²⁶ In some studies, business users and children have been excluded. In other studies, only short-term studies not exceeding 1 decade were performed.

- Further reading: http://www.nzine.co.nz/features/emr_cancer.html and related chapters

Sleep Disorders

Research Studies

There is some research confirming that microwaves can impact sleep. Researchers at the University of Zurich, Switzerland found that 15 minutes of exposure affected brain waves during sleep in young male volunteers.²⁷ In one study, the components of sleep thought to be important for daily recovery, have been found to be adversely impacted by wireless technologies as well. A 3-hour exposure prolonged the latency to reach the first cycle of deep sleep, and decreased stage 4 sleep.²⁸ Studies have shown that ELF *pulse-modulated* microwaves have effects upon sleep. Furthermore, *pulse-modulated* microwaves may increase regional cerebral blood flow and enhanced EEG power. In contrast, non-pulse-modulated microwaves did not enhance EEG power.²⁹ Concerning the EEG effects, it has also been found that the EEG alpha band are especially affected.³⁰

Corresponding Anecdotal and Epidemiological Evidence

One of the symptoms associated with microwave sickness is sleep issues, such as insomnia or frequent waking.³¹ In the 1990s, an experiment was performed with a short-wave radio broadcast transmitter in Schwarzenburg, Switzerland. This study found that microwaves may result in more difficulty falling asleep as well as maintaining sleep. Sleep quality improved when the transmitter was shut down. This was not a double-blind study, however, and so does not rule out the possibility of placebo-like effect.³² Another study by Citizens Initiative **Kempten West (Germany)** found that mobile phone masts resulted in a large decrease in serotonin in a majority of the participants. In any case, it is interesting to note that the use of prescription sleep aids has nearly tripled in young adults between 1998 and 2006.³³ In 1998 and 1999, were introduced cordless phones of the 2.4 GHz spectrum as well as Wi-Fi (see Appendix 1C).

In K. Crofton's book, *Radiation Rescue*, the first testimony is from someone who heeded the wireless wake-up call, following which her insomnia of 3 years disappeared, and she was sleeping well for a couple of weeks.

Calcium Efflux

Wireless radiation has been shown to remove calcium ions from membrane surfaces.³⁴ An experiment (Blackman et al) found calcium ion efflux from chick-brain tissue at certain field intensities.³⁵ This calcium efflux phenomenon may have impacts in multiple systems including the neurological and cardiovascular system. For example, contractions in the heart are influenced by calcium. Neurotransmitters in the brain are also influenced by calcium.³⁶ Some relevant research on cardiac and neurological effects will be discussed in the following sections.

We can further gather some insight into the importance of calcium, and the disruption that calcium efflux might have, by studying the delicate balance between Magnesium and Calcium in the body. Magnesium helps dissolve calcium and maintain calcium levels in the blood, the excess of which could effect calcification and disrupt cell function. Additionally, magnesium allows just enough calcium for electrical transmission along the nerves. Magnesium and calcium also work in opposite roles in the relaxation vs. contraction of muscles. Magnesium plays an important role as well as co-factor in chemical reactions, in the synthesis of proteins, and the the production of energy. Finally, Magnesium is also important in the detoxification process. According to *The Magnesium Miracle*, magnesium deficiency and calcium excess is potentially related to multiple conditions, including neurological, heart, infertility, osteoporosis, kidney stones, bowel disease, chronic fatigue syndrome, asthma, cramping, depression, and more.³⁷ Perhaps some of the symptoms of microwave sickness are related to the calcium efflux effect.

Cardiac Effects like Arrhythmia

Scientific Research

As mentioned previously, Calcium and Magnesium play an important role in the contraction and relaxation of the heart. Neuroscientist Allan Frey, who came up with a theory for microwave hearing, found that microwaves could trigger heart arrhythmia in laboratory animals or even stop hearts with the right modulations.³⁸ A study on frogs' hearts found a greater release of calcium ions within two intensity regions in response to electromagnetic waves.³⁹ Similarly, the calcium concentration in guinea pigs' heart muscle cells is also affected by low levels of microwave radiation.⁴⁰ Problems with heart rate have furthermore been observed in exposed chick embryos.⁴¹ Chick embryos exposed to GSM mobile phone radiation during development actually had higher mortality rates.⁴² With regards to humans, a study exposing ten healthy individuals to a digital cell phone for 35 minute periods in double-blind experiments found an average rise in systolic and diastolic blood pressure of 5-10 mm Hg as well as a slowing of heart rate.⁴³ Magda Havas has also performed a double-blind study which shows some volunteers' heart rate responding to DECT cordless phone stations without knowing whether the DECT station was plugged into a live or dead outlet.⁴⁴

Corresponding Anecdotal and Epidemiological Evidence

People living near radio towers or mobile phone masts appear to have increased cardiac symptoms such as arrhythmia. In

Switzerland, when examining adults before and after turning on a cell tower for arrhythmia, it was found that there was a significant increase in arrhythmia.⁴⁵ The example of Ouruhia, New Zealand, previously given, also included cardiac symptoms near the radio tower. Since the heart involves electrical signals, this may not be a complete surprise.

Cardiac problems have also been observed in the young. The usage of wireless technologies by pregnant women has been correlated to higher fetal and neonatal heart rate and decreased cardiac output, according to one study.⁴⁶ Since electrical disturbances in the heart may be responsible for some cases of Sudden Infant Death Syndrome (SIDS), we should also be concerned about a potential link between microwaves and SIDS.⁴⁷ The frightening thing is that people worried about SIDS often employ wireless baby monitors to check on their babies, not realizing that the monitor itself may cause electrical disturbances. There are anecdotes in which wireless DECT baby monitors gave babies more problems than the older analog wireless baby monitors.⁴⁸

Neurological Effects

Scientific Research

Other examples of leakage across barriers include the increased permeability of the blood-brain barrier (BBB) to various substances like albumin, which could damage neurons. Neuronal damage was found in rat brains 50 days after a 2 hour exposure to a level as low as 2mW per kg.⁴⁹ This increased permeability of the BBB in rats was also found after 7 and 14 days after the exposure.⁵⁰ Other studies have suggested that other substances besides albumin can also penetrate this barrier when exposed to microwaves.⁵¹ This BBB permeability may partly explain why some people have headaches around wireless technology.⁵²

Research has also found calcium efflux in brain tissue in response to microwaves. Blackman discovered two power density windows in which calcium would be removed from brain tissue.⁵³ As a possible mechanism, Andrew Goldsworthy suggests that if the voltage is just right, it will selectively remove the more strongly charged ions, such as divalent ions like calcium.

Since calcium plays an important role at the inter-neuron synapse in the release of neurotransmitters, this might further explain effects related to neurotransmitters. Changes in neurotransmitter functions have been found after low intensity exposures.⁵⁴ Dopamine, norepinephrine, acetylcholine levels, and 5-HT, a precursor to serotonin, and melatonin, for example, may be affected.⁵⁵ Low levels of norepinephrine may help explain feelings of stress. Low levels of serotonin may help explain symptoms of depression around mobile phone masts. Chronic exposure to GSM cell phone radiation was found to reduce synaptic activity in the hippocampus neurons, which may also help to explain memory loss in wireless phone use.⁵⁶ Impaired memory was also found in rats as a result of wireless exposure and is another symptom of microwave sickness.⁵⁷

Neuron death is another concern. BBC News reports that Swedish researchers studied rats whose brains are in the same development stage of a teenager. 50 days after a 2-hour exposure to radiation equivalent to mobile phones, they found an abundance of dead brain cells.⁵⁸ Exposed brain neurons may die more rapidly because of a lower capacity for DNA repair in brain cells. Neuron death could contribute to Alzheimer's disease or Parkinson's disease. Changes in protein folding resulting from microwaves could cause formations of long strands of proteins called fibrils which trigger heat shock proteins. Protein fibrils are likewise found in diseases like Alzheimer's and Parkinson's.⁵⁹

ADHD and Emotional Disorders

Mobile phone usage by pregnant mothers was recently correlated to the risk of having children with greater hyperactivity and emotional problems, even to the surprise of some of the researchers who expected to find otherwise.⁶⁰ This phenomenon might explain the rise of modern day disorders such as ADHD (attention deficit hyperactivity disorder). In Switzerland, when examining school children before and after turning on a cell tower for concentration problems, academic performance, and ADD, it was found that there was a significant increase in problems.⁶¹ A study in Latvia of children near an early warning radar station in the early 1990s, found decreased attention, memory, and learning ability in the children living close to the radar.⁶² The Skruna radar station operated from 1971 to 1998. Scientists were invited to conduct studies due to reports of ill health. Among the many effects they found included impaired memory and attention in school children.⁶³

Immune System Dysfunctions and Chronic Diseases

Unlike other particles and pathogens, microwaves can penetrate directly into the body. This is a problem for the immune system which relies a lot on skin as a barrier against pathogens. Some of the possible consequences found from microwave radiation include:

- Morphological alterations of immune cells
- Changes in lymphocytes dependent on the carrier frequency,
- Reduced T lymphocyte count, and
- Hypersensitivity manifesting as autoimmunity.^{64 65}

Johansson observed that electrohypersensitive individuals had higher densities of dendritic cells in their skin, which are reactors to ionizing radiation like X-rays and UV. Hence, electrohypersensitivity is postulated as being the result of irradiation due to effects similar to those documented of ionizing radiation like UV light. The increased numbers of mast cells could release histamines resulting in itch and pain. Mast cells are found to occur in many places, including the brain and heart. Chronic exposure to EMF was postulated to lead to chronic allergic responses and inflammatory responses.

Chronic Fatigue Immune Deficiency Syndrome (CFIDS or CFS)

The immune system dysfunctions caused by wireless technologies, may also be related to Chronic Fatigue Syndrome (CFS

or CFIDS) as noted by Olle Johansson. Whereas wireless technologies may initially stimulate the immune system, they can eventually exhaust it. The depressed immune system may then make one more susceptible to ordinary bacterias/viruses. CFS was a symptom mentioned found in Ouruhia, New Zealand, correlated to a radio tower. One individual claims to have recovered from Chronic Fatigue Syndrome, by escaping from wireless technologies.⁶⁶

Increased Asthma, Allergies and Rashes

Dr. Peter Finch discovered mobile phone frequencies increased the production of histamines, which are involved in allergic reactions and bronchial spasms. Consequently, Dr. Finch predicted an increase in allergies and asthma.⁷⁰ It is therefore interesting that asthma, along with headaches and impaired concentration, was one of the strongest connections found in users of wireless telephones, according to a study in Örebro University, Sweden.⁷¹ Asthma was also one of the symptoms found near the AM/FM radio towers in Ouruhia, New Zealand.

Even power frequencies may increase risk for asthma. Asthma of offspring is also being linked to the power line magnetic field exposure of mothers during pregnancy (**De-Kun Li et al, 2011**). Filters for dirty electricity, high frequency radiation on wires, have also reportedly reduced a number of symptoms, including headache, skin irritation, and asthma.⁷²

Possible Mechanisms for Asthma:

- Impacts on the autonomic parasympathetic vs. sympathetic system by wireless technologies. The parasympathetic system results in constriction of bronchial tubes, whereas the sympathetic system results in dilation. This system is mediated by neurotransmitters like acetylcholine which may be affected by wireless technologies. (Adams, The Asthma Sourcebook, p.4)
- As mentioned previously, the calcium efflux of microwaves affect might result in an imbalance of Calcium and Magnesium, which might have an impact on asthma. Calcium tends towards constriction of muscles vs. relaxation by Magnesium.
- Impacts on the immune system: Mobile phone frequencies result in an increase in histamines. Asthma may also be related to an increase in the number of mast cells, which store and release irritating chemicals. Wireless technologies may increase the number of mast cells.

Possible Mechanisms for Allergies, Rashes, Gut permeability:

One Japanese study found that microwave radiation can increase allergic responses to dust and pollen in adults with eczema, in comparison to the control group.⁶⁹ This may also be related to mast cells. Mast cells may cause other problems depending upon where they occur-- asthma related to bronchial tubes, hay fever related to the nose, conjunctivitis related to the eye, and eczema/hives related to the skin (Adams, pp8-9). The other hypothesis for the mechanism behind allergies is that it is the result of cell membrane weakening due to the calcium efflux effect. Andrew Goldsworthy explains that when calcium ions are replaced with monovalent ions, it weakens the cell membrane, increasing the likelihood of pores.⁶⁷ This membrane weakening can affect "tight junction barriers," such as nasal mucosa, lungs, and gut linings. Leakage through pores may allow increased amounts of toxins to enter in and damage the cell, resulting in increased allergies, multiple chemical sensitivities, asthma, skin rashes, bowel cancer, and gut permeability. Gut permeability might in turn contribute to many health conditions such as type-1 diabetes, Crohns disease, celiac disease, multiple sclerosis, and irritable bowel syndrome.⁶⁸

The Autism Hypothesis and Other Developmental Problems

Autism arose in the 1980s and 1990s around the time that wireless technologies started becoming popular.⁷³ Autism has been thought to be a "geek syndrome", rising amongst places like Silicon Valley, where a greater proportion of people are likely to be technology lovers, and hence, wireless users.⁷⁴ According to one source, it nearly tripled between 1987 and 1998 in California. Brick, NJ, also had autism, at the rate of 8 children per 1000 between ages 3 and 5. Investigators could not find a chemical contaminant to explain it, but 10 miles away was a Doppler weather radar transmitting at an extremely high power of 750,000 watts since late 1994.⁷⁵

Are there any studies which suggest a possible correlation between wireless technologies and autism?⁷⁶ One pilot study by Dietrich Klinghardt checked the body voltage and microwave power density that a person would have in the sleeping location of the pregnant mother. These numbers were compared for the sleeping location of women who later gave birth to healthy children versus the sleeping location of those who gave birth to autistic children. The study found significantly higher body voltages and microwave power density for the mothers who gave birth to the autistic child.⁷⁷

Suggestions for the cause of autism range from mercury toxicity from vaccines to problems with neurotransmitters to genetic damage to GMO's and food allergy problems, all of which can be exacerbated by wireless technologies. Klinghardt believes that electro-smog (wireless radiation) is one of three interconnected causes of autism. This electrosmog may contribute to the growth of molds and other bio-toxins, which may also be working in autism.⁷⁸ Another study in 2007 suggested that wireless technologies could make it more difficult for autistic children to excrete heavy metals, such as mercury.⁷⁹ With regards to synergy, it is possible that EMF worsens the effects of a toxin (e.g., by opening the blood-brain barrier, letting more of the toxin in) or stands in the way of the body's natural protective mechanism against the toxin (e.g., by reducing glutathione levels). Andrew Goldsworthy also hypothesizes that microwaves can interrupt the pruning process in neuron connections, and thereby contribute to autism.⁸⁰

The latest Bioinitiative Report (2012) notes additional clues that might link microwaves to an increased risk for autism. For example, some of these factors include increased oxidative stress, reduced glutathione levels, interference with calcium signaling, cell membrane peroxidation, impacts to gap junctions like the blood-brain barrier, genotoxicity, mitochondrial dysfunction, melatonin dysregulation, disturbed immune function, and brain cell damage. The report concludes that even if these links cannot be proven, that EMF can increase the risk by worsening challenging biological problems.

An increase of **Down's syndrome** was also found amongst the children of radar operators, and amongst residents near

satellite uplinks in the microwave bands in Vernon, NJ (radar and satellite also fall within the microwave band).⁸¹ Note that radar has also been linked to "internal bleeding, leukemia, cataracts, headaches, brain tumors, heart conditions, and liver involvement with jaundice" at certain power densities.⁸²

Effects on Mercury

Mercury also seems to be tied into Electromagnetic radiation. The Swedish book of testimonies of electromagnetic hypersensitivity, *Black on White*, includes many individuals who reported their sensitivity to microwaves following a dental appointment that impacted mercury levels.⁸³ Another anecdote has been provided of an otherwise normal patient who developed trigeminal neuralgia. It was suspected to be a result of this man's root canal with 2 metals and amalgam fillings in combination with the cell tower. The individual had the filling for 15-20 years before the neuralgia, but he did not become sick until after the cell tower came up. It is suggested that the amalgam fillings may act as an antenna.⁸⁴ Note that mercury also increases excretion of magnesium and calcium from kidneys. Magnesium levels are important as they can help in the excretion of certain heavy metals.⁸⁵ There is also a possibility that radiation increases mercury release, which can be dangerous since mercury is a toxic chemical.

Effects on Plants

Even plants seem to be affected by microwaves, including tomato plants, pine trees, aquatic plants, poplars, willows, and more. In Latvia, pines exposed to radar, experienced a decline in growth in comparison to surrounding trees, coinciding with the start of the emissions. Exposed pine trees were also found in other studies to have increased resin production (a possible stress response) and low seed germination. Trees near phone masts have similarly experienced deterioration.⁸⁶

Dr. Wolfgang Volkrodt, a retired Siemens physicist and engineer, studied deforestation in the German and Swiss Alps. He noticed areas of damage that occurred even where there was no acid rain. He hypothesized the cause was the massive communication between NATO countries and the soviet block. The theory was that the pine needles absorbed electrical current, and channeled this into the soil, which was destroyed. Indeed, U.S. satellites found deforestation in areas with massive communication. Some students built a Faraday cage around whole areas of forest, and those were the areas where the forests started to regenerate.⁸⁷

Effects on Animals

Effects can be seen not only in humans, but also in animals-- including horses, cows, pigs, birds, bird eggs, rats, monkeys, amphibians, bees, worms, drosophila (fruit flies), yeast, algae, and bacteria, some of which were mentioned earlier due to laboratory studies on animals.⁸⁸ Our mobile phone standard of 1.6 W/kg was itself based on a behavioral disturbance in monkeys in response to microwaves.

One possible explanation for some of these effects is related to magnetite, which is used in many animals as a navigational tool. Bees, butterflies, birds, fish, dolphins, and magnetobacteria have magnetite. In 1992, it was even discovered that the blood brain barrier and meninges covering the human brain (Joseph Kirschvink at California Institute of Technology) also has magnetite. The sinus region was also found to have magnetic material.⁸⁹ The pineal gland, which produces melatonin, has also been found to be contain calcite microcrystals with piezoelectric properties, which might operate with a similar mechanism as the magnetite crystals in the brain.⁹⁰

Mammals

It is interesting to consider a few case studies regarding livestock exposed to mobile phone masts or radio towers, which involve pigs, cows, and horses.

In Casaveieja, Spain, farmers blamed mobile phone base stations for pigs' miscarriages. Upon the disassembly of the antennae, the problems stopped.⁹¹

In Bavaria, Germany, a farmer started noticing problems beginning in 1992, and could not find a reason other than the radio frequency broadcasts. The cows' problems included conjunctivitis, itching, reproductive problems, decreased milk production, dancing or weaving in stalls, and pointing heads away from the transmission tower. When one cow was moved to a neighbor's farm 20 kilometers away, this strange behavior disappeared in 5 days. Not to mention also, this farmer's family also experienced many health issues, including headaches, non-malignant growth, aching joints, pains in bladder, head, and heart. Other animals, including birds, cats, and chickens and dogs, upon entering the farm, appeared to be strangely and negatively affected.⁹²

In New Zealand, well-known horse trainer Penny Hargreaves had a small farm near a radio tower. She had some cows which became nervous and disoriented. All 90 of her horses were also affected and became nervous and jumpy. Symptoms included loss of balance, volatile behavior, more infections than ever before, and walking as if their feet hurt. Penny and her daughter also suffered health problems including abdominal pain, joint pains, heart palpitations, ringing in the ears, mental confusion, and asthma, until they moved away.⁹³

Birds

Previously, negative effects were mentioned regarding exposed chick embryos. In scientific research, cell cultures of avian brain tissue subjected to cell phone frequency also had abnormal neuronal firing in over half of the cell samples, or else an abnormal shut down. In practice, around cell towers, we do see abandonment of nest sites, fewer eggs, chick deformities, a decrease of population,⁹⁴ as well as lower productivity in nests, plumage deterioration, and partial albinism.⁹⁵ The decrease in population may be in part due to cell tower collisions, but also in part due to interference with magnetic navigation.⁹⁶

Bees, Insects, & Worms

A serious problem has afflicted bee colonies worldwide, called colony collapse disorder. Beekeepers have been surprised to

find many beehives unusually abandoned. 25 to 50% of American bee keepers reported loss, e.g., 50% to 90% of their bees disappeared within a 6 month period.⁹⁷ While herbicides, pesticides, and GMO's may be suspected for problems with bee colonies, some also postulate that the increase of mobile phone masts (e.g., cell towers) could be related to colony collapse disorder by interfering with their navigational skills.⁹⁸

A limited study at Landau University put DECT wireless stations at the bottom of bee hives. The ones with greater exposure to the DECT stations had greater incidence of colony breakdown. Fewer bees returned to the hive, and the exposed hives had lower honeycomb weights.⁹⁹ A study in 2009 by Pattazhy from Kerala also found that mobile phone towers could damage the navigational skills of worker bees.¹⁰⁰

Another hypothesized mechanism is through the interference of the Nitrogen Monoxide (NO) system, which would disrupt not only learning capability and olfactory orientation but also the immune system. The mechanism by which this happens might be related to the sensitivity of NADH oxidase enzyme to magnetic and electromagnetic fields. As a result, not only would this interfere with bees' orientation, but also with their susceptibility to virus, fungi, and other microorganisms.¹⁰¹

Non-thermal microwave fields like that of cell phones were also found to induce heat-shock responses in the soil nematode *Caenorhabditis elegans*¹⁰² as well as fruit flies.¹⁰³

1 [PMID 17482179](#) and [PMID 17655195](#)

2 <http://www.microwavenews.com/>, Aug 16 entry

3 Hjollund et. al., 1997 (<http://www.c-a-r-e.org/powerpoints/07-Frankel.MD%20-Medical.ppt>)

4 [PMID 17628553](#)

5 [PMID 16846978](#)

6 Magras and Xenos, 1997 <http://www.c-a-r-e.org/powerpoints/07-Frankel.MD%20-Medical.ppt>

7 <http://www.ncbi.nlm.nih.gov/pubmed/19241083>

8 Harrill, Rob, "Wake-up Call" <http://www.washington.edu/alumni/columns/march05/wakeupcall01.html>
<http://www.biointiative.org/section6>

9 <http://www.microwavenews.com>, 9/3 entry

10 [PMID 16511873](#), [PMID 16107253](#), and <http://www.biointiative.org/section5>

11 <http://download.journals.elsevierhealth.com/pdfs/journals/0928-4680/PIIS0928468009000066.pdf> "Electromagnetic fields and DNA damage"

12 <http://download.journals.elsevierhealth.com/pdfs/journals/0928-4680/PIIS0928468009000066.pdf> and <http://electromagnetichealth.org/electromagnetic-health-blog/columbia-university-law-school-wireless-hazards-panel/>

13 http://www.emrpolicy.org/science/forum/macarthur_cell_phones_brain.pdf,
<http://linkinghub.elsevier.com/retrieve/pii/S0027510705004045>, http://www.next-up.org/pdf/Bees_Birds_Mankind_Destroying_Nature_by_Electrosmog_Ulrich_Warneke.pdf (36/47)

14 See IV. of <http://www.biointiative.org/section7>, <http://lohndmacarthur.com/reports/cellphones.html>, and http://www.emnetwork.org/position/macarthur_cell_phones_brain.pdf, see also http://www.icems.eu/docs/brazil/Blank_stress_proteins.ppt (slide 16 of 21)

15 http://www.der-mast-muss-weg.de/pdf/studien/04Goldsworthy_Thesaloniki.pdf

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17 brain-surgery.net.au/larrykinglive/, <http://www.biointiative.org/section10>

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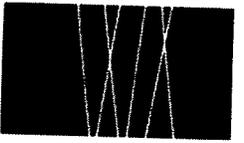
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**California
EMF
Program**

1515 Clay Street, 17th Floor
Oakland, CA 94612
(510) 622-4500 phone
(510) 622-4505 fax



Gray Davis
Governor
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Diana M. Bonta, R.N., Dr.P.H.
Director
Department of Health Services

**AN EVALUATION OF THE POSSIBLE RISKS FROM ELECTRIC AND
MAGNETIC FIELDS (EMFs) FROM POWER LINES, INTERNAL
WIRING, ELECTRICAL OCCUPATIONS, AND APPLIANCES**

Prepared by

Raymond Richard Neutra, M.D. Dr.P.H.
Vincent Delpizzo, Ph.D. GDE
Geraldine M. Lee, Ph.D.

FINAL REPORT JUNE 2002

OVERVIEW OF AND RATIONALE FOR THE CONCLUSIONS OF THE CALIFORNIA EMF RISK EVALUATION

1 Who Did the Evaluation and What Form Did the Conclusions Take?

1 On behalf of the California Public Utilities Commission (CPUC), three scientists who
2 work for the California Department of Health Services (DHS) were asked to review
3 the studies about possible health problems from electric and magnetic fields (EMFs)
4 from power lines, wiring in buildings, some jobs, and appliances. The CPUC request
5 for review did not include radio frequency EMFs from cell phones and radio towers.
6 Reviewer 1, Vincent Delipizzo, Ph.D., is a physicist and epidemiologist; Reviewer 2,
7 Raymond Richard Neutra, M.D., Dr.P.H., is a physician epidemiologist; and
8 Reviewer 3, Geraldine Lee, Ph.D., is an epidemiologist with training in genetics. All
9 three have published original research in the EMF area and have followed the field
10 for many years. To integrate and extend their body of knowledge, the EMF Program
11 contracted with specialists in biophysics, statistics, and animal experimentation to
12 prepare a background in critical literature review in their respective fields and to
13 make sure that the literature review was up to date through June 2000 (P. Gailey,
14 Ph.D., G. Sherman, Ph.D., W. Rogers, Ph.D., and A. Martin, Ph.D.). The first three
15 were involved with the writing of the 1998 National Institutes of Environmental
16 Health Sciences (NIHES) report. Furthermore, for each chapter of the review,
17 another DHS epidemiologist or toxicologist was asked to read the original literature
18 and consulted extensively with whichever of the three core reviewers was writing
19 that chapter. This ensured that the writer based his/her evaluation on an
20 understanding of the evidence that was as objective and consistent as possible. All
21 three reviewers worked for the EMF program for at least five years and to some
22 extent they influenced each other's thinking through their constant interaction and
23 the review of each other's chapters. All three did their reviews according to the Risk
24 Evaluation Guidelines (REG) that had been developed earlier and approved by the
25 program's Science Advisory Panel (SAP). The Guidelines specified that the
26 conclusions about any hazard should be done using two systems. The first was
27 developed by the International Agency for Research on Cancer (IARC) and has
28 been used by the NIEHS. It rates an agent as a Definite, Probable, Possible
29 carcinogen or Not a carcinogen, or specifies that the evidence is "Inadequate" to
30 rate the agent. In addition, the California Guidelines specified that in order to
31 accommodate the probability-based computer models of the program's policy
32 and 100 to denote their degree of certainty that epidemiological associations
33 between EMFs and certain diseases indicated that EMFs increased the risk of those
34 diseases to some degree. They indicated their best judgement graphically with a
35 little "x" and placed a shaded bar on either side of that "x" to indicate how uncertain
36

37 they were. The best judgement and the uncertainty ranges could be used in
38 quantitative policy analysis. The Guidelines, which were modified with advice from
39 public comment and the SAP and the DHS reviewers, attached pre-agreed-upon
40 English language phrases to various ranges of this degree of certainty. These are
41 presented below in Table I.

42 If all three judges had best judgments above 50 out of 100, but that fell in different
43 categories in Table I, judges were said to be "inclined to believe" that EMFs
44 increased the risk of that disease to some degree.

EXECUTIVE SUMMARY OF THE CALIFORNIA EMF RISK EVALUATION FOR POLICYMAKERS AND THE PUBLIC

WHY AND HOW THE EVALUATION WAS DONE:

On behalf of the California Public Utilities Commission (CPUC), three scientists who work for the California Department of Health Services (DHS) were asked to review the studies about possible health problems from electric and magnetic fields (EMFs) from power lines, wiring in buildings, some jobs, and appliances. The CPUC request for review did not include radio frequency EMFs from cell phones and radio towers. Reviewer 1, Vincent Delipizzo, Ph.D., is a physicist and epidemiologist; Reviewer 2, Raymond Richard Neutra, M.D., Dr.P.H., is a physician epidemiologist; and Reviewer 3, Geraldine Lee, Ph.D., is an epidemiologist with training in genetics. All three have published original research in the EMF area and have followed the field for many years. They were assisted in their reviews by DHS toxicologists, physicians, and epidemiologists.

THE CONCLUSIONS AFTER REVIEWING ALL THE EVIDENCE:

- To one degree or another, all three of the DHS scientists are inclined to believe that EMFs can cause some degree of increased risk of childhood leukemia, adult brain cancer, Lou Gehrig's Disease, and miscarriage.
- They strongly believe that EMFs do not increase the risk of birth defects, or low birth weight.
- They strongly believe that EMFs are not universal carcinogens, since there are a number of cancer types that are not associated with EMF exposure.
- To one degree or another they are inclined to believe that EMFs do not cause an increased risk of breast cancer, heart disease, Alzheimer's Disease, depression, or symptoms attributed by some to a sensitivity to EMFs. However,
- All three scientists had judgments that were "close to the dividing line between believing and not believing" that EMFs cause some degree of increased risk of suicide, or
- For adult leukemia, two of the scientists are "close to the dividing line between believing or not believing" and one was "prone to believe" that EMFs cause some degree of increased risk.

HOW AND WHY THE CONCLUSIONS DIFFER FROM THOSE OF OTHER RECENT REVIEWS:

While there are important differences between the three DHS reviewers' conclusions, the DHS scientists are more inclined to believe that EMF exposure increased the risk of the above health problems than the majority of the members of scientific committees convened to evaluate the scientific literature by the National Institutes of Environmental Health Sciences Working Group (NIEHS) in 1998, the International Agency for Research on Cancer (IARC) in 2001, and the British National Radiological Protection Board (NRPB) in 2001. These other committees all assessed EMFs as a "possible" carcinogen for childhood leukemia. Thus, like the DHS panel, these other three panels were not much swayed by theoretical arguments of physicists that residential EMFs were so weak as to make any biological effect impossible. NIEHS additionally assessed EMFs as a possible carcinogen for adult lymphoid leukemia and NRPB assessed a possible link with Lou Gehrig's Disease. The three DHS scientists differed in that they had a somewhat higher degree of belief that EMF is linked with these three diseases and gave credence to evidence of a link to adult brain cancer and miscarriage that the other panels either didn't consider or characterized as "inadequate." There are several reasons for these differences. The three DHS scientists thought there were reasons why animal and test tube experiments might have failed to pick up a mechanism or a health problem; hence, the absence of much

support from such animal and test tube studies did not reduce their confidence much or lead them to strongly distrust epidemiological evidence from statistical studies in human populations. They therefore had more faith in the quality of the epidemiological studies in human populations and hence gave more credence to them.

With the exception of miscarriage, which is common, the other diseases for which EMFs may be a contributing cause (childhood leukemia, adult brain cancer, Lou Gehrig's Disease) have low incidence, with rates between 1/100,000 and 1/10,000 a year. Even doubling such rates and accumulating them over a childhood or a lifetime leaves accumulated lifetime risks between 1/1,000 and 1%. Thus the vast majority (99%-99.9%) of highly exposed people would still not contract these diseases. Furthermore, calculations suggest that the fraction of all cases of the above-mentioned conditions that one could attribute to EMFs would be no more than a few percent of the total cases (if any). However, if EMFs do contribute to the cause of these conditions, even the low fractions of attributable cases and the size of accumulated lifetime risk of highly-exposed individuals could be of concern to regulators. Indeed, when deemed a real cause, estimated lifetime risks smaller than these (1/100,000) have triggered regulatory evaluation and, sometimes, actual regulation of chemical agents such as airborne benzene. The uncommon, accumulated high EMF exposures implicated by the evidence about these conditions come from unusual configurations of wiring in walls, grounded plumbing, nearby power lines, and exposure from some jobs in electrical occupations. There are ways to avoid these uncommon accumulated exposures by maintaining a distance from some appliances, changes in home wiring and plumbing, and power lines. However, to put things in perspective, individual decisions about things like buying a house or choosing a jogging route should involve the consideration of certain risks, such as those from traffic, fire, flood, and crime, as well as the uncertain comparable risks from EMFs.

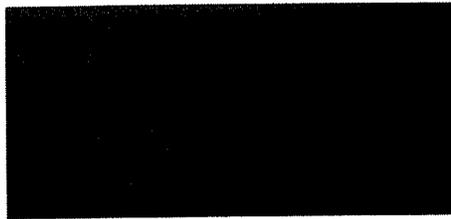
While rodent and chicken egg studies provide little or no support for EMF effects, some studies on early-model higher emitting video display terminals (VDTs) and two new epidemiology studies in humans suggest that EMFs might cause a substantial proportion of miscarriages. Miscarriages are common in any case (about 10 per 100 clinically diagnosed pregnancies) and the theoretical added risk for an EMF-exposed pregnant woman might be an additional 10 per 100 pregnancies according to these two studies. If truly causal this could clearly be of concern to individuals and regulators. However, the type of EMF exposures implicated by these two new epidemiological studies (short, very high exposures) probably come from being within a few inches of appliances and unusual configurations of wiring in walls and grounded plumbing, and only rarely from power lines. Since the majority of people come into contact with non-obvious sources of these fields on a daily basis, it may not be possible to avoid the majority of such exposures in modern life, even if we avoided the obvious sources like some appliances.

Seventy-five percent of the women in the studies had at least one of these brief high exposures during a given day. Even one exposure a day, if experienced regularly during pregnancy, seemed to increase the risk of miscarriage. Nonetheless, the majority of pregnant women with such exposures did NOT miscarry.

FOR PURPOSES OF POLICY ANALYSIS, HOW DID THE THREE SCIENTISTS EXPRESS THEIR JUDGMENT THAT THE ABOVE DEGREES OF RISK MIGHT BE REAL?

The EMF Program's policy analysis required each of the three DHS scientists to express in numbers their individual professional judgments that the range of added personal risks suggested by the epidemiological studies were "real." They did this as a numerical "degree of certainty" on a scale of 0 to 100. For the conditions with the most suggestive evidence of EMF risk, the three scientists each came up with a graph that depicts their best judgments with a little "x" and the margin of uncertainty with the shaded bar. The differences in certainty between the three reviewers arises primarily from how sure they were that they could rule out study flaws or other explanatory agents and how much the evidence on one disease influenced certainty in the findings for other diseases.

CONDITION	REVIEWER	DEGREE OF CERTAINTY IN SOME AMOUNT OF ADDED PERSONAL RISK
CHILDHOOD LEUKEMIA (REVIEWED THE 19 EPIDEMIOLOGY STUDIES)	1	0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100
	2	0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100
	3	0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100
ADULT LEUKEMIA (REVIEWED THE 43 EPIDEMIOLOGY STUDIES)	1	0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100
	2	0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100
	3	0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100
ADULT BRAIN CANCER (REVIEWED THE 29 EPIDEMIOLOGY STUDIES)	1	0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100
	2	0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100
	3	0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100
LOU GEHRIG'S DISEASE (ALS) (REVIEWED THE 7 EPIDEMIOLOGY STUDIES)	1	0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100
	2	0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100
	3	0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100
MISCARRIAGE (REVIEWED THE 10 VDT, 3 ELECTRIC BLANKET, 2 PERSONAL EXPOSURE STUDIES)	1	0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100
	2	0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100
	3	0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100



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Date: Mon, 10 Jan 2000 17:50:31 -0000

From: John Bueler <buelnerds@earthlink.net>

To: Roy Beavers <rbeavers@llion.org>

Subject: Fw: houston appraiser and transmission lines

Mr. Beavers I found the article I was looking for. So many people quote this article but this is the first time I have actually read the article. Please make this available for all you readers if you think it will be of help to them. Thank you for your suggestions of how to find it....

The following article has been sent by a user at CALIFORNIA STATE UNIVERSITY via ProQuest, a Bell & Howell information service.

Power lines short-circuit sales, homeowners claim Wall Street Journal

From The *Wall Street Journal*
Print Media Edition: Eastern edition
New York
Dec 8, 1993

Authors: Freedman, Alix M

Pagination: PAGE B1

ISSN: 00999660

Subject Terms: Real estate
Litigation
Electromagnetism
Electric power

Abstract:

After two decades of debate over the safety of the electromagnetic field, or EMFs, produced by electric power lines, courts in California, Florida and New York are now recognizing lawsuits against power companies that bypass medical issues and focus on the economic impact of home buyers' fears. Copyright Dow Jones & Company Inc Dec 8, 1993

Full Text:

The legal battles over the purported hazards of high-voltage power lines have shifted from health to real estate.

The new breed of plaintiffs are people like Jean and Martin Covalt, owners of a spacious villa in San Clemente, Calif., with avocado orchards, saunas -- and a power line running through their backyard.

Soon after the Covalts bought the house in 1989, San Diego Gas & Electric Co. workers added eight more wires to the line and cranked up the current. The fall-out: Near the family swimming pool, the electromagnetic fields, or EMFs, produced by that current rose to about 10 times the level that some people deem safe. The EMF readings were also extremely high in the bedroom of the Covalts' two infants.

Last year, after an epidemiologist dispatched by SDG&E failed to allay their fears, the frantic couple put their house up for sale. It didn't draw a single offer, even after its price was cut in half to \$750,000. Convinced the house is unsellable, the Covalts have stopped making their \$6,000-a-month mortgage payments and are wondering when their bank will foreclose.

Just before Thanksgiving, the Covalts delivered a jolt of their own: they joined with 22 neighbors in a class-action lawsuit against SDG&E. "We sank every dime into this house because we thought we would live here for 20 years," Ms. Covalt says. "The utility has basically ruined our lives and destroyed us."

Significantly, the lawsuit doesn't allege that anyone's health has been damaged by proximity to the power lines. Instead, these plaintiffs in tony San Clemente -- along with an increasing number of angry homeowners nationwide -- are saying that they should be compensated because the value of their property has fallen due to a perceived health risk.

Not surprisingly, SDG&E officials take a different view. "This is a group of well-to-do homeowners who purchased their home at the peak of the California real-estate market. . .and appear to be looking for a deep pocket to mitigate their loss in wealth," says Greg Barnes, an SDG&E lawyer.

For two decades, scientific debate has raged: How dangerous are the EMFs that emanate from every wire through which a current runs? Although the risks are believed to be low, some scientists have found an association between childhood cancer and power lines and similar risks among occupationally exposed workers.

A year ago, researchers from Sweden's prestigious Karolinska Institute reported finding up to a fourfold higher leukemia rate among Swedish children living near power lines. A companion study released at the same time by the National Institute of Occupational Health, also in Sweden, showed that male workers exposed to approximately the same levels of EMF had three times the rate of a certain kind of leukemia.

Still, certain other studies of workers have found no unusual cancer levels and health problems among exposed workers. And, no one has figured out how EMFs may cause cancer and how much exposure might be perilous. The utility industry, which is now spending more than \$15 million a year to fund EMF

studies, says the evidence is inconclusive.

Until now, plaintiffs charging that power lines caused their cancer have had scant success. But continuing scientific controversy and rising public awareness have produced plaintiffs like the Covalts. The biggest energizer: Courts in states including California, Florida and New York now allow lawsuits that bypass the medical issues to focus solely on the economic impact of home buyers' fears.

Last month, in a landmark case brought against the Power Authority of the State of New York, the state's Court of Appeals ruled that landowners whose property is seized by utilities for new construction can seek damages when "cancerphobia" lowers the value of the rest of their property. The judge said that property owners must present "credible, tangible evidence" of that fear. Plaintiffs' lawyers contend the ruling also applies to homeowners whose land hasn't actually been seized by a utility, but who live near new or existing lines.

Although their claims are largely untested, plaintiffs' new liberty to skip the science has utilities braced for more suits and more payouts. "Property devaluation cases are going to be a major source of litigation against utilities," says Michael Withey, a Seattle lawyer who is leading the nascent EMF bar's crusade. "They are cheaper to bring than personal-injury cases because you don't have to conduct mini-trials on the science."

Utility officials insist that EMFs pose no threat either to health or real estate values, but some are jittery about the sheer numbers of potential litigants. To date, transmission lines, which are highly visible and carry power cross-country at high voltage, have grabbed the headlines. Still the less imposing distribution lines that run through America's neighborhoods are far more ubiquitous and closer to homes. And these too can generate high levels of EMF.

"The potential impact of these suits may be greater because it's a lot easier to find someone who merely lives near a power line than someone with substantial EMF exposure who has died of cancer," says Mark Warnquist, a lawyer who represents the utility industry.

In Pleasantville, N.Y., Howard Reiss blames a Consolidated Edison Co. power line 75 feet from his house for driving him from his intended retirement home. Fearful for his health, he put his house up for sale in April and stopped counting after 89 prospective buyers trooped through his house (first priced at \$400,000 and now at \$275,000) without a single offer.

In Guilford, Conn., Kevin Brunelle accuses Connecticut Light & Power Co. of wreaking havoc on his marriage and his dream home, a two-family house located in the shadows of the utility's substation. In 1991, after his street gained media notoriety for what residents characterized as an unusually high incidence of EMF-related cancer, his tenants moved out. And when one of his sons developed a tumor in his leg, his wife and children decamped, too. Unable to handle his mounting debts, Mr. Brunelle put his house, appraised at \$140,000 in 1986, on the market for \$118,000. Eventually, his bank foreclosed; the house was sold last month after being listed at \$69,900.

Derek Benham, a new homeowner in Oakland, Calif., says when a realtor recently tried to show him a house a stone's throw away from a transmission line, he and his wife "just turned around and split." David Bolton, a Houston appraiser, did a study several months ago showing that 100 properties bordering a transmission line sold for 13% to 30% less than 100 comparable properties away from the line, but in the same neighborhood.

The utility industry tells a different story. Kansas City Power & Light Co. is just the latest to release a study concluding that power lines have no impact on property prices. Utility officials argue that the

economy, not fear of EMFs, is the prime culprit behind sluggish real-estate sales. And while many utilities are trying to reroute or reconfigure wiring on new lines to reduce EMF levels, they say the expense of rejiggering existing lines makes no sense since EMFs are an unproven hazard.

But some homeowners say such obduracy has made court their last resort.

At a town meeting with Con Edison Co. this past summer, Pleasantville residents entreated the utility to bury the line. But officials cited a \$10 million-per-mile figure, offering only to study the matter further. Now some irate residents have put out legal feelers. "They've pushed us to the point where we have no other alternatives," says Mr. Reiss. A Con Edison spokesman replies that the utility's concern is not the money but the absence of information about what levels of EMF may be unsafe.

Similarly, Dr. Mark McCartin, who brought the class action against SDG&E last November, says that he and his neighbors are fighting for the health of their kids and "would get out of their hair forever" if the utility would simply move its line to an unpopulated area.

But Mr. Barnes, SDG&E's lawyer, estimates that moving the three-mile line in question would cost a prohibitive \$1.8 million. The plaintiffs, he adds, turned down SDG&E's offer to reconfigure the line to cancel out some of the magnetic fields. That would have reduced EMF levels by up to 70% for a mere \$76,000.

It isn't clear if line-linked property claims will turn into the next asbestos litigation. Since EMFs are so omnipresent -- flowing from cellular phones, hairdryers and VDTs -- plaintiffs' lawyers suspect jurors will require land owners to offer powerful proof that EMFs truly were the cause of declining property values.

And things might prove tricky even for homeowners armed with reams of market data. Recently, for example, Dorothy English was forced to take a \$70,000 loss on her Feasterville, Pa., house, located just 100 feet from Philadelphia Electric Co.'s power line. Ms. English, who wants to sue the utility, claims the property registered dangerous levels of EMF. But Deborah Taylor, the new buyer, says the line never fazed her.

Why was the house such a bargain? "It didn't show very well because they had three dogs and 10 cats and the litter boxes on the wall-to-wall carpets could make you gag," Ms. Taylor says.

Credit: Staff Reporter of The Wall Street Journal

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San Juan Capistrano, CA 92675



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California Public Utilities Commission
Re: SCORE
c/o Ecology + Environment Inc
505 Sansome Street
San Francisco, CA 94111

STATE CAPITOL
P.O. BOX 942849
SACRAMENTO, CA 94249-0073
(916) 319-2073
FAX (916) 319-2173

Assembly California Legislature



WILLIAM P. BROUGH
ASSEMBLYMEMBER, SEVENTY-THIRD DISTRICT

April 1, 2015

California Public Utilities Commission
C/O Ecology and Environment, Inc.
505 Sansome Street, Suite 300
San Francisco, CA 94111

Also via email at socre.ceqa@ene.com

SUBJECT: SOCRE – Summary DEIR-A.12-05-020 (SUPPORT)

The California Public Utilities Commission (CPUC) has spent nearly three years analyzing San Diego Gas & Electric's (SDG&E) South Orange County Reliability Enhancement (SOCRE) project. I urge the commissioners to find a solution to the outstanding issues and recommend the expedited construction of this needed electric upgrade project in my district.

It is unacceptable to consider intermittent power interruptions as a solution. Reliable energy must be maintained and improved for my constituents. Currently, the Talega substation at our county border is the one and only 230kV transmission conduit to our entire region. Our hospitals, schools, water districts, wastewater authority, police, fire stations, and local businesses must have power to operate safely and effectively.

This project will provide hundreds of thousands of residents, including millions of visitors, in South Orange County affordable and reliable energy power. As the Assembly Representative for nearly the entire SDG&E service territory in Orange County, I ask the CPUC Commissioners approve the SDG&E South Orange County Reliability Enhancement (SOCRE) project.

Best Regards,

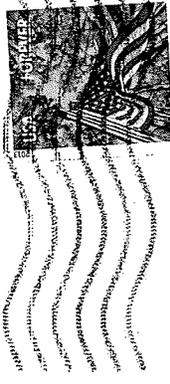
A handwritten signature in black ink, appearing to read "William P. Brough", followed by a horizontal line.

William P. Brough
Assemblyman, 73rd District

Assembly
California Legislature

WILLIAM P. BROUGH

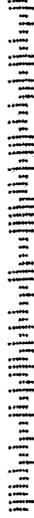
ASSEMBLY MEMBER, SEVENTY-THIRD DISTRICT
DISTRICT OFFICE
29122 RANCHO VIEJO ROAD, SUITE 111
SAN JUAN CAPISTRANO, CA 92675



SANTA ANA CA 926

04 APR 2015 PH 11

California Public Utilities Commission
C/O Ecology and Environment, Inc.
505 Sansome Street, Suite 300
San Francisco, CA 94111



9411315575

To: California Public Utilities Commission

Re: Socre Project

c/o Ecology and Environment, Inc.

505 Sansome Street. Suite 300

San Francisco, CA 94111

April 7, 2015

Gentlemen:

I am writing to tell you the reasons why we, residents of the San Juan Capistrano neighborhood next to, and very close to, the San Diego Gas and Electric power relay station, are asking you to consider disapproving of its proposed expansion. First, I want you to know that I like electricity, too, as we all do. I have a normal home with all the electrical appliances, and have lived in it for 40 years and love it.

1 – With the proposed expansion nearly doubling, the electro- magnetic fields it emits will also double. EMF's are so very destructive healthwise – cancer, nerve damage, among many more. We already have some of these in our homes. This danger to human health is never discussed by SDG&E, in fact, they try to hide it. The long term destructive nature of the EMF's is not discussed in the Environmental Impact Report, either. Do you really have to sacrifice human beings for electricity?

2 – Capistrano Unified School District is against this proposed expansion, also. Do they want school children to be exposed to these dangerous EMF's?

3 – The City of San Juan Capistrano is against this expansion.

4 – Home values will plummet. Is this fair for one neighborhood to take the brunt so other neighborhoods and businesses can have more power and a more reliable source of power?!

5 – It will also, aesthetically, be a bigger eyesore than it is now.

We are asking you to save us from these undesirable impacts. Please, please, please, do the right thing and tell SDG&E to move this SOCRE to a different location, far away from homes, schools, and parks.

Sincerely,



Lois Rabalais

31096 Via El Rosario, San Juan Capistrano, CA 92675

LOIS RABALAIS
31096 Via El Rosario
San Juan Capo, CA 92675

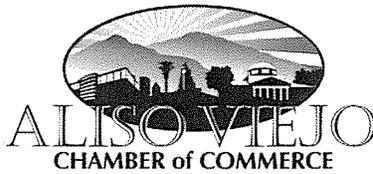


SANTA ANA CA 926
07 APR 2015 PM 2 L

California Public Utilities Commission
505 Sansome Street, Suite 300
San Francisco, CA 94111

c/o Ecology & Environ. - Socio-Economic





California Public Utilities Commission
RE: SOCRE Project
c/o Ecology and Environment, Inc.
505 Sansome Street, Suite 300
San Francisco, CA 94111

RE: Support, SDG&E's SOCRE project

CPUC Commission:

As the owner of three restaurants in Aliso Viejo, Dana Point and Los Flores, I know that reliable electric service is a critical component to my businesses. When the lights go out my customers leave, without electricity our operations cannot function in a safe and secure manor. My workers are sent home without pay and if the outage lasts long enough we are now dealing with spoilage that could cost me thousands.

I attended the Draft EIR hearing in San Clemente last week; I spoke as the President of the Aliso Viejo Chamber of Commerce and as a business owner. I support SDG&E's SOCRE project to provide reliable electric service to our south county area. As we learned from the release of the Draft EIR, the only real impacts from the proposed project would be temporary and only during the construction period. When I built our 'Shwack Beach Grill' restaurant a couple years ago in Dana Point we also had a few impacts during construction. Now that construction is complete, the impacts are gone. So it will be with the SOCRE project.

On a personal note, I have a son who needs electricity for medical reasons. Reliable electric power is a must for our family. If we have an outage of any duration we are headed to the emergency room for care. We do have a generator for back up emergency power, but the generator will only last for so long without refueling. If we have a major issue at the Talega Substation that this project could have prevented, we could be without power for hours, weeks or longer. If south Orange County is without electric power how do we get fuel for the generator? What will traffic be like without traffic signals? All this can be prevented by supporting SDG&E's SOCRE project as they have proposed.

Respectfully,

Dick Fisher

Cosmo's Italian – Aliso Viejo & Los Flores
Shwack Beach Grill – Dana Point

Chamber of Commerce
Eliso Creek Rd #200A
Viejo, Ca 92656

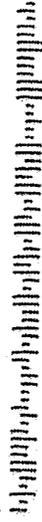
SANTA ANA, CA 926

09 APR 2015 PM 4 L



California Public Utilities Commission
Re: SOCRÉ Project
C/O Ecology and Environment, Inc
505 Sansome St Suite 300
San Francisco, Ca 94111

9411315575





City of Mission Viejo

Office of the Mayor and City Council

Cathy Schlicht
Mayor

Greg Rath
Mayor Pro Tem

Wendy Bucknum
Council Member

Edward Sachs
Council Member

Frank Ury
Council Member

April 7, 2015

California Public Utilities Commission
c/o Ecology and Environment, Inc.
505 Sansome Street, Suite 300
San Francisco, CA 94111

Re: Support - SDG&E South County Reliability Enhancement

CPUC:

The electrical transmission and distribution system in South Orange County has been operating effectively but virtually unchanged for the past five decades. However technology has come a long way since the 1950's. We have an opportunity today, through San Diego Gas & Electric's (SDG&E's) South Orange County Reliability Enhancement (SOCRE) project, to provide system redundancy and improved reliability for the seven cities and unincorporated area of South Orange County.

This project will rebuild and upgrade the Capistrano substation, which was last upgraded more than 50 years ago. The upgrade will provide South Orange County with a second 230kV substation. This will give the region guaranteed redundancy in the electrical transmission system. Once completed, both the Talega and Capistrano substations could independently keep the power flowing to homes and businesses throughout South Orange County if either of the two substations suffered a power failure.

While less important, it is nevertheless beneficial that the project will also provide increased capacity at the San Juan Capistrano Substation. With increased capacity, a redundant and highly reliable system, and state-of-the-art technology, the SOCRE project is critical to the future of South Orange County.

The City of Mission Viejo strongly supports SDG&E's application for the South Orange County Reliability Enhancement project and encourages the California Public Utilities Commission (CPUC) to approve the proposed project.

Sincerely,

Greg Rath
Mayor Pro Tem

Center of Mission Viejo

Center
Mission Viejo, California 92691

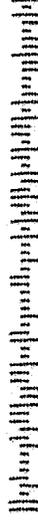
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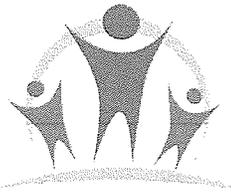


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California Public Utilities Commission
c/o Ecology and Environment, Inc.
505 Sansome Street, Suite 300
San Francisco, CA 94111

9411315575





**Citizens for SAFE and
RELIABLE POWER**

April 9, 2015

California Public Utilities Commission
RE: SOCRE Project
c/o Ecology and Environment, Inc.
505 Sansome Street, Suite 300
San Francisco, CA 94111

RE: Residents SUPPORT the South OC Reliability Enhancement Project as proposed

The Citizens for Safe and Reliable Power (CSRP) is a group of residents, businesses, taxpayer advocates and environmentalists that support reliable power for South Orange County. CSRP has been encouraging San Diego Gas & Electric (SDG&E) to upgrade its electrical infrastructure and build in transmission redundancy in an effort to ensure San Juan Capistrano and all of South Orange County long-term electric reliability for many years.

Each year San Juan Capistrano hosts the largest non-motorized parade in the country known as "Swallow's Day Parade" to celebrate the legend of the return of the swallows to the San Juan Capistrano Mission each year on St. Joseph's Day (March 19th). At this year's parade, we had a booth and dozens of residents asked about the status of the reliability project. When they were informed of the public comment period associated with the Draft Environmental Impact Report (DEIR), they were motivated to sign a letter of support for the proposed project.

Enclosed are copies of those letters. Please consider the voice of the residents and visitors of San Juan Capistrano who want the SDG&E South OC Reliability Enhancement project built now.

Thank you for your consideration of their requests.

Sincerely,

A handwritten signature in black ink, appearing to read "Ann Ronan". The signature is fluid and cursive, with a long horizontal stroke at the end.

Ann Ronan
Chairwoman
Citizens for Safe and Reliable Power

March 19, 2015

California Public Utilities Commission
RE: SOCRE Project
c/o Ecology and Environment, Inc.
505 Sansome Street, Suite 300
San Francisco, CA 94111

RE: SUPPORT - South Orange County Electrical Reliability Enhancement (SOCRE) by San Diego Gas & Electric (SDG&E)

Please approve the proposed SDG&E SOCRE project, which is designed to provide electric reliability to South Orange County. This project will be built on existing SDG&E property and easements. Because no new property is required, the environmental impacts will likely be far less than the unknown impacts of grading and constructing a new substation from scratch in a new location.

The other two alternatives under consideration – reconductoring the 138kV lines or the “no project” alternative – do not meet the purpose and need for a reliable electrical transmission system that has redundancies built in to protect us from power outages.

Reliable electricity is important to us in South Orange County and we encourage you to approve the proposed SDG&E SOCRE project to ensure safe and reliable power for our future power needs.

Sincerely,



82 SEASTAR CT
DANA POINT, CA
92629

March 19, 2015

California Public Utilities Commission
RE: SOCRE Project
c/o Ecology and Environment, Inc.
505 Sansome Street, Suite 300
San Francisco, CA 94111

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Sincerely,

Lise Nelson

Dana Point, CA 92629

March 19, 2015

California Public Utilities Commission
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c/o Ecology and Environment, Inc.
505 Sansome Street, Suite 300
San Francisco, CA 94111

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Sincerely,


Mona Elena Bontz
33561 Capstan Dr
Monarch Beach CA 92629

March 19, 2015

California Public Utilities Commission
RE: SOCRE Project
c/o Ecology and Environment, Inc.
505 Sansome Street, Suite 300
San Francisco, CA 94111

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Sincerely,



GREG SHIELDS

DANA PT.

March 19, 2015

California Public Utilities Commission
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505 Sansome Street, Suite 300
San Francisco, CA 94111

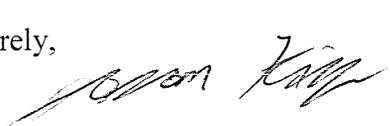
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Sincerely,

 (CAGUNA HILLS)

March 19, 2015

California Public Utilities Commission
RE: SOCRE Project
c/o Ecology and Environment, Inc.
505 Sansome Street, Suite 300
San Francisco, CA 94111

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Sincerely,



Frank R. Krause

Mission Viejo CA

March 19, 2015

California Public Utilities Commission
RE: SOCRE Project
c/o Ecology and Environment, Inc.
505 Sansome Street, Suite 300
San Francisco, CA 94111

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Sincerely,

Tito Aquino
M. V.

March 19, 2015

California Public Utilities Commission
RE: SOCRE Project
c/o Ecology and Environment, Inc.
505 Sansome Street, Suite 300
San Francisco, CA 94111

RE: SUPPORT - South Orange County Electrical Reliability Enhancement (SOCRE) by San Diego Gas & Electric (SDG&E)

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Sincerely,

A large, stylized handwritten signature in black ink, consisting of several loops and a long horizontal stroke extending to the right.

San Clemente, CA

March 19, 2015

California Public Utilities Commission
RE: SOCRE Project
c/o Ecology and Environment, Inc.
505 Sansome Street, Suite 300
San Francisco, CA 94111

RE: SUPPORT - South Orange County Electrical Reliability Enhancement (SOCRE) by San Diego Gas & Electric (SDG&E)

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Sincerely,



27229 Paseo Hornito

San Juan Capistrano, CA

92675

March 19, 2015

California Public Utilities Commission
RE: SOCRE Project
c/o Ecology and Environment, Inc.
505 Sansome Street, Suite 300
San Francisco, CA 94111

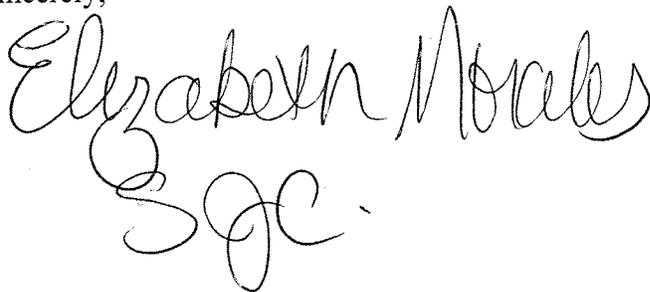
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The other two alternatives under consideration – reconductoring the 138kV lines or the “no project” alternative – do not meet the purpose and need for a reliable electrical transmission system that has redundancies built in to protect us from power outages.

Reliable electricity is important to us in South Orange County and we encourage you to approve the proposed SDG&E SOCRE project to ensure safe and reliable power for our future power needs.

Sincerely,



Elizabeth Morales
SGE

March 19, 2015

California Public Utilities Commission
RE: SOCRE Project
c/o Ecology and Environment, Inc.
505 Sansome Street, Suite 300
San Francisco, CA 94111

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A. AGOM

SAN JUAN CAPISTRANO, CA

March 19, 2015

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San Juan Capistrano, CA

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Paul & Bill Campbell

San Juan Capistrano

March 19, 2015

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Sincerely,

Angela Duzich Rohde
31372 Don Juan Ave
San Juan Capistrano
92675
Angela Duzich Rohde

March 19, 2015

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San Francisco, CA 94111

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SAN JUAN CAPISTRANO CA 92675

March 19, 2015

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505 Sansome Street, Suite 300
San Francisco, CA 94111

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31482 La Matanza
San Juan Capistrano CA 92675

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San Francisco, CA 94111

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Sincerely,



30982 Calle San Felipe SJO

March 19, 2015

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San Francisco, CA 94111

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SJC

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San Francisco, CA 94111

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San Juan Capistrano, CA 92675

21 de marzo 2015

California Public Utilities Commission
RE: SOCRE Project
c/o Ecology and Environment, Inc.
505 Sansome Street, Suite 300
San Francisco, CA 94111

RE: APOYO – Proyecto de San Diego Gas & Electric (SDG&E), Mejora de Confiabilidad al Sur del Condado de Orange (SOCRE)

Por favor, apruebe el SOCRE proyecto de SDG&E propuesto, que está diseñado para proporcionar una confiabilidad eléctrica al Sur del Condado de Orange. Este proyecto será construido en la propiedad y las servidumbres existentes de SDG&E. Debido a que no se requiere una nueva propiedad, los impactos ambientales serán probablemente mucho menos que los efectos desconocidos de la clasificación y la construcción de una nueva subestación desde cero en una nueva ubicación.

Las otras dos alternativas bajo consideración – cambio de conductores de las líneas de 138 kilovoltios o la alternativa de “no proyecto” – no cumplen el propósito y la necesidad de un sistema de transmisión eléctrica fiable que tiene redundancias incorporadas para protegernos de los cortes de energía.

Electricidad fiable es importante para nosotros en el Sur del Condado de Orange y le animamos a que apruebe el proyecto SOCRE de SDG&E propuesto para garantizar energía segura y confiable para nuestras futuras necesidades de energía.

Sinceramente,

Maria montes
San Juan Capistrano CA.

21 de marzo 2015

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c/o Ecology and Environment, Inc.
505 Sansome Street, Suite 300
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Sinceramente,

Rachel Medina

202 S. Calle Sanlle apt G
San Clemente CA 92672

21 de marzo 2015

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RE: SOCRE Project
c/o Ecology and Environment, Inc.
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TONY Medina
202 S. calle Seville-G
San Clemente, CA 92672

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Sinceramente,



Ladea Sanchez

April 2, 2015

California Public Utilities Commission
RE: SOCRE Project
c/o Ecology and Environment, Inc.
505 Sansome Street, Suite 300
San Francisco, CA 94111

Also via email at socre.ceqa@ene.com

RE: SUPPORT South Orange County Reliability Enhancement, as Proposed by SDG&E

Please do not approve any of the Alternatives identified in the South Orange County Reliability Enhancement Project EIR. Instead, I encourage you to approve SDG&E's proposal for a new substation on the existing site in San Juan Capistrano, with redundant 230kV lines to the Talega Substation.

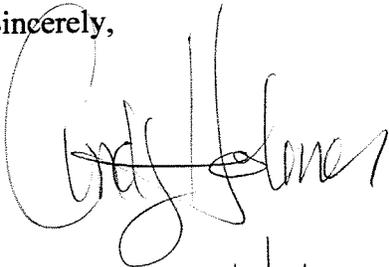
SDG&E's proposal is the least impactful, least expensive, and fastest solution to giving South Orange County the energy reliability that we want and deserve.

There are so many reasons to love living in the South Orange County region. On the outside—our beautiful beaches, rolling hills and robust business climate leave little to be desired. Our infrastructure however, is a mess. With only one freeway in and out of the County and lack of a redundant electrical infrastructure, our quality of life is at serious risk of harm.

We especially are concerned about the "No Project" Alternative that considers blackouts to be a viable solution. We simply cannot fathom any alternative that puts public health and safety at risk.

SDG&E presented the right solution to keeping the lights on in Orange County. Please approve this project and reject the staff recommendations.

Sincerely,



Cindy Holmes
Via Plesa, San Clemente

April 2, 2015

California Public Utilities Commission
RE: SOCRE Project
c/o Ecology and Environment, Inc.
505 Sansome Street, Suite 300
San Francisco, CA 94111

Also via email at socre.ceqa@ene.com

RE: SUPPORT South Orange County Reliability Enhancement, as Proposed by SDG&E

As a South Orange County business owner, having a reliable energy infrastructure is critical to the livelihood of my company, customers, employees and family.

I was greatly disappointed to see that the Draft EIR for the South Orange County Reliability Enhancement project did not identify SDG&E's plan for a new substation on the site of its old substation in San Juan Capistrano as an alternative in the EIR. This seemed like the best and least impactful solution.

The Alternatives favored in the plan were bleak for our community. Blackouts, or load-shedding, should not be considered to be a viable solution. Beyond the economic implications of a blackout, public safety is at risk. Our residents and visitors deserve better treatment.

Reconductoring does not address redundancy and should also not be considered. Finally, Southern California Edison Alternatives will add unnecessary delays and result in more permanent impacts – we can no longer wait for redundancy and reliability.

Please reconsider SDG&E's proposal. Temporary impacts from construction are a welcome tradeoff to finally have a safe and redundant energy infrastructure. I implore you: do not adopt any of the current Alternatives identified in the EIR and approve SDG&E's project as originally proposed.

Sincerely,

Christel Shipley
Christel Shipley
San Clemente, CA

April 2, 2015

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DON KINDRED

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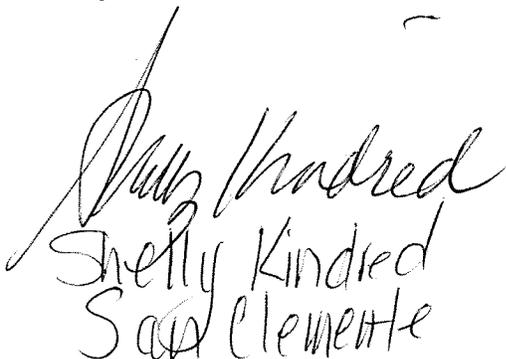
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Sincerely,


Shelly Kindred
Sara Clemente

April 2, 2015

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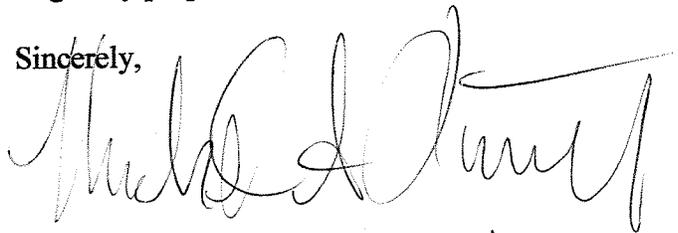
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Michael S. Finney
San Clemente