HOME KNOW YOUR RIGHTS TESTIMONIALS ATTORNEYS IN THE NEWS QUESTIONS & ANSWERS LINKS CONTACT US

Huntington Village Tattler August 13, 2010

"Rather than a welcome wagon, the tower’s new neighbors hired attorney Andrew J. Campanelli to argue against completion of the monopole."

Bedford-Katonah Patch November 25, 2010

"Attorney Andrew Campanelli of the firm Campanelli & Associates, P.C. added legal muscle to the group’s cause."

Home Page

We offer experienced legal representation to property owners, civic associations, and municipalities who seek to oppose or regulate the installation of cell towers.

KNOW YOUR RIGHTS

You don’t have to lay down for the wireless companies.

KNOW YOUR RIGHTS
Cell Phones & Wi-Fi—Are Children, Fetuses and Fertility at Risk?

Posted by on 10.3.2013

By Dr. Mercola

“It may take some sort of catastrophe to get people’s attention,” said Frank Clegg, former president of Microsoft Canada and founder of Canadians 4 Safe Technology, referring to the increasing saturation of Wi-Fi technologies on the public at large, and especially, children.

Leading experts from top universities recently convened at a program organized by ElectromagneticHealth.org in Connecticut to discuss the reality that such a catastrophe is already brewing and, as the panel warned, is now already negatively impacting children, fetuses and fertility. But the majority of parents are not connecting the dots by linking symptoms in their children to the radiation.

During the discussion “Cell Phones & Wi-Fi – Are Children, Fetuses and Fertility at Risk?,” a wide range of scientific evidence was presented that RF/MW electromagnetic radiation has indisputable biological and health effects, including at non-thermal levels, with chronic exposures generally associated with greater harm. This is the kind of radiation emitted not only by cell phones but also by:

- Wi-Fi routers
- Baby monitors
- Bluetooth earpieces
- Towers
- Antennas
- Smart boards
- Smart meters
- Cordless phones
- Other wireless devices

'Our Grandchildren and Children Are Being Used as Lab Rats...'

This quote, from Devra Davis, PhD, MPH, president of Environmental Health Trust, sums up perhaps the most alarming EMF issue to date. The fact is, we know that exposure to this ‘unnatural bath of radiation’ damages DNA and impairs natural cellular repair processes, a phenomenon that may lead to cancer. Yet we are proceeding with this large-scale, uncontrolled experiment anyway.

Because children are still developing, they have rapid cellular replication and growth rates that make them especially vulnerable to DNA damage. They also have a longer lifetime exposure to this new pervasive radiation than any previous generation.
As the expert panel stated, research shows that radiation from cell phones and Wi-Fi has already been shown to cause diminished reaction time in children, decreased motor function, increased distraction, hyperactivity and inability to focus on complex and long-term tasks.

In one controlled study, researchers from Yale University positioned a cell phone above a cage of pregnant mice. The phone was transmitting an uninterrupted active call for the entire 17 days of gestation.

When the exposed offspring were later tested, they showed signs of ADHD, and reduced transmissions in the prefrontal cortex of the brain. It's widely known that children, due to their thinner skulls, smaller brains, softer brain tissue and far more rapidly dividing cells, are far more susceptible to damage from cell phone use than adults. This study clearly showed brain patterns are altered, with life long repercussions from brief prenatal exposures to microwave radiation.

Dr. Taylor indicated that there was a dose-response relationship found, and that disruption to the electrical signaling between neurons resulted in permanent changes in the way the brain is patterned that will carry forward into adulthood. The electrical signaling plays a major role in how the brain develops, which determines a lot of who we are as adults, he said, including "how we think and how we behave."

"This is the first experimental evidence that fetal exposure to radiofrequency radiation from cellular telephones does in fact affect adult behavior..." said Hugh Taylor, Professor and Chairman, Department of Obstetrics, Gynecology and Reproductive Sciences, Yale University.

Camilla Rees, MBA of ElectromagneticHealth.org, said Dr. Taylor encouraged the audience to appreciate that while we don't think of ourselves as being on the cell phone 24 hours a day, the cell phone is still emitting radiation 24/7 and impacting us if it is turned on and near us, day or night.

"It's not talking on the phone that matters, it's any time the phone is turned on," he said. Every 900 milliseconds, whether you are using the phone or not, your cell phone has a spike in radiation because it is looking for a signal from the tower..."

She summarized key impacts on children from cell phone and WiFi radiation drawn from the BioInitiative Report, the Mobilewise (UK) report on cell phone effects on children, Russian research overseen by the Chairman of the Russian National Committee on Non-Ionizing Radiation Protection, and the Yale report, "Cell Phones: Technology, Exposures, Health Effects."

Reference to the latest BioInitiative Report's (2012) section on possible EMF links to autism written by Harvard Professor Dr. Martha Herbert, who runs the Transcend Research Lab at Mass General, was also made. Dr. Herbert has said,

"EMF/RFR from wifi and cell towers can exert a disorganizing effect on the ability to learn and remember, and can also be destabilizing to immune and metabolic function. This will make it harder for some children to learn, particularly those who are already having problems in the first place."

"Powerful industrial entities have a vested interest in leading the public to believe that EMF/RFR, which we cannot see, taste or touch, is harmless, but this is not true."

Several panelists mentioned the new condition "Digital Dementia," increasingly being reported globally, where children are exhibiting signs of deterioration in cognitive abilities from overuse of internet technologies, thought to result from imbalanced development of the brain. The lesser cognitive function will also result from the RF/MW exposures, but researchers who are focused on 'overuse' have not been as aware of this factor.

More research is necessary here to ferret out how much of the behavioral and brain effects of technology overuse are coming from the RF/MW, or brain changing aspects use of the technology itself, and the resulting lesser human interaction and lower quality relationships.

An excellent new book by Raffi Cavoukian, renowned singer, children's champion and supporter of a commercial-free childhood, "#Light Web Dark Web," takes a deep philosophical look at society's unquestioning embrace of these technologies for children. It covers the health, privacy, safety, security, social, societal, mental health and addiction issues from children's use of social media and modern communications technologies. Raffi says we need to "act quickly to subdue the perils of InfoTech's shadow," and "to move the risk-benefit ratio in favor of the LightWeb."
In light of the growing evidence for harm to children and fetuses, Dr. Davis explained:

"The cell phone standards we use today for the 6.5 billion cell phones in the world were set 17 years ago and have never been updated, despite the fact that the users and uses of cell phones are very different now. And they've never been tested for their safety around children... We're in the midst of a huge experiment on ourselves and on our children..."

A whole generation of people has been unaware of the risks of wireless radiation, and have not been taking precautions. This is why public health officials are so concerned. There is already evidence that exposure to radiofrequency radiation in excess leads to disease. And exposures have grown dramatically in the last few years. Our grandchildren and children are "being used as lab rats in an experiment with no controls... that's what we are doing with cell phone and wireless radiation with our children today."

Frank Clegg, formerly CEO of Microsoft Canada, also commented on the adequacy of safety guidelines: Clegg said he is disappointed with industry, and regrets the lack of responsibility demonstrated by the technology sector in turning a blind eye to the biological realities of this radiation.

Nine Types of Cancer are Linked to Cell Phone Use

It was back in 2011 that the International Agency for Research on Cancer (IARC), a committee of 27 scientists from 14 different countries working on behalf of the World Health Organization (WHO), concluded that exposure to cell phone radiation is a "possible carcinogen" and classified it into the 2B category -- the same category as the pesticide DDT, lead, gasoline engine exhaust, burning coal and dry cleaning chemicals, just to name a few. The children's health expert panel explained that, as of 2013, there are nine types of cancer linked to cell phone use, including:

- Glioma (brain cancer)
- Acoustic Neuroma (tumor on acoustic nerve)
- Meningioma (tumor of the meninges)
- Salivary Gland Cancer (parotid gland in cheek)
- Eye Cancer
- Testicular Cancer
- Leukemia
- Thyroid Cancer
- Breast Cancer

The science connecting cell phone and Wi-Fi radiation is among the strongest there is, and children, again, are slated to bear the brunt of what could become a new epidemic of cell-phone and Wi-Fi-induced cancers. The panel reported:

"The latency period between cell phone use and brain cancer is thought to be 20 to 30 years. Brain cancer rates are double for people who've been using cell phones for 10 years or more, appearing on the side of the head where they hold their phones, and risks are 5x greater for children using cell phones under the age of 20 than those over the age of 50."

Fertility and Sperm Count May Be at Risk

Infertility rates have been on the rise in the US, and today's children may be even worse off than their parents if current trends continue. Several of the panel members focused on this issue, including studies that have found cell phone radiation can affect men's sperm count and the quality and motility of their sperm. One such study, published in PLoS One, found:

"RF-EMR [radiofrequency electromagnetic radiation] in both the power density and frequency range of mobile phones enhances mitochondrial reactive oxygen species generation by human spermatozoa, decreasing the motility and vitality of these cells while stimulating DNA base adduct formation and, ultimately DNA fragmentation. These findings have clear implications for the safety of extensive mobile phone use by males of reproductive age, potentially affecting both their fertility and the health and"
wellbeing of their offspring."

The panel further reported:

"There is a direct relationship between duration of cell phone use and sperm count decline. Sperm count is reduced by half in men who carry cell phones in their pants pockets for four hours per day. The motility of the sperm is also impaired. The testicular barrier, that protects sperm, is the most sensitive of tissues in the body, and is 100x more absorbent. Besides sperm count and function, the mitochondrial DNA of sperm are damaged 3x more if exposed to cell phone radiation.

...DNA mutations have been linked more to damage on the male side in research from Iceland, the assumption being that male sperm is more vulnerable than female eggs, which are more protected. Mutations increase with the age of the father, and more autism and schizophrenia increase with the age of the father."

EMF-Free Zones Should Be Available for Pregnant Women and Children

The weight of the evidence clearly supports the need for Wi-Fi-free or low-Wi-Fi areas where pregnant women or those hoping to conceive, children and others sensitive to EMFs, can be protected, according to the panel.

The European Council has already taken the exemplary step of recommending that mobile phones and wireless networks get banned in classrooms and schools, according to Dr. Davis, and the Turkish government is launching a campaign to educate pregnant women and young men of reproductive age about the safety risks of cell phone radiation. Rajasthan India has banned cell towers on or near schools. The Israeli Health Ministry has issued a report recommending against Wi-Fi in schools, on the basis that not enough is known about its chronic exposure. It has been shown, however, that increasing numbers of people think and learn better in locations that are free of cell phones, wireless devices and other forms of EMFs.

The Israeli Supreme Court in July ordered the Israeli government to investigate how many Israeli students are suffering from electrosensitivity in response to a brief claiming that it is unreasonable to expose children to WiFi when it is proven to cause sickness. The Government must submit the result of its investigation, supported with a sworn affidavit, to the court by November 16, 2013. Israel Minister of Health Rabi Yaakov Litzman wrote to the Minister of Education saying:

"I do fear that there will come a day that we will all cry because the irreversible damage that we, in our own hands cause the future generation."

The panel noted that ‘extreme caution’ is advised for pregnant women and women hoping to conceive:

"Prenatal exposure results in fewer cells in the hippocampus of the brain, the area we need for thinking, reasoning, judgment and significantly impairs the development of neurons in the brain... Some of the most profound effects in children from in utero EMF exposure are emotional and behavioral."

Around the world, many countries are already adopting the Precautionary Principle regarding cell phone use, and this is also what the panel recommended. Russian officials have issued the recommendation that all children under the age of 18 should avoid using cell phones entirely. The UK, Israel, Belgium, Germany, India, France and Finland also urge citizens to err on the side of caution with respect to their children’s use of cell phones. Panel member Martin Blank, PhD said:

"The precautionary principle is in order here – certain precautions should be taken as a result of the risk that’s been identified. That’s the reason we have seat belts in cars... not because every car is going to crash, but because we want to minimize the damage when they do."

Safety Recommendations for Cell Phone and Wi-Fi Use

The cell phone industry is one of the fastest growing and strongest global industries in the world today and is even stronger than the pharmaceutical industry. As a multi-trillion dollar industry that funds media around the world they are capable of making sizable political donations and persistent lobbying efforts that dictate government policies, and that also influence science carried out at universities and prominent cancer institutes.

So while cell phone dangers will one day likely be as well known as tobacco dangers, there’s going to be a window when people are extremely vulnerable. And that window is right now. Children are especially vulnerable to damage from cell phone radiation, and should not use them at all (or only for very limited amounts). Men and women who want to have..."
Children, Fetuses and Fertility at Risk? | Marion Institute

healthy children need to take special precautions to protect their reproductive organs and should not keep phones in their front pockets or close to their abdomens.

In the US, public warnings are not yet commonplace, but it’s still important to protect yourself – and your children. There is plenty of science showing harm to warrant taking action now.

The panel advised:

- **Children should not play with radiating cell phones.** Young children should not use cell phones except in an emergency. While you can put the phone in ‘airplane mode,’ which disconnects it from Wi-Fi and the Internet, the cell phone still emits magnetic fields from the battery, which have also been shown to have equally important biological consequences.

In no cases should children sleep with cell phones.

Extreme caution was advised for pregnant women or women hoping to conceive due to the profound long-term impact of environmental factors.

- **Limit or eliminate Wi-Fi exposures. If you have a Wi-Fi router make sure your router is a low power version, not in a high-use area and keep it turned off as much as possible.** Consider putting it on a timer so it is only available during certain hours, and never during sleeping hours.
- **Schools should not have Wi-Fi.** Cabled/wired connections do not pose the same risks. If there is Wi-Fi, again, it should be limited to the time when the Wi-Fi is specifically needed and not be operating at other times. Ideally, classrooms and school libraries and gyms should be WiFi-free.
- **Resume using landline phones whenever possible.** Get rid of your portable phone and use your landline. At the very least, don’t keep your cell phone in your bedroom while you sleep. Be aware even landline phones emit magnetic fields from the speaker, and sensitive people can sometimes feel them, especially on long calls and particularly when using trim phones. Old-fashioned desk phone earpieces offer a greater distance between the speaker and your ear that can make a meaningful difference.
- **Keep your cell phone away from your body.** Avoid keeping it in your pocket or on your belt. If you’re pregnant, keep your cell phone away from your belly. Keep your phone at the other end of the room or on the seat of the car. Use texting more than talking. A cell phone case for the iPhone is available that filters out a significant portion of radiation (but by no means all the power and frequencies and other biologically disruptive signal characteristics also remain). There are several options for shielded cellphone cases and holsters at www.EMFSafetyStore.com.
- **Use a wired earpiece or headphones with cell phones.** Like with landline phones, some people are impacted by the magnetic fields from the speaker in the ear buds, so choose a model with the greatest distance from your ear, or use air tube technology with no electronics near your ear.
- **Use caution using your cell phone in your car.** Signals bounce around inside your vehicle, and your head is the antenna.
- **Opt-out of new utility meters called ‘smart meters.’** Prevent smart meters from being installed in your home whenever possible.
- **Avoid using wireless baby monitors,** as they all operate on microwave frequency. Look for the old wired monitors.
- **Know your exposures.** You or your community can purchase an RF meter for about $500 to measure the RF in homes, schools, churches, etc. See www.EMFSafetyStore.com.
- **Support labeling laws** that require cell phone manufacturers to list radiation levels in an obvious place on the packaging and at the retailer.

Learn more about this important topic by visiting the Biological Medicine Network.
Disclaimer:
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RCW 42.17.260(9) prohibits the release of lists of individuals requested for commercial purposes, and requestor expressly represents that no such use of any such list will be made by user or its transferee(s) or vendees(s).
"Commercial purposes" means contacting or in some way personally affecting the individuals identified on the list with the purpose of facilitating one's commercial activities.

Printed on: 7/8/2014

- TOWER LOCATION

DISTANCE FROM TOWER TO SCHOOL
Lesser EMF levels may still damage the foetus while not causing an actual miscarriage.

**Nutritionally Compromised Persons.** As with all biological stresses, EMF-induced stress does not occur in isolation. The cumulative effect of electromagnetic stress combines with other biological stresses and lifestyle factors.

Nutritional status almost certainly has an effect, either for good or otherwise, on the amount of cellular damage caused by electromagnetic radiation and on the extent to which the body can repair it.

**People who are already suffering from chronic degenerative conditions.** If you are sick then your body is already using all its available energy to heal itself. It is unlikely to have much energy to spare for repairing the damage done by electromagnetic radiation.

Also consider that electromagnetic pollution may have been a contributing factor to your illness. If so, you may be dealing with an actual cause of your illness, not just its symptoms, when you reduce your exposure to electromagnetic pollution.

**EMF Health damage - High risk group #2**

These people are more likely to suffer EMF health effects than others, because of their heavy EMF exposure:

**Workers** are at risk if they work in close proximity to electrical machinery (e.g. computers including laptops, electric ovens, sewing machines).

People who work with very strong electromagnetic fields like welders, power line technicians, subway workers, cell phone network operating equipment technicians, electric train drivers and others like them, may be strongly at risk and should carefully follow all sound guidelines and safety procedures to reduce their electromagnetic exposure. Even so, they might incur less risk if they were able to change their trade.

**Appliance Users.** People who spend more than a few (ten?) minutes a day talking on a cell phone (pressed to their ear), or standing next to a microwave oven or other high-EMF electrical appliance (see **EMF Table**), especially if they do this every day for years.

**People who live in a high-EMF Neighbourhood.** Anyone who lives within range of electric power lines or cell phone towers for several (five?) years or more (and especially children). The range depends on the electromagnetic field strength and distribution pattern. Generally 400 metres or more seems to be a safe distance for most power lines. An **EMF meter** can determine the effective EMF strength at different times of the day. (There is no authoritative safe level, but I would not want to live so close to an electromagnetic source that I was subjected to a constant electromagnetic field of 0.3 milligauss or more).

It's worth noting that when the body is overwhelmed by too much electromagnetic radiation, health effects can occur many years later. For instance, exposure to power line EMF in childhood can predispose a person to certain types of cancer later in adult life, according to one study.
To: City of Mukilteo  
Community Development Director

Ref: City proposed Cell American Tower at 2605 Mukilteo Spwy.  
SEPA Application /Conditional Uses report clarifications

Dear Patricia Love,

This letter is to clarify some important information regarding SEPA and Conditional Uses application for American Cell Tower proposal and present you a several important reasons why the proposed American Tower is not a place to be.

The ref. property (Parcel B, lot 1 and lot 2) is part of 5 Acres subdivision plan which was provided by previous Owner with a subdivision Survey and Geotech Report. I own a Parcel A (lot 3 and lot 4), which is adjusted on south and west side of ref. proposed Tower site (parcel B). (Attachment A included)

The Survey/ Short Plat and GeoTech Report for Parcel A and parcel B (2506 Mukilteo Spwy./ ref. site) was provided by David Evans & Acco., dated Dec. 1999 (Attachment included).

1. The site is environmentally sensitive portions on the site (i.e., all of the property lying beyond the top of bluff designated Native Grown Protective Area (NGPA) per City approval letter.

The site is “Critical Area” lot 2 (location of proposed tower)”The top of the slope is very abrupt and extends down to Southwest at angles approaching 100% percent below lot 1 and lot 2 “there is evidence of instability on the lower portion of the slope on the proposed Lot 2” per Geotech Report dated December 1999.

“The failures noted in the vicinity of Lot 2 show indication of failure potentially migrating toward the top of the slope and thus warrant an extended setback for potential building pad location of 30’ ft. min. setback”. Pg.3 per Geotech.

The proposal is presenting 25’ setback from center of the tower instead of 30’ ft from tower footing as recommended per Geotech report pg. 3.

For 125’ feet height monopole tower with three tower legs the footing will be big and deep(350 SF with boring depth as 25’ ft) but per Geotech report pg. 3 “not extend to depth greater than 3’ ft. below the existing grade “, so any other structure than typical residential construction could be a major disturbance to trigger a land slide to whole Mukilteo bluff community.

As residents of Mukilteo Puget Sound Bluff we do not want any disturbance to slide zone to be on the national News like Whidbey Island or OSO slide.
2. By Washington Department of Fish and Wildlife and per City approval letter this parcel (included proposed site) is adjusted to several of six known nest sites within 400’ ft. The eagle nest trees are all located the ravine areas as a Native Grown Protection Area (NGPA).

FACTORS CONSIDERED: Bald eagle habitat use was considered by analysis of territory integrity thought time, current surrounding habitat conditions, current status of the bald eagle population and scientific literature considering bald eagle habitat protection. (See page 7 included)

Studies have been conducted on impacts of tower electromagnetic radiation on migratory birds, including eagles.

(See Atachment C)

As citizens of Mukilteo, we want to protect City’s Critical Areas and Wildlife Habitat;

3. Our main concern is Human Health HAZARD. The site is situated in the middle of high density rural area in the town of Mukilteo which is famous for family oriented people.

The proposed American Tower is within appr. 200’ distance to the OLYMPIC Middle SCHOOL east of proposed ref. site and to nearest Residence on both sides (appr. 77’ and 140’) and other numerous single family residence and condos on east and on the west adjusted to National Grown Protective Area as preserve bald eagle habitat in the ravine.

School Boards and Parents should be aware of the above DANGERS.

It’s been clearly shown that microwave radiation penetrates the head of a child much easier than of an adult. This is due to the thinner and softer bones in the head of child. Skull bones don’t fully garden until age 22. Children should be not a subject to non-Ionizing Radiation when science has proven there could clearly be devastating effects.

The moratorium is needed to protect City of Mukilteo residents until reasonable minimum distance of protection from a cell phone tower to the SCHOOL and human habitat.

The proposed site is not for zoned for above ref. hazard activity. We can not resin or build houses next to lot who lease for commercial uses with a Health Hazard.

Surrounding area is not in the passive use (as indicated in the Application). We can not call the School Children and their future as a passive use. The adjusted site is 2 lots development and less ¼ mile south a development side with 28 buildings under construction.
The City of Mukilteo is top 10th places to live in (per CNNMoney.com). Mukilteo happens to be drop-dead gorgeous, with views of Puget Sound, the Olympic Mountains, and the Cascades. More reason to love it: TOP-NOTCH SCHOOLS. The nice town of Mukilteo is all about good life, safety and health of our next generation.
I am Puget Sound Bluff property owner of the ref. property. I do paying my property taxes (10K appr.) to have a safe, hazard free living, to enjoy a gorgeous view of Puget Sound and Olympic Mountains View, wild life and eagle habitat.

PLEASE:
Do NOT allow to erect the tower.
Do Not let KIDS leave the SCHOOL.
Do NOT let the people to leave the City.
Do NOT let destroy the human inhabitants.
Do Not let destroy a sensitive Bluff and Wildlife Habitat
Do NOT let ruin the architectural continuity of the site
Do NOT destroy property values.
Do NOT jeopardizing future of Mukilteans

Property owners are increasingly erecting cell phone towers or antennas because cell phone companies are willing to pay rental fees of thousands of dollars a month. But at what cost to the public’s health or kids health and safety living environmental.
I found deeply disturbing data that makes me wonder why the public is not being informed about health risks- and why our government seems intent on covering up troubling truth.

The American Tower and AT&T Wireless Communication Facility would cause irreparable and irreversible harm to a large developing neighborhood

We are residents of Mukilteo Puget Sound Bluff Community asking The City of Mukilteo to protect and enhance the City’s Critical Areas, Habitats and Shoreline Zones to support wildlife of great City of Mukilteo, to provide its citizens with a good place to live shop and play.
Thank you.

Truly Yours,
Lana Zenkina, the adjusted neighbor
Lzenkina@yahoo.com
(425)280-3497
7602 Mukilteo Speedway
Mukilteo, WA 98275
**Self-Supporting Towers:** For self-supporting towers, the number of borings depends on the width of the tower face and the type foundation used. The chart below summarizes the general recommendations.

<table>
<thead>
<tr>
<th>Foundation</th>
<th>Face Width</th>
<th>Borings</th>
<th>Depth (see note)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drilled pier</td>
<td><em>6'-25'</em></td>
<td>1</td>
<td>25+</td>
</tr>
<tr>
<td>Drilled pier</td>
<td>*25+</td>
<td>1 at each leg</td>
<td>25+</td>
</tr>
<tr>
<td>Pier &amp; pad</td>
<td><em>6'-25'</em></td>
<td>1</td>
<td>25+</td>
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<tr>
<td>Pier &amp; pad</td>
<td>*25+</td>
<td>1 at each leg</td>
<td>25+</td>
</tr>
<tr>
<td>Mat</td>
<td>All</td>
<td>1 at each leg</td>
<td>25+</td>
</tr>
</tbody>
</table>

* Not recommended for a width less than 6'-0"

**Note:** The type of foundation the geotechnical engineer recommends will influence the depth of the borings. A minimum boring depth of 25 is required. The depth should be varied if the recommended depth of 25 feet will not provide the required resistance. It is common to have a boring extend to a depth of 30 to 50 feet so that the drilled pier can be founded on a solid soil or rock layer.

A drilled pier foundation is usually best for towers with faces of 6 feet wide or larger providing the site may be economically reached by drilling equipment. (top)
The City of Mukilteo has issued a Mitigated Determination of Non-significance (MDNS) under the State Environmental Policy Act Rules (Chapter 197-11 WAC) for the following project:

**DESCRIPTION OF PROPOSAL:** Preliminary Short Plat to subdivide a 159,225 sq. ft. parcel into two (2) lots. The proposed lots are as follows: Lot 1 at 1,248 sq. ft. and Lot 2 at 104,892 sq. ft. The property is zoned Single Family Residential (RD 7.5).

**PROJECT NAME:** Zenkina Short Plat

**PROPOINENT:** Svetlana Zenkina

**LOCATION OF PROPOSAL:** Portion of Lot 37, West & Wheeler’s Sea View 5 Acre Tract, otherwise known as 7602 Mukilteo Speedway, Mukilteo, Washington.

**LEAD AGENCY:** City of Mukilteo

The lead agency for this proposal has determined that it does not have a probable significant adverse impact on the environment if the following mitigation measures are followed.

**DOCUMENTS INCORPORATED BY REFERENCE:**

In order to evaluate proposed actions, alternatives, or environmental impacts, an agency may use previously prepared environmental documents when issuing an environmental threshold determination (WAC 197-11-600 & 635). The Zenkina Short Plat has been compared to the following documents for consistency:


**MITIGATION MEASURES**

Issued in accordance with the substantive authority described in Mukilteo Municipal Code 17.84.160.


2. A comprehensive erosion and sedimentation control plan to ensure appropriate on-site and off-site water quality control shall be developed and implemented for all construction activities. The best management practices outlined in the 1992 DOE Stormwater Management Manual for the Puget Sound Basin shall be incorporated into the design. The plan shall include the following elements:

   - Exposed soils shall be stabilized and protected with straw, hydro-seeding or other appropriate materials to limit the extent and duration of exposure and
December 16, 1999

Ms. Alice Merrill
694 Sausalito Blvd.
Sausalito, CA 94965

SUBJECT: GEOTECHNICAL REPORT FOR THE ALICE MERRILL SHORT PLAT

Dear Ms. Merrill:

Enclosed is David Evans and Associates, Inc. (DEA)’s geotechnical report for the development of the proposed Alice Merrill Short Plat located at Mukilteo Speedway Mukilteo, Washington.

This report summarizes our conclusions drawn from the subsurface evaluation and provides recommendations for foundation design and development of the proposed short plat. The shallow subsurface investigation revealed that the site is underlain by a thin layer of topsoil, and underlain by a very dense glacial till capable of supporting the anticipated loads of residential construction. However, there is evidence of instability on the lower portion of the slope on the proposed Lot 2 at the northwest end of the project area. The noted instability will require that the setback from the top of the slope be a minimum of 30 feet. The remaining lots to the southeast appear to have similar conditions, though less steep, and should also adhere to the 25 foot setback requirement. Following the recommendations in this report will produce a site suitable for the proposed development.

We thank you for the opportunity to prepare this report and look forward to working with you during the construction of the project. If you have any questions, please call us at (253) 922-9780.

Sincerely,

DAVID EVANS AND ASSOCIATES, INC.

Matthew A. Miller, P.E.
Geological Engineer

PROPOSED TOWER SITE AT 2605 MUKILTEO SP.
Introduction
This report contains the results of the geotechnical investigation performed by David Evans and Associates, Inc. (DEA) at the site of the proposed Alice Merrill Short Plat in Mukilteo, Washington (Figure 1). The evaluation was performed in accordance with the scope of work authorized in June 1999, which included an evaluation of the site by visual reconnaissance and shallow test pits.

Figure 1: Vicinity Map

During the investigation, potentially unstable slopes were identified along the southwestern side of the property. There is a recent failure as well as older healed scars on the lower portion of the slope indicating past instability. Also noted on the lower slope was a seep line where groundwater continually emits from the slope that is likely related to the noted instability.

The failures noted on the lower portion of the slope could potentially cause disturbance beyond the top of slope noted on the drawing and therefore a 25 foot setback will be required. Foundations on the lots may be placed upon the dense to very dense soils found at shallow depths provided the setbacks are followed.

Project Description
The proposed development plan includes the creation of a four-lot short plat along the south side of Mukilteo Speedway. The four lots range in size from approximately 22,500 square feet to 38,275 square feet. They are roughly rectangular in shape and extend to the southwest from Mukilteo Speedway.

Site Description
The site of the proposed Alice Merrill Short Plat is located southeast of and including the current residence of 2605 Mukilteo Speedway. The current residence is at the northwest end of the proposed short plat and is setback from the top of the slope approximately 8 feet. At this time the property is all one lot. The proposal will divide the property into four lots, with Lot 1 being the exiting residence at the northwest end.

From Mukilteo Speedway the property begins approximately 50 feet from the edge of the pavement. At the base of the roadway embankment the topography is relatively level with a gentle slope to the southwest from the base of the embankment to the top of a slope located between 60 and 120 feet away. The top of the slope is very abrupt and extends down to the southwest at angles approaching 100 percent below lots 1 and 2. The slope angle below lots 3 and 4 are slightly less but still greater than 60 percent.
Vegetation in the area is heavy with blackberries, ivy, salal and other weeds. Also included in the vegetation are large fir trees and numerous vine maple and alder. The larger trees on the site especially the ones located at the top of and on the slope are an indicator of the history of the slope, thus giving an indication of its stability. The larger trees (up to 36 inches) along the top of the slope are stable with no indications of lateral movement. There are numerous trees on the lower slope however, which are leaning into and away from the slope. There are also trees with pistol butted trunks. All of these conditions are indications of recent and long-term movement no the lower slope associated with the colluvium and the seep.

Site Evaluation

Site Reconnaissance
On June 17, 1999, a DEA geological engineer performed a visual surface reconnaissance of the property and identified numerous failures that had occurred on the lower slope, in the area of Lot 2. Further to the southeast there are also surface failures on the slope however they appear to be older and have grown over.

Further evaluations including a shallow hand excavation were performed on July 30, 1999. The failures noted on the lower slope of Lot 2 were mapped and further evaluated. The largest failure is a large scarp with a near vertical backwall approximately 30 feet high. At the base of the failure is a seep, which appears to be the cause of the failure. Along the southeast flank of the largest failure is another one slightly smaller but with the same attributes.

The exposed soil in the failed area consists of a very dense glacial till from the top of the exposure to a depth of approximately 20 feet. Along the lower slope of the failure with a vertical contact and horizontal bedding is a medium dense silt. It is likely that the failure occurred along this contact of the two soil units.

Subsurface Conditions
During the investigation, three predominant soil horizons we encountered. There is a topsoil layer over the entire area back from the top of the slope, which is underlain by a very dense silty sandy gravel known locally as glacial till. On the lower slope there also appears to be a terrace that was overridden by the till which consists of a medium dense silty sand. It is likely that the contact between the two is the point of weakness on the slope, and a point of groundwater migration.
Site Preparation

Building Areas

In general, the vegetated areas within the building pad should be stripped prior to the placement of foundations or structural fill. The topsoil and vegetation should be removed from the site or stockpiled and used in landscaped areas, if needed. It is anticipated that the topsoil depth will be 6 to 10 inches.

The surface of the till when encountered should not require any further preparation prior to the placement of the footings, unless precipitation during the excavation disturbs the surface. If groundwater seepage or precipitation disturbs the surface, crushed rock may be required to stabilize it and create a solid pad for the placement of the foundation.

We recommend that the clearing of the lots be limited to the building pads and the access driveways to minimize the potential for erosion and further instability. The area within the setback should not be disturbed unless replaced with vegetation that will enhance the stability of the slope. Furthermore there shall be no fill placed within the setbacks either temporary or permanent.

Excavation Considerations

Conventional hydraulic excavators should be able to excavate the foundation area for the structure. Stability of the excavation sidewalls should be considered by the contractor when planning the construction sequence. Excavation slope stability is the function of many factors, including the following:

- the presence and abundance of groundwater,
- the type and density of the soil strata,
- the depth of the cut,
- the surcharge loading adjacent to the excavation, and
- the length of time the excavation remains open.

It should be the responsibility of the contractor to maintain safe slope configurations since the contractor is continuously on-site. It may be necessary to cover the sides of temporary slopes with plastic or otherwise protect them from the elements to minimize sloughing and erosion. All temporary excavations should be shored or sloped back at one horizontal to one vertical (1H:1V).
Structural Fill

It is not anticipated that structural fill will be necessary during the course of the project. However, if needed, the suitability of soil to be used for structural fill depends upon the gradation, the amount of organics, and the moisture content of the soil when it is placed. Clean, granular fill should consist of well-graded sands or sand and gravel containing less than 5 percent fines, based upon that fraction passing the U.S. Standard No. 200 sieve.

All structural fill material should be placed in maximum 12-inch lifts and compacted to 95 percent of maximum dry density (MDD) according to ASTM D-1557 Modified Proctor method. We recommend that a representative from a qualified testing lab be on-site to monitor the placement of the fill and verify that the required compaction is achieved. Compaction tests should be performed at a frequency of one test per lift per 2,500 square feet, or 500 lineal feet of trench. Due to the elevation of the water table, it may be difficult to place the structural fill at the base of the excavation. Stabilizing the base with crushed rock placed at the first lift of the structural fill may be necessary.

Foundation Support

Based upon the results of the subsurface exploration, it appears that after the cut is made for the shallow foundations they may be placed upon the dense glacial till which has adequate bearing capacity.

Footings

The following criteria should be utilized in the design of the conventional spread footings:

Maximum allowable bearing capacity: 3000 psf
Friction against sliding: 0.35

A one-third increase in allowable bearing capacity may be assumed in the design for short-term loads such as a seismic event or wind loading. We recommend that the soils engineer inspect all footing and pier excavations prior to concrete placement to assure bearing capacity and that the conditions of the excavation are as anticipated.

Seismic Considerations

Construction should be in accordance with current Uniform Building Code (UBC) related to potential seismic loading for the region. The property is located within the Puget Sound region that has been classified as a Zone 3 seismic area. According to Table 16-J of the 1997 UBC (Appendix), the soils should be classified as Sc.
Conclusion
We recommend that DEA be retained throughout the planning process until the plans are finalized and throughout the construction sequence to monitor site conditions.

Limitations
The information presented in this analysis has been prepared using generally accepted geologic and engineering practices in use at the time of our investigation. The use of the recommendations contained in this report for the proposed development assumes no warranty expressed or implied for the geologic and soil conditions described. The information presented is applicable to the subject property only. It is expected that the on-site soil conditions will reflect our findings, however, some variations may occur. Should conditions be encountered that cause concern and/or are not discussed herein, DEA should be contacted to re-examine the conditions encountered with regard to the proposed development.
WASHINGTON DEPARTMENT OF FISH AND WILDLIFE
16019 Mill Creek Blvd  Mill Creek, Washington 98012  (425) 775-1311 FAX (425) 338-2323

RCW 77.12.655
WAC 232-12-292

EAGLE SITE: Mukilteo #905

<table>
<thead>
<tr>
<th>Applicant</th>
<th>Site Location</th>
<th>Pending</th>
</tr>
</thead>
<tbody>
<tr>
<td>Svetland Zenkina</td>
<td>Parcel 006116000003700</td>
<td>Short plat, residential development</td>
</tr>
<tr>
<td>1430 W Casino Rd 322</td>
<td>T28N R04E S09</td>
<td></td>
</tr>
<tr>
<td>Everett, Wa 98204</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

BACKGROUND/JUSTIFICATION
This parcel is adjacent to several of the six known nest sites of the Mukilteo territory. The parcel has frontage on Mukilteo Speedway, but approximately 2/3 of the parcel is in a ravine. The eagle nest trees are all located in the ravine. The short plat proposal for this parcel includes setting aside the ravine area as a Native Growth Protection Area (NGPA: Figure 1). This will provide continued protection of the bald eagle habitat in the ravine while allowing the property to be developed.

ACTORS CONSIDERED
1) Landowner goals were considered through plans received Aug 31, 2005, 2005.

2) Bald eagle habitat use was considered by analysis of territory integrity through time, current surrounding habitat conditions, current status of the bald eagle population and scientific literature concerning bald eagle habitat protection.

CONDITIONS
The following condition(s) apply to protect bald eagles and their habitat.

1) Within the NGPA (Figure 1), retain all native vegetation. No trees may be cut or killed. Invasive non-native species (ivy, etc) may be removed, and their removal is encouraged.

2) Outside the NGPA, no restrictions on vegetation removal. No timing restrictions apply.

DURATION OF PROTECTION
This Plan applies to the landowner who signs the Plan. Since eagles return to the same traditional use areas each year, the conditions of this Plan shall apply indefinitely, unless a breeding territory has been unoccupied for 5 consecutive years. Please contact WDFW if the eagles change the location of their nest. Do not assume that the conditions of this Plan no longer apply.

REVIEW AND AMENDMENT
This Plan will be subject to the following review and amendment procedures. The Plan may be reviewed periodically by the Department and the landowner to determine whether: 1) the Plan requires amendment in response to changing eagle and landowner circumstances; or, 2) the terms of the Plan comply with applicable laws and regulations; or, 3) the parties to the Plan are complying with its terms.
300+ Days A Year
HIGH INCIDENCE OF FOR
IN THIS LOCATION

PICTURE WAS TAKEN ON JULY 15, 2014

CITY OF MUNILIO
JUL 18, 2014
RECEIVED
In Reply Refer To: (ER 14/0001) (ER 14/0004).

Mr. Eli Veenendaal
National Telecommunications and Information Administration
U.S. Department of Commerce
1401 Constitution Avenue, N.W.
Washington, D.C. 20230

Dear Mr. Veenendaal:

The Department of the Interior (Department) has reviewed the above referenced proposal and submits the following comments and attachment for consideration. Because the First Responder Network Authority (FirstNet) is a newly created entity, we commend the U.S. Department of Commerce for its timely proposals for NEPA implementing procedures.

The Department believes that some of the proposed procedures are not consistent with Executive Order 13186 Responsibilities of Federal Agencies to Protect Migratory Birds, which specifically requires federal agencies to develop and use principles, standards, and practices that will lessen the amount of unintentional take reasonably attributed to agency actions. The Department, through the Fish and Wildlife Service (FWS), finds that the proposals lack provisions necessary to conserve migratory bird resources, including eagles. The proposals also do not reflect current information regarding the effects of communication towers on birds. Our comments are intended to further clarify specific issues and address provisions in the proposals.

The Department recommends revisions to the proposed procedures to better reflect the impacts to resources under our jurisdiction from communication towers. The placement and operation of communication towers, including un-guyed, unlit, monopole or lattice-designed structures, impact protected migratory birds in two significant ways. The first is by injury, crippling loss, and death from collisions with towers and their supporting guy-wire infrastructure, where present. The second significant issue associated with communication towers involves impacts from non-ionizing electromagnetic radiation emitted by them (See Attachment).

In addition to the 147 Birds of Conservation Concern (BCC) species, the FWS has listed an additional 92 species as endangered or threatened under the Endangered Species Act. Together with the bald and golden eagle, this represents 241 species of birds whose populations are in trouble or otherwise merit special protection, according to the varying criteria of these lists. The Department suggests that FirstNet consider preparing a programmatic environmental impact statement (see attachment) to determine and address cumulative impacts from authorizing FirstNet projects on those 241 species for which the incremental impact of tower mortality, when
added to other past, present, and reasonably foreseeable future actions, is most likely significant, given their overall imperiled status. Notwithstanding the proposed implementing procedures, a programmatic NEPA document might be the most effective and efficient method for establishing best management practices for individual projects, reducing the burden on individual applicants, and addressing cumulative impacts.

Categorical Exclusions
The Department has identified 13 of the proposed categorical exclusions (A-6, A-7, A-8, A-9, A-10, A-11, A-12, A-13, A-14 A-15, A-16, A-17, and A-19) as having the potential to significantly affect wildlife and the biological environment. Given this potential, we want to underscore the importance of our comments on FirstNet’s procedural guidance under Environmental Review and Consultation Requirements for NEPA Reviews and its list of extraordinary circumstances in Appendix D.

Environmental Review and Consultation Requirements for NEPA Reviews
To ensure there are no potentially significant impacts on birds from projects that may otherwise be categorically excluded, the Department recommends including the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act to the list of requirements in this section.

Extraordinary Circumstances
To avoid potentially significant impacts on birds from projects that may otherwise be categorically excluded, the Department recommends including species covered under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act to the list of environmentally sensitive resources. Additionally, adding important resources to migratory birds such as sites in the Western Hemisphere Shorebird Reserve Network and Audubon Important Bird Areas to the paragraph on areas having special designation or recognition would help ensure their consideration when contemplating use of a categorical exclusion.

Developing the Purpose and Need
The Department recommends inclusion of language that would ensure consideration of all other authorities to which NEPA is supplemental as opposed to simply the FirstNet mission. As currently written, the procedures are limited to ensuring the purpose and need considers the FirstNet mission. If strictly applied, this approach would severely limit the range of reasonable alternatives, and likely preclude consideration of more environmentally benign locations or construction practices.

Environmental Review Process, Apply NEPA Early in the Process, Where Action is by Non-Federal Entity
The Department recommends that FirstNet be required to coordinate with federal agencies having jurisdiction by law or special expertise on construction and lighting of its network of towers.
Thank you for the opportunity to comment on the draft document. If you have any questions concerning the comments, please contact Diana Whitington, NEPA Migratory Bird lead, at (703) 258-2010. If you have any questions regarding Departmental NEPA procedures, contact Lisa Treichel, Office of Environmental Policy and Compliance at (202) 208-7116.

Sincerely,

Willie R. Taylor
Director, Office of Environmental Policy and Compliance

Enclosure
Disclaimer:
Neither Snohomish County nor the Department of Planning and Development Services warrants the accuracy, reliability or timeliness of any information contained herein and shall not be held liable for losses caused by using this information. Portions of this information may not be current or accurate. Any person or entity who relies on any information obtained from this system, does so at his or her own risk. All critical information should be independently verified.

RCW 42.17.260(9) prohibits the release of lists of individuals requested for commercial purposes, and requestor expressly represents that no such use of any such list will be made by user or its transferee(s) or vendee(s). "Commercial purposes" means contacting or in some way personally affecting the individuals identified on the list with the purpose of facilitating one's commercial activities.

Printed on: 7/8/2014

- TOWER LOCATION

\[ \text{DISTANCE FROM TOWER TO SCHOOL} \]
reducing your electromagnetic radiation exposure will reduce your risk of becoming sick.

EMF Health damage - High risk group.

Given the same EMF exposure, some people are more likely to suffer EMF health effects than others, because of their own biology:

Children are particularly at risk for several reasons:
They are biologically more vulnerable - their skulls are thinner, their tissues - including their brains - are not fully developed.

Children will accumulate higher lifetime levels of radiation than older people because they have entered the world at a time when electromagnetic pollution levels are much higher than was the case when their parents were young.

Children are also at risk because they may not be able to control how much they use cell phones, how long they play on computers or watch TV and how close they sit to the screen.
The chart below summarizes the general recommendations for the foundation, face width, borings, and depth. *Not recommended for a width less than 6'-0".

<table>
<thead>
<tr>
<th>Foundation</th>
<th>Face Width</th>
<th>Borings</th>
<th>Depth</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drilled pier</td>
<td>6'-25'</td>
<td>1</td>
<td>25'+</td>
<td>PT</td>
</tr>
<tr>
<td>Drilled pier</td>
<td>25'+</td>
<td>1 at each leg</td>
<td>25'+</td>
<td></td>
</tr>
<tr>
<td>Pier &amp; pad</td>
<td>6'-25'</td>
<td>1</td>
<td>25'+</td>
<td></td>
</tr>
<tr>
<td>Pier &amp; pad</td>
<td>25'+</td>
<td>1 at each leg</td>
<td>25'+</td>
<td></td>
</tr>
<tr>
<td>Mat</td>
<td>All</td>
<td>1 at each leg</td>
<td>25'+</td>
<td></td>
</tr>
</tbody>
</table>

Note: The type of foundation the geotechnical engineer recommends will influence the depth of the borings. A minimum boring depth of 25' is required. The depth should be varied if the recommended depth of 25 feet will not provide the required resistance. It is common to have a boring extend to a depth of 30 to 50 feet so that the driller can found on a solid soil or rock layer.

Typical Self-Supporting Tower:

- Should be 30' setback minimum from end of pier and 3' max depth below exist grade.
- Not a 25' plus depth per geotech.
WILDLIFE AND BALD EAGLE HABITAT

BLUFF
100% STEEP SLOPE

BALD EAGLE EST (0 TOTAL)

WILDLIFE HABITAT

PUGET SOUND

300 FT

25 FT
2. The habitat of any State-listed Rare or Endangered Wildlife or Rare Plant Species;
3. Within 100' horizontally from any regulated wetland;
4. Within 200' horizontally of the Outer Riparian Zone of any river or
5. Within 500' horizontally from any Historic District;
6. Within 500' horizontally from any known archaeological site;
7. Within 1000' horizontally from any school buildings, playgrounds and athletic fields; and
8. Within 600' horizontally from any residential structure.

The proposed revision would read:

4920. Siting Criteria for Towers & WT Facilities
Installation and development of Cell Towers shall meet all pertinent Federal and State regulations including review by the National Heritage and Endangered Species Program. No Tower or WT Facility or Repeater shall be located within any of the following prohibited areas.
All distances are to be measured from the nearest property line of the Facility Site.
Whatever your present situation, the first step in reducing your electromagnetic radiation exposure is to minimize your risk of becoming sick.

EMF Health damage - High risk group #1

Given the same EMF exposure, some people are more likely to suffer EMF health effects than others, because of their biology:

Children are particularly at risk for several reasons. They are biologically more vulnerable - their skulls are thinner, their tissues - including their brains - are not fully developed.

Children will accumulate higher lifetime levels of radiation than older people because they have entered the electromagnetic environment at a younger age. Moreover, children are more likely to be exposed to electromagnetic radiation from multiple sources at the same time, including computers, cell phones, and TV screens.

Children are also at risk because they may not be able to control how much they use cell phones, how long they play on computers or watch TV and how close they hold the screen.

Pregnant women should be especially concerned when evaluating their risk from electromagnetic radiation. Developing embryos and fetuses may have magnified consequences for the child. Pregnant women should avoid electromagnetic exposure as far as possible.
J. The minimum distance from the base of the Tower, to be measured from the vertical center line of the monopole, to any property line or road right-of-way shall be at least 1.5 times the height of the Tower to ensure an adequate fall zone.

K. The Tower shall be located a minimum distance of 1,000 feet from school buildings, playgrounds and athletic fields. Towers shall be located at least 600 feet from any residential structures to minimize impact on RESIDENTIAL USES.

AMERICAN TOWER
125' FT.
EXIST. TREES 65' FT. MAX

200'
DISTANCE TO SCHOOL

OLYMPIC SCHOOL

7602 MUKILTEO SP. HOUSE SOUTH OF REF. TOWER

Non-ionizing radiation hazard sign
LOT 3, LOT 4

ZENKINA
PROPERTY 7602/7600

LEASER
PROPERTY

P.L.

30' FT. MAX. HEIGHT
RESTRICT.

7602 MUKILTEO

EXIST.

TREES
60' FT.

7600 MUKILTEO

500 X 500

LEASED AREA

LEASER
PROPERTY

HUGE FIG.

WEST OF MUKILTEO SPWY
**Tower Facts**

- Construction of communication towers (including radio, television, cellular, and microwave) in the United States has been increasing at an estimated 6 percent to 8 percent annually since development of the cellular telephone, and construction continues at a rate of approximately 1,000 towers per month. The Federal Communications Commission (FCC) currently estimated the total number of towers at approximately 120,000.
- Loss of migratory birds at communication towers is estimated at 4.5 million annually. Potentially impacted resources include bird species which are threatened or endangered and 124 non-game species of management concern.
- Lighted guy-wired towers taller than 199 feet above ground level (AGL), are particularly hazardous to migratory birds, especially night-nesting song birds. While lighting for towers taller than 199 feet AGL is required by the Federal Aviation Administration to avoid aircraft accidents, certain types of lighting may attract birds to the towers.
- Lighted towers are particularly hazardous during periods of poor visibility caused by low cloud ceilings, rain, snow, or fog.
- Documented cumulative losses of birds since 1955 number over 1 million.

**Other Related Sites:**

- [http://migratorybirds.fws.gov/issues/towers/towers.htm](http://migratorybirds.fws.gov/issues/towers/towers.htm)

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**United States Department of the Interior**

**FISH AND WILDLIFE SERVICE**

176 Ceghan Spa Road, Suite 200
Charleston, South Carolina 29407

U.S. Fish and Wildlife Service Clearance to Proceed with Communication Tower Projects

The U.S. Fish and Wildlife Service (Service) is one of two Federal Agencies responsible for the protection and conservation of Federal trust resources, such as threatened and endangered species and migratory birds, in accordance with the following Acts:

- Section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.) (ESA);
- Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d) (Eagle Act); and

5. If all possible, new towers should be sited within existing "antenna farms" (i.e., clusters of towers), in degraded areas (e.g., strip mines or other heavily industrialized areas), in commercial agricultural lands, in Superfund sites, or other areas where bird habitat is poor or marginal. Towers should not be sited in or near wetlands, other known bird concentration areas (e.g., state of Federal refuges, staging areas, rookeries, and Important Bird Areas), in known migratory, daily movement byways, areas of breeding concentration, in habitat of threatened or endangered species, or key habitats for Birds of Conservation Concern (FWS 2008). Disturbance can result in effects to bird populations which may cumulatively affect their survival. The Service has recommended some disturbance-free buffers for Ferruginous Hawks and Bald Eagles during nesting season, and 1-mi disturbance free buffers for Ferruginous Hawks and Bald Eagles during nesting season in Wyoming (FWS WY Ecological Services Field Office, referenced in Manville 2009, 2013). The effects of towers on "prairie grouse," "sage grouse," and "grassland and shrub Narragansett" prior to tower design, siting and construction, if it has been determined that a significant number of breeding, feeding and roosting birds, especially those of the Conservation Concern (FWS 2008), state or federally-listed bird species, and eagles are known to habitually use the proposed tower construction area, relocation to an alternate site is highly recommended. If this is not an option, seasonal restrictions on construction are advised in order to avoid disturbance,
WASHINGTON DEPARTMENT OF FISH AND WILDLIFE
BALD EAGLE MANAGEMENT PLAN
Short Plan for Clearing, Grading, Remodeling, and Single Home Construction
Not for Forest Practice Applications, Subdivisions, Short Plats, or Conversions
RCW 77.12.655, WAC 232-12-292

TERRITORY  Northwest-Mill Creek  Occurrence #  Nest #

ACTIVITY  Short Plat

CONDITIONS: The following conditions apply to the entire parcel or lot.

☐ CONDITION 1: This lot is within 400 feet of a bald eagle nest. Any construction or vegetation removal on this lot requires a site-specific Bald Eagle Management Plan. The landowner must contact and consult with the Washington Department of Fish and Wildlife (WDFW) prior to any clearing or construction. Contact the WDFW at (425) 379-2301.

☐ CONDITION 2: This lot occurs > 400 feet from a bald eagle nest but within a bald eagle management area. Retain all known perch trees and all conifers ≥24 inches diameter at breast height (d.b.h.). Retain all cottonwoods ≥20 inches diameter at breast height (d.b.h.). Also retain ≥50% of pre-clearing or pre-construction conifer stand with diameter distributions representative of the original stand, and hardwood/conifer ratios representative of the original stand (>6 feet tall). Windowing and low limbing of trees is acceptable provided no more than 30% of the live crown is removed. Topping of trees is not allowed.

Tract 37 of West & Wheeler's

I have read and understand the above condition(s) placed on Parcel  Seaview 5ac. located in the NW Quarter of SE Quarter of Section 9, Township 28, Range 4 (East/West meridian) with actual street address of 7602 Mukilteo Speedway. If the conditions set forth above are acceptable, please sign below and this will serve as your Bald Eagle Management Plan. Activities will be periodically monitored and failure to comply with this Plan constitutes a misdemeanor as set forth in RCW 77.15.130.

C. L. 8-1-05
County/City Planner Signature  (Date)

S. Lenkner  Aug 2, 2000
Landowner Name  (Print)

1430 W. CASINO  822
Street
EVERETT, WA 98204
City, State, Zip

(425) 485-7280-3497
Phone

Regional Wildlife Biologist

Send Copy To: WDFW
Wildlife Resource Data Systems
600 Capitol Way N
Olympia, WA 98501-1091
Fax: (425) 379-2323

County/City Short Plan: Oct 02, 2001
Whose health is at risk from EMF radiation?

Gauss meters
aaronia.com/rf-emf-meter
HighEnd Analyzer at low cost even show Frequency, Power and Limits

To a degree, everyone who is exposed to EM radiation bears an increased health risk. In fact it appears there is no safe level of electromagnetic radiation, either for low frequency (ELF & VLF) or Radio/Microwave fields.

For example, biological effects have been observed with low-frequency EMF (50/60 Hz) at levels as low as 0.2 mG, which is far lower than a typical urban dweller’s average exposure level.

But that doesn’t mean that we are all doomed to get sick. It means that we need to understand and manage our risk. The good news is that whatever your present EMF health risk category, reducing your electromagnetic radiation exposure will reduce your risk of becoming sick.

EMF Health damage - High risk group #1

Given the same EMF exposure, some people are more likely to suffer EMF health effects than others, because of their own biology:

Children are particularly at risk for several reasons. They are biologically more vulnerable - their skulls are thinner, their tissues - including their brains - are not fully developed.

Children will accumulate higher lifetime levels of radiation than older people because they have entered the world at a time when electromagnetic pollution levels are much higher than was the case when their parents were young.

Children are also at risk because they may not be able to control how much they use cell phones, how long they play on computers or watch TV and how close they sit to the screen.

Pregnant women should be especially conservative when evaluating their risk from electromagnetic fields because any cellular damage in a developing embryo may have magnified consequences for the child. They should avoid electromagnetic exposure as far as possible, by keeping away from high EMF sources and by minimising the duration of any electromagnetic exposure.

It has been demonstrated that pregnant women are at risk of miscarriage if they are subjected to high intensity EMFs during pregnancy. Miscarriage is an extreme (and tragic) response to a high level of EM radiation exposure.
Black body radiation

Black body radiation is radiation from an idealized radiator that emits at any temperature the maximum possible amount of radiation at any given wavelength. A black body will also absorb the maximum possible incident radiation at any given wavelength. The radiation emitted covers the entire electromagnetic spectrum and the intensity (power/unit-area) at a given frequency is dictated by Planck's law of radiation. A black body at temperatures at or below room temperature would thus appear absolutely black as it would not reflect any light. Theoretically a black body emits electromagnetic radiation over the entire spectrum from very low frequency radio waves to X-rays. The frequency at which the black body radiation is at maximum is given by Wien's displacement law.

See also

- Ionizing radiation
- Electromagnetic hypersensitivity
- Mobile phone radiation and health
- Electromagnetic radiation and health
- Wireless electronic devices and health
- Electronic harassment

References

Cellular Phone Towers

Cellular phone towers first became widely available in the United States in the 1990s, but since then their use has increased dramatically. The widespread use of cell phones has led to cell phone towers being placed in many communities. These towers, also called base stations, have electronic equipment and antennas that receive and transmit radiofrequency (RF) signals.

How do cellular phone towers work?

Cell phone base stations may be free-standing towers or mounted on existing structures, such as trees, water tanks, or tall buildings. The antennas need to be high enough so they can adequately cover the area. Base stations are usually from 50-200 feet high.

Cell phones communicate with nearby cell towers mainly through radiofrequency (RF) waves, a form of energy in the electromagnetic spectrum between FM radio waves and microwaves. Like FM radio waves, microwaves, visible light, and heat, they are forms of non-ionizing radiation. This means they cannot cause cancer by directly damaging DNA.

RF waves are different from stronger types of radiation such as x-rays, gamma rays, and ultraviolet (UV) light, which can break the chemical bonds in DNA.

At very high levels, RF waves can heat up body tissues. (This is the basis for how microwave ovens work.) But the levels of energy used by cell phones and towers are much lower.
When a person makes a cell phone call, a signal is sent from the phone's antenna to the nearest base station antenna. The base station responds to this signal by assigning it an available radiofrequency channel. RF waves transfer the voice information to the base station. The voice signals are then sent to a switching center, which transfers the call to its destination. Voice signals are then relayed back and forth during the call.

How are people exposed to the energy from cellular phone towers?

As people use cell phones to make calls, signals are transmitted back and forth to the base station. The RF waves produced at the base station are given off into the environment, where people can be exposed to them.

The energy from a cellular phone tower antenna, like that of other telecommunication antennas, is directed toward the horizon (parallel to the ground), with some downward scatter. Base station antennas use higher power levels than other types of land-mobile antennas, but much lower levels than those from radio and television broadcast stations. The amount of energy decreases rapidly with increasing distance from the antenna. As a result, the level of exposure to radio waves at ground level is very low compared to the level close to the antenna.

Public exposure to radio waves from cell phone tower antennas is slight for several reasons. The power levels are relatively low, the antennas are mounted high above ground level, and the signals are transmitted intermittently, rather than constantly.

At ground level near typical cellular base stations, the amount of RF energy is thousands of times less than the limits for safe exposure set by the US Federal Communication Commission (FCC) and other regulatory authorities. It is very unlikely that a person could be exposed to RF levels in excess of these limits just by being near a cell phone tower.

When a cellular antenna is mounted on a roof, it is possible that a person on the roof could be exposed to RF levels greater than those typically encountered on the ground. But even then, exposure levels approaching or exceeding the FCC safety guidelines are only likely to be found very close to and directly in front of the antennas. If this is the case, access to these areas should be limited.

The level of RF energy inside buildings where a base station is mounted is typically much lower than the level outside, depending on the construction materials of the building. Wood or cement block reduces the exposure level of RF radiation by a factor of about 10. The energy level behind an antenna is hundreds to thousands of times lower than in front. Therefore, if an antenna is mounted on the side of a building, the exposure level in the room directly behind the wall is typically well below the recommended exposure limits.

Do cellular phone towers cause cancer?

Some people have expressed concern that living, working, or going to school near a cell phone tower might increase the risk of cancer or other health problems. At this time, there is very little evidence to support this idea. In theory, there are some important points that would argue against cellular phone towers being able to cause cancer.

First, the energy level of radiofrequency (RF) waves is relatively low, especially when compared with the types of radiation that are known to increase cancer risk, such as gamma rays, x-rays, and ultraviolet (UV) light. The energy of RF waves given off by cell phone towers is not enough to break chemical bonds in DNA molecules, which is how these stronger forms of radiation may lead to cancer.

A second issue has to do with wavelength. RF waves have long wavelengths, which can only be concentrated to about an inch or two in size. This makes it unlikely that the energy from RF waves could be concentrated enough to affect individual cells in the body.

Third, even if RF waves were somehow able to affect cells in the body at higher doses, the level of RF waves present at ground level is very low - well below the recommended limits. Levels of energy from RF waves near cell phone towers are not significantly different from the background levels of RF radiation in urban areas from other sources, such as radio and television broadcast stations.

For these reasons, most scientists agree that cell phone antennas or towers are unlikely to cause cancer.

Studies in people

Very few human studies have focused specifically on cellular phone towers and cancer risk.

In one large study, British researchers compared a group of more than 1,000 families of young children with cancer against a similar group of families of children without cancer. They found no link between a mother's exposure to the
towers during pregnancy (based on the distance from the home to the nearest tower and on the amount of energy given off by nearby towers) and the risk of early childhood cancer.

In another study, researchers compared a group of more than 2,600 children with cancer to a group of similar children without cancer. They found that those who lived in a town that could have exposed them to higher than average RF radiation from cellular phone towers in the previous 5 years had a slightly higher risk of cancer, although not of any certain type of cancer (like leukemia or brain tumors). This study estimated the children's possible exposure based on the number of towers in their town and how strong the signals were from the towers. It did not look at actual exposure of any individual child based on how far their home or school was from a tower.

One study looked for signs of DNA and cell damage in blood cells as a possible indicator of cancer-causing potential. They found that the damage was no worse in people who lived near a cell phone tower as compared with those didn't.

The amount of exposure from living near a cell phone tower is typically many times lower than the exposure from using a cell phone. About 30 studies have looked at possible links between cell phone use and tumors in people. Most studies to date have not found a link between cell phone use and the development of tumors, although these studies have had some important limitations. This is an area of active research. For more information, see the document, Cellular Phones.

Studies done in the lab

Laboratory studies have looked at whether the types of RF waves used in cell phone communication can cause DNA damage. Most of these studies have supported the idea that the RF waves given off by cell phones and towers don't have enough energy to damage DNA directly.

Some scientists have reported that the RF waves may produce other effects in human cells (in lab dishes) that might possibly help tumors grow. However, these studies have not been verified, and these effects weren't seen in a study that looked at the blood cells from people living near a cellular phone tower.

Several studies in rats and mice have looked at whether RF energy might promote the development of tumors caused by cancer known carcinogens (cancer-causing agents). These studies did not find evidence of tumor promotion. Research in this area continues.

What expert agencies say

About cell phone towers

The 3 expert agencies that usually classify cancer-causing exposures (carcinogens) — the International Agency for Research on Cancer (IARC), the National Toxicology Program (NTP), and the US Environmental Protection Agency (EPA) — have not classified cell phone towers as to their cancer-causing potential.

The US Federal Communications Commission (FCC) has said this about cell phone towers near homes or schools:

“Radiofrequency emissions from antennas used for cellular and PCS (personal communications service) transmissions result in exposure levels on the ground that are typically thousands of times below safety limits. These safety limits were adopted by the FCC based on the recommendations of expert organizations and endorsed by agencies of the Federal Government responsible for health and safety. Therefore, there is no reason to believe that such towers could constitute a potential health hazard to nearby residents or students.”

About RF radiation

Some of the agencies that classify cancer-causing exposures have, however, made statements about radiofrequency radiation.

The International Agency for Research on Cancer (IARC) has classified RF fields as "possibly carcinogenic to humans," based on limited evidence of a possible increase in risk for brain tumors among cell phone users, and inadequate evidence for other types of cancer. (For more information on the IARC classification system, see our document, Known and Probable Human Carcinogens.) IARC also noted that exposure to the brain from RF fields from cell phone base stations (mounted on roofs or towers) is less than 1/100th the exposure to the brain from mobile devices such as cell phones.

The Environmental Protection Agency (EPA) states:
"Exposure to radio frequency (RF) radiation has climbed rapidly with the advent of cell phones and other wireless technologies. Studies of the link between exposure to RF and to electric and magnetic frequency (EMF) radiation have found RF and EMF to be 'potential carcinogens,' but the data linking RF and EMF to cancer is not conclusive. Worldwide, health physicists (scientists who study the biological effects of radiation) continue to study the issue."

Do cellular phone towers cause any other health problems?

High levels of RF waves can cause a warming of body tissues, but the energy levels on the ground near a cell phone tower are far below the levels needed to cause this effect. So far, there is no evidence in published scientific reports that cell phone towers cause any other health problems.

Can I limit my exposure?

Cell phone towers are not known to cause any health effects. But if you are concerned about possible exposure from a cell phone tower near your home or office, you can ask a government agency or private firm to measure the RF field strength near the tower (where a person could be exposed) to ensure that it is within the acceptable range.

What should I do if I've been exposed to cellular phone towers?

There is no test to measure whether you have been exposed to RF radiation from cellular phone towers. But as noted above, most researchers and regulatory authorities do not believe that cell phone towers pose health risks under ordinary conditions. If you have additional health concerns, you might want to talk with your doctor.

Additional resources

More information from your American Cancer Society

The following related information may also be helpful to you. These materials may be viewed on our Web site or ordered from our toll-free number, at 1-800-227-2345.

Cellular Phones

Does This Cause Cancer?

Known and Probable Human Carcinogens

Microwaves, Radio Waves, and Other Types of Radiofrequency Radiation

National organizations and Web sites*

In addition to the American Cancer Society, other sources of information and support include:

Environmental Protection Agency
Home page: www.epa.gov
Understanding radiation: www.epa.gov/radiation/understanding-radiation-overview.html

Federal Communications Commission
RF Safety Program, Office of Engineering and Technology
Web site: www.fcc.gov/bureaus/rfsafety

Food and Drug Administration
Home page: www.fda.gov

National Cancer Institute
Toll-free number: 1-800-422-6237 (1-800-4-CANCER)
Home page: www.cancer.gov
Cellular telephone use and cancer risk: www.cancer.gov/cancertopics/factsheet/Risk/cellphones

National Institute of Environmental Health Sciences
Home page: www.niehs.nih.gov
Electric and magnetic fields: www.niehs.nih.gov/health/topics/agents/emf/index.cfm
Cell Phones

Under the law, FDA does not review the safety of radiation-emitting consumer products such as cell phones and similar wireless devices before they can be sold, as it does with new drugs or medical devices. However, FDA does have the authority to take action if cell phones are shown to emit radiofrequency energy (RF) at a level that is hazardous to the user. In such a case, FDA could require cell phone manufacturers to notify users of the health hazard and to repair, replace or recall the phones so that the hazard no longer exists.

Interagency Working Group

FDA belongs to the Radiofrequency Interagency Work Group. The federal agencies in this group have responsibility for different aspects of RF safety and work to ensure coordinated efforts at the federal level. The other agencies in this group are:

- National Institute for Occupational Safety and Health
- Environmental Protection Agency
- Federal Communications Commission
- Occupational Safety and Health Administration
- National Telecommunications and Information Administration

Federal Communications Commission

FDA shares regulatory responsibilities for cell phones with the Federal Communications Commission (FCC). FCC certifies wireless devices, and all phones that are sold in the United States must comply with FCC guidelines on RF exposure. FCC relies on the FDA and other health agencies on health and safety related questions about cell phones.

FCC also regulates cell phone base stations. These base stations operate at higher power than cell phones. The RF exposures people experience from base stations are typically much lower than from cell phones because base station antennas are mounted on towers or other building structures and are thus substantially farther away from the public. Both cell phones and base stations are required to comply with FCC RF exposure guidelines.

International Workgroup

For the past several years, delegations from Japan, Korea, the European Union, Australia, China, the World Health Organization, and the United States have met to discuss health concerns for wireless telecommunications. The purpose of these workshops has been to discuss scientific issues related to RF exposure from wireless communications technology from an international perspective. Specific topics addressed have included:

- health effects of emerging wireless technologies
Health Issues

Do cell phones pose a health hazard?

Many people are concerned that cell phone radiation will cause cancer or other serious health hazards. The weight of scientific evidence has not linked cell phones with any health problems.

Cell phones emit low levels of radiofrequency energy (RF). Over the past 15 years, scientists have conducted hundreds of studies looking at the biological effects of the radiofrequency energy emitted by cell phones. While some researchers have reported biological changes associated with RF energy, these studies have failed to be replicated. The majority of studies published have failed to show an association between exposure to radiofrequency from a cell phone and health problems.

The low levels of RF cell phones emit while in use are in the microwave frequency range. They also emit RF at substantially reduced time intervals when in the stand-by mode. Whereas high levels of RF can produce health effects (by heating tissue), exposure to low level RF that does not produce heating effects causes no known adverse health effects.

The biological effects of radiofrequency energy should not be confused with the effects from other types of electromagnetic energy.

Very high levels of electromagnetic energy, such as is found in X-rays and gamma rays can ionize biological tissues. Ionization is a process where electrons are stripped away from their normal locations in atoms and molecules. It can permanently damage biological tissues including DNA, the genetic material.

The energy levels associated with radiofrequency energy, including both radio waves and microwaves, are not great enough to cause the ionization of atoms and molecules. Therefore, RF energy is a type of non-ionizing radiation. Other types of non-ionizing radiation include visible light, infrared radiation (heat) and other forms of electromagnetic radiation with relatively low frequencies.

While RF energy doesn't ionize particles, large amounts can increase body temperatures and cause tissue damage. Two areas of the body, the eyes and the testes, are particularly vulnerable to RF heating because there is relatively little blood flow in them to carry away excess heat.

Related Resources

- Current Research Results
- No Evidence Linking Cell Phone Use to Risk of Brain Tumors

Page Last Updated: 08/08/2012

Note: If you need help accessing information in different file formats, see Instructions for Downloading Viewers and Players.
With the increasing number of applications for new communication towers, many municipal officials are aware of aesthetic and possible health concerns posed by these structures. Fewer may be aware that the towers often pose a serious hazard to migrating birds. Every spring millions of birds make the long journey from the tropics to breed and fill their ecological niches in North America. In the fall they must return again to the rich sources of food in Central and South America.

These journeys are already long and arduous. The increasing number of communication towers is an added, deadly obstacle course. Many migrating birds crash into the towers or their supporting structures and are killed. Ornithologists have been studying the effect of towers on migration for decades. Based on this well-documented history the United States Fish and Wildlife Service now estimates that at least four million birds—and possibly as many as 40 million—are killed every year at towers nationwide.

Since most birds migrate at night the largest threat is posed by lighted towers. When birds encounter lighted structures their nocturnal navigation systems can become disoriented. They circle the structure repeatedly, reluctant to leave the lighted area. The birds collide with the guy wires, or with the tower itself, or with each other. Many of the birds killed belong to species that are already in decline. The numbers and species known to be affected are probably only the tip of the iceberg.

Studies have been conducted at only a small minority of towers, and most bird carcasses are quickly scavenged by predators. While mortality may be low on some nights studied, it can reach drastic proportions under certain weather conditions, such as fog. In 1998 between 5,000 and 10,000 birds of a single species - Lapland Longspurs - were killed at one 420 foot tower in Kansas on one night. In New York kills over 1,000 birds on a single night have been documented at an 850 foot tower in Elmira.

Most studies have been conducted at towers over 500 feet, but any tower over 200 feet, and those within three miles of an airport are required to be lit by the Federal Aviation
WASHINGTON DEPARTMENT OF FISH AND WILDLIFE
BALD EAGLE MANAGEMENT PLAN
Short Plan for Clearing, Grading, Remodeling, and Single Home Construction
Not for Forest Practice Applications, Subdivisions, Short Plats, or Conversions
RCW 77.12.655, WAC 232-12-292

TERRITORY Northwest - Mill Creek
ACTIVITY Short Plat

CONDITIONS: The following conditions apply to the entire parcel or lot.

.condition 1: This lot is within 400 feet of a bald eagle nest. Any construction or vegetation removal on this lot requires a site-specific Bald Eagle Management Plan. The landowner must contact and consult with the Washington Department of Fish and Wildlife (WDFW) prior to any clearing or construction. Contact the WDFW at (425) 379-2301.

WASHINGTON DEPARTMENT OF FISH AND WILDLIFE
16018 Mill Creek Blvd Mill Creek, Washington 98012 (425) 775-1311 FAX (425) 338-2323

RCW 77.12.655
WAC 232-12-292

EAGLE SITE: Mukilteo #905
Applicant

Svetlan Zenkina
1430 W Casino Rd 322
Everett, Wa 98204

Site Location
Parcel 00611600003700
T28N R04E S09

Pending
Short plat, residential development

BACKGROUND/JUSTIFICATION
This parcel is adjacent to several of the six known nest sites of the Mukilteo territory. The parcel has frontage on Mukilteo Speedway, but approximately 2/3 of the parcel is in a ravine. The eagle nest trees are all located the ravine. The short plat proposal for this parcel includes setting aside the ravine area as a Native Growth Protection Area (NGPA: Figure 1). This will provide continued protection of the bald eagle habitat in the ravine while allowing the property to be developed.

FACTORS CONSIDERED
1) Landowner goals were considered through plans received Aug 31, 2005, 2005.

2) Bald eagle habitat use was considered by analysis of territory integrity through time, current surrounding habitat conditions, current status of the bald eagle population and scientific literature concerning bald eagle
1 Reference Documents

The following data was used to figure the noise level for the site.

<table>
<thead>
<tr>
<th>Data</th>
<th>Document</th>
<th>Author</th>
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<tbody>
<tr>
<td>Sound Power</td>
<td>ANSI/AHRI Standard 275</td>
<td>AHRI</td>
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<td>Power Calculation</td>
<td>Equipment Specification Sheet</td>
<td>Manufacturer</td>
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<td>Equipment Installed</td>
<td>Revised 100% Zoning Drawings</td>
<td>Glotel</td>
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<td>SPL Limits</td>
<td>Washington Administrative Code</td>
<td>State of Washington</td>
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2 Site Equipment Contributing to Environmental Noise

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<td>73</td>
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3 Adjacent Properties

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<tr>
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<th>Land Use Designation / Zoning</th>
<th>Distance from Source (ft)</th>
<th>Direction</th>
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<tr>
<td>611600003704</td>
<td>Residential</td>
<td>170</td>
<td>West</td>
</tr>
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Snohomish County Permit, Planning, and Zoning Map
Distances are from equipment most near adjacent property line
Area shaded in red denotes extent of Project Site Map (below). Blue line is the 20,000-foot boundary specified in federal regulations, Title 14 CFR §77.13(2)(i).

**Project Site Map**
Red circle on map is the location of the proposed structure at the project site.

**Paine Field Vicinity Map**
Area shaded in red denotes extent of Project Site Map. Blue line is the 20,000-foot boundary specified in federal regulations, Title 14 CFR §77.13(2)(i).

**Project Site Map**
Red circle on map is the proposed project site.
Based upon the evidence the City’s allocation of FCC authority is misplaced and an act under color of state law within the meaning of 18 U.S.C. § 242. The FCC does not have authority to ignore: eminent radiation dangers posed by other State and Federal government agencies; potential damage to humans and residences in the area; damage to animal and bird species including those that are endangered or threatened by State and Federal laws. The FCC does not have authority to perpetrate adverse / taking actions against humans and property under color of law (within the meaning of 18 U.S.C. § 242) for private purpose (such as cell tower for a private cell tower company). The FCC does not have jurisdiction over historical sites requiring extraordinary approvals. The FCC does not have jurisdiction over towers placed contiguous to sensitive areas including steep slopes and wetlands.

A cell tower within striking distance of any public or private property is a taking for private enterprise with no “compensation.” According to Art. 1 § 16 of the State Constitution a private cell tower is not “...a private way of necessity.” I have received no offer for “just compensation” to compensate me for the radiation damage and for placing the tower within striking distance of my “dwellings” (within the meaning of 42 U.S.C. § 3602(b)).

“Private property shall not be taken for private use, except for private ways of necessity, and for drains, flumes, or ditches on or across the lands of others for agricultural, domestic, or sanitary purposes. No private property shall be taken or damaged for public or private use without just compensation having been first made, or paid into court for the owner; and no right-of-way shall be appropriated to the use of any corporation other than municipal until full compensation therefore be first made in money, or ascertained and paid into court for the owner, irrespective of any benefit from any improvement proposed by such corporation, which compensation shall be ascertained by a jury, unless a jury be waived, as in other civil cases in courts of record, in the manner prescribed by law. Whenever an attempt is made to take private property for a use alleged to be public, the question whether the contemplated use be really public shall be a judicial question, and determined as such, without regard to any legislative assertion that the use is public.”

Please let this serve as notice of prima facia evidence of intentional endangerment and willful failure to notify the public of eminent radiation dangers inter alia.
According to the United States Department of The Interior Fish and Wildlife Service from Director Jamie Rappaport Clark subject: Service Guidance on the Siting, Construction, Operation and Decommissioning of Communications Towers:

"The construction of new towers creates a potentially significant impact on migratory birds, especially some 350 species of night-migrating birds. Communication towers are estimated to kill 4-5 million birds per year, which violates the Migratory Bird Treaty Act and the Code of Federal Regulations at Part 50 designed to implement the MBTA. Some of the species affected are also protected under the Endangered Species Act and Bald and Gold Eagle Act."

"Towers should not be sited in or near wetlands, other known birds concentration areas (e.g., State or Federal Refuges, staging areas, rookeries), in known migratory or daily movement flyways, or in habitat of threatened or endangered species. Towers should not be sited in areas with a high incidences of fog, most, and low ceilings.”

The soil on the bank where the pole is to be situated is a slide area and prone to failure.

The City notice states the 125’ pole is within striking distance of two “dwellings” and a highway situated within 77° of the pole. The lot adjacent to my residence may be designated for housing the disabled. If approved, the tower should be located no less than 1.5 times the striking distance of any potential “building” designated “...for the construction or location thereon of any such building, structure, or portion thereof...” (within the meaning of 42 U.S.C. § 3602(b)).

The flashing light is a public nuisance and will annoy, injure or endanger the safety, health, comfort, or repose of the public and those residing in the proximity of the tower.

Fog inundates the area many months of the year. The cell tower will exceed the height of trees and may subject endangered species and migratory birds to death.

The application appears to be purposefully submitted at a summer vacation time when school children’s parents cannot be notified of the pending dangers of the cell tower. I believe the failure to notify each and every parent of each corresponding student is willful, knowing and an action under color of state law in violation of 18 U.S.C. § 242.

I have received no response to my letters including without limitation the information quoted by the Dept. of Interior Attacks FCC regarding Adverse Impact of Cell Tower Radiation on Wildlife. The presumption is the City personnel tacitly agree all my information submitted is true and factual.

I have received no survey map showing the striking distance in the event the tower collapses and strikes the existing dwelling and the “dwellings” to be constructed for the
disabled on my contiguous lot. The dwelling is occupied by the handicapped who fragile immune systems will be adversely affected by cell tower radiation. As proposed, the cell tower places the handicapped in eminent danger.

Sincerely,

Lana  S. Lemo
A-Weighted Sound Pressure Levels

<table>
<thead>
<tr>
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</tbody>
</table>

CITY OF MUKILTEO AND CITY OF EDMONDS ARE SISTERS CITIES.

Community Development CODE of Edmonds is prohibited any monopoles in all residential areas. Why CODE the City of Mukilteo uses?

STRIKING DISTANCE FROM TOWER TO ADJACENT RESIDENCE Parcel #611600003703 only 77’ feet, when the Tower height is 125’ ft.

HIGHWAY/ Mukilteo Spwy. is only 90’ away and OLYMPIC SCHOOL entrance is 120’+ away.

This time the concern wasn't about a monopole collapse, but anxiety for...
Zillow For Pros - Get More Leads - Looking to become a millionaire real estate agent? Get started today!

Sent from my mobile.
STRIKING DISTANCE SHOULD BE AT LEAST 1.5 TIMES (187.5 ft) FROM TOWER TO ADJACENT PROPERTIES.

60.040 Prohibitions. Community Development Code/Edmonds
The following wireless communications facilities are prohibited:
1. Guyed towers.
2. Lattice towers.
Monopoles are prohibited in the following locations:
1. All residential zones [single family (SF) and multifamily (MF)];
2. Downtown Waterfront Activity Center;
3. Public (P) and Open Space (OS) zoned parcels; and,
4. Within the City rights-of-way.

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This time the concern wasn't about monopole collapse, but anxiety for a resident falling at a zoning meeting.
Welcome

The Mukilteo Historical Society is committed to preserving the Mukilteo Light Station and the history of Mukilteo. The Mukilteo Historical Society assists the U.S. Coast Guard and the City of Mukilteo in the preservation, maintenance and accessibility of the light station for all to enjoy.

The Mukilteo Light Station continues to play an important navigational role with its Fourth Order Fresnel lens that has a range of 12 nautical miles. In addition to the beautifully landscaped grounds and stunning works of architecture, visitors are drawn to its romantic, scenic, educational, and historical values.

Come, explore, and savor the beauty - we'll leave the light on!

Lens and Light exhibit

A new small exhibit of lighthouse and lens replicas is available for viewing in room B of the light station.

See Winter 2014 Newsletter for more information.

1925 Mukilteo Cottage

2 bedrooms, 1 bath, 918 sq ft, 1.41 acres on the Bluff

MLS 2402828 Map: 45-05-22/2605 Mukilteo Speedwa

Paulette Clayton Windermere 425-750-0507

Collocation on Buildings and Non-Tower Structures outside Historic Districts (Attachment V)

For buildings and non-tower structures, the Agreement allows collocation without consultation or review under Section 106 in some circumstances. Collocation without Section 106 review is more limited in these cases to account for the fact that the building or non-tower structure itself could be a historic property. There are four situations involving the mounting of antennas on buildings and non-tower structures that require review:

1. the building or structure is over 45 years old; or,
2. the building or structure is (a) inside the boundary of a historic district, or (b) outside (but within 250 feet of) the boundary of a historic district and the antenna is visible from ground level anywhere within the historic district; or
3. the building or structure is either (a) a designated National Historic Landmark or (b) listed in or eligible for listing in the National Register of Historic Places; or,

the Areas of Potential Effects, submit photographs as described below. Photographs should show views from the proposed location in all directions. The direction (e.g., north, south, etc.) should be indicated on each photograph, and, as a group, the photographs should present a complete (360 degree) view of the area around the

Photograph Requirements:

Except in cases where no Historic should be in color, marked so as it should be noted. The source of t identified on the photograph.

Photograph Requirements:

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Disclaimer:
Neither Snohomish County nor the Department of Planning and
Development Services warrants the accuracy, reliability or timeliness of any
information contained herein and shall not be held liable for losses caused
by using this information. Portions of this information may not be current or
accurate. Any person or entity who relies on any information obtained from
this system, does so at his or her own risk. All critical information should be
independently verified.

RCW 42.17.260(9) prohibits the release of lists of individuals requested for
commercial purposes, and requestor expressly represents that no such use
of any such list will be made by user or its transferee(s) or vendee(s).
"Commercial purposes" means contacting or in some way personally
affecting the individuals identified on the list with the purpose of facilitating
one's commercial activities.

Printed on: 7/8/2014

- TOWER LOCATION IS ONLY 300 FT. FROM STREAMS IN NGPA

GENERATOR LEAKS TOXICS CAN GO TO CATCH BASINS (80 FT. WAY) TO THE CREEK AND PUGET SOUND
Tower Facts

- Construction of communication towers (including radio, television, cellular, and microwave) in the United States has been increasing at an estimated 6 percent to 8 percent annually since development of the cellular telephone, and construction continues at a rate of approximately 1,000 towers per month. The Federal Communications Commission (FCC) currently estimated the total number of towers at approximately 120,000.
- Loss of migratory birds at communication towers is estimated at 4.5 million annually. Potentially impacted resources include bird species which are threatened or endangered and 124 non-game species of management concern.
- Lighted guy-wired towers taller than 199 feet above ground level (AGL), are particularly hazardous to migratory birds, especially night-migrating song birds. While lighting for towers taller than 199 feet AGL is required by the Federal Aviation Administration to avoid aircraft accidents, certain types of lighting may attract birds to the towers.
- Lighted towers are particularly hazardous during periods of poor visibility caused by low cloud ceilings, rain, snow, or fog.
- Documented cumulative losses of birds since 1958 number over 1 million.

Other Related Sites:

- [http://migratorybirds.fws.gov/issuestowerstower.htm](http://migratorybirds.fws.gov/issuestowerstower.htm)

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U.S. Fish and Wildlife Service Home

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
174 Coggin Point Road, Suite 300
Charleston, South Carolina 29407

U.S. Fish and Wildlife Service Clearance to Proceed with Communication Tower Projects

The U.S. Fish and Wildlife Service (Services) is one of two Federal Agencies responsible for the protection and conservation of Federal trust resources, such as threatened and endangered species and migratory birds, in accordance with the following Acts:

- Section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.) (ESA);
- Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d) (Eagle Act); and

5. If at all possible, new towers should be sited within existing "antenna farms" (i.e., clusters of towers), in degraded areas (e.g., strip mines or other heavily industrialized areas), in commercial agricultural lands, in Superfund sites, or other areas where bird habitat is poor or marginal.

   Towers should not be sited in or near wetlands, other known bird concentration areas (e.g., state of federal refuges, staging areas, rookeries, and Important Bird Areas), in known migratory, daily movement flyways, areas of breeding concentration, in habitat of threatened or endangered species, or key habitats for Birds of Conservation Concern (FWS 2008). Disturbance can result in effects to bird populations which may cumulatively affect their survival. The Service has recommended some disturbance-free buffers, e.g., 0.5 mi around raptor nests during the nesting season in Wyoming (FWS/WY Ecological Services Field Office, referenced in Mauville 2007:23). The effects of towers on "prairie grouse," "sage grouse," and grassland and shrub.

Before tower design, siting and construction, if it has been determined that a significant number of breeding, feeding and roosting birds, especially of Birds of Conservation Concern (FWS 2008), state- and federally-listed bird species, and eagles are known to habitually use the proposed tower construction area, relocation to an alternate site is highly recommended. If this is not an option, seasonal restrictions on construction are advised in order to avoid disturbance,


**Stability**

A field reconnaissance on the site included visual observations of the surface conditions and the surrounding area. In general, the slope has had numerous failures that need to be recognized in the planning of the development on the property. The failures noted in the vicinity of Lot 2 show indications of failure potential migrating toward the top of the slope and thus warrant an extended back for the potential building pad locations of 30 feet.

From Mukilteo Speedway the property begins approximately 50 feet from the edge of the pavement. At the base of the roadway embankment the topography is relatively level with a gentle slope to the southwest from the base of the embankment to the top of the slope located between 60 and 120 feet away. The top of the slope is very abrupt and extends down to the southwest at angles approaching 100 percent below lots 1 and 2.

**Recommendations**

The project will include minimal excavations for the placement of single-family residences and should not extend to depths greater than 3 feet below the existing grade. Due to the conditions found, conventional spread footings may be used on the residences placed outside the given setbacks form the top of the slope.
TABLE 3
CAISSON DESIGN DATA

<table>
<thead>
<tr>
<th>SITE NO.</th>
<th>MONOPOLE HEIGHT (ft)</th>
<th>DIAMETER (ft)</th>
<th>LENGTH $\lambda_0/\lambda_C$</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-1</td>
<td>100</td>
<td>5.0</td>
<td>25</td>
</tr>
<tr>
<td>A-2</td>
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<td>6.0</td>
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<tr>
<td>A-3</td>
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<td>B-2</td>
<td>150</td>
<td>5.5</td>
<td>20</td>
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<tr>
<td>B-3</td>
<td>125</td>
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<td>**</td>
</tr>
<tr>
<td>C-1</td>
<td>75</td>
<td>5.5</td>
<td>25</td>
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<tr>
<td>C-2</td>
<td>100</td>
<td>6.0</td>
<td>30</td>
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<tr>
<td>C-3</td>
<td>100</td>
<td>6.0</td>
<td>30</td>
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<tr>
<td>C-4</td>
<td>100</td>
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<td>25</td>
</tr>
<tr>
<td>C-5</td>
<td>35</td>
<td>4.0</td>
<td>18</td>
</tr>
</tbody>
</table>

*Plus permanent steel casing
**Not yet determined

CAISSON CONSTRUCTION PROCEDURES

The preferred method of caisson construction for a given site is primarily a function of soil type, although other factors such as groundwater level and proximity of the caisson to existing buildings will affect the procedures used to install the caisson. The most common methods can be categorized into three groups as follows:

1. Uncased excavations
2. Cased augered holes
3. Slurry displacement installations

Construction of caissons in uncase excavations has been limited to sites with subsurface conditions comprised of stiff cohesive glacial till soils with no groundwater. Only two of the fifteen sites contained in Table 2 (B-1 and C-2) were constructed as uncase excavations in this manner. Advancement of the caisson excavation is accomplished basically by dry augering to the necessary bearing depth. Short term sidewall stability under these circumstances was not a problem as installation of reinforcing and concrete placement was performed soon after completion of the excavation. To ensure the aforementioned sequence of events, the contract documents prohibited any uncase excavations from being left open overnight.

At site B-1, the relatively simple uncase excavation process was complicated when a large boulder was encountered 5 feet above the proposed bearing stratum after the caisson was relocated 15 feet away from its original location. Caisson design modifications to account for the reduced depth included bailing of the caisson base and enlarging the diameter of the top portion of the caisson by an additional six feet to a depth of four feet. Implementation of these modifications occurred over several days and as a result, the use of temporary casing became necessary for sidewall stability.

Cased augered holes were the most common construction method used to install the caissons in predominantly granular soils where groundwater was not encountered. As the caisson excavation was advanced, temporary casing was lowered to maintain sidewall stability. The casing usually extended to a depth of at least one-half to two-thirds of the caisson length, depending on soil conditions. During placement of concrete, the temporary casing was withdrawn incrementally as the concrete was placed. Since maintenance of anchor bolt alignment was critical to ensure proper orientation of the monopole and antennas with respect to true north, constant checking of the anchor bolts was necessary during the concrete placement and casing withdrawal process.

There were a few sites where casing was left permanently in place due to the proximity of the caisson to existing structures and logistical considerations associated with the installation process. Caissons at sites A-4 and A-6 were each located within 5 feet of existing structures that are supported on shallow footing foundations. To prevent possible undermining of these foundations, the use of temporary surface casing was stipulated in the contract documents. Because of limited equipment access and the

FIGURE 5 - Caisson Installation at Site B-2
Table 3 contains physical characteristics of the monopole structures and caisson foundations for fifteen representative cell sites in the metropolitan New York area, including monopole height and resultant caisson dimensions.

It is not uncommon for these monopoles to be located close to existing buildings and other structures. Site B-2 required a unique design to accommodate its proximity to an existing building. The centerline of this monopole is only 6 feet from the existing basement wall, which extends approximately 7 feet below grade.

Preliminary analysis indicated that the minimum diameter of the caisson would be 5.5 feet, which would place the edge of the caisson within 3 feet of the building. Due to the age and condition of the building foundation wall, it was necessary to avoid transferring the substantial lateral load from the monopole to the adjacent wall. Therefore, a caisson with a double steel casing separated by a layer of compressible material as shown in Figure 4 was designed to absorb lateral loads induced by the monopole. The 5.5 foot diameter inner casing extended full depth to the top of sound rock to enclose the caisson concrete. The larger outer casing extended to just below the building footing. The four inch annular space between the two casings was filled with polystyrene granules which can compress and absorb the lateral deflection and minimize load transfer from the monopole. A neoprene rubber gasket was installed at the top of the annular space to protect the compressible material and minimize intrusion of water.

At this point, the economy of the design is reviewed to determine if appreciable savings could be achieved by altering the soil parameters. This can be accomplished in some instances by excavating the natural soil around the top of the caisson to a reasonable depth (three to four feet) and replacing it with compacted backfill, to increase the horizontal subgrade modulus of the surficial soils. The lateral extent of excavation and replacement is shown in Figure 4. This soil replacement method is also effective in reducing the required caisson length by as much as five to ten feet.
TABLE 1
MONOPOLE BASE REACTIONS

<table>
<thead>
<tr>
<th>MONOPOLE HEIGHT (ft)</th>
<th>AXIAL (k)</th>
<th>SHEAR (k)</th>
<th>MOMENT (k ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>75</td>
<td>13</td>
<td>14</td>
<td>760</td>
</tr>
<tr>
<td>100</td>
<td>20</td>
<td>19</td>
<td>1320</td>
</tr>
<tr>
<td>125</td>
<td>32</td>
<td>31</td>
<td>2530</td>
</tr>
</tbody>
</table>

SUBSURFACE INVESTIGATION

A geotechnical investigation was performed at each cell site within the limits of the proposed monopole structure to identify types and distribution of subsurface materials, delineate engineering characteristics of the subsurface materials and establish caisson foundation design criteria. Generally, each site investigation consisted of one boring drilled to a depth which varied from 25 to 42 feet. Borings were advanced through overburden soils using either a hollow stem power auger or a roller bit with casing and water. Standard penetration testing (SPT) and split spoon sampling were generally performed at five foot intervals in accordance with ASTM D1586. Where rock was encountered, an RX size diamond core barrel was used to advance the borehole a minimum of 10 feet into sound rock.

An abbreviated laboratory testing program was usually performed for each site to verify field classification of samples and establish index properties of the foundation materials. Gradation analysis, moisture content, and Atterberg limits testing were routinely performed. Unconfined compressive strength testing of soil samples and uniaxial compression testing of rock cores were only occasionally performed to develop additional shear strength characteristics of the foundation materials on marginal sites.

REGIONAL SUBSURFACE CONDITIONS

Subsurface conditions vary considerably throughout the metropolitan New York area. The geologic conditions can be characterized, however, by several distinct regions.

Long Island, including Brooklyn and Queens (identified as Region A in Figure 1), is generally comprised of granular coastal plain sediments. These sediments are comprised largely of stratified sand and silt layers with varying amounts of gravel. The distribution and extent of these sediment deposits is fairly consistent, although moderate variations in silt content was found at the various sites investigated. Soil densities generally varied from compact to medium dense as determined during Standard Penetration Testing (SPT). Groundwater levels varied from 10 to 35 feet below grade and were considered to be representative of static conditions based on the pervious nature of the soil deposits.

Embankment deposits of organic clays and silts overlying the granular sediments were encountered along the coastal areas of Queens. These organic deposits are generally 5 to 10 feet in thickness. In many of these tidal areas, fills of between 5 and 10 feet thick have been placed over the embankment deposits to reclaim these areas for development.

Westchester County and the boroughs of Manhattan and the Bronx (Region B in Figure 1) are characterized by predominantly granular deposits overlying glacial till. Directly underlying this glacial till is bedrock. The granular deposits are primarily tan sands and gravel with little to moderate amounts of silt. The glacial till consists of a matrix of grey and grey-brown sand, gravel, silt and clay that exists in various proportions throughout the region. The till is generally quite dense, with SPT values consistently greater than 50 blows per foot, and is underlain by bedrock. The depth of bedrock is widely varied throughout the region. Bedrock formations encountered during the site investigations included granitic and granodioritic gneiss in the upper and central areas of Westchester and mica schist in the more southerly areas. Depth to groundwater varied substantially, and when encountered, was usually due to perched conditions.

Subsurface conditions in Northern New Jersey (indicated as Region C in Figure 1) are similar to Westchester, although soil color and bedrock type differ markedly. Additionally, the granular deposits overlying the glacial till are generally deeper in extent than those encountered at the Westchester sites. The glacial tills are a heterogeneous mixture of reddish brown sands, gravel, silt and clay, with sand predominating the mix proportion. The underlying bedrock was most commonly found to be part of the Brunswick shale formation, which is generally weathered at the contact surface and becomes more massive with depth. Discontinuities in the shale were generally at low angles to the horizontal. Groundwater conditions were quite variable, with depths ranging from three feet to greater than 35 feet.

FOUNDATION DESIGN CRITERIA

Selection and development of geotechnical design criteria for the caisson foundations is a function of soil type, loading conditions and structural design methodology. The soil type determines which of the general shear strength parameters, friction angle and/or cohesion, are necessary to characterize the strength and behavior of the foundation materials. As mentioned previously, the loading conditions considered most critical are overturning due to substantial lateral loading of the monopole and, to a lesser extent, compressive loads imposed by the weight of the structure.

Since lateral capacity of the caisson to accommodate overturning moments was considered to be the most critical parameter, development of foundation design criteria had to consider the method of analysis for caisson design. Initially, hand solutions developed by Broms were used to size caissons and determine concrete reinforcing requirements. Subsequently, the
FIGURE 1 - Metropolitan New York Area

MONOPOLE CONFIGURATION AND LOADING CONDITIONS

The monopoles utilized in this program range from 35 to 150 feet in height, with a majority being 100 feet tall. Each was fitted with a triangular-shaped structural steel platform at the top to facilitate mounting of the antennas.

The pole shaft is uniformly tapered, with a diameter of one to two feet at the top, increasing to between three and five feet at the base, depending on the total height. The cross-section is either 12 or 16 sided, and is fabricated from steel. Except for the platform, the structure resembles in many ways the poles used for mounting of lighting fixtures or power lines in various parts of the country. A typical installation is shown in Figure 2.

The most significant loading condition to which the pole is subjected is wind load acting on the shaft, platform, antennas and other appurtenances, and ice which may accumulate on the structure. The magnitudes of wind and ice loads are based on design criteria recommended by EIA(1991), which has been established as an American National Standard. The load definition is consistent with the familiar approach presented in ASCE(1990), which was formerly published as ANSI A58.1 and incorporated into numerous building codes.

FIGURE 2 - Typical Monopole Installation

Within the metropolitan New York area, the minimum wind speed required for design (based on a 50 year mean recurrence interval) varies from 70 to 90 mph. However, it was decided at the start of the program that a single conservative loading criterion should be used for monopole design. This was to facilitate use of a "stock" pole at any location, thereby reducing lead time and the overall construction duration.

The pole manufacturer normally performs the necessary analysis to determine service load reactions at the foundation level, including shear, overturning moment, and compression. Foundation reactions are presented in Table 1 for a range of monopole heights. It is noted that a major portion of these reactions is due to the presence of the platform atop the pole.
### Table 1

<table>
<thead>
<tr>
<th>MONOPOLE</th>
<th>AXIAL</th>
<th>SHEAR</th>
<th>MOMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>HEIGHT (ft)</td>
<td>(K)</td>
<td>(K)</td>
<td>(K-ft)</td>
</tr>
<tr>
<td>75</td>
<td>13</td>
<td>14</td>
<td>760</td>
</tr>
<tr>
<td>100</td>
<td>20</td>
<td>19</td>
<td>1320</td>
</tr>
<tr>
<td>125</td>
<td>32</td>
<td>31</td>
<td>2530</td>
</tr>
</tbody>
</table>

**Subsurface Investigation**

A geotechnical investigation was performed at each cell site within the limits of the proposed monopole structure to identify types and distribution of subsurface materials, delineate engineering characteristics of the subsurface materials and establish caisson foundation design criteria. Generally, each site investigation consisted of one boring drilled to a depth which varied from 25 to 42 feet. Boreholes were advanced through overburden soils using either a hollow stem power auger or a roller bit with casing and water. Standard penetration testing (SPT) and split spoon sampling were generally performed at five-foot intervals in accordance with ASTM D1586. Where rock was encountered, an NQ size diamond core barrel was used to advance the borehole a minimum of 10 feet into sound rock.

An abbreviated laboratory testing program was usually performed for each site to verify field classification of samples and establish index properties of the foundation materials. Gradation analysis, moisture content, and Atterberg limits testing were routinely performed. Unconfined compressive strength testing of soil samples and uniaxial compression testing of rock cores were only occasionally performed to develop additional shear strength characteristics of the foundation materials on marginal sites.

**Regional Subsurface Conditions**

Subsurface conditions vary considerably throughout the metropolitan New York area. The geologic conditions can be characterized, however, by several distinct regions.

Long Island, including Brooklyn and Queens (identified as Region A in Figure 1), is generally comprised of granular coastal plain sedimentary deposits. These sediments are comprised largely of stratified sand and silt layers with varying amounts of gravel. The distribution and extent of these sediment deposits is fairly consistent, although moderate variation in silt content was found at the various sites investigated. Soil densities generally varied from compact to medium dense as determined during Standard Penetration Testing (SPT). Groundwater levels varied from 10 to 35 feet below grade and were considered to be representative of static conditions based on the pervious nature of the soil deposits.

Embayment deposits of organic clays and silts overlying the granular sediments were encountered along the coastal areas of Queens. These organic deposits are generally 5 to 10 feet in thickness. In many of these tidal areas, fills of between 5 and 10 feet thick have been placed over the embayment deposits to reclaim these areas for development.

Westchester County and the boroughs of Manhattan and the Bronx (Region B in Figure 1) are characterized by predominantly granular deposits overlying glacial till. Directly underlying this glacial till is bedrock. The granular deposits are primarily tan sands and gravel with little to moderate amounts of silt. The glacial till consists of a random matrix of grey and greybrown sand, gravel, silt and clay that exists in various proportions throughout the region. The till is generally quite dense, with SPT values consistently greater than 50 blows per foot, and is underlain by bedrock. The depth to bedrock is widely varied throughout the region. Bedrock formations at the sites investigated included granitic and granodiorite gneiss in the upper and central areas of Westchester and mica schist in the more southerly areas. Depth to groundwater varied substantially, and when encountered, was usually due to perched conditions.

Subsurface conditions in Northern New Jersey (indicated as Region C in Figure 1) are similar to Westchester, although soil color and bedrock type differ markedly. Additionally, the granular deposits overlying the glacial till are generally deeper in extent than those encountered at the Westchester sites. The glacial tills are a heterogeneous mixture of reddish brown sands, gravel, silt and clay, with sand predominating in the mix proportion. The underlying bedrock was most commonly found to be part of the Brunswick shale formation, which is generally weathered at the contact surface and becomes more massive with depth. Discontinuities in the shale were generally at low angles to the horizontal. Groundwater conditions were quite variable, with depths ranging from three feet to greater than 35 feet.

**Foundation Design Criteria**

Selection and development of geotechnical design criteria for the caisson foundations is a function of soil type, loading conditions and structural design methodology. The soil type determines which of the general shear strength parameters, friction angle and/or cohesion, are necessary to characterize the strength and behavior of the foundation materials. As mentioned previously, the loading conditions considered most critical are overturning due to substantial lateral loading of the monopole and, to a lesser extent, compressive loads imposed by the weight of the structure.

Since lateral capacity of the caisson to accommodate overturning moments was considered to be the most critical parameter, development of foundation design criteria had to consider the method of analysis for caisson design. Initially, hand solutions developed by Brooks were used to size caissons and determine concrete reinforcing requirements. Subsequently, the
analysis and design of caissons was performed with commercially available computer programs, LPILE and STIFFL, which are described by Reese and Wang (1989) and by Wang and Reese (1987). These two analysis methods require somewhat different input data which dictated the type of soil parameters developed as discussed herein.

Determination of allowable bearing capacity to support the compressive loads of the monopole and lateral soil resistance to accommodate overturning were based on empirical relationships developed from the boring and laboratory test data obtained at each site. In the determination of allowable bearing capacity, only point bearing was considered. Side resistance (skin friction) was not evaluated because this additional capacity was generally not needed due to the nominal compressive design loads. For point bearing, a minimum design depth was specified to ensure bearing on a suitable foundation subgrade.

Based on procedures developed by Reese and O’Neill (1988), SPT values were input directly into the following relationship to determine ultimate point bearing of caissons founded on granular soils:

\[ q_{ult} = 0.6 N_{spt} \]  

where \( q_{ult} \) = ultimate bearing capacity (tsf)  
\( N_{spt} \) = average uncorrected SPT value (blows/ft) obtained directly beneath the caisson base to a depth of twice the base diameter

Notes:
1. \( q_{ult} \) obtained from this relationship limits settlement to five percent of the base diameter.
2. For caisson diameters over 50 inches, reduce \( q_{ult} \) by 50/D, where D is caisson diameter in inches, to maintain settlement within acceptable limits.

For cohesive soils, point bearing was determined from the relationship:

\[ q_{ult} = N_C c_u \]  

where \( c_u \) = average undrained shear strength (tsf)  
\( N_C = 0.011 + 0.2 \) (L/D) \< 9  
with L = shaft length(ft)

Values of undrained shear strength are computed over a depth of 1 to 2 diameters below the caisson base, and were developed based on established empirical relationships with SPT results and Atterberg limits test data.

Table 2 contains values of allowable bearing capacities determined for the various sites along with soil classifications and unit weights, SPT results, and general shear strength parameters (\( \phi \) and \( c \)). Values of allowable bearing capacity are based on a factor of safety between 2.5 and 3.0, depending upon the extent of field and laboratory data obtained for a given site and past experience with similar foundation material types.

<table>
<thead>
<tr>
<th>SIZE NO.</th>
<th>SOIL TYPE</th>
<th>N_spt (blows/ft)</th>
<th>( Y_d ) (pcf)</th>
<th>( \phi ) ((^{0}))</th>
<th>( c(2) ) (pcf)</th>
<th>q(ult) (tsf)</th>
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</thead>
<tbody>
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<td>35(^{0})</td>
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</tr>
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<tr>
<td>B-3</td>
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<td>&gt;50</td>
<td>130</td>
<td>38(^{0})</td>
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<td>C-1</td>
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<td>38(^{0})</td>
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<td>8.0</td>
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Notes:
1. Soil description based on Unified Soil Classification System
2. Cohesion based on effective strength parameters
3. ROQ value determined at foundation bearing depth
4. Based on shear strength of discontinuities
5. Maximum allowable bearing capacity as determined from NYC Building Code

Preparation of foundation design criteria for use with Broms’ method of analysis required development of lateral earth pressure resistance diagrams with depth. For granular soils, ultimate lateral soil resistance varies with depth and is determined from the relationship:

\[ p = 3DyZK_p \]  

where \( p \) = ultimate lateral resistance (pounds per foot of depth)  
\( y \) = effective unit weight of soil (pcf)  
\( D \) = caisson diameter (ft)  
\( Z \) = depth along caisson (ft)  
\( K_p \) = Rankine coefficient of passive earth pressure
For cohesive soils, ultimate lateral soil resistance is uniform with depth and determined by:

\[ p = 9c_u \ v \]  \hspace{1cm} (4)

The aforementioned lateral soil resistance design criteria were input into Broms’ equations to develop maximum resistance of the caissons as discussed further on.

The use of software to assist in designing the caissons necessitated development of alternate foundation design criteria for use as input. Briefly, soil deflection under lateral loading is modeled with p-y (load vs. deflection) curves in the LPILE program. These p-y curves can either be input manually or generated from preprogrammed p-y curves for several different soil conditions from the LPILE database. These preprogrammed families of p-y curves were developed by the LPILE authors based on extensive full-scale field load test results. The basic types of soil conditions are:

- Dry and Submerged Sands
- Saturated Soft Clays
- Saturated Stiff Clays
- Dry Stiff Clays

To facilitate analysis and minimize design costs, computer-generated p-y curves were used for design and analysis of the caissons at the various sites.

Geotechnical design parameters that are similar for both Broms’ and LPILE methods of analysis include shear strength, (friction angle and/or cohesion) and effective unit weight of the soils. For the LPILE analysis using the computer-generated p-y curves, additional geotechnical input included the modulus of horizontal subgrade reaction \( k_h \). These values were determined based on established empirical relationships with SPT results.

For clays, values of strain \( \varepsilon_{50} \) corresponding to one-half the maximum principal stress difference determined from unconfined or triaxial compression tests are also needed. Typical values of \( \varepsilon_{50} \) were obtained from established relationships correlating shear strength \( c_u \) to strain.

**STRUCTURAL DESIGN PROCEDURE**

Magnitudes of the lateral loads imposed on the monopole and transferred to its foundation are developed in accordance with parameters established by the EIA as discussed previously.

Using the foundation loading data and geotechnical design criteria, the following procedure was used to design the caisson. The procedure described herein differs from that presented in ACI(1989) by incorporating the behavior of layered soils, and focuses on the use of computer software to perform the analysis.

1. Establish minimum diameter of the foundation based on the size of the base plate and clearances for anchor bolts and reinforcing. Minimum vertical reinforcement required by ACI(1989) is calculated as:

\[ A_{s, min} = 0.005 A_c \]  \hspace{1cm} (5)

2. Model the soil as a layered medium, based on material types, ground water, and stiffness parameters. These parameters are expressed as a load-deformation relationship (p-y curve) indexed to the soil type and factored by the horizontal subgrade modulus.

3. Depending on the soil stiffness, the maximum moment will occur at a point approximately 1.5 diameters below grade. Estimate this maximum moment and calculate a trial value for the effective stiffness of the caisson and rebar as:

\[ K_{eff} = \frac{E_c I_{eff}}{L_{eff}} \]  \hspace{1cm} (6)

where \( I_{eff} \) is the transformed moment of inertia of the cracked section under the given moment and axial load. In practice, this is calculated by the STIFFP program, which can also incorporate the stiffness contribution of a permanent steel casing.

4. Run the LPILE analysis to determine deflection of the foundation at grade and maximum bending moment under the given service loads. The deflection is compared to an allowable value of \( 3/8" \), and the moment is compared to the estimated value used in the stiffness computation. Determine if additional caisson stiffness or a correction to the estimated stiffness value is needed.

5. Adjust the caisson length, diameter, or vertical reinforcement to obtain the required stiffness. Repeat the analysis until the deflection criterion is satisfied and convergence is obtained.

6. Modify the soil parameters to assess the sensitivity of the design and confirm that predicted behavior will be consistent throughout a reasonable range of variation.

7. Verify that the structural capacity is adequate in accordance with ACI(1989), and that soil pressures are within acceptable limits.

A typical caisson foundation for a monopole is shown in Figure 3.
At this point, the economy of the design is reviewed to determine if appreciable savings could be achieved by altering the soil parameters. This can be accomplished in some instances by excavating the natural soil around the top of the caisson to a reasonable depth (three to four feet) and replacing it with compacted backfill, to increase the horizontal subgrade modulus of the surficial soils. The lateral extent of excavation and replacement is shown in Figure 4. This soil replacement method is also effective in reducing the required caisson length by as much as five to ten feet.

**FIGURE 3 - Caisson Foundation**

**FIGURE 4 - Soil Replacement**

Table 3 contains physical characteristics of the monopole structures and caisson foundations for fifteen representative cell sites in the metropolitan New York area, including monopole height and resultant caisson dimensions.

It is not uncommon for these monopoles to be located close to existing buildings and other structures. Site B-2 required a unique design to accommodate its proximity to an existing building. The centerline of this monopole is only 6 feet from the existing basement wall, which extends approximately 7 feet below grade.

Preliminary analysis indicated that the minimum diameter of the caisson would be 5.5 feet, which would place the edge of the caisson within 3 feet of the building. Due to the age and condition of the building foundation wall, it was necessary to avoid transferring the substantial lateral load from the monopole to the adjacent wall. Therefore, a caisson with a double casing separated by a layer of compressible material as shown in Figure 5 was designed to absorb lateral loads induced by the monopole. The 5.2 foot diameter inner casing extended full depth to the top of sound rock to enclose the caisson concrete. The larger outer casing extended to just below the building footing. The four inch annular space between the two casings was filled with polystyrene granules which can compress and absorb the lateral deflection and minimize load transfer from the monopole. A neoprene rubber gasket was installed at the top of the annular space to protect the compressible material and minimize intrusion of water.
TABLE 3
CAISSON DESIGN DATA

<table>
<thead>
<tr>
<th>SITE NO.</th>
<th>MONOPOLE HEIGHT (ft)</th>
<th>DIAMETER (ft)</th>
<th>LENGTH (ft)</th>
<th>$A_s/A_c$</th>
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<tr>
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<td>100</td>
<td>5.0</td>
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</tr>
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<td>A-3</td>
<td>125</td>
<td>7.0</td>
<td>35</td>
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<td>18</td>
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*Plus permanent steel casing
**Not yet determined

CAISSON CONSTRUCTION PROCEDURES

The preferred method of caisson construction for a given site is primarily a function of soil type, although other factors such as groundwater level and proximity of the caisson to existing building foundations will affect the procedures used to install the caisson. The most common methods can be categorized into three groups as follows:

1. Uncased excavations
2. Cased augered holes
3. Slurry displacement installations

Construction of caissons in uncased excavations has been limited to sites with subsurface conditions comprised of stiff cohesive glacial till soils with no groundwater. Only two of the fifteen sites contained in Table 2 (B-1 and C-2) were constructed as uncased excavations in this manner. Advancement of the caisson excavation is accomplished basically by dry augering to the necessary bearing depth. Short-term side wall stability under these circumstances was not a problem as installation of reinforcing and concrete placement was performed soon after completion of the excavation. To ensure the aforementioned sequence of events, the contract documents prohibited any uncased excavations from being left open overnight.

At site B-1, the relatively simple uncased excavation process was complicated when a large boulder was encountered 5 feet above the proposed bearing stratum after the caisson was relocated 15 feet away from its original location. Caisson design modifications to account for the reduced depth included bailing of the caisson base and enlarging the diameter of the top portion of the caisson by an additional 2 feet to a depth of four feet. Implementation of these modifications occurred over several days and as a result, the use of temporary casing became necessary for side wall stability.

Cased augered holes were the most common construction method used to install the caissons in predominately granular soils where groundwater was not encountered. As the caisson excavation was advanced, temporary casing was lowered to maintain side wall stability. The casing usually extended to a depth of at least one-half to two-thirds of the caisson length, depending on soil conditions. During placement of concrete, the temporary casing was withdrawn incrementally as the concrete was placed. Since maintenance of anchor bolt alignment was critical to ensure proper orientation of the monopile and antennas with respect to true north, constant checking of the anchor bolts was necessary during the concrete placement and casing withdrawal process.

There were a few sites where casing was left permanently in place due to the proximity of the caisson to existing structures and logistical considerations associated with the installation process. Caissons at sites A-4 and A-5 were each located within 5 feet of existing structures that are supported on shallow footing foundations. To prevent possible undermining of these foundations, the use of temporary surface casing was stipulated in the contract documents. Because of limited equipment access and the
concern for protection of the existing structures, the contractor elected to leave the casings in place.

The use of bentonite slurry to advance caisson excavations was used primarily in granular soils with high groundwater levels that were typically encountered on Long Island and in Queens. In most circumstances, sidewall stability above groundwater was maintained with temporary casing. Once groundwater was encountered, a bentonite slurry mix was placed into the excavation. The slurry level was generally maintained several feet above the groundwater level to maintain a positive head and alleviate the possibility of base disturbance due to liquefaction. Once the excavation was advanced to the appropriate depth, the reinforcing cage and anchor bolt assembly was inserted into the excavation and the concrete was placed using tremie methods. The displaced bentonite slurry was usually disposed of on site.

CONCLUSIONS

The growth of the cellular telephone industry has led to the development of numerous antenna sites in the metropolitan New York area. Single caisson foundations have been found to be the most desirable method of supporting monopoles used as antenna supporting structures.

As part of this construction program, the structural configuration and loading conditions were standardized, enabling the design to focus on site-specific subsurface conditions. Three distinct regions were identified, and foundation design criteria were developed based on geotechnical investigations.

Although simplified field investigation and laboratory testing procedures were used to develop the foundation design criteria for these structures, the quality of the data obtained has turned out to be more than adequate.

A structural design procedure based on computer analysis methods allowed rapid evaluation of the sensitivity of the overall caisson design to the various soil parameters. A major benefit derived from this capability was obtained in several instances where surficial soil excavation and replacement was used to decrease predicted caisson deflections. This was accomplished at a significant reduction in cost compared to deepening or enlarging the caisson.

The various construction procedures employed have also been discussed. By implementing careful planning and supervision at each site prior to and during construction, satisfactory caisson installations resulted at all locations. This was accomplished despite the accelerated construction schedules and the inevitable obstacles that were encountered during construction within the urban/suburban environment.

The performance of each of the completed monopoles has been satisfactory in the two years since the start of the program, which included several severe wind storms, and is expected to continue for the useful life of the structures.

SYMBOLS

\( A_c \) gross concrete area
\( A_r \) area of reinforcing steel
\( C_r \) cohesion
\( C_u \) undrained shear strength
\( D \) caisson diameter
\( E_{ec} \) modulus of elasticity for concrete
\( E_{eff} \) effective moment of inertia of transverse cracked section
\( K_{eff} \) effective caisson flexural stiffness
\( N_c \) modulus of horizontal subgrade reaction
\( P \) Rankine coefficient of passive earth pressure
\( P_{apt} \) embedment length
\( q_a \) bearing capacity factor
\( q_{ult} \) average uncorrected blow count
\( S \) ultimate lateral resistance
\( Z \) ultimate bearing capacity
\( Y \) depth along caisson
\( \psi \) effective unit weight of soil
\( \psi_d \) dry unit weight of soil
\( \varepsilon_50 \) strain
\( \phi \) angle of internal friction

REFERENCES

ACI (1985). "Suggested Design and Construction Procedures for Pier Foundations, ACI 336.3R- 72 (Revised)", American Concrete Institute, Detroit, MI.

ACI (1989). "Building Code Requirements for Reinforced Concrete, ACI 318-89", American Concrete Institute, Detroit, MI.


To: City of Mukilteo

Do NOT allow to erect the tower.
Do NOT let KIDS leave the SCHOOL
Do NOT let the people to leave the City.
Do NOT let destroy the human inhabitants.
Do NOT let destroy a sensitive Bluff and Wildlife Habitat
Do NOT let ruin the architectural continuity of the site
Do NOT destroy property values.
Do NOT jeopardizing future of Mukileans

The American Tower and AT&T Wireless Communication Facility would cause irreparable and irreversible harm to a large developing neighborhood

We are residents of Mukilete Puget Sound Bluff Community asking The City of Mukilteo to protect and enhance the City’s Critical Areas, Habitats and Shoreline Zones to support wildlife of great City of Mukilteo, to provide its citizens with a good place to live shop and play.

Thank you.

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<td>S Zenkina</td>
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<tr>
<td>Luke Thompson</td>
<td>7602 Mukilteo Blvd</td>
<td>L Thompson</td>
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<tr>
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Site Description

The site of the proposed Alice Merrill Short Plat is located southeast of and including the current residence of 2605 Mukilteo Speedway. The current residence is at the northwest end of the proposed short plat and is setback from the top of the slope approximately 8 feet. At this time the property is all one lot. The proposal will divide the property into four lots, with Lot 1 being the exitng residence at the northwest end.

From Mukilteo Speedway the property begins approximately 50 feet from the edge of the pavement. At the base of the roadway embankment the topography is relatively level with a gentle slope to the southwest from the base of the embankment to the top of a slope located between 60 and 120 feet away. The top of the slope is very abrupt and extends down to the southwest at angles approaching 100 percent below lots 1 and 2. The slope angle below lots 3 and 4 are slightly less but still greater than 60 percent.

Site Stability

Our reconnaissance of the site included visual observations of the surface conditions and the surrounding area. In general, the slope has had numerous failures that need to be recognized in the planning of the development on the property. The failures noted in the vicinity of Lot 2 show indications of failure potentially migrating toward the top of the slope and thus warrant an extended setback for the potential building pad locations of 30 feet. Lots 3 and 4 do not have the same indications and a 25-foot setback from the top of the slope is warranted.

Geotechnical Report. All development proposals which include land that within a designated geologic sensitive area must submit a geotechnical report and site assessment per MMC 17.52A.

Grading and Erosion Control Plan. All development proposals within geologic sensitive area shall submit grading, excavation, and erosion control plans approved and sealed by a licensed professional in accordance with Mukilteo Municipal Code (MMC) Chapter 15.16.