SAN FRANCISCO
PLANNING DEPARTMENT

Executive Summary
Conditional Use Authorization
HEARING DATE: SEPTEMBER 11, 2014

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San Francisco,
CA 94103-2479

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Date:	September 4, 2014
Case No.:	**2014.0846C**
Project Address:	**444 Presidio Avenue**
Current Zoning:	NC-2 (Neighborhood Commercial, Small-Scale) 40-X Height and Bulk District
Block/Lot:	1022/026
Project Sponsor:	AT&T Mobility represented by Talin Aghazarian, Ericsson, Inc., 530 Bush Street, 5th Floor San Francisco, CA
Staff Contact:	Omar Masry – (415) 575-9116 Omar.Masry@sfgov.org

PROJECT DESCRIPTION

The proposal is to allow the development of an AT&T Mobility macro wireless telecommunication services ("WTS") facility. The macro WTS facility would consist of twelve (12) screened rooftop mounted panel antennas, and electronic equipment necessary to run the facility on the roof and the first floor parking area of an existing hotel (Laurel Inn). Based on the presence of existing macro WTS facilities for Sprint and Clearwire, the WTS facility is proposed on a Location Preference 2 Site (Preferred Location, Co-Location) according to the WTS Facilities Siting Guidelines.

The proposed antennas would measure approximately 55" high, by 12" wide, by 7" thick, and would be fully screened from view utilizing a combination of three (3) rooftop-mounted chimney boxes, featuring four (4) antennas each. The faux chimney box elements would be setback seven (7) feet from the nearest building edge and rise approximately seven (7) feet above the 45-foot tall roof.

The screening material used for the faux vent pipes and chimney boxes would be composed of a fiberglass like material known as fibre-reinforced plastic (FRP), which would be painted and textured to mimic mechanical elements. The FRP material allows for the screening of panel antennas, while still allowing radio waves to pass through.

Electronic equipment necessary to run the facility would be located in two areas. A portion of the equipment would be located on the roof at locations (height and setback from roof edges) which would not be prominently visible from adjacent public rights-of-way. The relatively larger, equipment cabinets would be placed within a portion of the parking garage on the first floor, and would include battery back-up cabinets, to provide backup power in the event of a power outage or disaster.

SITE DESCRIPTION AND PRESENT USE

The Project Site is located on Assessor's Block 1022, Lot 026 at the northeast corner of Presidio Avenue and California Street. The Subject building was developed in 1962, and is an approximately 45-foot tall,

four-story hotel (Laurel Inn).

The rooftop of the Subject Building features existing macro WTS facilities for Sprint (Case No. 2003.1258C), with four antennas approved, but three panel antennas installed, and a Clearwire WTS facility (Case No. 2010.0223C) with three panel antennas approved and installed.

The Clearwire antennas are no longer in operation; however, Clearwire was acquired by Sprint, which is in the process of transferring portions of the network frequencies (assigned by the Federal Communications Commission) for high speed data use by Sprint mobile customers. Staff and the carrier are evaluating opportunities to consolidate and/or remove antennas as the conversion progresses.

SURROUNDING PROPERTIES AND NEIGHBORHOOD

The Project Site lies along the western and southern borders of the Pacific Heights neighborhood. The Project Site is surrounded to the north (Sacramento Street Neighborhood Commercial District) and south (Western Addition Neighborhood) by predominantly three-story residential and mixed-use (two residential floors over ground floor commercial) buildings. A low-rise two-story shopping center with surface parking lot is located to the east, and the Jewish Community Center is located to the west, across Presidio Avenue (Presidio Heights Neighborhood). The area to the southwest includes a two-story office building (San Francisco Fire Credit Union) set in front of the Laurel Heights Campus of the University of California at San Francisco (UCSF).

ENVIRONMENTAL REVIEW

The Project is exempt from the California Environmental Quality Act ("CEQA") as a Class 3 categorical exemption. The categorical exemption and all pertinent documents may be found in the files of the Planning Department, as the custodian of records, at 1650 Mission Street, San Francisco.

HEARING NOTIFICATION

TYPE	REQUIRED PERIOD	REQUIRED NOTICE DATE	ACTUAL NOTICE DATE	ACTUAL PERIOD
Classified News Ad	20 days	August 22, 2014	August 20, 2014	22 days
Posted Notice	20 days	August 22, 2014	August 22, 2014	22 days
Mailed Notice	10 days	September 1, 2014	August 22, 2014	20 days

PUBLIC COMMENT

As of August 4, 2014, the Department has received comments and a petition from 97 residents opposed to the proposed Project, based primarily on health concerns related to radio-frequency emissions.

In addition, the Project Sponsor held a community meeting at the San Francisco Public Library, Presidio Branch, at 3150 Sacramento Street, to discuss the Project at 6:00 p.m. on July 8, 2014. Twenty-seven (27) community members attended the meeting. Inquires included the potential health effects of radio-frequency (RF) emissions, the location of existing wireless facilities, the need for the facility, the scope of

notification outreach, compliance with the Planning Code, potential interference, and monitoring standards.

ISSUES AND OTHER CONSIDERATIONS

- Health and safety aspects of all wireless Projects are reviewed under the Department of Public Health and the Department of Building Inspection. The RF emissions associated with this Project have been determined to comply with limits established by the Federal Communications Commission (FCC).
- An updated Five Year Plan with approximate longitudinal and latitudinal coordinates of proposed locations, including the Project Site, is on file with the Planning Department.
- All required public notifications were conducted in compliance with the Planning Code and adopted WTS policies.

REQUIRED COMMISSION ACTION

Pursuant to Sections 711.83 and 303 of the Planning Code, a Conditional Use Authorization is required for a WTS facility (Public Use) in an NC-2 (Neighborhood Commercial, Small-Scale) Zoning District.

BASIS FOR RECOMMENDATION

This Project is necessary and/or desirable under Section 303 of the Planning Code for the following reasons:

- The Project complies with the applicable requirements of the Planning Code.
- The Project is consistent with the Objectives and Policies of the General Plan.
- The Project is consistent with the 1996 WTS Facilities Siting Guidelines, Planning Commission Resolution No. 14182, 16539, and 18523 supplementing the 1996 WTS Guidelines.
- Health and safety aspects of all wireless projects are reviewed under the Department of Public Health and the Department of Building Inspections.
- The expected RF emissions fall well within the limits established by the Federal Communications Commission (FCC).
- The Project Site is considered a Preferred Location (Location Preference 2, Co-Location), according to the Wireless Telecommunications Services (WTS) Facilities Siting Guidelines, as the Project Site features existing Clearwire and Sprint macro WTS facilities.
- Based on propagation maps provided by AT&T Mobility, the Project would provide enhanced 700 - 2170 Megahertz 4G LTE (4th Generation, Long-Term-Evolution, voice and data) coverage in an area that currently experiences gaps in coverage and capacity.
- Based on the analysis provided by AT&T Mobility, the Project will provide additional capacity in an area that currently experiences insufficient service during periods of high data usage.
- Based on independent third-party evaluation, the maps, data, and conclusions about service coverage and capacity provided by AT&T Mobility are accurate.
- The roof-mounted antennas will be screened from view by faux elements intended to resemble chimneys boxes. Related electronic equipment would be located on the roof, and in a first floor parking area, but would not be prominently visible from adjacent public rights-of-way.

The facility would continue to avoid intrusion into public vistas, avoid disruption of the architectural integrity of building and insure harmony with neighborhood character.

- The Project has been reviewed by staff and found to be categorically exempt from further environmental review, as a Class 3 exemption of the California Environmental Quality Act.

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RECOMMENDATION:	**Approval with Conditions**

☒	Executive Summary	☒	Project sponsor submittal
☒	Draft Motion		Drawings: Proposed Project
☒	Zoning District Map	☒	Check for legibility
☐	Height & Bulk Map	☒	Photo Simulations
☒	Parcel Map	☒	Coverage Maps
☒	Sanborn Map	☒	RF Report
☒	Aerial Photo	☒	DPH Approval
☒	Context Photos	☒	Community Outreach Report
☒	Site Photos	☒	Independent Evaluation

Exhibits above marked with an "X" are included in this packet om Planner's Initials

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Planning Commission Motion No. XXXXX

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ADOPTING FINDINGS RELATING TO THE APPROVAL OF A CONDITIONAL USE AUTHORIZATION UNDER PLANNING CODE SECTIONS 303(c) AND 711.83 TO INSTALL A MACRO WIRELESS TELECOMMUNICATIONS SERVICES FACILITY CONSISTING OF TWELVE SCREENED PANEL ANTENNAS AND ASSOCIATED EQUIPMENT LOCATED ON THE ROOFTOP AND PARKING GARAGE OF AN EXISTING HOTEL AS PART OF AT&T MOBILITY'S WIRELESS TELECOMMUNICATIONS NETWORK WITHIN AN NC-2 (NEIGHBORHOOD COMMERCIAL, SMALL-SCALE) ZONING DISTRICT, AND A 40-X HEIGHT AND BULK DISTRICT.

PREAMBLE

On June 5, 2014, AT&T Mobility (hereinafter "Project Sponsor"), submitted an application (hereinafter "Application"), for a Conditional Use Authorization on the property at 444 Presidio Avenue, Lot 026, in Assessor's Block 1022, (hereinafter "Project Site") to install a wireless telecommunications service facility (hereinafter "WTS") consisting of twelve (12) screened panel antennas and equipment located on the roof and garage of the Subject Building, as part of AT&T Mobility's telecommunications network, within an NC-2 (Neighborhood Commercial, Small-Scale) Zoning District, and a 40-X Height and Bulk District.

The Project is exempt from the California Environmental Quality Act ("CEQA") as a Class 3 Categorical Exemption (Section 15303 of the California Environmental Quality Act). The Planning Commission has reviewed and concurs with said determination. The categorical exemption and all pertinent documents may be found in the files of the Planning Department (hereinafter "Department"), as the custodian of records, at 1650 Mission Street, San Francisco.

On September 11, 2014, the San Francisco Planning Commission (hereinafter "Commission") conducted a duly noticed public hearing at a regularly scheduled meeting on the Application for a Conditional Use Authorization.

The Commission has heard and considered the testimony presented to it at the public hearing and has further considered written materials and oral testimony presented on behalf of the Applicant, Department Staff, and other interested parties.

MOVED, that the Commission hereby authorizes the Conditional Use in Application No. 2014.0846C, subject to the conditions contained in "EXHIBIT A" of this motion, based on the following findings:

FINDINGS

Having reviewed the materials identified in the preamble above, and having heard all testimony and arguments, this Commission finds, concludes, and determines as follows:

1. The above recitals are accurate and constitute findings of this Commission.

2. **Site Description and Present Use**. The Project Site is located on Assessor's Block 1022, Lot 026 at the northeast corner of Presidio Avenue and California Street. The Project Site was developed in 1962, and is an approximately 45-foot tall, four-story hotel (Laurel Inn).

   The rooftop of the Subject Building features existing macro WTS facilities for Sprint (Case No. 2003.1258C), with four antennas approved, but three panel antennas installed, and a Clearwire WTS facility (Case No. 2010.0223C) with three panel antennas approved and installed.

   The Clearwire antennas are no longer in operation; however, Clearwire was acquired by Sprint, which is in the process of transferring portions of the network frequencies (assigned by the Federal Communications Commission) for high speed data use by Sprint mobile customers. Staff and the carrier are evaluating opportunities to consolidate and/or remove antennas as the conversion progresses.

3. **Surrounding Properties and Neighborhood**. The Project Site lies along the western and southern border of the Pacific Heights neighborhood. The Project Site is surrounded to the north (Sacramento Street Neighborhood Commercial District) and south (Western Addition Neighborhood) by predominantly three-story residential and mixed-use (two residential floors over ground floor commercial) buildings. A low-rise two-story shopping center with surface parking lot is located to the east, and the Jewish Community Center is located to the west, across Presidio Avenue (Presidio Heights Neighborhood). The area to the southwest includes a two-story office building (San Francisco Fire Credit Union) set in front of the Laurel Heights Campus of the University of California at San Francisco (UCSF).

4. **Project Description.** The proposal is to allow the development of an AT&T Mobility macro wireless telecommunication services ("WTS") facility. The macro WTS facility would consist of twelve (12) screened rooftop mounted panel antennas, and electronic equipment necessary to run the facility on the roof and the first floor parking area of an existing hotel (Laurel Inn).

   The proposed antennas would measure approximately 55" high, by 12" wide, by 7" thick, and would be fully screened from view utilizing a combination of three (3) chimney boxes, featuring four (4) antennas each. The faux chimney box elements would be setback seven (7) feet from the nearest building edge and rise approximately seven (7) feet above the 45-foot tall roof.

   The screening material used for the faux vent pipes and chimney boxes would be composed of a fiberglass like material known as fibre-reinforced plastic (FRP), which would be painted and textured to mimic mechanical elements. The FRP material allows for the screening of panel antennas, while still allowing radio waves to pass through.

   Electronic equipment necessary to run the facility would be located in two areas. A portion of the equipment would be located on the roof at locations (height and setback from roof edges) that would not be prominently visible from adjacent public rights-of-way. The relatively larger, equipment cabinets would be placed within a portion of the parking garage on the first floor, and would include battery back-up cabinets, to provide backup power in the event of a power outage or disaster.

5. **Past History and Actions.** The Planning Commission adopted the *Wireless Telecommunications Services (WTS) Facilities Siting Guidelines* ("Guidelines") for the installation of wireless telecommunications facilities in 1996. These Guidelines set forth the land use policies and practices that guide the installation and approval of wireless facilities throughout San Francisco. A large portion of the Guidelines was dedicated to establishing location preferences for these installations. The Board of Supervisors, in Resolution No. 635-96, provided input as to where wireless facilities should be located within San Francisco. The Guidelines were updated by the Commission in 2003 and again in 2012, requiring community outreach, notification, and detailed information about the facilities to be installed.

   Section 8.1 of the Guidelines outlines Location Preferences for wireless facilities. There are five primary areas were the installation of wireless facilities should be located:

   1. Publicly-used Structures: such facilities as fire stations, utility structures, community facilities, and other public structures;
   2. Co-Location Site: encourages installation of facilities on buildings that already have wireless installations;
   3. Industrial or Commercial Structures: buildings such as warehouses, factories, garages, service stations;

4. Industrial or Commercial Structures: buildings such as supermarkets, retail stores, banks; and
5. Mixed-Use Buildings in High Density Districts: buildings such as housing above commercial or other non-residential space.

Section 8.1 of the WTS Siting Guidelines further stipulates that the Planning Commission will not approve WTS applications for Preference 5 or below Location Sites unless the application describes (a) what publicly-used building, co-location site or other Preferred Location Sites are located within the geographic service area; (b) what good faith efforts and measures were taken to secure these more Preferred Locations, (c) explains why such efforts were unsuccessful; and (d) demonstrates that the location for the site is essential to meet demands in the geographic service area and the Applicant's citywide networks.

Before the Planning Commission can review an application to install a wireless facility, the Project Sponsor must submit a five-year facilities plan, which must be updated biannually, an emissions report and approval by the Department of Public Health, Section 106 Declaration of Intent, an independent evaluation verifying coverage and capacity, a submittal checklist and details about the facilities to be installed.

Under Section 704(B)(iv) of the 1996 Federal Telecommunications Act, local jurisdictions cannot deny wireless facilities based on Radio Frequency (RF) radiation emissions so long as such facilities comply with the FCC's regulations concerning such emissions.

6. **Location Preference.** The *WTS Facilities Siting Guidelines* identify different types of zoning districts and building uses for the siting of wireless telecommunications facilities. Under the *Guidelines*, and based on the presence of macro WTS facilities for Sprint and Clearwire, the WTS facility is proposed on a Location Preference 2 Site (Preferred Location, Co-Location) according to the WTS Facilities Siting Guidelines.

7. **Radio Waves Range.** The Project Sponsor has stated that the proposed wireless network is designed to address coverage and capacity needs in the area. The network will operate in the 700 – 2,170 Megahertz (MHZ) bands, which are regulated by the Federal Communications Commission (FCC) and must comply with the FCC-adopted health and safety standards for electromagnetic radiation and radio frequency radiation.

8. **Radiofrequency (RF) Emissions:** The Project Sponsor retained Hammett & Edison, Inc., a radio engineering consulting firm, to prepare a report describing the expected RF emissions from the proposed facility. Pursuant to the *Guidelines*, the Department of Public Health reviewed the report and determined that the proposed facility complies with the standards set forth in the Guidelines.

9. **Department of Public Health Review and Approval.** The proposed Project was referred to the Department of Public Health (DPH) for emissions exposure analysis. Existing radio-frequency (RF) levels at ground level were around 1% of the FCC public exposure limit.

AT&T Mobility proposes to install twelve (12) panel antennas. The antennas will be mounted at a height of approximately 50 feet above the ground. The estimated ambient RF field from the proposed AT&T Mobility transmitters at ground level is calculated to be 0.039 mW/sq. cm., which is 4.3% of the FCC public exposure limit. The three dimensional perimeter of RF levels equal to the public exposure limit extends 70 feet and does not reach any publicly accessible areas. Warning signs must be posted at the antennas and roof access points in English, Spanish, and Chinese. Workers should not have access to the area (20 feet) directly in front of the antenna while it is in operation.

10. **Coverage and Capacity Verification.** The maps, data, and conclusion provided by AT&T Mobility to demonstrate need for outdoor and indoor coverage and capacity have been determined by Hammett & Edison, and engineering consultant and independent third party to accurately represent the carrier's present and post-installation conclusions.

11. **Maintenance Schedule**. The proposed facility would operate without on-site staff but with a two-person maintenance crew visiting the property approximately once a month and on an as-needed basis to service and monitor the facility.

12. **Community Outreach.** Per the *Guidelines*, the Project Sponsor held a community meeting at the San Francisco Public Library, Presidio Branch, at 3150 Sacramento Street, to discuss the Project at 6:00 p.m. on July 8, 2014. Twenty-seven (27) community members attended the meeting. Inquires included the potential health effects of radio-frequency (RF) emissions, the location of existing wireless facilities, the need for the facility, the scope of notification outreach, compliance with the Planning Code, potential interference, and monitoring standards.

13. **Five-year plan:** Per the Guidelines, the Project Sponsor submitted an updated five-year plan, as required, in April 2014.

14. **Public Comment.** As of September 4, 2014, the Department has received comments and a petition from 97 residents opposed to the proposed Project, based primarily on health concerns related to radio-frequency emissions.

15. **Planning Code Compliance.** The Commission finds that the Project is consistent with the relevant provisions of the Planning Code in the following manner:

    A. **Use.** Per Planning Code Section 711.83, a Conditional Use Authorization is required for the installation of wireless telecommunication services facility (Public Use).

16. **Planning Code Section 303** establishes criteria for the Planning Commission to consider when reviewing applications for Conditional Use approval. On balance, the Project does comply with said criteria in that:

A. The proposed new uses and building, at the size and intensity contemplated and at the proposed location, will provide a development that is necessary or desirable, and compatible with, the neighborhood or the community.

i. *Desirable: San Francisco is a leader of the technological economy; it is important and desirable to the vitality of the City to have and maintain adequate telecommunications coverage and data capacity. This includes the installation and upgrading of systems to keep up with changing technology and increases in usage. It is desirable for the City to allow wireless facilities to be installed.*

The proposed Project at 444 Presidio Avenue is generally desirable and compatible with the surrounding neighborhood because the Project will not conflict with the existing uses of the property and will be designed to be compatible with the surrounding neighborhood. The placement of antennas and related support and protection features are so located, designed, and treated architecturally to minimize their visibility from public places, to avoid intrusion into public vistas, to avoid disruption of the architectural design integrity of buildings, and to insure harmony with the existing neighborhood character and promote public safety. The Project has been reviewed and determined to not cause the removal or alteration of any significant architectural features of the subject building.

ii. *Necessary: In the case of wireless installations, there are two criteria that the Commission reviews: coverage and capacity.*

Coverage: San Francisco does have sufficient overall wireless coverage (note that this is separate from carrier capacity). San Francisco's unique coverage issues are due to topography and building heights. The hills and buildings disrupt lines of site between WTS base stations. Thus, telecommunication carriers continue to install additional installations to make sure coverage is sufficient.

Capacity: While a carrier may have adequate coverage in a certain area, the capacity may not be sufficient. With the continuous innovations in wireless data technology and demand placed on existing infrastructure, individual telecommunications carriers must upgrade and in some instances expand their facilities network to provide proper data and voice capacity. It is necessary for San Francisco, as a leader in technology, to have adequate capacity.

The proposed Project at 444 Presidio Avenue is necessary in order to achieve sufficient street and in-building mobile phone coverage and data capacity. Recent drive tests in the subject area conducted by the AT&T Mobility Radio Frequency Engineering Team provide that the Project Site is a preferable location, based on factors including quality of coverage and aesthetics.

B. The proposed project will not be detrimental to the health, safety, convenience or general welfare of persons residing or working in the vicinity. There are no features

of the project that could be detrimental to the health, safety or convenience of those residing or working the area, in that:

i. Nature of proposed site, including its size and shape, and the proposed size, shape and arrangement of structures;

The Project must comply with all applicable Federal and State regulations to safeguard the health, safety and to ensure that persons residing or working in the vicinity will not be affected, and prevent harm to other personal property.

The Department of Public Health conducted an evaluation of potential health effects from Radio Frequency radiation, and has concluded that the proposed wireless transmission facilities will have no adverse health effects if operated in compliance with the FCC-adopted health and safety standards.

ii. The accessibility and traffic patterns for persons and vehicles, the type and volume of such traffic, and the adequacy of proposed off-street parking and loading;

No increase in traffic volume is anticipated with the facilities operating unmanned, with a maintenance crew visiting the Site once a month or on an as-needed basis.

iii. The safeguards afforded to prevent noxious or offensive emissions such as noise, glare, dust and odor;

While some noise and dust may result from the installation of the antennas and transceiver equipment, noise or noxious emissions from continued use are not likely to be significantly greater than ambient conditions due to the operation of the wireless communication network.

iv. Treatment given, as appropriate, to such aspects as landscaping, screening, open spaces, parking and loading areas, service areas, lighting and signs;

All of the antennas and roof-mounted equipment areas are screened, or so located so as to approximate mechanical appurtenances normally found on similar building rooftops. Related electronic equipment would be placed in the garage and on the roof at a height, and setback from roof edge, so as to not be visible from adjacent public rights-of-way. The proposed antennas and equipment will not affect landscaping, open space, parking, lighting or signage at the Project Site or surrounding area.

C. That the use as proposed will comply with the applicable provisions of the Planning Code and will not adversely affect the General Plan.

The Project complies with all relevant requirements and standards of the Planning Code and is consistent with Objectives and Policies of the General Plan, as detailed below.

D. That the use as proposed would provide development that is in conformity with the purpose of the applicable Neighborhood Commercial District.

The Project is consisted with the purpose of this Neighborhood Commercial District in that the intended use is located on an existing building and would not alter the character of the building or surrounding area. Furthermore, the facility would not impact the primary use of the building which is a hotel.

17. **General Plan Compliance.** The Project is, on balance, consistent with the following Objectives and Policies of the General Plan:

HOUSING ELEMENT
Objectives and Policies

BALANCE HOUSING CONSTRUCTION AND COMMUNITY INFRASTRUCTURE

OBJECTIVE 12:
BALANCE HOUSING GROWTH WITH ADEQUATE INFRASTRUCTURE THAT SERVES THE CITY'S GROWING POPULATION.

Policy 12.3:
Ensure new housing is sustainable supported by the City's public infrastructure systems.

The Project will improve AT&T Mobility's coverage and capacity along Presidio Avenue and California Streets, which are important commercial corridors at the confluence of the Pacific Heights, Presidio Heights, and Western Addition neighborhoods.

URBAN DESIGN ELEMENT
Objectives and Policies

HUMAN NEEDS

OBJECTIVE 4:
IMPROVEMENT OF THE NEIGHBORHOOD ENVIRONMENT TO INCREASE PERSONAL SAFETY, COMFORT, PRIDE AND OPPORTUNITY.

Policy 4.14:
Remove and obscure distracting and cluttering elements.

The proposed antennas and rooftop equipment, where visible from adjacent public rights-of-way, would be located in such as manner as to approximate mechanical appurtenances associated with a similar building rooftop. The height, setback from roof edge, and use of stealthing, would ensure the facility does not appear cluttered or distracting.

COMMERCE AND INDUSTRY ELEMENT
Objectives and Policies

OBJECTIVE 1:
MANAGE ECONOMIC GROWTH AND CHANGE TO ENSURE ENHANCEMENT OF THE TOTAL CITY LIVING AND WORKING ENVIRONMENT.

Policy 1.1:
Encourage development, which provides substantial net benefits and minimizes undesirable consequences. Discourage development, which has substantial undesirable consequences that cannot be mitigated.

Policy 1.2:
Assure that all commercial and industrial uses meet minimum, reasonable performance standards.

The Project would enhance the total city living and working environment by providing communication services for residents and workers within the City. Additionally, the Project would comply with Federal, State and Local performance standards.

OBJECTIVE 2:
MAINTAIN AND ENHANCE A SOUND AND DIVERSE ECONOMIC BASE AND FISCAL STRUCTURE FOR THE CITY.

Policy 2.1:
Seek to retain existing commercial and industrial activity and to attract new such activity to the city.

Policy 2.3:
Maintain a favorable social and cultural climate in the city in order to enhance its attractiveness as a firm location.

The Site would be an integral part of a new wireless communications network that would enhance the City's diverse economic base.

OBJECTIVE 4:
IMPROVE THE VIABILITY OF EXISTING INDUSTRY IN THE CITY AND THE ATTRACTIVENESS OF THE CITY AS A LOCATION FOR NEW INDUSTRY.

Policy 4.1:
Maintain and enhance a favorable business climate in the City.

Policy 4.2:
Promote and attract those economic activities with potential benefit to the City.

The Project would benefit the City by enhancing the business climate through improved communication services for residents and workers.

VISITOR TRADE ELEMENT

OBJECTIVE 8:
ENHANCE SAN FRANCISCO'S POSITION AS A NATIONAL CENTER FOR CONVENTIONS AND VISITOR TRADE.

Policy 8.3:
Assure that areas of particular visitor attraction are provided with adequate public services for both residents and visitors.

The Project would ensure that residents and visitors have adequate public service in the form of AT&T Mobility telecommunications.

COMMUNITY SAFETY ELEMENT
Objectives and Policies

OBJECTIVE 3:
ESTABLISH STRATEGIES TO ADDRESS THE IMMEDIATE EFFECTS OF A DISASTER.

Policy 1.20
Increase communication capabilities in preparation for all phases of a disaster and ensure communication abilities extend to hard-to-reach areas and special populations.

Policy 2.4
Bolster the Department of Emergency Management's role as the City's provider of emergency planning and communication, and prioritize its actions to meet the needs of San Francisco.

Policy 2.15
Utilize advancing technology to enhance communication capabilities in preparation for all phases of a disaster, particularly in the high-contact period immediately following a disaster.

Policy 3.7:
Develop a system to convey personalized information during and immediately after a disaster.

The Project would enhance the ability of the City to protect both life and property from the effects of a fire or natural disaster by providing communication services.

18. **Planning Code Section 101.1(b)** establishes eight priority-planning policies and requires review of permits for consistency with said policies. On balance, the Project does comply with said policies in that:

A. That existing neighborhood-serving retail uses be preserved and enhanced and future opportunities for resident employment in and ownership of such businesses be enhanced.

The wireless communications network would enhance personal communication services for businesses and customers in the surrounding area.

B. That existing housing and neighborhood character be conserved and protected in order to preserve the cultural and economic diversity of our neighborhoods.

No residential uses would be displaced or altered in any way by the granting of this Authorization. The facility consists of roof-mounted equipment and equipment within the Subject Building. The roof-mounted equipment would be screened or minimally visible, and would therefore not adversely affect the neighborhood character.

C. That the City's supply of affordable housing be preserved and enhanced.

The Project would have no adverse effect on housing in the vicinity.

D. That commuter traffic not impede MUNI transit service or overburden our streets or neighborhood parking.

Due to the nature of the Project and minimal maintenance or repair, municipal transit service would not be significantly impeded and neighborhood parking would not be overburdened.

E. That a diverse economic base be maintained by protecting our industrial and service sectors from displacement due to commercial office development, and that future opportunities for resident employment and ownership in these sectors be enhanced.

The Project would cause no displacement of industrial and service sector activity.

F. That the City achieve the greatest possible preparedness to protect against injury and loss of life in an earthquake.

Compliance with applicable structural safety and seismic safety requirements would be considered during the building permit application review process.

G. That landmarks and historic buildings be preserved.

The Project Site is considered a Potential Historic Resource, developed in 1962. The majority of the facility, which is visible from the public right-of-way, consists of twelve (12) panel

antennas, which would be screened from view by elements intended to mimic faux chimney boxes typically found on buildings within the City. The faux chimney boxes would be of a massing, height, and setback from roof edge so as to not appear out of scale with the Subject Building. No elements exhibiting craftsmanship or detailing are present at areas where the facility is proposed. Furthermore the proposed facility would not detract from views of other buildings considered potential historic resources in the surrounding area.

H. That our parks and open space and their access to sunlight and vistas be protected from development.

The Project would have no adverse effect on parks or open space, or their access to sunlight or public vistas.

19. The Project is consistent with and would promote the general and specific purposes of the Code provided under Section 101.1(b) in that, as designed, the Project would contribute to the character and stability of the neighborhood and would constitute a beneficial development.

20. The Commission hereby finds that approval of the Conditional Use Authorization would promote the health, safety and welfare of the City.

DECISION

The Commission, after carefully balancing the competing public and private interests, and based upon the Recitals and Findings set forth above, in accordance with the standards specified in the Code, hereby approves the Conditional Use Authorization under Planning Code Sections 711.83 and 303 to install twelve (12) screened panel antennas and associated equipment cabinets on the roof and garage of the Project Site and as part of a wireless transmission network operated by AT&T Mobility on a Location Preference 2 (Preferred Location, Co-Location) according to the Wireless Telecommunications Services (WTS) Facilities Siting Guidelines, within an NC-2 (Neighborhood Commercial, Small-Scale) District, and a 40-X Height and Bulk District, and subject to the conditions of approval attached hereto as **Exhibit A;** in general conformance with the plans, dated May 16, 2014, and stamped "Exhibit B."

APPEAL AND EFFECTIVE DATE OF MOTION: Any aggrieved person may appeal this Conditional Use Authorization to the Board of Supervisors within thirty (30) days after the date of this Motion No. XXXXX. The effective date of this Motion shall be the date of this Motion if not appealed (after the 30-day period has expired) OR the date of the decision of the Board of Supervisors if appealed to the Board of Supervisors. For further information, please contact the Board of Supervisors at (415) 554-5184, City Hall, Room 244, 1 Dr. Carlton B. Goodlett Place, San Francisco, CA 94102.

Protest of Fee or Exaction: You may protest any fee or exaction subject to Government Code Section 66000 that is imposed as a condition of approval by following the procedures set forth in Government Code Section 66020. The protest must satisfy the requirements of Government Code Section 66020(a) and must be filed within 90 days of the date of the first approval or conditional approval of the development referencing the challenged fee or exaction. For purposes of Government Code Section 66020, the date of imposition of the fee shall be the date of the earliest discretionary approval by the City of the subject development.

If the City has not previously given Notice of an earlier discretionary approval of the project, the Planning Commission's adoption of this Motion, Resolution, Discretionary Review Action or the Zoning Administrator's Variance Decision Letter constitutes the approval or conditional approval of the development and the City hereby gives **NOTICE** that the 90-day protest period under Government Code Section 66020 has begun. If the City has already given Notice that the 90-day approval period has begun for the subject development, then this document does not re-commence the 90-day approval period.

I hereby certify that the foregoing Motion was adopted by the Planning Commission on **September 11, 2014**.

Jonas P. Ionin
Commission Secretary

AYES:

NAYS:

ABSENT:

ADOPTED: September 11, 2014

EXHIBIT A

AUTHORIZATION

This authorization is for a Conditional Use Authorization under Planning Code Sections 711.83 and 303 to install twelve (12) screened panel antennas and associated equipment cabinets on the roof and garage of the Project Site and as part of a wireless transmission network operated by AT&T Mobility on a Location Preference 2 (Preferred Location, Co-Location) according to the Wireless Telecommunications Services (WTS) Facilities Siting Guidelines, within an NC-2 (Neighborhood Commercial, Small-Scale) District, and a 40-X Height and Bulk District, and subject to the conditions of approval attached hereto as Exhibit A; in general conformance with the plans, dated May 16, 2014, and stamped "Exhibit B."

RECORDATION OF CONDITIONS OF APPROVAL

Prior to the issuance of the building permit or commencement of use for the Project the Zoning Administrator shall approve and order the recordation of a Notice in the Official Records of the Recorder of the City and County of San Francisco for the subject property. This Notice shall state that the Project is subject to the conditions of approval contained herein and reviewed and approved by the Planning Commission on **September 11, 2014** under Motion No. XXXXX.

PRINTING OF CONDITIONS OF APPROVAL ON PLANS

The conditions of approval under the 'Exhibit A' of this Planning Commission Motion No. XXXXX shall be reproduced on the Index Sheet of construction plans submitted with the Site or Building permit application for the Project. The Index Sheet of the construction plans shall reference to the Conditional Use Authorization and any subsequent amendments or modifications.

SEVERABILITY

The Project shall comply with all applicable City codes and requirements. If any clause, sentence, section or any part of these conditions of approval is for any reason held to be invalid, such invalidity shall not affect or impair other remaining clauses, sentences, or sections of these conditions. This decision conveys no right to construct, or to receive a building permit. "Project Sponsor" shall include any subsequent responsible party.

CHANGES AND MODIFICATIONS

Changes to the approved plans may be approved administratively by the Zoning Administrator. Significant changes and modifications of conditions shall require Planning Commission approval of a new Conditional Use Authorization.

Conditions of Approval, Compliance, Monitoring, and Reporting

PERFORMANCE

1. **Validity and Expiration.** The authorization and right vested by virtue of this action is valid for three (3) years from the effective date of the Motion. A building permit from the Department of Building Inspection to construct the project and/or commence the approved use must be issued as this Conditional Use Authorization is only an approval of the proposed project and conveys no independent right to construct the Project or to commence the approved use. The Planning Commission may, in a public hearing, consider the revocation of the approvals granted if a site or building permit has not been obtained within three (3) years of the date of the Motion approving the Project. Once a site or building permit has been issued, construction must commence within the timeframe required by the Department of Building Inspection and be continued diligently to completion. The Commission may also consider revoking the approvals if a permit for the Project has been issued but is allowed to expire and more than three (3) years have passed since the Motion was approved.
   For information about compliance, contact Code Enforcement, Planning Department at 415-575-6863, www.sf-planning.org.

2. **Extension.** This authorization may be extended at the discretion of the Zoning Administrator only where failure to issue a permit by the Department of Building Inspection to perform said tenant improvements is caused by a delay by a local, State or Federal agency or by any appeal of the issuance of such permit(s).
   For information about compliance, contact Code Enforcement, Planning Department at 415-575-6863, www.sf-planning.org .

DESIGN – COMPLIANCE AT PLAN STAGE

3. **Plan Drawings - WTS**. Prior to the issuance of any building or electrical permits for the installation of the facilities, the Project Sponsor shall submit final scaled drawings for review and approval by the Planning Department ("Plan Drawings"). The Plan Drawings shall describe:
   a. Structure and Siting. Identify all facility related support and protection measures to be installed. This includes, but is not limited to, the location(s) and method(s) of placement, support, protection, screening, paint and/or other treatments of the antennas and other appurtenances to insure public safety, insure compatibility with urban design, architectural and historic preservation principles, and harmony with neighborhood character.
   b. For the Project Site, regardless of the ownership of the existing facilities. Identify the location of all existing antennas and facilities; and identify the location of all approved (but not installed) antennas and facilities.
   c. Emissions. Provide a report, subject to approval of the Zoning Administrator, that operation of the facilities in addition to ambient RF emission levels will not exceed adopted FCC standards with regard to human exposure in uncontrolled areas.
      For information about compliance, contact the Case Planner, Planning Department at 415-575-9078, www.sf-planning.org .

4. **Screening - WTS.** To the extent necessary to ensure compliance with adopted FCC regulations regarding human exposure to RF emissions, and upon the recommendation of the Zoning Administrator, the Project Sponsor shall:
   a. Modify the placement of the facilities;
   b. Install fencing, barriers or other appropriate structures or devices to restrict access to the facilities;
   c. Install multi-lingual signage, including the RF radiation hazard warning symbol identified in ANSI C95.2 1982, to notify persons that the facility could cause exposure to RF emissions;
   d. Implement any other practice reasonably necessary to ensure that the facility is operated in compliance with adopted FCC RF emission standards.
   e. To the extent necessary to minimize visual obtrusion and clutter, installations shall conform to the following standards:
   f. Antennas and back up equipment shall be painted, fenced, landscaped or otherwise treated architecturally so as to minimize visual effects;
   g. Rooftop installations shall be setback such that back up facilities are not viewed from the street;
   h. Antennas attached to building facades shall be so placed, screened or otherwise treated to minimize any negative visual impact; and
   i. Although co location of various companies' facilities may be desirable, a maximum number of antennas and back up facilities on the Project Site shall be established, on a case by case basis, such that "antennae farms" or similar visual intrusions for the site and area is not created.

   For information about compliance, contact the Case Planner, Planning Department at 415-575-9078, www.sf-planning.org .

MONITORING - AFTER ENTITLEMENT

5. **Enforcement.** Violation of any of the Planning Department conditions of approval contained in this Motion or of any other provisions of Planning Code applicable to this Project shall be subject to the enforcement procedures and administrative penalties set forth under Planning Code Section 176 or Section 176.1. The Planning Department may also refer the violation complaints to other city departments and agencies for appropriate enforcement action under their jurisdiction.
   For information about compliance, contact Code Enforcement, Planning Department at 415-575-6863, www.sf-planning.org

6. **Monitoring.** The Project requires monitoring of the conditions of approval in this Motion. The Project Sponsor or the subsequent responsible parties for the Project shall pay fees as established under Planning Code Section 351(e) (1) and work with the Planning Department for information about compliance.
   For information about compliance, contact Code Enforcement, Planning Department at 415-575-6863, www.sf-planning.org

7. **Revocation due to Violation of Conditions.** Should implementation of this Project result in complaints from interested property owners, residents, or commercial lessees which are not resolved by the Project Sponsor and found to be in violation of the Planning Code and/or the specific Conditions of Approval for the Project as set forth in Exhibit A of this Motion, the Zoning Administrator shall refer such complaints to the Commission, after which it may hold a public hearing on the matter to consider revocation of this authorization.
   For information about compliance, contact Code Enforcement, Planning Department at 415-575-6863, www.sf-planning.org.

8. **Implementation Costs - WTS**.
   a. The Project Sponsor, on an equitable basis with other WTS providers, shall pay the cost of preparing and adopting appropriate General Plan policies related to the placement of WTS facilities. Should future legislation be enacted to provide for cost recovery for planning, the Project Sponsor shall be bound by such legislation.
   b. The Project Sponsor or its successors shall be responsible for the payment of all reasonable costs associated with implementation of the conditions of approval contained in this authorization, including costs incurred by this Department, the Department of Public Health, the Department of Technology, Office of the City Attorney, or any other appropriate City Department or agency. The Planning Department shall collect such costs on behalf of the City.
   c. The Project Sponsor shall be responsible for the payment of all fees associated with the installation of the subject facility, which are assessed by the City pursuant to all applicable law.
      For information about compliance, contact Code Enforcement, Planning Department at 415-575-6863, www.sf-planning.org

9. **Implementation and Monitoring - WTS**. In the event that the Project implementation report includes a finding that RF emissions for the site exceed FCC Standards in any uncontrolled location, the Zoning Administrator may require the Applicant to immediately cease and desist operation of the facility until such time that the violation is corrected to the satisfaction of the Zoning Administrator.
   For information about compliance, contact Code Enforcement, Planning Department at 415-575-6863, www.sf-planning.org

10. **Project Implementation Report - WTS**. The Project Sponsor shall prepare and submit to the Zoning Administrator a Project Implementation Report. The Project Implementation Report shall:
    a. Identify the three dimensional perimeter closest to the facility at which adopted FCC standards for human exposure to RF emissions in uncontrolled areas are satisfied;
    b. Document testing that demonstrates that the facility will not cause any potential exposure to RF emissions that exceed adopted FCC emission standards for human exposure in uncontrolled areas.
    c. The Project Implementation Report shall compare test results for each test point with applicable FCC standards. Testing shall be conducted in compliance with FCC regulations governing the measurement of RF emissions and shall be conducted during

normal business hours on a non-holiday weekday with the subject equipment measured while operating at maximum power.

d. Testing, Monitoring, and Preparation. The Project Implementation Report shall be prepared by a certified professional engineer or other technical expert approved by the Department. At the sole option of the Department, the Department (or its agents) may monitor the performance of testing required for preparation of the Project Implementation Report. The cost of such monitoring shall be borne by the Project Sponsor pursuant to the condition related to the payment of the City's reasonable costs.
    i. Notification and Testing. The Project Implementation Report shall set forth the testing and measurements undertaken pursuant to Conditions 2 and 4.
    ii. Approval. The Zoning Administrator shall request that the Certification of Final Completion for operation of the facility not be issued by the Department of Building Inspection until such time that the Project Implementation Report is approved by the Department for compliance with these conditions.

For information about compliance, contact the Environmental Health Section, Department of Public Health at (415) 252-3800, www.sfdph.org.

11. **Notification prior to Project Implementation Report - WTS.** The Project Sponsor shall undertake to inform and perform appropriate tests for residents of any dwelling units located within 25 feet of the transmitting antenna at the time of testing for the Project Implementation Report.
    a. At least twenty calendar days prior to conducting the testing required for preparation of the Project Implementation Report, the Project Sponsor shall mail notice to the Department, as well as to the resident of any legal dwelling unit within 25 feet of a transmitting antenna of the date on which testing will be conducted. The Applicant will submit a written affidavit attesting to this mail notice along with the mailing list.
    b. When requested in advance by a resident notified of testing pursuant to subsection (a), the Project Sponsor shall conduct testing of total power density of RF emissions within the residence of that resident on the date on which the testing is conducted for the Project Implementation Report.

    For information about compliance, contact Code Enforcement, Planning Department at 415-575-6863, www.sf-planning.org

12. **Installation - WTS.** Within 10 days of the installation and operation of the facilities, the Project Sponsor shall confirm in writing to the Zoning Administrator that the facilities are being maintained and operated in compliance with applicable Building, Electrical and other Code requirements, as well as applicable FCC emissions standards.
    For information about compliance, contact Code Enforcement, Planning Department at 415-575-6863, www.sf-planning.org

13. **Periodic Safety Monitoring - WTS.** The Project Sponsor shall submit to the Zoning Administrator 10 days after installation of the facilities, and every two years thereafter, a certification attested to by a licensed engineer expert in the field of EMR/RF emissions, that the facilities are and have been operated within the then current applicable FCC standards for RF/EMF emissions.

For information about compliance, contact the Environmental Health Section, Department of Public Health at (415) 252-3800, www.sfdph.org.

OPERATION

14. **Community Liaison.** Prior to issuance of a building permit application to construct the project and implement the approved use, the Project Sponsor shall appoint a community liaison officer to deal with the issues of concern to owners and occupants of nearby properties. The Project Sponsor shall provide the Zoning Administrator written notice of the name, business address, and telephone number of the community liaison. Should the contact information change, the Zoning Administrator shall be made aware of such change. The community liaison shall report to the Zoning Administrator what issues, if any, are of concern to the community and what issues have not been resolved by the Project Sponsor.
For information about compliance, contact Code Enforcement, Planning Department at 415-575-6863, www.sf-planning.org

15. **Out of Service – WTS**. The Project Sponsor or Property Owner shall remove antennas and equipment that has been out of service or otherwise abandoned for a continuous period of six months.
For information about compliance, contact Code Enforcement, Planning Department at 415-575-6863, www.sf-planning.org

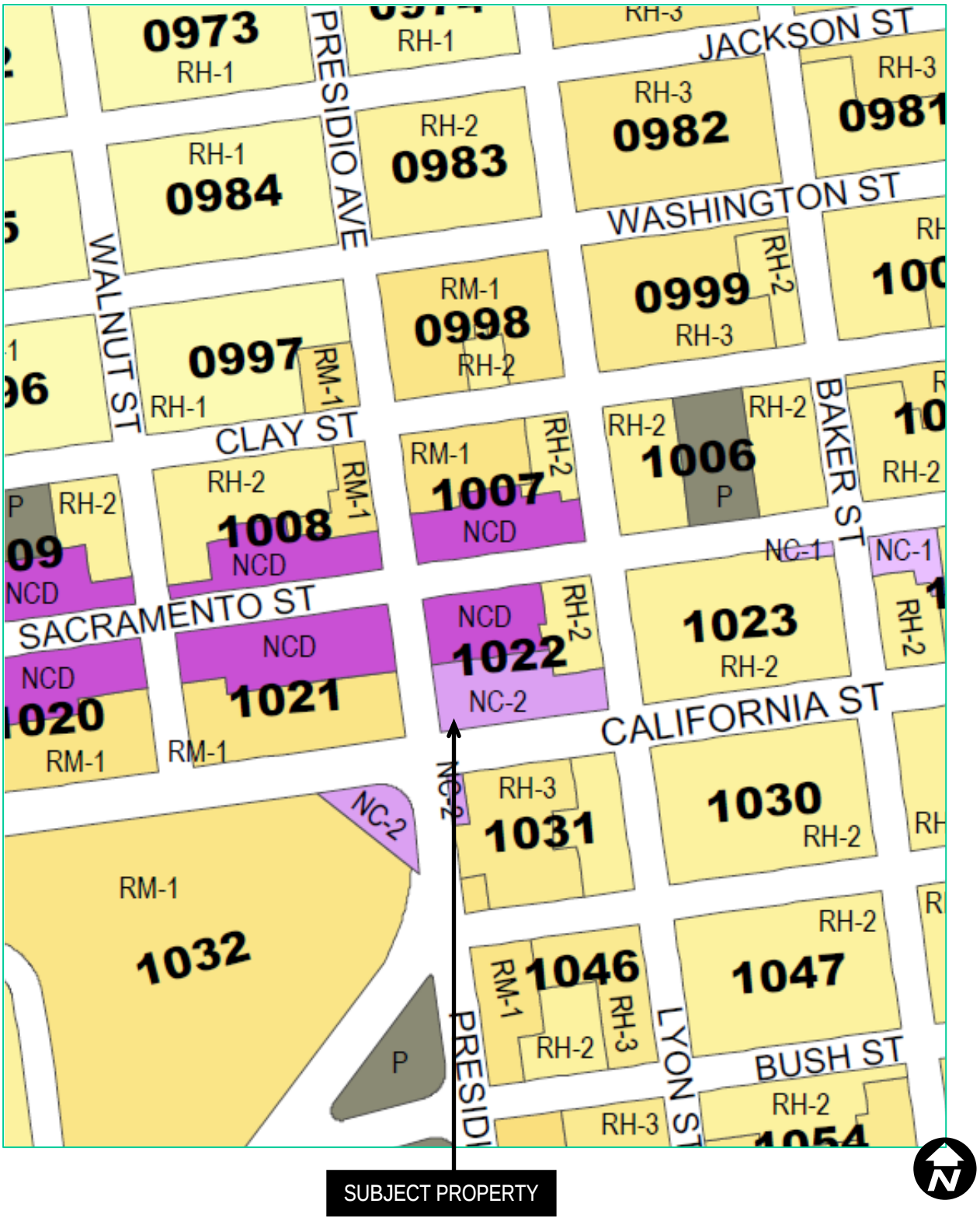
16. **Emissions Conditions – WTS**. It is a continuing condition of this authorization that the facilities be operated in such a manner so as not to contribute to ambient RF/EMF emissions in excess of then current FCC adopted RF/EMF emission standards; violation of this condition shall be grounds for revocation.
For information about compliance, contact the Environmental Health Section, Department of Public Health at (415) 252-3800, www.sfdph.org.

17. **Noise and Heat – WTS**. The WTS facility, including power source and cooling facility, shall be operated at all times within the limits of the San Francisco Noise Control Ordinance. The WTS facility, including power source and any heating/cooling facility, shall not be operated so as to cause the generation of heat that adversely affects a building occupant.
For information about compliance, contact the Environmental Health Section, Department of Public Health at (415) 252-3800, www.sfdph.org.

18. **Transfer of Operation – WTS**. Any carrier/provider authorized by the Zoning Administrator or by the Planning Commission to operate a specific WTS installation may assign the operation of the facility to another carrier licensed by the FCC for that radio frequency provided that such transfer is made known to the Zoning Administrator in advance of such operation, and all conditions of approval for the subject installation are carried out by the new carrier/provider.
For information about compliance, contact Code Enforcement, Planning Department at 415-575-6863, www.sf-planning.org

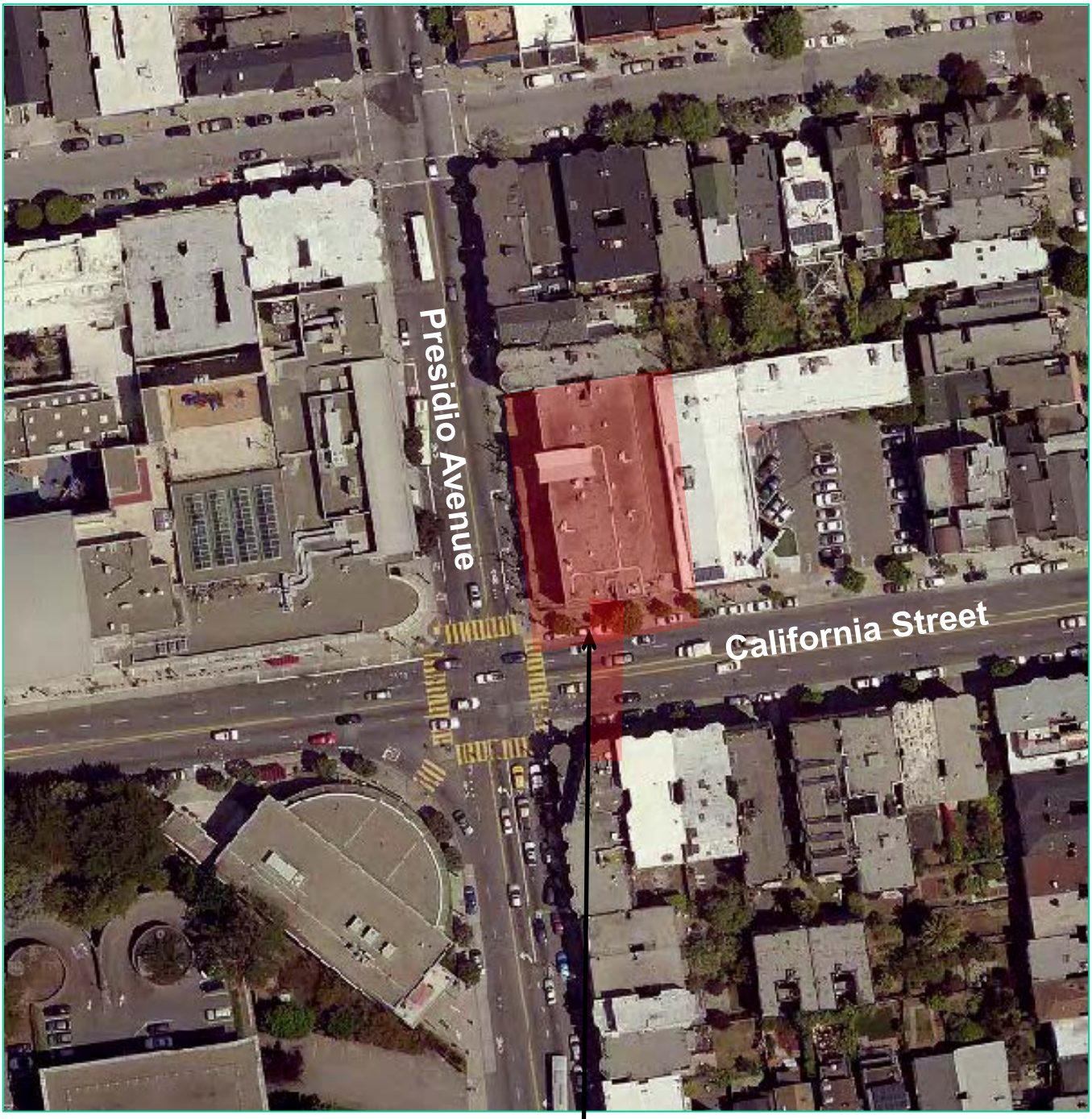
19. **Compatibility with City Emergency Services – WTS**. The facility shall not be operated or caused to transmit on or adjacent to any radio frequencies licensed to the City for emergency telecommunication services such that the City's emergency telecommunications system experiences interference, unless prior approval for such has been granted in writing by the City.
For information about compliance, contact the Department of Technology, 415-581-4000, http://sfgov3.org/index.aspx?page=1421

Zoning Map



Case Number 2014.0846C
AT&T Mobility Macro WTS Facility
444 Presidio Avenue

Aerial Photo

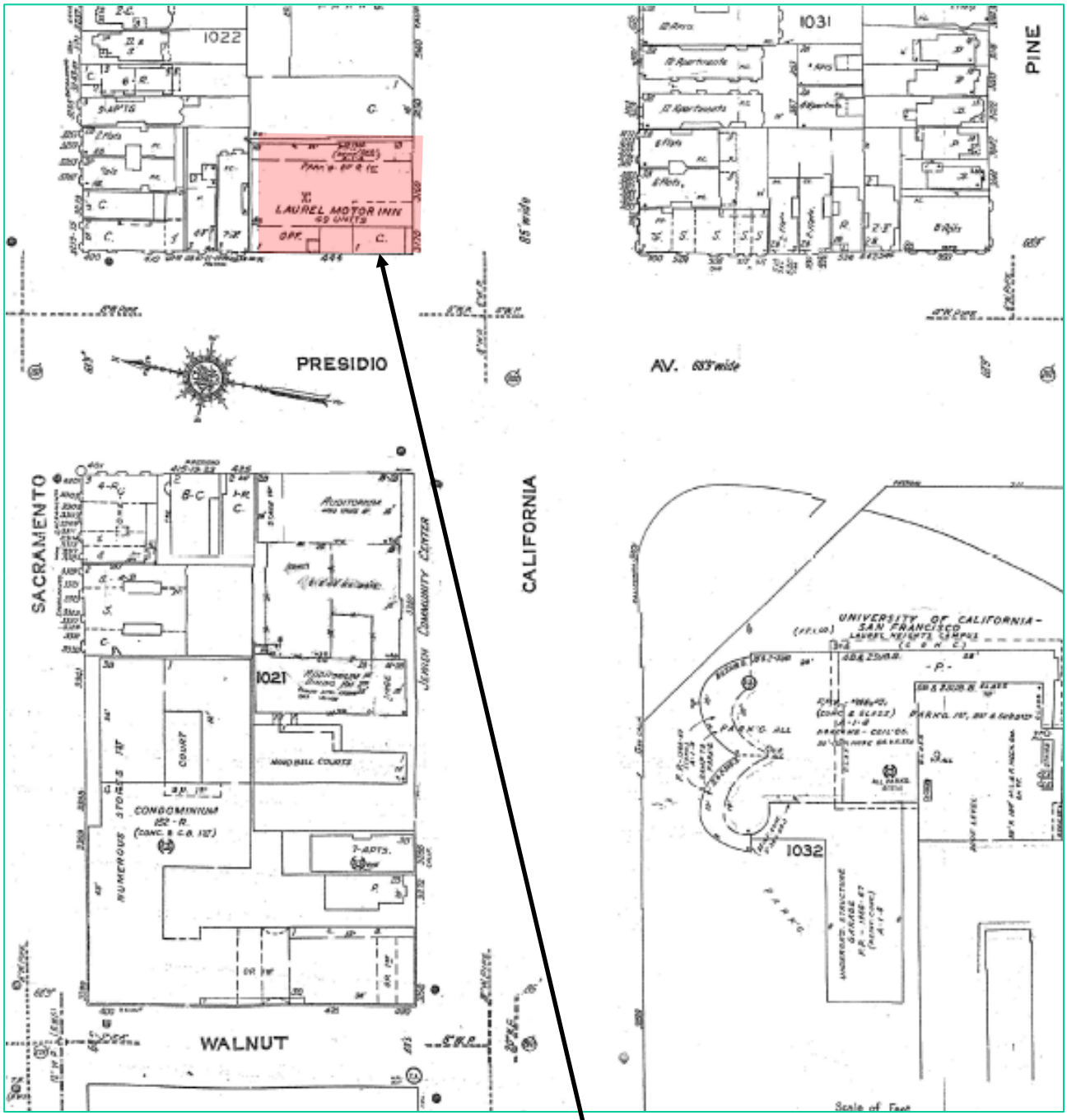


Case Number 2014.0846C
AT&T Mobility Macro WTS Facility
444 Presidio Avenue

Parcel Map

Case Number 2014.0846C
AT&T Mobility Macro WTS Facility
444 Presidio Avenue

Sanborn Map*



**The Sanborn Maps in San Francisco have not been updated since 1998, and this map may not accurately reflect existing conditions.*

Case Number 2014.0846C
AT&T Mobility Macro WTS Facility
444 Presidio Avenue

G. Contextual Photographs

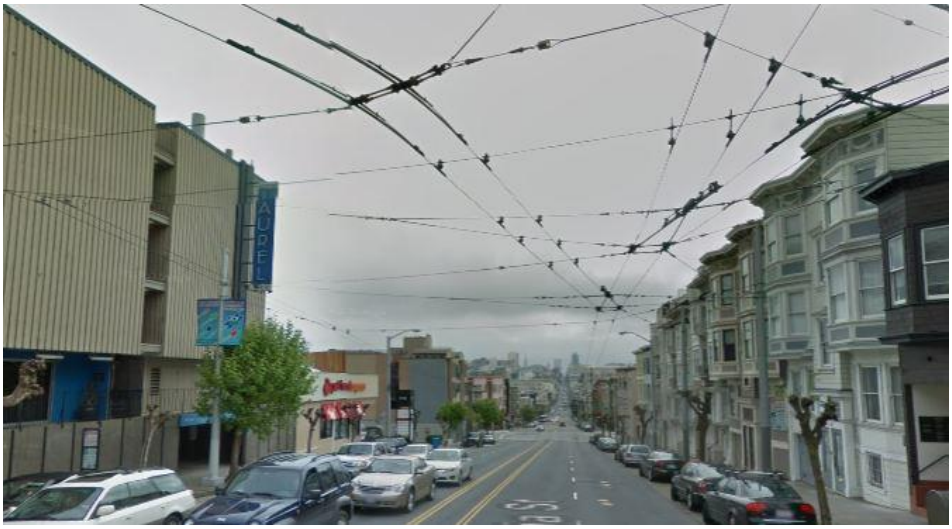
The following are photographs of the surrounding buildings within 100-feet of the subject property showing the facades and heights of nearby buildings:

Subject Site

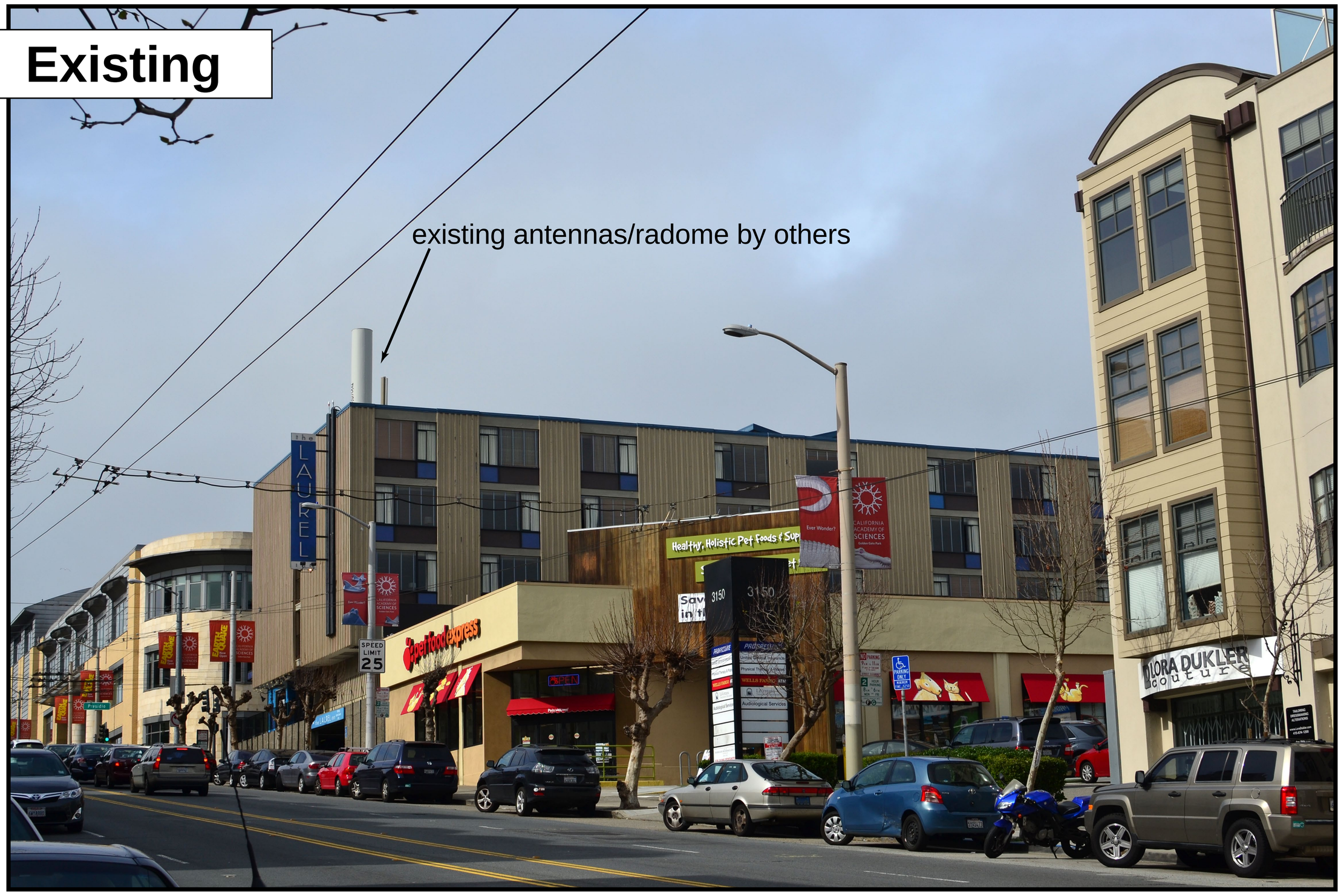
View looking North along Presidio

View looking West along California

View looking south along Presidio


View looking East along California

Existing



Proposed

Photo simulation as seen looking west from California Street

Prepared by: **05.15.2014**
WW Design & Consulting, Inc.
1654 Candelero Court
Walnut Creek, CA 94598
info@photosims.com

at&t

CCU5217 Laurel Inn
444 Presidio Avenue, San Francisco, CA 94118

Existing

Proposed

Photo simulation as seen looking northeast from California Street

Prepared by: **05.15.2014**
WW Design & Consulting, Inc.
1654 Candelero Court
Walnut Creek, CA 94598
info@photosims.com

at&t

CCU5217 Laurel Inn
444 Presidio Avenue, San Francisco, CA 94118

AT&T Mobility • Proposed Base Station (Site No. CC5217)
444 Presidio Avenue • San Francisco, California

Statement of Hammett & Edison, Inc., Consulting Engineers

The firm of Hammett & Edison, Inc., Consulting Engineers, has been retained on behalf of AT&T Mobility, a personal wireless telecommunications carrier, to evaluate the base station (Site No. CC5217) proposed to be located at 444 Presidio Avenue in San Francisco, California, for compliance with appropriate guidelines limiting human exposure to radio frequency ("RF") electromagnetic fields.

Background

The San Francisco Department of Public Health has adopted a 10-point checklist for determining compliance of proposed WTS facilities or proposed modifications to such facilities with prevailing safety standards. The acceptable limits set by the FCC for exposures of unlimited duration are:

Wireless Service	Frequency Band	Occupational Limit	Public Limit
Microwave (Point-to-Point)	5,000–80,000 MHz	5.00 mW/cm^2	1.00 mW/cm^2
BRS (Broadband Radio)	2,600	5.00	1.00
WCS (Wireless Communication)	2,300	5.00	1.00
AWS (Advanced Wireless)	2,100	5.00	1.00
PCS (Personal Communication)	1,950	5.00	1.00
Cellular	870	2.90	0.58
SMR (Specialized Mobile Radio)	855	2.85	0.57
700 MHz	700	2.40	0.48
[most restrictive frequency range]	30–300	1.00	0.20

The site was visited by Ms. Jody Purdom, a qualified field technician contracted by Hammett & Edison, Inc., during normal business hours on April 2, 2014, a non-holiday weekday, and reference has been made to information provided by AT&T, including zoning drawings by Streamline Engineering and Design, Inc., dated April 21, 2014.*

Checklist

1. The location of all existing antennas and facilities at site. Existing RF levels.

Sprint Nextel and Clearwire had installed directional panel antennas above the roof of the four-story hotel located at 444 Presidio Avenue; the Clearwire antennas would not be active now, with Sprint's new use of the 2.5 GHz frequencies. Existing RF levels for a person at ground near the site were less than 1% of the most restrictive public exposure limit. The measurement equipment used was a Wandel & Goltermann Type EMR-300 Radiation Meter with Type 18 Isotropic Electric Field Probe (Serial No. C-0010). The meter and probe were under current calibration by the manufacturer.

* It is noted that these drawings are to be updated to reflect those antenna locations shown in Figure 2, attached.

2. *The location of all approved (but not installed) antennas and facilities. Expected RF levels from approved antennas.*

No other WTS facilities are reported to be approved for this site but not installed.

3. *The number and types of WTS within 100 feet of proposed site and estimates of additive EMR emissions at proposed site.*

There were no other WTS facilities observed within 100 feet of the site.

4. *Location (and number) of Applicant's antennas and back-up facilities per building and location (and number) of other WTS at site.*

AT&T proposes to install twelve Andrew Model SBNHH-1D65A directional panel antennas above the roof of the building. Three antennas would be installed within individual cylindrical enclosures above the center of the roof, oriented toward 30°T, and the other antennas would be installed within two view screen enclosures above the southeast and southwest ends of the roof, oriented in groups of three toward 140°T and 240°T. The configuration of the proposed AT&T antennas, as well as the assumed configuration of the Sprint Nextel antennas, is shown in Figure 1, and their approximate locations are shown in Figure 2.

5. *Power rating (maximum and expected operating power) for all existing and proposed backup equipment subject to application.*

The expected operating power of the AT&T transmitters is reflected in the resulting effective radiated power given in Item 6 below; the transmitters may operate at a power below their maximum rating. The power ratings for the Sprint Nextel transmitters are not known.

6. *Total number of watts per installation and total number of watts for all installations at site.*

The maximum effective radiated power proposed by AT&T in any direction is 11,550 watts and the maximum effective radiated power assumed for Sprint Nextel is 7,770 watts.

7. *Plot or roof plan showing method of attachment of antennas, directionality of antennas, and height above roof level. Discuss nearby inhabited buildings.*

The drawings show the antennas to be installed as described in Item 4 above. There were noted buildings of similar height located at least 70 feet from the proposed AT&T antennas.

8. *Estimated ambient RF levels for proposed site and identify three-dimensional perimeter where exposure standards are exceeded.*

For a person anywhere at ground, the maximum RF exposure level due to the proposed AT&T operation by itself is calculated to be 0.039 mW/cm^2, which is 4.3% of the applicable public exposure limit. Ambient RF levels at ground level near the site are therefore estimated to be below 5.3% of the limit. The maximum calculated cumulative level at any nearby building is 78% of the public limit.

The three-dimensional perimeter of RF levels equal to the public exposure limit is calculated to extend up to 70 feet out from the antenna faces and to much lesser distances above, below, and to the sides; this includes areas of the roof of the building, but does not reach any publicly accessible areas.

9. Describe proposed signage at site.

It is recommended that barricades be erected, as shown in Figure 2, to preclude access by unauthorized persons within certain areas on the roof in front of the antennas. To prevent occupational exposures in excess of the FCC guidelines, it is recommended that appropriate RF safety training be provided to all authorized personnel who have access to the areas within the barricades, including employees and contractors of the wireless carriers as well as roofers, HVAC workers, and building maintenance staff. No access within 20 feet directly in front of the antennas themselves, such as might occur during maintenance work within the barricades, should be allowed while the base station is in operation, unless other measures can be demonstrated to ensure that occupational protection requirements are met. Marking "Prohibited Access Areas" with red paint stripes and "Worker Notification Areas" with yellow paint stripes on the roof of the building in front of the antennas, as shown in Figure 2, and posting explanatory signs† at the roof access door, on the barricades, and on the antenna enclosures, such that the signs would be readily visible from any angle of approach to persons who might need to work within that distance, would be sufficient to meet FCC-adopted guidelines. Similar measures should already be in place for Sprint Nextel; the applicable keep-back distance for that carrier has not been determined as part of this study.

10. Statement of authorship.

The undersigned author of this statement is a qualified Professional Engineer, holding California Registration Nos. E-13026 and M-20676, which expire on June 30, 2015. This work has been carried out under his direction, and all statements are true and correct of his own knowledge except, where noted, when data has been supplied by others, which data he believes to be correct.

† Signs should comply with OET-65 color, symbol, and content recommendations. Contact information should be provided (*e.g.*, a telephone number) to arrange for access to restricted areas. The selection of language(s) is not an engineering matter; the San Francisco Department of Public Health recommends that all signs be written in English, Spanish, and Chinese.

Conclusion

Based on the information and analysis above, it is the undersigned's professional opinion that operation of the base station proposed by AT&T Mobility at 444 Presidio Avenue in San Francisco, California, can comply with the prevailing standards for limiting human exposure to radio frequency energy and, therefore, need not for this reason cause a significant impact on the environment. The highest calculated level in publicly accessible areas is much less than the prevailing standards allow for exposures of unlimited duration. This finding is consistent with measurements of actual exposure conditions taken at other operating base stations. Erecting barricades is recommended to establish compliance with public exposure limitations; training authorized personnel, marking roof areas, and posting explanatory signs are recommended to establish compliance with occupational exposure limitations.

William F. Hammett, P.E.
707/996-5200

May 20, 2014

AT&T Mobility • Base Station No. CC5217
444 Presidio Avenue • San Francisco, California

Antenna Inventory Table

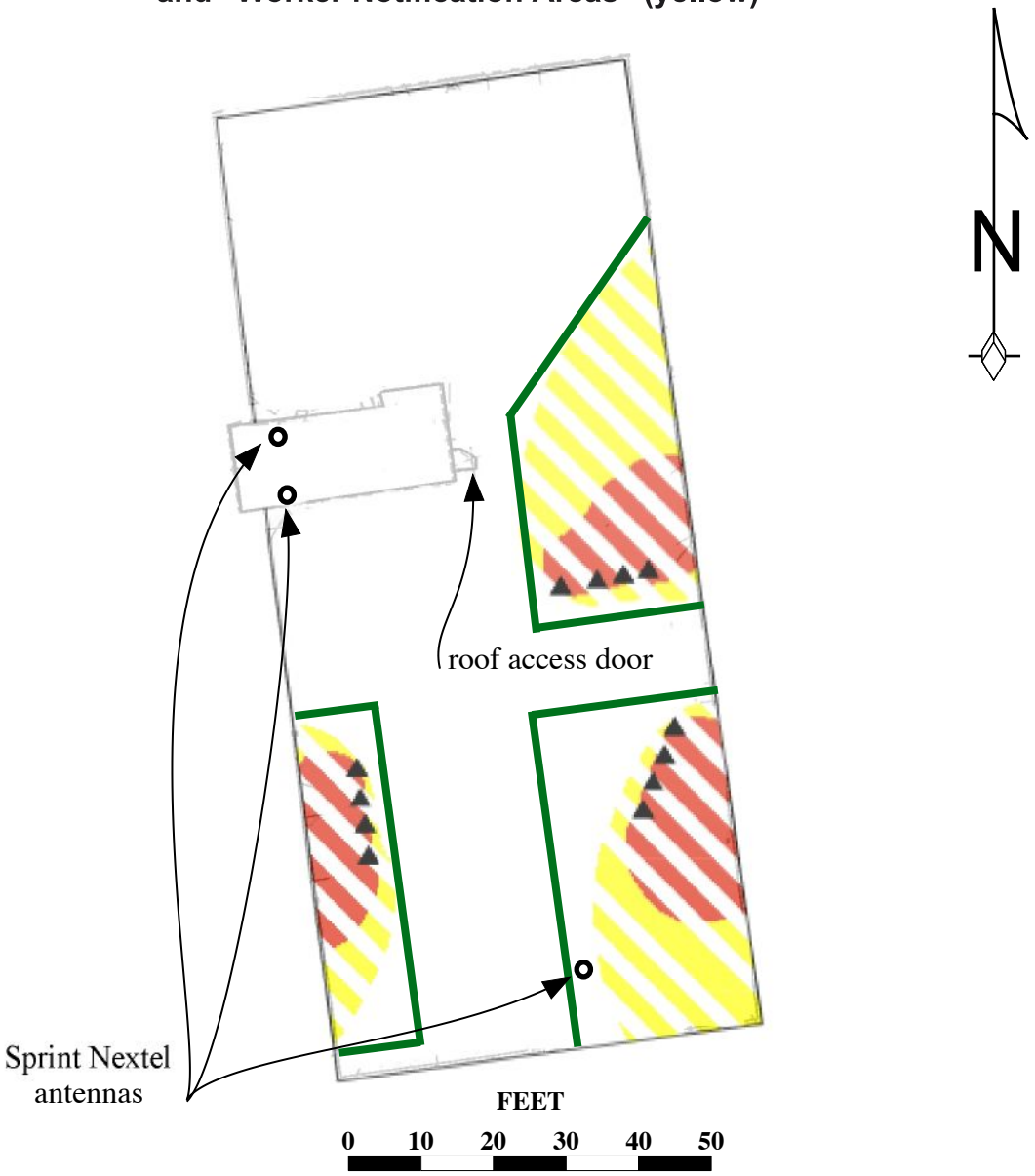
Orientation (°T) Antenna ID	Operator	Antenna Make	Antenna Model	Technology	Frequency Band (MHz)	Horizontal Beamwidth (°)	Antenna Aperture (ft)	Antenna Gain (dBd)	Maximum ERP (watts)	Downtilt (°)	COR Above Ground (ft)	COR Above Roof (ft)
30-1	AT&T	Andrew	SBNHH-1D65A	LTE	700	67	4.6	10.85	670	0	49½	5
30-1	AT&T	Andrew	SBNHH-1D65A	LTE	1950	64	4.6	14.55	1330	2	49½	5
30-2	AT&T	Andrew	SBNHH-1D65A	UMTS	1950	64	4.6	14.55	1010	0	49½	5
30-3	AT&T	Andrew	SBNHH-1D65A	UMTS	870	62	4.6	10.45	800	2	49½	5
30-3	AT&T	Andrew	SBNHH-1D65A	UMTS	1950	64	4.6	14.55	2020	0	49½	5
30-4	AT&T	Andrew	SBNHH-1D65A	LTE	700	67	4.6	10.85	670	6	49½	5
30-4	AT&T	Andrew	SBNHH-1D65A	LTE	2300	61	4.6	14.95	4380	8	49½	5
140-1	AT&T	Andrew	SBNHH-1D65A	LTE	700	67	4.6	10.85	670	0	49½	5
140-1	AT&T	Andrew	SBNHH-1D65A	LTE	1950	64	4.6	14.55	1330	2	49½	5
140-2	AT&T	Andrew	SBNHH-1D65A	UMTS	1950	64	4.6	14.55	1010	0	49½	5
140-3	AT&T	Andrew	SBNHH-1D65A	UMTS	870	62	4.6	10.45	800	2	49½	5
140-3	AT&T	Andrew	SBNHH-1D65A	UMTS	1950	64	4.6	14.55	2020	0	49½	5
140-4	AT&T	Andrew	SBNHH-1D65A	LTE	700	67	4.6	10.85	670	6	49½	5
140-4	AT&T	Andrew	SBNHH-1D65A	LTE	2300	61	4.6	14.95	4380	8	49½	5
240-1	AT&T	Andrew	SBNHH-1D65A	LTE	700	67	4.6	10.85	670	0	49½	5
240-1	AT&T	Andrew	SBNHH-1D65A	LTE	1950	64	4.6	14.55	1330	2	49½	5
240-2	AT&T	Andrew	SBNHH-1D65A	UMTS	1950	64	4.6	14.55	1010	0	49½	5
240-3	AT&T	Andrew	SBNHH-1D65A	UMTS	870	62	4.6	10.45	800	2	49½	5
240-3	AT&T	Andrew	SBNHH-1D65A	UMTS	1950	64	4.6	14.55	2020	0	49½	5
240-4	AT&T	Andrew	SBNHH-1D65A	LTE	700	67	4.6	10.85	670	6	49½	5
240-4	AT&T	Andrew	SBNHH-1D65A	LTE	2300	61	4.6	14.95	4380	8	49½	5
35-1	Sprint Nextel	Commscope	DHTT65B-3XR	LTE	2500	60	6.0	15.55	1440	4	49½	5
35-1	Sprint Nextel	Commscope	DHTT65B-3XR	EVDO	1950	68	6.0	15.15	5900	4	49½	5
35-1	Sprint Nextel	Commscope	DHTT65B-3XR	EVDO	855	62	6.0	13.25	430	4	49½	5
155-1	Sprint Nextel	Commscope	DHTT65B-3XR	LTE	2500	60	6.0	15.55	1440	4	49½	5
155-1	Sprint Nextel	Commscope	DHTT65B-3XR	EVDO	1950	68	6.0	15.15	5900	4	49½	5
155-1	Sprint Nextel	Commscope	DHTT65B-3XR	EVDO	855	62	6.0	13.25	430	4	49½	5
225-1	Sprint Nextel	Commscope	DHTT65B-3XR	LTE	2500	60	6.0	15.55	1440	4	49½	5
225-1	Sprint Nextel	Commscope	DHTT65B-3XR	EVDO	1950	68	6.0	15.15	5900	4	49½	5
225-1	Sprint Nextel	Commscope	DHTT65B-3XR	EVDO	855	62	6.0	13.25	430	4	49½	5
300-1	Sprint Nextel	Commscope	DHTT65B-3XR	LTE	2500	60	6.0	15.55	1440	4	49½	5
300-1	Sprint Nextel	Commscope	DHTT65B-3XR	EVDO	1950	68	6.0	15.15	5900	4	49½	5
300-1	Sprint Nextel	Commscope	DHTT65B-3XR	EVDO	855	62	6.0	13.25	430	4	49½	5

Acronyms

LTE	Long Term Evolution
UMTS	Universal Mobile Telecommunications System
EVDO	Evolution – Data Optimized
ERP	Effective Radiated Power
COR	Center of Radiation

AT&T Mobility • Proposed Base Station (Site No. CC5217)
444 Presidio Avenue • San Francisco, California

Suggested Locations for Barricades (green) and for Striping to Identify "Prohibited Access Areas" (red) and "Worker Notification Areas" (yellow)



Calculated exposure levels and barricade locations shown are based on contribution of AT&T only.

Notes:
Base drawing from Streamline Engineering and Design, Inc., dated April 21, 2014. It is noted that these drawings are to be updated to reflect those antenna locations shown.
Barricades should be erected to preclude access by the public to areas in front of the antennas.
"Prohibited Access Areas" should be marked with red paint stripes, "Worker Notification Areas" should be marked with yellow paint stripes, and explanatory signs should be posted outside the areas, readily visible to authorized workers needing access. See text.

City and County of San Francisco
DEPARTMENT OF PUBLIC HEALTH
ENVIRONMENTAL HEALTH SECTION

Edwin M. Lee, Mayor
Barbara A. Garcia, MPA, Director of Health
Richard J. Lee, MPH, CIH REHS, Director of EH

Review of Cellular Antenna Site Proposals

Project Sponsor : *AT&T Wireless* **Planner:** *Omar Masry*

RF Engineer Consultant: *Hammett and Edison* **Phone Number:** *(707) 996-5200*

Project Address/Location: *444 Presidio Av*

Site ID: *1840* **SiteNo.:** *CC5217*

The following information is required to be provided before approval of this project can be made. These information requirements are established in the San Francisco Planning Department Wireless Telecommunications Services Facility Siting Guidelines dated August 1996.
In order to facilitate quicker approval of this project, it is recommended that the project sponsor review this document before submitting the proposal to ensure that all requirements are included.

X 1. The location of all existing antennas and facilities. Existing RF levels. (WTS-FSG, Section 11, 2b)

☑ Existing Antennas No Existing Antennas: **4**

X 2. The location of all approved (but not installed) antennas and facilities. Expected RF levels from the approved antennas. (WTS-FSG Section 11, 2b)

◉ **Yes** ○ **No**

X 3. The number and types of WTS within 100 feet of the proposed site and provide estimates of cumulative EMR emissions at the proposed site. (WTS-FSG, Section 10.5.2)

◉ **Yes** ○ **No**

X 4. Location (and number) of the Applicant's antennas and back-up facilities per building and number and location of other telecommunication facilities on the property (WTS-FSG, Section 10.4.1a)

X 5. Power rating (maximum and expected operating power) for all existing and proposed backup equipment subject to the application (WTS-FSG, Section 10.4.1c)

Maximum Power Rating: **11550** watts.

X 6. The total number of watts per installation and the total number of watts per sector for all installations or the building (roof or side) (WTS-FSG, Section 10.5.1).

Maximum Effective Radiant: **11550** watts.

X 7. Preferred method of attachment of proposed antenna (roof, wall mounted, monopole) with plot or roof plan. Show directionality of antennas. Indicate height above roof level. Discuss nearby inhabited buildings (particularly in direction of antennas) (WTS-FSG, Section 10.41d)

X 8. Report estimated cumulative radio frequency fields for the proposed site including ground level (identify the three-dimensional perimeter where the FCC standards are exceeded.) (WTS-FSG, Section 10.5) State FCC standard utilized and power density exposure level (i.e. 1986 NCRP, 200 mw/cm2)

Maximum RF Exposure: **0.039** mW/cm^2 Maximum RF Exposure Percent: **4.3**

X 9. Signage at the facility identifying all WTS equipment and safety precautions for people nearing the equipment as may be required by any applicable FCC-adopted standards. (WTS-FSG, Section 10.9.2). Discuss signage for those who speak languages other than English.

☑ Public_Exclusion_Area Public Exclusion In Feet: **70**

☑ Occupational_Exclusion_Area Occupational Exclusion In Feet: **20**

X 10. Statement on who produced this report and qualifications.

X **Approved**. Based on the information provided the following staff believes that the project proposal will comply with the current Federal Communication Commission safety standards for radiofrequency radiation exposure. FCC standard CFR47 1.1310 **Approval of the subsequent Project Implementation Report is based on project sponsor completing recommendations by project consultant and DPH.**

Comments:

There are currently no antennas operated by AT&T Wireless installed on the roof top of the building at 444 Presidio Avenue. Existing RF levels at ground level were around 1% of the FCC public exposure limit. Sprint also has 4 operational antennas at this location. AT&T Wireless proposes to install 12 new antennas. The antennas will be mounted at a height of about 50 feet above the ground. The estimated ambient RF field from the proposed AT&T Wireless transmitters at ground level is calculated to be 0.039 mW/sq cm., which is 4.3% of the FCC public exposure limit. The three dimensional perimeter of RF levels equal to the public exposure limit extends 70 feet and includes portions of the rooftop areas. Barricades must be installed to prevent access to these areas. AT&T and Sprint should coordinate the barricade installations in areas where the two companies have antennas collocated. The maximum calculated cumulative level for any nearby building is predicted to be 78% of the FCC standard for the building located to the west across Presidio Avenue. Post installation measurement should be taken at this building in order to ensure compliance with the standard. Warning signs must be posted at the antennas, barricades and roof access points in English, Spanish and Chinese. Workers should not have access to within 20 feet of the front of the antennas while they are in operation. Prohibited access areas should be marked with signs and red striping on the rooftop. Worker notification zones should be marked with yellow striping on the rooftop.

—— **Not Approved**, additional information required.

—— **Not Approved**, does not comply with Federal Communication Commission safety standards for radiofrequency radiation exposure. FCC Standard

1 Hours spent reviewing

Charges to Project Sponsor (in addition to previous charges, to be received at time of receipt by Sponsor)

Signed: Paul Fosdahl Dated: 5/27/2014

Patrick Fosdahl
Environmental Health Management Section
San Francisco Dept. of Public Health
1390 Market St., Suite 210,
San Francisco, CA. 94102
(415) 252-3904

Service Improvement Objective (CC5217)

444 Presidio Ave

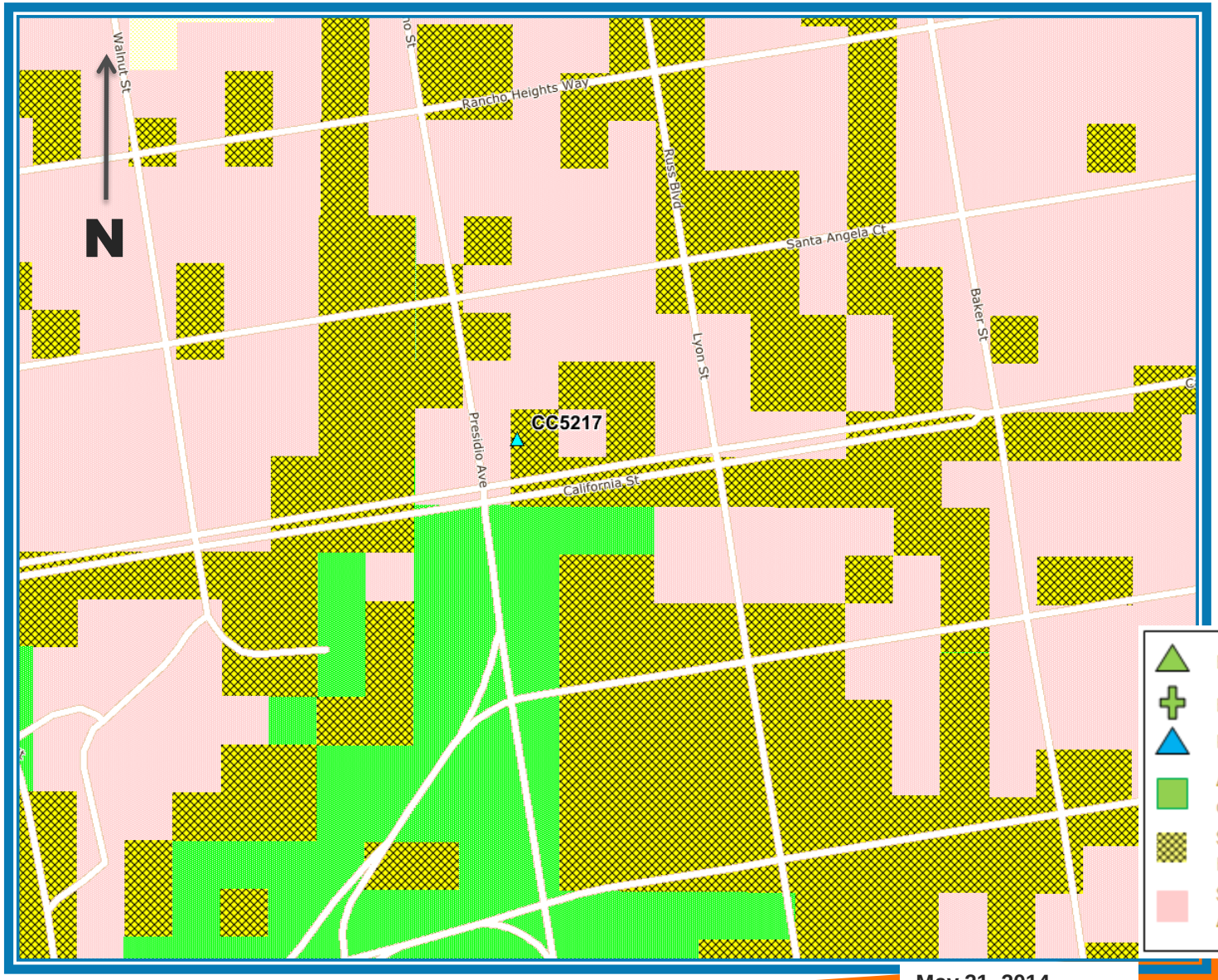
The green shaded area shows the general area for wireless service improvements addressed by this application.

In order to achieve the service goals as defined, at&t network engineers considered site locations in the area defined by the red circle

May 21, 2014

Exhibit 2 - Proposed Site at 444 Presidio (CC5217)

Service Area BEFORE site is constructed



May 21, 2014

Exhibit 3 - Current 7-Day Traffic Profile for the Location of CC5217

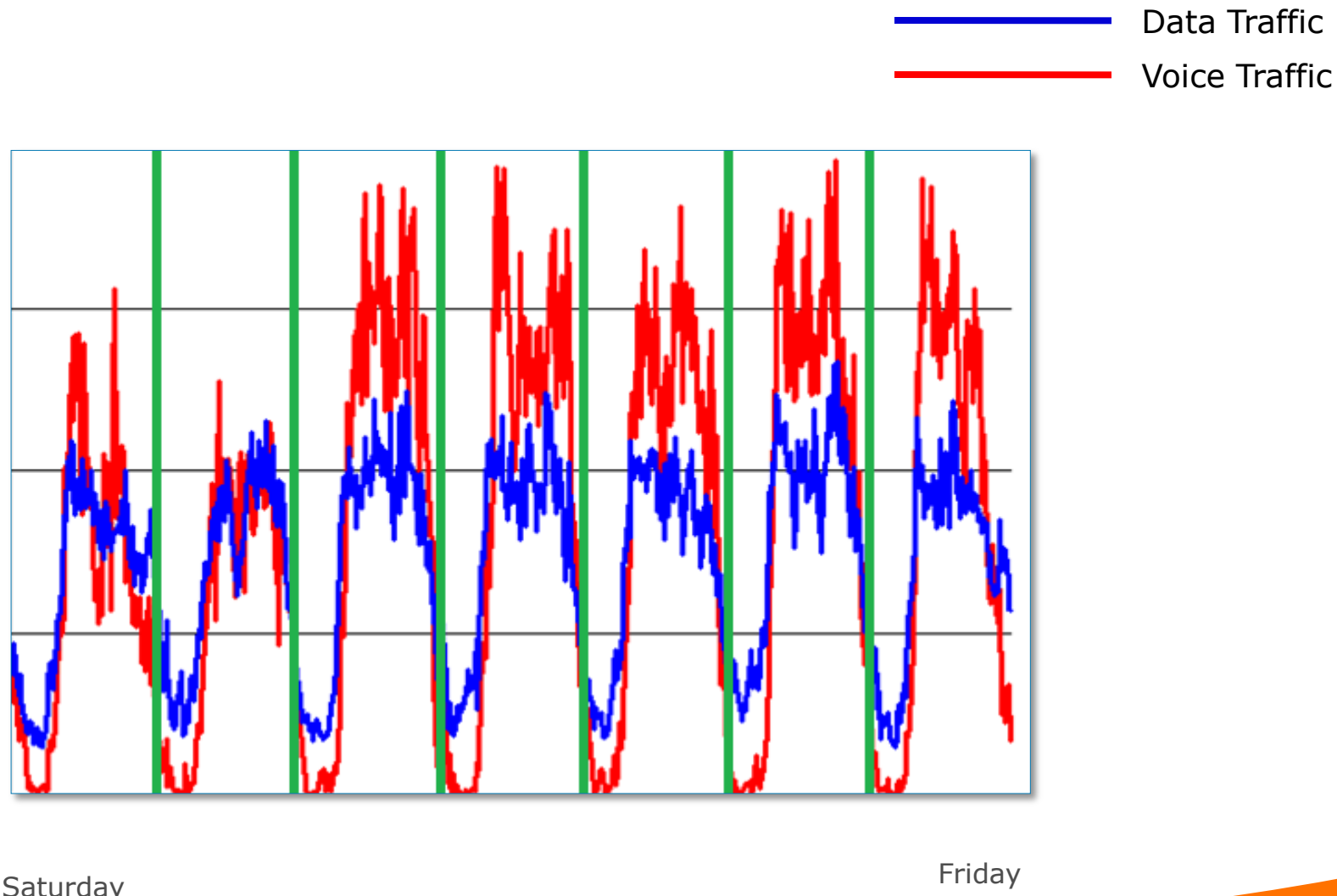


Exhibit 3 - Current 24-Hour Traffic Profile for the Location of CC5217

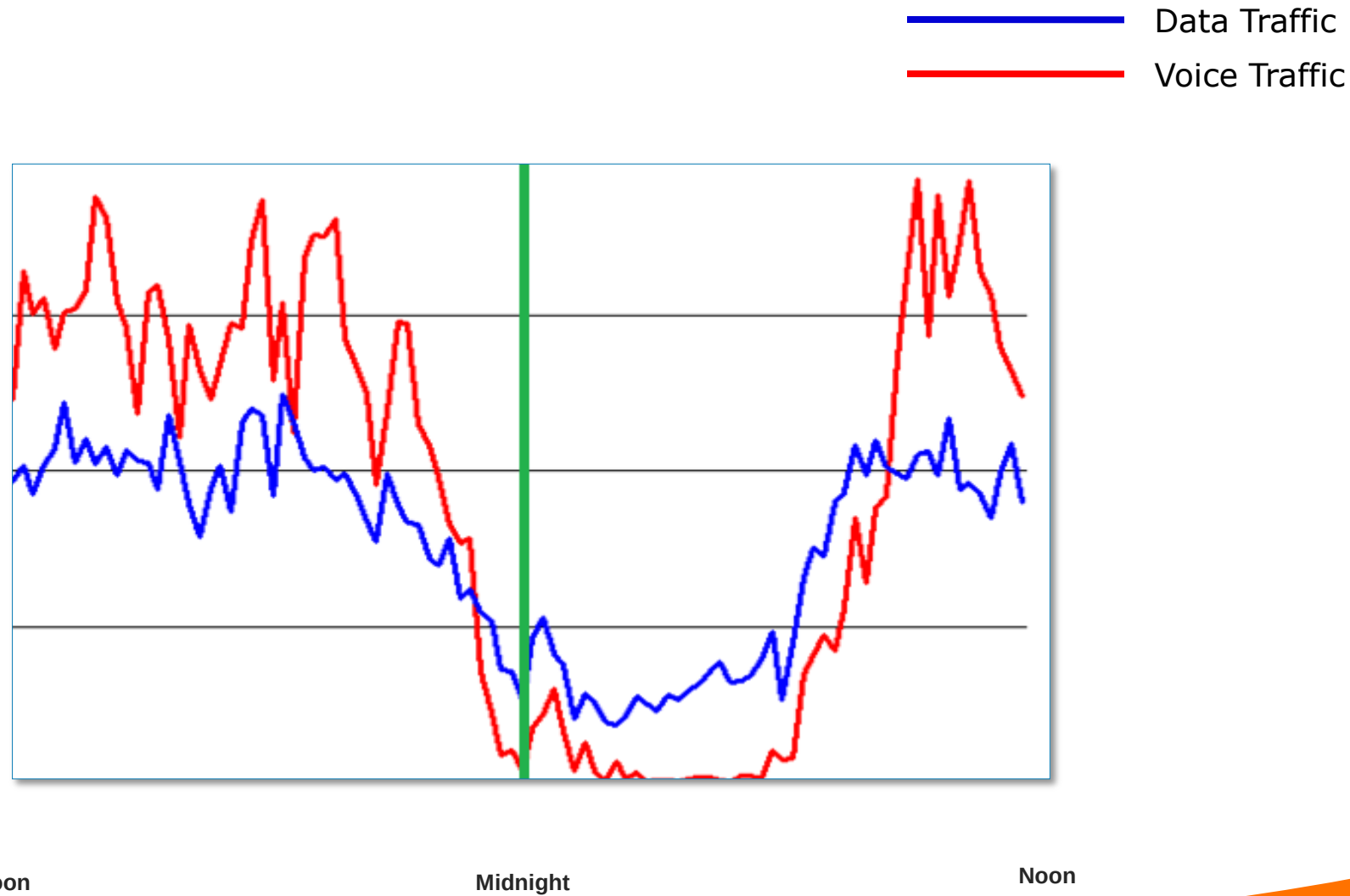
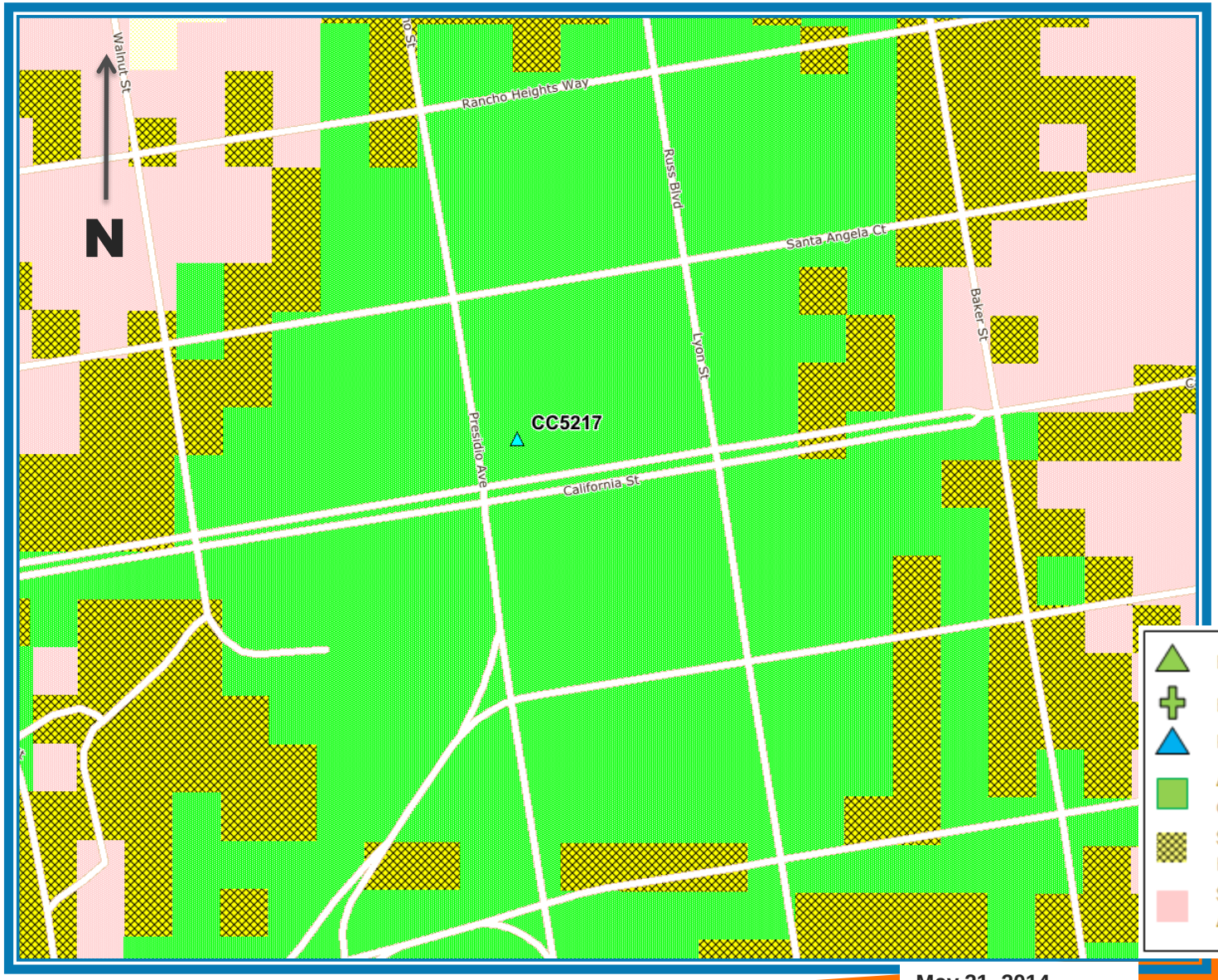


Exhibit 4 - Proposed Site at 444 Presidio (CC5217)

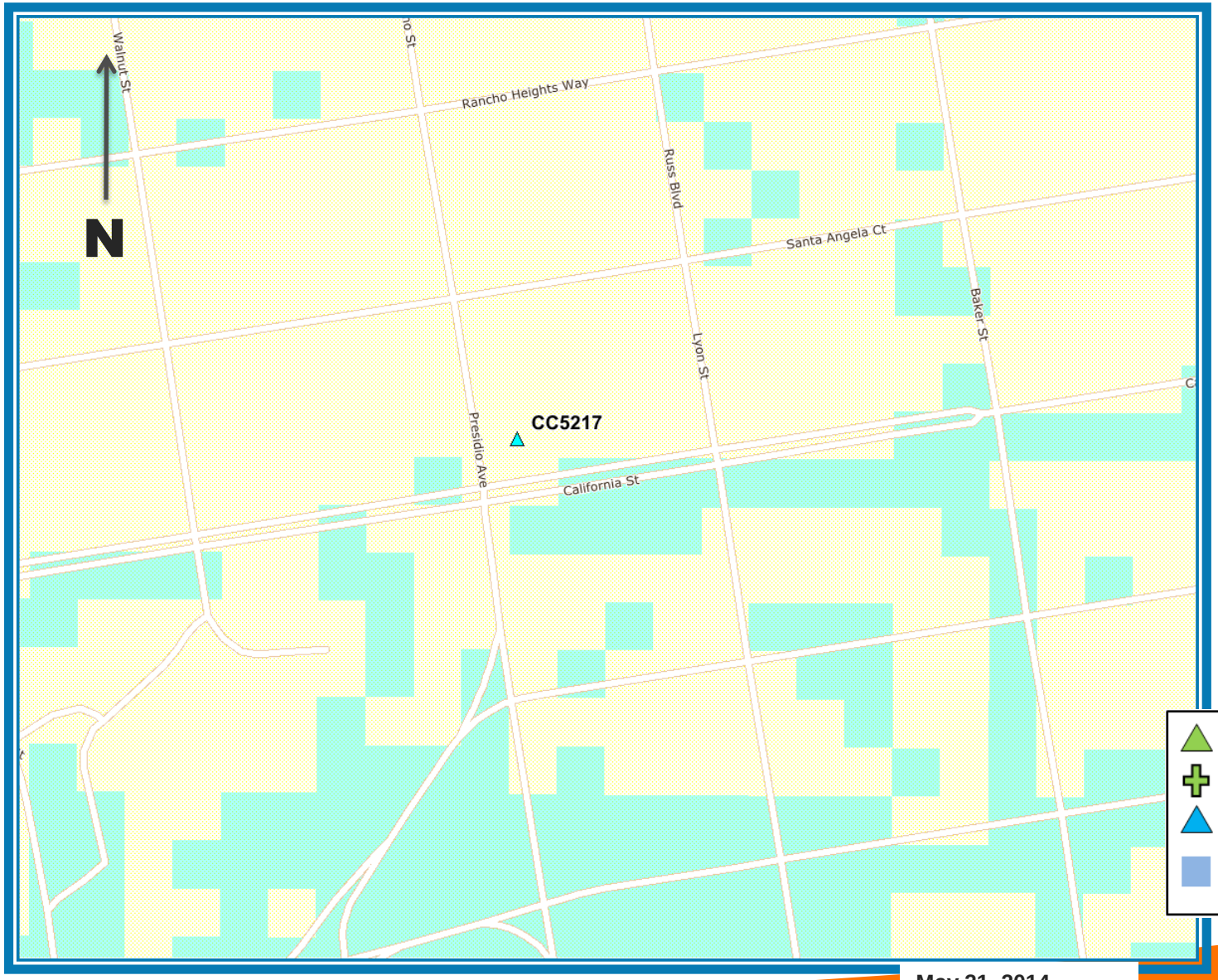
Service Area AFTER site is constructed



May 21, 2014

Exhibit 5 - Proposed Site at 444 Presidio (CC5217)

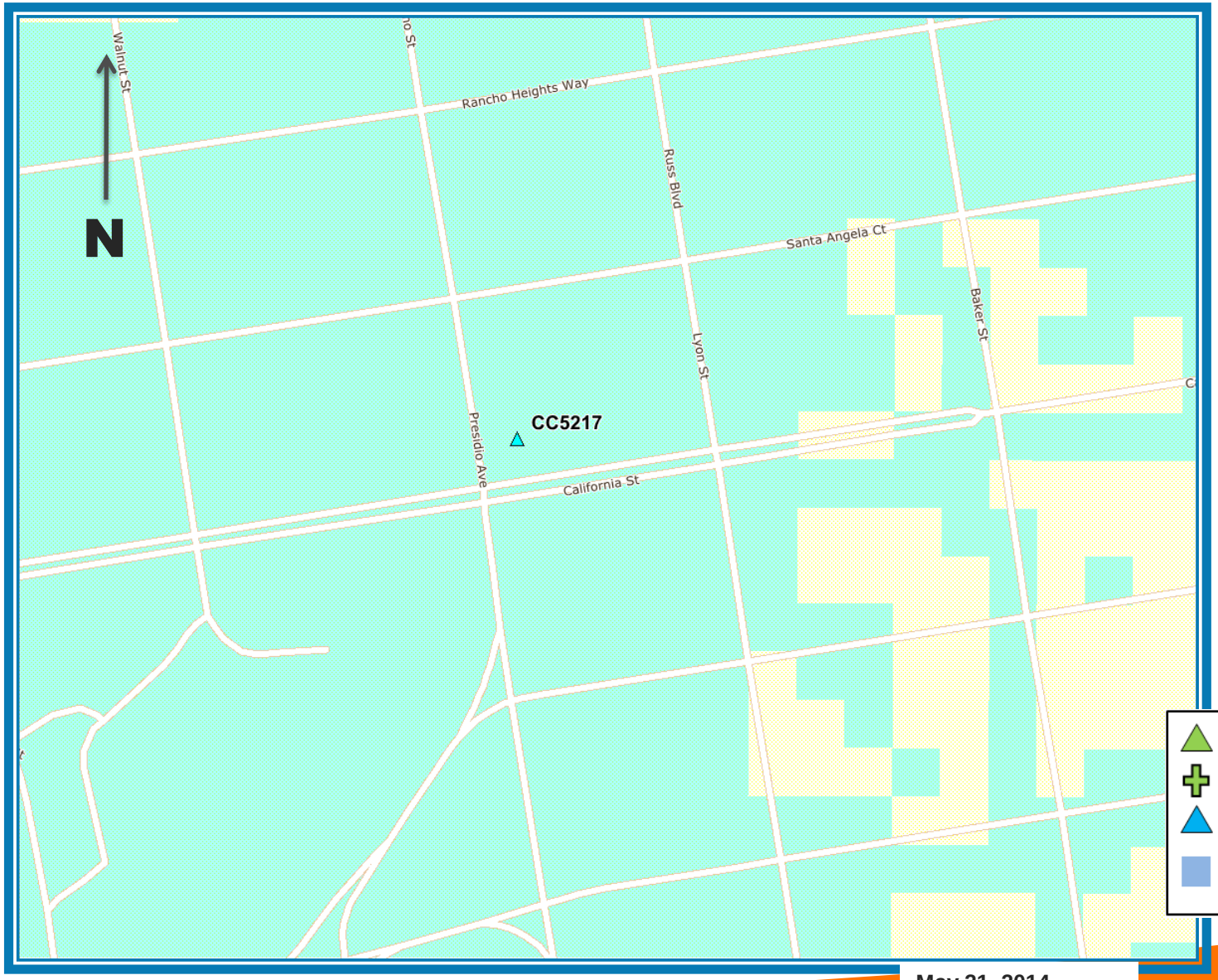
4G LTE Service Area BEFORE site is constructed



May 21, 2014

Exhibit 6 - Proposed Site at 444 Presidio (CC5217)

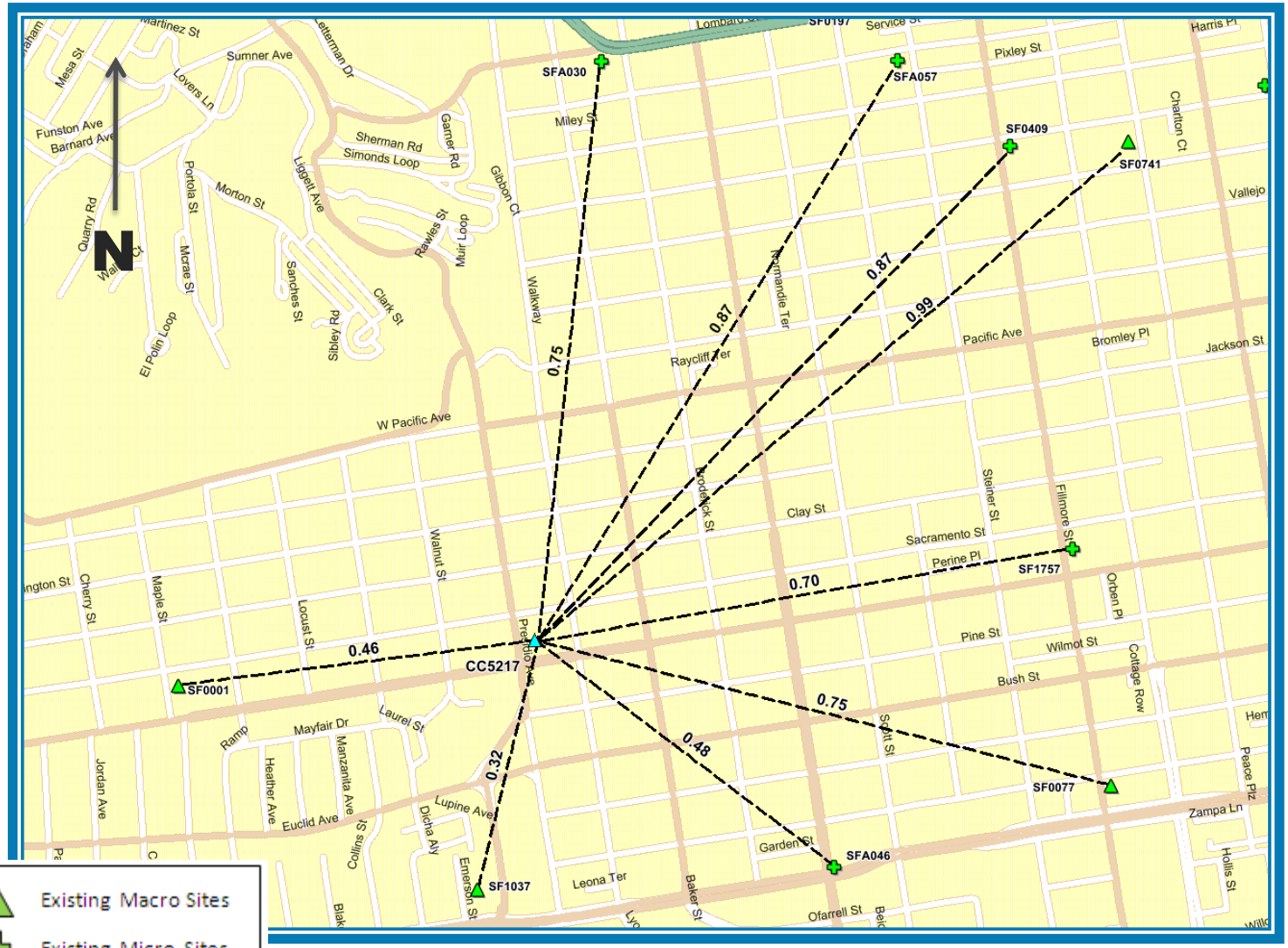
4G LTE Service Area AFTER site is constructed



May 21, 2014

Existing Surrounding Sites at 444 Presidio

CC5217



AT&T Mobility Conditional Use Permit Application
444 Presidio Ave, San Francisco

STATEMENT OF MICHAEL CANIGLIA

I manage AT&T's design with respect to the proposed wireless communications facility at 444 Presidio Ave, San Francisco (the "Property"). Based on my personal knowledge of the Property and with AT&T's wireless network, as well as my review of AT&T's records with respect to the Property and its wireless telecommunications facilities in the surrounding area, I have concluded that the work associated with this permit request is needed to close a significant service coverage gap in the area roughly bordered by Washington, Baker, Bush, and Walnut Streets.

The service coverage gap is caused by obsolete or inadequate (or, in the case of 4G LTE, non-existent) infrastructure along with increased use of wireless broadband services in the area. As explained further in Exhibit 1, AT&T's existing facilities cannot adequately serve its customers in the desired area of coverage, let alone address rapidly increasing data usage. Although there is reasonable 3G outdoor signal strength in the area, 3G coverage indoors may be weak and the quality of 3G service overall is unacceptable, particularly during high usage periods of the day. Moreover, 4G LTE service coverage has not yet been deployed in this area.

AT&T uses Signal-to-Noise information to identify the areas in its network where capacity restraints limit service. This information is developed from many sources including terrain and clutter databases, which simulate the environment, and propagation models that simulate signal propagation in the presence of terrain and clutter variation. Signal-to-Noise information measures the difference between the signal strength and the noise floor within a radio frequency channel, which, in turn, provides a measurement of service quality in an area. Although the signal level may be adequate by itself, the noise level fluctuates with usage due to the nature of the 3G technology and at certain levels of usage the noise level rises to a point where the signal-to-noise ratio is not adequate to maintain a satisfactory level of service. In other words, while the signal itself fluctuates as a function of distance of the user from the base station, the noise level fluctuates with the level of usage on the network on all mobiles and base stations in the vicinity. Signal-to-Noise information identifies where the radio frequency channel is usable; as noise increases during high usage periods, the range of the radio frequency channel declines causing the service coverage area for the cell to contract.

Exhibit 2 to this Statement is a map of existing service coverage (without the proposed installation at the Property) in the area at issue. It includes service coverage provided by existing AT&T sites. The green shaded areas depict areas within a Signal-to-Noise range that provide acceptable service coverage even during high demand periods. Thus, based upon current usage, customers are able to initiate and complete voice or data calls either outdoors or most indoor areas at any time of the day, independent of the number of users on the network. The yellow shaded cross-hatched areas depict areas within a Signal-to-Noise range that results in a service coverage gap during high demand periods. In this area, severe service interruptions occur during periods of high usage, but reliable and uninterrupted service may be available during low demand periods. The pink shading depicts areas within a Signal-to-Noise range in which a customer might have difficulty receiving a consistently acceptable level of service at any time, day or night, not just during high demand periods. The quality of service experienced by any individual customer can differ greatly depending on whether that customer is indoors, outdoors, stationary, or in transit. Any area in the pink or yellow cross-hatched category is considered inadequate service coverage and constitutes a service coverage gap.

Exhibit 3 to this Statement depicts the current actual voice and data traffic in the immediate area. As you can see from the exhibit, the traffic fluctuates at different times of the day. In actuality, the service coverage footprint is constantly changing; wireless engineers call it "cell breathing" and during high usage periods, as depicted in the chart, the service coverage gap increases substantially. The time periods in which the existing surrounding cell sites experience highest usage conditions (as depicted in the yellow shaded cross-hatched area in Exhibit 2) are significant. Based upon my review of the maps, the Signal-to-Noise information, and the actual voice and data traffic in this area, it is my opinion that the service coverage gap shown in Exhibit 2 is significant.

Exhibit 4 to this Statement is a map that predicts service coverage based on Signal-to-Noise information in the vicinity of the Property if antennas are placed as proposed in the application. As shown by this map, placement of the equipment at the Property closes the significant 3G service coverage gap.

In addition to these 3G wireless service gap issues, AT&T is in the process of deploying its 4G LTE service in San Francisco with the goal of providing the most advanced personal wireless experience available to residents of the City. 4G LTE is capable of delivering speeds up to 10 times faster than industry-average 3G speeds. LTE technology also offers lower latency, or the processing time it takes to move data through a network, such as how long it takes to start downloading a webpage or file once

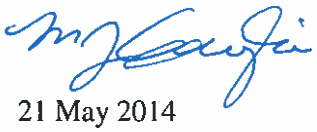
you've sent the request. Lower latency helps to improve the quality of personal wireless services. What's more, LTE uses spectrum more efficiently than other technologies, creating more space to carry data traffic and services and to deliver a better overall network experience. This is particularly important in San Francisco because of the likely high penetration of the new 4G LTE iPad and other LTE devices.

Exhibit 5 is a map that depicts 4G LTE service in the area surrounding the Property, and it shows a significant 4G LTE service gap in the area. After the upgrades, Exhibit 6 shows that 4G LTE service is available both indoors and outdoors in the targeted service area. This is important in part because as existing customers migrate to 4G LTE, the LTE technology will provide the added benefit of reducing 3G data traffic, which currently contributes to the significant service coverage gap on the UMTS (3G) network during peak usage periods as shown in Exhibit 2.

In order to close the 4G LTE service coverage gap shown in Exhibit 5 and provide the benefits associated with 4G LTE personal wireless service, it is necessary to include 4G LTE-specific antennas to the proposed site. Exhibit 6 shows that the work subject to this application closes the gap.

I have a Master's degree in Business Administration, a Bachelor's degree in Electrical Engineering and an Associate's degree in Electronic Communication Technology. I have worked as an engineering expert in the Wireless Communications Industry for over 20 years.

Michael Caniglia



21 May 2014

EXHIBIT 1

Prepared by AT&T Mobility

AT&T's digital wireless technology converts voice or data signals into a stream of digits to allow a single radio channel to carry multiple simultaneous signal transmissions. This technology allows AT&T to offer services such as secured transmissions and enhanced voice, high-speed data, texting, video conferencing, paging and imaging capabilities, as well as voicemail, visual voicemail, call forwarding and call waiting that are unavailable in analog-based systems. With consumers' strong adoption of smartphones, customers now have access thousands of wireless broadband applications, which consumers utilize at a growing number.

AT&T customers are using these applications in a manner that has caused a ***30,000% increase in mobile data usage on AT&T's network since 2007.*** AT&T expects total mobile data volume to ***grow 8x-10x over the next five years***. To put this estimate in perspective, all of AT&T Mobility's mobile traffic during 2010 would be equal to only six or seven weeks of mobile traffic volume in 2015. The FCC stated that U.S. mobile data traffic grew almost 300% in 2011, and driven by 4G LTE smartphones and tablets, traffic is projected to grow an additional 16-fold by 2016.

Mobile devices using AT&T's technology transmit a radio signal to antennas mounted on a tower, pole, building, or other structure. The antenna feeds the signal to electronic devices housed in a small equipment cabinet, or base station. The base station is connected by microwave, fiber optic cable, or ordinary copper telephone wire to the Radio Network Controller, subsequently routing the calls and data throughout the world.

The operation of AT&T's wireless network depends upon a network of wireless communications facilities. The range between wireless facilities varies based on a number of factors including topographical challenges, blockage from buildings, trees, and other obstructions as well as the limited capacity of existing facilities.

To provide effective, reliable, and uninterrupted service to AT&T customers in their cars, public transportation, home, and office, without interruption or lack of access, coverage must overlap in a grid pattern resembling a honeycomb.

In the event that AT&T is unable to construct or upgrade a wireless communications facility within a specific geographic area, so that each site's coverage reliably overlaps with at least one adjacent facility, AT&T will not be able to provide consistent service quality to its customers within that area. Some consumers will experience an abrupt loss of service. Others will be unable to obtain reliable service, particularly during periods of high usage.

Consumers may also experience service coverage gaps in situations where coverage overlaps and AT&T's outdoor signal strength is strong. Even in these areas AT&T can experience significant service coverage gaps, especially in its 3G network due to high "noise" level and for vehicular traffic or indoors where more and more users are finding cellular service a necessity. The following paragraphs provide a simplified explanation of why these service coverage gaps exist even though signal strength may appear strong.

AT&T operates a 3G network within San Francisco. 3G means that the mobile telecommunications network can achieve specific benchmark data rates. In AT&T's 3G network, every mobile transmitter shares the same frequency with other mobile transmitters; likewise, every base transmitter shares the same frequency with other base transmitters. Under

normal circumstances, this means mobile transmitters would interfere with each other and base transmitters would interfere with other base transmitters. CDMA (code division multiple access) technology used in AT&T's 3G network, however, gives individual receivers the ability to distinguish each transmitter from every other transmitter. Put differently, CDMA is analogous to people speaking the same language being able to communicate and understand each other, but other languages are perceived as noise and rejected. This ability to discriminate based upon different "codes" breaks down, and where it breaks down it create gaps in service coverage, even when the network has been perfectly optimized and signal strength may otherwise appear strong. This problem generally occurs in the following three general scenarios:

Scenario 1: There is a gap in coverage when several transmitters can be received at roughly equal signal levels. This might occur when the receiver is equidistant from multiple transmitters and no one transmitter predominates; this is much more likely to occur, based upon geometry, when the receiver is relatively far from all of the transmitters.

Scenario 2: There is a gap in coverage when many users are utilizing the same cell site transmitter. In this scenario each user generates interference to every other user on the shared channel. In order to minimize this self-generated interference, the users that are furthest from the site are prevented from using the channel. In essence, the coverage from this particular cell shrinks as usage increases.

Scenario 3: No signals can reach the receiver at sufficient strength to be decoded. This is the classical signal coverage scenario that plagues all forms of communication and is generally what is indicated when your phone shows zero bars.

Service problems caused by any of the scenarios above can and do occur for customers even in locations where the coverage maps on AT&T's "Coverage Viewer" website appear to indicate that coverage is available. As the legend to the Coverage Viewer maps indicates, these maps depict an *approximation* of coverage; *actual* coverage in an area may differ substantially from map graphics, and may be affected by such things as terrain, foliage, buildings and other construction, motion, customer equipment, and network traffic.

It is also important to note that the signal losses and service problems described above can and do occur for customers even at times when certain other customers in the same vicinity may be able to initiate and complete calls on AT&T's network (or other networks) on their wireless phones. These problems also can and do occur even when certain customers' wireless phones indicate "all bars" of signal strength on the handset.

The bars of signal strength that individual customers can see on their wireless phones are an imprecise and slow-to-update estimate of service quality. In other words, a customer's wireless phone can show "four bars" of signal strength, but that customer can still, at times, be unable to initiate voice calls, complete calls, or download data reliably and without service interruptions. Scenarios 1 and 2 above cause this result.

The reason that raw outdoor signal strength numbers can be an inadequate measurement of wireless service quality (and thus not be reflective of actual "gaps" in wireless service quality) is that these measurements do not reflect the degradation in the quality of the signal as determined by the Signal-to-Noise ratio in the area at various times of day (during periods of greater usage, like in scenario 2 above). While signal strength is an important factor, so is noise, and the more noise that is present in a given vicinity at a particular time of day, the more likely

the connections will be unreliable. Signal-to-Noise is a key quality parameter used to determine where service gaps are likely to appear.

To determine where new or upgraded telecommunications facilities need to be located for the provision of reliable service in any area, AT&T's radio frequency engineers rely on far more complete tools and data sources than just signal strength from individual phones. AT&T creates maps incorporating signal and noise information that, in turn, depict existing service coverage and service coverage gaps in a given area.

The service coverage gap is caused in part by a high demand for voice and data service being requested in the coverage area, similar to scenario 2 above, and the insufficient resources to handle the requests; this may be defined as a capacity constraint. The high demand for services causes increased "noise" on each frequency, much like having more individuals all talking at the same time in a room causes more "noise" that makes it harder to hear. In the case of the room full of people analogy, picture a void being created as people crowd closer and closer to each other in order to be able to hear. This natural contraction of crowds of people results in open spaces in the room; if these spaces are partitioned off, then people will have new defined spaces within which they can hold conversations.

During peak usage times, this capacity constraint can degrade the quality of both voice and data services provided to customers in this area, and can reduce services in the pink and yellow shaded cross-hatched areas as shown on the attached map in Exhibit 2.

The restriction of the site's service coverage area occurs during high usage periods because, during those times, many users are utilizing the same existing cell site transmitter. In this scenario each user generates interference to every other user on the shared channel. In order

to minimize this self-generated interference, the users that are furthest from the existing site are prevented from using the channel. In essence, the coverage from this particular site shrinks as usage increases. As set forth in Exhibit 2, this has caused a significant service coverage gap in AT&T's network.

To rectify this significant gap in its service coverage, AT&T needs to locate a wireless facility in the immediate vicinity of the Property. To continue the analogy above, AT&T must utilize the voids or “gaps” that occur in the crowded room to create new spaces and redistribute the people in the room so that more people can carry on intelligible conversations.

V. Least Intrusive Means to Remedy the Significant Service Coverage Gap

Executive summary: In order to remedy the significant service coverage gap identified in Section IV, AT&T proposes to install twelve (12) roof mounted antennas partially screened in FRP screens. The associated equipment will be located in the parking garage and will not visible to the public.

The following is the process AT&T deploys to identify the least intrusive location to remedy a service coverage gap, and the application of that methodology to the gap at issue in this application.

A. AT&T's site location methodology

When a service coverage gap is identified on AT&T's network, the existing service area is mapped using a service prediction tool that includes signal strength and quality of service (Signal-to-Noise) prediction, along with other pertinent network information. This information is developed from many sources including terrain and clutter databases, which simulate the environment, and propagation models that simulate signal propagation in the presence of terrain and clutter variation. The information identifies the areas of AT&T's network that need to be improved in order to close the service coverage gap. AT&T network engineers then create a virtual model of a proposed new facility to close the gap and add it to the service prediction model in the approximate location of need. By using a modeling tool the engineers can optimally position a virtual transmitter, taking into account likely obstructions, and generate a resulting signal pattern that will serve the area. This analysis yields a predictive service map and a target area. The target area provides the necessary guidance for AT&T's real estate and construction experts to identify an appropriate location for a proposed site based on local zoning guidelines and network design requirements. The following slide depicts the target area for which facilities must be placed to close the significant service coverage gap discussed in Section IV above:

B. Locating a site and evaluation of alternative sites

AT&T real estate and construction experts work through Section 8.1 of the WTS Facilities Siting Guidelines, which state the "Preferred Locations Within A Particular Service Area." The team examines preferred locations (most desirable to least desirable under Section 8.1) until a location is found to close the significant service coverage gap.

Once a location is identified, the team confirms that the site is (1) serviceable (it has sufficient electrical power and telephone service as well as adequate space for equipment cabinets, antennas, construction, and maintenance) and (2) meets necessary structural and architectural requirements (the existing structure is not only sturdy enough to handle the equipment without excessive modification but also that the antennas may be mounted in such a way that they can meet the dual objective of not being obstructed while also being visually obscured or aesthetically unobtrusive).

The following represents the results of this investigation, and the team's analysis of each alternative location:

1. Publicly-used structures:

Alternate Location Site Location A
655 Presidio

The site at 655 Presidio is the San Francisco Fire Department Museum located within the P (Public) zoning district, a Preference 1 location according to the WTS Guidelines. In order to meet AT&T Mobility's service objective, line-of-sight to the defined service area is required. Although it is a Preference 1, the building is roughly one block outside the search area and is too low and does not have line-of-sight for all three proposed sectors. For these reasons, it was determined that this location was not a feasible alternative.

Alternative Site Location B
415 Presidio

The site at 415 Presidio (Jewish Communtiy Center) is located within the RM-1 Residential Mixed Low Density zoning district a Preference 1 Location according to the WTS Guidelines. In order to meet AT&T Mobility's service objective, line-of-sight to the defined service area is required. There is limited space on the rooftop to allow for three sectors. In addition the sector needed for the northeast direction would be blocked by the adjacent building to the north. For these reasons, it was determined that this location was not a feasible alternative.

Alternative Site Location C
3333 California St

The building at 3333 California Street is part of the UCSF campus and located within the RM-1 Residential Mixed Low Density zoning district a Preference 1 Location according to the WTS Guidelines. In order to meet AT&T Mobility's service objective, line-of-sight to the defined service area is required. The building is too low and located on the south side of Presidio which slopes downward and would not be able to accommodate the line-of-sight for the northeast sector. For this reason, it was determined that this location was not a feasible alternative.

2. Co-Location Site: There are no Co-Location sites in the target area except the proposed site.

3. Industrial or Commercial Structures: There are no wholly industrial or commercial structures in the target area.

4. Industrial or Commercial Structures: There are no wholly industrial or commercial structures in the area

Alternative Site Location D
3150 California

The building at 3150 California is a wholly commercial building located within the NC-2 zoning district a Preference 4 Location according to the WTS Guidelines. The subject site has a higher preference and is a preferred location. Furthermore, the building at 3150 California is too low and all three sectors would be blocked by surrounding buildings. Therefore, the subject site is the least intrusive means by which AT&T Mobility and can close the existing significant service coverage gap and, as a result, it was determined that this alternative was not the most suitable candidate.

Alternative Site Location E
3201 California St

The building at 3201 California Street is an all commercial use and located within the NC-2 Neighborhood Commercial zoning district a Preference 4 Location according to the WTS Guidelines. In order to meet AT&T Mobility's service objective, line-of-sight to the defined service area is required. The building is too low and located on the south side of Presidio which slopes downward and would not be able to accommodate the line-of-sight for the northeast sector.

For this reason, it was determined that this location was not a feasible alternative.

5. Mixed Use Buildings in High Density Districts: There are no mixed used buildings in high density structures in the target area.

Alternative Site Location F
424-432 Presidio

The building at 424-432 is a mixed use building located within the NCD (Sacramento Neighborhood Commercial) zoning district a Preference 6 Location according to the WTS Guidelines. The subject site has a higher preference and is a preferred location. Furthermore, the northeast sector would be blocked by the adjacent building to the north. Therefore, the subject site is the least intrusive means by which AT&T Mobility and can close the existing significant service coverage gap and, as a result, it was determined that this alternative was not the most suitable candidate.

Alternative Site Location G
418-422 Presidio

The building at 418-422 Presidio is a mixed use building located within the NCD (Sacramento Neighborhood Commercial) zoning district a Preference 6 Location according to the WTS Guidelines. The subject site has a higher preference and is a preferred location. Furthermore, the building at 418-422 Presidio has a pitched roof which would prove challenging to locate all three sectors on the roof. Therefore, the subject site is the least intrusive means by which AT&T Mobility and can close the existing significant service coverage gap and, as a result, it was determined that this alternative was not the most suitable candidate.

Alternative Site Location H
3273 Sacramento

The building at 3273 Sacramento is a mixed use building located within the NCD (Sacramento Neighborhood Commercial) zoning district a Preference 6 Location according to the WTS Guidelines. The subject site has a higher preference and is a preferred location. Furthermore, the building at 3273 Sacramento is too low and the adjacent building to the south would not provide the line-of-sight for the southeast and southwest sectors. Therefore, the subject site is the least intrusive means by which AT&T Mobility and can close the existing significant service coverage

gap and, as a result, it was determined that this alternative was not the most suitable candidate.

Alternative Site Location I
3303-3315 Sacramento

The building at 3303-3315 Sacramento is a mixed use building located within the NCD (Sacramento Neighborhood Commercial) zoning district a Preference 6 Location according to the WTS Guidelines. The subject site has a higher preference and is a preferred location. Furthermore, the building at 3303-3325 Sacramento would be blocked by the adjacent building to the south and would not provide the line-of-sight for the southeast and southwest sectors. Therefore, the subject site is the least intrusive means by which AT&T Mobility and can close the existing significant service coverage gap and, as a result, it was determined that this alternative was not the most suitable candidate.

Alternative Site Location J
3267 Sacramento

The building at 3267 Sacramento is a wholly commercial building located within the NCD (Sacramento Neighborhood Commercial) zoning district a Preference 6 Location according to the WTS Guidelines. The subject site has a higher preference and is a preferred location. Furthermore, the building at 3267 Sacramento is too low and would not provide the line-of-sight

for all three proposed sectors. Therefore, the subject site is the least intrusive means by which AT&T Mobility and can close the existing significant service coverage gap and, as a result, it was determined that this alternative was not the most suitable candidate.

Alternative Site Location K
3263 Sacramento

The building at 3263 Sacramento is a wholly commercial building located within the NCD (Sacramento Neighborhood Commercial) zoning district a Preference 6 Location according to the WTS Guidelines. The subject site has a higher preference and is a preferred location. Furthermore, the building at 3263 Sacramento would be blocked by the building to the east would not provide the line-of-sight for the southeast sector. Therefore, the subject site is the least intrusive means by which AT&T Mobility and can close the existing significant service coverage gap and, as a result, it was determined that this alternative was not the most suitable candidate.

Alternative Site Location L
3255 Sacramento

The building at 3255 Sacramento is a mixed use building located within the NCD (Sacramento Neighborhood Commercial) zoning district a Preference 6 Location according to the WTS Guidelines. The subject site has a higher preference and is a preferred location. Furthermore, the building at 3263 Sacramento would be blocked by the building to the east would not provide the line-of-sight for the southeast sector. Therefore, the subject site is the least intrusive means by which AT&T Mobility and can close the existing significant service coverage gap and, as a result, it was determined that this alternative was not the most suitable candidate.

Alternative Site Location M
3247 Sacramento

The building at 3247 Sacramento is a mixed use building located within the NCD (Sacramento Neighborhood Commercial) zoning district a Preference 6 Location according to the WTS Guidelines. The subject site has a higher preference and is a preferred location. Furthermore, the building at 3247 Sacramento would be blocked by the buildings to the east and west would not provide the line-of-sight for the southeast and southwest sector. Therefore, the subject site is the

least intrusive means by which AT&T Mobility and can close the existing significant service coverage gap and, as a result, it was determined that this alternative was not the most suitable candidate.

Alternative Site Location N
3195 California

The building at 3195 CAlifornia is a mixed use building located within the NCD (Sacramento Neighborhood Commercial) zoning district a Preference 6 Location according to the WTS Guidelines. The subject site has a higher preference and is a preferred location. Furthermore, the building at 3195 California is too low and would not provide the line-of-sight for all proposed sectors. Therefore, the subject site is the least intrusive means by which AT&T Mobility and can close the existing significant service coverage gap and, as a result, it was determined that this alternative was not the most suitable candidate.

7. Disfavored Sites

Alternative Site location O
3183 California

This all residential building is located at 3183 California and is located within the RH-3 Residential House Three Family zoning district, a Preference 7 Location according to the

WTS Guidelines. This building is considered a disfavored location and the subject site has a higher preference and is a preferred location. Therefore, the subject site is the least intrusive means by which AT&T Mobility and can close the existing significant service coverage gap and, as a result, it was determined that this alternative was not the most suitable candidate.

Alternative Site location P
3167 California

This all residential building is located at 3167 California and is located within the RH-3 Residential House Three Family zoning district, a Preference 7 Location according to the WTS Guidelines. This building is considered a disfavored location and the subject site has a higher preference and is a preferred location. Therefore, the subject site is the least intrusive means by which AT&T Mobility and can close the existing significant service coverage gap and, as a result, it was determined that this alternative was not the most suitable candidate.

Alternative Site location Q
3151 California

This all residential building is located at 3151 California and is located within the RH-3 Residential House Three Family zoning district, a Preference 7 Location according to the WTS Guidelines. This building is considered a disfavored location and the subject site has a higher preference and is a preferred location. Therefore, the subject site is the least intrusive means by which AT&T Mobility and can close the existing significant service coverage gap and, as a result, it was determined that this alternative was not the most suitable candidate.

ERICSSON

July 9, 2014

Omar Masry
San Francisco Department of Planning
1650 Mission Street, 4th Floor
San Francisco, CA 94103

Re: Case No. 2014.0846C - Community Meeting for proposed AT&T Mobility facility at 444 Presidio

Dear Mr. Masry:

On July 8, 2014 AT&T mobility held a community meeting regarding the proposed wireless facility at 444 Presidio. The attached notification announced the community presentation was to be held at the Presidio Branch Library. Notice of the meeting was mailed out on June 19, 2014 to 968 owners and tenants within 500 feet of the proposed installation and 29 neighborhood organizations.

I conducted the meeting on behalf of AT&T Mobility as the project sponsor along with Boe Hayward, AT&T Public External Affairs as well as Stan Starkiskov with BergDavis Public Affairs. Raj Mathur, a professional licensed engineer with Hammett and Edison was there to answer any questions regarding the EMF emissions from the proposed wireless facility. There were 27 members of the community who attended the meeting. The project details were presented to the community members along with where the project is currently at with the city planning process. Several community members had specific questions in regards to the EMF emissions, site selection and other existing sites in the area. All questions were satisfactorily answered by Talin, Boe and Raj. They provided their contact information to all the meeting attendee's, so that they could contact them.

The following is a summary of additional questions posed by the community members:

- What is the FCC standard?
- What would be the frequency strength of RF emission at ground level, at roof level, and at the antenna site itself?
- If RF emission exceed FCC standards directly at the antenna site itself, how does barricading and striping mitigate exposure?
- How do the FCC standard compare with European standards?
- What is the cumulative impact of RF emission over time?

- Are there before and after studies monitoring the impact of RF emission on humans?
- Have there been reported illnesses following the installation of antennas at other sites?
- Have these antennas already been approved by the city to meet the FCC standard?

Other non-health related questions included:

- Are there other nearby antennas?
- Are antennas evenly distributed throughout the city?
- Are there antennas at 14th Avenue and Balboa?
- What are the notice requirements?
- What follow up monitoring would take place once the antennas are installed?
- How will the antennas be attached to the building?
- Will these antennas interfere with television and landline frequencies?
- Do these antennas comply with NC-2 zoning requirements?

If you have any questions, please contact me.

Sincerely,

Talin Aghazarian
Ericsson, Inc.
6140 Stoneridge Mall Road, Suite 365
Pleasanton, CA 94588, US
Mobile (510) 206-1674

Elizabeth Engler

American Language Services

444 PRESIDIO STREET WIRELESS MEETING

July 8, 2014

(at the Presidio Branch Library)

NAME	ADDRESS	PHONE	EMAIL
Rabinovich Lipaide	3365 Sacramento St	(415) 387-2814	
Ambartsumova Nina	3365 Sacramento St.	(415) 409-4472	
Voloman Tsetskiy	3365 Sacramento St	(415) 922-6362	
Lyubarskaya Khava	— " —	(415) 345-1786	
Yurnik Irina	— " —	(415) 749-1902	
Nessis-Gorskiy Victor	— " —	(415) 613-3865	
Abram Shilman	— " —	(415) 749-0527	
Mikhail Gelmont	— " —	(415) 471-4929	
Etya Kuzmin	— " — "	(415) 345-8224	
Sofya Manoylo	— " —	(415) 931-8240	
Yakov Schwartz	— "	415 922-0222	
Yevdokiya Ilyenko	— " — "	415 776-13-05	
Knyazeva Lina	— " — "	415 409-69-22	
Grigoriy Ilyenko		(415) 776-13-05	
Chizzik Valentin	— " — " —	415 775-11-31	
Livshits David		(415) 673-68-15	

444 PRESIDIO STREET WIRELESS MEETING

July 8, 2014

(at the Presidio Branch Library)

NAME	ADDRESS	PHONE	EMAIL
LUCIA Chen			luchai@yahoo.com
Barbara D'Arcy Piazzy	3755 Sacramento St #1	415-567-6539	N/A
MARIE McNULTY	3169 CALIFORNIA ST.	415-983-5440	MMCNULTY@AEGONUSA.COM
Anna Kish	3365 Sacramento st apt 345	(415)-359-9424	N/A
Mariya KIZLER	3365 Sacramento St 515	(415) 202-0649	—
Naum KIZLER	3365 Sacramento apt 515	—"—"—	—
Alex Kishinyovsky	3365 Sacramento st	(415) 359-9424	~~N/A~~ N/A
Kats Kenya	3365 sacramento st	(415) 351-1542	N/A
Kats Michail	3365 sacramento st	(415) 351-1542	N/A

NOTICE OF COMMUNITY OUTREACH MEETING ON A WIRELESS COMMUNICATION FACILITY PROPOSED IN YOUR NEIGHBORHOOD

To: Neighborhood Groups and Neighbors & Owners within a 500' radius of 444 Presidio Avenue (also listed as 488 Presidio Avenue)

Meeting Information
Date: **Tuesday July 8, 2014**
Time: **6:00 PM-7:30 PM**

Where: Presidio Branch Library, 3150 Sacramento Street, San Francisco, CA 94115

Site Information
Address: 444 Presidio Avenue (also listed as 488 Presidio Avenue)
Zoning: NC-2 Neighborhood Commercial, Small Scale
Block/Lot: 1022/026
Applicant
AT&T Mobility

Contact Information
AT&T Mobility Hotline
(415) 646-0972

AT&T Mobility is proposing to install a macro wireless communication facility at 444 Presidio Avenue (also listed as 488 Presidio Avenue) needed by AT&T Mobility as part of its San Francisco wireless network. The proposed site is an unmanned facility consisting of the installation of twelve (12) panel antennas. The antennas will be mounted on the roof. The associated equipment will also be located in the parking garage of the building. Plans and photo simulations will be available for your review at the meeting. You are invited to attend an informational community meeting located at the Presidio Branch Library to learn more about the project.

If you have any questions regarding the proposal and are unable to attend the meeting, please contact the AT&T Mobility Hotline at (415) 646-0972 and an AT&T Mobility specialist will return your call. Please contact Omar Masry with the San Francisco Planning Department at (415) 575-9116, omar.masry@sfgov.org if you have any questions regarding the planning process.

NOTE: If you require an interpreter to be present at the meeting, please contact our office at (415) 646-0972 no later than 5:00pm on Wednesday July 2, 2014 and we will make every effort to provide you with an interpreter.

NOTIFICACIÓN DE REUNIÓN DE ALCANCE COMUNITARIO SOBRE UNA INSTALACIÓN DE COMUNICACIONES INALÁMBRICAS PROPUESTA EN SU VECINDARIO

Para: Grupos del vecindario y vecinos y propietarios dentro de un radio de 500' de 444 Presidio Avenue (que también figura como 488 Presidio Avenue)

Información de la reunión
Fecha: **Martes, 8 de julio de 2014**
Hora: **6:00 PM-7:30 PM**

Dónde: Presidio Branch Library, 3150 Sacramento Street, San Francisco, CA 94115

Información del lugar
Dirección: 444 Presidio Avenue (que también figura como 488 Presidio Avenue)
Zonificación: Vecindario Comercial Pequeño NC-2
Cuadra/Lote: 1022/026
Solicitante
AT&T Mobility

Información de contacto
Línea directa de AT&T Mobility
(415) 646-0972

AT&T Mobility propone colocar una instalación de comunicaciones inalámbricas en 444 Presidio Avenue (que también figura como 488 Presidio Avenue), necesaria para AT&T Mobility como parte de su red inalámbrica en San Francisco. La ubicación propuesta de AT&T Mobility es una instalación sin personal que consiste en la instalación de doce (12) antenas panel. Las antenas se montarán en el techo. El equipamiento asociado se ubicará también en el estacionamiento del edificio. Habrá planos y fotos disponibles para que usted los revise en la reunión. Se lo invita a asistir a una reunión informativa de la comunidad que se realizará en la Presidio Branch Library para tener más información sobre el proyecto.

Si tiene preguntas relacionadas con la propuesta y no puede asistir a la reunión, por favor llame a la Línea Directa de AT&T Mobility, (415) 646-0972, y un especialista de AT&T Mobility le devolverá el llamado. Por favor, contacte a Omar Masry del Departamento de Planificación de San Francisco al (415) 575-9116, omar.masry@sfgov.org si tiene alguna pregunta relacionada con el proceso de planificación.

NOTA: Si necesita que un intérprete esté presente en la reunión, por favor, contacte a nuestra oficina al (415) 646-0972 antes del miércoles 2 de julio de 2014 a las 5:00 p.m., y haremos todos lo posible para proporcionarle un intérprete.

關於計畫在您所在街區安裝一座無線通信設施的社區資訊通報會通知

致：Presidio 大街 444 號（还稱為 Presidio 大街 488 號）周圍方圓五百英尺內的居民組織、居民和業主

會議資訊資訊
日期： **2014 年 7 月 8 日（星期二）**
時間： **下午 6:00-7:30**

地點： Presidio Branch Library, 3150 Sacramento Street, San Francisco, CA 94115

設施地點資訊
地址： Presidio 大街 444 號（还稱為 Presidio 大街 488 號）
分區：NC-2 社區商用小規模
街區/地塊：1022/026

申請公司
AT&T Mobility

聯繫資訊
AT&T Mobility公司熱線電話
(415) 646-0972

AT&T Mobility 公司計畫在 Presidio 大街 444 號（还稱為 Presidio 大街 488 號）安裝一座無線通訊設施，作為 AT&T Mobility 公司在三藩市無線網路的一部分。計畫中的 AT&T Mobility 站為無人操作設施，需要安裝十二 (12) 根平板天線。這些天線將被放置在屋頂，而相關設備將安裝在建築物的停車場內。 我們在會上將提供計畫書和類比圖片供您參考。我們誠邀您參加在 Presidio Branch Library 召開的社區資訊通報會，以便您瞭解有關本專案的更多資訊。

如果您對該計畫有任何疑問，但是無法出席這次會議，請撥打AT&T Mobility公司熱線電話(415) 646-0972，AT&T Mobility公司的一位專業人員將會回復您的電話。如果您對本規劃程式有任何疑問，請致電 (415) 575-9116與三藩市城市規劃局的 Omar Masry 聯繫，電子郵件是 omar.masry@sfgov.org。

注意☒如果您需要一名翻譯陪同您出席會議，請在不晚於 2014 年 7 月 2 日（星期五）下午 5 點前致電 (415) 646-0972 與本辦公室聯繫，我們將盡力為您配備一名翻譯。

September 11, 2014

Dear Members of the Planning Commission Decision Meeting:

We are honored that you are here to listen to our concerns regarding the massive AT&T wireless facility being proposed for 444/488 Presidio, San Francisco (aka, the Laurel Inn, a Joie de Vivre hotel).

We urge you to support our position that the facility, as designed, is not appropriate for our neighborhood of families and small businesses, and is harmful to our health, safety and well-being, not to mention the character of our neighborhood.

History: AT&T stated in their permit request the location was a "preferred" location. By that, they mean choosing the location allows AT&T to take advantage of infrastructure already in place from (2) existing wireless facilities currently operating on the roof of 444/488 Presidio. Precisely, it is this flawed reasoning that we oppose. We believe AT&T should be building a facility of this magnitude with integrity, not just a cheap fix, to piggyback onto existing infrastructure.

Furthermore, we know that when the original (Clearwire) antennas were proposed for this location, the community opposed it on the grounds that it was not the right fit for a small scale family centered neighborhood. More importantly, the issue was raised that "once the door opens to one wireless facility, more will follow." Of course, Clearwire denied that would be a possibility! Several years later, Sprint seized a similar opportunity to put antennas on the same "preferred location". Again, objections were raised by residents that our community is not a dumping ground, i.e. "preferred location" for any and all wireless companies coming out of the woodwork, wanting to cheaply build their monstrosities, with no thought whatsoever to the nature of the community those facilities would forever blemish.

Who We Are: We are a multi-generational family centric small neighborhood composed of single family homes, small apartment buildings, single owner small businesses, community library, park, a historic cultural / spiritual institution (Jewish Community Center, "the JCC") with a membership in the thousands of families, children, teens, seniors and singles attending cultural events, senior and preschool learning , gym and fitness classes, swimming, basketball, teen dances, evening concerts, breakfasts, subsidized lunches, spiritual celebrations, 7 days a week from early morning to late evening. In addition, Menorah Park, a senior housing facility with 200+ mostly Russian emigres is a cornerstone of our vibrant yet quiet neighborhood. We are people of all ages, of all walks of life who cherish and take pride in our community and each other. We are people, we are not a "preferred location"!!

Excerpts from the following insightful supporting research publications are available at the close of this meeting. You may also open the links referenced below to read the publications in their entirety:

1. **"Cell Tower Health Risks"**
http://www.emwatch.com/Cellmasts.htm

2. **"International Association of Firefighters, Division of Occupational Health, Safety and Medicine Position on the Health Effects from Radio Frequency/Microwave (RF/MW) Radiation in Fire Department Facilities from Base Stations for Antennas and Towers for the Conduction of Cell Phone Transmissions**
http://www.iaff.org/hs/Facts/CellTowerFinal.asp

July30, 2014
San francisco Planning Department
1650 Mission St, Ste 400
c/o Omar Masry.

Mr. Omar Masry

We kindly ask you to support us in stopping AT&T from installing 12 panel antennas for a macro wireless communication on the roof of the building of the hotel at 444 Presidio Avenue in San Francisco.

This building is located in a neighborhood where there is JCC, kindergarten, swimming pools,schol and many more activities, banks, fire department, stores, library, restaurants and a lot of residential houses. Only in Menorah Park house/ 3365 Sacramento St/ 150 apartments where are living and working 200 people.

The scientists and physicians researches at the Boston and Harvard Universities, Schools of Public Health have called cell phone towers a radiation hazard. There is strong evidence that electromagnetic radiation from cell phone towers is damaging to human (and animal) health.

This is the second attempt by AT&T company to install such antenna in this area. The first attempt was strongly opposed by the people residing around the Park Presidio Avenue in San Francisco. This action was successful and the antennas was not installed.
We must do our best to stop the AT&T from installing the antennas in our neighborhood, too!

Please note that the letter stating the date and time of the first meeting the 7/8/2014 regarding antennas installation was not sent to ALL people residing in this area. Hence, people who live around 444 Presidio Avenue are not aware of AT&T plans.
We appeal to you to give your immediate attention to the problem people may encounter if these antennas for a macro wireless communication will be installed in our neighborhood.

We believe on your support in helping us prevent installing thise potentially hazardous antennas. People's health needs to be protected from radiation which is emitted by such antennas. We know that you took an active participation in preventing many dangerous thinks often happen in San Francisco because you are our Supervisor, and we hope you will help us solve this problem successfully.

Also, for your consideration, we attach the copy of AT&T letter as well as the petition in support of our effort to stop AT&T from installing 12 panel antennas on the roof of 444 Presidio Ave.

Sincerely,
Menorah Park Tenant

3365 Sacramento St., apt

San Francisco, CA 94118

Name	Apartment	Signature
City Chiu	621	
yee jee Hui	457	
cui zhen cu	546	
cucy Ho	548	
Shu Fung Yu	647	
Kan Kwan Ng	456	
Jian Pan	424	
xi zhen ci	434	
xiao ping Huang	437	
Ying Yong Dong	443	
Paul Ngan	235	
May Ngan	235	
Qing cui chen	426	
Ci zhue Wen	403	
Guan Hui Qiang	403	
xian sie Yang	451	
Jing qing zeng	451	
Huang xin Ping	233	
Oi chu chui	626	
zhiguang yu	524	
Fung sin chan	527	
Tian Jing Luo	503	
Tam chich yu	543	
Guora Tam	334	
Pui Yin Wong	334	
Hai xian Ci	652	
inling yew hse	238	
Monica To	309	
I		

Name	Apartment	Signature
Y. Vaysman	303	Vaysman
Begun Roza	302	Begun
Reznik Efim	302	Reznik
Schwartz Yakov	509	
Schorer Valentin	504	
[illegible]	[illegible]	[illegible]
Ambartsumova Nina	511	
Mak Chin	421	Mak Chin
Rabinovich Lyuda	532	Rabinovich
Dora Grinberg	408	D Grinberg
Генерейлатор	402	
Chukhrov Mariya	346	
Basin	417	
Elena Slivnyak	452	
Eydelman	429	
Kirimbekova	427	
Orlova	432	
Ryvkina	428	Ryvkina
Orinshteyn	419	
Горенштейн	418	

Name	Apartment	Signature
Rosenblum Emma	407	
Khzak Liza	435	
Litvinska	455	
Vernik Irina	429	
Balan Yelizaveta	409	
Vinokur	411	
Krapivskaya	410	
Shilmon	444	
Goldman	430	
Manylo	440	
Stirnyak	452	
Gorsky Viktor	415	
Melita Lezer	448	
Kuzminer	453	
Druguensky Semyon	416	
Kristal Nina	623	
Krysova Inna	624	
Shushpanova Ludmila	654	
Emgashev, I.	328	
Gotsban	329	
Inna Lisa	345	
Gelmont Mikhail	338	
GENYA Shapir	335	
TVERDOHLEBOV	339	
Naum KIZLER, Mariya	515	
Kreimer Grigori	315	

Name	Apartment	Signature
Geller	501	
Beker	505	
Livshits	508	
Naumova	510	
Zayats	516	
Pranoylenko	517	
Litvak	519	
Altshuler	521	
Artamonov	522	
Kutnovskaya	524	
Grimboym	528	
Gurevich	529	
Fiterman	530	
Gamretsky	531	
Radovitsky	549	
Kamen	551	
Barman	552	
Rotiner	553	
Liakhovetskaia	554	
Rishinyovskey Alex	345	
Donna Walsh	3149 California #12E	

September 11, 2014

Dear Members of the Planning Commission Decision Meeting:

We are honored that you are here to listen to our concerns regarding the massive AT&T wireless facility being proposed for 444/488 Presidio, San Francisco (aka, the Laurel Inn, a Joie de Vivre hotel).

We urge you to support our position that the facility, as designed, is not appropriate for our neighborhood of families and small businesses, and is harmful to our health, safety and well-being, not to mention the character of our neighborhood.

History: AT&T stated in their permit request the location was a "preferred" location. By that, they mean choosing the location allows AT&T to take advantage of infrastructure already in place from (2) existing wireless facilities currently operating on the roof of 444/488 Presidio. Precisely, it is this flawed reasoning that we oppose. We believe AT&T should be building a facility of this magnitude with integrity, not just a cheap fix, to piggyback onto existing infrastructure.

Furthermore, we know that when the original (Clearwire) antennas were proposed for this location, the community opposed it on the grounds that it was not the right fit for a small scale family centered neighborhood. More importantly, the issue was raised that "once the door opens to one wireless facility, more will follow." Of course, Clearwire denied that would be a possibility! Several years later, Sprint seized a similar opportunity to put antennas on the same "preferred location". Again, objections were raised by residents that our community is not a dumping ground, i.e. "preferred location" for any and all wireless companies coming out of the woodwork, wanting to cheaply build their monstrosities, with no thought whatsoever to the nature of the community those facilities would forever blemish.

Who We Are: We are a multi-generational family centric small neighborhood composed of single family homes, small apartment buildings, single owner small businesses, community library, park, a historic cultural / spiritual institution (Jewish Community Center, "the JCC") with a membership in the thousands of families, children, teens, seniors and singles attending cultural events, senior and preschool learning , gym and fitness classes, swimming, basketball, teen dances, evening concerts, breakfasts, subsidized lunches, spiritual celebrations, 7 days a week from early morning to late evening. In addition, Menorah Park, a senior housing facility with 200+ mostly Russian emigres is a cornerstone of our vibrant yet quiet neighborhood. We are people of all ages, of all walks of life who cherish and take pride in our community and each other. We are people, we are not a "preferred location"!!

Excerpts from the following insightful supporting research publications are available at the close of this meeting. You may also open the links referenced below to read the publications in their entirety:

1. **"Cell Tower Health Risks"**
http://www.emwatch.com/Cellmasts.htm

2. **"International Association of Firefighters, Division of Occupational Health, Safety and Medicine Position on the Health Effects from Radio Frequency/Microwave (RF/MW) Radiation in Fire Department Facilities from Base Stations for Antennas and Towers for the Conduction of Cell Phone Transmissions**
http://www.iaff.org/hs/Facts/CellTowerFinal.asp

July30, 2014
San francisco Planning Department
1650 Mission St, Ste 400
c/o Omar Masry.

Mr. Omar Masry

We kindly ask you to support us in stopping AT&T from installing 12 panel antennas for a macro wireless communication on the roof of the building of the hotel at 444 Presidio Avenue in San Francisco.

This building is located in a neighborhood where there is JCC, kindergarten, swimming pools,schol and many more activities, banks, fire department, stores, library, restaurants and a lot of residential houses. Only in Menorah Park house/ 3365 Sacramento St/ 150 apartments where are living and working 200 people.

The scientists and physicians researches at the Boston and Harvard Universities, Schools of Public Health have called cell phone towers a radiation hazard. There is strong evidence that electromagnetic radiation from cell phone towers is damaging to human (and animal) health.

This is the second attempt by AT&T company to install such antenna in this area. The first attempt was strongly opposed by the people residing around the Park Presidio Avenue in San Francisco. This action was successful and the antennas was not installed.
We must do our best to stop the AT&T from installing the antennas in our neighborhood, too!

Please note that the letter stating the date and time of the first meeting the 7/8/2014 regarding antennas installation was not sent to ALL people residing in this area. Hence, people who live around 444 Presidio Avenue are not aware of AT&T plans.
We appeal to you to give your immediate attention to the problem people may encounter if these antennas for a macro wireless communication will be installed in our neighborhood.

We believe on your support in helping us prevent installing thise potentially hazardous antennas. People's health needs to be protected from radiation which is emitted by such antennas. We know that you took an active participation in preventing many dangerous thinks often happen in San Francisco because you are our Supervisor, and we hope you will help us solve this problem successfully.

Also, for your consideration, we attach the copy of AT&T letter as well as the petition in support of our effort to stop AT&T from installing 12 panel antennas on the roof of 444 Presidio Ave.

Sincerely,
Menorah Park Tenant

3365 Sacramento St., apt

San Francisco, CA 94118

Name	Apartment	Signature
City Chiu	621	
Mee Yee Hui	457	
Cui zhen Lu	546	
Lucy Ho	548	
Shu Fang Yu	457	
Kam Kwan Ng	456	
Jian Pan	434	
Xi zhen Li	434	
Xiao Ping Huang	437	
Jing Yong Dong	443	
Paul Ngan	235	
May Ngan	235	
Qing Jie Chen	426	
Li Zhue Wen	403	
Guan Hui Qing	403	
Xian Sie Zeng	451	
Jing Qing Zeng	451	
Huang Xin Ping	233	
Oi Chu Chui	626	
Zhiguang Yu	524	
Fung Sin Chan	527	
Tian Jing Luo	503	
Tam Chich Yu	543	
Guoda Tam	334	
Pui Yin Wong	334	
Hui Xian Li	652	
inling yew hse	238	
Monica To	309	
I		

Name	Apartment	Signature
Y. Vaysman	303	Vaysman
Begun Roza	302	Begun
Reznik Efim	302	Reznik
Schwartz Yakov	509	
Schorer Valentin	504	
[illegible]	[illegible]	[illegible]
Ambartsumova Nina	511	
Mak Chin	421	Mak Chin
Rabinovich Yunna	532	Rabinovich
Dora Grinberg	408	D Grinberg
Генерозатор	402	
Chukhrova Mariya	346	
Basin	417	
Elena Slivnyak	452	
Zydelman	449	
Kirimbekova	427	
Orlova	432	
Ryvkina	428	Ryvkina
Orinshteyn	419	
Горенштейн	418	

Name	Apartment	Signature
Rosenblum Emma	407	[illegible]
Khzak Liza	435	[illegible]
Litvinska	455	[illegible]
Vernik Irina	429	I. Ver.
Balan Yelizaveta	409	[illegible]
Vinokur	411	S. Vinokur
Krapivskaya	410	P. [illegible]
Shilman	444	Shul[illegible]
Goldman	430	[illegible]
Manylo	440	Manylo
Slivnyak	452	[illegible]
Gorsky Viktor	415	[illegible]
Melita Lerer	448	Melita Lerer
Kuzminer	453	[illegible]
Drugunsky Semyon	416	[illegible]
Kimstal Nina	623	N Kimstal
Krysova Inna	624	[illegible]
Shushpanova Ludmila	657	Shush[illegible]
Elyashev, I.	328	[illegible]
Gotsban	329	Z. Gotsban
Inna Fish	345	[illegible]
Gelmont Mikhail	338	M Gelmont
Genya Shapir	335	Shapir
Tverdohledov	339	[illegible]
Naum Kizler, Mariya	515	[illegible]
Kreiumer Crivoe	315	[illegible]

Name	Apartment	Signature
Geller	501	
Beker	505	
Livshits	508	
Naumova	510	
Zayats	516	
Pramoylenko	517	
Litvak	519	
Altshuler	521	
Artamonov	522	
Kutnovskaya	524	
Grimboym	528	
Gurevich	529	
Fiterman	530	
Gametsky	531	
Radovitsky	549	
Kamen	551	
Barman	552	
Rotiner	553	
Liakhovetskaia	554	
Rishinyovsky Alex	345	
DONNA WALSH	3149 CALIFORNIA #12E	

REFERENCES:

1. **CELL TOWER RISKS (EMwatch.com July 2012)**

   An overview of issues, questions and answers relating to the safety of Cell Tower Base Stations

2. **INTERNATIONAL ASSOCIATION OF FIRE FIGHTERS**
   DIVISION OF OCCUPATIONAL HEALTH, SAFETY AND MEDICINE
   (Position on the Health Effects from Radio Frequency/Microwave (RF/MW) Radiation in Fire Department Facilities from Base Stations for Antennas and Towers for the Conduction of Cell Phone Transmissions) (3/2005)

   An exhaustively, scientifically researched report generated by the Association in response to noticeable and disturbing health problems and myriad adverse symptoms experienced firsthand by fire fighters and emergency responders living and working in or adjacent to fire stations soon after Cell Tower Base Stations had been installed, usually on the roofs of those Fire Stations.

   This report supports their members' unanimous "opposition to the use of fire stations as base stations for antennas and towers for the conduction of cell phone transmissions until such installations are proven not to be hazardous to the health of our membership", with detailed profound and chilling scientific evidence supporting their findings.

   This report is a must read.

Cell Tower Health Risks

More cell tower radiation

Cell Towers are the base stations which control cell phone communication. The generic term "cell site" can also be used - to include all cell phone towers, antenna masts and other base station forms. Each cell site services one or more "cells".

Cell tower numbers have grown exponentially in recent years, as service providers raced to improve their coverage.

Increased cell phone traffic also contributes to cell tower density. When a cell becomes too busy, a frequent solution is to divide it into smaller cells, which then require more cell sites.

In 2009 there were over 200,000 cell sites in the USA alone, and 50,000 in U.K.

Cell tower radiation from chimneys?

Cell sites may take the form of a mast or tower, but may also be disguised, in some cases so they cannot be visually discerned at all.

You might notice the camouflaged "trees", but perhaps not the cell sites on top of buildings, looking like elongated loudspeaker boxes.

You'd almost certainly miss the cell sites installed inside chimneys and church steeples, even flagpoles.

Where a base station is installed on top of a building where people live or work, those occupants may be quite unaware that they are in very close proximity to equipment which produces substantial electromagnetic radiation.

Cell tower health dangers

Cellular phone industry spokespersons continue to assert that cell phone towers pose no health risk. Almost all scientists in this field would disagree, at the very least claiming that no such assurance can be given.

There is strong evidence that electromagnetic radiation from cell phone towers is damaging to human (and animal) health.

A study into the effects of a cell tower on a herd of dairy cattle was conducted by the Bavarian state government in Germany and published in 1998. The erection of the tower caused adverse health effects resulting in a measurable drop in milk yield. Relocating the cattle restored the milk yield. Moving them back to the original

pasture recreated the problem. Dairy Cow Study

A human study (Kempten West) in 2007 measured blood levels of seratonin and melatonin (important hormones involved in brain messaging, mood, sleep regulation and immune system function) both before, and five months after, the activation of a new cell site.

Twenty-five participants lived within 300 metres of the site. Substantial unfavourable changes occurred with respect to both hormones, in almost all participants. Kemptem West Study

Over 100 scientists and physicians at Boston and Harvard Universities Schools of Public Health have called cell phone towers a radiation hazard.

Cell phone towers cancer risk

A study performed by doctors from the German city of Naila monitored 1000 residents who had lived in an area around two cell phone towers for 10 years. During the last 5 years of the study they found that those living within 400 meters of either tower had a newly-diagnosed cancer rate three times higher than those who lived further away. Breast cancer topped the list, but cancers of the prostate, pancreas, bowel, skin melanoma, lung and blood cancer were all increased. Naila Study

Another study by researchers at Tel Aviv university compared 622 residents who lived within 350 meters of a cell phone tower with 1222 control patients who lived further away. They found 8 cancer cases in the group affected by the cell tower, compared with only 2 cases amongst the controls. Further info

Very few studies have specifically concentrated on cancer risk from cell phone towers. This lack of studies is in itself a cause for concern, especially since anecdotal evidence is plentiful.

For example, in a case known as "Towers of Doom", two cell masts were installed (in 1994) on a five story apartment building in London. Residents complained of many health problems in the following years. Seven of them were diagnosed with cancer. The cancer rate of the top floor residents (closest to the tower) was 10 times the national average. Further info.

We agree that more research is needed, but it may be slow in coming. Those who might fund major studies are the very same organisations who would be disadvantaged if a definite link between cell towers and cancer were established.

In the meantime, it is reasonable to apply the precautionary principle.

If cell towers are causing cancer, we would expect that several years of exposure (with only minor effects on people's health) might be required, followed by an

unexpectedly high occurrence of the disease amongst the exposed population.

The damage from radiation exposure accumulates over many years, but the breakdown in health happens only after all body defences and repair mechanisms have been exhausted.

Cell phone tower radiation limits

The current US standard for cell site radiation in the US is 580-1000 microwatts per square centimetre.

Many other countries have set levels hundreds of times lower.

The reason for the disparity is that no one really knows what level of cell tower radiation is safe.

Current limits have been influenced more by economic and political imperatives than by research into health and safety.

More important than the intensity of electromagnetic radiation emitted at the tower is the strength of the resulting EMF wherever people live and work. This depends on the intensity at the source - and one's distance from it.

Cell towers safe distance

Different cell sites emit different amounts of radiation.

Radiation levels from a single cell site vary, depending on usage. Even maintenance issues can affect how much radiation a cell site is currently producing.

Radiation around a single cell tower may not be uniform - there can be hot and cold spots.

Measurement with a suitable meter is the only way to know how much radiation you are receiving at a particular spot.

But it seems that 400 metres is a safe distance for most people, and smaller distances may also be safe in some cases.

Cell tower health effects

Individuals differ in their response to similar levels of EMF radiation.

For some people, short term effects from cell tower radiation exposure may include headaches, sleep disorders, poor memory, mental excitation, confusion, anxiety, depression, appetite disturbance and listlessness.

This list is not intended as a diagnostic aid, as each symptom here can have many causes.

But if you and your family do not experience any of these symptoms you are probably not being overwhelmed by cell tower radiation.

Cell tower safety - personal action plan

If you are still concerned, try to obtain the use of an RF (radio frequency) gauss meter designed for measuring electromagnetic radiation in the cell phone frequency (microwave) range.

Switch off all wireless devices including computer networks, modems and mobile phones before measuring RF radiation. What remains will probably be mainly cell tower radiation, although TV and radio station signals may also contribute.

How much cell tower radiation is too much for your long-term health? No one is exactly sure. **But if you detect more than 100 mv/m (millivolts per metre) in places where you spend several hours a day, you might consider moving.**

If you cannot obtain a meter, you must rely on estimating the distance to the nearest cell site. If that distance exceeds 400 metres you are probably not being harmed - although high risk groups may need to be more cautious. See our page **Who is at Risk?**

Also bear in mind that it is getting harder and harder to be sure where the nearest cell site is situated, especially in built-up areas.

Cell sites are often disguised. And many units are much smaller than the old familiar towers (though probably not less potent), and installed in unexpected locations.

When you next change your job or your house, find out how far away you are going to be from the nearest cell site, and let that influence your decision. Do the same when you decide where to send your child to school.

If you have reason to be concerned about your exposure to cell tower radiation - but there is nothing you can do about it yet - then concentrate on reducing EMFs from other sources. For suggestions see our page **EMF Protection.**

In the long term, we need to find ways of providing cell phone convenience without exposing people to the existing dangers of cell tower radiation.

INTERNATIONAL ASSOCIATION OF FIRE FIGHTERS

DIVISION OF OCCUPATIONAL HEALTH, SAFETY AND MEDICINE

Position on the Health Effects from Radio Frequency/Microwave (RF/MW) Radiation in Fire Department Facilities from Base Stations for Antennas and Towers for the Conduction of Cell Phone Transmissions

The International Association of Fire Fighters' position on locating cell towers commercial wireless infrastructure on fire department facilities, as adopted by its membership in August 2004 [1], is that the IAFF oppose the use of fire stations as base stations for towers and/or antennas for the conduction of cell phone transmissions until a study with the highest scientific merit and integrity on health effects of exposure to low-intensity RF/MW radiation is conducted and it is proven that such sitings are not hazardous to the health of our members.

Further, the IAFF is investigating funding for a U.S. and Canadian study that would characterize exposures from RF/MW radiation in fire houses with and without cellular antennae, and examine the health status of the fire fighters as a function of their assignment in exposed or unexposed fire houses. Specifically, there is concern for the effects of radio frequency radiation on the central nervous system (CNS) and the immune system, as well as other metabolic effects observed in preliminary studies.

It is the belief of some international governments and regulatory bodies and of the wireless telecommunications industry that no consistent increases in health risk exist from exposure to RF/MW radiation unless the intensity of the radiation is sufficient to heat body tissue. However, it is important to note that these positions are based on non-continuous exposures to the general public to low intensity RF/MW radiation emitted from wireless telecommunications base stations. Furthermore, most studies that are the basis of this position are at least five years old and generally look at the safety of the phone itself. IAFF members are concerned about the effects of living directly under these antenna base stations for a considerable stationary period of time and on a daily basis. There are established biological effects from exposure to low-level RF/MW radiation. Such biological effects are recognized as markers of adverse health effects when they arise from exposure to toxic chemicals for example. The IAFF's efforts will attempt to establish whether there is a correlation between such biological effects and a health risk to fire fighters and emergency medical personnel due to the siting of cell phone antennas and base stations at fire stations and facilities where they work.

Background

Critical questions concerning the health effects and safety of RF/MW radiation remain. Accordingly, should we allow exposure of our fire fighters and emergency medical personnel to this radiation to continue for the next twenty years when there is ongoing controversy over many aspects of RF/MW health effects? While no one disagrees

that serious health hazards occur when living cells in the body are heated, as happens with high intensity RF/MW exposure (just like in a microwave oven), scientists are currently investigating the health hazards of low intensity RF/MW exposure. Low intensity RF/MW exposure is exposure which does not raise the temperature of the living cells in the body.

Additionally, a National Institute of Environmental Health Sciences panel designated power frequency electromagnetic fields (ELF/EMF) as "possible human carcinogens." [2] In March 2002 The International Association on Research on Cancer of the World Health Organization also assigned this designation to ELF/EMF in Volume 80 of its *IARC Monographs on the Evaluation of Carcinogenic Risks to Humans.* [3]

Fixed antennas used for wireless telecommunications are referred to as cellular base stations, cell stations, PCS ("Personal Communications Service") stations or telephone transmission towers. These base stations consist of antennas and electronic equipment. Because the antennas need to be high in the air, they are often located on towers, poles, water tanks, or rooftops. Typical heights for freestanding base station towers are 50-200 feet.

Some base stations use antennas that look like poles, 10 to 15 feet in length, that are referred to as "omni-directional" antennas. These types of antennas are usually found in rural areas. In urban and suburban areas, wireless providers now more commonly use panel or sector antennas for their base stations. These antennas consist of rectangular panels, about 1 by 4 feet in dimension. The antennas are usually arranged in three groups of three antennas each. One antenna in each group is used to transmit signals to wireless phones, and the other two antennas in each group are used to receive signals from wireless phones.

At any base station site, the amount of RF/MW radiation produced depends on the number of radio channels (transmitters) per antenna and the power of each transmitter. Typically, 21 channels per antenna sector are available. For a typical cell site using sector antennas, each of the three transmitting antennas could be connected to up to 21 transmitters for a total of 63 transmitters. When omni-directional antennas are used, a cellular base station could theoretically use up to 96 transmitters. Base stations used for PCS communications generally require fewer transmitters than those used for cellular radio transmissions, since PCS carriers usually have a higher density of base station antenna sites.

The electromagnetic RF/MW radiation transmitted from base station antennas travel toward the horizon in relatively narrow paths. The individual pattern for a single array of sector antennas is wedge-shaped, like a piece of pie. Cellular and PCS base stations in the United States are required to comply with limits for exposure recommended by expert organizations and endorsed by government agencies responsible for health and safety. When cellular and PCS antennas are mounted on rooftops, RF/MW radiation levels on that roof or on others near by would be greater than those typically encountered on the ground.

The telecommunications industry claims cellular antennas are safe because the RF/MW radiation they produce is too weak to cause heating, i.e., a "thermal effect." They point to "safety standards" from groups such as ANSI/IEEE or ICNIRP to support their claims. But these groups have explicitly stated that their claims of "safe RF/MW radiation exposure is harmless" rest on the fact that it is too weak to produce a rise in body temperature, a "thermal effect."-[4]

There is a large body of internationally accepted scientific evidence which points to the existence of non-thermal effects of RF/MW radiation. The issue at the present time is not whether such evidence exists, but rather what weight to give it.

Internationally acknowledged experts in the field of RF/MW radiation research have shown that RF/MW transmissions of the type used in digital cellular antennas and phones can have critical effects on cell cultures, animals, and people in laboratories and have also found epidemiological evidence (studies of communities, not in the laboratory) of serious health effects at "non-thermal levels," where the intensity of the RF/MW radiation was too low to cause heating. They have found:

- Increased cell growth of brain cancer cells [5]
- A doubling of the rate of lymphoma in mice [6]
- Changes in tumor growth in rats [7]
- An increased number of tumors in rats [8]
- Increased single- and double-strand breaks in DNA, our genetic material [9]

- 2 to 4 times as many cancers in Polish soldiers exposed to RF [10]
- More childhood leukemia in children exposed to RF [11]
- Changes in sleep patterns and REM type sleep [12]
- Headaches caused by RF/MW radiation exposure [13]
- Neurologic changes [14] including:
    - Changes in the blood-brain-barrier [15]
    - Changes in cellular morphology (including cell death) [16]
    - Changes in neural electrophysiology (EEG) [17]
    - Changes in neurotransmitters (which affect motivation and pain perception) [18]
    - Metabolic changes (of calcium ions, for instance) [19]
    - Cytogenetic effects (which can affect cancer, Alzheimer's, neurodegenerative diseases) [20]
- Decreased memory, attention, and slower reaction time in school children [21]
- Retarded learning in rats indicating a deficit in spatial "working memory" [22]
- Increased blood pressure in healthy men [23]
- Damage to eye cells when combined with commonly used glaucoma medications [24]

Many national and international organizations have recognized the need to define the true risk of low intensity, non-thermal RF/MW radiation exposure, calling for intensive scientific investigation to answer the open questions. These include:

- The World Health Organization, noting reports of "cancer, reduced fertility, memory loss, and adverse changes in the behavior and development of children." [25]
- The U. S. Food and Drug Administration (FDA) [26]
- The International Agency for Research on Cancer (IARC) [27]
- The Swedish Work Environmental Fund [28]
- The National Cancer Institute (NCI) [29]
- The European Commission (EC) [30]
- New Zealand's Ministry of Health [31]
- National Health and Medical Research Council of Australia [32]
- Commonwealth Scientific Industrial Research Organization of Australia (CSIRO) [33]
- The Royal Society of Canada expert group report prepared for Health Canada [34]
- European Union's REFLEX Project (Risk Evaluation of Potential Environmental Hazards from Low Frequency Electromagnetic Field Exposure Using Sensitive *in vitro* Methods) [35]
- The Independent Group on Electromagnetic Fields of the Swedish Radiation Protection Board (SSI) [36]
- The United Kingdom's National Radiological Protection Board (NRPB) [37]
- The EMF-Team Finland's Helsinki Appeal 2005 [38]

Non-thermal effects are recognized by experts on RF/MW radiation and health to be potential health hazards. Safe levels of RF/MW exposure for these low intensity, non-thermal effects have not yet been established.

The FDA has explicitly rejected claims that cellular phones are "safe." [39]

The Environmental Protection Agency (EPA) has stated repeatedly that the current (ANSI/IEEE) RF/MW safety standards protect only against thermal effects. [40]

Many scientists and physicians question the safety of exposure to RF/MW radiation. The CSIRO study, for example, notes that there are no clear cutoff levels at which low intensity RF/MW exposure has no effect, and that the results of ongoing studies will take years to analyze. [41]

Internationally, researchers and physicians have issued statements that biological effects from low-intensity RF/MW radiation exposure are scientifically established:

- The 1998 Vienna-EMF Resolution [42]
- The 2000 Salzburg Resolution on Mobile Telecommunication Base Stations [43]
- The 2002 Catania Resolution [44]
- The 2002 Freiburger Appeal [45]
- The 2004 Report of the European Union's REFLEX Project (Risk Evaluation of Potential Environmental Hazards from Low Frequency Electromagnetic Field Exposure Using Sensitive *in vitro* Methods) [46]
- The 2004 Second Annual Report from Sweden's Radiation Protection Board (SSI) Independent Expert Group on Electromagnetic Fields Recent Research on Mobile Telephony and Health Risks [47]
- Mobile Phones and Health 2004: Report by the Board of NRPB (The UK's National Radiological Protection Board) [48]

The county of Palm Beach, Florida, the City of Los Angeles, California, and the country of New Zealand have all prohibited cell phone base stations and antennas near schools due to safety concerns. The British Columbia Confederation of Parent Advisory Councils [BCCPAC] passed a resolution in 2003 banning cellular antennae from schools and school grounds. This organization is comparable to the Parent Teachers Association (PTA) in the United States. The resolution was directed to B.C. Ministry of Education, B.C. Ministry of Children and Family Development, B.C. School Trustees Association, and B.C. Association of Municipalities.

US Government Information

In the United States, the Federal Communications Commission (FCC) has used safety guidelines for RF/MW radiation environmental exposure since 1985.

The FCC guidelines for human exposure to RF/MW radiation are derived from the recommendations of two organizations, the National Council on Radiation Protection and Measurements (NCRP) and the Institute of Electrical and Electronics Engineers (IEEE). In both cases, the recommendations were developed by scientific and engineering experts drawn from industry, government, and academia after extensive reviews of the scientific literature related to the biological effects of RF/MW radiation.

Many countries in Europe and elsewhere use exposure guidelines developed by the International Commission on Non-Ionizing Radiation Protection (ICNIRP). The ICNIRP safety limits are generally similar to those of the NCRP and IEEE, with a few exceptions. For example, ICNIRP recommends different exposure levels in the lower and upper frequency ranges and for localized exposure from certain products such as hand-held wireless telephones. Currently, the World Health Organization is working to provide a framework for international harmonization of RF/MW radiation safety standards.

In order to affirm conformity to standards regarding heating of tissue, measurements are time averaged over 0.1 hours [6 minutes]. This method eliminates any spikes in the readings. Computer power bars have surge protectors to prevent damage to computers. **Fire fighters and emergency medical personnel do not!**

The NCRP, IEEE, and ICNIRP all have identified a whole-body Specific Absorption Rate (SAR) value of 4 watts per kilogram (4 W/kg) as a threshold level of exposure at which harmful biological thermal effects due to tissue heating may occur. Exposure guidelines in terms of field strength, power density and localized SAR were then derived from this threshold value. In addition, the NCRP, IEEE, and ICNIRP guidelines vary depending on the frequency of the RF/MW radiation exposure. This is due to the finding that whole-body human absorption of RF/MW radiation varies with the frequency of the RF signal. The most restrictive limits on whole-body exposure are in the frequency range of 30-300 MHz where the human body absorbs RF/MW energy most efficiently. For products that only expose part of the body, such as wireless phones, exposure limits in terms of SAR only are specified.

Similarly, the exposure limits used by the FCC are expressed in terms of SAR, electric and magnetic field strength, and power density for transmitters operating at frequencies from 300 kHz to 100 GHz. The specific values can be found in two FCC bulletins, OET Bulletins 56 and 65.

OET Bulletin 56, *"Questions and Answers about Biological Effects and Potential Hazards of Radiofrequency Electromagnetic Fields"* was designed to provide factual information to the public by answering some of the most commonly asked questions. It includes the latest information on FCC guidelines for human exposure to RF/MW radiation. Further information and a downloadable version of Bulletin 56 can be found at: http://www.fcc.gov/oet/info/documents/bulletins/#56 (http://www.fcc.gov/oet/info/documents/bulletins/#56)

OET Bulletin 65, *"Evaluating Compliance With FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields"* was prepared to provide assistance in determining whether proposed or existing transmitting facilities, operations or devices comply with limits for human exposure to RF/MW radiation adopted by the Federal Communications Commission (FCC). Further information and a downloadable version of Bulletin 65 can be found at: http://www.fcc.gov/oet/info/documents/bulletins/#65 (http://www.fcc.gov/oet/info/documents/bulletins/#65)

The FCC authorizes and licenses products, transmitters, and facilities that generate RF and microwave radiation. It has jurisdiction over all transmitting services in the U.S. except those specifically operated by the Federal Government. Under the National Environmental Policy Act of 1969 (NEPA), the FCC has certain responsibilities to consider whether its actions will significantly affect the quality of the human environment. Therefore, FCC approval and licensing of transmitters and facilities must be evaluated for significant impact on the environment. Human exposure to RF radiation emitted by FCC-regulated transmitters is one of several factors that must be considered in such environmental evaluations. In 1996, the FCC revised its guidelines for RF/MW radiation exposure as a result of a multi-year proceeding and as required by the Telecommunications Act of 1996.

For further information and answers to questions about the safety of RF/MW radiation from transmitters and facilities regulated by the FCC go to http://www.fcc.gov/oet/rfsafety/rf-faqs.html (http://www.fcc.gov/oet/rfsafety/rf-faqs.html).

Canadian Government Information

Industry Canada is the organization that sets regulatory requirements for electromagnetic spectrum management and radio equipment in Canada. Industry Canada establishes standards for equipment certification and, as part of these standards, developed RSS-102, which specifies permissible radiofrequency RF/MW radiation levels. For this purpose, Industry Canada adopted the limits outlined in Health Canada's Safety-Code 6, which is a guideline document for limiting RF exposure. A downloadable version of *"RSS-102 - Evaluation Procedure for Mobile and Portable Radio Transmitters with respect to Health Canada's Safety Code 6 for Exposure of Humans to Radio Frequency Fields"*, as well as additional information can be found at: http://strategis.ic.gc.ca/epic/internet/insmt-gst.nsf/vwapj/rss102.pdf/$FILE/rss102.pdf (http://strategis.ic.gc.ca/epic/internet/insmt-gst.nsf/vwapj/rss102.pdf/$FILE/rss102.pdf).

Safety Code 6 specifies the requirements for the use of radiation emitting devices. This Code replaces the previous Safety Code 6 - EHD-TR-160. A downloadable version of "Limits of Human Exposure to Radiofrequency Electromagnetic Fields in the Frequency Range from 3 kHz TO 300 GHz – Safety Code 6", as well as further detailed information can be found at http://www.hc-sc.gc.ca/hecs-sesc/ccrpb/publication/99ehd237/toc.htm (http://www.hc-sc.gc.ca/hecs-sesc/ccrpb/publication/99ehd237/toc.htm).

US and Canadian Legal Issues

Although some local and state governments have enacted rules and regulations about human exposure to RF/MW radiation in the past, the Telecommunications Act of 1996 requires the United States Federal Government to control human exposure to RF/MW radiation. In particular, Section 704 of the Act states that, "No State or local government or instrumentality thereof may regulate the placement, construction, and modification of personal wireless service facilities on the basis of the environmental effects of radio frequency emissions to the extent that such facilities comply with the Commission's regulations concerning such emissions." Further information on federal authority and FCC policy is available in a fact sheet from the FCC's Wireless Telecommunications Bureau at www.fcc.gov/wtb (http://www.fcc.gov/wtb).

In a recent opinion filed by Senior Circuit Judge Stephen F. Williams, No. 03-1336 *EMR Network v. Federal Communications Commission and United States of America*, the Court upheld the FCC's decision not to initiate an inquiry on the need to revise its regulations to address non-thermal effects of radiofrequency (RF) radiation from the

facilities and products subject to FCC regulation as EMR Network had requested in its September 2001 Petition for Inquiry.

At the request of the EMR Network, the EMR Policy Institute provided legal and research support for this appeal. On January 13, 2005, a Petition for Rehearing *en banc* by the full panel of judges at the DC Circuit Court of Appeals was filed. Briefs, background documents and the DC Circuit decision are found at: http://www.emrpolicy.org/litigation/case_law/index.htm (http://www.emrpolicy.org/litigation/case_law/index.htm).

The Toronto Medical Officer of Health for the Toronto Board of Health recommended to Health Canada that public exposure limits for RF/MW radiation be made 100 times stricter; however the recommendation was not allowed, since, as in the US, only the Canadian federal government can regulate RF/MW radiation exposure level.

World Health Organization Efforts

In 1996, the World Health Organization (WHO) established the International EMF Project to review the scientific literature and work towards resolution of health concerns over the use of RF/MW technology. WHO maintains a Web site that provides addition information on this project and about RF/MW biological effects and research. For further information go to http://www.who.int/peh-emf/en/ (http://www.who.int/peh-emf/en/).

Conclusion

For decades, the International Association of Fire Fighters has been directly involved in protecting and promoting the health and safety of our membership. However, we simply don't know at this time what the possible health consequences of long-term-exposure to low-intensity RF/MW radiation of the type used by the cell phone base stations and antennas will be. No one knows--the data just aren't there. The chairman of the International Commission on Non-Ionizing Radiation Protection ICNIRP), one of the leading international organizations which formulated the current RF/MW radiation exposure guidelines, has stated that the guidelines include "no consideration regarding prudent avoidance" for health effects for which evidence is less than conclusive (49)

Again, fire department facilities, where fire fighters and emergency response personnel live and work are not the proper place for a technology which could endanger their health and safety

The only reasonable and responsible course is to conduct a study of the highest scientific merit and integrity on the RF/MW radiation health effects to our membership and, in the interim, oppose the use of fire stations as base stations for towers and/or antennas for the conduction of cell phone transmissions until it is proven that such sitings are not hazardous to the health of our members.

Footnotes

[back] 1. **Revised and Amended IAFF Resolution No. 15; August 2004**

Study of Firefighters Exposed to Radio Frequency (RF) Radiation from Cell Towers/Masts

WHEREAS, fire stations across the United States and Canada are being sought by wireless companies as base stations for the antennas and towers for the conduction of cell phone transmissions; and

WHEREAS, many firefighters who are living with cell towers on or adjacent to their stations are paying a substantial price in terms of physical and mental health. As first responders and protectors of the general public, it is crucial that firefighters are functioning at optimal cognitive and physical capacity at all times; and

WHEREAS, the brain is the first organ to be affected by RF radiation and symptoms manifest in a multitude of neurological conditions including migraine headaches, extreme fatigue, disorientation, slowed reaction time, vertigo, vital memory loss and attention deficit amidst life threatening emergencies; and

WHEREAS, most of the firefighters who are experiencing symptoms can attribute the onset to the first week(s) these towers/antennas were activated; and

WHEREAS, RF radiation is emitted by these cellular antennas and RF radiation can penetrate every living cell, including plants, animals and humans; and

WHEREAS, both the U. S. and Canadian governments established regulatory limits for RF radiation based on thermal (heat) measurements with no regard for the adverse health effects from non-thermal radiation which is proven to harm the human brain and immune system; and

WHEREAS, the U. S. Environmental Protection Agency stated in a July 16, 2002, letter, "Federal health and safety agencies have not yet developed policies concerning possible risk from long-term, non-thermal exposures. The FCC's exposure guideline is considered protective of effects arising from a thermal mechanism (RF radiation from cell towers is non-thermal) but not from all possible mechanisms. Therefore, the generalization by many that the guidelines protecting human beings from harm by any or all mechanisms is not justified"; and

WHEREAS, an Expert Panel Report requested by the Royal Society of Canada prepared for Health Canada (1999) stated that, "Exposure to RF fields at intensities far less than levels required to produce measurable heating can cause effects in cells and tissues. These biological effects include alterations in the activity of the enzyme ornithine decarboxylase, in calcium regulation, and in the permeability of the blood-brain barrier. Some of these biological effects brought about by non-thermal exposure levels of RF could potentially be associated with adverse health effects"; and

WHEREAS, based on concerns over growing scientific evidence of dangers from RF radiation, an international conference was convened in Salzburg, Austria, in the summer of 2000 where renowned scientists declared the upper-most RF radiation exposure limit from a tower-mast should be 1/10th of 1 microwatt (Note that 1/10th of 1 microwatt is 10,000 times lower than the uppermost limit allowed by the U. S. or Canada.); and it should be noted this limit was set because of study results showing brain wave changes at 1/10th of 1 microwatt; and

WHEREAS, in a recently cleared paper by Dr. Richard A. Albanese of the U. S. Air Force, a highly recognized physician in the area of the impact of radiation on the human body, Dr. Albanese states, "I would ask a good faith effort in achieving as low exposure rates as are possible within reasonable financial constraints. Also I would fund targeted studies using animal subjects and human groups living or working in high radiation settings or heavy cellular phone users, emphasizing disease causations. I urge acceptance of the ideal that there should be no unmonitored occupational or environmental exposures whose associated disease rates are unknown." (The opinions expressed herein are those of Dr. Albanese, and do not reflect the policies of the United States Air Force.); and

WHEREAS, recently a study, not affiliated with the wireless industry, was conducted of firefighters exposed to RF radiation from cell towers/antennas affixed to their stations.** The study revealed brain damage that can be differentiated from chemical causation (such as inhalation of toxic smoke) suggesting RF radiation as the cause of the brain damage found on SPECT scans; and

WHEREAS, firefighters are the protectors of people and property and should be protected under the Precautionary Principle of Science and therefore, unless radiation is proven safe and harmless, cellular antennas should not be placed on or near fire stations; therefore be it

RESOLVED, That the IAFF shall seek funding for an initial U. S. and Canadian study with the highest scientific merit and integrity, contrasting firefighters with residence in stations with towers to firefighters without similar exposure; and be it further

RESOLVED, That in accordance with the results of the study, the IAFF will establish protective policy measures with the health and safety of all firefighters as the paramount objective; and be it further

RESOLVED, That the IAFF oppose the use of fire stations as base stations for antennas and towers for the conduction of cell phone transmissions until such installations are proven not to be hazardous to the health of our members.

**Note: A pilot study was conducted in 2004 of six California fire fighters working and sleeping in stations with towers. The study, conducted by Gunnar Heuser, M.D., PhD. of Agoura Hills, CA, focused on neurological symptoms of six fire fighters who had been working for up to five years in stations with cell towers. Those symptoms included slowed reaction time, lack of focus, lack of impulse control, severe headaches, anesthesia-like sleep, sleep deprivation, depression, and tremors. Dr. Heuser used functional brain scans - SPECT scans - to assess any changes in the brains of the six fire fighters as compared to healthy brains of men of the same age. Computerized psychological testing known as TOVA was used to study reaction time, impulse control, and attention span. The SPECT scans revealed a pattern of abnormal change which was concentrated over a wider area than would normally be seen in brains of individuals exposed to toxic inhalation, as might be expected from

fighting fires. Dr. Heuser concluded the only plausible explanation at this time would be RF radiation exposure. Additionally, the TOVA testing revealed among the six fire fighters delayed reaction time, lack of impulse control, and difficulty in maintaining mental focus.

[back] 2. An international blue ribbon panel assembled by the National Institute of Environmental Health Sciences (NIEHS) designated power frequency electromagnetic fields (EMF) as "possible human carcinogens" on June 24, 1998. The panel's decision was based largely on the results of epidemiological studies of children exposed at home and workers exposed on the job. The evaluation of the EMF literature followed procedures developed by the International Agency for Research on Cancer (IARC), based in Lyon, France. The working group's report will be the basis for the NIEHS report to Congress on the EMF Research and Public Information Dissemination program (EMF RAPID). The National Radiological Protection Board (NRPB) of the United Kingdom noted that the views of its Advisory Group on Non-Ionizing Radiation are "consistent with those of the NIEHS expert panel."

June 26, 1998 statement of the National Radiological Protection Board, sited in Microwave News, July/August 1998

[back] 3. *World Health Organization; International Agency for Research on Cancer; IARC Monographs on the Evaluation of Carcinogenic Risks to Humans; Volume 80 Non-Ionizing Radiation, Part 1: Static and Extremely Low-Frequency (ELF) Electric and Magnetic Fields; 2002; 429 pages; ISBN 92 832 1280 0;* See http://www-cie.iarc.fr/htdocs/monographs/vol80/80. (http://www-cie.iarc.fr/htdocs/monographs/vol80/80.html) This IARC Monograph provides the rationale for its designation of ELF/EMF as a possible human carcinogen. It states that:

A few studies on genetic effects have examined chromosomal aberrations and micronuclei in lymphocytes from workers exposed to ELF electric and magnetic fields. In these studies, confounding by genotoxic agents (tobacco, solvents) and comparability between the exposed and control groups are of concern. Thus, the studies reporting an increased frequency of chromosomal aberrations and micronuclei are difficult to interpret.

Many studies have been conducted to investigate the effects of ELF magnetic fields on various genetic end-points. Although increased DNA strand breaks have been reported in brain cells of exposed rodents, the results are inconclusive; most of the studies show no effects in mammalian cells exposed to magnetic fields alone at levels below 50 μT. However, extremely strong ELF magnetic fields have caused adverse genetic effects in some studies. In addition, several groups have reported that ELF magnetic fields enhance the effects of known DNA- and chromosome-damaging agents such as ionizing radiation.

The few animal studies on cancer-related non-genetic effects are inconclusive. Results on the effects on in-vitro cell proliferation and malignant transformation are inconsistent, but some studies suggest that ELF magnetic fields affect cell proliferation and modify cellular responses to other factors such as melatonin. An increase in apoptosis following exposure of various cell lines to ELF electric and magnetic fields has been reported in several studies with different exposure conditions. Numerous studies have investigated effects of ELF magnetic fields on cellular end-points associated with signal transduction, but the results are not consistent.

[back] 4. The International Commission on Non-Ionizing Radiation Protection (ICNIRP) statement "Health Issues Related to the Use of Hand-Held Radiotelephones and Base Transmitters" of 1996 reads:

"Thermally mediated effects of RF fields have been studied in animals, including primates. These data suggest effects that will probably occur in humans subjected to whole body or localized heating sufficient to increase tissue temperatures by greater than 1C. They include the induction of opacities of the lens of the eye, possible effects on development and male fertility, various physiological and thermoregulatory responses to heat, and a decreased ability to perform mental tasks as body temperature increases. Similar effects have been reported in people subject to heat stress, for example while working in hot environments or by fever. The various effects are well established and form the biological basis for restricting occupational and public exposure to radiofrequency fields. In contrast, non-thermal effects are not well established and currently do not form a scientifically acceptable basis for restricting human exposure for frequencies used by hand-held radiotelephones and base stations."

International Commission on Non-Ionizing Radiation Protection, "Health Issues Related to the Use of Hand-Held Radiotelephones and Base Transmitters," Health Physics 70:587-593, 1996

The ANSI/IEEE Standard for Safety Levels of 1992 similarly states:

"An extensive review of the literature revealed once again that the most sensitive measurements of potentially harmful biological effects were based on the disruption of ongoing behavior associated with an increase of body temperature in the presence of electromagnetic fields. Because of the paucity of reliable data on chronic exposures, IEEE Subcommittee IV focused on evidence of behavioral disruption under acute exposures, even disruption of a transient and fully reversible nature."

IEEE Standards Coordinating committee 28 on Non-Ionizing Radiation Hazards: Standard for Safe Levels With Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 KHz to 300 GHz (ANSI/IEEE C95.1-1991), The Institute of Electrical and Electronics Engineers, New York, 1992.

[back] 5. Drs. Czerska, Casamento, Ning, and Davis (working for the Food and Drug Administration in 1997) using "a waveform identical to that used in digital cellular phones" at a power level within our current standards (SAR of 1.6 W/Kg, the maximum spatial peak exposure level recommended for the general population in the ANSI C95.1-1991 standard) found increases in cellular proliferation in human glioblastoma cells. This shows that "acceptable" levels of radiation can cause human cancer cells to multiply faster. The authors note that "because of reported associations between cellular phone exposure and the occurrence of a brain tumor, glioblastoma, a human glioblastoma cell line was used" in their research.

E.M. Czerska, J. Casamento, J. T. Ning, and C. Davis, "Effects of Radiofrequency Electromagnetic Radiation on Cell Proliferation," [Abstract presented on February 7, 1997 at the workshop 'Physical Characteristics and Possible Biological Effects of Microwaves Applied in Wireless Communication, Rockville, MD] E. M. Czerska, J. Casamento Centers for Devices and Radiological Health, Food and Drug Administration, Rockville, Maryland 20857, USA; H. T. Ning, Indian Health Service, Rockville, Maryland 20857, USA; C. Davis, Electrical Engineering Dept., Univ. of Maryland, College Park, Maryland 20742, USA

[back] 6. Dr. Michael Repacholi (in 1997, currently the director of the International Electromagnetic Fields Project at the World Health Organization) took one hundred transgenic mice and exposed some to radiation for two 30 minute periods a day for up to 18 months. He found that the exposed mice developed lymphomas (a type of cancer) at twice the rate of the unexposed mice. While telecommunications industry spokespersons criticized the experiment for using mice with a mutation which predisposed them to cancer (transgenic) the researchers pointed out that "some individuals inherit mutations in other genes...that predispose them to develop cancer, and these individuals may comprise a subpopulation at special risk from agents that would pose an otherwise insignificant risk of cancer."

Dr. Repacholi stated "I believe this is the first animal study showing a true non-thermal effect." He repeated the experiment in 1998 using 50 Hz fields instead of the 900 MHz pulsed radiation (the type used by cellular phones) used in the original experiment and found no cancer risk. He stated that this new data had implications for his original cellular phone study: "the control groups for both our RF and 50 Hz field studies showed no statistical differences, which lessens the possibility that the RF/MW radiation study result was a chance event or due to errors in methodology."

It is extremely important to note that Dr. Michael Repacholi was Chairman of the ICNIRP at the time its Statement on Health Issues Related to the Use of Hand-Held Radiotelephones and Base Transmitters was developed in 1996.

M. Repacholi et al., "Lymphomas in Eμ-Pim1 Transgenic Mice Exposed to Pulsed 900 MHz Electromagnetic Fields," Radiation Research, 147, pp.631-640, May 1997

[back] 7. Dr. Ross Adey (Veterans Administration Hospital at Loma Linda University in 1996) found what appeared to be a protective effect in rats exposed to the type of radiation used in digital cellular phones. The rats were exposed to an SAR of 0.58-0.75 W/Kg 836 MHz pulsed radiation of the TDMA type two hours a day, four days a week for 23 months, with the signals turned on and off every 7.5 minutes, so total exposure was 4 hours a week. Interestingly this effect was not present when a non-digital, analog signal was used. Rats exposed developed cancer less often. This study shows that low power fields of the digital cellular frequency can influence cancer development. Whether they would protect or promote in our children is a question for further study.

Ross Adey of the Veterans Administration Hospital at Loma Linda University, CA presented the results of pulsed (digital cellular) radiation on June 13, 1996 at the 18th Annual Meeting of the Bioelectromagnetics Society in Victoria, Canada. He presented the findings of the analog cellular phone radiation effect at the June 1997 2nd World Congress for Electricity and Magnetism in Biology and Medicine in Bologna, Italy. Reviews can be found in Microwave News issues July/August, 1996 and March/April 1997.

In recognition of his more than three decades of "fundamental contributions to the emerging science of the biological effects of electromagnetic fields," the authors of the November 2004 Report of the European Union's REFLEX Project (*Risk Evaluation of Potential Environmental Hazards From Low Frequency Electromagnetic Field Exposure Using Sensitive in vitro Methods*) chose to include Dr. Adey's personal views on Electromagnetic Field Exposure research as the Foreword to that report. To view the entire report, see: http://www.itis.ethz.ch/downloads/REFLEX_Final%20Report_171104.pdf (http://www.itis.ethz.ch/downloads/REFLEX_Final%20Report_171104.pdf)

The following is taken from Dr. Adey's Foreword found on pages 1-3 of the REFLEX Report:

The Future of Fundamental Research in a Society Seeking Categoric Answers to Health Risks of New Technologies

In summary, we have become superstitious users of an ever-growing range of technologies, but we are now unable to escape the web that they have woven around us.

Media reporters in general are no better informed. Lacking either responsibility or accountability, they have created feeding frenzies from the tiniest snippets of information gleaned from scientific meetings or from their own inaccurate interpretation of published research. In consequence, the public has turned with pleading voices to government legislatures and bureaucracies for guidance . . .

We face the problem brought on by the blind leading the blind. Because of public pressure for rapid answers to very complex biological and physical issues, short-term research programs have been funded to answer specific questions about certain health risks.

In many countries, and particularly in the USA, the effects of such harassing and troublesome tactics on independent, careful fundamental research have been near tragic. Beguiled by health hazard research as the only source of funding, accomplished basic scientists have diverted from a completely new frontier in physical regulation of biological mechanisms at the atomic level. Not only have governments permitted corporate interests in the communications industry to fund this research, they have even permitted them to determine the research questions to be addressed and to select the institutions performing the research.

[back] 8. Dr. A. W. Guy reported an extensive investigation on rats chronically exposed from 2 up to 27 months of age to low-level pulsed microwaves at SARs up to 0.4 W/Kg. The exposed group was found to have a significantly higher incidence of primary cancers.

A. W. Guy, C. K. Chou, L. Kunz, L, Crowley, and J. Krupp, "Effects of Long-Term Low-Level Radiofrequency Radiation Exposure on Rats." Volume 9. Summary. Brooks Air Force Base, Texas, USAF School of Aerospace Medicine, USF-SAM-TR-85-11; 1985

[back] 9. Drs. Henry Lai and N. P. Singh of the University of Washington in Seattle have reported both single- and double-strand DNA breaks in the brains of rats exposed to radiofrequency electromagnetic radiation at an SAR of 1.2 W/Kg. DNA is the carrier of the genetic information in all living cells. Cumulated DNA strand breaks in brain cells can lead to cancer or neurodegenerative diseases.

H. Lai and N. P. Singh, "Single- and Double-Strand DNA Breaks in Rat Brain Cells After Acute Exposure to Radiofrequency Electromagnetic Radiation," International Journal of Radiation Biology, Vol 69, No. 4, 513-521, 1996

[back] 10. Dr. Stanislaw Szmigielski has studied many thousands of Polish soldiers. He has found that those exposed to radiofrequency and microwave radiation in the workplace had more than double the cancer rate of the unexposed servicemen analyzing data from 1971-1985. He has presented further data suggesting a dose-response relationship with soldiers exposed to 100-200 W/cm^2 suffering 1.69 times as many cancers as the unexposed, and those exposed to 600-1000 W/cm^2 suffering 4.63 times as many cancers. The level considered safe for the public according to FCC regulations is 1000 W/cm^2. Occupational exposure up to 5000 W/cm^2 is allowed.

S. Szmigielski, "Cancer Morbidity in Subjects Occupationally Exposed to High Frequency (Radiofrequency and Microwave) Electromagnetic Radiation," The Science of the Total Environment 180:9-17, 1996

[back] 11. Dr. Bruce Hocking found an association between increased childhood leukemia incidence and mortality in the proximity of television towers. The power density ranged from 0.2-8.0 W/cm^2 nearer and 0.02 W/cm^2 farther from the towers.

B. Hocking, I. R. Gordon, H. L. Grain, and G. E: Hatfield, "Cancer Incidence and Mortality and Proximity to TV Towers," Medical Journal of Australia 165: 601-605; 1996

[back] 12. Drs. Mann and Röschke investigated the influence of pulsed high-frequency RF/MW radiation of digital mobile radio telephones on sleep in healthy humans. They found a hypnotic effect with shortening of sleep onset latency and a REM (Rapid Eye Movement) suppressive effect with reduction of duration and percentage of REM sleep. "REM sleep plays a special physiological role for information processing in the brain, especially concerning consolidation of new experiences. Thus the effects observed possibly could be associated with alterations of memory and learning functions."

K. Mann and J. Röschke, "Effects of Pulsed High-Frequency Electromagnetic Fields on Human Sleep," Neuropsychobiology 33:41-47, 1996

[back] 13. Dr. Allen Frey has been researching RF/MW radiation for over 3 decades. Here is the abstract on a paper concerning headaches and cellular phone radiation. "There have been numerous recent reports of headaches occurring in association with the use of hand-held cellular telephones. Are these reported headaches real? Are they due to emissions from telephones? There is reason to believe that the answer is "yes" to both questions. There are several lines of evidence to support this conclusion. First, headaches as a consequence of exposure to low intensity microwaves were reported in the literature 30 years ago. These were observed during the course of microwave hearing research before there were cellular telephones. Second, the blood-brain barrier appears to be involved in headaches, and low intensity microwave energy exposure affects the barrier. Third, the dopamine-opiate systems of the brain appear to be involved in headaches, and low intensity electromagnetic energy exposure affects those systems. In all three lines of research, the microwave energy used was approximately the same--in frequencies, modulations, and incident energies--as those emitted by present day cellular telephones, Could the current reports of headaches be the canary in the coal mine, warning of biologically significant effects?"

A. H. Frey, "Headaches from Cellular Telephones: Are they Real and What Are the Implications?" Environmental Health Perspectives Volume 106, Number 3, pp.101-103, March 1998

[back] 14. Henry Lai's review of the literature concerning neurological effects of RF/MW radiation: Existing data indicate that RF/MW radiation of relatively low intensity can affect the nervous system. Changes in blood-brain barrier, morphology, electrophysiology, neurotransmitter functions, cellular metabolism, and calcium efflux, and genetic effects have been reported in the brain of animals after exposure to RF. These changes can lead to functional changes in the nervous system. Behavioral changes in animals after exposure to RR have been reported.

Even a temporary change in neural functions after RF/MW radiation exposure could lead to adverse consequences. For example, a transient loss of memory function or concentration could result in an accident when a person is driving. Loss of short term working memory has indeed been observed in rats after acute exposure to RF/MW radiation.

Research has also shown that the effects of RF/MW radiation on the nervous system can cumulate with repeated exposure. The important question is, after repeated exposure, will the nervous system adapt to the perturbation and when will homeostasis break down? Related to this is that various lines of evidence suggest that responses of the central nervous system to RF/MW radiation could be a stress response. Stress effects are well known to cumulate over time and involve first adaptation and then an eventual break down of homeostatic processes.

H. Lai, "Neurological Effects of Radiofrequency Electromagnetic Radiation Relating to Wireless Communication Technology," Paper presentation at the IBC-UK Conference: "Mobile Phones-Is There a Health Risk?" September 16-17, 1997, Brussels, Belgium

[back] 15. Blood-Brain-Barrier: The blood-brain-barrier (BBB) is primarily a continuous layer of cells lining the blood vessels of the brain. It is critical for regulation of the brain's activity. Lai notes that "Even though most studies indicate that changes in the BBB occurs only after exposure to RF/MW radiation of high intensities with significant increase in tissue temperature, several studies have reported increases in permeability after exposure to RF/MW radiation of relatively low intensities...Pulsed RF seems to be more potent than continuous wave RF." Pulsed RF/MW is the type used in digital cellular systems. Effects on the BBB were noted at the 0.2 W/cm^2 level, and even at SAR of 0.016-5 W/kg. These effects could lead to local changes in brain function.

H. Lai, Ibid

[back] 16. Cellular Morphology: RF/MW radiation induced morphological changes of the central nervous system cells and tissues have been shown to occur under relatively high intensity or prolonged exposure to the RF/MW radiation. However, there are several studies which show that repeated exposure at relatively low power intensities caused morphological changes in the central nervous system. Again here pulsed (as in digital phone use) RF/MW radiation produced more pronounced effects. Certain drugs given to nonhuman primates sensitized them, for instance allowing eye damage to occur at very low power intensities. Dr Lai notes "Changes in morphology, especially cell death, could have an important implication on health. Injury-induced cell proliferation has been hypothesized as a cause of cancer." Some of these experiments were in the range of SAR 0.53 W/kg or even 0.26 W/kg.

H. Lai, Ibid

[back] 17. Neural Electrophysiology: Changes in neuronal electrophysiology, evoked potentials, and EEG have been reported. Some effects were observed at low intensities and after repeated exposure, suggesting cumulative effect. Energy density levels were as low as 50 W/cm^2.

H. Lai, Ibid

[back] 18. Neurotransmitters: Neurotransmitters are molecules which transmit information from one nerve cell to another. Early studies have reported changes in various neurotransmitters (catecholamines, serotonin, and acetylcholine) in the brain of animals only after exposure to high intensities of RF/MW radiation. However, there are more recent studies that show changes in neurotransmitter functions after exposure to low intensities of RF radiation. For example, effects were seen at 50 $\mu W/cm^2$ in one experiment. U.S. and Canadian RF/MW radiation safety policies allow exposures of 1000 $\mu W/cm^2$ at that frequency.

RF/MW radiation activates endogenous opioids in the brain. Endogenous opioids are neurotransmitters with morphine-like properties and are involved in many important physiological and behavioral functions, such as pain perception and motivation.

The response to RF/MW radiation depends on the area of the brain studied and on the duration of exposure. Exposure to RF/MW radiation has been shown to affect the behavioral actions of benzodiazepines (these are drugs such as Valium).

H. Lai, Ibid

[back] 19. Metabolic Changes in Neural Tissue: Several studies investigated the effects of RF/MW radiation exposure on energy metabolism in the rat brain. Surprisingly, changes were reported after exposure to relatively low intensity RF/MW radiation for a short duration of time (minutes). The effects depended on the frequency and modulation characteristics of the RF/MW radiation and did not seem to be related to temperature changes in the tissue.

Calcium ions play important roles in the functions of the nervous system, such as the release of neurotransmitters and the actions of some neurotransmitter receptors. Thus changes in calcium ion concentration could lead to alterations in neural functions. This is an area of considerable controversy because some researchers have also reported no significant effects of RF/MW radiation exposure on calcium efflux. However, when positive effects were observed, they occurred after exposure to RF/MW radiation of relatively low intensities and were dependent on the modulation and intensity of the RF/MW radiation studied (window effects). Some studies had SARs as low as 0.05-0.005 W/Kg.

H. Lai, Ibid

[back] 20. Cytogenetic effects have been reported in various types of cells after exposure to RF/MW radiation. Recently, several studies have reported cytogenetic changes in brain cells by RF/MW radiation , and these results could have important implication for the health effects of RF/MW radiation . Genetic damage to glial cells can result in carcinogenesis. However, since neurons do not undergo mitosis, a more likely consequence of neuronal genetic damage is changes in functions and cell death, which could either lead to or accelerate the development of neurodegenerative diseases. Power densities of 1 mW/cm^2 were employed, a level considered safe for the public by the FCC.

RF/MW radiation -induced increases in single and double strand DNA breaks in rats can be blocked by treating the rats with melatonin or the spin-trap compound N-t-butyl--phenylnitrone. Since both compounds are potent free radical scavengers, these data suggest that free radicals may play a role in the genetic effect of RF. If free radicals are involved in the RF-induced DNA strand breaks in brain cells, results from this study could have an important implication on the health effects of RF exposure. Involvement of free radicals in human diseases, such as cancer and atherosclerosis, has been suggested. Free radicals also play an important role in the aging process, which has been ascribed to be a consequence of accumulated oxidative damage to body tissues, and involvement of free radicals in neurodegenerative diseases, such as Alzheimer's, Huntington, and Parkinson, has also been suggested. One can also speculate that some individuals may be more susceptible to the effects of RF/MW radiation exposure.

H. Lai, Ibid

[back] 21. Dr. A. A. Kolodynski and V. V. Kolodynska of the Institute of Biology, Latvian Academy of Sciences, presented the results of experiments on school children living in the area of the Skrunda Radio Location Station in Latvia. Motor function, memory, and attention significantly differed between the exposed and control groups. The children living in front of the station had less developed memory and attention and their reaction time was slower.

A. A. Kolodynski, V. V. Kolodynska, "Motor and Psychological Functions of School Children Living in the Area of the Skrunda Radio Location Station in Latvia," The Science of the Total Environment 180:87-93, 1996

[back] 22. Dr. H. Lai and colleagues in 1993 exposed rats to 45 minutes of pulsed high frequency RF/MW radiation at low intensity and found that the rats showed retarded learning, indicating a deficit in spatial "working memory" function.

H Lai, A. Horita, and A. W. Guy, "Microwave Irradiation Affects Radial-Arm Maze Performance in the Rat," Bioelectromagnetics 15:95-104, 1994

NOTE: *Dr. Lai's January 2005 compilation of published RF/MW radiation studies demonstrating biological effects of exposure to low-intensity RF/MW radiation is included as a Reference section at the end of this report.*

[back] 23. Dr. Stefan Braune reported a 5-10 mm Hg resting blood pressure rise during exposure to RF/MW radiation of the sort used by cellular phones in Europe. The Lancet, the British medical journal where the report appeared, stated that "Such an increase could have adverse effects on people with high blood pressure."

S. Braune, "Resting Blood Pressure Increase During Exposure to a Radio-Frequency Electromagnetic Field," The Lancet 351, pp. 1,857-1,858, 1998

[back] 24. Dr. Kues and colleagues (of Johns Hopkins University and the Food and Drug Administration) found that placing timolol and pilocarpine into the eyes of monkeys and then exposing them to low power density pulsed RF/MW radiation caused a significant reduction in the power-density threshold for causing damage to the cells covering the eye and the iris. In fact the power was reduced by a factor of 10, so that it entered the "acceptable, safe" level of the FCC, 1 mW/cm^2! Timolol and pilocarpine are commonly used by people suffering from glaucoma. This is a very important study, as it points to the fact that laboratory experiments under "ideal" conditions are rarely what one finds in real life. The "safe" level of RF/MW radiation exposure for healthy people is likely to be very different than for those of us who suffer from illness, take medications, or are perhaps simply younger or older than those in the experiments.

H. A. Kues, J. C. Monahan, S. A. D'Anna, D. S. McLeod, G. A. Lutty, and S. Koslov, "Increased Sensitivity of the Non-Human Primate Eye to Microwave Radiation Following Ophthalmic Drug Pretreatment," Bioelectromagnetics 13:379-393, 1992

[back] 25. The World Health Organization states that "concerns have been raised about the safety of cellular mobile telephones, electric power lines and police speed-control 'radar guns.' Scientific reports have suggested that exposure to electromagnetic fields emitted from these devices could have adverse health effects, such as cancer, reduced fertility, memory loss, and adverse changes in the behaviour and development of children." Therefore, "In May 1996, in response to growing public health concerns in many Member States over possible health effects from exposure to an ever-increasing number and diversity of EMF sources, the World Health Organization launched an international project to assess health and environmental effects of exposure to electric and magnetic fields, which became known as the International EMF Project. The International EMF Project will last for five years." "A number

of studies at [frequencies above about 1 MHz] suggest that exposure to RF fields too weak to cause heating may have adverse health consequences, including cancer and memory loss. Identifying and encouraging coordinated research into these open questions is one of the major objectives of the International EMF Project."

World Health Organization Fact Sheet N181, "Electromagnetic Fields and Public Health, The International EMF Project," reviewed May 1998 and World Health Organization Fact Sheet N182, "Electromagnetic Fields and Public Health, Physical Properties and Effects on Biological Systems," reviewed May 1998,

[back] 26. The U. S. Food and Drug Administration in a January 14, 1998 letter to the House Telecommunications Subcommittee stated it "believes additional research in the area of RF is needed." In 1997 the FDA established the following priorities:

- Chronic (lifetime) animal exposures should be given the highest priority.
- Chronic animal exposures should be performed both with and without the application of chemical initiating agents to investigate tumor promotion in addition to tumorigenesis.
- Identification of potential risks should include end points other than brain cancer (e.g. ocular effects of RF radiation exposure).
- Replication of prior studies demonstrating positive biological effects work is needed. A careful replication of the Chou and Guy study (*Bioelectromagnetics, 13,* pp.469-496, 1992) which suggests that chronic exposure of rats to microwaves is associated with an increase in tumors, would contribute a great deal to the risk identification process for wireless communication products.
- Genetic toxicology studies should focus on single cell gel studies of DNA strand breakage and on induction of micronuclei.
- Epidemiology studies focused on approaches optimized for hazard identification are warranted.

Food and Drug Administration Recommendations quoted in Microwave News, March/April, 1997

[back] 27. The International Agency for Research on Cancer (IARC) is planning a multi-country, multi-million dollar study of cancer among users of wireless phones, beginning 1998. *Microwave News, January/February, 1998*

[back] 28. The Swedish Work Environmental Fund initiated a new epidemiological study on cellular phone radiation and brain tumors in 1997. *Microwave News, November/December, 1997*

[back] 29. The National Cancer Institute announced plans for a 5 year study of brain tumors and RF/MW radiation in 1993. *Microwave News, January/February, 1993*

[back] 30. The European Commission (EC) Expert Group on health effects of wireless phones called for a 5 year research program with a $20 million budget, reported 1997. *Microwave News , January/February, 1997*

[back] 31. A report commissioned by New Zealand's Ministry of Health stated that "It is imperative that the scientific issues be clarified as soon as possible, as there is much at stake." It called for more research to examine the potential health effects of RF radiation. *Microwave News, November/December, 1996*

[back] 32. The National Health and Medical Research Council of Australia announced its sponsorship of a 5 year, $3.5 million project on potential health effects of mobile phone technology in 1996. *Microwave News, November/December, 1996*

[back] 33. The Commonwealth Scientific Industrial Research Organization (CSIRO) of Australia concluded in 1995 that the safety of cellular telephones cannot be resolved "in the near future." Dr. Stan Barnett, a principal researcher of CSIRO, states that "My goal is to establish a national committee to approach this problem by coordinating relevant and focused research." He estimated a budget of $3 million over a 3 year period would be necessary.

Commonwealth Scientific Industrial Research Organization, "Status of Research on Biological Effects and Safety of Electromagnetic Radiation: Telecommunications Frequencies," a report prepared by Dr. Stan Barnett, as sited in Microwave News, September/October, 1995

[back] 34. In Canada, Expert Panels are formed in response to requests from governments and other organizations for guidance on public policy issues where specialized knowledge is required. The Royal Society of Canada (RSC) is the only national academic organization, encompassing all fields of study in the sciences, arts and humanities that provides, through its Committee on Expert Panels, a service to Canadians by convening Expert Panels that produce publicly disseminated, arms-length, third party reviews. The most recent Expert Panel report addressing RF/MW radiation examines new data on dosimetry and exposure assessment, thermoregulation, biological effects such as enzyme induction, and toxicological effects, including genotoxicity, carcinogenicity, and testicular and reproductive outcomes. Epidemiological studies of mobile phone users and occupationally exposed populations are examined, along with human and animal studies of neurological and behavioural effects. All of the authoritative reviews completed within the last two years have supported the need for further research to clarify the possible associations between RF fields and adverse health outcomes that have appeared in some reports. See: http://www.rsc.ca//index.php?lang_id=1&page_id=120 (http://www.rsc.ca/index.php?lang_id=1&page_id=120).

Recent Advances in Research on Radiofrequency Fields and Health: 2001-2003; A Follow-up to The Royal Society of Canada, Report on the Potential Health Risks of Radiofrequency Fields from Wireless Telecommunication Devices, 1999

[back] 35. The European Union effort to address this issue is in the study *Risk Evaluation of Potential Environmental Hazards from Low Energy Electromagnetic Field Exposure Using Sensitive in vitro Methods* (REFLEX). Exposure to electromagnetic fields (EMF) in relation to health is a controversial topic throughout the industrial world. So far epidemiological and animal studies have generated conflicting data and thus uncertainty regarding possible adverse health effects. This situation has triggered controversies in communities especially in Europe with its high density of population and industry and the omnipresence of EMF in infrastructures and consumer products. These controversies are affecting the siting of facilities, leading people to relocate, schools to close or power lines to be re-sited, all at great expense. The European Union believes that causality between EMF exposure and disease can never be regarded as proven without knowledge and understanding of the basic mechanisms possibly triggered by EMF. To search for those basic mechanisms powerful technologies developed in toxicology and molecular biology were to be employed in the REFLEX project to investigate cellular and sub-cellular responses of living cells exposed to EMF in vitro.

The REFLEX data have made a substantial addition to the data base relating to genotoxic and phenotypic effects of both ELF-EMF and RF-EMF on *in vitro* cellular systems. While the data neither precludes nor confirms a health risk due to EMF exposure nor was the project designed for this purpose, the value lies in providing new data that will enable mechanisms of EMF effects to be studied more effectively than in the past. Furthermore, the REFLEX data provide new information that will be used for risk evaluation by WHO, IARC and ICNIRP. For further information on REFLEX see: http://europa.eu.int/comm/research/quality-of-life/ka4/ka4_electromagnetic_en.html (http://europa.eu.int/comm/research/quality-of-life/ka4/ka4_electromagnetic_en.html)

[back] 36. The Swedish Radiation Protections Institute (SSI) endeavors to ensure that human beings and the environment are protected from the harmful effects of radiation, both in the present and in the future. SSI has focused on epidemiological research on cancer and exposure from mobile phones and transmitters as well as experimental cancer research. In addition three selected topics were also discussed, namely blood-brain barrier, heat shock proteins, and precautionary framework. For further information on SSI see: http://www.ssi.se/forfattning/eng_forfattlista.html (http://www.ssi.se/forfattning/eng_forfattlista.html)

[back] 37. In the United Kingdom, the National Radiological Protection Board (NRPB) was created by the Radiological Protection Act 1970. The statutory functions of NRPB are to advance the acquisition of knowledge about the protection of mankind from radiation hazards through research and to provide information and advice to persons (including Government Departments) with responsibilities in the United Kingdom in relation to the protection from radiation hazards either of the community as a whole or of particular sections of the community. The NFPB believes that there is a need for better occupational studies rather than simply for more. In particular, the studies need to be of occupational groups for whom measurements show that there is genuinely a substantially raised exposure to RF fields. If the studies are to be more informative than those so far, a key requirement will be for improved exposure measurement (or improved estimation of exposure) for individuals, or at least for occupational groups. It would be desirable, as far as practical, that the studies should measure the intensity and timing of RF field exposures, and also that they should include some assessment of major RF field exposures from

sources other than the current occupation. Ideally, exposure assessment needs to be anatomical site (organ)-specific, because some sources result in greatly differing doses to different parts of the body. It is a difficulty in these prescriptions, of course, that the appropriate exposure metric is unknown. For further information on NRPB see: http://www.nrpb.org/index.htm (http://www.nrpb.org/index.htm)

[back] 38. On January 5, 2005, the EMF-Team Finland issued the Helsinki Appeal 2005 to members of the European Parliament. In it physicians and researchers call on the European Parliament to apply the Precautionary Principle to electromagnetic fields, especially in the radio- and microwave- frequency bands. They criticize the present RF/MW radiation safety standards that do not recognize the biological effects caused by non-thermal exposures to non-ionizing radiation [i.e., RF/MW radiation.] They also call for continued refunding of the REFLEX EMF research program. The text of the Helsinke Appeal 2005 is found at: http://www.emrpolicy.org/news/headlines/index.htm (http://www.emrpolicy.org/news/headlines/index.htm)

[back] 39. On July 19, 1993 Dr. Elizabeth Jacobson, Deputy Director for Science, Center for Devices and Radiological Health, Food and Drug Administration criticized Thomas Wheeler, President of the Cellular Telecommunications Industry Association:

"I am writing to let you know that we were concerned about two important aspects of your press conference of July 16 concerning the safety of cellular phones, and to ask that you carefully consider the following comments when you make future statements to the press. First, both the written press statements and your verbal comments during the conference seemed to display an unwarranted confidence that these products will be found absolutely safe. In fact, the unremittingly upbeat tone of the press packet strongly implies that there can be no hazard, leading the reader to wonder why any further research would be needed at all.....More specifically, your press packet selectively quotes from our Talk Paper of February 4 in order to imply that FDA believes that cellular phones are "safe." ("There is no proof at this point that cellular phones are harmful.") In fact, the same Talk Paper also states, "There is not enough evidence to know for sure, either way." Our position, as we have stated it before, is this: Although there is no direct evidence linking cellular phones with harmful effects in humans, a few animal studies suggest that such effects could exist. It is simply too soon to assume that cellular phones are perfectly safe, or that they are hazardous--either assumption would be premature. This is precisely why more research is needed."

Full text of letter can be found in Microwave News, July/August, 1993

[back] 40. In 1993 the Director of the Office of Radiation and Indoor Air of the Environmental Protection Agency suggested that the FCC not adopt the 1992 ANSI/IEEE standard "due to serious flaws," among them (1) "the ANSI/IEEE conclusion that there is no scientific data indicating that certain subgroups of the population are more at risk than others is not supported by NCRP and EPA reports" and (2) "the thesis that ANSI/IEEE recommendations are protective of all mechanisms of interaction is unwarranted because the adverse effects level in the 1992 ANSI/IEEE standard are based on a thermal effect."

Letter from Margo T. Oge, Director, Office of Radiation and Indoor Air to Thomas Stanley, Chief Engineer, Office of engineering and Technology, FCC, dated Nov 9, 1993

[back] 41. A brief sampling of the CSIRO report:

Problems in studies of human populations published to date include imprecise estimates of exposure. As a result, such epidemiological studies may underestimate any real risk. The likelihood of epidemiological studies providing useful information is questionable, particularly if the biological end point cannot be predicted. Its value in the short term (less than 10 years) must be negligible unless there was an enormous increase in the rate of cancer growth. Interestingly, the incidence of brain tumors in the EC countries has increased substantially in recent years.

RF safety cannot be assessed in the absence of reported serious effects when so little research has been aimed at the problem. It is somewhat surprising, and rather disappointing, to find that although the literature contains many hundreds of publications, there are very few areas of consensus....At low levels the absence of clear thresholds and [the] presence of intensity and frequency windows have created questions rather than provided answers.

There is no doubt that the interpretation of bioeffects data has been clouded by a preoccupation with thermally mediated processes. In fact, development of the ANSI/IEEE standard is based only on well-established thermal effects, and ignores the more subtle non-thermal processes that are more difficult to interpret and apply to human

health.

Commonwealth Scientific Industrial Research Organization, "Status of Research on Biological Effects and Safety of Electromagnetic Radiation: Telecommunications Frequencies," a report prepared by Dr. Stan Barnett, as sited in Microwave News, September/October, 1995

[back] 42. Statement from the October 25-28, 1998 "*Symposium of Mobile Phones and Health - Workshop on Possible Biological and Health Effects of RF Electromagnetic Fields*" held at the University of Vienna, Austria.

The preferred terminology to be used in public communication: Instead of using the terms "athermal", "non-thermal" or "microthermal" effects, the term "low intensity biological effects" is more appropriate.

Preamble: The participants agreed that biological effects from low-intensity exposures are scientifically established. However, the current state of scientific consensus is inadequate to derive reliable exposure standards. The existing evidence demands an increase in the research efforts on the possible health impact and on an adequate exposure and dose assessment.

Base stations: How could satisfactory Public Participation be ensured: The public should be given timely participation in the process. This should include information on technical and exposure data as well as information on the status of the health debate. Public participation in the decision (limits, siting, etc.) should be enabled.

Cellular phones: How could the situation of the users be improved: Technical data should be made available to the users to allow comparison with respect to EMF-exposure. In order to promote prudent usage, sufficient information on the health debate should be provided. This procedure should offer opportunities for the users to manage reduction in EMF-exposure. In addition, this process could stimulate further developments of low-intensity emission devices.

[back] 43. Statement from the June 7-8, 2000 International Conference on Cell Tower Siting Linking Science and Public Health, Salzburg, Austria. The full report can be found at: www.land-sbg.gv.at/celltower (http://www.land-sbg.gv.at/celltower)

- It is recommended that development rights for the erection and for operation of a base station should be subject to a permission procedure. The protocol should include the following aspects:
    - Information ahead and active involvement of the local public
    - Inspection of alternative locations for the siting
    - Protection of health and wellbeing
    - Considerations on conservation of land- and townscape
    - Computation and measurement of exposure
    - Considerations on existing sources of HF-EMF exposure
    - Inspection and monitoring after installation

- It is recommended that a national database be set up on a governmental level giving details of all base stations and their emissions.
- It is recommended for existing and new base stations to exploit all technical possibilities to ensure exposure is as low as achievable (ALATA-principle) and that new base stations are planned to guarantee that the exposure at places where people spend longer periods of time is as low as possible, but within the strict public health guidelines.
- Presently the assessment of biological effects of exposures from base stations in the low-dose range is difficult but indispensable for protection of public health. There is at present evidence of no threshold for adverse health effects.

- Recommendations of specific exposure limits are prone to considerable uncertainties and should be considered preliminary. For the total of all high frequency irradiation a limit value of 100 mW/m² (10 µW/cm²) is recommended.
- For preventive public health protection a preliminary guideline level for the sum total of exposures from all ELF pulse modulated high-frequency facilities such as GSM base stations of 1 mW/m² (0.1 µW/cm²) is recommended.

[back] 44. Scientists attending the September 13-14, 2002 International Conference "State of the Research on Electromagnetic Fields – Scientific and Legal Issues," organized by ISPESL (National Institute for Prevention and Work Safety, Italy), the University of Vienna, and the City of Catania, held in Catania, Italy, agreed to the following:

- Epidemiological and *in vivo* and *in vitro* experimental evidence demonstrates the existence for electromagnetic field (EMF) induced effects, some of which can be adverse to health.
- We take exception to arguments suggesting that weak (low intensity) EMF cannot interact with tissue.
- There are plausible mechanistic explanations for EMF-induced effects which occur below present ICNIRP and IEEE guidelines and exposure recommendations by the EU.
- The weight of evidence calls for preventive strategies based on the precautionary principle. At times the precautionary principle may involve prudent avoidance and prudent use.
- We are aware that there are gaps in knowledge on biological and physical effects, and health risks related to EMF, which require additional independent research.

[back] 45. The Freiburger Appeal is a German based appeal by mainly medical practitioners who are concerned about the effects, they believe, from mobile phone technology including masts that are appearing in their patients. It started in Oct 2002 and with very little international publicity has got 50,000 signatories with at least 2000 medical signatures from across the world. Mast These physicians and scientists agreed to establish an international scientific commission to promote research for the protection of public health from EMF and to develop the scientific basis and strategies for assessment, prevention, management and communication of risk, based on the precautionary principle.

Excerpt:

On the basis of our daily experiences, we hold the current mobile communications technology (introduced in 1992 and since then globally extensive) and cordless digital telephones (DECT standard) to be among the fundamental triggers for this fatal development. One can no longer evade these pulsed microwaves. They heighten the risk of already-present chemical/physical influences, stress the body–immune system, and can bring the body–still-functioning regulatory mechanisms to a halt. Pregnant women, children, adolescents, elderly and sick people are especially at risk.

Statement of the physicians and researchers of Interdisziplinäre Gesellschaft für Umweltmedizin e. V. (Interdisciplinary Association for Environmental Medicine) IGUMED, Sackingen, Germany, September 19, 2002. The Freiburger Appeal can be found at: http://www.mastsanity.org/doctors-appeals.html (http://www.mastsanity.org/doctors-appeals.html).

[back] 46. Report of the European Union's REFLEX Project (Risk Evaluation of Potential Environmental Hazards from Low Frequency Electromagnetic Field Exposure Using Sensitive *in vitro* Methods), November 2004. The Project studied ELF and RF exposures to various animal cell types. The report is found at: http://www.itis.ethz.ch/downloads/REFLEX_Final%20Report_171104.pdf (http://www.itis.ethz.ch/downloads/REFLEX_Final%20Report_171104.pdf)

From the Summary: *[t]he omnipresence of EMF's in infrastructures and consumer products have become a topic of public concern. This is due to the fear of people that based on the many conflicting research data a risk to their health cannot be excluded with some certainty. Therefore, the overall objective of REFLEX was to find out whether or not the fundamental biological processes at the cellular and molecular level support such an assumption. For this purpose, possible effects of EMF's on cellular events controlling key functions, including those involved in carcinogenesis and in the pathogenesis of neurodegenerative disorders, were studied through*

focused research. Failure to observe the occurrence of such key critical events in living cells after EMF exposure would have suggested that further research efforts in this field could be suspended and financial resources be reallocated to the investigation of more important issues. But as clearly demonstrated, the results of the REFLEX project show the way into the opposite direction.

[back] 47. From the Discussion section of the December 20, 2004 Second Annual Report of Sweden's Radiation Protection Board (SSI) entitled: *Recent Research on Mobile Telephony and Health Risks: Second Annual Report from SSI's Independent Expert Group on Electromagnetic Fields.* The complete report is available at: http://www.ssi.se/english/EMF_exp_Eng_2004.pdf (http://www.ssi.se/english/EMF_exp_Eng_2004.pdf)

To date, little is known about the levels of radiofrequency radiation exposure in the general population from sources such as mobile phones being used by oneself or other people, mobile phone base stations, and radio and television transmitters. Measurements that have been performed have usually been made as a result of public concern about base station exposures or other specific sources, and have therefore been made at locations that could be assumed to have higher fields than would be the case if measurement locations were selected randomly. Furthermore, all measurements have been stationary, and there is today no knowledge about the level of exposure that an individual will have throughout the day.

There is need for information about the personal exposure to RF fields in the general population, to enhance the understanding of the relative importance of exposure from base stations close to the home, from radio and television transmitters, and from the use of mobile phones . . . Studies with personal RF exposure measurements of randomly selected samples of the general population are strongly encouraged.

[back] 48. Released January 11, 2005, Mobile Phones and Health 2004: Report by the Board of NRPB Documents of the NRPB: Volume 15, No. 5. See: http://www.nrpb.org/publications/documents_of_nrpb/abstracts/absd15-5.htm (http://www.nrpb.org/publications/documents_of_nrpb/abstracts/absd15-5.htm)

From the Executive Summary:

The Board notes that a central recommendation in the Stewart Report was that a precautionary approach to the use of mobile phone technologies be adopted until much more detailed and scientifically robust information on any health effects becomes available.

The Board considers that it is important to understand the signal characteristics and field strengths arising from new telecommunications systems and related technologies, to assess the RF exposure of people, and to understand the potential biological effects on the human body.

[back] 49. The ICNIRP exposure guidelines are only designed to protect against "known adverse health impacts," according to Dr. Jürgen Bernhardt, ICNIRP's chairman. Bernhardt reviewed the updated limits, which cover the spectrum from 1 Hz to 300 GHz, in a presentation at the *20th Annual Meeting of the Bioelectromagnetics Society* in St. Pete Beach, FL, on June 10. The limits protect against "short-term, immediate health effects" such as nerve stimulation, contact shocks and thermal insults, according to the guidelines, which appear in the April issue of *Health Physics* (*74*, pp.494-522, 1998). Despite "suggestive" evidence that power frequency magnetic fields can be carcinogenic, ICNIRP has concluded that this and other non-thermal health effects have not been "established." ICNIRP has long followed this approach to standard-setting. In his talk, Bernhardt noted that the guidelines include "no consideration regarding prudent avoidance" for health effects for which evidence is less than conclusive.

Microwave News, July/August 1998

Additional References and Studies

The following references reporting biological effects of radiofrequency radiation (RFR) at low intensities through January 2005 were compiled on 12/27/04 by Henry C. Lai PhD, Research Professor of Bioengineering, University of Washington, Seattle, WA

Balode *Sci Total Environ* 180(1):81-85, 1996 - blood cells from cows from a farm close and in front of a radar installation showed significantly higher level of severe genetic damage.

Boscol et al. *Sci Total Environ* 273(1-3):1-10, 2001 - RFR from radio transmission stations (0.005 mW/cm^2) affects immune system in women.

Chiang et al. *J. Bioelectricity* 8:127-131, 1989 - people who lived and worked near radio antennae and radar installations showed deficits in psychological and short-term memory tests.

de Pomerai et al. *Nature* 405:417-418, 2000. *Enzyme Microbial Tech* 30:73-79, 2002 - reported an increase in a molecular stress response in cells after exposure to a RFR at a SAR of 0.001 W/kg. This stress response is a basic biological process that is present in almost all animals - including humans.

de Pomerai et al. (*FEBS Lett* 22;543(1-3):93-97, 2003 - RFR damages proteins at 0.015-0.020 W/kg.

D'Inzeo et al. *Bioelectromagnetics* 9(4):363-372, 1988 - very low intensity RFR (0.002 – 0.004 mW/cm^2) affects the operation of acetylcholine-related ion-channels in cells. These channels play important roles in physiological and behavioral functions.

Dolk et al. *Am J Epidemiol* 145(1):1-91997- a significant increase in adult leukemias was found in residents who lived near the Sutton Coldfield television (TV) and frequency modulation (FM) radio transmitter in England.

Dutta et al.*Bioelectromagnetics* 10(2):197-202 1989 - reported an increase in calcium efflux in cells after exposure to RFR at 0.005 W/kg. Calcium is an important component of normal cellular functions.

Fesenko et al. *Bioelectrochem Bioenerg* 49(1):29-35, 1999 - reported a change in immunological functions in mice after exposure to RFR at a power density of 0.001 mW/cm^2.

Hallberg O, Johansson O, (2004) concluded that continuous disturbance of cell repair mechanisms by body-resonant FM electromagnetic fields seems to amplify the carcinogenic effects resulting from cell damage caused e.g. by UV-radiation.

Hjollund et al. *Reprod Toxicol* 11(6):897, 1997 - sperm counts of Danish military personnel, who operated mobile ground-to-air missile units that use several RFR emitting radar systems (maximal mean exposure 0.01 mW/cm^2), were significantly lower compared to references.

Hocking et al. *Med J Aust* 165(11-12):601-605, 1996 - an association was found between increased childhood leukemia incidence and mortality and proximity to TV towers.

Ivaschuk et al. *Bioelectromagnetics* 18(3):223-229, 1999 - short-term exposure to cellular phone RFR of very low SAR (26 mW/kg) affected a gene related to cancer.

Kolodynski and Kolodynska, *Sci Total Environ* 180(1):87-93, 1996 - school children who lived in front of a radio station had less developed memory and attention, their reaction time was slower, and their neuromuscular apparatus endurance was decreased.

Kwee et al. *Electro- and Magnetobiology* 20: 141-152, 2001 - 20 minutes of cell phone RFR exposure at 0.0021 W/kg increased stress protein in human cells.

Lebedeva et al. *Crit Rev Biomed Eng* 28(1-2):323-337, 2000 - brain wave activation was observed in human subjects exposed to cellular phone RFR at 0.06 mW/cm^2.

Magras and Xenos *Bioelectromagnetics* 18(6):455-461, 1999 - reported a decrease in reproductive function in mice exposed to RFR at power densities of 0.000168 - 0.001053 mW/cm^2. Irreversible sterility was found in the fifth generation of offspring.

Mann et al. *Neuroendocrinology* 67(2):139-144, 1998 - a transient increase in blood cortisol was observed in human subjects exposed to cellular phone RFR at 0.02 mW/cm^2. Cortisol is a hormone involved in stress reaction.

Marinelli et al. *J Cell Physiol.* 198(2):324-332, 2004 - exposure to 900-MHz RFR at 0.0035 W/kg affected cell's self-defense responses.

Michelozzi et al. *Epidemiology* 9 (Suppl) 354p, 1998 - leukemia mortality within 3.5 km (5,863 inhabitants) near a high power radio-transmitter in a peripheral area of Rome was higher than expected.

Michelozzi et al. *Am J Epidemiol* 155(12):1096-1103, 2002 - childhood leukemia higher at a distance up to 6 km from a radio station.

Navakatikian and Tomashevskaya "Biological Effects of Electric and Magnetic Fields, Volume 1," D.O. Carpenter (ed) Academic Press, San Diego, CA, pp.333-342. 1994 - RFR at low intensities (0.01 - 0.1 mW/cm^2; 0.0027-0.027 W/kg) induced behavioral and endocrine changes in rats. Decreases in blood concentrations of testosterone and insulin were reported.

Novoselova et al. *Bioelectrochem Bioenerg* 49(1):37-41, 1999 -low intensity RFR (0.001 mW/cm^2) affects functions of the immune system.

Park et al. *International Archives of Occupational and Environmental Health* 77(6):387-394, 2004 - higher mortality rates for all cancers and leukemia in some age groups in the area near the AM radio broadcasting towers.

Persson et al. *Wireless Network* 3:455-461, 1997 - reported an increase in the permeability of the blood-brain barrier in mice exposed to RFR at 0.0004 - 0.008 W/kg. The blood-brain barrier envelops the brain and protects it from toxic substances.

Phillips et al. *Bioelectrochem. Bioenerg.* 45:103-110, 1998 - reported DNA damage in cells exposed to RFR at SAR of 0.0024 - 0.024 W/kg.

Polonga-Moraru et al. *Bioelectrochemistry* 56(1-2):223-225, 2002 - change in membrane of cells in the retina (eye) after exposure to RFR at 15 $\mu W/cm^2$.

Pyrpasopoulou et al. *Bioelectromagnetics* 25(3):216-227, 2004 - exposure to cell phone radiation during early gestation at SAR of 0.0005 W/kg (5 $\mu W/cm^2$) affected kidney development in rats.

Salford et al. *Environ Health Persp* Online January 29, 2003 - Nerve cell damage in mammalian brain after exposure to microwaves from GSM mobile phones signal at 0.02 W/kg.

Santini et al. *Pathol Biol* (Paris) 50(6):369-373, 2002 - increase in complaint frequencies for tiredness, headache, sleep disturbance, discomfort, irritability, depression, loss of memory, dizziness, libido decrease, in people who lived within 300 m of mobile phone base stations.

Sarimov et al. *IEEE Trans Plasma Sci* 32:1600-1608, 2004 - GSM microwaves affect human lymphocyte chromatin similar to stress response at 0.0054 W/kg.

Schwartz et al. *Bioelectromagnetics* 11(4):349-358, 1990 - calcium movement in the heart affected by RFR at SAR of 0.00015 W/kg. Calcium is important in muscle contraction. Changes in calcium can affect heart functions.

Somosy et al. *Scanning Microsc* 5(4):1145-1155, 1991 - RFR at 0.024 W/kg caused molecular and structural changes in cells of mouse embryos.

Stagg et al. *Bioelectromagnetics* 18(3):230-236, 1997- glioma cells exposed to cellular phone RFR at 0.0059 W/kg showed significant increases in thymidine incorporation, which may be an indication of an increase in cell division.

Stark et al. *J Pineal Res* 22(4):171-176, 1997 - a two- to seven-fold increase of salivary melatonin concentration was observed in dairy cattle exposed to RFR from a radio transmitter antenna.

Tattersall et al. *Brain Res* 904(1):43-53, 2001 - low-intensity RFR (0.0016 - 0.0044 W/kg) can modulate the function of a part of the brain called the hippocampus, in the absence of gross thermal effects. The changes in excitability may be consistent with reported behavioral effects of RFR, since the hippocampus is involved in learning and memory.

Vangelova et al. *Cent Eur J Public Health* 10(1-2):24-28, 2002 - operators of satellite station exposed to low dose (0.1127 J/kg) of RFR over a 24-hr shift showed an increased excretion of stress hormones.

Velizarov et al. *Bioelectrochem Bioenerg* 48(1):177-180, 1999 - showed a decrease in cell proliferation (division) after exposure to RFR of 0.000021 - 0.0021 W/kg.

Veyret et al. *Bioelectromagnetics* 12(1):47-56, 1991 - low intensity RFR at SAR of 0.015 W/kg affects functions of the immune system.

Wolke et al. *Bioelectromagnetics* 17(2):144-153, 1996 - RFR at 0.001W/kg affects calcium concentration in heart muscle cells of guinea pigs.

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The International Association of Fire Fighters recognizes IAFF Local 3368, Carpinteria-Summerland, California, who brought this issue to the attention of our membership through the Resolution 15, submitted through our biennial convention in August 2004. Additionally, the following local affiliates provided support for the passage of the resolution: Brookline, Massachusetts, San Diego, California, San Francisco, California and Vancouver, British Columbia. We also acknowledge the efforts of Dr. Henry C. Lai, University of Washington, Seattle, Washington; Dr. Magda Havas of Trent University, Peterborough, Ontario; Janet Newton, President of the EMR Policy Institute; and Susan Foster Ambrose for their technical support and continued passion to protect the health and safety of fire fighters and emergency medical personnel. Finally, we thank Dr. Leslie Plachta and the Safe Ossining Schools for their research efforts and their battle to stop siting cell towers on Ossining, New York schools.

RMD; 3/2005

Programs & Services
(http://client.prod.iaff.org/#page=ProgramsAndServices)
How to Become a Fire Fighter (http://client.prod.iaff.org/#menuid=29)
Fire Ops 101 (http://www.iaff.org/et/fireops101/index.htm)
Fire Ground Survival (http://client.prod.iaff.org/#menuid=31)
Fit to Survive (http://www.iaff.org/hs/FTS/ftsdefault.asp)
HazMat/WMD Training (http://www.iaff.org/et/HW/index.htm?src=web)
IAFF Financial Corporation (http://www.iaff-fc.com/bt/)
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Kaplan University (http://client.prod.iaff.org/#menuid=34)
Burn Prevention (http://client.prod.iaff.org/#menuid=27)
IAFF-MDA (http://client.prod.iaff.org/#menuid=36)
Firefighters for Operation Warm (http://www.FireFightersOW.org?target=_blank)
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DANE E. ERICKSEN, P.E.
CONSULTANT

BY E-MAIL TV8342@ATT.COM

June 19, 2014

Theadora K. Vriheas, Esq.
AT&T Mobility
430 Bush Street
San Francisco, California 94108-3735

Dear Tedi:

As requested, we have conducted the review required by the City of San Francisco of the coverage maps that AT&T Mobility will submit as part of its application package for its base station proposed to be located at 444 Presidio Avenue (Site No. CC5217). This is to fulfill the submittal requirements for Planning Department review.

Executive Summary

We concur with the maps, data, and conclusions provided by AT&T. The maps provided to show the before and after conditions accurately represent the carrier's present and post-installation indoor coverage.

AT&T proposes to install twelve Andrew Model SBNHH-1D65A directional panel antennas above the roof of the four-story hotel located at 444 Presidio Avenue. Three antennas would be installed within individual cylindrical enclosures above the center of the roof, oriented toward 30°T, and the other antennas would be installed within two view screen enclosures above the southeast and southwest ends of the roof, oriented in groups of three toward 140°T and 240°T. The antennas would be mounted at an effective height of 49½ feet above ground, 5 feet above the roof. The maximum effective radiated power in any direction would be 10,880 watts, representing simultaneous operation at 4,380 watts for WCS, 4,360 watts for PCS, 800 watts for cellular, and 1,340 watts for 700 MHz service.

AT&T provided for review two pairs of coverage maps, dated May 21, 2014, attached for reference. The maps show AT&T's cellular UMTS (850 MHz) and 4G LTE (700 MHz) indoor coverage in the area before and after the site is operational. Both the before and after UMTS maps show three levels of coverage, which AT&T colors and defines as follows:

Green	Acceptable service coverage during high demand periods
Hashed Yellow	Service coverage gap during high demand periods
Pink	Service coverage gap during all demand periods

The 4G LTE maps do not differentiate between demand periods; rather they indicate, with the color blue, locations where 4G service is and would be acceptable.

e-mail: **bhammett@h-e.com**
Delivery: **470 Third Street West • Sonoma, California 95476**
Telephone: **707/996-5200 San Francisco • 707/996-5280 Facsimile • 202/396-5200 D.C.**

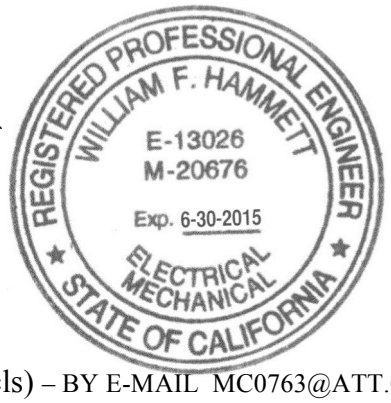
We undertook a two-step process in our review. As a first step, we obtained information from AT&T on the software and the service thresholds that were used to generate its coverage maps. This carrier uses commercially available software to develop its coverage maps. The outdoor service thresholds that AT&T uses to estimate indoor service are in line with industry standards, similar to the thresholds used by other wireless service providers.

As a second step, we conducted our own drive test to measure the actual AT&T UMTS and LTE 4G signal strength in the vicinity of the proposed site. Our fieldwork was conducted on June 12, 2014, between 10:10 AM and 11:20 AM. The field measurements were conducted using an Ascom TEMS Pocket network diagnostic tool with built-in GPS along a measurement route selected to cover all the streets within the map area that AT&T had indicated would receive improved service.

Based on the measurement data, we conclude that the AT&T UMTS and 4G LTE coverage maps showing the service area without the proposed installation represent areas of deficiency in the carrier's present indoor coverage. The maps submitted to show the after coverage with the proposed base station in operation were prepared on the same basis as the maps of the existing conditions and so are expected to accurately illustrate the improvements in coverage.

We appreciate the opportunity to be of service. Please let us know if any questions arise on this matter.

Sincerely yours,



William F. Hammett, P.E.

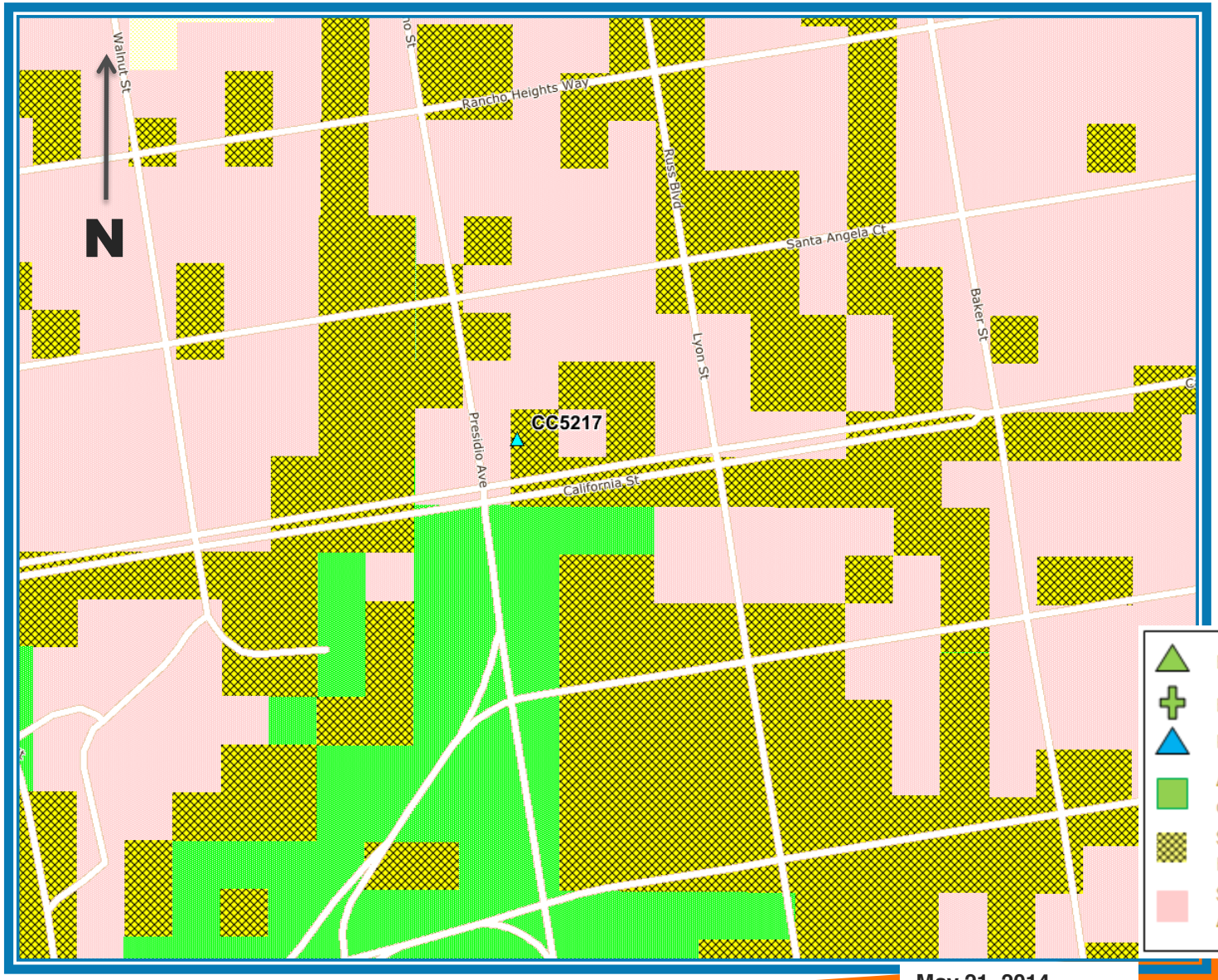
cz

Enclosures

cc: Mr. Michael J. Caniglia (w/encls) – BY E-MAIL MC0763@ATT.COM
Ms. Talin Aghazarian (w/encls) – BY E-MAIL TALIN.AGHAZARIAN@ERICSSON.COM

Exhibit 2 - Proposed Site at 444 Presidio (CC5217)

Service Area BEFORE site is constructed

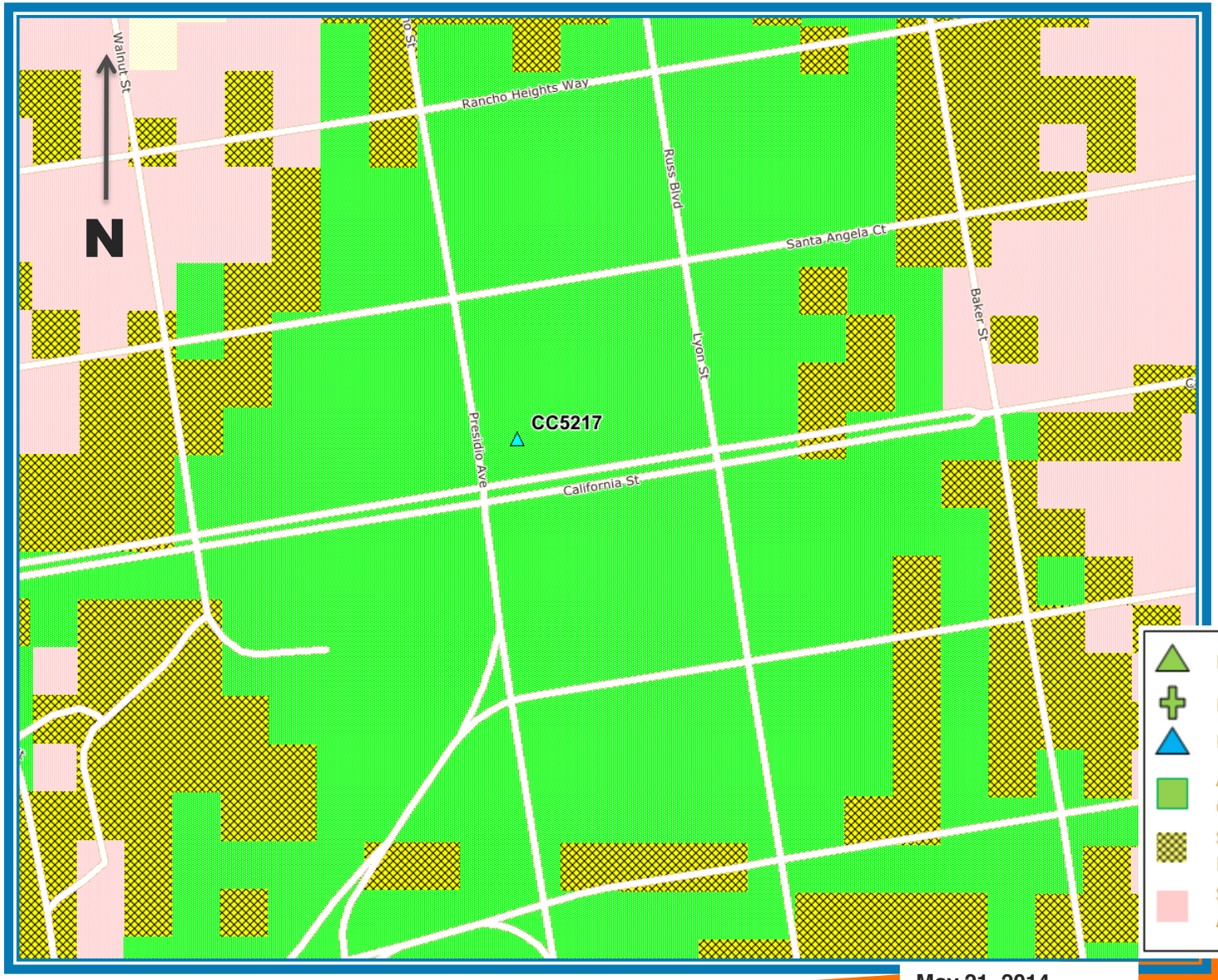


May 21, 2014

at&t

Exhibit 4 - Proposed Site at 444 Presidio (CC5217)

Service Area AFTER site is constructed

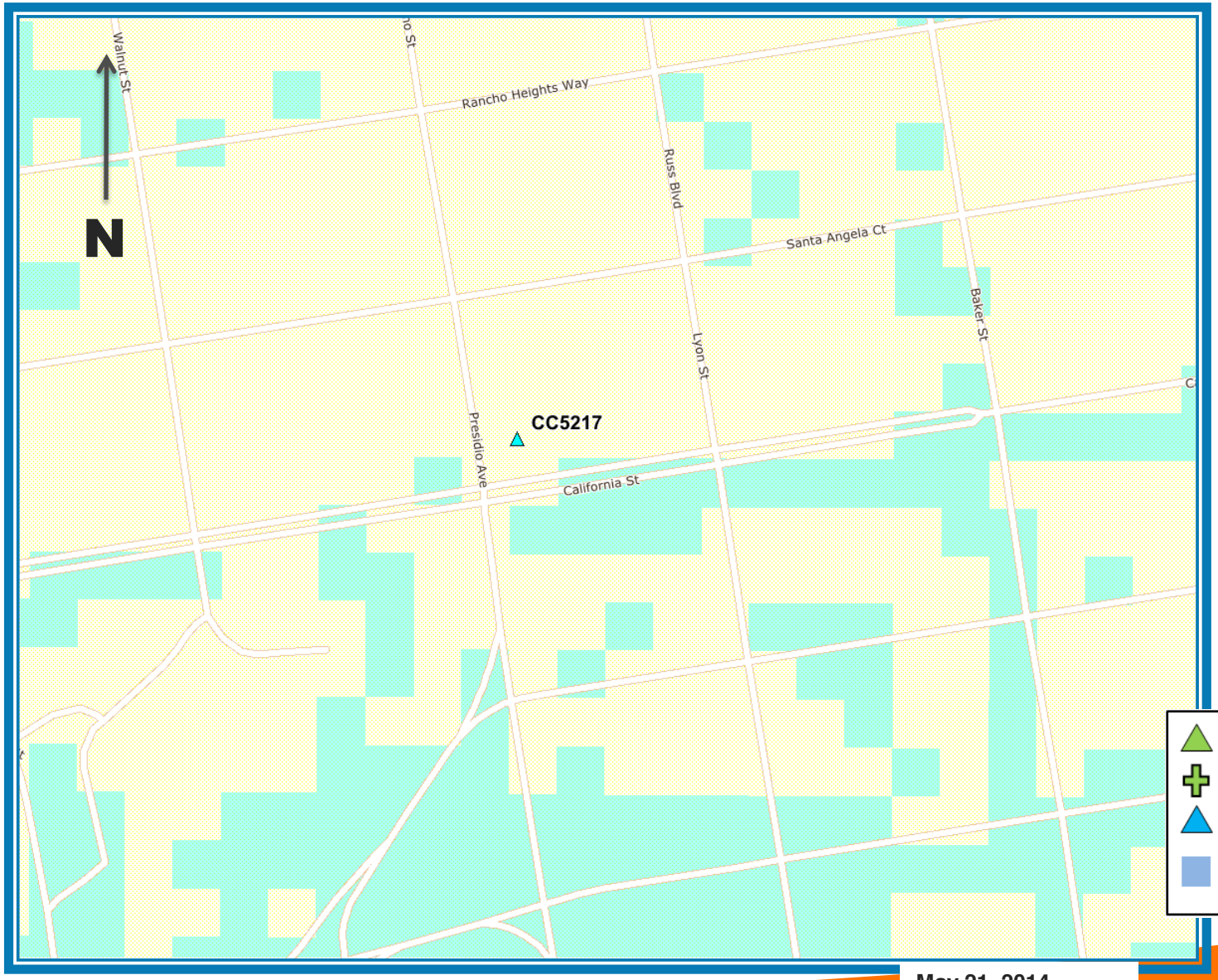


May 21, 2014

at&t

Exhibit 5 - Proposed Site at 444 Presidio (CC5217)

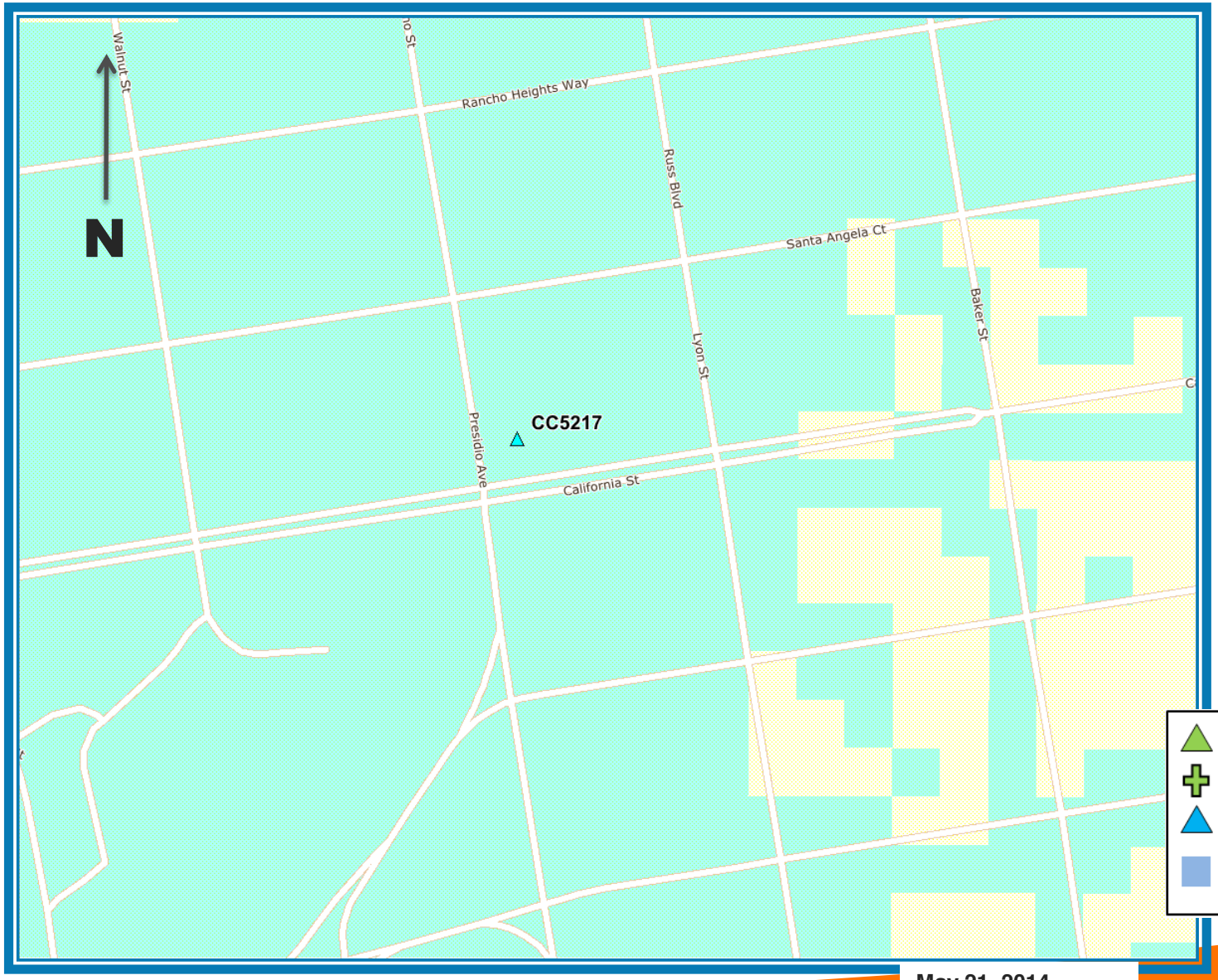
4G LTE Service Area BEFORE site is constructed



May 21, 2014

Exhibit 6 - Proposed Site at 444 Presidio (CC5217)

4G LTE Service Area AFTER site is constructed



May 21, 2014

LAUREL INN
444 PRESIDIO AVE
SAN FRANCISCO, CA 94118
CCU5217

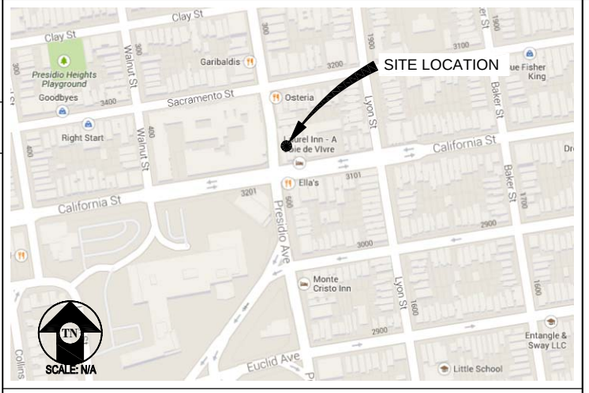
PROJECT DESCRIPTION

A (P) UNMANNED TELECOMMUNICATION FACILITY CONSISTING OF A (P) AT&T 20'-0"X10'-10" (217 SQ FT) EQUIPMENT LEASE AREA & (P) 213 SQ FT ANTENNA LEASE AREA W/ (1) (P) RBA72 CABINET, (1) (P) RBA72-36 CABINET, (6) (P) PURCELL CABINETS, & (12) (P) AT&T ANTENNAS INSIDE (4) (P) FRP VENTS & (2) (P) FRP BOXES. PAINT (P) FRP VENTS & BOXES TO MATCH (E) BUILDING.

PROJECT INFORMATION

SITE NAME:	LAUREL INN	SITE #:	CCU5217
COUNTY:	SAN FRANCISCO	JURISDICTION:	CITY OF SAN FRANCISCO
BLOCK/LOT:	1022-026	POWER:	PG&E
SITE ADDRESS:	444 PRESIDIO AVE SAN FRANCISCO, CA 94118	TELEPHONE:	AT&T
CURRENT ZONING:	NC-2-NEIGHBORHOOD COMMERCIAL, SMALL SCALE		
CONSTRUCTION TYPE:	V-B		
OCCUPANCY TYPE:	U, (UNMANNED COMMUNICATIONS FACILITY)		
HEIGHT / BULK:	40-X		
PROPERTY OWNER:	LAUREL SPE LLC 530 BUSH ST #501 SAN FRANCISCO, CA 94108		
APPLICANT:	AT&T 430 BUSH ST, 5TH FLOOR SAN FRANCISCO, CA 94108		
LEASING CONTACT:	ATTN: MARK JONES (330) 391-0360		
ZONING CONTACT:	ATTN: TALIN AGHAZARIAN (510) 206-1674		
CONSTRUCTION CONTACT:	ATTN: AARON MCCLAIN (805) 471-2605		
LATITUDE: LONGITUDE:	N 37° 47' 15.34" NAD 83 W 122° 26' 47.71" NAD 83		
AMSL:	±255.1'		

VICINITY MAP



DRIVING DIRECTIONS

FROM: 430 BUSH ST, 5TH FLOOR, SAN FRANCISCO, CA 94108
TO: 444 PRESIDIO AVE, SAN FRANCISCO, CA 94118

1. HEAD EAST ON BUSH ST TOWARD CLAUDE LN	197 FT
2. TAKE THE 1ST LEFT ONTO KEARNY ST	344 FT
3. TAKE THE 1ST LEFT ONTO PINE ST	2.3 MI
4. TURN RIGHT ONTO PRESIDIO AVE	387 FT

END AT: 444 PRESIDIO AVE, SAN FRANCISCO, CA 94118

ESTIMATED TIME: 7 MINUTES ESTIMATED DISTANCE: 2.5 MILES

CODE COMPLIANCE

ALL WORK & MATERIALS SHALL BE PERFORMED & INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES. NOTHING IN THESE PLANS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THESE CODES:

2013 CALIFORNIA ADMINISTRATIVE CODE, PART 1, TITLE 24 C.C.R.
2013 CALIFORNIA BUILDING CODE (CBC), PART 2, TITLE 24 C.C.R.
(2012 INTERNATIONAL BUILDING CODE VOLUMES 1-2 AND 2013 CALIFORNIA AMENDMENTS)
2013 CALIFORNIA ELECTRICAL CODE (CEC), PART 3, TITLE 24 C.C.R.
(2011 NATIONAL ELECTRICAL CODE AND 2013 CALIFORNIA AMENDMENTS)
2013 CALIFORNIA MECHANICAL CODE (CMC) PART 4, TITLE 24 C.C.R.
(2012 UNIFORM MECHANICAL CODE AND 2013 CALIFORNIA AMENDMENTS)
2013 CALIFORNIA PLUMBING CODE (CPC), PART 5, TITLE 24 C.C.R.
(2012 UNIFORM PLUMBING CODE AND 2013 CALIFORNIA AMENDMENTS)
2010 CALIFORNIA ENERGY CODE (CEC), PART 6, TITLE 24 C.C.R.
2013 CITY OF SAN FRANCISCO FIRE CODE
(2012 INTERNATIONAL FIRE CODE AND 2013 CALIFORNIA AMENDMENTS)
2013 CALIFORNIA GREEN BUILDING STANDARDS CODE, PART 11, TITLE 24 C.C.R.
2013 CALIFORNIA REFERENCED STANDARDS, PART 12, TITLE 24 C.C.R.
ANSI/EIA-TIA-222-G

ALONG WITH ANY OTHER APPLICABLE LOCAL & STATE LAWS AND REGULATIONS

DISABLED ACCESS REQUIREMENTS

THIS FACILITY IS UNMANNED & NOT FOR HUMAN HABITATION. DISABLED ACCESS & REQUIREMENTS ARE NOT REQUIRED IN ACCORDANCE WITH CALIFORNIA STATE BUILDING CODE, TITLE 24 PART 2, SECTION 11B-203.4

SHEET INDEX

SHEET	DESCRIPTION	REV
T-1	TITLE SHEET	-
LS-1	TOPOGRAPHIC SURVEY	-
A-1	SITE PLAN	-
A-2	EQUIPMENT PLAN & DETAILS	-
A-3	ANTENNA PLAN & DETAILS	-
A-4	ANTENNA PLANS	-
A-5	ELEVATIONS	-
A-6	ELEVATIONS	-

APPROVAL

RF

LEASING

ZONING

CONSTRUCTION

AT&T

LAUREL INN
CCU5217
444 PRESIDIO AVE
SAN FRANCISCO, CA 94118

ISSUE STATUS

△	DATE	DESCRIPTION	BY
	04/21/14	ZD 90%	C.C.
	05/16/14	ZD 100%	V.C.
	-	-	-
	-	-	-
	-	-	-
	-	-	-

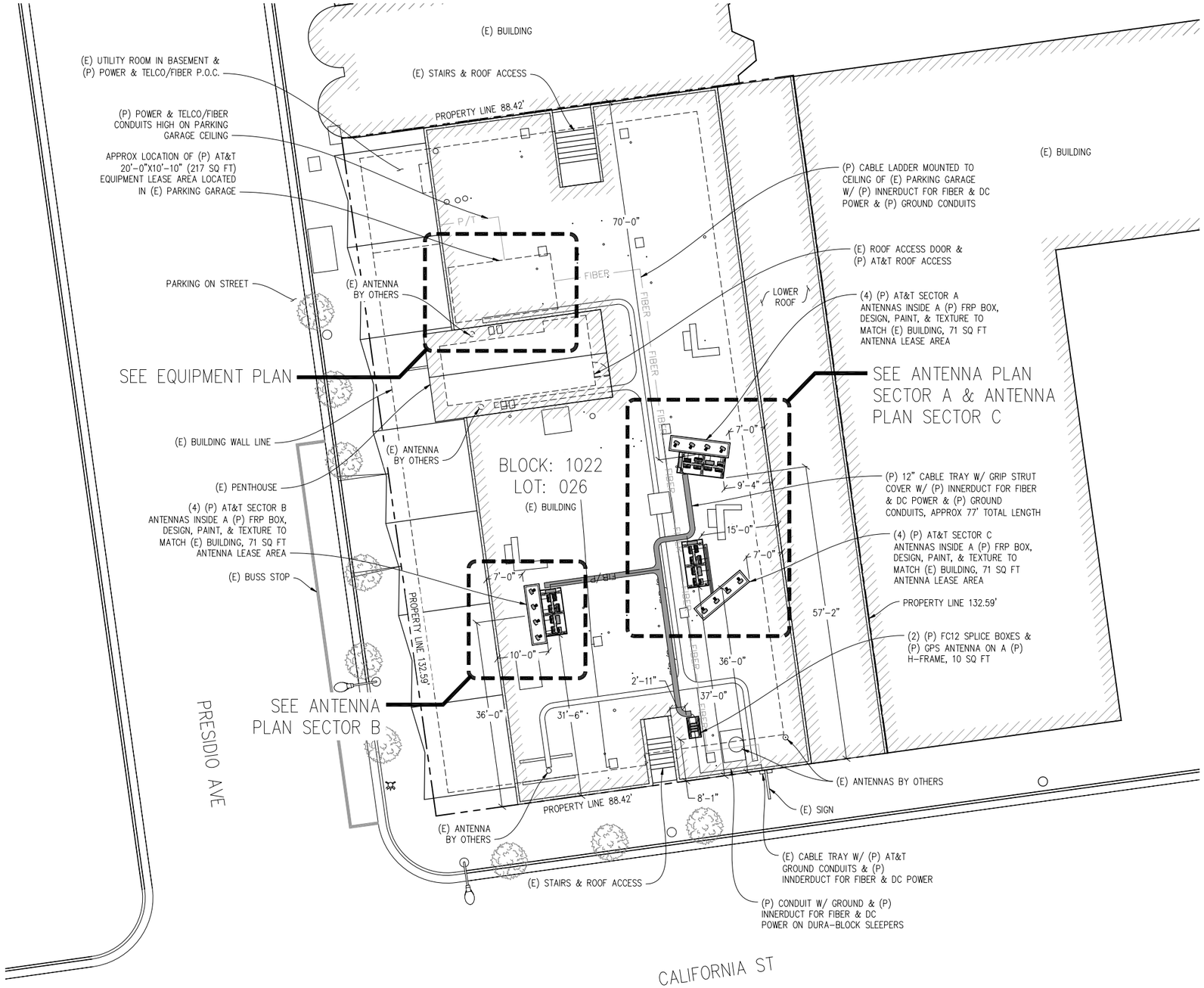
DRAWN BY: C. CODY
CHECKED BY: J. GRAY
APPROVED BY: -
DATE: 05/16/14

Streamline Engineering and Design, Inc.
8445 Sierra College Blvd, Suite E Granite Bay, CA 95746
Contact: Larry Houghtby Phone: 916-275-4180
E-Mail: larry@streamlineeng.com Fax: 916-660-1941

430 BUSH ST, 5TH FLOOR
SAN FRANCISCO, CA 94108

SHEET TITLE:
TITLE

SHEET NUMBER:
T-1



SITE PLAN

1"=10'-0"

0 5' 10' 20' 30' 50'

LAUREL INN

CCU5217
444 PRESIDIO AVE
SAN FRANCISCO, CA 94118

ISSUE STATUS

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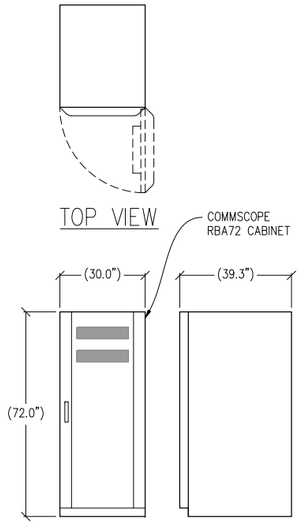
at&t

430 BUSH ST. 5TH FLOOR
SAN FRANCISCO, CA 94108

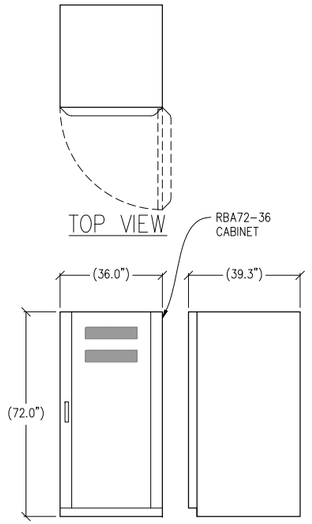
SHEET TITLE:
SITE PLAN

SHEET NUMBER:
A-1



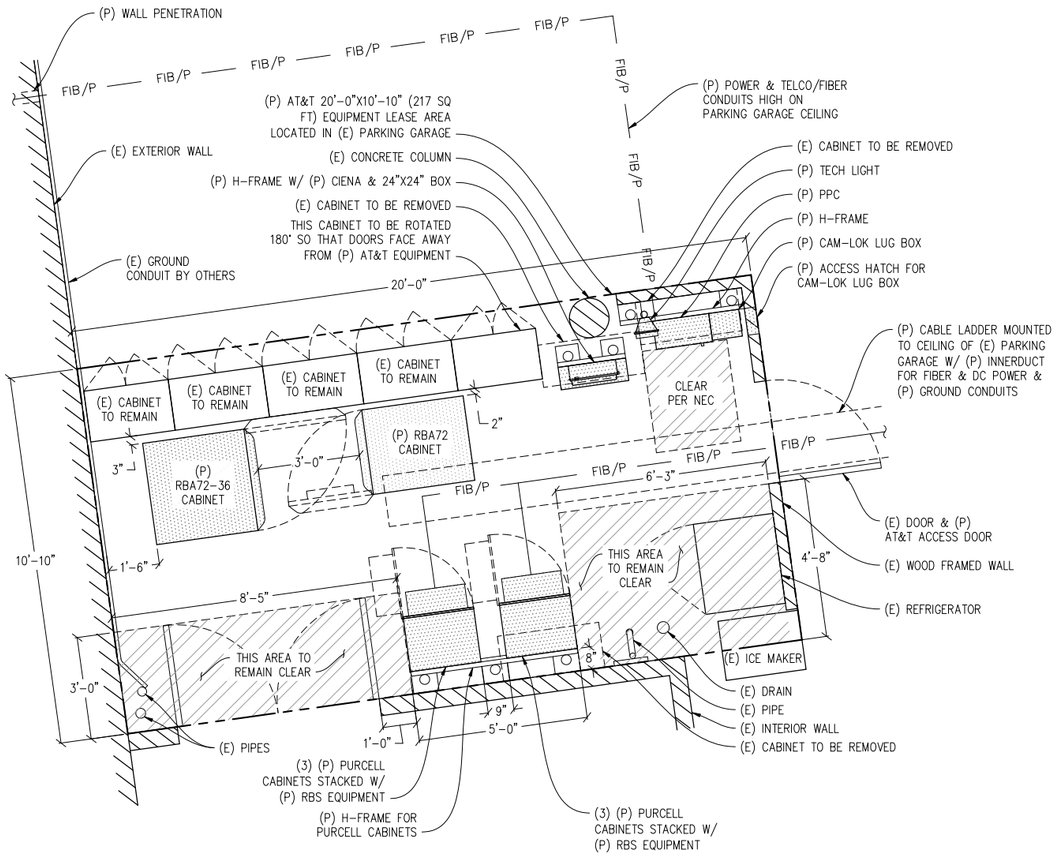
1 CABINET DETAIL

½"=1'-0" MAX WEIGHT: 2000 LBS



2 CABINET DETAIL

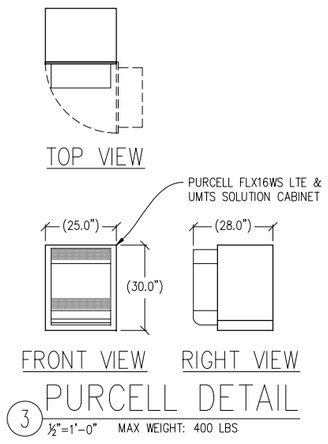
½"=1'-0" MAX WEIGHT: 2350 LBS



TN EQUIPMENT PLAN

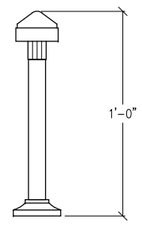
½"=1'-0"

0 6" 1' 2' 3' 5' 7' 10'



3 PURCELL DETAIL

½"=1'-0" MAX WEIGHT: 400 LBS



4 GPS DETAIL

3"=1'-0"

LAUREL INN

CCU5217

444 PRESIDIO AVE
SAN FRANCISCO, CA 94118

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DRAWN BY:	C. CODY
CHECKED BY:	J. GRAY
APPROVED BY:	–
DATE:	05/16/14

Streamline Engineering and Design, Inc.
8445 Sierra College Blvd. Suite E Granite Bay, CA 95746
Contact: Larry Houghtby Phone: 916-275-4180
E-Mail: larry@streamlineeng.com Fax: 916-660-1941

at&t

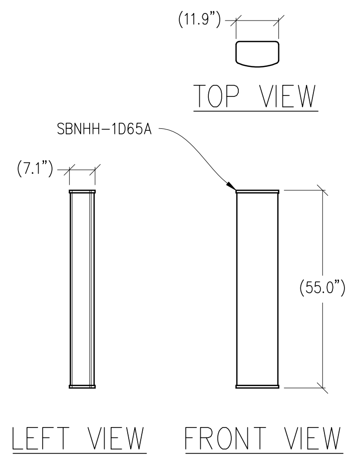
430 BUSH ST. 5TH FLOOR
SAN FRANCISCO, CA 94108

SHEET TITLE:

EQUIPMENT PLAN & DETAILS

SHEET NUMBER:

A-2



1 ANTENNA DETAIL
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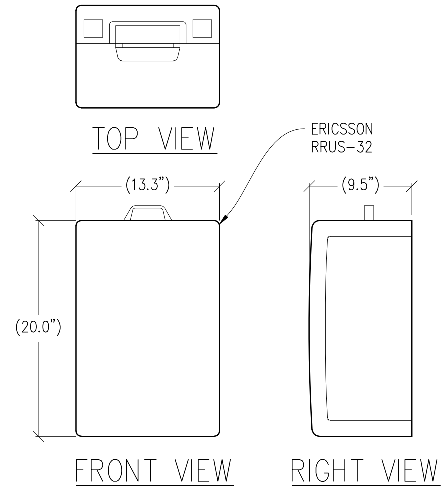
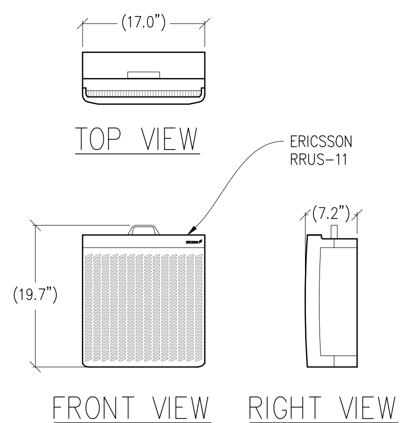
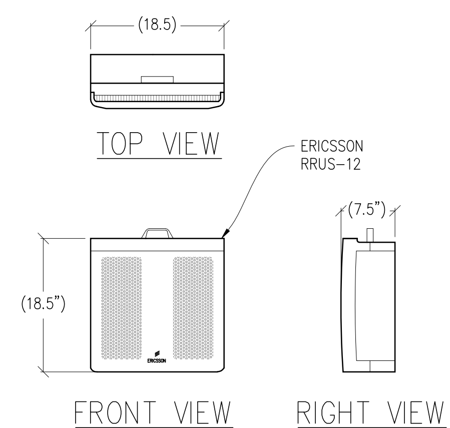


2 RRUS-32 DETAIL
1½"=1'-0" MAX WEIGHT: 77 LBS



3 RRUS-11 DETAIL
1"=1'-0" MAX WEIGHT: 50 LBS



4 RRUS-12 DETAIL
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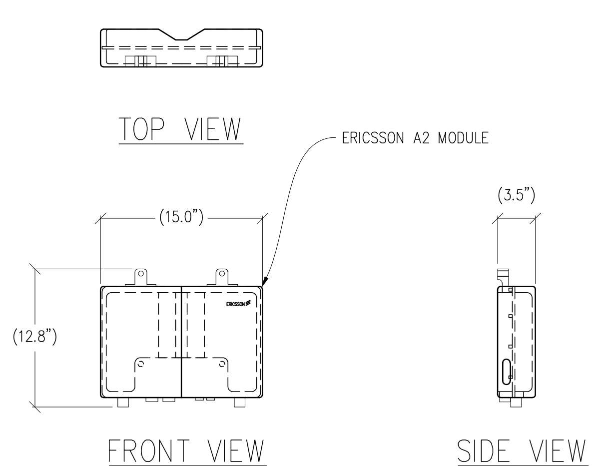
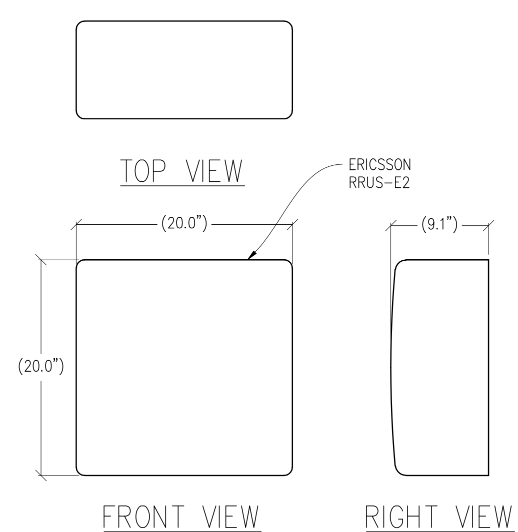


5 A2 MODULE DETAIL
1½"=1'-0" MAX WEIGHT: 22 LBS



6 RRUS-E2 DETAIL
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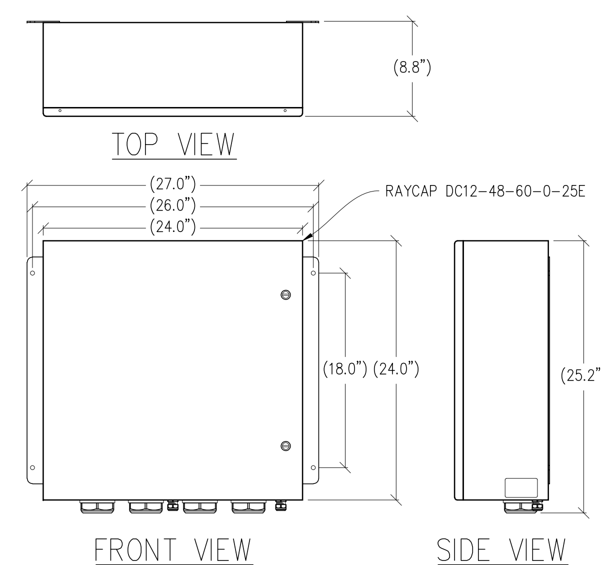
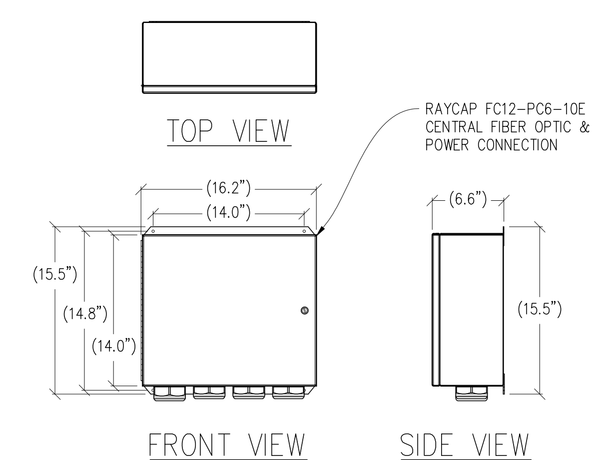


7 SURGE SUPPRESSION DETAIL
1½"=1'-0" MAX WEIGHT: 56.3 LBS



8 SPLICE BOX DETAIL
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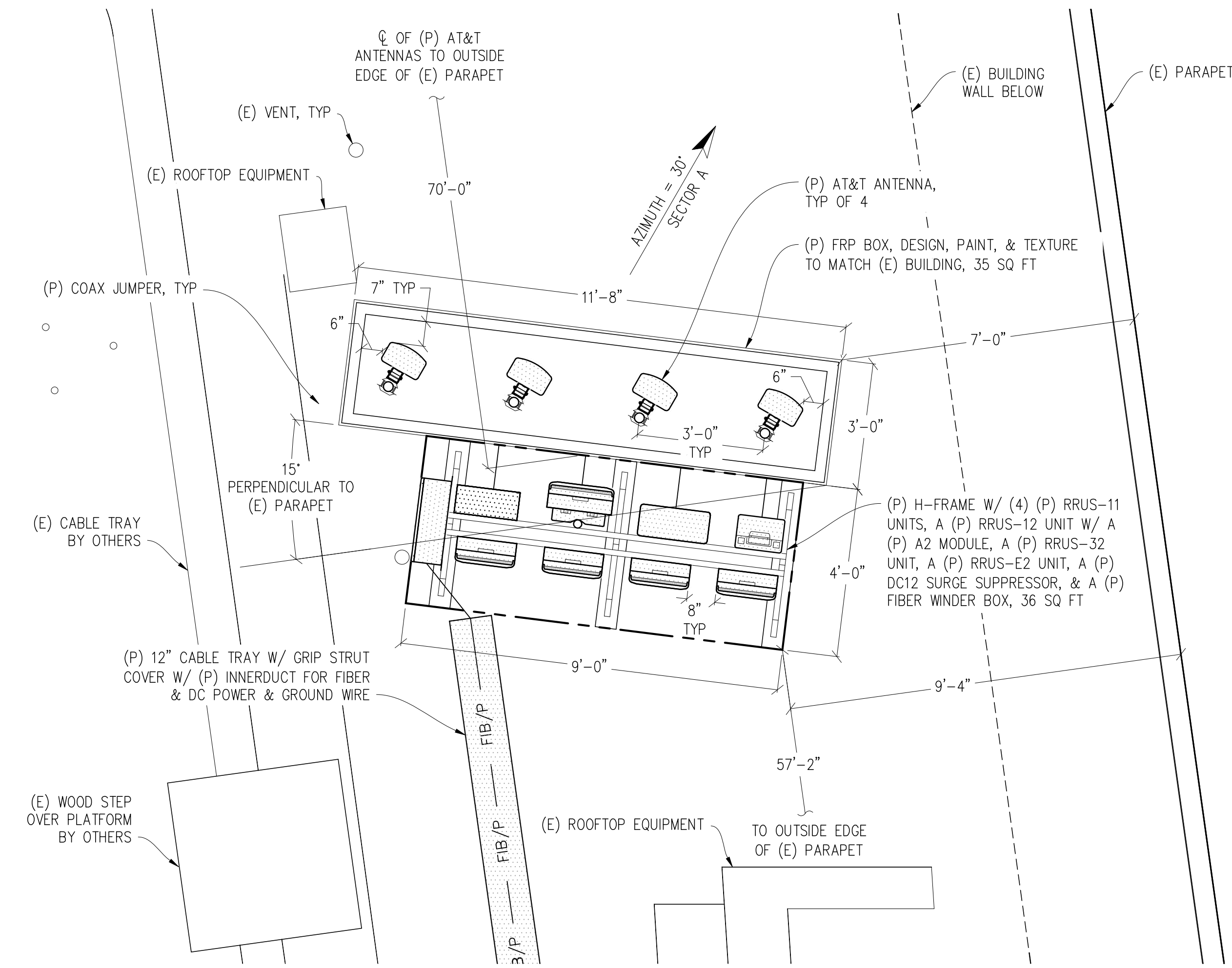

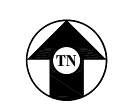

ANTENNA PLAN SECTOR A
½"=1'-0"

LAUREL INN

CCU5217
444 PRESIDIO AVE
SAN FRANCISCO, CA 94118

ISSUE STATUS

△	DATE	DESCRIPTION	BY
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	05/16/14	ZD 100%	V.C.
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DRAWN BY:	C. CODY
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APPROVED BY:	–
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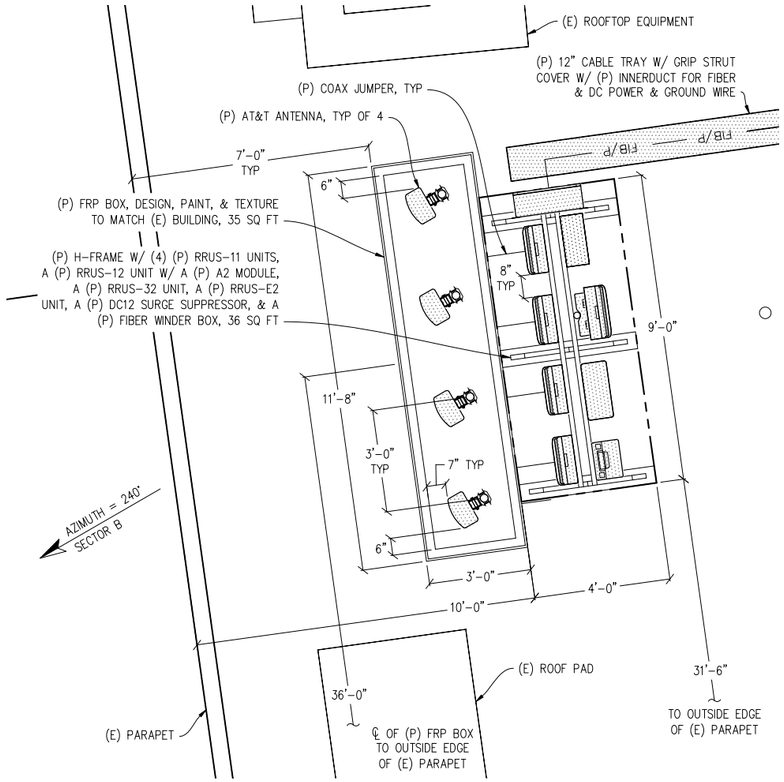
430 BUSH ST, 5TH FLOOR
SAN FRANCISCO, CA 94108

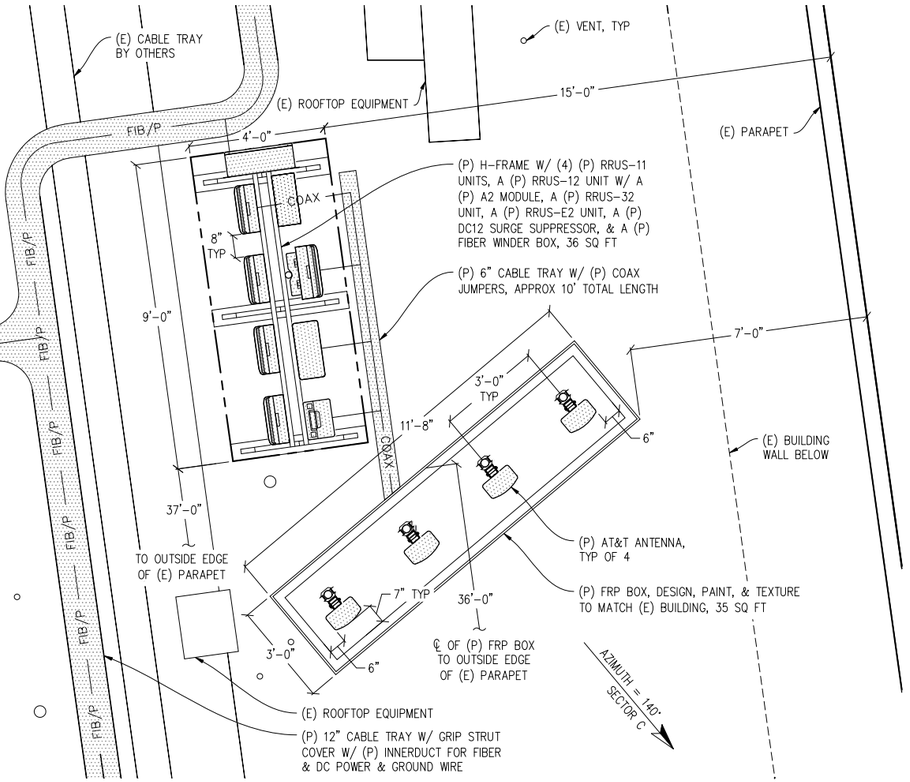
SHEET TITLE:
ANTENNA PLAN & DETAILS

SHEET NUMBER:
A-3



ANTENNA PLAN SECTOR B

½"=1'-0"



ANTENNA PLAN SECTOR C

½"=1'-0"

LAUREL INN

CCU5217
444 PRESIDIO AVE
SAN FRANCISCO, CA 94118

ISSUE STATUS

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	–	–	–
	–	–	–
	–	–	–

DRAWN BY:	C. CODY
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APPROVED BY:	–
DATE:	05/16/14

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at&t

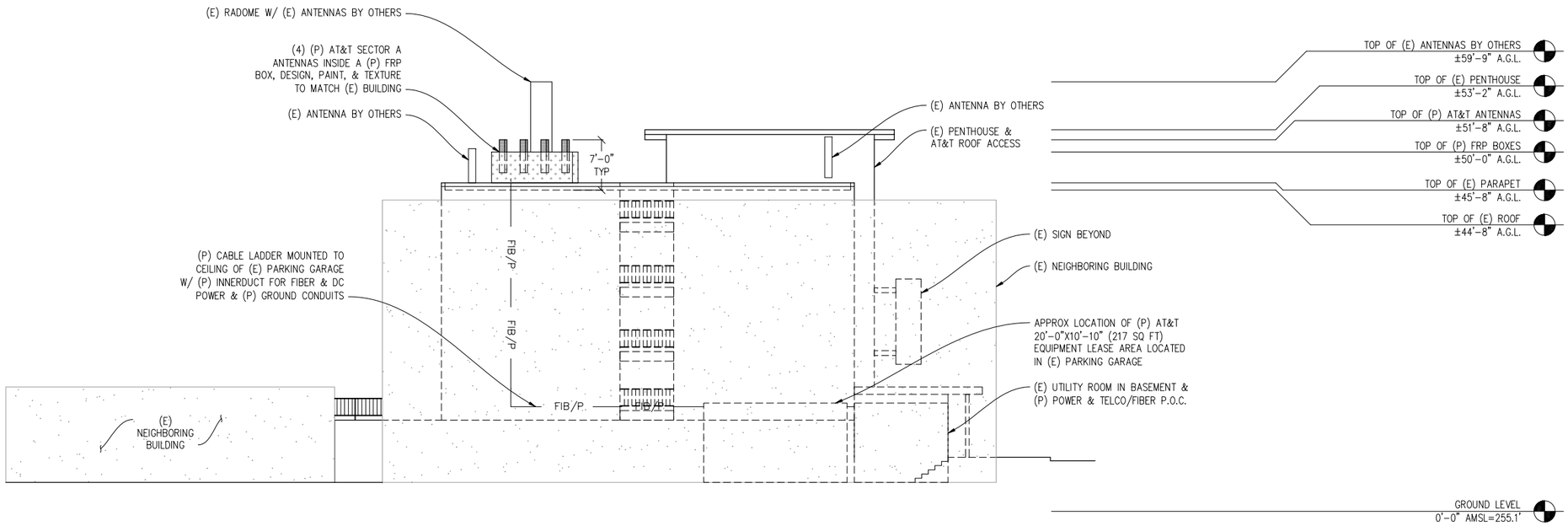
430 BUSH ST, 5TH FLOOR
SAN FRANCISCO, CA 94108

SHEET TITLE:

ANTENNA PLANS

SHEET NUMBER:

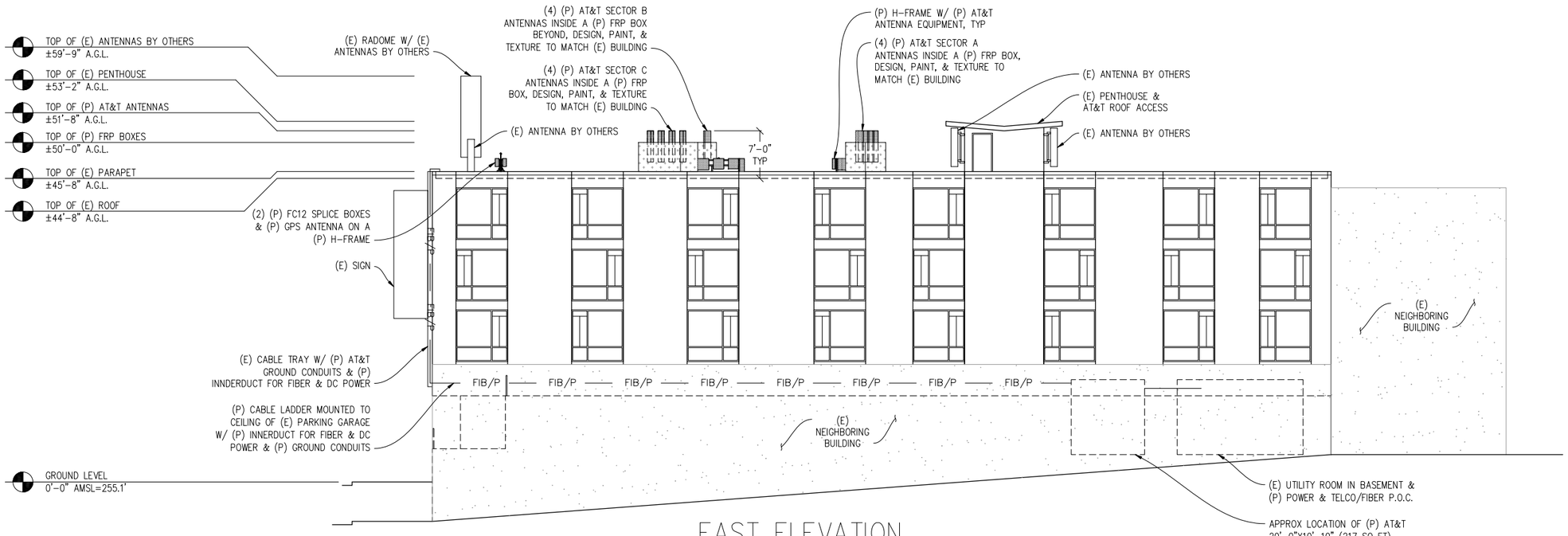
A-4



NORTH ELEVATION

⅛"=1'-0"

VIEW FROM SACRAMENTO ST



EAST ELEVATION

⅛"=1'-0"

VIEW FROM LYON ST

LAUREL INN

CCU5217
444 PRESIDIO AVE
SAN FRANCISCO, CA 94118

ISSUE STATUS

△	DATE	DESCRIPTION	BY
	04/21/14	ZD 90%	C.C.
	05/16/14	ZD 100%	V.C.
	–	–	–
	–	–	–
	–	–	–
	–	–	–

DRAWN BY:	C. CODY
CHECKED BY:	J. GRAY
APPROVED BY:	–
DATE:	05/16/14

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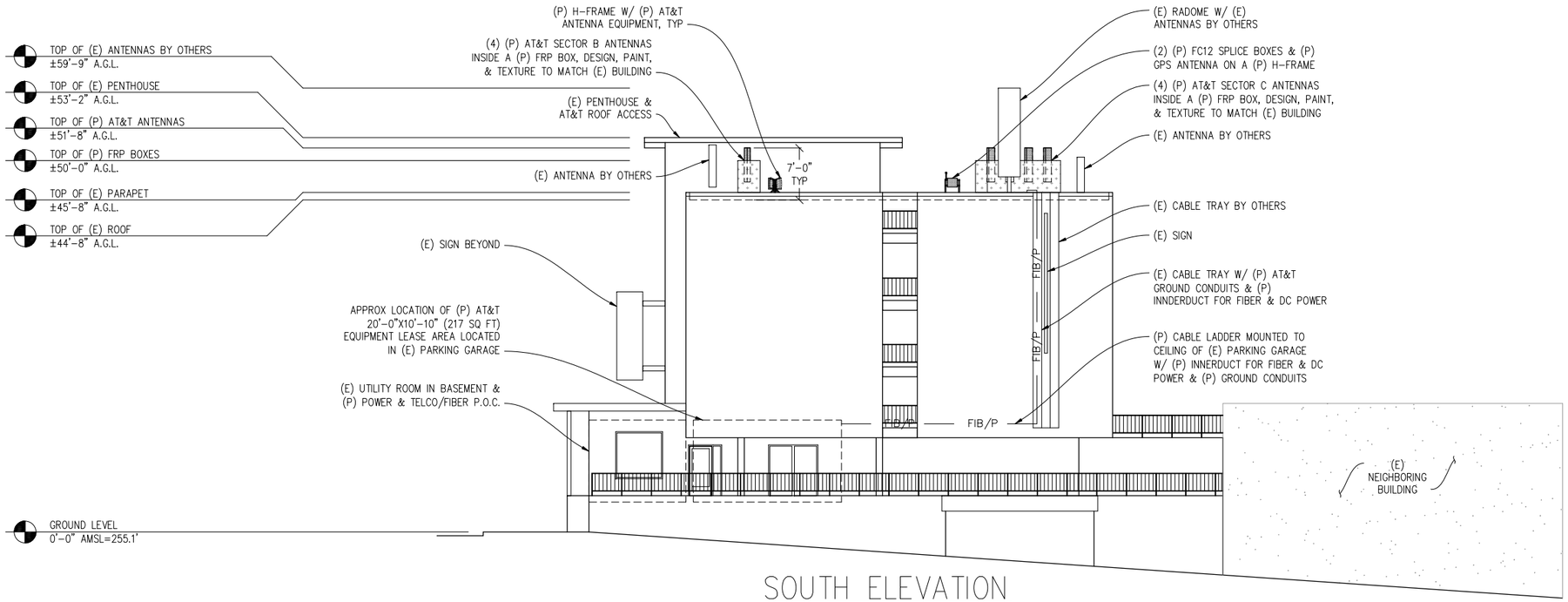
430 BUSH ST, 5TH FLOOR
SAN FRANCISCO, CA 94108

SHEET TITLE:

ELEVATIONS

SHEET NUMBER:

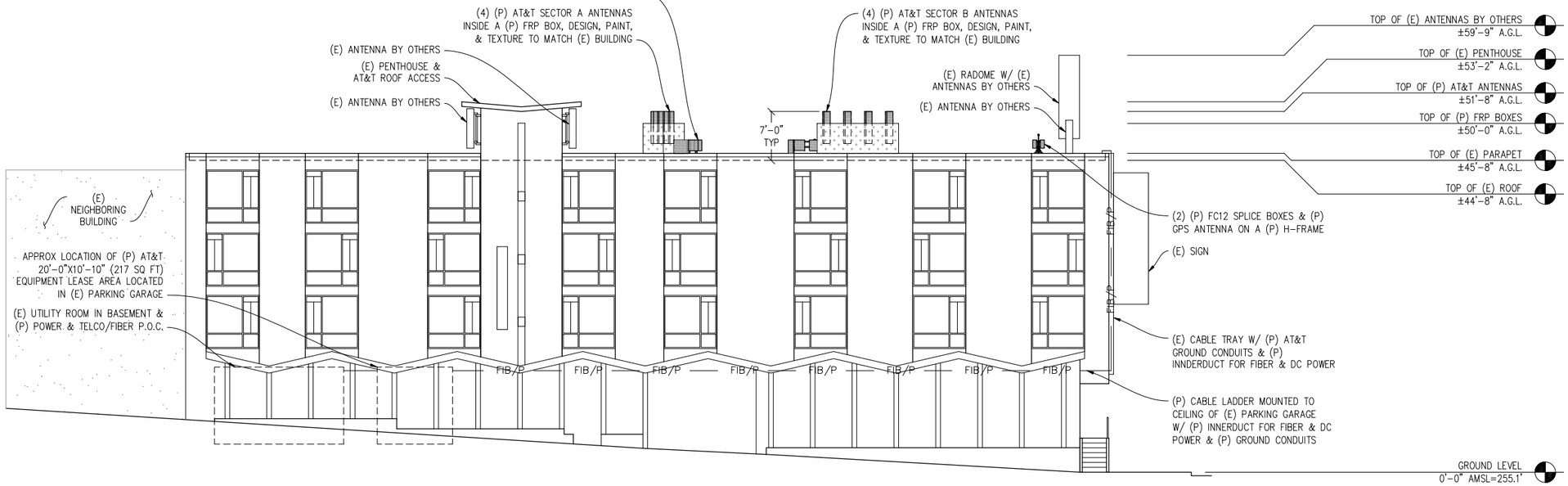
A-5



SOUTH ELEVATION

1/8"=1'-0"

VIEW FROM CALIFORNIA



WEST ELEVATION

1/8"=1'-0"

VIEW FROM PRESIDIO AVE

LAUREL INN

CCU5217
444 PRESIDIO AVE
SAN FRANCISCO, CA 94118

ISSUE STATUS

△	DATE	DESCRIPTION	BY
	04/21/14	ZD 90%	C.C.
	05/16/14	ZD 100%	V.C.
	–	–	–
	–	–	–
	–	–	–
	–	–	–

DRAWN BY:	C. CODY
CHECKED BY:	J. GRAY
APPROVED BY:	–
DATE:	05/16/14

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SHEET TITLE:

ELEVATIONS

SHEET NUMBER:

A-6