

# Staff Report to the Zoning Administrator

Application Number: 04-0600

Applicant: Marsha Converse (for Velocitel) Owner: County of Santa Cruz Public Works APN: No APN (County Right of Way) Agenda Date: January 6, 2006 Agenda Item #: 4 Time: After 10:00 a.m.

**Project Description:** Proposal to co-locate a micro-cell wireless communication facility on **an** existing utility pole in the County right of way adjacent to Assessor's Parcel number 068-201-01. Requires a Commercial Development Permit.

**Location:** Located on Branciforte Drive abou: 1 miles north of Highway 1, just south of the entrance to the George Washington Picnic Area, (2nd utility pole south of the 4.19 mile mark on west side of road).

Supervisoral District: First District (District Supervisor: Jan Beautz)

Permits Required: Commercial Development Permit



# Staff Recommendation:

- Approval of Application 04-0600, based on the attached findings and conditions
- Certification that the proposal is exempt from further Environmental Review under the California Environmental Quality Act.

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# Exhibits

- A. Project plans
- B. Findings
- C. Conditions
- D. Categorical Exemption (CEQA determination)
- E. Assessor's parcel map
- F. Zoning map and General Plan maps

# H. RF ReportI. Letter from Tom Bolich, Director of

Public Works, dated 3/28/05

Photo-simulations of site

J. Comments & Correspondence

# **Parcel Information**

Parcel Size:	Not applicable, right-of-way
Existing Land Use - Parcel:	Branciforte Drive right-of-way
Existing Land Use - Surrounding:	Agriculture land to the west, public park to the east

County of Santa Cruz Planning Department 701 Ocean Street, 4<sup>th</sup> Floor, Santa Cruz CA 95060 Application #: 04-0600 APN: No APN (County Right of Way) Owner: County of Santa Cruz

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Project Access:	Branciforte Drive
Planning Area:	Carbonera
Land Use Designation:	Right-of-way (adjacent to R-R, Rural Residential)
Zone District:	Right-of-way (adjacent to A, Agriculture)
Coastal Zone:	Inside <u>X</u> Outside
Appealable to Calif. Coastal Comm.	Yes X No

#### **Environmental Information**

Geologic Hazards:	Not mapped/no physical evidence on site
Soils:	N/A
Fire Hazard:	Not a mapped constraint
Slopes:	NIA
Env. Sen. Habitat:	Not mapped/no physical evidence on site
Grading:	No grading proposed
Tree Removal:	No trees proposed to be removed
Scenic:	Not a mapped resource
Drainage:	Existing drainage adequate
Archeology:	Not mapped/no physical evidence on site

#### **Services Information**

Urban/Rural Services Line:	Inside <u>X</u> Outside
Water Supply:	Not applicable
Sewage Disposal:	Not applicable
Fire District:	Scotts Valley-BranciforteFire Protection District
Drainage District:	No drainage district

#### **Project Setting**

The project site is located within the Branciforte Drive right-of-way, about 1.1 miles north of Highway 1 just south of the entrance to the George Washington Picnic Area. The subject utility pole is located on the west side of the road (adjacent to parcel 068-201-01, 150 Mill Road), and is the second pole south of the 4.19 mile marker when traveling southbound on Branciforte Drive.

The setting is rural, with grazing fields to the west of the project site and a public park and picnic area to the east of the project site, in the form of the George Washington Picnic Area of De Laveaga Park.

#### Zoning & General Plan Consistency

The project site is located within the Branciforte Drive right-of-way, a County-owned right-ofway. This portion of the right-of-way is zoned A (Agriculture), with a General Plan land use designation of R-R (Rural Residential). County Code Section 13.10.661(C)(3) encourages the co-location of micro-cells on existing utility **poles**, when the visual impact of the facility is minimized.

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Application # 04-0600 APN: No APN (County Right of Way) **Owner:** County of Santa **Cruz** 

#### **Visual Impacts**

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The *two* antennas (both measuring no more than 22.8"  $\times$  10.3") and the two equipment cabinets (24" x 17") will be mounted on the pole, and will be of a size and color that will not be visually obtrusive to passing motorists, nearby residents, or users of the adjacent park. The antennas and panels will be painted a color to match that of the existing pole, in order to appear as equipment commonly used on utility poles.

# **Radio-Frequency**

The proposed micro-cell site will comply with all Federal Communications Commission standards for public exposure to Radio-Frequency radiation, in that the antennas will only reach 8.7% of the maximum public exposure limit within 1,000 feet of the site (Exhibit H).

### Conclusion

As proposed and conditioned, the project is consistent with all applicable codes and policies of the Zoning Ordinance and General Plan/LCP. Please see Exhibit "B"("Findings") for a complete listing of findings and evidence related to the above discussion.

### **Staff Recommendation**

- **APPROVAL** of Application Number **04-0600**, based on the attached findings and conditions.
- Certification that the proposal is exempt from further Environmental Review under the California Environmental Quality Act.

Supplementary reports and information referred to in this report are on fie and available for viewing at the Santa Cruz County Planning Department, and are hereby made a part of the administrative record for the proposed project.

The County Code and General Plan, as well as hearing agendas and additional information are available online at: <a href="http://www.co.santa-cruz.ca.us">www.co.santa-cruz.ca.us</a>

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APN: No APN (County Right of Way) Owner: County of Santa Cruz

Application # 04-0600

# Wireless Communication Facility Use Permit Findings

1. The development of the proposed wireless communications facility will not significantly affect any designated visual resources, or otherwise environmentally sensitive areas or resources, as defined in the Santa Cruz County General Plan/LCP (sections 5.1, 5.10, and 8.6.6), or there is no other environmentally superior and technically feasible alternative to the proposed location with less visual impacts and the proposed facility has been modified to minimize its visual and environmental impacts.

This finding can be made, in that the proposed micro cellular wireless communication facility will be co-located on an existing utility pole within the Branciforte Drive right-of-way. Micro cellular wireless communication facility installations that are co-located on existing utility poles, such as this proposal, are an environmentally superior alternative to larger wireless communication facility installations and their associated visual and environmental impacts, The use of such co-located micro cellular wireless communication facility installations, when technically feasible, minimizes the visual and environmental impacts associated with the construction of wireless communication facilities due to the smaller size of the proposed facilities and the presence of an existing pole and utilities infrastructure.

2. The site is adequate for the development of the proposed wireless communications facility and, for sites located in one of the restricted areas set forth in section 13.10.661(b) that the applicant has demonstrated that there are not environmentally equivalent or superior and technically feasible alternative sites outside the restricted area or designs for the proposed facility.

This finding can be made, in that the installation of micro cellular wireless communications facilities co-located on existing utility poles are allowed without the requirement of **further** alternatives analysis.

3. The subject property upon which the wireless communications facility is to be built is in compliance with all rules and regulations pertaining to zoning uses, subdivisions and other applicable provisions of this title (County Code 13.10.660) and that all zoning violation abatement costs, if any, have been paid.

This finding can be made, in that the project site is located within **a** public right-of-way and is used for the purpose of public access and utilities infrastructure.

4. The proposed wireless communication facility will not create a hazard for aircraft in flight.

This finding can be made, in that the proposed micro-cells will be located on an existing 40 foot high utility pole, an elevation too low to interfere with aircraft in flight.



- 5. The proposed wireless communication facility is in compliance with all FCC (federal communications commission) and California PUC (public utilities commission) standards and requirements.

This finding can be made, in that the maximum ambient RF levels at ground level due to the existing wireless communications facilities and the proposed operation are calculated to be 8.7 percent of the most restrictive applicable limit.

6. For wireless communications facilities in the coastal **zone**, the proposed wireless communication facility as conditioned is consistent with all the applicable requirements of the Local Coastal Program.

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Not applicable.

# **Development Permit Findings**

1. That the proposed location of the project and the conditions under which it would be operated or maintained will not be detrimental to the health, safety, or welfare of persons residing or working in the neighborhood or the general public, and will not result in inefficient or wasteful use of energy, and will not be materially injurious to properties or improvements in the vicinity.

This finding can be made, in that the maximum ambient RF levels at ground level due to the existing wireless communications facilities and the proposed operation are calculated to be 8.7 percent of the most restrictive applicable limit.

The proposed project will not result in inefficient or wasteful use of energy, in that the most recent and efficient technology available to provide wireless communication services will be required as a condition of this permit. Upgrades to more efficient and effective technologies will be required to occur as new technologies are developed.

The project will not be materially injurious to properties or improvements in the vicinity in that the project will be co-located on an existing utility pole, resulting in a minimal visual impact,

2. That the proposed location of the project and the conditions under which it would be operated or maintained will be consistent with all pertinent County ordinances and the purpose of the zone district in which the site is located.

This finding can be made, in that the installation of micro cellular wireless communications facilities co-located on existing utility poles are allowed as an exception to the restricted areas prohibition without the requirement of further alternatives analysis, per County Code section 13.10.661(c)(3). The project site is located within the A (Agriculture)zone district with a Rural-Residential (R-R) General Plan land use designation.

3. That the proposed use is consistent with all elements of the County General Plan and with any specific plan which has been adopted for the area.

This finding can be made, in that the proposed micro cellular wireless communication facility will be co-located on an existing utility pole. Micro cellular wireless communication facility installations that are co-located on existing utility poles, such as this proposal, are an environmentally superior alternative to larger wireless communication facility installations and their associated visual and environmental impacts.

The proposed project complies with General Plan Policy 5.10.3 (Protection of Public Vistas), in that the use of such co-located micro cellular wireless communication facilities minimizes the visual and environmental impacts associated with the construction of wireless communication facilities due to the small size of the proposed facilities (the antennas measure 22.8" x 10.3" and the cabinets measure 24" x 17") and the equipment will be painted brown to closely match the color of the existing utility pole. The existing public views from Branciforte Drive will remain

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A specific plan has not been adopted for this portion of the County.

4. That the proposed use will not overload utilities and will not generate more than the acceptable level of traffic on the streets in the vicinity.

The project will not require the use of public services such as water or sewer, but will require electric power and telephone connections. The facility will require inspection by maintenance personnel at least once per month and this will not result in increasing traffic to unacceptable levels in the vicinity.

5. That the proposed project will complement and harmonize with the existing and proposed land uses in the vicinity and will be compatible with the physical design aspects, land use intensities, and dwelling unit densities of the neighborhood.

This finding can be made, in that the proposed facility will be co-located on an existing utility pole. This proposed design will adequately mitigate any potential visual impacts to the surrounding area.

6. The proposed development project is consistent with the Design Standards and Guidelines (sections 13.11.070 through 13.11.076), and any other applicable requirements of this chapter.

This finding can be made, in that the proposed facility will be co-located on an existing utility pole and will blend with the existing utilities infrastructure to reduce potential visual impacts to the surrounding area.

# **Conditions of Approval**

Exhibit A: Project plans, three pages, drawn by Velocitel, dated 11/29/04 and revised 4/4/05

- I. This permit authorizes the construction of two antennas and *two* cabinets co-located on to an existing utility pole. Prior to exercising any rights granted by this permit including, without limitation, any construction or site disturbance, the applicant/owner shall:
  - A. Sign, date, and return to the Planning Department one copy of the approval to indicate acceptance and agreement with the conditions thereof.
  - B. Obtain a Building Permit from the Santa Cruz County Building Official.
  - C. Obtain an Encroachment Permit from the Department of Public Works for all offsite work performed in the County road right-of-way.
  - D. The applicant shall obtain all required approvals from the California Public Utilities Commission (CPUC) and the Federal Communications Commission H (FCC), for this wireless communication facility.
- II. Prior to issuance of a Building Permit the applicant/owner shall:
  - **A.** Submit proof that these conditions have been recorded in the official records of the County of Santa Cruz (Office of the County Recorder).
  - B. Submit final architectural plans for review and approval by the Planning Department. The final plans shall be in substantial compliance with the plans marked Exhibit "A" on file with the Planning Department. Any changes from the approved Exhibit "A" for this development permit on the plans submitted for the Building Permit must be clearly called out and labeled by standard architectural methods to indicate such changes. Any changes that are not properly called out and labeled will not be authorized by any Building Permit that is issued for the proposed development. The final plans shall include the following additional information:
    - 1. Identify finish and colors of both the antennas and cabinets for Planning Department approval. All colors and materials must be non-reflective and blend with the existing utilities infrastructure. Color boards must be in 8.5" x 11" format.
    - 2. Details showing compliance with fire department requirements, including all requirements of the Urban Wildland **Intermix** Code, if applicable.
  - **C.** Submit four copies of the approved Discretionary Permit with the Conditions of Approval attached. The Conditions of Approval shall be recorded prior to submittal, if applicable.



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- D. Meet all requirements and pay any applicable plan check fee of the CDF/County Fire Protection District.
- III. All construction shall be performed according to the approved plans for the Building Permit. Prior to final building inspection, the applicant/owner must meet the following conditions:
  - **A.** All site improvements shown on the final approved Building Permit plans shall be installed.
  - B. All inspections required by the building permit shall be completed to the satisfaction of the County Building Official.
  - C. Pursuant to Sections 16.40.040 and 16.42.100 of the County Code, if at any time during site preparation, excavation, or other ground disturbance associated with this development, any artifact or other evidence of an historic archaeological resource or a Native American cultural site is discovered, the responsible persons shall immediately cease and desist from all further site excavation and notify the Sheriff-Coroner if the discovery contains human remains, or the Planning Director if the discovery contains no human remains. The procedures established in Sections 16.40.040 and 16.42.100, shall be observed.
- IV. Operational Conditions
  - A. The exterior finish and materials of the wireless communication facility must be maintained on an annual basis to continue to blend with the existing utilities infrastructure. Additional paint and/or replacement materials shall be installed as necessary to blend the wireless communication facility with the existing utilities infrastructure.
  - B. The operator of the wireless communication facility must submit within 90 days of commencement of normal operations (or within 90 days of any major modification of power output of the facility) a written report to the Santa Cruz County Planning Department documenting the measurements and findings with respect to compliance with the established Federal Communications Commission (FCC) Non-Ionizing Electromagnetic Radiation (NEIR) exposure standard. **The** wireless communication facility must remain in continued compliance with the NEIR standard established by the FCC at all times. Failure to submit required reports or to remain in continued compliance with the NEIR standard established by the FCC will be a violation of the terms of this permit.
  - C. If, in the future, the pole based utilities are relocated underground at this location, the operator of the wireless communication facility must abandon the facility and be responsible for the removal of all permanent structures and the restoration of the site as needed to re-establish the area consistent with the character of the surrounding natural landscape.







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- D. If, as a result of **future** scientific studies and alterations of industry-wide standards resulting from those studies, substantial evidence is presented to **Santa** Cruz county that radio frequency transmissions may pose a hazard to human health and/or safety, the Santa Cruz County Planning Department shall set a public hearing and in its sole discretion, may revoke or modify the conditions of this permit.
- E. If future technological advances would allow for reduced visual impacts resulting from the proposed telecommunication facility, the operator of the wireless communication facility must make those modifications which would allow for reduced visual impact of the proposed facility as part of the normal replacement schedule. If, in the future; the facility is no longer needed, the operator of the wireless communication facility must abandon the facility and be responsible for the removal of all permanent structures and the restoration of the site as needed to re-establish the area consistent with the character of the surrounding natural landscape.
- F. Any modification in the type of equipment shall be reviewed and acted on by the Planning Department staff. The County may deny or modify the conditions at this time, or the Planning Director may refer it for public hearing before the Zoning Administrator.
- *G.* A Planning Department review that includes a public hearing shall be required for any future co-location at this wireless communications facility.
- H. In the event that future County inspections of the subject property disclose noncompliance with any Conditions of this approval or any violation of the County Code, the owner shall pay to the County the full cost of such County inspections, including any follow-up inspections and/or necessary enforcement actions, up to and including permit revocation.
- V. As a condition of this development approval, the holder of this development approval ("Development Approval Holder"), is required to defend, indemnify, and hold harmless the COUNTY, its officers, employees, and agents, from and against any claim (including attorneys' fees), against the COUNTY, it officers, employees, and agents to attack, set aside, void, or annul **this** development approval of the COUNTY or any subsequent amendment of this development approval which is requested by the Development Approval Holder.
  - A. COUNTY shall promptly notify the Development Approval Holder of any claim, action, **or** proceeding against which the COUNTY seeks to be defended, indemnified, or held harmless. COUNTY shall cooperate fully in such defense. If COUNTY fails to notify the Development Approval Holder within sixty (60) days of any such claim, action, or proceeding, or fails to cooperate fully in the defense thereof, the Development Approval Holder shall not thereafter be responsible to defend, indemnify, or hold harmless the COUNTY if such failure to notify or cooperate was significantly prejudicial to the Development Approval Holder.

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- 1. COUNTY bears its own attorney's fees and costs; and
- 2. COUNTY defends the action in good faith.
- C. <u>Settlement</u>. The Development Approval Holder shall not be required to pay or perform any settlement unless such Development Approval Holder has approved the settlement. When representing the County, the Development Approval Holder shall not enter into any stipulation or settlement modifying or affecting the interpretation or validity of any of the terms or conditions of the development approval without the prior written consent of the County.
- D. <u>Successors Bound</u>. "Development Approval Holder" shall include the applicant and the successor'(s) in interest, transferee(s), and assign(s) of the applicant.

Minor variations to this permit which do not affect the overall concept or density may be approved by the Planning Director at the request of the applicant or staff in accordance with Chapter 18 10 of the County Code

Please note: This permit expires two years from the effective date unless you obtain the required permits and commence construction.

Approval Date: \_\_\_\_\_

Effective Date: \_\_\_\_

Expiration Date:

Don Bussey Deputy Zoning Administrator

David Keyon Project Planner

Appeals: Any property owner, or other person aggrieved, or any other person whose interests are adversely affected by any act or determination of the *Zoning* Administrator, may appeal the act or determination to the Planning Commission in accordance with chapter 18.10 of the Santa Cruz County Code.

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# CALIFORNIA ENVIRONMENTAL QUALITY ACT NOTICE OF EXEMPTION

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The Santa Cruz County Planning Department has reviewed the project described below and has determined that it is exempt from the provisions of CEQA as specified in Sections 15061 - 15332 of CEQA for the reason(s) which have been specified in this document.

Application Number: 04-0600 Assessor Parcel Number: No APN (County Right of Way) Project Location: Branciforte Drive, 2nd utility pole south of mile post 4.19 (soutbound, past entrance to George Washington Picnic Area)

# Project Description: Co-location of two micro-cells on an existing utility pole

# Person or Agency Proposing Project: Marsha Converse

# Contact Phone Number: (925) 734-6631

- A. \_\_\_\_\_ The proposed activity is not a project under CEQA Guidelines Section 15378.
  B. \_\_\_\_\_ The proposed activity is not subject to CEQA as specified under CEQA Guidelines Section 15060 (c).
- **C.** \_\_\_\_\_ **Ministerial Project** involving only the use of fixed standards or objective measurements without personal judgment.
- **D.** <u>Statutory Exemption</u> other than a Ministerial Project (CEQA Guidelines Section 15260 to 15285).

Specify type:

# E. <u>X</u> <u>Categorical Exemption</u>

Specify type: 15303: New Construction or Conversion of Small Structures

# F. Reasons why the project is exempt:

Construction of **a** utility pole mounted micro-cellular facility that is not anticipated to generate any environmental impacts.

In addition, none of the conditions described in Section 15300.2 apply to this project.

David Keyon, Project Planner

Date:\_\_\_\_\_





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# AT&T Wireless • Proposed Base Station (Site No. SNFCCA2228) - Branciforte Drive • Santa Cruz, California

# Statement of Hammett& Edison, Inc., Consulting Engineers

The firm of Hammett & Edison, Inc., Consulting Engineers, has been retained on behalf of AT&T Wireless, a personal wireless telecommunications carrier, to evaluate the base station (Site No. SNFCCA2228) proposed to be located along Branciforte Drive in Santa Cruz, California, for compliance with appropriate guidelines limiting human exposure to radio frequency ("RF") electromagneticfields.

# **Prevailing Exposure Standards**

The U.S. Congress requires that the Federal Communications Commission ("FCC") evaluate its actions for possible significant impact on the environment. In Docket 93-62, effective October 15, 1997, the FCC adopted the human exposure limits for field strength and power density recommended in Report No. 86, "Biological Effects and Exposure Criteria for Radiofrequency Electromagnetic Fields," published in 1986 by the Congressionally chartered National Council on Radiation Protection and Measurements ("NCRP"). Separate limits apply for occupational and public exposure conditions, with the latter limits generally five times more restrictive. The more recent Institute of Electrical and Electronics Engineers ("IEEE) Standard C95.1-1999, "Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz," includes nearly identical exposure limits. A *summary* of the FCC's exposure limits is shown in Figure 1. These limits apply for continuous exposures and are intended to provide a prudent margin of safety for all persons, regardless of age, gender, size, or health.

The most restrictive limit for exposures of unlimited duration to radio frequency energy for several personal wireless services are as follows:

Personal Wireless Service	Approx. Frequency	Occupational Limit	Public Limit
Personal Communication("PCS")	1,950 MHz	5.00 mW/cm <sup>2</sup>	$1.00\mathrm{mW/cm^2}$
Cellular Telephone	870	2.90	0.58
Specialized Mobile Radio	855	2.85	0.57
[most restrictive frequency range]	30-300	1.00	0.20

Power line frequencies (60 Hz) are well below the applicable range of these standards, and there **is** considered to be no compounding effect from simultaneous exposure to power line and radio frequency fields.

# **General Facility Requirements**

Base stations typically consist of two distinct **parts:** the electronic transceivers (also called "radios" or "cabinets") that are connected to the traditional wired telephone lines, and the passive antennas that send the wireless signals created by the radios out to be received by individual subscriber units. The

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EXHIBIT H

# AT&T Wireless • Proposed Base Station (Site No. SNFCCA2228) Branciforte Drive • Santa Cruz, California

transceivers **are**. often located at ground level and **are** connected to the **antennas** by coaxial cables about **1** inch thick. Because of the short wavelength of the frequencies assigned by the FCC for wireless services, the antennas require line-of-sight paths for their signals to propagate well and so are installed at some height above ground. The antennas are designed to concentrate their energy toward the horizon, with very little energy wasted toward the sky or the ground. Along with the low power of such facilities, this means that it is generally not possible for exposure conditions to approach the maximum permissible exposure limits without being physically very near the antennas

#### **Computer Modeling Method**

The FCC provides direction for determining compliance in its Office of Engineering and Technology Bulletin No. 65, "Evaluating Compliance with FCC-Specified Guidelines for Human Exposure to Radio Frequency Radiation," dated August 1997. Figure 2 attached describes the calculation methodologies, reflecting the facts that a directional antenna's radiation pattern is not fully formed at locations very close by (the "near-field" effect) and that the power level from an energy source decreases with the square of the distance from it (the "inverse square law"). The conservative nature of this method for evaluating exposure conditions has been verified by numerous field tests.

#### **Site and Facility Description**

Based upon information provided by AT&T, it is proposed to mount four Kathrein Scala Model AP12-14 directional dualband antennas on an existing 40-foot wood utility pole in the right of way along Branciforte Drive, about 300 feet south of the entrance to the George Washington Picnic Grounds in De Laveaga Park in Santa Cruz. The antennas would be mounted at an effective height of about 20 feet above ground and would be oriented in pairs toward 20°T and 225°T. The maximum effective radiated power in any direction would be 750 watts, representing 500 watts for PCS service and 250 watts for cellular service. There are reported no other wireless telecommunications base stations installed nearby.

#### **Study Results**

For a person anywhere at ground, the maximum ambient RF exposure level within 1,000 feet due to the proposed AT&T operation is calculated to be 0.075 mW/cm<sup>2</sup>, which is 8.7% of the applicable public limit. It should be noted that this result includes several "worst-case" assumptions and therefore is expected to overstate actual power density levels. Figure 3 attached provides the specific data required under Santa Cruz County Code Section 13.10.659(g)(2)(ix), for reporting the analysis of RF exposure conditions.



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# AT&T Wireless • Proposed Base Station (Site No. SNFCCA2228) Branciforte Drive • Santa Cruz, California

#### **Recommended Mitigation Measures**

Since they are to be mounted on a tall pole, the AT&T antennas are not accessible to the general public, and so no mitigation measures **are** necessary to comply with the FCC public exposure guidelines. It is presumed that AT&T will, as an FCC licensee, take adequate steps to ensure that its employees or contractors comply with FCC occupational exposure guidelines whenever work is required near the antennas themselves. To comply with FCC occupational exposure guidelines for other workers, it is recommended that explanatory warning signs' be posted at the antennas and/or on the pole below the antennas, such that the signs would be readily visible from any angle of approach to persons who might need to work within that distance.

#### Conclusion

Based on the information and analysis above, it is the undersigned's professional opinion that the base station proposed by AT&T Wireless at Branciforte Drive in Santa *Cruz*, 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.

#### 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, 2005. This work has been carried out by him or 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.



December 17,2004

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Warning signs should comply with **ANSI** *C95.2* color, symbol, and content conventions. In addition, contact information should be provided (*e.g.*, a telephone number) to arrange for access to restricted areas. The selection of **ianguage(s)** is not an engineering **matter**, and guidance **from** the **landlord**, local *zoning* or health authority, or appropriate professionals **may** be **required**.

#### **FCC Radio Frequency Protection Guide**

The U.S. Congress required (1996 Telecom Act) the Federal Communications Commission ("FCC") to adopt a nationwide human exposure standard to ensure that its licensees do not, cumulatively, have a significant impact on the environment. The FCC adopted the limits from Report No. 86, "Biological Effects and Exposure Criteria for Radiofrequency Electromagnetic Fields," published in 1986 by the Congressionally chartered National Council on Radiation Protection and Measurements, which are nearly identical to the more recent Institute of Electrical and Electronics Engineers Standard C95.1-1999, "Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz." These limits apply for continuous exposures from all sources and are intended to provide a prudent margin of safety for all persons, regardless of age, gender, size, or health.

As shown in the table and chart below, separate limits apply for occupational and public exposure conditions, with the latter limits (in *italics* and/or dashed) up to five times more restrictive:



Higher levels are allowed for short periods of time, such that total exposure levels averaged over six or thirty minutes, for occupational or public settings, respectively, do not exceed the limits, and higher levels also are allowed for exposures to small areas, such that the spatially averaged levels do not exceed the limits. However, neither of these allowances is incorporated in the conservative calculation formulas in the FCC Office of Engineering and Technology Bulletin No. 65 (August 1997) for projecting field levels. Hammett & Edison has built those formulas into a proprietary program that calculates, at each location on an arbitrary rectangular grid, the total expected power density from any number of individual radio sources. The program allows for the description of buildings and uneven terrain, if required to obtain more accurate projections.

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FCC Guidelines Figure 1

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# **RFRCALC<sup>™</sup>** Calculation Methodology

#### Assessment by Calculation of Compliance with FCC Exposure Guidelines

The US. Congress required (1996 Telecom Act) the Federal Communications Commission ("FCC") to adopt a nationwide human exposure standard to ensure that its licensees do not, cumulatively, have a significant impact on the environment. The maximum permissible exposure limits adopted by the FCC (see Figure 1) apply for continuous exposures from all sources and **are** intended to provide a prudent margin of safety for all persons, regardless of age, gender, size, or health. Higher levels are allowed for short periods of time, such that total exposure levels averaged over six or thirty minutes, for occupational or public settings, respectively, do not exceed the limits.

#### Near Field.

Prediction methods have been developed for the near field zone of panel (directional) and whip (omnidirectional) antennas, typical at wireless telecommunications cell sites. The near field zone is defined by the distance, D, from an antenna beyond which the manufacturer's published, far field antenna patterns will be fully formed; the near field may exist for increasing D until some or all of three conditions have been met:

1) 
$$D > \frac{2h^2}{\lambda}$$
 2)  $D > 5h$  3)  $D > 1.6\lambda$ 

where h = aperture height of the antenna, in meters, and  $\lambda =$  wavelength of the transmitted signal, in meters

The FCC Office of Engineering and Technology Bulletin No. 65 (August 1997) gives this formula for calculating power density in the near field zone about an individual RF source:

power density 
$$S = \frac{180}{\theta_{BW}} \times \frac{0.1 \times P_{net}}{\pi \times D \times h}$$
, in mW/cm<sup>2</sup>,

where  $\theta_{BW} =$  half-power beamwidth of antenna, in degrees, and

 $P_{net}$  = net power input to the antenna, in watts.

The factor of 0.1 in the numerator converts to the desired units of power density This formula has been built into a proprietary program that calculates distances to FCC public and occupational limits.

#### Far Field.

OET-65 gives this formula for calculating power density in the far field of an individual RF source:

power density 
$$S = \frac{2.56 \times 1.64 \times 100 \times RFF^2 \times ERP}{4 \times \pi \times D^2}$$
, in mW/cm<sup>2</sup>,

where ERP = tctal ERP (all polarizations), in kilowatts,

RFF = relative field factor at the direction to the actual point of calculation, and

D = distance from the center of radiation to the point of calculation, in meters.

The factor of 2.56 accounts for the increase in power density due to ground reflection, assuming a reflection coefficient of  $1.6(1.6 \times 1.6 = 2.56)$ . The factor of 1.64 is the gain of a half-wave dipole relative to an isotropic radiator. The factor of 100 in the numerator converts to the desired units of power density. This formula has been built into a proprietary program that calculates, at each location on an arbitrary rectangular grid, the total expected power density from any number of individual radiation sources. The program also allows for the description of uneven terrain in the vicinity, to obtain more accurate projections.



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Methodology Figure 2



# AT&T Wireless • Proposed Base Station (Site No. SivFCCA2228) Branciforte Drive • Santa Cruz, California

#### Compliance with Santa Cruz County Code §13.10.659(g)(2)(ix)

"Compliance with the FCC's nonionizing electromagnetic radiation (NIER) standards or other applicable standards shall be demonstrated for any new wireless communication facility through submission, at the time of application for the necessary permit or entitlement, of NIER calculations specifying NIER levels in the area surrounding the proposed facility. Calculations shall be made of expected NIER exposure levels during peak operation periods at a range of distances from fifty (50) to one thousand (1,000) feet, taking into account cumulative NIER exposure levels from the proposed source in combination with all other existing NIER transmission sources within a one-mile radius. This should also include a plan to ensure that the public would be hept *a* a safe distance from any NIER transmission source associated with the proposed wireless communication facility, consistent with the NIER standards of the FCC, or any potential future superceding standards."





Calculated using formulas in FCC Office of Engineering Technology Bulletin No. 65 (1997)

Maximum effective radiated power (peak operation) - 750 watts

Effective AT&T antenna height above ground - 20 feet

Other sources nearby -None

Other sources within one mile - No AM, FM, or TV broadcast stations No two-way stations close enough to affect compliance

Plan for restricting public access - Antennas are mounted on a tall pole

HAMMETT & EDISON, INC CONSULTING ENGINEERS SAN FRANCISCO

AT2228595 Figure **3A** 





AT&T Wireless Proposed Base Station (Site No. S. CA2228N) Branciforte Drive \* Santa Cruz, California

> Calculated NIER Exposure Levels Within 1,000 Feet of Proposed Site



Aerial photo from Maps a la Carte, Inc.

Legend blank - less than 1% of FCC public limit (*i.e.*, more than 100 times below) 1% and above near ground level (highest level is 8.7%)

Calculated using formulas in FCC Office of Engineering Technology Bulletin No. 65 (1997), considering terrain variations within 1,000 feet of site. See text for further information.



HAMMETT & EDISON, INC. CONSULTING ENGINEERS SAN FRANCISCO AT2228595 Figure 3B







County of Santa Cruz

#### **DEPARTMENT OF PUBLIC WORKS**

701 OCEAN STREET, ROOM410, SANTA CRUZ. CA 95060-4070 (831) 454-2160 FAX (831) 454-2385 TDD (831) 454-2123

THOMAS L. BOLICH DIRECTOR OF PUBLIC WORKS

March 28, 2005

DAVID M. MINGER Velocitel 4160-B Hacienda Drive Pleasanton, CA 94588

### SUBJECT: AT&T WIRELESS SITE 2228-N / WOOD UTILITY POLE NUMBER 35, BRANCIFORTE DRIVE

Dear Mr. Minger:

This is in response to your letter dated February 11,2005, in which you requested confirmation as to whether or not utility pole number 35 on Branciforte Drive is located within the public right-of-way. This confirmation of right-of-way possession is being requested as part of a submittal by your company to the Santa Cruz County Planning Department in pursuit of a development permit to use the pole as a wireless communications microcell site.

As noted in your letter, when first approached regarding this request, the Department of Public Works requested the completion of a professional survey of the area to confirm the location of the pole with regard to the County right-of-way. As per our request, you submitted with your letter a copy of a survey performed by Evans Surveys, Inc. that was based on 1926 survey data obtained from the original construction drawings for Branciforte Drive. The survey drawings indicated that the roadway deviated from the 1926 right-of-way data to exclude utility pole number 35.

Pursuant to your submittal, the County survey crew performed an independent survey of the area and found the drawing generated by Evans Surveys, Inc. to be incorrect. This second survey concluded that the section of Branciforte Drive adjacent to wood utility pole number 35 does conform to the 1926 construction drawings, and subsequently that wood utility pole number 35 is located within the County right-of-way.



DAVID M. MINGER Page -2-

Although the Department of Public Works is not the fee owner as public right-ofway is not deeded to the County, we do acknowledge County possession of the right-of-way, It is Public Works' understanding that this letter confirms only that we are aware of your company's plans to pursue the issuance of a use permit by the Santa Cruz County Planning Department. Any proposed improvements to the existing pole will require an encroachment permit from our department, which may be applied for after securing the proper permits from the Santa Cruz County Planning Department.

If you have any questions regarding this letter, please contact the undersigned at (831) 454-2160.

Yours truly,

THOMAS L. BOLICH Director of Public Works

By:

John Swenson Senior Civil Engineer

CIB:mh



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EXHIBIT