

Staff Report to the Zoning Administrator

Application Number: 05-0537

Applicant: Evan Shepherd Rief, for Peacock Associates (Metro PCS) Owner: Santa Clara Valley Corporation **APN:** 041-042-42 Agenda Date: January 20,2005

Agenda Item #: 8 Time: After 10:00 a.m.

Project Description: Proposal to co-locate three new panel antennas onto an existing telecommunications facility (monopine) next to existing Sprint PCS antennas, construct three equipment cabinets on a 40 square foot concrete pad, two power-telcoboxes, and one GPS antenna. Requires an Amendment to Commercial Development Permits 99-0173, 00-0237, and 02-0327.

Location: Property located on the south side of Post Office Drive (140 Post Office Drive) approximately 400 feet south from the intersection of Soquel Drive and Post Office Drive, Aptos.

Supervisoral District: 2nd District (District Supervisor: Ellen Pine)

Permits Required: Amendment to Commercial Development Permits 99-0173, 00-0237, and 02-0327

Staff Recommendation:

- Approval of Application 05-0537, based on the attached findings and conditions
- Certification that the proposal is exempt from further Environmental Review under the California Environmental Quality Act

Exhibits

- A. Project plans
- B. Findings
- C. Conditions
- D. Categorical Exemption (CEQA determination)
- E. Assessor's parcel map

- F. Zoning and General Plan maps
- G. Photo-simulations
- H. Radio-Frequency study
- I. Comments & Correspondence

Parcel Information

Parcel Size:	About 24,500 square feet
Existing Land Use - Parcel:	Commercial-retail with two existing Wireless
-	Communications Facilities
Existing Land Use - Surrounding:	Parks and recreation, Highway 1
Project Access:	Post Office Drive
Planning Area:	Aptos
Land Use Designation:	C-C (Community Commercial)
Zone District:	C-1 (Neighborhood Commercial)
Coastal Zone:	Inside <u>X</u> Outside
Appealable to Calif. Coastal Comm.	YesXNo

Environmental Information

Geologic Hazards:	Not mapped/no physical evidence on site
Soils:	Elder Sandy Loam, Lompico-Felton Complex
Fire Hazard:	Not a mapped constraint
Slopes:	N/A
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
Traffic:	N/A
Roads:	Existing roads adequate
Parks:	Existing park facilities adequate
Archeology:	Not mappedino physical evidence on site

Services Information

Urban/Rural Services Line:	X Inside Outside
Water Supply:	Soquel Creek Water District
Sewage Disposal:	Santa Cruz County Sanitation District
Fire District:	Aptos/La Selva Fire Protection District
Drainage District:	Zone 6

Project Setting

The project site is located at the south end of Post Office Drive, on the edge of the Aptos Village within an area designated for neighborhood commercial uses. Highway 1, a County designated scenic road, runs south of the site, and the site is bounded by land designated for parks and recreation to the east and west. The site is heavily wooded by evergreen vegetation to the west, south, and east of the project site, screening visibility of the facility from Highway 1.

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monopine and monopole.

The antennas will be constructed on an existing 67-foot tall monopine originally approved under Commercial Development Permit 99-0173, on site with a 4,000 square foot retail commercial building and a 44-foot tall monopole (approved under permit 96-0094). To support the existing wireless communications facilities, three sets of equipment cabinets exist on site adjacent to the

Zoning & General Plan Consistency

The project site is located on a portion of the property that is zoned C-1 (Neighborhood Commercial) with a General Plan Land Use Designation of C-C (Community Commercial). The co-location of wireless communication facilities is a permitted use within the C-1 zone district, where the co-location will not significantly increase visual impacts to surrounding properties or scenic roads.

Visual Impacts and Design Review

The three new flat-panel antennas will be located adjacent to the existing Sprint PCS antennas approved under permit 99-0173. The new antennas will not result in significant visual impacts to surrounding properties as no increase in the height of the tower is proposed, the antennas will be painted to match the color of the existing antennas, and the antennas will be obscured by the existing branches of the monopine. As the monopine will remain the same height, the redwoods to the south of the project site will continue to screen the facility from Highway 1. Equipment cabinets will not be visible from surrounding properties, and will be required to be painted a natural earth-tone color to complement the forested setting.

Compliance with FCC Standards

According to the report prepared by Hammett and Edison on Radio-Frequencylevels (Exhibit H), the proposed antennas will comply with FCC (Federal Communications Commission) standards for maximum public exposure levels, both individually and cumulatively with the other wireless providers on site. On the ground, the Radio-frequency emitting from the proposed antennas will be 0.1 1% of the maximum public limit established by the FCC, and cumulatively all four carriers will result in an output no greater than 2.2% of the maximum public limit.

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 **05-0537**, 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 file 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: <u>www.co.santa-cruz.ca.us</u>

Report Prepared By: David Keyon Santa Cruz County Planning Department 701 Ocean Street, 4th Floor Santa Cruz CA 95060 Phone Number: (831) 454-3561 E-mail: <u>david.keyon@co.santa-cruz.ca.us</u>

Wireless Communication Facility Use Permit Findings

1. The development of the proposed wireless communications facility as conditioned will not significantly affect any designated visual resources, environmentally sensitive habitat resources (as defined in the Santa Cruz County General Plan/LCP Sections 5.1, 5.10, and 8.6.6.), and/or other significant County resources, including agricultural, open space, and community character resources; or there are no other environmentally equivalent and/or superior and technically feasible alternatives to the proposed wireless communications facility as conditioned (including alternative locations and/or designs) with less visual and/or other resource impacts and the proposed facility has been modified by condition and/or project design to minimize and mitigate its visual and other resource impacts.

'Thisfinding can be made, in that the proposed co-location of three flat-panel antennas onto an existing monopine will not significantly impact views from Highway 1 (a County designated scenic road) or from neighboring properties. The antennas will be located at the same height as the existing Sprint PCS antennas, and will be partially cbscured by the monopine "branches," minimizing the visibility of the antennas from surrounding properties. Furthermore, existing evergreen vegetation to the west, south, and east of the project site will obscure views of the monopine from Highway 1 and adjacent open space and park lands, making the proposal the least visually obtrusive option for co-location on the site.

2. The site is adequate for the development of the proposed wireless communications facility and, for sites located in one of the prohibited and/or restricted areas set forth in Sections 13.10.661(b) and 13.10.661(c), that the applicant has demonstrated that there are not environmentally equivalent or superior and technically feasible: (1) alternative sites outside the prohibited and restricted areas; and/or (2) alternative designs for the proposed facility as conditioned.

This finding can be made, in that the proposed project is a co-location onto an existing facility in a commercial zone district. Co-location of wireless facilities is encouraged, and the C-1 zone district is outside of the prohibited or restricted zone districts outlined in Sections 13.10.661(b) and (c).

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 any 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 existing commercial use of the subject property is in compliance with the requirements of the C-1 (Neighborhood Commercial) zone district and the C-C (Community Commercial) General Plan designation, in which it is located. Furthermore, the existing wireless facilities comply with the conditions of approval of the previous approved permits.

No zoning violation abatement fees are applicable to the subject property.



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

This finding can be made, as the monopine will not be increased in height, and will remain below the height of surrounding trees.

5. The proposed wireless communication facility as conditioned is in compliance with all FCC and California PUC 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 2.2 percent of the most restrictive applicable limit.

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

The facility is located outside of the Coastal Zone.

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 proposed co-located antennas will not result in an increase in visual impacts to surrounding properties as the height of the tower will not be increased, the antennas will he shielded by existing "branches" of the monopine, and thick evergreen vegetation surrounds the site on three sides. Furthermore, the maximum cumulative Radio-Frequency exposure will remain well below the maximum FCC public exposure limit.

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

This finding can be made, as the proposed co-location complies with all applicable County Codes, including the site standards and purposes of the C-1 (Neighborhood Commercial) zone district and Sections 13.10.660 through 13.10.665 (Wireless Communication Facility regulations). Co-locations on existing facilities are encouraged by the County Code, and the project site is located outside of a prohibited or restricted zone district.

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 commercial use is consistent with the use and density requirements specified for the Community Commercial (C-C) land use designation in the County General Plan.

The proposed co-location complies with General Plan Policies 5.10.2 and 5.10.3 (Development Within Visual Resource Areas and Protection of Public Vistas) in that the height of the monopine will not be increased, the antennas will be partially obscured by the monopine "branches," and existing vegetation to the west, south, and east of the project site shields visibility of the monopine from Highway 1.

The project site is located within the Aptos Village Planning area, but will not alter the character of Aptos Village due to camouflage techniques to disguise the antennas and the location of the equipment cabinets behind an existing building, away from the public viewshed.

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.

This finding can be made, as adequate utility service will continue to be available to the property. The only traffic generated by the new facility will be for occasional inspections and maintenance, which will not significantly impact roads in the vicinity.

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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 proposal to construct three new antennas on an existing monopine will complement the physical design aspects of the site, as the height of the monopine will not be increased and the antennas will be painted a dark-green color to blend with the surrounding "faux" branches. The additional equipment cabinets will be located behind the existing commercial building, out of public view.

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 co-location of three wireless antennas on an existing monopine will not be visible from Highway 1, as existing vegetation will continue to shield visibility of the facility from Highway 1, the antennas will be painted to match the color of the "faux" branches, and the height of the monopine will not be increased. Equipment cabinets will be located behind the existing commercial building, and will not be visible from either the Highway or Soquel Drive.

Conditions of Approval

- Exhibit A: Project plans, six sheets, drawn by Omni Design Group, final revision dated 12/7/05.
- I. This permit authorizes the construction of three flat-panel antennas on an existing monopine, and the construction of three equipment cabinets and two power-telco boxes. Prior to exercising any rights granted by this permit including, without limitation, any construction or site disturbance, the applicantiowner 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. The applicant shall obtain approval from the California Public Utilities Commission and the Federal Communications Commission to install and operate this 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. The final plans shall include the following additional information:
 - 1. Identify finish and color of exterior materials of both the antennas and the equipment cabinets/telco boxes for Planning Department approval. Any color boards must be in 8.5" x 11" format. Antenna color must match the color of existing antennas.
 - 2. Drainage plans, if any increase in impervious surface is proposed.
 - 3. Details showing compliance with fire department requirements.
 - **4.** A lighting plan. All lighting must be manual and must not be visible from neighboring properties.
 - C. To guarantee that the camouflaged tower remains in good visual condition and to ensure the continued provision of mitigation of the visual impact of the wireless communications facility, the applicant shall submit a maintenance program prior to building permit issuance which includes a signed contract for maintenance with the company that provides for **annual** visual inspection and follow up repair, painting, and resurfacing as necessary.



- D. 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.
- E. Meet all requirements of and pay Zone 6 drainage fees to the County Department of Public Works, Drainage, if any increase in impervious area is proposed.
- F. Meet all requirements and pay any applicable plan check fee of the Aptos/La Selva Fire Protection District.
- III. All construction shall be performed according to the approved plans for the BuildingPermit. Prior to final building inspection, the applicantiowner 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.
- IV. Operational Conditions
 - A. 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.
 - B. 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.
 - C. The antennas, fences, and equipment cabinets shall be permanently maintained and replacement materials and/or paint shall be applied as necessary.
 - D. All site, building, security and landscape lighting shall be directed onto the lease site and away from adjacent properties. Light sources shall not be visible from adjacent properties. Light sources can be shielded by landscaping, structure, fixture design or other physical means. Building and security lighting shall be integrated into the building design.
 - E. If future technological advances would allow for reduced visual impacts resulting from the proposed telecommunication facility, **the** applicant agrees through accepting the terms of this permit to 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



applicant agrees to 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 vegetation.

- F. If, as a result of future scientific studies and alteration of industry-wide standards resulting from these studies, substantial evidence is presented to Santa Cruz County that radio frequency transmissions may pose a hazard to human health and/or safety and existing Federal standards are modified, the Santa Cruz County Planning Department shall set a public hearing and in its sole discretion, may revoke or modify the condition of this permit.
- 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.
 - B. Nothing contained herein shall prohibit the COUNTY from participating in the defense of any claim, action, or proceeding if both of the following occur:
 - 1. COUNTY bears its own attorney'sfees 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.

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Minor vanations 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.

EXHIBIT C

CALIFORNIA ENVIRONMENTAL QUALITY ACT NOTICE OF EXEMPTION

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: 05-0537 Assessor Parcel Number: 041-042-42 Project Location: 140 Post Office Drive

Project Description: Construct 3 antennas on an existing wireless communications facility (monopine).

Person or Agency Proposing Project: Evan Shepherd Rief, for Peacock Associates

Contact Phone Number: (831) 345-2245

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(<i>c</i>).
С	Ministerial Proiect involving only the use of fixed standards or objective
	measurements without personal judgment.
D	Statutory Exemption other than a Ministerial Project (CEQA Guidelines Section

15260 to 15285).

Specify type:

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

Specify type: 15301: Existing facilites

F. Reasons why the project is exempt:

Construction of new antennas on an existing wireless communications facility

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

Date:_____

David Keyon, Project Planner



IBIT E

Zoning Map





CARIDI

Photograph looking northwest, representing the view for northbound Hwy 1 motorists.









Statement of Hammett & Edison, Inc., Consulting Engineers

The firm of Hammett & Edison, Inc., Consulting Engineers, has been retained on behalf of MetroPCS, a personal wireless telecommunications carrier, to evaluate the base station (Site No. SF16431B) proposed to be located at 1 Post Office Drive in Aptos, California, for compliance with appropriate guidelines limiting human exposure to radio frequency ("RF") electromagnetic fields.

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")	1,950MHz	$5.00 {\rm mW/cm^2}$	$1.00{ m mW/cm^2}$
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

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 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



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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 Metro, including zoning drawings by Omni Design Group, Inc., dated November 2, 2005, it is proposed to mount three EMS Model RR6518-00DPL directional panel PCS antennas on an existing 67-foot steel pole, configured to resemble a pine tree, located at 1 Post Office Drive in Aptos. The antennas would be mounted at an effective height of about 60 feet above ground and would be oriented toward 20°T, 140°T, and 280°T. The maximum effective radiated power in any direction would be 1,890 watts, representing six channels operating simultaneously at 315 watts each.

Presently located (or proposed to be located) on the same pole are similar antennas for use by Sprint PCS and by Verizon Wireless, other wireless telecommunications carriers. T-Mobile also has similar antennas installed at a pole located to the south. Transmitting facilities reportedly used by those carriers are as follows:

Camer	Antenna Model	Maximum ERP	Height
Sprint	EMS RV9018 & RV9017	2,500 watts	59112 feet
Verizon	Andrew 731DG65VTAXM	2,400	50 ¹ /2
T-Mobile	DAPA 59000 & Andrew I IMWDP-06516-XDH	600	42

Study Results

For a person anywhere at ground the maximum ambient RF exposure level due to the proposed Metro operation by itself is calculated to be 0.0020 mW/cm^2 , which is 0.20% of the applicable public exposure limit. The maximum calculated cumulative level at ground for the simultaneous operation of all four carriers is 1.1% of the public exposure limit; the maximum calculated cumulative level on the



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roof of any nearby building is 2.4% of the public exposure limit. It should be noted that these results include several "worst-case" assumptions and therefore are 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.

No Recommended Mitigation Measures

Since they are to be mounted on a tall pole, the Metro 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 the several carriers will, as FCC licensees, take adequate steps to ensure that their employees or contractors comply with FCC occupational exposure guidelines whenever work is required near the antennas themselves.

Conclusion

Based on the information and analysis above, it is the undersigned's professional opinion that the base station proposed by MetroPCS at 1 Post Office Drive in Aptos, California, will comply with the prevailing standards for limiting public exposure to radio frequency energy and, therefore, will 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 30,2007. 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 30,2005



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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:

Freauency	Electro	magnetic]	Fields (f is fr	equency of	emission in	MHz)
Applicable Range (MHz)	Elec Field S (V/	ctric trength m)	Mag Field S (A/	netic trength m)	Equivalen Power (mW)	t Far-Field Density /cm ²)
0.3 - 1.34	614	614	1.63	1.63	100	100
1.34-3.0	614	823.8/f	1.63	2.19/f	100	180/ f ²
3.0-30	18421 f	823.8/f	4.891f	2.19/ f	900/ f ²	180/ f ²
30- 300	61.4	27.5	0.163	0.0729	1.0	0.2
300- 1,500	3.54d-f	1.59 \ f	√f/106	√f/238	f/300	f/1500
1,500- 100,000	137	61.4	0.364	0.163	5.0	1.0
Power 1000 101 1.0 Density 0.1 0.1 0.1	Public Ex	posure	Occupat	PCS	sure	

Frequency (MHz)

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



RFR.CALC[™] Calculation Methodology

Assessment by Calculation of Compliance with FCC Exposure Guidelines

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 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 λ = 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/cm²,

where θ_{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/cm²,

where ERP = total 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

FXHIBIT

Н

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

"Compliance with the FCC's non-ionizing 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 kept at 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 Cumulative NIER Exposure Levels during Peak Operation Periods

	9						
Distance (feet)	50	100	200	300	500	750	1,000
wound	0.70%	0.18%	0.42%	0.37%	0.23%	0.23%	0.082%
second floor	-	1.8%	2.0%	1.3%	0.72%	0.38%	0.22%

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

Maximum effective radiated power (peak operation) - 600 watts

Effective T-Mobile antenna height above ground - 42 feet

Other sources nearby - MetroPCS, Sprint PCS, and Verizon Wireless.

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

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TMSF05736595 Figure 3A



Calculated NIER Exposure Levels Within 1,000 Feet of Proposed Site for Simultaneous Operation & MetroPCS, T-Mobile, Sprint PCS, and Verizon Wireless



Aerial photo from Terraserver

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 1.1%) - 1% and above at 2nd floor level (highest level is 2.4%)

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

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MP1643595 1 Figure 3B



