



# STAFF REPORT

**TO: PLANNING COMMISSION**

**PREPARED BY: Anjana Mevani, Associate Planner**

**REVIEWED BY: Terry Blount, AICP, Planning Manager**

## GENERAL INFORMATION

**APPLICANT:** T-Mobile/Landmark Wireless - Karen Lienert

**LOCATION:** PG&E Tower in Hidden Valley Park near tennis courts and Center Avenue (APN 155-370-071)

**GENERAL PLAN:** Public Permanent Open Space (PPOS)

**ZONING:** Residential: R-3.5 (Family Residential: 3,500 sq. ft. per dwelling unit) and R-6.0 (Single Family Residential: 6,000 sq. ft. minimum lot area)

**ENVIRONMENTAL:** Staff has yet to determine the level of environmental review that will be required for this project. All environmental documentation will be presented to the Planning Commission for either adoption or denial at a subsequent Commission hearing. Copies of the Initial Study document, if one is to be required for this project, will be made available to the general public at a date to be determined, at City Hall.

**PROPOSAL:** Study session to discuss and receive input on a proposal for an installation of a new wireless telecommunications facility on an existing PG&E tower in Hidden Valley Park near the tennis courts and off of Center Avenue. The proposed project consists of adding three panel antennas on the top portion of the tower. T-Mobile will be leasing a 15'x20' area near the tower for an equipment enclosure. The proposed project is located in a residential zoning district, which requires a Use Permit and Design Review.

## RECOMMENDATION

Review proposal, accept public comment, and provide feedback and direction to staff and the applicant on the proposal. The purpose of the study session is to allow for preliminary project review. No Planning Commission action is to be taken at this time. Should the Commission find that it can support such a project, the applicant will be

instructed on the formal application process.

### **SITE, CONTEXT, PROJECT DESCRIPTION**

The Hidden Valley Park site, also referred to as Linear Park, is located off of Center Avenue. This portion of Hidden Valley Park is approximately 2.26 acres and has two Pacific Gas and Electric Company (PG&E) utility towers, tennis courts, and a basketball court. The PG&E right-of-way easement traverses through the middle of park. The proposed project is proposed for the PG&E tower that is located closer to Center Avenue.

The park is located in a residential zoning district, where pursuant to Martinez Municipal Code Chapter 22.39, "Wireless Telecommunications Facilities," a Use Permit and Design Review approval is required for any wireless facility installation. To the east and west of the park and the PG&E tower are single family residences. Directly north of the tower are the park's tennis courts and Center Avenue is located on the south.

The applicant, T-Mobile, is proposing to install a new wireless telecommunications facility by adding three panel antennas to the top of the existing PG&E tower. The applicant is also proposing to place an equipment enclosure (communication box) near the base of the tower. T-Mobile will be leasing a 15'x20' area for the equipment enclosure that will be fenced and surrounded by landscaping for screening. The adjacent dirt area around the enclosure will be landscaped as well, per the Parks, Recreation, Marina and Cultural Commission approval of the communication box (see attached). The Parks, Recreation, Marina and Cultural Commission reviewed and approved the proposal for the communication box on August 17, 2010.

As stated in the applicant's written statement (see attached), T-Mobile is seeking to improve coverage by eliminating a gap in coverage and adding capacity in the area. The expanded coverage and capacity will benefit T-Mobile's customers in Martinez. The wireless telecommunications facility will operate unmanned and the equipment will be serviced one to two times a month. Noise from the equipment must meet the noise requirements set in the Martinez Municipal Code Chapter 8.34.020 and shall not exceed 60dBA for exterior noise level. In addition, the attached Radio Frequency Radiation Report demonstrates that the proposed wireless facility will be within the permissible public exposure standards set by the Federal Communications Commission (FCC). It should be noted that the Telecommunications Act of 1996 states that no state or local governmental entity may regulate the placement, construction, or modification of wireless facilities on the basis of environmental effects of radio frequency emissions to the extent that the emissions comply with FCC regulations.

### **DISCUSSION**

#### **Use Permit**

As mentioned above, a Use Permit is required to permit a wireless telecommunications facility of this type. The Martinez Municipal Code Section 22.39, Adopting Standards and Criteria for Telecommunication Facilities – Resolution No. 071-01 (III B), location preference for telecommunication facilities is given to publicly used structures, co-location, and shared-location sites, such as a public utility power pole/tower structure.

However, residentially zoned areas are not preferred sites; therefore, the applicant must sufficiently demonstrate that no other feasible alternative location exists.

The applicant has provided an alternative facility locations analysis (see attached written statement) that identifies alternative sites within a search ring that could accommodate the proposed wireless telecommunications facility and provides similar service to the proposed coverage area. T-Mobile considered existing structures in the coverage hole and concluded that the only existing structures with significant height are the PG&E towers. The PG&E tower in Hidden Valley Park with the Metro PCS wireless facility was evaluated as a possible alternative site, but due to the non-standard design of the tower this alternative was not technically feasible for a second wireless carrier. The proposed tower was the only other PG&E tower identified in the search ring that would meet the coverage requirements.

### **Design Review**

The existing PG&E tower is 131.7 feet high, and will remain the same height with the installation of the proposed antennas. It should be noted that utility poles and towers are not subject to height limits (Martinez Municipal Code Chapter 22.34.170B). The three panel antennas will be installed at the top of the tower and will be centered at an elevation of 129.7 feet. Further, the antennas proposed to be placed on the tower are approximately 55.9" in height, 13" in width, and 3.15" in depth. The antennas and any associated brackets shall be painted to match the existing PG&E tower. The applicant has provided photo simulations with various views of the antennas and equipment enclosure (see attached photo simulations).

The proposed 15'x20' equipment enclosure (communication box) will be located near the base of the tower and will be enclosed by a wooden fence and surrounded by landscaping for screening. At grade, the equipment within the enclosure will not be visible above the 8 foot wooden fence line. Photina shrubs will surround the enclosure and will provide screening for both the equipment and enclosure. The adjacent dirt area around the enclosure will also be landscaped with shrubs by the applicant. Additionally, should the applicant decide to move forward, the project will be reviewed by the Design Review Committee, prior to returning to the Planning Commission.

### **ATTACHMENTS**

- A. Site Context Map
- B. Written Statement from Applicant
- C. T-Mobile Neighborhood Outreach Letters and Information
- D. Parks, Recreation, Marina and Cultural Commission Staff Report with attachments and Meeting Minutes from August 17, 2010
- E. Photo Simulations
- F. Antenna Cutsheet
- G. Coverage Maps
- H. Existing and Proposed T-Mobile Sites in Martinez
- I. Radio Frequency Radiation Report
- J. Noise Information

**EXHIBITS**

Location Plan, Survey, Equipment Layout Plan, Project Elevations, Landscaping Plan,  
and Irrigation Plan

F:\Community Development\All Projects\Wireless Facilities\Hidden Valley Park - T-Mobile\T-Mobile Wireless - StdySessnRpt.doc

# Site Map





August 30, 2010

City of Martinez  
525 Henrietta Street  
Martinez, CA 94553-2394



Re: Request for Planning Commission Study Session  
Hidden Valley Park, Ophir Ct.  
APN: # 155-370-071

### **Project Justification**

T-Mobile is currently working to improve its wireless communications network in the Bay Area. T-Mobile is similar to other wireless communications carriers in that it relies on the installation and operation of base station antenna sites in strategic areas to provide adequate coverage for its customers. T-Mobile has a need for improved coverage in the Martinez area and specifically in the residential area bounded by Highway 4 to the North, Highway 680 to the East, Chilpancingo Parkway to the South, and Morello Avenue to the West.

### **Requested Entitlement and Project Description**

T-Mobile respectfully requests that this application be considered for the installation of 3 panel antennas, 1 per sector, on an existing 131.7' PG&E tower, to be centered at an elevation of 129.7'. T-Mobile will install associated radio cabinets within a fenced 15' x 20' leased area which will be leased from the City of Martinez. Landscaping improvements will be made to the existing park area and will be coordinated with PG&E and the Parks, Recreation, Marina and Cultural Commission.

### **Site Description**

This site is north of Center Avenue. This parcel is the site of Hidden Valley Park directly across from Hidden Lakes Park. The site is zoned R3.5. The impact from the viewpoint of a park user will be minimal once the City has added irrigation landscape improvements will be made to this area. This site was chosen as it allows for the use of an existing structure and will eliminate the need for a new tower structure in the area. T-Mobile had previously proposed building a new structure in Hidden Lakes Park. That application has since been withdrawn and this installation would eliminate the need for that project. Other than the PG&E towers in the area, there are no structures within this area that would provide the necessary height to provide coverage to the area.

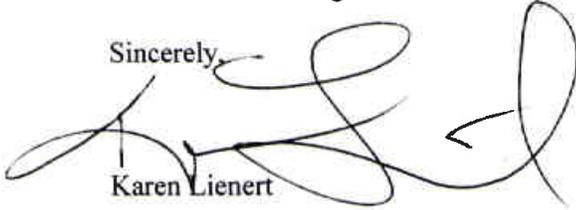
### **Neighborhood Outreach**

T-Mobile will conduct a neighborhood meeting and will coordinate such meeting with the City of Martinez and the Parks, Recreation, Marina & Cultural Commission in the next 30 days.

**Summary**

T-Mobile has used existing structures whenever possible in designing their network. This proposal to install antennas on an existing PG&E tower will help improve coverage in the area of this site by eliminating a gap in coverage and adding additional capacity in the area. The approval and installation of T-Mobile's proposed antennas will not be detrimental to the health, safety, and general welfare of the surrounding community, and also fully complies with the general preference of the City's Planning Department for the location of wireless antenna facilities on existing structures and towers.

Sincerely,

A handwritten signature in black ink, appearing to read 'Karen Lienert', written over a horizontal line. The signature is fluid and cursive, with a large loop at the end.

Karen Lienert



RECEIVED  
APR 15 2011  
COMMUNITY DEV. DEPT.

Alternative Facility Locations Analysis  
PG&E Collocation - APN: 155-370-071

The current coverage hole for this proposed project is approximately 1 mile in radius. The existing PG&E transmission tower sits within the center of the coverage hole. From the site the area of coverage to be expanded is north from the site to Highway 4, east from the site to Contra Costa Canal Trail, south to Morello Avenue and west to Vine Hill Way.

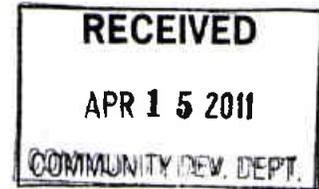
In reviewing possible site locations for this T-Mobile antenna installation the first choice was to identify a site that would not require the construction of a new tower. A search of the area was conducted for existing structures (i.e. towers, rooftops, water tanks). The only existing structures with any significant height are the existing PG&E transmission towers. The first tower that was evaluated was located within Hidden Lakes Park and has MetroPCS antennas installed on it. This tower was evaluated by PG&E as a collocation opportunity, however due to a non-standard tower design this tower was not technically feasible as it was not possible to meet the design guidelines established by the Public Utilities Commission for a second wireless carrier. The tower that is currently proposed was the only other existing structure identified within this search ring that would meet the coverage objective.

While this tower sits on residentially zoned property (R 3.5), the property is currently being used as a park and does not contain a residential use. With the exception of a handful of properties everything within this search ring is zoned residential. The properties that are not residentially zoned are zoned GF, RF, or OS. These properties are all surrounded by residentially zoned parcels. The use of any of these other parcels would require the construction of a new tower structure in a primarily residential area. The use of this existing PG&E tower provides the least impact to the residential area that the site is designed to cover and complies with the City's preference for collocation and the use of existing utility structures in residential areas.



1st notice  
Attachment C

February 3, 2011



Re: Proposed Development – Hidden Valley Park

Dear Neighbor:

T-Mobile has proposed the development of a wireless communication site at Hidden Valley Park located north of Center Drive between Glacier Drive and Redwood Drive. T-Mobile is proposing to install three panel antennas on the top of an existing PG&E tower that is located south of the tennis courts. There will be associated radio cabinets installed in a 15' x 20' lease area on the west side of the property. The antennas will be painted to match the existing tower and there will be no increase in the overall height of the tower. This project is proposed to improve coverage in the Martinez area and specifically in the residential area bounded by Highway 4 to the North, Highway 680 to the East, Chilpancingo Parkway to the South, and Morello Avenue to the West. There will be landscape improvements made to the park in the area south of the tennis court and along the walking/bike path. This facility will not interfere with TV, radio, telephone or satellite signals.

We will be holding an informational meeting to discuss the project on February 12th at 7:00 p.m. This meeting will be held in Room D-1 at Hidden Valley Elementary School at 500 Glacier Dr, Martinez, CA 9455. This will be an opportunity for the community to have questions answered and provide input on the project. There will be no formal action taken at this meeting.

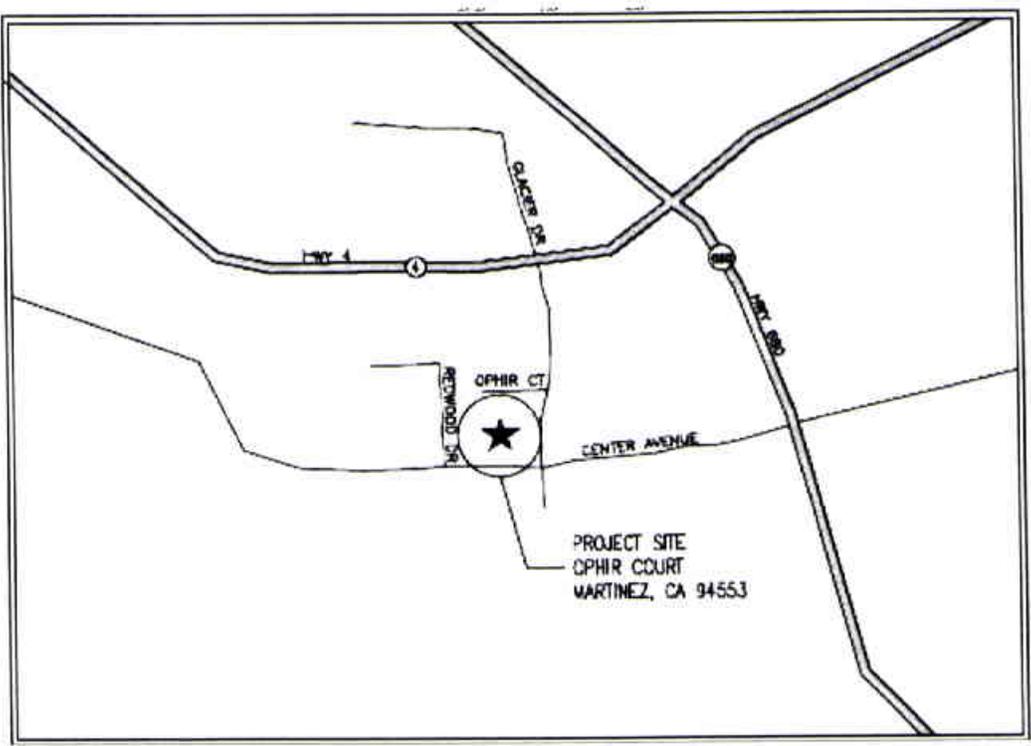
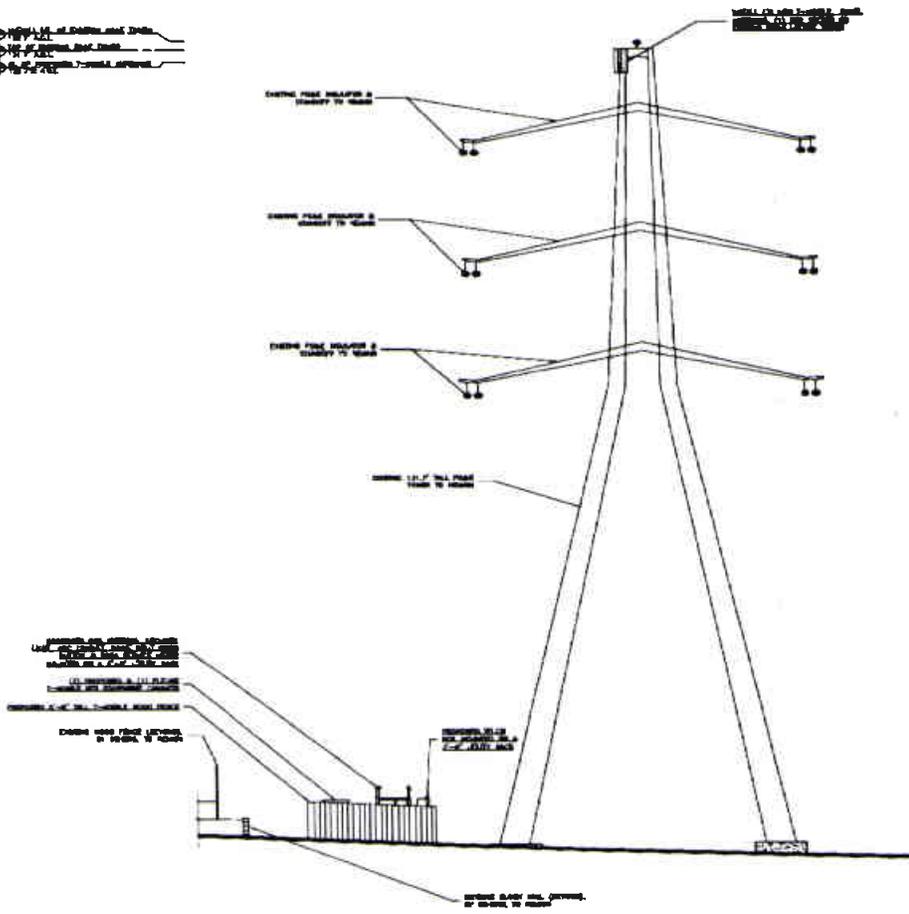
There will be a public hearing on this project before the Martinez Planning Commission at a later date to make a formal decision on the project. This hearing has not yet been scheduled.

If you have any questions on this project or would like additional information, please feel free to contact me at (916) 834-0834 and I would be happy to further discuss the project.

Thank you.

Sincerely,  
Karen Lienert  
T-Mobile Zoning Specialist

- ◆ 100% OF DISTANCE TO ROAD
- ◆ 10% OF DISTANCE TO ROAD
- ◆ 5% OF DISTANCE TO ROAD



nd notice



RECEIVED  
APR 15 2011  
COMMUNITY DEV. DEPT

March 1, 2011

Re: Proposed Development – Hidden Valley Park

Dear Neighbor:

A notice was previously sent to you regarding T-Mobile's proposed development at Hidden Valley Park. The notice provided a meeting date of February 12<sup>th</sup>, unfortunately the date in the notice was incorrect.

At this point in time rather than reschedule the meeting, I would like to provide an opportunity for any neighbors who have questions or concerns to contact me directly and I can share the materials that would have been presented at the meeting over email or through the mail.

If it appears following the feedback I receive from neighbors that a meeting on the project would be beneficial I will schedule it at that time. However, I would like to provide an opportunity for people who may have attended on February 12<sup>th</sup> to have their questions answered without having to come out again.

The proposed development is for the installation of three panel antennas on the top of an existing PG&E tower that is located south of the tennis courts at Hidden Valley Park. There will be associated radio cabinets installed in a 15' x 20' lease area which will be fenced on the west side of the property. The antennas will be painted to match the existing tower and there will be no increase in the overall height of the tower. Additionally, there will be landscape improvements made to the park in the area south of the tennis court and along the walking/bike path.

This project will improve wireless phone service in the area of Hidden Valley Park. This facility will not interfere with TV, radio, telephone or satellite signals.

There will be a public hearing on this project before the Martinez Planning Commission at a later date to make a formal decision on the project. This hearing has not yet been scheduled.

I apologize for my error on the noticing of the original meeting, and welcome any questions on this project. Please contact me at (916) 834-0834 or by email at [landmarkconsulting@sbcglobal.net](mailto:landmarkconsulting@sbcglobal.net) if you would like any additional information. I am happy to discuss the project with you.

Thank you.

Sincerely,  
*Karen Lienert*  
T-Mobile Zoning Specialist





CITY OF MARTINEZ

PARKS, RECREATION, MARINA & CULTURAL  
COMMISSION

DATE: August 17, 2010  
TO: Parks, Recreation, Marina & Cultural Commission  
FROM: Mitch Austin, Recreation Manager  
SUBJECT: Proposal for Communication Box Installation at Hidden Valley Park

**RECOMMENDATION**

Recommend approval of proposed location of the Communication Box (Telco box) as shown in **Attachment A** with the agreement that T-Mobile will provide landscaping of the entire adjacent dirt area shown in the hatch area of **Attachment A**.

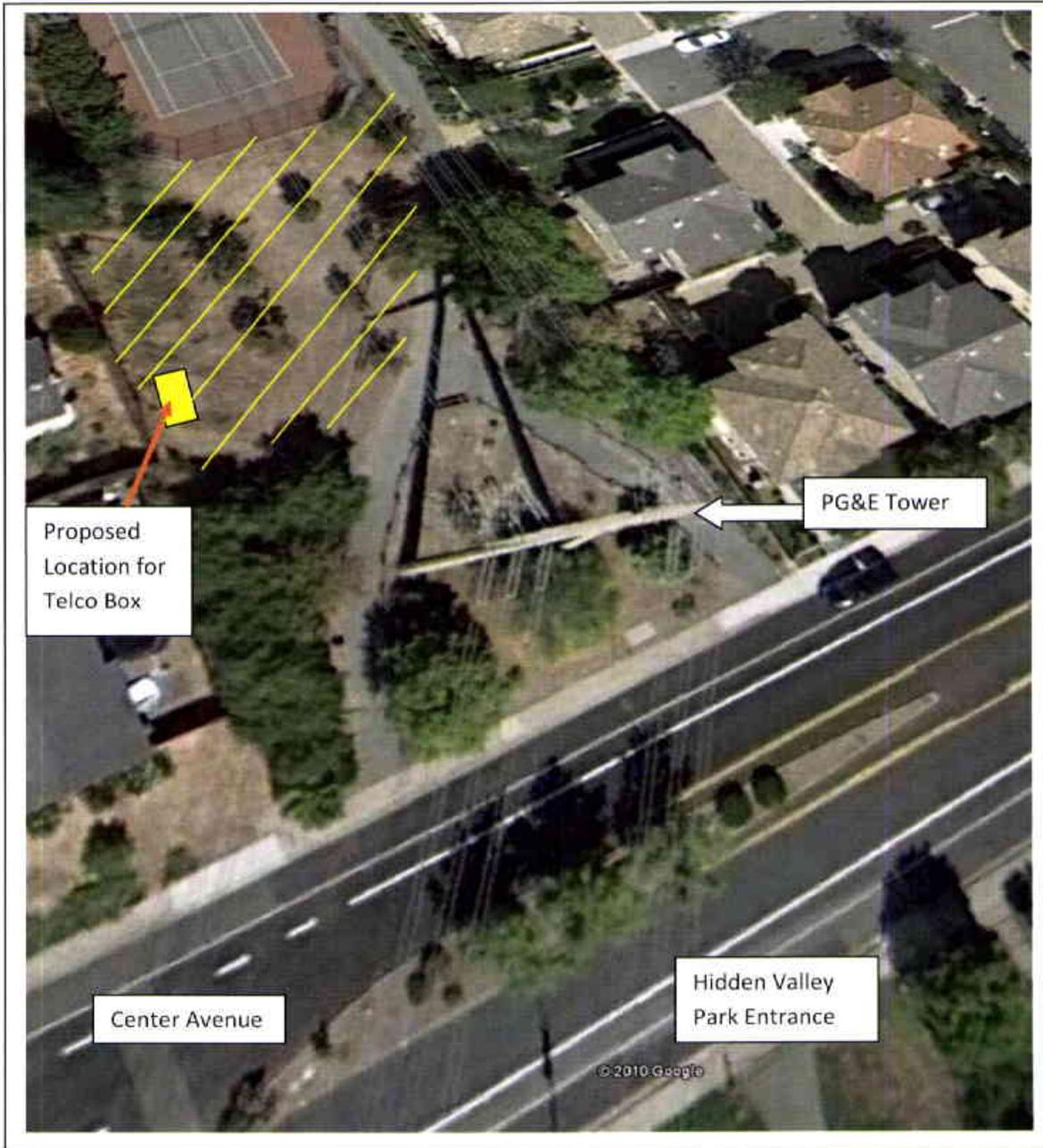
**BACKGROUND**

In lieu of the previously proposed antennae installation near the ball fields at Hidden Lakes Park, T-Mobile is now proposing installation of a communication box near the tennis courts at Hidden Valley Park as shown in **Attachment A**. The box would be fenced in by a 6' foot fence and would be 20' by 15' in length. T-Mobile is planning to work with PG&E for installation of antennae on the existing electrical tower which would relay signals to the communication box. The plans for antennae and communication box installation are shown in **Attachment B**.

Staff believes the location to be ideal from a park impact point of view. The only impact from a park user stand point would be its impact on viewscape because the area is so bare and in dire need of beautification, the installation of the box may catch more visual attention than desirable. As part of the installation of the communication box, T-Mobile is being asked to provide the landscaping of the area once the City has installed irrigation. This improvement will help improve the viewscape of the walking area and take away attention on the newly installed fencing for the communication box.

The project will next be reviewed by the Planning Commission and then to the City Council for consideration.

T-Mobile Proposal for Telco Box



Yellow Box – Proposed Location of Communication Box (Telco Box)

Yellow Diagonal Lines - Shows area for proposed landscaping by T-Mobile









**Regular Meeting  
Parks, Recreation, Marina and Cultural Commission  
August 17, 2010  
Martinez, CA  
Approved September 21, 2010**

A regular meeting of the Parks, Recreation, Marina and Cultural Commission was called to order by Chair Radke at 7:03 p.m. on August 17, 2010, at Council Chambers, 525 Henrietta Street, Martinez, California 94553.

**I. ROLL CALL**

PRESENT: Karen Bell-Patten, Commissioner, Brian Eychner, Commissioner, Katherine Hern, Vice Chair, Ingemar Olsson, Commissioner, Richard Patchin, Commissioner, and Dylan Radke, Chair.

EXCUSED: John Fuller, Commissioner, Gay Gerlack, Commissioner, Donald Pallotta, Commissioner, and Marta Van Loan, Commissioner.

ABSENT: None.

STAFF:  Mitch Austin, Recreation Manager  
Tim Tucker, City Engineer

**II. PUBLIC COMMENT**

None.

**III. CONSENT CALENDAR**

**a. Minutes of July 20, 2010**

The Commissioners requested the following corrections to the minutes of July 20, 2010:

Page 2: Under Special Requests for Uses in Parks, paragraph 1, line 2: Insert "15<sup>th</sup>" after the word "August".

Page 5: Under New Business, paragraph 2, line 3: Delete the words "and docks" after the word "pier".

Commissioner Olsson made a motion to approve the minutes with the changes of the July 20, 2010 meeting, seconded by Commissioner Bell-Patten. The motion was approved by the following vote: All Ayes.

**b. Staff Updates**

**i. Recreation**

**ii. Parks Maintenance**

Commissioner Patchin suggested that the starting and ending dates for all the recreation programs be included in staff reports and the amount of usage of the

facilities.

Commissioner Patchin asked if the plaza next to Bank of America has an official name. Tim Tucker, City Engineer, said the plaza is referenced as the Main Street Plaza, but that it does not have an official name. Commissioner Patchin suggested the plaza be put on the list for naming unnamed parks and recreation areas.

**c. Special Requests for Uses in Parks**  
**i. Ignacio Plaza - Private Rental**

Mitch Austin, Recreation Manager, explained that the special request for the use of Ignacio Plaza is for a wedding reception scheduled for October 2nd. He said they are asking for a conditional approval and, if approved, the requesting party will move to notify neighbors.

Commissioner Patchin asked if a restroom and washing station will be provided. Rob Schroder, requesting party, said they will have to bring in port-a-potties.

Vice Chair Hern asked if there is a standard form that goes out to residents regarding noticing them of an event. M. Austin replied that notification is written by the applicant, but that the notification must include certain specified information.

Commissioner Olsson noted that the Commission meeting date on the form needs to be corrected to the 3<sup>rd</sup> Tuesday of the month.

Commissioner Patchin made a motion to accept the special request, seconded by Commissioner Bell-Patten. The motion was approved by the following vote: All Ayes.

**ii. Waterfront Park - St. Catherine's School Jog-A-Thon**

Mitch Austin said this would be the first year of the Jog-A-Thon, which is scheduled for Saturday, November 6<sup>th</sup>. He discussed the creation of a course on the grass and alternate track arrangements should the weather be an issue.

Scott Alstad, representative for St. Catherine's of Sienna School, explained how the races will be conducted and explained that the fundraiser is for improving classrooms and educational experience.

Commissioner Olsson made motion to approve the special request, seconded by Commissioner Bell-Patten. The motion was approved by the following vote: All Ayes.

**IV. PRMCC SUB-COMMITTEE REPORTS**

**a. Pool Subcommittee Update, Tim Tucker, City Engineer**

Tim Tucker reported that the City received 16 bids for the Martinez Aquatic Center Project. He said \$6 million has been earmarked for the Measure H project, which includes funding for design and permits, construction, construction management, a public art component, necessary contingencies, and special inspection. T. Tucker

said the bids ranged from approximately \$4.3 to \$5.7 million. After briefly reviewing some of the bids, he told the Commission that the building contractor contract is slated to be accepted by City Council at their next meeting. T. Tucker acknowledged the Commission and Subcommittee's time and effort and complimented them on their hard work.

Commissioner Hern thanked staff and the Pool Subcommittee for all their work.

There was a brief discussion of the reputation and work of the building contractor, Reeve-Knight Construction, which is based out of Roseville.

Commissioner Bell-Patten acknowledged and thanked Tim Tucker for his hard work and guidance.

Mike Alford asked for the start and end date of the project. T. Tucker said they will start the project in September and expect to finish in July.

#### **b. Grant Subcommittee Update, Mitch Austin, Recreation Manager**

Mitch Austin explained that the Grant Subcommittee recommends that they forgo the project selection in spring 2011 for Measure WW funds pending the Prop 84 round two funding outcome. He further explained that the subcommittee has begun identifying projects for round two of Prop 84 grant funding.

M. Austin provided the Commission with a list of possible grant application projects and reviewed the chart outlining the grant fund eligibility of the projects and whether the funding sources would cover the entire cost of the project. He said they found 3 projects that looked best for the applications, but noted the Ferry Point Park/Fishing Pier improvement seemed to be the most beneficial and highly competitive. He stated the subcommittee recommends that they focus on the Ferry Point Park/Fishing Pier project and give their recommendation to City Council by September.

Chair Radke noted that even though the subcommittee has made a recommendation, the Commission is not bound to agree with their recommendation.

Commissioner Patchin expressed concerns regarding how certain projects will fit within the parameters of Measure H and Prop 84. He noted that he felt the fishing pier needs to be replaced rather than repaired.

Chair Radke echoed Commissioner Patchin's comments regarding the fishing pier and noted that \$5 million seemed to be enough money to replace the pier.

Commissioner Bell-Patten made a motion to approve all three staff recommendations, seconded by Vice Chair Hern. The motion ~~was~~ approved by the following vote: All Ayes.

### **V. NEW BUSINESS**

#### **a. T-Mobile Proposal for Site at Hidden Lakes Park**

Mitch Austin explained that T-Mobile has re-evaluated their previous proposal, which no

longer meets their needs and provided a new, adjusted proposal. He reviewed the proposed location of the communication box, which is an area that is not an active use area in Hidden Valley Park and that doesn't impact recreation or leisure. M. Austin noted staff recommends the approval of the proposal with the condition that the adjacent area be beautified.

Karen Leonard, representative for T-Mobile, provided the Commission with a copy of simulated pictures of the constructed communication box.

Commissioner Olsson inquired about the purpose of the box. Ms. Leonard replied that it will provide additional improved coverage and increase capacity.

Commissioner Patchin asked if ESL students will be used for landscaping the adjacent area. Mitch Austin said this area would be a good opportunity to use them.

Commissioner Patchin asked if the beautification of the area would be in lieu of any revenue benefit from T-Mobile. Ms. Leonard replied that the beautification would be in addition to revenue benefited from entering into a lease with the City.

Warren Owen inquired about the timeline for the project. Ms. Leonard stated it would take about 8 months.

Commissioner Eychner made motion to approve the proposed location for the Communication Box with the agreement that T-Mobile provide landscaping of the adjacent area, seconded by Commissioner Olsson. The motion was approved by the following vote: All Ayes.

#### **b. Morello Childcare Facility Agreement with Lasting Impressions**

M. Austin informed the Commission that the Morello Childcare Facility is run by Lasting Impressions and that the lease agreement is set to expire on September 21, 2010. He said that they are asking that the lease agreement be extended until the end of the school year to provide them with time to prepare putting the facility out to competitive bid and put out a well-written RFP (Request for Proposals).

Chair Radke asked how they will assess an additional year of rent. M. Austin replied that the same terms of the rent will be kept.

Vice Chair Hern made a motion to approve the lease extension until the end of the 2010/11 school year, seconded by Commissioner Bell-Patten. The motion was approved by the following vote: All Ayes.

#### **c. Memorial Park Naming Review and Discussion**

Mitch Austin provided the Commission with an update as they move forward with the process of naming the unnamed park on the corner of Alhambra and Marina Vista and the unnamed Plaza. He reviewed the information to be compiled in accordance with the Naming Policy and discussed their need to create a protocol. M. Austin also reviewed the proposal for a process for considering naming the un-named park area Memorial Park. He requested that an ad hoc Park Naming Subcommittee be appointed to

shepherd the naming process.

Commissioner Olsson said he would prefer that the park be named after the beavers and have a memorial park where the other commemorative benches are.

Commissioner Eychner raised concerns about the maintenance of the park and problems with vandalism should it become a memorial park. He stated that he would like the park naming process to include discussion by the ad hoc committee whether the area should be used for a memorial park or something else.

Phil Ciaramitaro suggested that they could involve the local youth in the process and asked that they consider encouraging children to submit names for unnamed parks.

Vice Chair Hern made a motion to approve forming an ad hoc Park Naming Subcommittee and move forward with the process to consider the use of the unnamed park, seconded by Commissioner Eychner. The motion was approved by the following vote: All Ayes.

Chair Radke recommended postponing the appointment of the subcommittee until more Commission members are present.

## **VI. OLD BUSINESS**

### **a. Library Scope of Work and Cost Projections**

Mitch Austin reported that the construction plans for the library are complete and that they are ready to put out the bid information and begin the bidding process for the project. He stated the professional bid estimate for the improvements is between \$1.32 and \$1.54 million. M. Austin noted that they expect to receive bids in September, so staff can give the Commission an update and more concrete numbers at the September meeting. He also outlined the scope of the project and the improvements to be included.

In response to an inquiry by Commissioner Patchin regarding furniture for staff and the public, M. Austin replied that purchasing furniture for staff is not outside the realm of discussion.

## **VII. FUTURE AGENDA ITEMS**

### **a. Revised Agenda Plan for August**

The Commission briefly discussed viable dates for the fall retreat, what they hope to accomplish at the retreat, and possible topics of discussion.

Mitch Austin informed the Commission that the staff picnic has been adjusted to September 21st at Nancy Boyd Park. He also noted Hidden Lakes Park, grant status and Measure WW discussion, cameras in parks, and program planning library downstairs have been added to the agenda plan.

Vice Chair Hern said they need to consider a pool planning process.

Commissioner Olsson requested that the Marina Plan review be added to the September agenda.

Chair Radke asked if the approval of Rankin Park is moving forward to City Council for approval at the September meeting. M. Austin stated he would provide that information to the Commissioners via email.

Commissioner Bell-Patten asked about the status of video-taping the minutes for the PRMCC meetings. M. Austin said they can bring the item back for discussion and discuss how the taping may be funded. Commissioner Bell-Patten asked that it be put on the unscheduled agenda items list.

#### **VIII. COMMISSIONER & STAFF COMMENTS**

Commissioner Patchin inquired whether or not the city will include requirements for hiring local labor force for the Measure H redevelopment projects. Mitch Austin explained the difficulties associated with meeting those requirements, but noted that local labor force is something staff looks at very seriously. M. Austin stated he would ask Tim Tucker to explore and explain such requirements.

Vice Chair Hern commended staff for all the summer programs.

Mitch Austin said *Cats and Dogs* will be ~~showed~~ shown on movie night at Nancy Boyd Park at 9 p.m.

Chair Radke said Art in the Park was a nice, well-attended event. He also inquired about the installation of the number of trellises at the bocce courts, which the Commission approved at a previous meeting. Chair Radke asked that staff double check that only 2 trellises were installed and not three.

#### **IX. CORRESPONDENCE**

None.

#### **X. NEXT MEETING DATE: September 21, 2010**

#### **XI. ADJOURNMENT**

On motion of Commissioner Patchin, seconded by Commissioner Eychner, the Commission unanimously voted to adjourn at 9:00 p.m.

RECEIVED

JUN - 8 2011

COMMUNITY DEV. DEPT.

Existing



Proposed



view from Center Avenue looking northwest at site

AdvanceSim   
© 2008-2011 AdvanceSim, Inc. All rights reserved.

T-Mobile

BA11007 PG&E Hidden Valley Park  
Ophir Court, Martinez, CA

Attachment E

RECEIVED

JUN - 3 2011

COMMUNITY DEV. DEPT.

Existing



Proposed



view from Center Avenue looking northeast at site

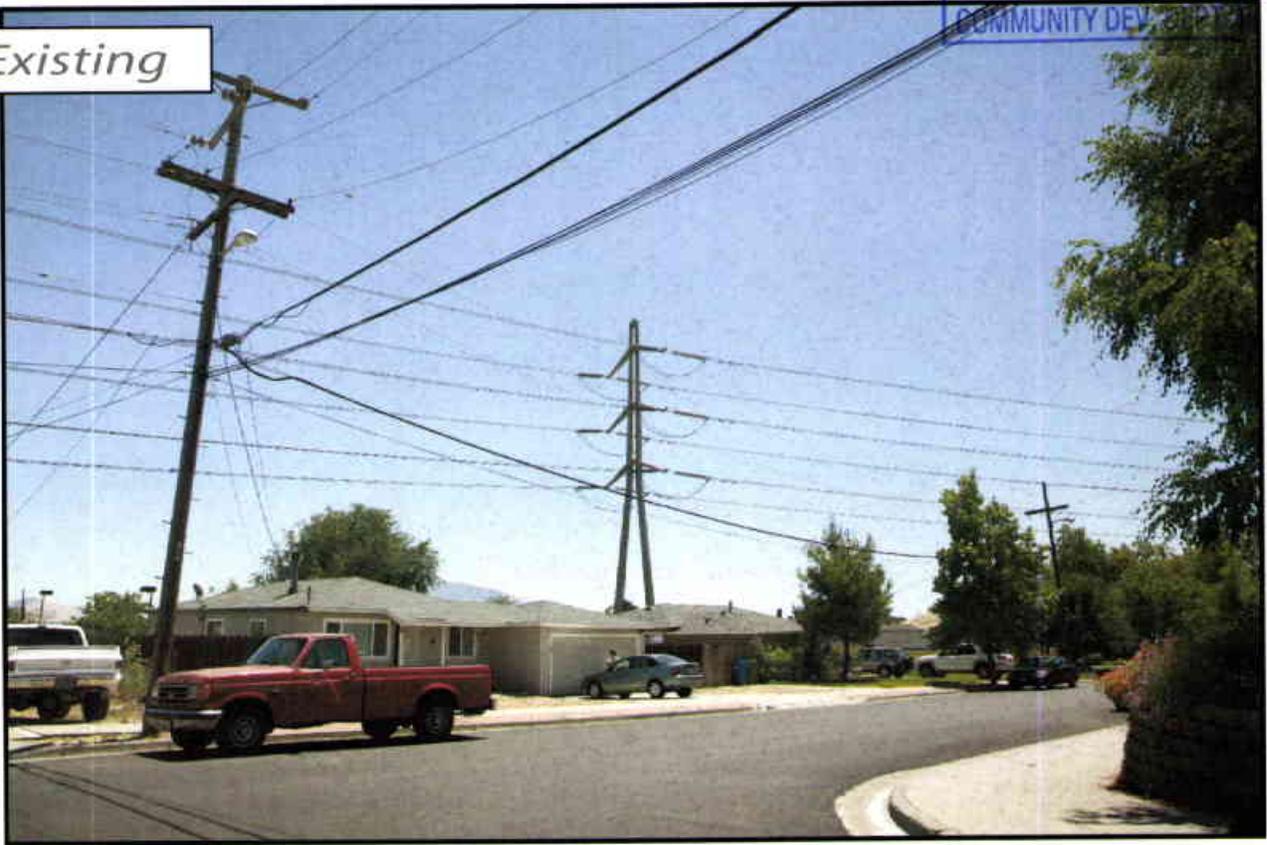
**T-Mobile**  
BA11007 PG&E Hidden Valley Park  
Ophir Court, Martinez, CA

RECEIVED

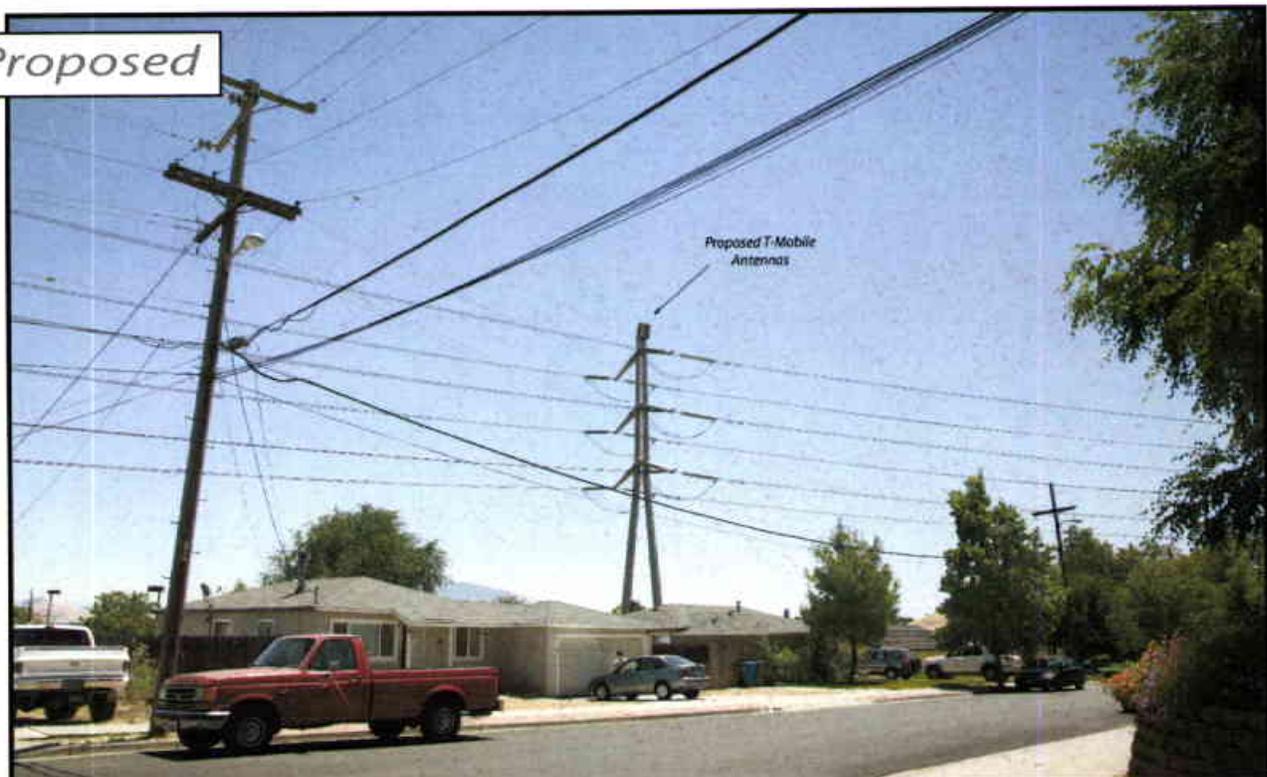
JUN - 3 2011

COMMUNITY DEV.

Existing



Proposed



view from Redwood Drive looking southeast at site



BA11007 PG&E Hidden Valley Park  
Ophir Court, Martinez, CA

Optimizer® Side-by-Side Dual Polarized Antenna, 1710-2200, 65deg, 18.4dBi, 1.4m, VET, 0-10deg RET

**Product Description**

A combination of two X-Polarized antennas in a single radome, this pair of variable tilt antennas provides exceptional suppression of all upper sidelobes at all downtilt angles. It also features a wide downtilt range. This antenna is optimized for performance across the entire frequency band (1710-2200 MHz). The antenna comes pre-connected with two antenna control units (ACU).

**Features/Benefits**

- Variable electrical downtilt - provides enhanced precision in controlling intercell interference. The tilt is infield adjustable 0-10 deg.
- High Suppression of all Upper Sidelobes (Typically <-20dB).
- Gain tracking - difference between AWS UL (1710-1755 MHz) and DL (2110-2155 MHz) <1dB.
- Two X-Polarised panels in a single radome.
- Azimuth horizontal beamwidth difference <4deg between AWS UL (1710-1755 MHz) and DL (2110-2155 MHz).
- Low profile for low visual impact.
- Dual polarization; Broadband design.
- Includes (2) AISG 2.0 Compatible ACU-A20-N antenna control units.

**Technical Specifications****Electrical Specifications**

Frequency Range, MHz	1710-2200
Horizontal Beamwidth, deg	65
Vertical Beamwidth, deg	5.9 to 7.7
Electrical Downtilt, deg	0-10
Gain, dBi (dBd)	18.4 (16.3)
1st Upper Sidelobe Suppression, dB	> 18 (typically > 20)
Upper Sidelobe Suppression, dB	> 18 all (typically > 20)
Front-To-Back Ratio, dB	> 26 (typically 28)
Polarization	Dual pol +/-45°
VSWR	< 1.5:1
Isolation between Ports, dB	> 30
3rd Order IMP @ 2 x 43 dBm, dBc	> 150 (155 Typical)
Impedance, Ohms	50
Maximum Power Input, W	300
Lightning Protection	Direct Ground
Connector Type	(4) 7-16 Long Neck Female

**Mechanical Specifications**

Dimensions - HxWxD, mm (in)	1420 x 331 x 80 (55.9 x 13 x 3.15)
Weight w/o Mtg Hardware, kg (lb)	18.5 (40.7)
Survival Wind Speed, km/h (mph)	200 (125)
Rated Wind Speed, km/h (mph)	160 (100)
Max Wind Loading Area, m <sup>2</sup> (ft <sup>2</sup> )	0.47 (5.03)
Front Thrust @ Rated Wind, N (lbf)	756 (170)
Maximum Thrust @ Rated Wind, N (lbf)	756 (170)
Wind Load - Side @ Rated Wind, N (lbf)	231 (52)
Wind Load - Rear @ Rated Wind, N (lbf)	408 (92)
Radome Material	Fiberglass
Radome Color	Light Grey RAL7035
Mounting Hardware Material	Diecasted Aluminum
Shipping Weight, kg (lb)	24.5 (53.9)
Packing Dimensions, HxWxD, mm (in)	1520 x 408 x 198 (59.8 x 16 x 7.8)

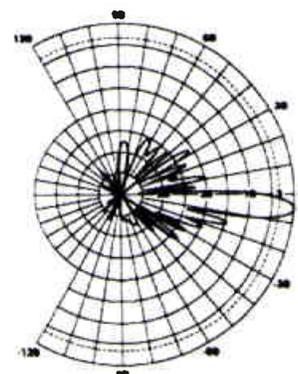
**Ordering Information**

Mounting Hardware	APM40-2 + APM40-E2
-------------------	--------------------

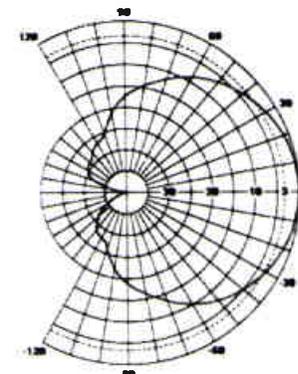
RECEIVED

APR 15 2011

COMMUNITY DEV. DEPT.



Vertical Pattern



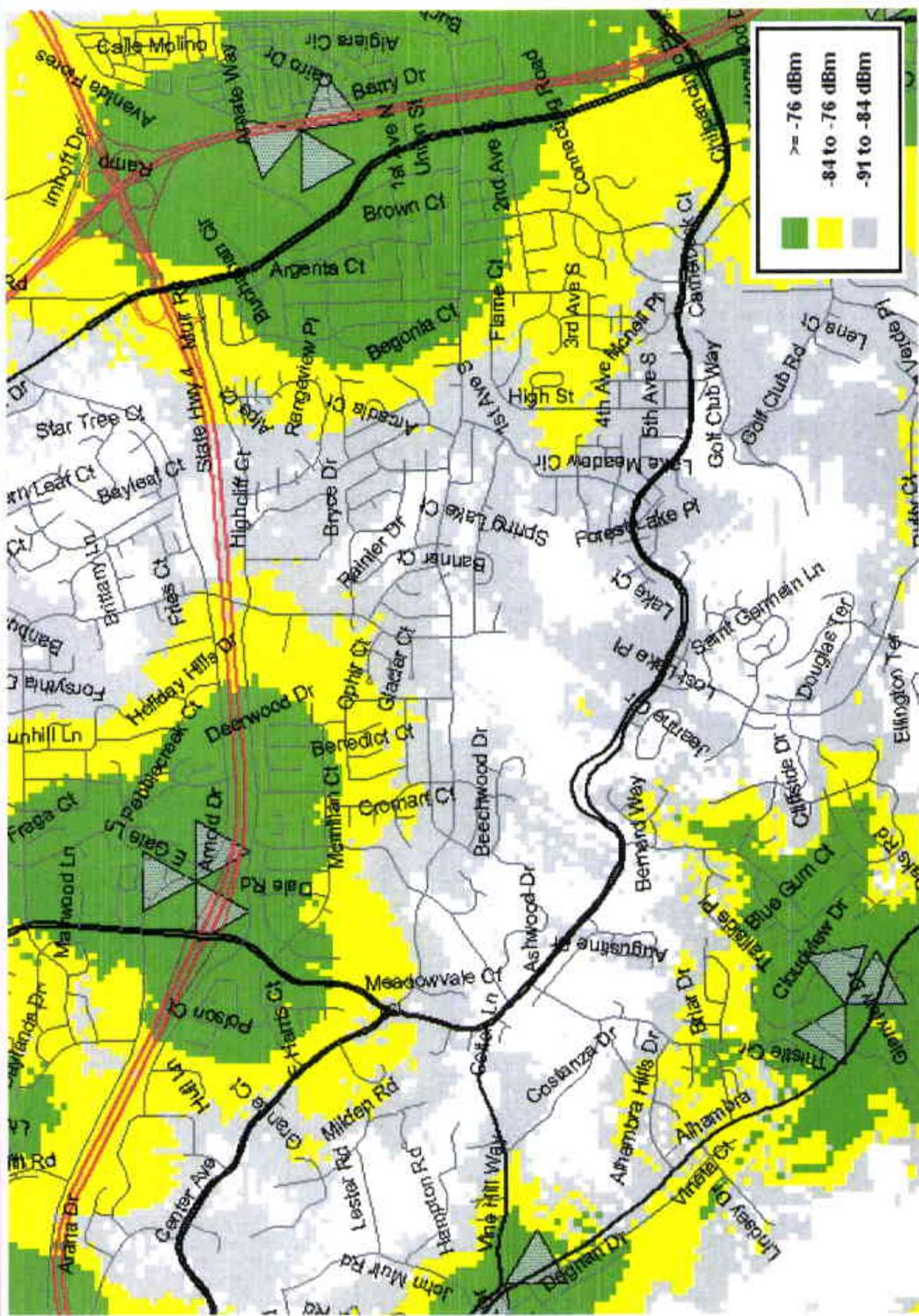
Horizontal Pattern



**ROCKSOLID**  
COVERAGE

RECEIVED  
AUG 31 2018  
COMMUNITY DEV. DEPT.

### Prediction of Surrounding Sites

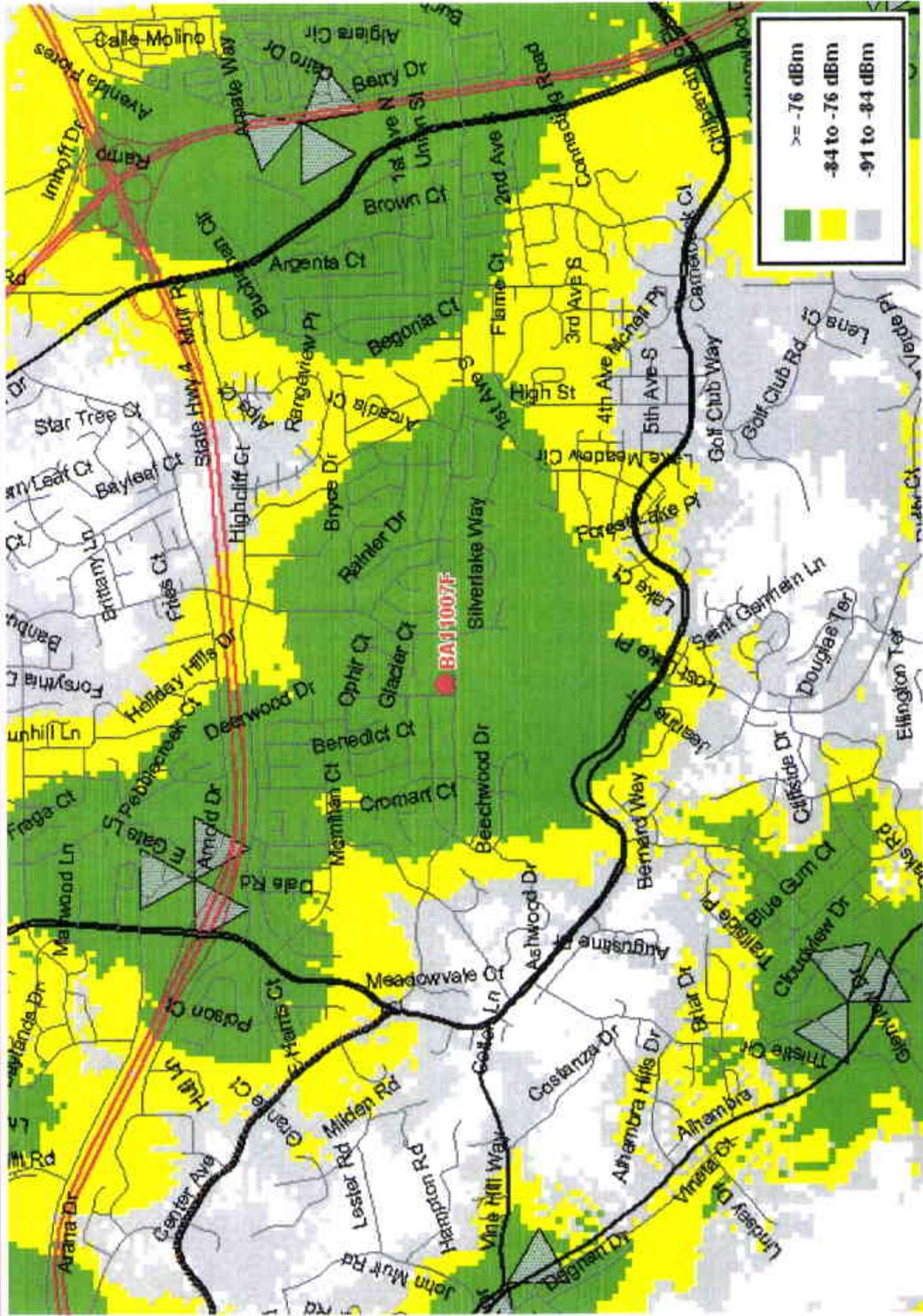




**ROCKSOLID**  
COVERAGE

RECEIVED  
AUG 31 2010  
COMMUNITY DEVELOPMENT

### Prediction of BA11007 Together With Surrounding Sites

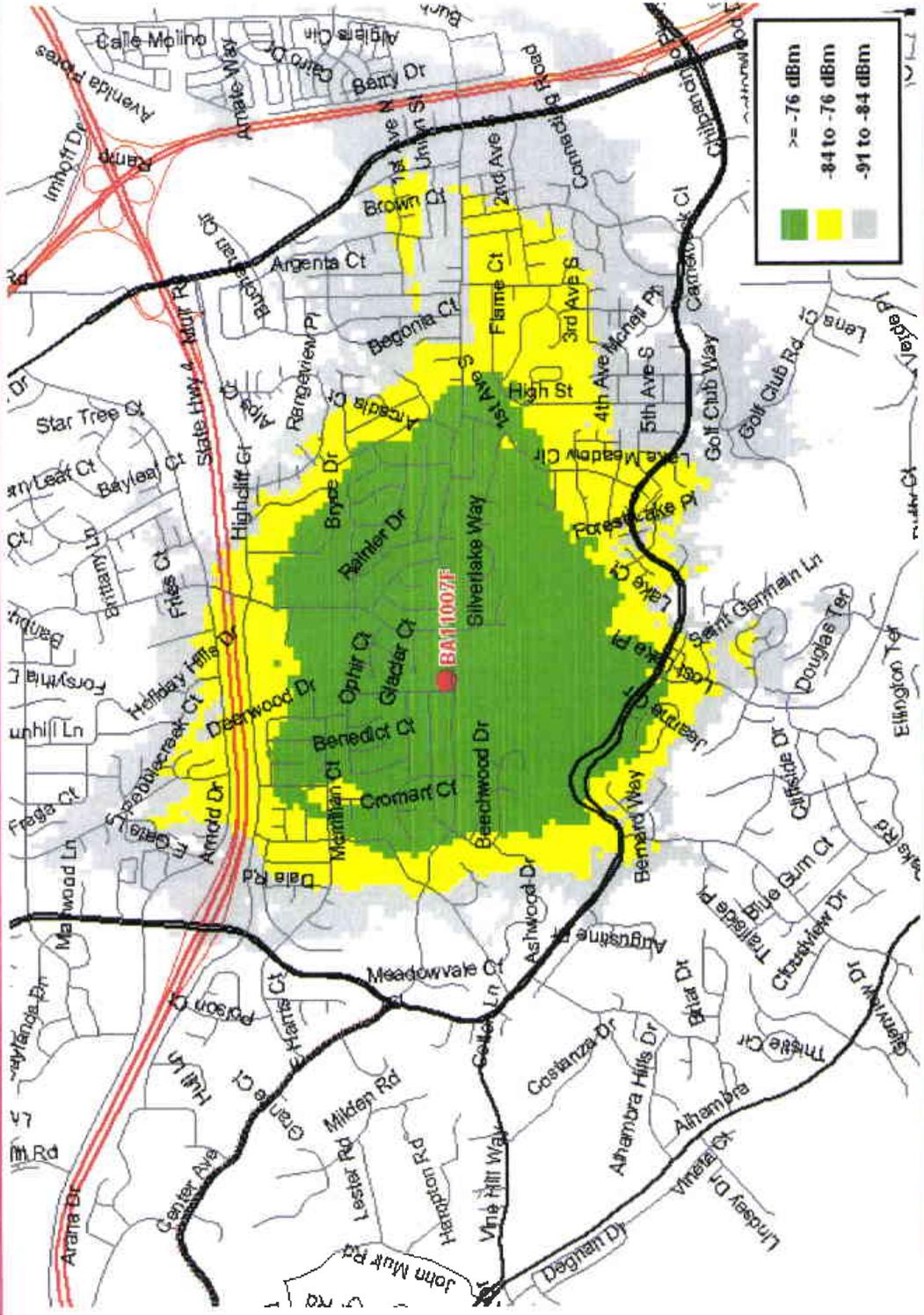




**ROCKSOLID**  
COVERAGE

RECEIVED  
AUG 31 2010  
COMMUNITY DEV. DEPT.

### Prediction of BA11007



## Existing T-Mobile Sites

site_id	Site type	structure_ht	Structure Type	Longitude	Latitude	address
BA01231A	Collocation	68	JPA	-122.1020278	38.00505556	150 MORELLO AVE
BA01242A	Collocation	30	Rooftop	-122.09826	37.99205	1350 ARNOLD DR
BA01243A	Collocation	14	Rooftop	-122.103981	37.971398	200 WILDCROFT DR
BA01244A	Building	39	Rooftop	-122.12064	37.993746	445 MUIR STATION RD
BA01247A	Rawland	31	Monopole	-122.098934	38.019349	3800 ARTHUR RD
BA01248A	Building	29	Rooftop	-122.1298604	38.0155	1311 PINE ST # 1333
BA01249A	Collocation	12	Utility Wooden Pole	-122.1625222	38.00290111	2670 FRANKLIN CANYON RD
BA01293A	Collocation	163	Utility Lattice Tower	-122.1180271	37.96266667	814 CARTER ACRES LN
BA01322A	Rawland	17	Monopole	-122.1889719	38.01347222	CUMMINGS SKWY & BARRY HILL RD
BA01367A	Collocation	39	Utility Monopole	-122.1151667	37.98208267	870 VINE HILL WAY

## Proposed T-Mobile Sites

BA 51981	Proposed site at Martinez United Methodist Church	122-07-22.03	37-59-10.85
BA 51994	New Search Ring	122-8-13.68	38-00-39.6
BA 51991	New Search Ring	122-5-31.11	37-57-28.44
BA 11553	New Project - Zoning Pending	-122.0898528	37.99367777
BA 21645	New Search Ring	-122.104	37.98360000
BA 41446	New Project - Zoning Approved	-122.1350694	38.01925277

RECEIVED

AUG 31 2010

COMMUNITY DEV. DEPT.





**SITE ANALYSIS  
OF  
RADIO FREQUENCY ELECTROMAGNETIC FIELDS**



**For Base Station: BA11007F**

MPE Analysis Tool v2.9.07

ANTENNA SYSTEM 1 GSM CELL: **BA11007F\_A**

- THIS CELL IS **NOT** CATEGORICALLY EXCLUDED FROM THE REQUIREMENT FOR AN MPE ANALYSIS
- PASS: GENERAL POPULATION/UNCONTROLLED EXPOSURE LIMITS
- PASS: OCCUPATIONAL/CONTROLLED EXPOSURE LIMITS

ANTENNA SYSTEM 1 GSM CELL: **BA11007F\_B**

- THIS CELL IS **NOT** CATEGORICALLY EXCLUDED FROM THE REQUIREMENT FOR AN MPE ANALYSIS
- PASS: GENERAL POPULATION/UNCONTROLLED EXPOSURE LIMITS
- PASS: OCCUPATIONAL/CONTROLLED EXPOSURE LIMITS

ANTENNA SYSTEM 1 GSM CELL: **BA11007F\_C**

- THIS CELL IS **NOT** CATEGORICALLY EXCLUDED FROM THE REQUIREMENT FOR AN MPE ANALYSIS
- PASS: GENERAL POPULATION/UNCONTROLLED EXPOSURE LIMITS
- PASS: OCCUPATIONAL/CONTROLLED EXPOSURE LIMITS

**Name:**

Region: --, Market: SF, Site: BA11007F

**Site Address:**

OPHIR COURT, MARTINEZ, CA

**Submitted By:**

STEPHEN NELSON

**Date:**

Thursday, August 26, 2010

**FCC:**

COMPLIANT

**REPORT SUMMARY**

This report was generated based on Engineering and Design data provided by **STEPHEN NELSON**, on behalf of T-Mobile, USA, for the cell site located at **OPHIR COURT, MARTINEZ, CA**. The report's technical data was derived in part by the **FCC OET65B FCC Exposure Guidelines** for measuring Maximum Permissible Exposure (MPE) on PCS Networks.

Based on the output power, number of radios and antenna height for this site:

Sector 'A' Antenna System(s):

- Meets 100% of the FCC general population/uncontrolled exposure limit at a horz distance of **3 ft** (0.91 m) from the nearest access point.
- Meets 100% of the FCC occupational/controlled exposure limit at a horz distance of **3 ft** (0.91 m) from the nearest access point.

Sector 'B' Antenna System(s):

- Meets 100% of the FCC general population/uncontrolled exposure limit at a horz distance of **3 ft** (0.91 m) from the nearest access point.
- Meets 100% of the FCC occupational/controlled exposure limit at a horz distance of **3 ft** (0.91 m) from the nearest access point.

Sector 'C' Antenna System(s):

- Meets 100% of the FCC general population/uncontrolled exposure limit at a horz distance of **3 ft** (0.91 m) from the nearest access point.
- Meets 100% of the FCC occupational/controlled exposure limit at a horz distance of **3 ft** (0.91 m) from the nearest access point.

For Occupational/Controlled personnel who may come in closer proximity to the antenna than **3 ft** (0.91 m) precautions must be exercised. For example, all personnel should have appropriate training on exposure limits. All T-Mobile personnel should wear exposure detecting equipment. Proper signage must be posted. Due to the mounting methods used by T-Mobile, USA, public access to the face of an antenna would be difficult.

- RF warning signs should be posted at the entrance of this site or at the entrance of the antenna locations.

**Analysis Overview**

T-Mobile, USA has conducted an analysis for determining the MPE compliance for the cell site located at **OPHIR COURT, MARTINEZ, CA** (Latitude: 37.98393889, Longitude: -122.09035278). This analysis consists of the actual site design parameters, the number of radios transmitting and the resulting calculation of the estimated RF field strength from the

antennas. The output is then compared to the FCC recommended guidelines for human exposure to RF electromagnetic fields (OET65b).

### **Site Description**

Based on the Engineering and Design Data provided by **STEPHEN NELSON**, the proposed site will have the following parameters:

**Site Type:**

Pole (this includes any non-building mounted site)

**Collocation:**

NO

**Controlled/Uncontrolled Access to Antenna Face:**

N/A

**Antenna Make (GSM)**

Sector	GSM (2G) Antenna Make
BA11007F_A	RFS
BA11007F_B	RFS
BA11007F_C	RFS

**Antenna Model (GSM)**

Sector	GSM (2G) Antenna Model
BA11007F_A	APX16DWV_16DWVS_01
BA11007F_B	APX16DWV_16DWVS_01
BA11007F_C	APX16DWV_16DWVS_01

**Frequency & Orientation (GSM)**

Sector	GSM (2G) Freq / Azimuth
BA11007F_A	1920 MHz / 70°
BA11007F_B	1920 MHz / 200°
BA11007F_C	1920 MHz / 300°

**Max Antenna Gain & Horz beamwidth (GSM)**

Sector	GSM (2G) Max Antenna Gain / BW
A	18 dBi / 65°
B	18 dBi / 65°
C	18 dBi / 65°

**Max ERP<sub>chan</sub> into Ant (GSM)**

Sector	GSM (2G) Max ERP <sub>chan</sub> into Ant
A	2.229 Watts
B	2.297 Watts
C	2.297 Watts

**Max ERP<sub>Chan</sub> (GSM)**

Sector	GSM (2G) Max ERP <sub>Chan</sub>
A	140.655 Watts
B	144.929 Watts
C	144.929 Watts

**No. of Channels (GSM)**

Sector	GSM (2G) No. of Channels
A	4
B	4
C	4

**Total EIRP (GSM+UMTS)**

ERP(W)\*1.64\*Channels\*Activity\_factor  
(activity factor equals .65 for GSM and .95 for UMTS)

Sector	Total EIRP
A	599.753 Watts
B	617.977 Watts
C	617.977 Watts

**Antenna Mounting:**

[Unknown]

**Distributed Antenna System (DAS):**

NO

**Radiation Centerline:**

131.7 ft (40.1 m) AGL

**Additional comments:**

No comments for system 1.

No comments for system 2.

**Antenna System 1, Cell: BA11007F\_A**

Dist (ft)	Deg	Gain (dBi)	Power Density		Charted		Max Distance Calc			
			Far Field ( $\mu\text{W}/\text{cm}^2$ )	Near Field ( $\mu\text{W}/\text{cm}^2$ )	Power Density ( $\mu\text{W}/\text{cm}^2$ )	% of Limit	Power Density (ft)	>5% MPE	>100% MPE	>500% MPE
0.656	81.7	18	12.7	10.22	10.22	1.02	0.66	0	0	0
0.6561	81.7	18	12.7	10.22	10.22	1.02	0	0	0	0
0.7	81.68	18	12.7	10.22	10.22	1.02	0	0	0	0
0.8	81.64	18	12.7	10.22	10.22	1.02	0	0	0	0
0.9	81.59	18	12.7	10.22	10.22	1.02	0	0	0	0
1	81.55	18	12.7	10.22	10.22	1.02	0	0	0	0
2	81.09	18	12.7	10.22	10.22	1.02	0	0	0	0
3	80.64	18	12.7	10.22	10.22	1.02	0	0	0	0
4	80.18	18	12.69	10.21	10.21	1.02	0	0	0	0
5	79.73	18	12.68	10.21	10.21	1.02	0	0	0	0
6	79.28	18	12.68	10.21	10.21	1.02	0	0	0	0

7	78.83	18	12.67	10.2	10.2	1.02	0	0	0	0
8	78.37	18	12.65	10.2	10.2	1.02	0	0	0	0
9	77.92	18	12.64	10.19	10.19	1.02	0	0	0	0
10	77.47	18	12.62	10.19	10.19	1.02	0	0	0	0
11	77.02	18	12.61	10.18	10.18	1.02	0	0	0	0
12	76.57	18	12.59	10.17	10.17	1.02	0	0	0	0
13	76.12	18	12.57	10.16	10.16	1.02	0	0	0	0
14	75.67	18	12.55	10.16	10.16	1.02	0	0	0	0
15	75.22	18	12.53	10.15	10.15	1.01	0	0	0	0
16	74.77	18	12.5	10.14	10.14	1.01	0	0	0	0
17	74.33	18	12.48	10.13	10.13	1.01	0	0	0	0
18	73.88	18	12.45	10.12	10.12	1.01	0	0	0	0
19	73.44	18	12.42	10.1	10.1	1.01	0	0	0	0
20	72.99	18	12.39	10.09	10.09	1.01	0	0	0	0
21	72.55	18	12.36	10.08	10.08	1.01	0	0	0	0
22	72.11	18	12.33	10.07	10.07	1.01	0	0	0	0
23	71.67	18	12.3	10.05	10.05	1.01	0	0	0	0
24	71.23	18	12.26	10.04	10.04	1	0	0	0	0
25	70.79	18	12.22	10.02	10.02	1	0	0	0	0
26	70.36	18	12.19	10.01	10.01	1	0	0	0	0
27	69.92	18	12.15	9.99	9.99	1	0	0	0	0
28	69.49	18	12.11	9.98	9.98	1	0	0	0	0
29	69.06	18	12.07	9.96	9.96	1	0	0	0	0
30	68.63	18	12.02	9.94	9.94	0.99	0	0	0	0
31	68.2	18	11.98	9.92	9.92	0.99	0	0	0	0
32	67.77	18	11.94	9.91	9.91	0.99	0	0	0	0
33	67.35	18	11.89	9.89	9.89	0.99	0	0	0	0
34	66.92	18	11.84	9.87	9.87	0.99	0	0	0	0
35	66.5	18	11.8	9.85	9.85	0.98	0	0	0	0
36	66.08	18	11.75	9.83	9.83	0.98	0	0	0	0
37	65.66	18	11.7	9.81	9.81	0.98	0	0	0	0
38	65.24	18	11.65	9.78	9.78	0.98	0	0	0	0
39	64.83	18	11.6	9.76	9.76	0.98	0	0	0	0
40	64.41	18	11.54	9.74	9.74	0.97	0	0	0	0
41	64	18	11.49	9.72	9.72	0.97	0	0	0	0
42	63.59	18	11.44	9.7	9.7	0.97	0	0	0	0
43	63.18	18	11.38	9.67	9.67	0.97	0	0	0	0
44	62.78	18	11.33	9.65	9.65	0.96	0	0	0	0
45	62.37	18	11.27	9.62	9.62	0.96	0	0	0	0
46	61.97	18	11.21	9.6	9.6	0.96	0	0	0	0
47	61.57	18	11.16	9.58	9.58	0.96	0	0	0	0
48	61.18	18	11.1	9.55	9.55	0.96	0	0	0	0
49	60.78	18	11.04	9.53	9.53	0.95	0	0	0	0
50	60.39	18	10.98	9.5	9.5	0.95	0	0	0	0
60	56.57	18	10.36	9.23	9.23	0.92	0	0	0	0
70	52.98	18	9.72	8.94	8.94	0.89	0	0	0	0
80	49.63	18	9.06	8.63	8.63	0.86	0	0	0	0
90	46.51	18	8.42	8.32	8.32	0.83	0	0	0	0
100	43.61	18	7.8	8.01	7.8	0.78	0	0	0	0
110	40.92	18	7.22	7.7	7.22	0.72	0	0	0	0
120	38.44	18	6.67	7.41	6.67	0.67	0	0	0	0
130	36.15	18	6.16	7.12	6.16	0.62	0	0	0	0
140	34.03	18	5.7	6.84	5.7	0.57	0	0	0	0
150	32.08	18	5.27	6.58	5.27	0.53	0	0	0	0

160	30.26	18	4.87	6.33	4.87	0.49	0	0	0	0
170	28.59	18	4.51	6.09	4.51	0.45	0	0	0	0
180	27.03	18	4.19	5.87	4.19	0.42	0	0	0	0
190	25.59	18	3.89	5.65	3.89	0.39	0	0	0	0
200	24.25	18	3.62	5.45	3.62	0.36	0	0	0	0
210	23	18	3.37	5.26	3.37	0.34	0	0	0	0
220	21.84	18	3.15	5.08	3.15	0.31	0	0	0	0
230	20.75	18	2.94	4.92	2.94	0.29	0	0	0	0
240	19.74	18	2.75	4.76	2.75	0.28	0	0	0	0
250	18.78	18	2.58	4.6	2.58	0.26	0	0	0	0
260	17.89	18	2.42	4.46	2.42	0.24	0	0	0	0
270	17.05	18	2.28	4.33	2.28	0.23	0	0	0	0
280	16.26	18	2.14	4.2	2.14	0.21	0	0	0	0
290	15.52	18	2.02	4.08	2.02	0.2	0	0	0	0
300	14.81	18	1.91	3.96	1.91	0.19	0	0	0	0
310	14.15	18	1.81	3.85	1.81	0.18	0	0	0	0
320	13.52	18	1.71	3.75	1.71	0.17	0	0	0	0
330	12.93	18	1.62	3.65	1.62	0.16	0	0	0	0
340	12.36	18	1.54	3.56	1.54	0.15	0	0	0	0
350	11.83	18	1.46	3.47	1.46	0.15	0	0	0	0
360	11.32	18	1.39	3.38	1.39	0.14	0	0	0	0
370	10.83	18	1.32	3.3	1.32	0.13	0	0	0	0
380	10.37	18	1.26	3.22	1.26	0.13	0	0	0	0
390	9.93	18	1.2	3.15	1.2	0.12	0	0	0	0
400	9.51	18	1.15	3.07	1.15	0.12	0	0	0	0
410	9.11	18	1.1	3.01	1.1	0.11	0	0	0	0
420	8.72	18	1.05	2.94	1.05	0.11	0	0	0	0
430	8.36	18	1.01	2.88	1.01	0.1	0	0	0	0
440	8	18	0.97	2.82	0.97	0.1	0	0	0	0
450	7.67	18	0.93	2.76	0.93	0.09	0	0	0	0
460	7.34	18	0.89	2.7	0.89	0.09	0	0	0	0
470	7.03	18	0.85	2.65	0.85	0.09	0	0	0	0
480	6.73	18	0.82	2.6	0.82	0.08	0	0	0	0
490	6.44	18	0.79	2.55	0.79	0.08	0	0	0	0
500	6.17	18	0.76	2.5	0.76	0.08	0	0	0	0
600	3.88	18	0.54	2.1	0.54	0.05	0	0	0	0
700	2.22	18	0.4	1.81	0.4	0.04	0	0	0	0
800	0.96	18	0.31	1.59	0.31	0.03	0	0	0	0
900	-0.02	18	0.24	1.42	0.24	0.02	0	0	0	0
1000	-0.81	18	0.2	1.28	0.2	0.02	0	0	0	0
1100	-1.46	18	0.17	1.16	0.17	0.02	0	0	0	0
1200	-2	18	0.14	1.07	0.14	0.01	0	0	0	0
1300	-2.46	18	0.12	0.99	0.12	0.01	0	0	0	0
1400	-2.85	18	0.1	0.92	0.1	0.01	0	0	0	0
1500	-3.19	18	0.09	0.86	0.09	0.01	0	0	0	0
1600	-3.49	18	0.08	0.8	0.08	0.01	0	0	0	0
1700	-3.75	18	0.07	0.76	0.07	0.01	0	0	0	0
1800	-3.99	18	0.06	0.71	0.06	0.01	0	0	0	0
1900	-4.2	18	0.06	0.68	0.06	0.01	0	0	0	0
2000	-4.39	18	0.05	0.64	0.05	0.01	0	0	0	0

**Antenna System 1, Cell: BA11007F\_B**

Dist	Deg	Gain	Power Density		Charted		Max Distance Calc		
			Far Field	Near Field	Power	% of	Power	>5%	>100%

(ft)		(dBI)	( $\mu\text{W}/\text{cm}^2$ )	( $\mu\text{W}/\text{cm}^2$ )	Density ( $\mu\text{W}/\text{cm}^2$ )	Limit	Density (ft)	MPE	MPE	MPE
0.656	82.7	18	13.09	10.53	10.53	1.05	0.66	0	0	0
0.6561	82.7	18	13.09	10.53	10.53	1.05	0	0	0	0
0.7	82.68	18	13.09	10.53	10.53	1.05	0	0	0	0
0.8	82.64	18	13.09	10.53	10.53	1.05	0	0	0	0
0.9	82.59	18	13.09	10.53	10.53	1.05	0	0	0	0
1	82.55	18	13.09	10.53	10.53	1.05	0	0	0	0
2	82.09	18	13.09	10.53	10.53	1.05	0	0	0	0
3	81.64	18	13.08	10.53	10.53	1.05	0	0	0	0
4	81.18	18	13.08	10.52	10.52	1.05	0	0	0	0
5	80.73	18	13.07	10.52	10.52	1.05	0	0	0	0
6	80.28	18	13.06	10.52	10.52	1.05	0	0	0	0
7	79.83	18	13.05	10.51	10.51	1.05	0	0	0	0
8	79.37	18	13.04	10.51	10.51	1.05	0	0	0	0
9	78.92	18	13.02	10.5	10.5	1.05	0	0	0	0
10	78.47	18	13.01	10.5	10.5	1.05	0	0	0	0
11	78.02	18	12.99	10.49	10.49	1.05	0	0	0	0
12	77.57	18	12.97	10.48	10.48	1.05	0	0	0	0
13	77.12	18	12.95	10.47	10.47	1.05	0	0	0	0
14	76.67	18	12.93	10.47	10.47	1.05	0	0	0	0
15	76.22	18	12.91	10.46	10.46	1.05	0	0	0	0
16	75.77	18	12.88	10.45	10.45	1.04	0	0	0	0
17	75.33	18	12.86	10.44	10.44	1.04	0	0	0	0
18	74.88	18	12.83	10.42	10.42	1.04	0	0	0	0
19	74.44	18	12.8	10.41	10.41	1.04	0	0	0	0
20	73.99	18	12.77	10.4	10.4	1.04	0	0	0	0
21	73.55	18	12.74	10.39	10.39	1.04	0	0	0	0
22	73.11	18	12.7	10.37	10.37	1.04	0	0	0	0
23	72.67	18	12.67	10.36	10.36	1.04	0	0	0	0
24	72.23	18	12.63	10.34	10.34	1.03	0	0	0	0
25	71.79	18	12.6	10.33	10.33	1.03	0	0	0	0
26	71.36	18	12.56	10.31	10.31	1.03	0	0	0	0
27	70.92	18	12.52	10.3	10.3	1.03	0	0	0	0
28	70.49	18	12.48	10.28	10.28	1.03	0	0	0	0
29	70.06	18	12.43	10.26	10.26	1.03	0	0	0	0
30	69.63	18	12.39	10.24	10.24	1.02	0	0	0	0
31	69.2	18	12.35	10.23	10.23	1.02	0	0	0	0
32	68.77	18	12.3	10.21	10.21	1.02	0	0	0	0
33	68.35	18	12.25	10.19	10.19	1.02	0	0	0	0
34	67.92	18	12.2	10.17	10.17	1.02	0	0	0	0
35	67.5	18	12.16	10.15	10.15	1.01	0	0	0	0
36	67.08	18	12.1	10.13	10.13	1.01	0	0	0	0
37	66.66	18	12.05	10.1	10.1	1.01	0	0	0	0
38	66.24	18	12	10.08	10.08	1.01	0	0	0	0
39	65.83	18	11.95	10.06	10.06	1.01	0	0	0	0
40	65.41	18	11.9	10.04	10.04	1	0	0	0	0
41	65	18	11.84	10.01	10.01	1	0	0	0	0
42	64.59	18	11.78	9.99	9.99	1	0	0	0	0
43	64.18	18	11.73	9.97	9.97	1	0	0	0	0
44	63.78	18	11.67	9.94	9.94	0.99	0	0	0	0
45	63.37	18	11.61	9.92	9.92	0.99	0	0	0	0
46	62.97	18	11.55	9.89	9.89	0.99	0	0	0	0
47	62.57	18	11.5	9.87	9.87	0.99	0	0	0	0

48	62.18	18	11.44	9.84	9.84	0.98	0	0	0	0
49	61.78	18	11.38	9.82	9.82	0.98	0	0	0	0
50	61.39	18	11.31	9.79	9.79	0.98	0	0	0	0
60	57.57	18	10.68	9.51	9.51	0.95	0	0	0	0
70	53.98	18	10.01	9.21	9.21	0.92	0	0	0	0
80	50.63	18	9.34	8.89	8.89	0.89	0	0	0	0
90	47.51	18	8.68	8.57	8.57	0.86	0	0	0	0
100	44.61	18	8.04	8.25	8.04	0.8	0	0	0	0
110	41.92	18	7.44	7.94	7.44	0.74	0	0	0	0
120	39.44	18	6.87	7.63	6.87	0.69	0	0	0	0
130	37.15	18	6.35	7.33	6.35	0.64	0	0	0	0
140	35.03	18	5.87	7.05	5.87	0.59	0	0	0	0
150	33.08	18	5.43	6.78	5.43	0.54	0	0	0	0
160	31.26	18	5.02	6.52	5.02	0.5	0	0	0	0
170	29.59	18	4.65	6.28	4.65	0.47	0	0	0	0
180	28.03	18	4.31	6.05	4.31	0.43	0	0	0	0
190	26.59	18	4.01	5.83	4.01	0.4	0	0	0	0
200	25.25	18	3.73	5.62	3.73	0.37	0	0	0	0
210	24	18	3.47	5.42	3.47	0.35	0	0	0	0
220	22.84	18	3.24	5.24	3.24	0.32	0	0	0	0
230	21.75	18	3.03	5.07	3.03	0.3	0	0	0	0
240	20.74	18	2.84	4.9	2.84	0.28	0	0	0	0
250	19.78	18	2.66	4.75	2.66	0.27	0	0	0	0
260	18.89	18	2.5	4.6	2.5	0.25	0	0	0	0
270	18.05	18	2.35	4.46	2.35	0.23	0	0	0	0
280	17.26	18	2.21	4.33	2.21	0.22	0	0	0	0
290	16.52	18	2.08	4.2	2.08	0.21	0	0	0	0
300	15.81	18	1.97	4.08	1.97	0.2	0	0	0	0
310	15.15	18	1.86	3.97	1.86	0.19	0	0	0	0
320	14.52	18	1.76	3.86	1.76	0.18	0	0	0	0
330	13.93	18	1.67	3.76	1.67	0.17	0	0	0	0
340	13.36	18	1.59	3.66	1.59	0.16	0	0	0	0
350	12.83	18	1.51	3.57	1.51	0.15	0	0	0	0
360	12.32	18	1.43	3.48	1.43	0.14	0	0	0	0
370	11.83	18	1.36	3.4	1.36	0.14	0	0	0	0
380	11.37	18	1.3	3.32	1.3	0.13	0	0	0	0
390	10.93	18	1.24	3.24	1.24	0.12	0	0	0	0
400	10.51	18	1.19	3.17	1.19	0.12	0	0	0	0
410	10.11	18	1.13	3.1	1.13	0.11	0	0	0	0
420	9.72	18	1.08	3.03	1.08	0.11	0	0	0	0
430	9.36	18	1.04	2.97	1.04	0.1	0	0	0	0
440	9	18	0.99	2.9	0.99	0.1	0	0	0	0
450	8.67	18	0.95	2.84	0.95	0.1	0	0	0	0
460	8.34	18	0.92	2.79	0.92	0.09	0	0	0	0
470	8.03	18	0.88	2.73	0.88	0.09	0	0	0	0
480	7.73	18	0.85	2.68	0.85	0.08	0	0	0	0
490	7.44	18	0.81	2.63	0.81	0.08	0	0	0	0
500	7.17	18	0.78	2.58	0.78	0.08	0	0	0	0
600	4.88	18	0.55	2.17	0.55	0.06	0	0	0	0
700	3.22	18	0.41	1.87	0.41	0.04	0	0	0	0
800	1.96	18	0.32	1.64	0.32	0.03	0	0	0	0
900	0.98	18	0.25	1.46	0.25	0.03	0	0	0	0
1000	0.19	18	0.21	1.32	0.21	0.02	0	0	0	0
1100	-0.46	18	0.17	1.2	0.17	0.02	0	0	0	0

1200	-1	18	0.14	1.1	0.14	0.01	0	0	0	0
1300	-1.46	18	0.12	1.02	0.12	0.01	0	0	0	0
1400	-1.85	18	0.11	0.95	0.11	0.01	0	0	0	0
1500	-2.19	18	0.09	0.88	0.09	0.01	0	0	0	0
1600	-2.49	18	0.08	0.83	0.08	0.01	0	0	0	0
1700	-2.75	18	0.07	0.78	0.07	0.01	0	0	0	0
1800	-2.99	18	0.06	0.74	0.06	0.01	0	0	0	0
1900	-3.2	18	0.06	0.7	0.06	0.01	0	0	0	0
2000	-3.39	18	0.05	0.66	0.05	0.01	0	0	0	0

**Antenna System 1, Cell: BA11007F\_C**

Dist (ft)	Deg	Gain (dBI)	Power Density		Charted		Max Distance Calc			
			Far Field ( $\mu\text{W}/\text{cm}^2$ )	Near Field ( $\mu\text{W}/\text{cm}^2$ )	Power Density ( $\mu\text{W}/\text{cm}^2$ )	% of Limit	Power Density (ft)	>5% MPE	>100% MPE	>500% MPE
0.656	80.7	18	13.09	10.53	10.53	1.05	0.66	0	0	0
0.6561	80.7	18	13.09	10.53	10.53	1.05	0	0	0	0
0.7	80.68	18	13.09	10.53	10.53	1.05	0	0	0	0
0.8	80.64	18	13.09	10.53	10.53	1.05	0	0	0	0
0.9	80.59	18	13.09	10.53	10.53	1.05	0	0	0	0
1	80.55	18	13.09	10.53	10.53	1.05	0	0	0	0
2	80.09	18	13.09	10.53	10.53	1.05	0	0	0	0
3	79.64	18	13.08	10.53	10.53	1.05	0	0	0	0
4	79.18	18	13.08	10.52	10.52	1.05	0	0	0	0
5	78.73	18	13.07	10.52	10.52	1.05	0	0	0	0
6	78.28	18	13.06	10.52	10.52	1.05	0	0	0	0
7	77.83	18	13.05	10.51	10.51	1.05	0	0	0	0
8	77.37	18	13.04	10.51	10.51	1.05	0	0	0	0
9	76.92	18	13.02	10.5	10.5	1.05	0	0	0	0
10	76.47	18	13.01	10.5	10.5	1.05	0	0	0	0
11	76.02	18	12.99	10.49	10.49	1.05	0	0	0	0
12	75.57	18	12.97	10.48	10.48	1.05	0	0	0	0
13	75.12	18	12.95	10.47	10.47	1.05	0	0	0	0
14	74.67	18	12.93	10.47	10.47	1.05	0	0	0	0
15	74.22	18	12.91	10.46	10.46	1.05	0	0	0	0
16	73.77	18	12.88	10.45	10.45	1.04	0	0	0	0
17	73.33	18	12.86	10.44	10.44	1.04	0	0	0	0
18	72.88	18	12.83	10.42	10.42	1.04	0	0	0	0
19	72.44	18	12.8	10.41	10.41	1.04	0	0	0	0
20	71.99	18	12.77	10.4	10.4	1.04	0	0	0	0
21	71.55	18	12.74	10.39	10.39	1.04	0	0	0	0
22	71.11	18	12.7	10.37	10.37	1.04	0	0	0	0
23	70.67	18	12.67	10.36	10.36	1.04	0	0	0	0
24	70.23	18	12.63	10.34	10.34	1.03	0	0	0	0
25	69.79	18	12.6	10.33	10.33	1.03	0	0	0	0
26	69.36	18	12.56	10.31	10.31	1.03	0	0	0	0
27	68.92	18	12.52	10.3	10.3	1.03	0	0	0	0
28	68.49	18	12.48	10.28	10.28	1.03	0	0	0	0
29	68.06	18	12.43	10.26	10.26	1.03	0	0	0	0
30	67.63	18	12.39	10.24	10.24	1.02	0	0	0	0
31	67.2	18	12.35	10.23	10.23	1.02	0	0	0	0
32	66.77	18	12.3	10.21	10.21	1.02	0	0	0	0
33	66.35	18	12.25	10.19	10.19	1.02	0	0	0	0
34	65.92	18	12.2	10.17	10.17	1.02	0	0	0	0

35	65.5	18	12.16	10.15	10.15	1.01	0	0	0	0
36	65.08	18	12.1	10.13	10.13	1.01	0	0	0	0
37	64.66	18	12.05	10.1	10.1	1.01	0	0	0	0
38	64.24	18	12	10.08	10.08	1.01	0	0	0	0
39	63.83	18	11.95	10.06	10.06	1.01	0	0	0	0
40	63.41	18	11.9	10.04	10.04	1	0	0	0	0
41	63	18	11.84	10.01	10.01	1	0	0	0	0
42	62.59	18	11.78	9.99	9.99	1	0	0	0	0
43	62.18	18	11.73	9.97	9.97	1	0	0	0	0
44	61.78	18	11.67	9.94	9.94	0.99	0	0	0	0
45	61.37	18	11.61	9.92	9.92	0.99	0	0	0	0
46	60.97	18	11.55	9.89	9.89	0.99	0	0	0	0
47	60.57	18	11.5	9.87	9.87	0.99	0	0	0	0
48	60.18	18	11.44	9.84	9.84	0.98	0	0	0	0
49	59.78	18	11.38	9.82	9.82	0.98	0	0	0	0
50	59.39	18	11.31	9.79	9.79	0.98	0	0	0	0
60	55.57	18	10.68	9.51	9.51	0.95	0	0	0	0
70	51.98	18	10.01	9.21	9.21	0.92	0	0	0	0
80	48.63	18	9.34	8.89	8.89	0.89	0	0	0	0
90	45.51	18	8.68	8.57	8.57	0.86	0	0	0	0
100	42.61	18	8.04	8.25	8.04	0.8	0	0	0	0
110	39.92	18	7.44	7.94	7.44	0.74	0	0	0	0
120	37.44	18	6.87	7.63	6.87	0.69	0	0	0	0
130	35.15	18	6.35	7.33	6.35	0.64	0	0	0	0
140	33.03	18	5.87	7.05	5.87	0.59	0	0	0	0
150	31.08	18	5.43	6.78	5.43	0.54	0	0	0	0
160	29.26	18	5.02	6.52	5.02	0.5	0	0	0	0
170	27.59	18	4.65	6.28	4.65	0.47	0	0	0	0
180	26.03	18	4.31	6.05	4.31	0.43	0	0	0	0
190	24.59	18	4.01	5.83	4.01	0.4	0	0	0	0
200	23.25	18	3.73	5.62	3.73	0.37	0	0	0	0
210	22	18	3.47	5.42	3.47	0.35	0	0	0	0
220	20.84	18	3.24	5.24	3.24	0.32	0	0	0	0
230	19.75	18	3.03	5.07	3.03	0.3	0	0	0	0
240	18.74	18	2.84	4.9	2.84	0.28	0	0	0	0
250	17.78	18	2.66	4.75	2.66	0.27	0	0	0	0
260	16.89	18	2.5	4.6	2.5	0.25	0	0	0	0
270	16.05	18	2.35	4.46	2.35	0.23	0	0	0	0
280	15.26	18	2.21	4.33	2.21	0.22	0	0	0	0
290	14.52	18	2.08	4.2	2.08	0.21	0	0	0	0
300	13.81	18	1.97	4.08	1.97	0.2	0	0	0	0
310	13.15	18	1.86	3.97	1.86	0.19	0	0	0	0
320	12.52	18	1.76	3.86	1.76	0.18	0	0	0	0
330	11.93	18	1.67	3.76	1.67	0.17	0	0	0	0
340	11.36	18	1.59	3.66	1.59	0.16	0	0	0	0
350	10.83	18	1.51	3.57	1.51	0.15	0	0	0	0
360	10.32	18	1.43	3.48	1.43	0.14	0	0	0	0
370	9.83	18	1.36	3.4	1.36	0.14	0	0	0	0
380	9.37	18	1.3	3.32	1.3	0.13	0	0	0	0
390	8.93	18	1.24	3.24	1.24	0.12	0	0	0	0
400	8.51	18	1.19	3.17	1.19	0.12	0	0	0	0
410	8.11	18	1.13	3.1	1.13	0.11	0	0	0	0
420	7.72	18	1.08	3.03	1.08	0.11	0	0	0	0
430	7.36	18	1.04	2.97	1.04	0.1	0	0	0	0

440	7	18	0.99	2.9	0.99	0.1	0	0	0	0
450	6.67	18	0.95	2.84	0.95	0.1	0	0	0	0
460	6.34	18	0.92	2.79	0.92	0.09	0	0	0	0
470	6.03	18	0.88	2.73	0.88	0.09	0	0	0	0
480	5.73	18	0.85	2.68	0.85	0.08	0	0	0	0
490	5.44	18	0.81	2.63	0.81	0.08	0	0	0	0
500	5.17	18	0.78	2.58	0.78	0.08	0	0	0	0
600	2.88	18	0.55	2.17	0.55	0.06	0	0	0	0
700	1.22	18	0.41	1.87	0.41	0.04	0	0	0	0
800	-0.04	18	0.32	1.64	0.32	0.03	0	0	0	0
900	-1.02	18	0.25	1.46	0.25	0.03	0	0	0	0
1000	-1.81	18	0.21	1.32	0.21	0.02	0	0	0	0
1100	-2.46	18	0.17	1.2	0.17	0.02	0	0	0	0
1200	-3	18	0.14	1.1	0.14	0.01	0	0	0	0
1300	-3.46	18	0.12	1.02	0.12	0.01	0	0	0	0
1400	-3.85	18	0.11	0.95	0.11	0.01	0	0	0	0
1500	-4.19	18	0.09	0.88	0.09	0.01	0	0	0	0
1600	-4.49	18	0.08	0.83	0.08	0.01	0	0	0	0
1700	-4.75	18	0.07	0.78	0.07	0.01	0	0	0	0
1800	-4.99	18	0.06	0.74	0.06	0.01	0	0	0	0
1900	-5.2	18	0.06	0.7	0.06	0.01	0	0	0	0
2000	-5.39	18	0.05	0.66	0.05	0.01	0	0	0	0

GSM Cell: BA11007F_A		Power Density		@ Horz Dist
Maximum Power Density:	10.218 $\mu\text{W}/\text{cm}^2$	1.022 % of limit	0.656 ft (0.2 m)	
97.8632 times lower than the MPE limit for an uncontrolled environment				
Power:	222.99 Watts (ERP), 365.703 Watts (EIRP)			

UMTS Cell: UBA11007F_A		Power Density		@ Horz Dist
Maximum Power Density:	0 $\mu\text{W}/\text{cm}^2$	0 % of limit	0 ft (0 m)	
97.8632 times lower than the MPE limit for an uncontrolled environment				
Power:	0 Watts (ERP), 0 Watts (EIRP)			

GSM Cell: BA11007F_B		Power Density		@ Horz Dist
Maximum Power Density:	10.53 $\mu\text{W}/\text{cm}^2$	1.053 % of limit	0.656 ft (0.2 m)	
94.9661 times lower than the MPE limit for an uncontrolled environment				
Power:	229.765 Watts (ERP), 376.815 Watts (EIRP)			

UMTS Cell: UBA11007F_B		Power Density		@ Horz Dist
Maximum Power Density:	0 $\mu\text{W}/\text{cm}^2$	0 % of limit	0 ft (0 m)	
94.9661 times lower than the MPE limit for an uncontrolled environment				
Power:	0 Watts (ERP), 0 Watts (EIRP)			

GSM Cell: BA11007F_C		Power Density		@ Horz Dist
Maximum Power Density:	10.53 $\mu\text{W}/\text{cm}^2$	1.053 % of limit	0.656 ft (0.2 m)	
94.9661 times lower than the MPE limit for an uncontrolled environment				
Power:	229.765 Watts (ERP), 376.815 Watts (EIRP)			

UMTS Cell: UBA11007F_C	Power Density		@ Horz Dist
Maximum Power Density:	0 $\mu\text{W}/\text{cm}^2$	0 % of limit	0 ft (0 m)
94.9661 times lower than the MPE limit for an uncontrolled environment			
Power:	0 Watts (ERP), 0 Watts (EIRP)		

## **RF Field Strength Calculation Methodology**

A generally accepted method is used to calculate the expected RF field strength. The method uses the FCC's recommended equation (*Reference Federal Communication Commission Office of Engineering Technology Bulletin 65*) which predicts field strength on a worst case basis by doubling the predicted field strength.

The power density at any distance from an isotropic antenna is simply the transmitter power  $P_t$  divided by the surface area of a sphere ( $4 \times \text{PI} \times R^2$ ) at that distance. The surface area of the sphere increases by the square of the radius, therefore the power density,  $P_D$  (watts/square meter), decreases by the square of the radius. For a directional antenna with a gain  $G$  (*max radiation intensity of directional antenna / radiation intensity of isotropic antenna with same power input*), the power density at a distant point is the gain of the antenna multiplied by the power density of an isotropic radiator,  $P_D = (P_t \times G_t) / (4 \times \text{PI} \times R^2)$ . This is the basis of the far-field and near-field power density equations used in this report.

The far-field power density equation used here is:

$$S = \frac{2.56 \times N \times 1.64 \times \text{ERP}_{\phi}/\text{chan} \times 10^6}{4 \times \pi \times R^2}$$

Where:

S = power density

2.56 = reflection coefficient

N = number of RF channels

1.64 x ERP $_{\phi}$ /chan = EIRP per channel at the angle for the calculation point

R = horizontal distance to the center of radiation

The far-field power density is then adjusted for any miscellaneous attenuation specified by the engineer.

The near-field power density equation used is:

$$S = \frac{N \times P_{\text{W}}/\text{chan} \times 10^6}{2 \times \pi \times R \times h \times \omega/360}$$

Where:

S = power density

N = number of RF channels

$P_{IN}/chan = \text{Max power input to the antenna per channel} = \text{Max\_ERP}_{ch} / 10^{(\text{Max\_Gain} / 10)}$

R = horizontal distance to the center of radiation

h = vertical aperture of the antenna

$\alpha/360 = 3 \text{ dB horizontal beamwidth of the antenna pattern divided by } 360$

If the antenna aperture is less than 6.56 feet, the near-field power density is multiplied by the aperture height and divided by 6.56. The near-field power density is then multiplied by the cosine of the angle from the horizon to the calculation point. Finally, the power density is adjusted for any miscellaneous attenuation.

Whether the near-field or far-field equation is used depends on the distance formula  $d = 1.28 \times (1.64 \times \text{Antenna Gain}) \times \text{Height of Antenna Aperture} \times (3\text{dB Beamwidth}/360)$ , **note:  $EIRP = 1.64 \times ERP$** . If the distance from the face of the antenna is greater than  $d$  then the lesser result of the near-field and far-field equations is used. If the vertical distance from calculation point to bottom (or top) of the antenna is greater than 0.25 times the aperture height, then the lesser of the near-field / far-field equations is used. Otherwise the near-field value is used. **Note: All lengths are converted from feet to centimeters during calculations.**

#### **Final analysis for Antenna System 1, Cell BA11007F A**

Using **4** channels and a maximum effective radiated power (ERP) of **140.65 Watts** (51.48 dBm), and a downtilt of **8°**, the calculated power density for this site at the nearest controlled access point of **3 ft** (0.91 m) is **10.22  $\mu\text{W}/\text{cm}^2$** . The calculated power density for the site at the nearest uncontrolled access point of **3 ft** (0.91 m) is **10.22  $\mu\text{W}/\text{cm}^2$** . Using this result, the maximum calculated field strength at the nearest accessible point is **1.02%** of the applicable public limit for uncontrolled exposure.

- The 100% FCC general population/uncontrolled exposure minimum distance is **0 ft** (0 m).
- The 100% FCC occupational/controlled exposure minimum distance is **0 ft** (0 m).

#### **Final analysis for Antenna System 1, Cell BA11007F B**

Using **4** channels and a maximum effective radiated power (ERP) of **144.93 Watts** (51.61 dBm), and a downtilt of **7°**, the calculated power density for this site at the nearest controlled access point of **3 ft** (0.91 m) is **10.53  $\mu\text{W}/\text{cm}^2$** . The calculated power density for the site at the nearest uncontrolled access point of **3 ft** (0.91 m) is **10.53  $\mu\text{W}/\text{cm}^2$** . Using this result, the maximum calculated field strength at the nearest accessible point is **1.05%** of the applicable public limit for uncontrolled exposure.

- The 100% FCC general population/uncontrolled exposure minimum distance is **0 ft** (0 m).
- The 100% FCC occupational/controlled exposure minimum distance is **0 ft** (0 m).

#### **Final analysis for Antenna System 1, Cell BA11007F C**

Using **4** channels and a maximum effective radiated power (ERP) of **144.93 Watts** (51.61 dBm), and a downtilt of **9°**, the calculated power density for this site at the nearest controlled access point of **3 ft** (0.91 m) is **10.53  $\mu\text{W}/\text{cm}^2$** . The calculated power density for the site at the nearest uncontrolled access point of **3 ft** (0.91 m) is **10.53  $\mu\text{W}/\text{cm}^2$** .

Using this result, the maximum calculated field strength at the nearest accessible point is **1.05%** of the applicable public limit for uncontrolled exposure.

- The 100% FCC general population/uncontrolled exposure minimum distance is **0 ft** (0 m).
- The 100% FCC occupational/controlled exposure minimum distance is **0 ft** (0 m).

See Table 1 for the FCC's guidelines on Maximum Permissible Exposure (MPE). Note that the RF range referenced for this analysis is the range of 1500 - 100,000 MHz shown in Table 1, which is included in Appendix A.

### **Signage Guidelines**

Due to the type of access for this site, the following signage is required:



Posted at or near the site entrance or rooftop access

### **Exposure Environments**

The FCC guidelines incorporate two separate tiers of exposure limits that are dependant on the situation in which the exposure takes place and/or the status of the individuals who are subject to exposure. The decision as to which tier applies in a given situation should be based on the application of the following definitions.

**Occupational/controlled** exposure limits apply to situations in which persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully aware of the potential for exposure and can exercise control over their exposure. Occupational/controlled exposure limits also apply where exposure is of a transient nature as a result of incidental passage through a location where exposure levels may be above general population/uncontrolled limits (see below) as long as the exposed

person has been made fully aware of the potential for exposure and can exercise control over his/her exposure by leaving the area or by some other appropriate means.

**General population/uncontrolled** exposure limits apply to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general public always fall under this category when exposure is not employment-related.

For purposes of applying these definitions, awareness of the potential for RF exposure in a workplace or similar environment can be provided through specific training as part of a RF safety program. Warning signs and labels can also be used to establish such awareness as long as they provide information, in a prominent manner, on risk of potential exposure and instructions on methods to minimize such exposure risk.

For example, a sign warning of RF exposure risk and indicating that individuals should not remain in the area for more than a certain period of time could be acceptable.

Another important point to remember concerning the FCC's exposure guidelines is that they constitute **exposure** limits (not **emission** limits), and they are relevant only to locations that are **accessible** to workers or members of the public. Such access can be restricted or controlled by appropriate means such as the use of fences, warning signs, etc., as noted above. For the case of occupational/controlled exposure, procedures can be instituted for working in the vicinity of RF sources that will prevent exposures in excess of the guidelines. An example of such procedures would be restricting the time an individual could be near an RF source or requiring that work on or near such sources be performed while the transmitter is turned off or while power is appropriately reduced.

Signed: \_\_\_\_\_

Date: *Thursday, August 26, 2010*

## Appendix A

### Term Definitions

**GSM** – Global System for Mobile communications is the most popular standard for mobile phones in the world. Its promoter, the GSM Association, estimates that 82% of the global mobile market uses the standard. GSM is used by over 2 billion people across more than 212 countries and territories. Its ubiquity makes international roaming very common between mobile phone operators, enabling subscribers to use their phones in many parts of the world. GSM differs from its predecessors in that both signaling and speech channels are digital call quality, and so is considered a second generation (2G) mobile phone system. This has also meant that data communication were built into the system using the 3rd Generation Partnership Project (3GPP).

**UMTS** – Universal Mobile Telecommunications System is one of the third-generation (3G) cell phone technologies. Currently, the most common form of UMTS uses W-CDMA as the underlying air interface. It is standardized by the 3GPP, and is the European answer to the ITU IMT-2000 requirements for 3G cellular radio systems.

**Isotropic Antenna** – a theoretical point source of waves which exhibits the same magnitude or properties when measured in all directions. It has no preferred direction of radiation. It radiates uniformly in all directions over a sphere centred on the source. It is a reference radiator with which other sources are compared.

**Exposure** – Exposure occurs whenever and wherever a person is subjected to electric, magnetic or electromagnetic fields other than those originating from physiological processes in the body and other natural phenomena.

**Exposure, partial body** – Partial-body exposure results when RF fields are substantially non-uniform over the body. Fields that are non-uniform over volumes comparable to the human body may occur due to highly directional sources, standing-waves, re-radiating sources or in the near field.

**General population/uncontrolled exposure** – For FCC purposes, applies to human exposure RF fields when the general public is exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general public always fall under this category when exposure is not employment-related.

**Maximum permissible exposure (MPE)** – The rms and peak electric and magnetic field strength, their squares, or the plane-wave equivalent power densities associated with these fields to which a person may be exposed without harmful effect and with an acceptable safety factor.

**Occupational/controlled exposure** – For FCC purposes, applies to human exposure to RF fields when persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully aware of the potential for exposure and can exercise control over their exposure. Occupational/controlled exposure limits also apply where exposure is of a transient nature as a result of incidental passage through a location where exposure levels may be above general population/uncontrolled limits (see definition above), as long as the exposed person has been made fully aware of the potential for exposure and can exercise control over his/her exposure by leaving the area or by some other appropriate means.

## **Appendix B**

### **Collocation Sites**

Special rules apply at sites with multiple transmitters on buildings. Regardless of the categorical exemption rules detailed about for single carriers, if a T-Mobile, USA site's emissions:

1. are more than 5% above the emissions limits in an "accessible area;" and
2. contribute at least 5% of all the emissions at any site which together result in an overall effect of more than 100% of the emission limits then we, and each carrier meeting this definition, are individually and collectively responsible for compliance. The FCC expects each carrier to make a good faith effort to consider emissions from other carriers and make the determination.

That said, the FCC Office of Engineering and Technology has supported the following exception:

- Within a controlled environment at a multi-transmitter site, if a carrier can physically elevate its antenna so that, as a practical matter, the volume of space where the RF field exceeds 5 percent of the controlled environments limits in Table of Section 1.1310 is 2 meters or more above any rooftop walkways (i.e., the volume where the fields exceed 5 percent of the limit are practically inaccessible), that carriers would be relieved of any responsibility for ensuring compliance of all transmitters at the site. This assumes, of course, that the carrier does not exceed 5 percent of the general public exposure limit in any uncontrolled areas.

Regulatory Compliance recommends conducting the routine environmental analysis whenever collocating on a rooftop. Although the need for analysis usually arises when we are first installing equipment or upgrading a site, we are responsible for total emissions at the site even when a new carrier collocates at our existing site. If after the analysis, the total emissions exceed 100% of the limit, all carriers on the site should be contacted to work out a joint solution to the problem [however, if the last carrier pushes the site over the limit, there is support in the rules that the last carrier should bear the burden of addressing compliance].

### **Professionally Managed Sites**

As noted above, the carrier is always responsible for the RF compliance of its equipment. The FCC OET, however, does realize that some site managers undertake the responsibility for RF compliance (and that carriers likewise may rely on consultants to document compliance. The OET has stated that:

- As with other licensee responsibilities, while ultimate responsibility for compliance rests with the licensee, compliance with the RF exposure regulations can be delegated to specialized consultants, site managers, or specific individuals within a company, and, as long as the delegation itself is reasonable a licensee may certify compliance on the basis of the delegate's report.

In either case, a copy of the site manager or RF consultant's report should be maintained in the site file.

### **Table 1. LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)**

(A) Limits for Occupational/Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm <sup>2</sup> )	Averaging Time [E <sup>2</sup> , H <sup>2</sup> or S (minutes)]
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	(900/f <sup>2</sup> )*	6
30-300	61.4	0.163	1.0	6
300-1500	--	--	f/300	6
1500-100,000	--	--	5	6

(B) Limits for General Population/Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm <sup>2</sup> )	Averaging Time [E <sup>2</sup> , H <sup>2</sup> or S (minutes)]
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f <sup>2</sup> )*	30
30-300	27.5	0.073	0.2	30
300-1500	--	--	f/1500	30
1500-100,000	--	--	1.0	30

f = frequency in MHz

\*Plane-wave equivalent power density

NOTE 1: **Occupational/controlled** limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he/she is made aware of the potential for exposure.

NOTE 2: **General population/uncontrolled** exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or can not exercise control over their exposure.

[Home](#) | [T-Mobile Regulatory Compliance Page](#) | [FCC Office of Engineering & Technology](#)

[Home](#) | [MPE Home](#) | [New Analysis](#) | [Print](#) | [Save to Word](#) | [Search](#) | [Edit](#)

---

**Sound Prediction Report**  
*"Hidden Valley Park"*  
*T-Mobile Site No. BA11007*



Background: T-Mobile contracted an acoustical engineer to record sound levels at an existing telecommunication site located at the Windemere Parkway Fire Station, Contra Costa County, California. The measured levels are listed in the following table.

<b>Measured Sound Levels</b>		
<i>Location</i>	<i>Sound level with fan running and air conditioner off</i>	<i>Sound level with air conditioner running</i>
Ericsson 2000 Series Cabinet	61.2 dB(A)	74.2 dB(A)

Based upon these measurements the following estimates were made for up to four Ericsson equipment cabinets.

<b>Predicted sound contribution at various distances from the proposed equipment</b>		
<i>Location</i>	<i>Sound level with all fans running and air conditioners off</i>	<i>Sound level with all air conditioners running</i>
20' from proposed equipment	41.2 dB(A)	54.2dB(A)
32' from proposed equipment	37.1 dB(A)	50.1dB(A)
40' from proposed equipment	35.2 dB(A)	48.2 dB(A)
60' from proposed equipment	31.6 dB(A)	44.6 dB(A)

The closest residence to the project site for T-Mobiles proposed BA 11007 site is approximately 25' from the location of the proposed equipment cabinets.

<b>Environmental Noise</b>	
Weakest sound heard	0dB
Normal conversation (3-5')	60-70dB
Telephone dial tone	80dB
City Traffic (inside car)	85dB
Train whistle at 500'	90dB
Subway train at 200'	95dB
<i>Level at which sustained exposure may result in hearing loss</i>	<i>90 - 95dB</i>
Power mower	107dB
Power saw	110dB
<i>Pain begins</i>	<i>125dB</i>
Pneumatic riveter at 4'	125dB
Jet engine at 100'	140dB
Death of hearing tissue	180dB
Loudest sound possible	194dB

<b>OSHA Daily Permissible Noise Level Exposure</b>	
Hours per day	Sound level
8	90dB
6	92dB
4	95dB
3	97dB
2	100dB
1.5	102dB
1	105dB
.5	110dB
.25 or less	115dB

<b>Perceptions of Increases in Decibel Level</b>	
Imperceptible Change	1dB
Barely Perceptible Change	3dB
Clearly Noticeable Change	5dB
About Twice as Loud	10dB
About Four Times as Loud	20dB

<b>Sound Levels of Music</b>	
Normal piano practice	60 -70dB

Fortissimo Singer, 3'	70dB
Chamber music, small auditorium	75 - 85dB
Piano Fortissimo	84 - 103dB
Violin	82 - 92dB
Cello	85 - 111dB
Oboe	95-112dB
Flute	92 - 103dB
Piccolo	90 - 106dB
Clarinet	85 - 114dB
French horn	90 - 106dB
Trombone	85 - 114dB
Tympani & bass drum	106dB
Walkman on 5/10	94dB
Symphonic music peak	120 - 137dB
Amplifier rock, 4-6'	120dB
Rock music peak	150dB

RECEIVED  
AUG 31 2010  
COMMUNITY DEV. DEPT.

### Acoustic Dispersion, Heat Exchanger

The cabinet noise dispersion for an RBS 2106 with Heat Exchanger Climate Unit is shown in the two figures below. The figures show the noise dispersion generated by a free-standing cabinet, and by a cabinet mounted against a wall.

**Note:** The acoustic noise dispersion values for a free-standing cabinet and a cabinet installed against a wall were tested according to the ISO 9614-2 standard. Deviations from these values can occur depending on the materials used in the environment where the cabinet is installed. Objects near the cabinet can reflect or absorb sound and thus affect acoustic dispersion.

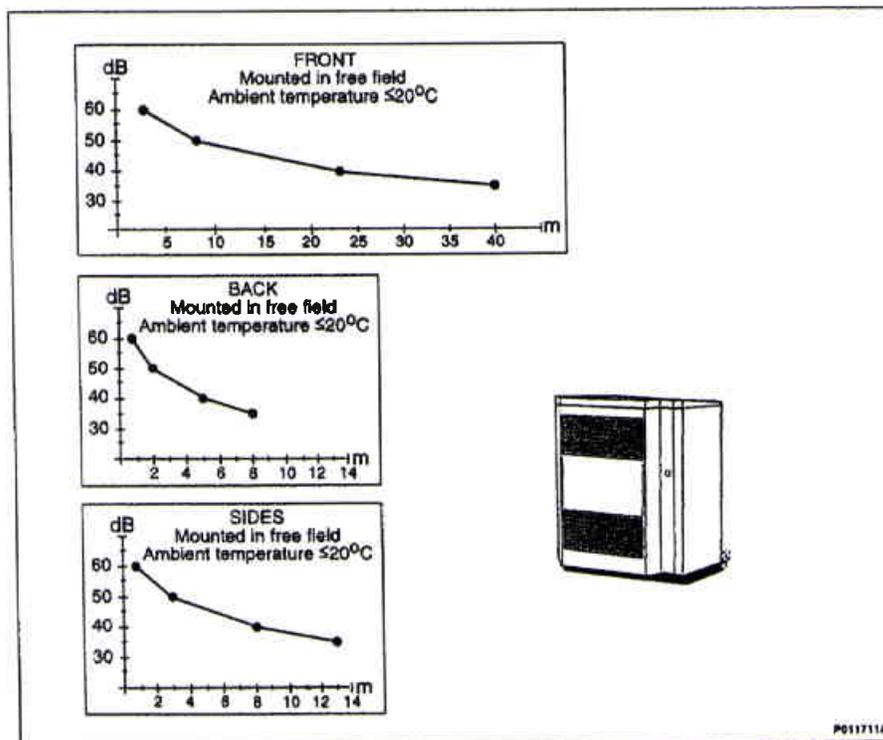


Figure 5 Acoustic Dispersion for a Free-standing RBS 2106 with Heat Exchanger Climate Unit

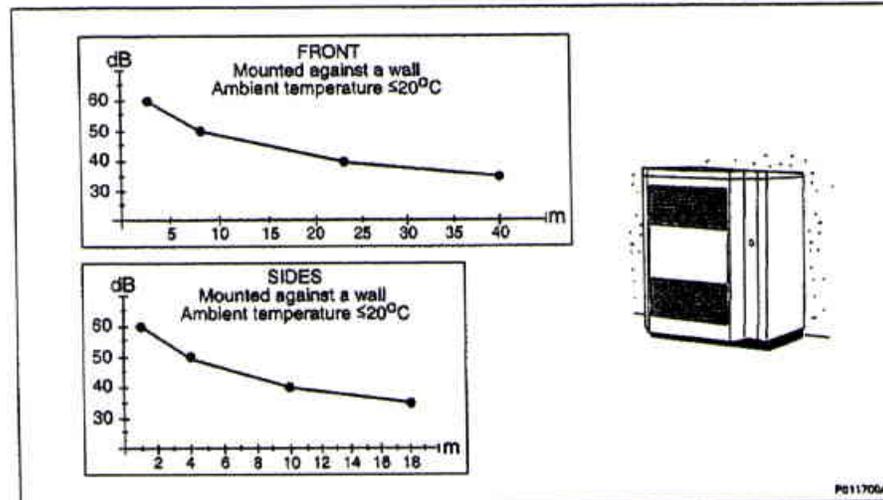


Figure 6 Acoustic Dispersion for a Wall-mounted RBS 2106 with Heat Exchanger Climate Unit

#### Acoustic Dispersion, Combined Climate Unit

The cabinet noise dispersion for an RBS 2106 with Combined Climate Unit is shown in the two figures below. The figures show the noise dispersion generated by a free-standing cabinet and by a cabinet mounted against a wall.

**Note:** The acoustic noise dispersion values for a free-standing cabinet and a cabinet installed against a wall were tested according to the ISO 9614-2 standard. Deviations from these values can occur depending on the materials used in the environment where the cabinet is installed. Objects near the cabinet can reflect or absorb sound and thus affect acoustic dispersion.

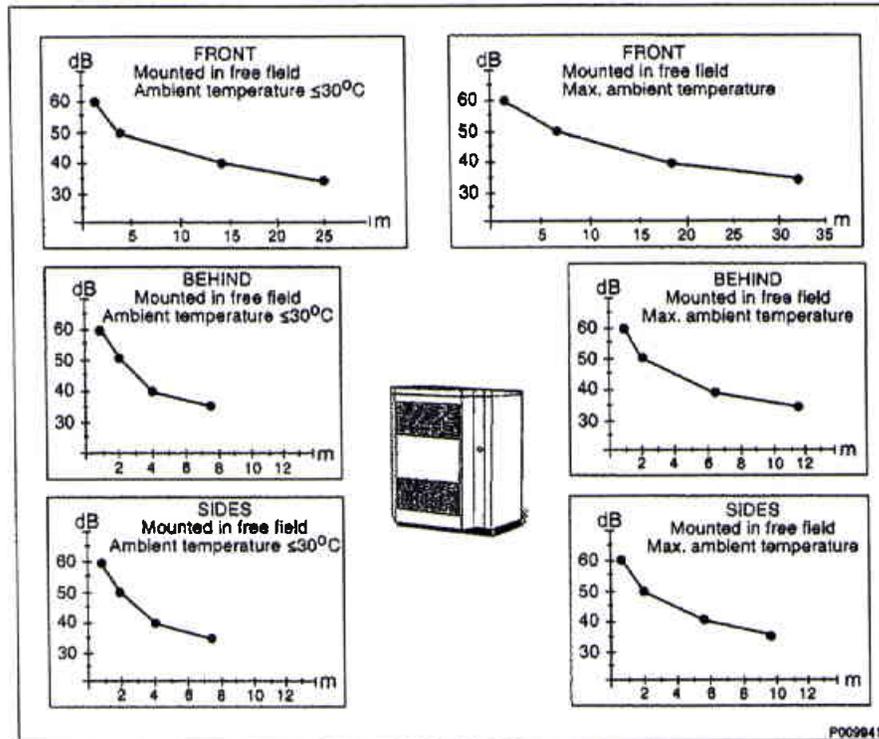


Figure 7 Acoustic Dispersion for a Free-standing RBS 2106 with Combined Climate Unit

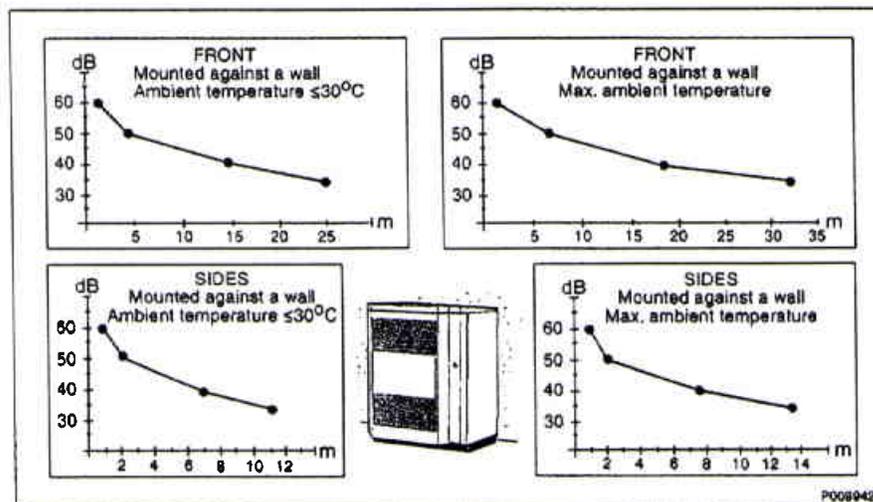


Figure 8 Acoustic Dispersion for a Wall-mounted RBS 2106 with Combined Climate Unit