



STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@po.state.ct.us
Web Site: www.state.ct.us/csc/index.htm

October 8, 2002

Christopher B. Fisher, Esq.
Cuddy & Feder & Worby LLP
90 Maple Avenue
White Plains, NY 10601-5196

RE: **EM-AT&T-076-020927** - AT&T Wireless notice of intent to modify an existing telecommunications facility located at 135 New Road, Madison, Connecticut.

Dear Attorney Fisher:


At a public meeting held on October 7, 2002, the Connecticut Siting Council (Council) acknowledged your notice to modify this existing telecommunications facility, pursuant to Section 16-50j-73 of the Regulations of Connecticut State Agencies with the condition that the tower be reinforced according to the recommendations of H.E. Bergeron Engineers and that a professional engineer certify the successful completion of these reinforcements to the Council.

The proposed modifications are to be implemented as specified here and in your notice received in our office on September 27, 2002. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility site that would not increase tower height, extend the boundaries of the tower site, increase noise levels at the tower site boundary by six decibels, and increase the total radio frequencies electromagnetic radiation power density measured at the tower site boundary to or above the standard adopted by the State Department of Environmental Protection pursuant to General Statutes § 22a-162. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower.

This decision is under the exclusive jurisdiction of the Council. Any additional change to this facility will require explicit notice to this agency pursuant to Regulations of Connecticut State Agencies Section 16-50j-73. Such notice shall include all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65. Any deviation from this format may result in the Council implementing enforcement proceedings pursuant to General Statutes § 16-50u including, without limitation, imposition of expenses resulting from such failure and of civil penalties in an amount not less than one thousand dollars per day for each day of construction or operation in material violation.

Thank you for your attention and cooperation.

Very truly yours,

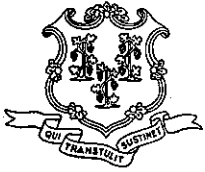

Merrimer A. Gelston
Chairman

MAG/laf

c: Honorable Thomas S. Scarpati, First Selectman, Town of Madison
Marilyn M. Ozols, Planning & Zoning Administrator, Town of Madison
Salvatore Giuliano, Manager of Real Estate and Planning, The Connecticut Light & Power Co.
Julie Donaldson Kohler, Esq., Hurwitz & Sagarin LLC
Stephen J. Humes, Esq., LeBoeuf, Lamb, Greene & MacRae

EM-AT&T-076-020927
135 New Road
Madison 10/3/02





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September 27, 2002

Honorable Thomas S. Scarpati
First Selectman
Town of Madison
Madison Town Campus
8 Campus Drive
Madison, CT 06443-2563

RE: **EM-AT&T-076-020927** - AT&T Wireless notice of intent to modify an existing telecommunications facility located at 135 New Road, Madison, Connecticut.

Dear Mr. Scarpati:

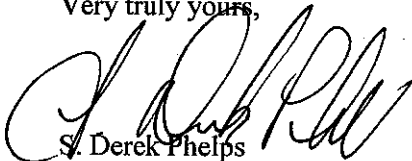
The Connecticut Siting Council (Council) received this request to modify an existing telecommunications facility, pursuant to Regulations of Connecticut State Agencies Section 16-50j-72.

The Council will consider this item at the next meeting tentatively scheduled for October 7, 2002, at 1:30 p.m. in Hearing Room One, Ten Franklin Square, New Britain, Connecticut.

Please call me or inform the Council if you have any questions or comments regarding this proposal.

Thank you for your cooperation and consideration.

Very truly yours,



S. Derek Phelps
Executive Director

SDP/slm

Enclosure: Notice of Intent

c: Marilyn M. Ozols, Planning & Zoning Administrator, Town of Madison

**NOTICE OF INTENT TO MODIFY AN
EXISTING TELECOMMUNICATIONS FACILITY AT
135 NEW ROAD, MADISON, CONNECTICUT**

RECEIVED

SEP 27 2002

CONNECTICUT
SITING COUNCIL

Pursuant to the Public Utility Environmental Standards Act, Connecticut General Statutes § 16-50g et. seq. ("PUESA"), and Sections 16-50j-72(b) of the Regulations of Connecticut State Agencies adopted pursuant to the PUESA, AT&T Wireless PCS, LLC, by and through its agent AT&T Wireless PCS, Inc., ("AT&T Wireless") hereby notifies the Connecticut Siting Council of its intent to modify an existing facility located at 135 New Road, Madison, Connecticut (the "New Road Facility"), owned by Connecticut Light & Power Company ("CL&P"). AT&T Wireless and CL&P have agreed to share the use of the New Road Facility, as detailed below.

The New Road Facility

The New Road Facility consists of an approximately one hundred eighty (180) foot guyed lattice tower (the "Tower") and associated equipment currently being used for communications by Sprint, Omnipoint and others. A chain link fence surrounds the Tower compound. The surrounding land uses are predominantly residential.

AT&T Wireless' Facility

As shown on the enclosed plans prepared by URS Corporation, including a site plan, equipment layout and tower elevation AT&T Wireless proposes installing six panel antennas at the 77'-6" foot level of the existing 180 foot CL&P lattice tower and associated unmanned equipment cabinets (2 proposed, 2 future, each 76"H x 30" W x 30" D) on a concrete pad in the reconfigured fenced compound within the existing site boundaries. The existing gravel access drive will be relocated to provide access to the facility for construction activities and routine maintenance. As evidenced on page 5 of a structural report prepared by H.E. Bergeron Engineers, PA, annexed hereto as Exhibit B, reinforcement of the tower will be required to accommodate the additional proposed loading. Reinforcement will include additional bracing, guys and other work to be implemented by AT&T.

AT&T Wireless' Facility Constitutes An Exempt Modification

The proposed addition of AT&T Wireless' antennas and equipment to the New Road Facility constitutes an exempt "modification" of an existing facility as defined in Connecticut General Statutes Section 16-50i(d) and Council regulations promulgated pursuant thereto. Addition of AT&T Wireless' antennas and equipment to the Tower will not result in an increase of the Tower's height nor extend the site boundaries. Further, there will be no increase in noise levels by six (6) decibels or more at the Tower site's boundary. As set forth in an Emissions Report prepared by Nader Soliman, Radio Frequency Engineer, annexed hereto as Exhibit C, the total radio frequency electromagnetic radiation power density at the Tower site's boundary will not

be increased to or above the standard adopted by the Connecticut Department of Environmental Protection as set forth in Section 22a-162 of the Connecticut General Statutes and MPE limits established by the Federal Communications Commission. For all the foregoing reasons, addition of AT&T Wireless' facility to the Tower constitutes an exempt modification which will not have a substantially adverse environmental effect.

Conclusion

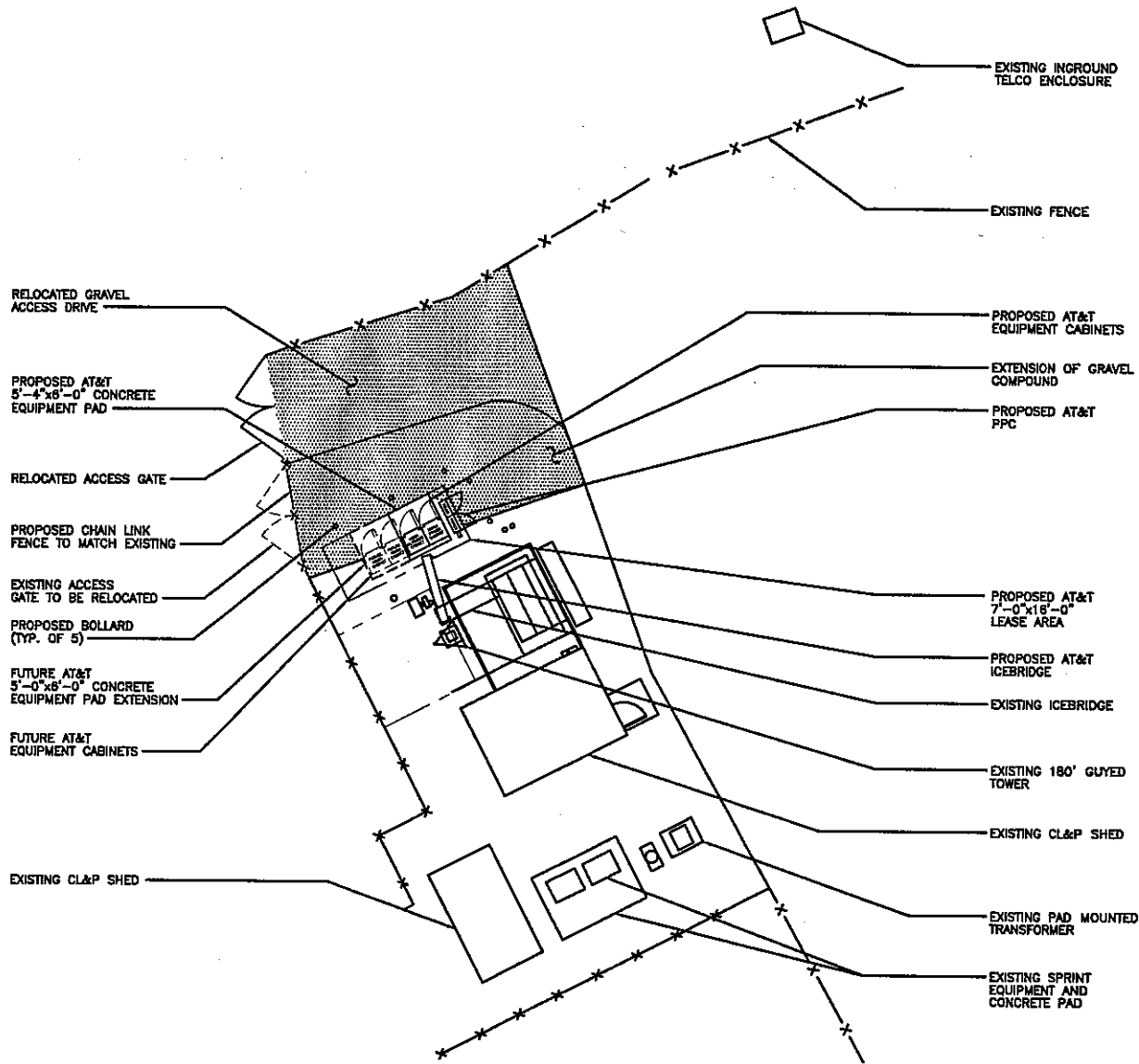
Accordingly, AT&T Wireless requests that the Connecticut Siting Council acknowledge that its proposed modification to the New Road Facility meets the Council's exemption criteria.

Respectfully Submitted,



Christopher B. Fisher, Esq.
On behalf of AT&T Wireless

cc: First Selectman, Town of Madison
RJ Wetzel, Bechtel



1 COMPOUND PLAN
SC-1 SCALE: 1" = 20'-0"



ISSUED FOR SITING COUNCIL

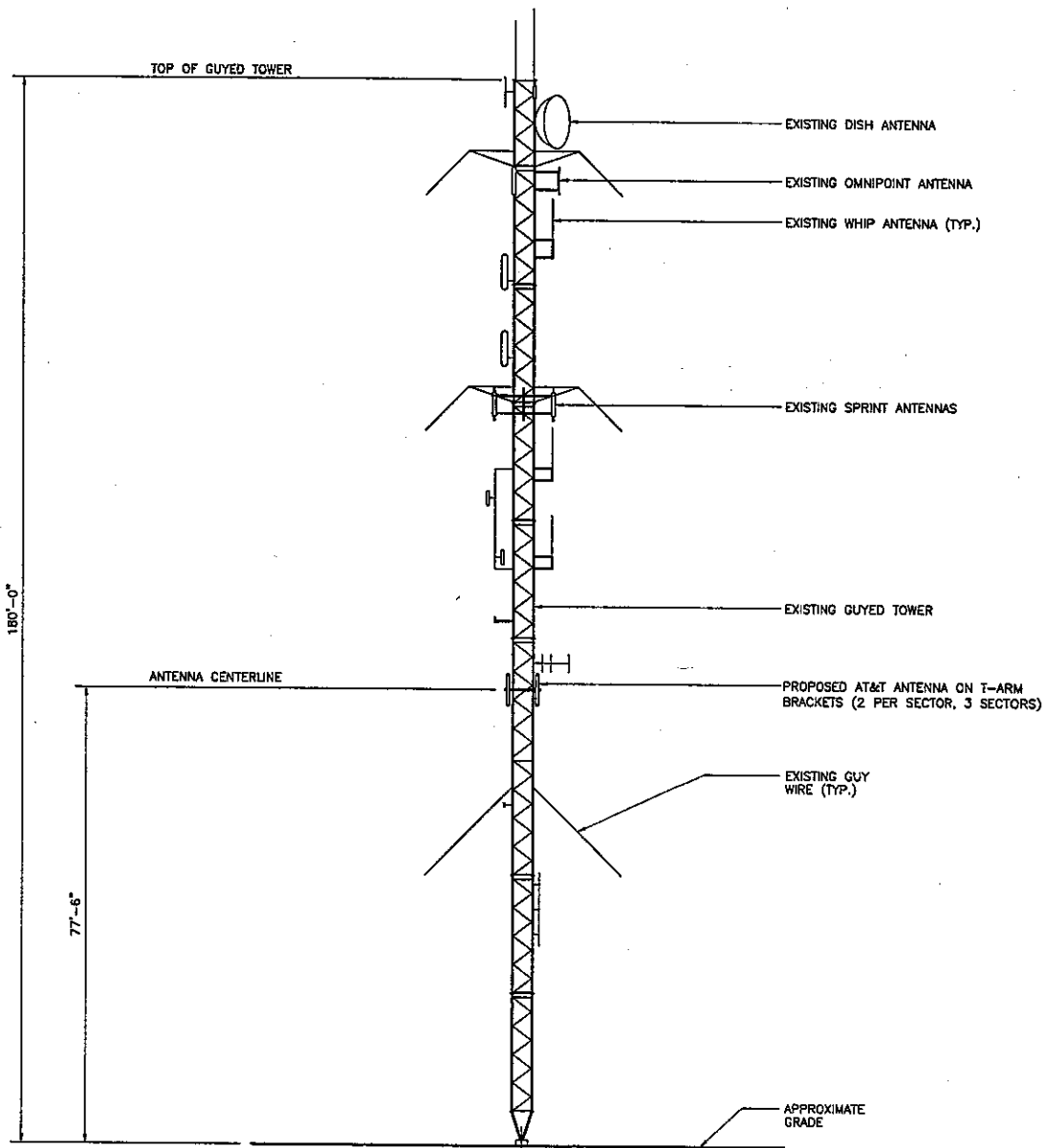
LATITUDE: 41.29312" (NAD 83)
LONGITUDE: 71.57837" (NAD 83)

DRAWING TITLE: 907-007-206A-SC1	
REVISION NO. 1	DRAWN BY: KJB
DATE ISSUED: 06/27/02	CHECKED BY: JCF
SCALE: AS NOTED	APPROVED BY:
	SHEET NO. 1 OF 2
URS JOB NO.: F301924.36	

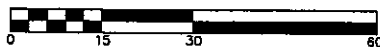
URS
URS CORPORATION-AES
795 BROOK STREET, BLDG 5
ROCKY HILL, CT. 06067
1-(860)-529-6882
1-(860)-529-5566 (FAX)

 **AT&T**
AT&T WIRELESS PCS LLC
12 OMEGA DRIVE
STAMFORD, CONNECTICUT 05902

DRAWING TITLE:
COMPOUND PLAN
PROJECT INFORMATION:
MADISON CL&P TOWER
CT-206
135 NEW ROAD
MADISON, CONNECTICUT
PROPERTY OWNER:
CONNECTICUT LIGHT AND POWER
PO BOX 2010
HARTFORD, CONNECTICUT 06101



1 TOWER ELEVATION
 SC-2 SCALE: 1" = 30'-0"



ISSUED FOR SITING COUNCIL

LATITUDE: 41.29312' (NAD 83)
 LONGITUDE: 71.57837' (NAD 83)

URS
 URS CORPORATION-AES
 795 BROOK STREET, BLDG 5
 ROCKY HILL, CT. 06067
 1-(860)-529-8882
 1-(860)-529-5568 (FAX)

 **AT&T**
 AT&T WIRELESS PCS LLC
 12 OMEGA DRIVE
 STAMFORD, CONNECTICUT 06902

DRAWING TITLE: COMPOUND PLAN
PROJECT INFORMATION: MADISON CL&P TOWER
 CT-206
 135 NEW ROAD
 MADISON, CONNECTICUT
PROPERTY OWNER: CONNECTICUT LIGHT AND POWER
 PO BOX 2010
 HARTFORD, CONNECTICUT 06101

DRAWING TITLE:	
907-007-206A-SC2	
REVISION NO. 1	DRAWN BY: KJB
DATE ISSUED: 06/27/02	CHECKED BY: JCF
SCALE: AS NOTED	APPROVED BY:
	SHEET NO. 2 OF 2
URS JOB NO.: F301924.36	



**Northeast
Utilities System**

107 Selden Street, Berlin, CT 06037

Northeast Utilities Service Company
P.O. Box 270
Hartford, CT 06141-0270
(860) 665-5000

September 19, 2002

Mr. Harold Hewett
Site Acquisition
Bechtel Telecommunications
AT&T Wireless Project-Connecticut Market
210 Pomeroy Avenue
Meriden, CT 06450

Re: Site Permitting Authorization
Madison Telecommunications Site (AWS Site CT-206)

Dear Mr. Hewett:

Authorization is hereby given to AT&T Wireless Services (AT&T), its employees and its duly authorized agents and independent contractors (hereinafter collectively referred to as "AT&T"), to apply for any and all local municipal, state and federal licenses, permits and approvals, including but not limited to Connecticut Siting Council, building permits, zoning variances, zoning special exceptions, site plan and subdivision approvals, driveway, wetlands and terrain alteration permits, which are or may be necessary or required for AT&T to construct, operate and maintain a wireless communications system (PCS System), and/or antenna site on the following property over which The Connecticut Light & Power Company (CL&P) has easement rights:

CL&P Structure #CT-206
135 New Road
Madison, Connecticut

The foregoing authorization is given subject to the following conditions:

1. This authorization shall be nonexclusive. Nothing herein shall prevent or restrict CL&P from authorizing any other person or entity to apply for any similar licenses, permits or approvals to construct, operate and maintain any other communication system or facility of any type on the property at any time.
2. This authorization shall not obligate CL&P to pay for or reimburse any costs or expenses or to provide any assistance of any kind in connection with any applications, or bind or obligate CL&P to agree or be responsible for any on-site or off-site improvements, development restrictions, impact fees or assessments, capital improvement charges, bonds or other security, or any other fee, assessment, charge or expense imposed or required as a condition of any license, permit or approval. AT&T shall be solely and fully responsible for all fees, charges costs and expenses of any kind in connection with any applications. CL&P agrees to reasonably cooperate with AT&T in signing such applications or other similar documents as may be required in order for AT&T to apply for any license, permit or approval.
3. This authorization shall not be deemed or construed to grant or transfer to AT&T any interest in the property, whatsoever, and shall not in any respect obligate or require CL&P to sell, lease or license the Property to AT&T or otherwise allow AT&T to use or occupy the property for any purpose,

regardless of whether any licenses, permits and approvals applied for by AT&T for the property are granted. AT&T understands and acknowledges that any and all applications filed by AT&T for the property at AT&T's sole risk and without any enforceable expectation that the property will be made available for AT&T's use.

- 4. AT&T shall be required to supply to CL&P, free of charge and contemporaneous with AT&T's filing of same, a complete copy of any and all applications, plans, reports and other public filings made by AT&T with any local, municipal, state or federal governmental or regulatory officer, agency board, bureau, commission or other person or body for any licenses, permits or approvals for the property, and to keep CL&P fully informed on a regular basis of the status of AT&T's applications.
- 5. This authorization shall automatically expire six (6) months after the date of this letter, unless extended in writing by mutual agreement of CL&P and AT&T.

Very truly yours,



Salvatore Giuliano, Manager
Real Estate and Land Planning

AGREED TO ON BEHALF OF AT&T Wireless Services

By: Harold Hewitt *Harold Hewitt, Bachel Eng.*
Duly Authorized *AGENT OF AT&T WIRELESS*

Date: 9/19/02

H. E. Bergeron Engineers

• Civil • Structural • Land Surveying



P.O. Box 440
2605 White Mountain Highway
North Conway, NH 03860
(603) 356-6936
(603) 356-7715 (fax)



65 W. Commercial Street
Portland, ME 04101
(207) 780-1100
(207) 780-1101 (fax)
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BECHTEL ID#: 907-007-206

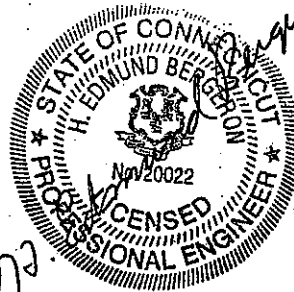
AWS ID#: NYNYCT2269

HEB

**STRUCTURAL ANALYSIS REPORT
OF
180' ROHN 80 GUYED TOWER
MADISON, CONNECTICUT**

Prepared for URS Corporation
Project #F300001924.36
AT&T Site #CT-206

August 21, 2002



Prepared by:

H. E. Bergeron Engineers, P.A.
P.O. Box 440, 2605 White Mountain Highway
North Conway, NH 03860
HEB Project No. 97058C-005

RECEIVED
SEP 06 2002

BY: 

HEB

STRUCTURAL ANALYSIS REPORT
of
NORTHEAST UTILITIES'
180' ROHN 80 GUYED TOWER
MADISON, CONNECTICUT
prepared for
URS Corporation - Project # F30001924.36
AT&T Site #CT - 206

EXECUTIVE SUMMARY:

H. E. Bergeron Engineers, P.A. (HEB) performed a structural analysis of this 180-foot ROHN 80 guyed tower. The analysis was performed with the proposed addition of six ALLGON 7250.03 panel antennas at the 77.5 foot elevation. Each antenna will be fed by two runs of 1¼" coaxial cabling. The future loading of 16 panels for Metricom was not included in this analysis.

Our analysis indicates the existing tower is *not* capable of supporting the proposed loading without performing the upgrades specified in HEB's report dated January 21, 2002. While the tower leg members are capable of supporting the proposed antennas, the bracing and bolts from the 60-foot to 80-foot elevation and the 100-foot to 140-foot elevation are overstressed and need to be upgraded. The guy cables at the 128-foot elevation are undersized and do not meet the 2.0 safety factor required by EIA.

INTRODUCTION & PURPOSE:

Structural analysis of this 180-foot communications tower was performed by H. E. Bergeron Engineers, P.A. (HEB) for URS Corporation. The tower is located off New Road in Madison, Connecticut. The tower was previously climbed and inspected by Robert E. Adair, P.E. and Albert L. Hall, E.I.T. on May 12, 1997, and compared dimensionally with assembly drawings provided to HEB.

The structure is a 180-foot, three-legged, Model 80 guyed tower manufactured by UNR-ROHN. It currently supports multiple whip, dipole, yagi, and panel antennas, a GPS antenna, and one microwave dish antenna. A list of antennas is provided on the antenna page in the Appendix B calculations. According to information supplied by URS Corporation, the analysis was performed with six ALLGON 7250.03 panels mounted on three small boom mounts with a 4-foot horizontal separation at the 77.5-foot elevation.

HEB

STRUCTURAL ANALYSIS:

Methodology:

The structural analysis was done in accordance with TIA/EIA-222-F (EIA), Structural Standards for Steel Antenna Towers and Antenna Supporting Structures; the American Institute of Steel Construction (AISC), Manual of Steel Construction, Allowable Stress Design, Ninth Edition; and Northeast Utilities' (NU) General Guidelines for Communications Antennas Proposed on Telecommunications Towers.

The analysis was conducted by applying a wind load of 85 miles per hour. The TIA/EIA Standard requires a minimum of 85-mph wind load for New Haven County, Connecticut.

A combination of two analytical methods were used to evaluate the structure: a two-dimensional model using spreadsheet programs developed by HEB, and a three-dimensional analysis using CSTRAD finite element software distributed by ECOM Associates. The HEB 2-D model was used to generate dead loads of the tower and all of its appurtenances, and the resultant wind loading.

Loads generated in the 2-D model were input into the CSTRAD program to calculate movement of the structure under load and to evaluate maximum axial loads and bending moments. The maximum bending moments and axial loads were used to calculate stresses on tower leg members and on the tower mast as a unit, which were compared to allowable stresses according to AISC and TIA/EIA. Calculated twist (rotation) and sway (deflection) values were compared to maximum allowable values of 1.0 degrees specified by NU. The analysis of this structure is conservative in that a P-Delta analysis (load induced with deflection) was performed, which is not required by EIA for guyed towers.

The TIA/EIA standard permits a one-third increase in allowable stresses for towers less than 700-feet tall. Allowable stresses of tower members were increased by one-third in computing the load capacity values indicated herein.

ANALYSIS RESULTS:

Our analysis determined the tower will **not** support the proposed antennae under its current configuration. Our analysis used yield strengths of 50 ksi for leg members, 36 ksi for angle bracing and plate members, and 36 ksi for tube steel bracing. Splice and bracing bolts are ASTM A325 bolts. The bracing bolts are undersized from the 60-foot elevation to the 80-foot elevation and the 100-foot to 140-foot elevations. The

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existing $\frac{1}{2}$ " bolts need to be upgraded to $\frac{3}{4}$ " bolts to support the proposed loading. Supporting calculations are provided in Appendix B.

Leg Members:

The leg members are comprised of $2\frac{1}{2}$ " standard steel pipe. Leg members were calculated to be adequately-sized to support maximum compressive stresses induced by the proposed loading

Bracing Members:

The tower supports two types of diagonal bracing. From 120' to 140' and 160' to 180', the tower is braced with $1\frac{1}{2}$ " x $1\frac{1}{2}$ " x $\frac{3}{16}$ " angle steel cross-bracing and from 0' to 120' and 140' to 160' with $1\frac{1}{2}$ " OD, 16 gauge tubing. Most bracing members were found to be adequately-sized to support calculated compressive stresses, however bracing members from 60' to 80' and 100' to 140' are overstressed under the proposed loading. To accommodate the proposed loading, the overstressed members from 60-80 feet and 100-120 feet need to be replaced with $\frac{1}{4}$ " Schedule 40 (standard pipe) and the members from 120-140 feet need to be replaced with $1\frac{1}{2}$ " x $1\frac{1}{2}$ " x $\frac{1}{4}$ " angles.

Bracing Bolts:

Bracing bolts, which are $\frac{1}{2}$ " diameter A325 bolts, have a capacity of 5.49 kips (bearing-type connection with threads included in shear plane; standard round holes; $\frac{1}{3}$ increase in allowable stresses per EIA). Bracing bolts from 40' to 80' and 100' to 140' were calculated to be inadequately-sized for the proposed loads on the tower. To accommodate the proposed loading, the overstressed bolts must be replaced with $\frac{3}{4}$ " diameter A325 bolts, which have a capacity of 12.4 kips.

Guy Cables:

Guy sizes were obtained from ROHN as-built drawing number C-760842. The guy cables extending from the top torque arm at 168' are $\frac{1}{2}$ " diameter EHS cable. The guy cables extending from the bottom torque arm at 128' and from the 60' elevation are $\frac{9}{16}$ " diameter EHS cable. HEB calculated the maximum guy tension under the proposed loading to be 6.7 kips for the $\frac{1}{2}$ " guy cables. The published breaking strength of $\frac{1}{2}$ " EHS cable is 26.9 kips. The maximum guy tension for the $\frac{9}{16}$ " guy cables was calculated to be 18.7 kips. The published breaking strength of $\frac{9}{16}$ " EHS cable is 35 kips. TIA/EIA-222-F Paragraph 8.2.1 requires that the safety factor of guys and their connections shall not be less than 2.0 for structures under 700' in height. The $\frac{9}{16}$ " guy cables at the 128-foot elevation do not meet the required safety factor under the proposed loading, and therefore must be replaced with $\frac{5}{8}$ " diameter

HEB

EHS cable. The existing ½" guy cables do meet the required safety factor under the proposed loading.

Twist:

HEB calculates twist and sway by using AutoCAD drawing software to graphically plot CSTRAAD nodal displacements at the noted elevation. The displaced structure is compared to the undeformed shape to measure horizontal and angular movement. Two wind directions were evaluated to determine the worst case conditions: first with wind blowing perpendicular to one tower face, and second with wind blowing parallel to one tower face.

Maximum twist (rotation) was calculated under proposed conditions with 85 mph and no ice at the 9-foot microwave dish at the 173-foot elevation. Twist was calculated to be approximately 0.06 degrees with the proposed antennas, which is within Northeast Utilities' requirements of 1.0 degrees of allowable twist.

Sway:

Sway was calculated at the approximate elevation of NU's 9-foot microwave dish at the 173-foot elevation. Sway under the 85 mph wind load was calculated to be approximately 0.01 degrees, within Northeast Utilities' requirements of 1.0 degrees of maximum allowable sway.

Illustrations of calculated twist and sway are presented in Appendix A.

Base Foundation and Guy Anchors:

HEB's calculated reactions for the tower base and guy anchors were compared to design values provided on ROHN drawing C-760842. Vertical reactions imposed by wind load on the guy anchors were found to be within the design values as presented below:

	<u>HEB</u>	<u>ROHN Design</u>
Compression at Base	64.7k	75.0k
Horizontal Guy Anchor	32.1k	35.2k
Vertical Guy Anchor	28.2k	30.0k

The guy anchors are capable of supporting the proposed loads, assuming they were constructed according to ROHN's design drawings and specifications.

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CONCLUSIONS AND SUGGESTIONS:

As detailed above, our analysis indicates that the existing 180' ROHN 80 guyed tower in Madison, Connecticut is *not* capable of supporting the additional loading proposed, without performing the specified reinforcements of the tower mentioned in this report.

Tower twist and sway under the proposed loading does meet NU's 1.0 degree criteria.

Reinforcement and Replacement:

The following is a summary of the reinforcement and replacements necessary to upgrade the tower to accommodate the additional proposed loading:

- To meet EIA requirements, the 9/16" guy cables at the 128-foot elevation need to be replaced with at least 5/8" diameter EHS cable or greater.
- The overstressed bracing between the 60-80' and 100-120' elevations needs to be replaced with 1 1/4" schedule 40 pipe (standard pipe).
- The overstressed bracing between the 100-120' need to be replaced with 1 1/2" x 1 1/2" x 1/4" galvanized angle steel.
- The corresponding overstressed 1/2" bracing bolts between the 60-80' and 100-140' elevations need to be replaced with galvanized 3/4" diameter A325 bolts. All drilled holes must be 13/16" diameter and painted with zinc-rich paint.

LIMITATIONS:

This report is based on the following:

1. Tower is properly installed and maintained.
2. All members are in new condition.
3. All required members are in place.
4. All bolts are in place and are properly tightened.
5. Weep holes on tube and pipe members are open.
6. Tower is in plumb condition.
7. All members are galvanized.
8. All tower members were properly designed, detailed, fabricated, and installed and have been properly maintained since erection.

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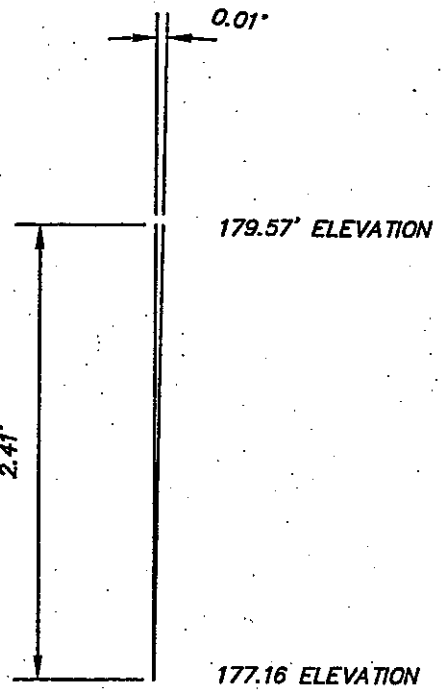
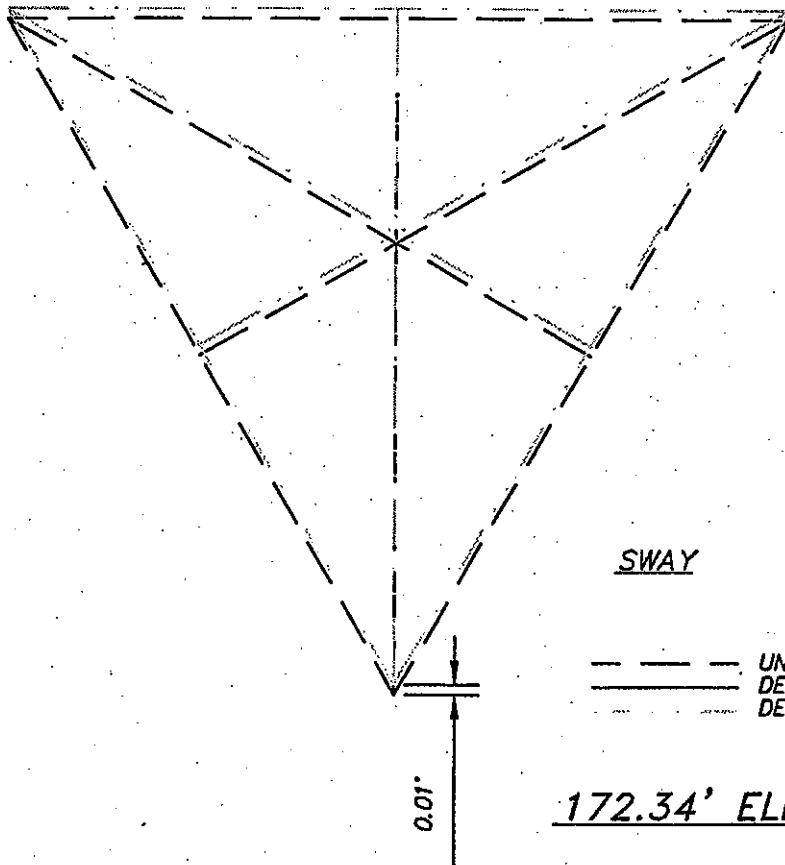
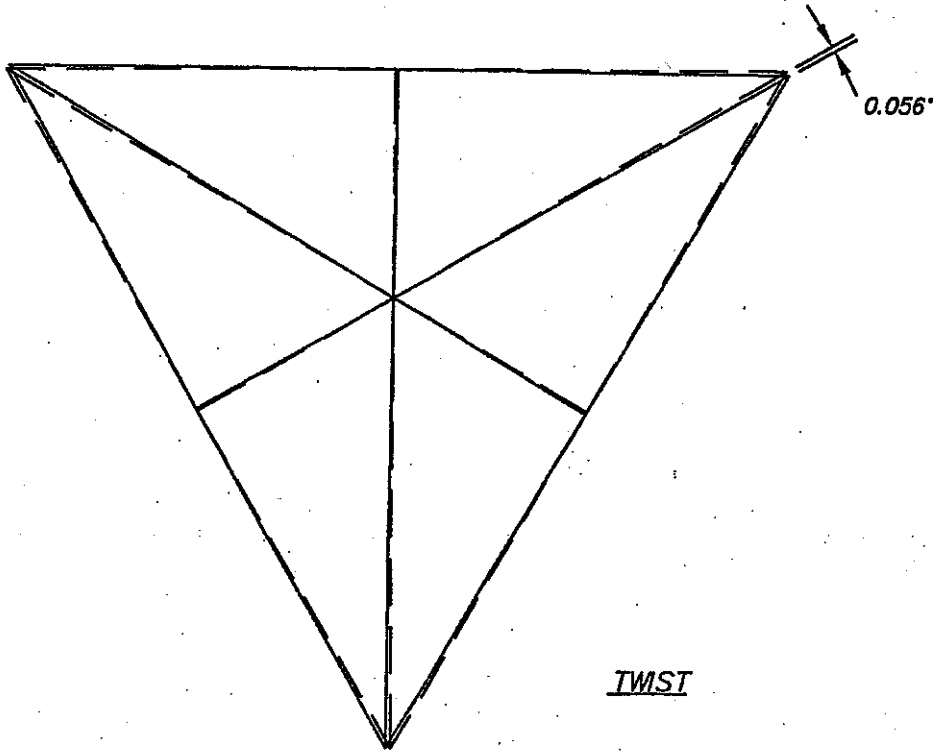
H. E Bergeron Engineers, P.A. (HEB) is not responsible for any modifications completed prior to or hereafter which HEB is not or was not directly involved. Modifications include but are not limited to:

1. Replacing or strengthening bracing members.
2. Reinforcing vertical members in any manner.
3. Adding or relocating stabilizers.
4. Installing antenna mounting gates or side arms.
5. Extending tower.

HEB states that this document represents the entire report and assumes no liability for any factual changes that may occur after the date of this report. All representations, recommendations, and conclusions are based upon the information contained herein. If you are aware of any information which conflicts with that which is contained herein, or you are aware of any defects arising from original design, material, fabrication, or erection deficiencies, you should disregard this report and immediately contact HEB. HEB disclaims all liability for any representation, recommendation, or conclusion not expressly stated herein.

Appendix A

Drawings



- - - - - UNDEFORMED TOWER
 = = = = = DEFORMED TOWER AT 180' ELEVATION.
 DEFORMED TOWER AT 173.3' ELEVATION.

172.34' ELEVATION

Plotted 9/1/00, 459

HEB

HEB
 250 WEST 100TH STREET
 CHICAGO, IL 60642
 (773) 399-8000

TWIST & SWAY EVALUATION
 MADISON, CONNECTICUT
 prepared for
 URS Corp

FIGURE 1

DRWN: JCK SCALE: N.T.S.
 DATE: 21 AUG 02 PROJ #: 97058C-5



**RF Exposure Analysis for Proposed
AT&T Wireless Antenna Facility**

SITE ID: 907-007-206

June 5, 2002

**Prepared by AT&T Wireless Services, Inc.
Nader Soliman RF Engineer**

Table of Contents

1. INTRODUCTION	3
2. SITE DATA.....	3
3. RF EXPOSURE PREDICTION.....	3
4. FCC GUIDELINES FOR EVALUATING THE ENVIRONMENTAL EFFECTS OF RF RADIATION 4	
5. COMPARISON WITH STANDARDS	4
6. CONCLUSION	4
7. FCC LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE.....	5
8. EXHIBIT A	6
9. FOR FURTHER INFORMATION.....	7
10. REFERENCES	7

1. Introduction

This report constitutes an RF exposure analysis for the proposed AT&T Wireless antenna facility to be located at 135 New Road, Madison, CT 06443. This analysis uses site-specific engineering data to determine the predicted levels of radio frequency (RF) electromagnetic energy in the vicinity of the proposed facility and compares those levels with the Maximum Permissible Exposure (MPE) limits established by the Federal Communications Commission.

2. Site Data

Site Name: <i>Clinton Hammosee</i>	
Number of simultaneously operating channels	12
Type of antenna	Allgon 7250.03
Power per channel (Watts ERP)	250.0 Watts
Height of antenna (feet AGL)	77.50 feet
Antenna Aperture Length	5 feet

3. RF Exposure Prediction

The following equations established by the FCC, in conjunction with the site data, were used to determine the levels of RF electromagnetic energy present in the vicinity of the proposed facility¹:

$$PowerDensity = \frac{0.64 * N * EIRP(\theta)}{\pi * R^2} \text{ (mW/cm}^2\text{)} \quad \text{Eq. 1-Far-field}$$

Where, *N*= Number of channels, *R*= distance in cm from the RC (Radiation Center) of antenna, and *EIRP(θ)* = The isotropic power expressed in milliwatts in the direction of prediction point. This is the correct equation for antennas which have their gain expressed in dBi, which is the usual case for the PCS bands.

$$PowerDensity = \frac{P_{in} / ch * N * 10^3}{2 * \pi * R * h * \alpha / 360} \text{ (mW/cm}^2\text{)} \quad \text{Eq. 2-Near-field}$$

Where *P_{in}/ch* = Input power to antenna terminals in watts/ch, *R* = distance to center of radiation, *h* = aperture height in meters, *α* = 3 dB beam-width of horizontal pattern.

¹ RF exposure is measured and predicted in terms of power density in units of milliwatts (mW), a thousandth of a watt, or microwatts (μW), a millionth of a watt, per square centimeter (cm²). Data comparing predictive analysis with on site measurements has demonstrated that power density can be effectively predicted at given locations in the vicinity of a wireless antenna facility.

4. FCC Guidelines for Evaluating the Environmental Effects of RF Radiation

In 1985, the FCC established rules to regulate radio frequency (RF) exposure from FCC licensed antenna facilities. In 1996, the FCC updated these rules, which were further amended in August 1997 by a Second Memorandum Opinion and Order. These new rules represent a consensus of the federal agencies responsible for the protection of public health and the environment, including the Environmental Protection Agency (EPA), the Food and Drug Administration (FDA), the National Institute for Occupational Health and Safety (NIOSH), and the Occupational Safety and Health Administration (OSHA).

Under the laws that govern the delivery of wireless communications services in the United States, as amended by the Telecommunications Act of 1996, the FCC has exclusive jurisdiction over RF emissions from personal wireless antenna facilities, which include cellular, PCS, messaging and aviation sites.² Pursuant to its authority under federal law, the FCC has established rules to regulate the safety of emissions from these facilities.

5. Comparison with Standards

Exhibit A shows the levels of RF electromagnetic energy as one moves away from the antenna facility. As shown in Exhibit A, the maximum power density is 0.000887 mW/cm² which occurs at 150 feet from the antenna facility. The chart in exhibit A also shows that the power density is only 0.000170 mW/cm² at a distance of 4 feet. Table 1 below shows the Maximum Permissible Exposure (MPE) limits established by the FCC. There are different MPE limits for public/uncontrolled and occupational/controlled environments.

Table 1: Maximum Permissible Exposure limits for RF radiation

<i>Frequency</i>	<i>Public/Uncontrolled</i>	<i>Occupational/controlled</i>	<i>Maximum power density at Accessible location</i>
Cellular	.580 mW/cm ²	2.9 mW/cm ²	0.000887 mW/cm ²
PCS	1 mW/cm ²	5 mW/cm ²	

The maximum power density from AT&T's proposed system represents only 0.09% of the public MPE limit for PCS frequencies.

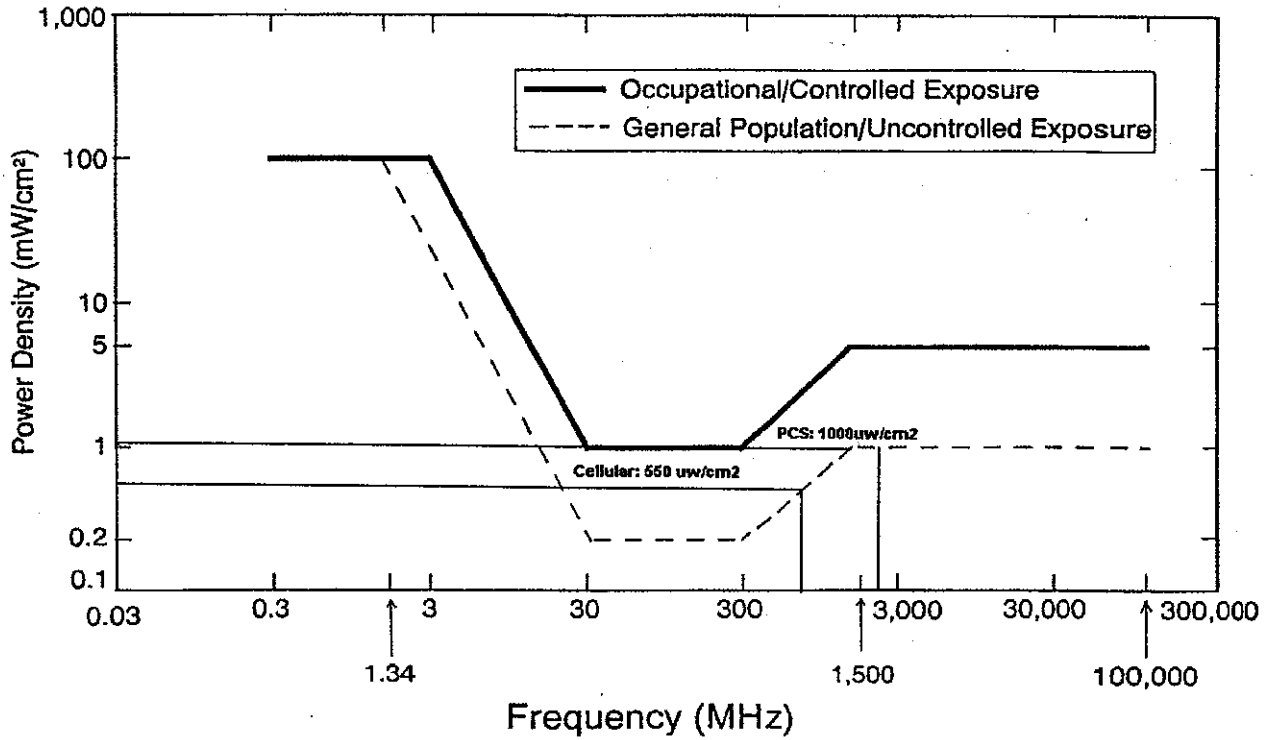
6. Conclusion

This analysis show that the maximum power density in accessible areas at this location is 82.97% of Maximum Permissible Exposure, a level of RF energy that is below the limit established by the FCC.

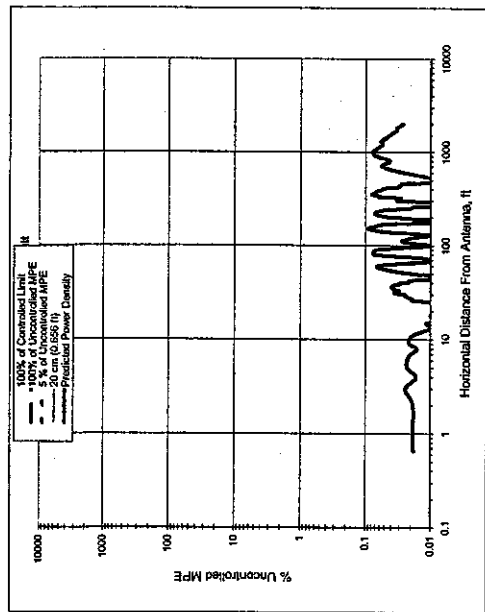
² 47 U.S. C. Section 332 (c) (7)(B)(iv) states that "[n]o State or local government or instrumentality thereof may regulate the placement, construction, and modification of personal wireless service facilities on the basis of the environmental effects of radio frequency emissions to the extent that such facilities comply with the Commission's regulations concerning such emissions."

7. FCC Limits for Maximum Permissible Exposure

FCC Limits for Maximum Permissible Exposure (MPE)
Plane-wave Equivalent Power Density



8. Exhibit A



Number of Antenna Systems: 1
 Meets FCC Controlled Limits for The Antenna Systems.

Meets FCC Uncontrolled Limits for The Antenna Systems.

Meets 5% of FCC Uncontrolled Limits for The Antenna Systems.

No Further Maximum Permissible Exposure (MPE) Analysis Required.

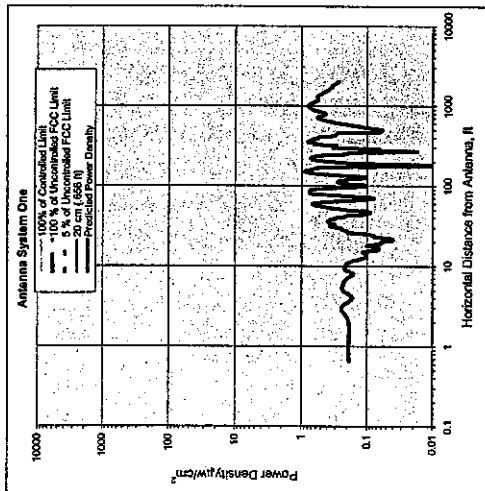
	Power Density		@Horiz. Dist. feet
	mW/cm ²	% of limit	
Maximum Power Density =	0.000887	0.09	150.00
1,127.13 times lower than the MPE limit for uncontrolled environment			
Composite Power (ERP) =	3,000.00	Watts	

Site ID: 907-007-206
 Site Name: Clinton Hammosee
 Site Location: 135 New Road
 Madison, CT 06443

Performed By: Nader Saliman
 Date: 6/5/02

The previous filing reflects that the combined % MPE is: 82.88%

The combined % MPE when adding AT&T Wireless' antennas will therefore be 83.97%



Antenna System One

Frequency	units	Value
1950	MHz	1950
# of Channels	#	12
Max ERP/Ch	Watts	250
Max Pwr/Ch Into Ant.	Watts	5,860,572.04
(Center of Calculation Point	feet	77.5
or roof surface)	feet	0
No.		Align 7250.03
Max Ant Gain	dBd	16.3
Down tilt	degrees	0
Miscellaneous Att.	dB	0
Height of aperture	feet	5.11
Ant HBW	degrees	65
Distance to Antenna	feet	74,945
WOST?	Y/NT	n

Ant System ONE Owner: AT&T
 Sector: 3
 Azimuth: 0/120/240

Non Ionizing Radiation Computation

Location: 135 New Rd
Madison, CT

Description: The proposed facility is an EMS Wireless three sector PCS array and ancillary equipment. The antennas used by Omnipoint are EMS RR90-17-00DP DualPol™ units.

Analysis: The non-ionizing radiation analysis conducted here is in accordance with FCC OET Bulletin 65, 1997 edition, and demonstrates that the power density due to the proposed antenna array is well below either the more stringent of the FCC or CT standard for public exposure at the base of the transmission tower. At 0.476% of MPE, Omnipoint will not be a significant contributor to the NIR level at this site.

Calculations: The three-sector array is treated as a single spherical radiator (as is customary at PCS frequencies) centered at the lowest radiating part of the antenna. A ground reflection coefficient of 1.6 is used. This is a worst case analysis that insures the actual exposure at the base of the tower is well below the calculated value.

Proposed Omnipoint Antenna	
Top of tower above grade (feet AGL)	180'
Proposed Radiation point above grade (feet AGL)	160'4"
Proposed Antenna tip above grade (feet AGL)	165'
Calculated power density at base of tower, mW/cm ²	0.00476
Maximum Permissible Exposure (MPE), mW/cm ²	1
Percentage of MPE of proposed facility at tower base	0.476%

NIR Source	MPE Standard mW/cm ²	Power Density at tower base mW/cm ²	MPE percentage at tower base	Power Density at fenced boundary mW/cm ²	MPE percentage at fenced boundary mW/cm ²
952.37 MHz	0.635 ✓	0.0022	0.35	?	?
37.48 MHz	0.200 ✓	0.0013	0.67	?	?
37.60 MHz	0.200 ✓	0.0016	0.82	?	?
48.34 MHz	0.200 ✓	0.0013	0.67	?	?
44.14 MHz	0.200 ✓	0.0011	0.55	?	?
48.16 MHz	0.200 ✓	0.0013	0.67	?	?
6995.00 MHz	1.000 ✓	0.0102	1.02	?	?
154.46 MHz	0.200 ✓	0.0158	7.91	?	?
48.00 MHz	0.200 ✓	0.0024	1.18	?	?
152.48 MHz	0.200 ✓	0.0146	7.31	?	?
158.70 MHz	0.200 ✓	0.0101	5.05	?	?
454.05 MHz	0.303	0.0063	2.09	?	?
929.4125 MHz 929.4975 MHz 929.9375 MHz	0.620 ✓	0.2503	40.37	?	?
48.00 MHz	0.200 ✓	0.0213	10.66	?	?
Sprint	1.000 ✓	0.0309	3.09	?	?
Proposed Omnipoint	1.000 ✓	0.00476	0.476	0.00475	0.475

Omnipoint Calculations Prepared By:
RCC Consultants, Inc. 100 Woodbridge Center Drive, Woodbridge NJ 07095
Contact: Michael J. Clarkson, Director RF-Engineering 1-732-404-2467

Site Totals	0.37546	82.88	N/A*	N/A*
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of current NIR (Non-Ionizing Radiation) levels: Notice of Intent to make exempt changes to an existing tower facility; Sprint PCS, CL&P Cell Site, Received by the CSC on September 16, 1997.

*Power density at the site boundary not given for the existing users, so the total at the boundary was not computed. RCC in their calculations used the spherical (most conservative) EIR model. When using the spherical model, as long as the ground level at the boundary is no higher than the tower base, NIR levels from radiators on the tower at the boundary will always be less than at the tower base. Additionally, while the tower is fenced off from access by the general public, it is not restricted from those that have access to the CL&P service center yard. The tower base numbers are those that should be used.

Omnipoint Calculations Prepared By:
RCC Consultants, Inc. 100 Woodbridge Center Drive, Woodbridge NJ 07095
Contact: Michael J. Clarson, Director RF-Engineering 1-732-404-2467

9. For Further Information

Additional information about the environmental impact of RF energy from personal wireless antenna facilities can be obtained from the Federal Communications Commission:

Dr. Robert Cleveland
Federal Communications Commission
Office of Engineering and Technology
Washington, DC 20554

RF Safety Program: 202-418-2464
Internet address: rfsafety@fcc.gov
RF Safety Web Site: www.fcc.gov/oet/rfsafety

10. References

- [1] The Communications Act of 1934, as amended by the Telecommunications Act of 1996, 47 U.S.C. Section 332 (c)(7)(B)(iv).
- [2] *Guidelines for Evaluating the Environmental Effects of Radio frequency Radiation*, Notice of Proposed Rulemaking, ET Docket 93-62, 8 FCC Rcd 2849 (1993).
- [3] *Guidelines for Evaluating the Environmental Effects of Radio frequency Radiation*, Report and Order, ET Docket 93-62, FCC 96-326, adopted August 1, 1996. 61 Federal Register 41006 (1996).
- [4] *Guidelines for Evaluating the Environmental Effects of Radio frequency Radiation*, Second Memorandum Opinion and Order, ET Docket 93-62, adopted August 25, 1997.
- [5] *Evaluating Compliance with FCC Guidelines for Human Exposure to Radio frequency Electromagnetic Fields*, OET Bulletin 65, August, 1997.