# 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


May 24, 2002

Stephen J. Humes
LeBoeuf, Lamb, Greene & MacRae
Goodwin Square
225 Asylum Street
Hartford, CT 06103

RE: **EM-VOICESTREAM-164-020509** - Omnipoint Communications, Inc. notice of intent to modify an existing telecommunications facility located at 440 Hayden Station Road, Windsor, Connecticut.

Dear Attorney Humes:

At a public meeting held on May 21, 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.

The proposed modifications are to be implemented as specified here and in your notice dated May 9, 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,

Mortimer A. Gelston
Chairman

MAG/DM/laf

c: Honorable Donald Trinks, Mayor, Town of Windsor
R. Leon Churchill, Jr., Town Manager, Town of Windsor
Mario Zavarella, Town Planner, Town of Windsor
Julie M. Donaldson, Esq., Hurwitz & Sagarin LLC
Michele G. Briggs, SNET Mobility LLC

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# LeBoeuf, Lamb, Greene & MacRae
L.L.P.

A LIMITED LIABILITY PARTNERSHIP INCLUDING PROFESSIONAL CORPORATIONS

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May 9, 2002



Mortimer A. Gelston, Chairman
Connecticut Siting Council
10 Franklin Square
New Britain, Connecticut 06051

Re: Notice of Exempt Modification
440 Hayden Station Road, Windsor, Connecticut

Dear Chairman Gelston and Members of the Council:

Please be advised that LeBoeuf, Lamb, Greene & MacRae, L.L.P. represents Omnipoint Communications, Inc. ("VoiceStream"), a subsidiary of VoiceStream Wireless Corporation in the above-referenced matter. VoiceStream intends to remove its two (2) existing antennas at the above-referenced site. VoiceStream proposes to replace them with six (6) new panel antennas at the same elevation on the existing structure at the existing facility in Windsor. Please accept this letter as notification, pursuant to R.C.S.A. § 16-50j-73, of construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to the Windsor Mayor, Mary B. Hogan and the Windsor Town Manager, R. Leon Churchill, Jr.

**Background** Effective as of the May 31, 2001 merger between Deutsche Telekom AG and VoiceStream Wireless Corp., the corporate structure of VoiceStream has changed.[1] VoiceStream holds the "A block" "Wideband PCS" license for the 2-GHz PCS frequencies for the greater New York City area, including the entire State of Connecticut. VoiceStream is licensed by the Federal Communications Commission (FCC) to provide PCS wireless telecommunications service in the State of Connecticut, which includes the area to be served by the proposed installation.

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[1]The corporate structure of VoiceStream is as follows: Omnipoint Communications, Inc. ("Omnipoint") is a 95.4% subsidiary of Omnipoint PCS, Inc. (hereinafter" OPCS"). OPCS is a wholly owned subsidiary of Omnipoint Finance, LLC (hereinafter, "OF"). OF is a wholly owned subsidiary of Omnipoint Finance Holding, LLC (hereinafter, "OFH"). OFH is a subsidiary of VoiceStream Wireless Corporation (hereinafter "VS"), which owns all of the outstanding common shares of OFH. VS is a wholly owned subsidiary of T-Mobile International AG (hereinafter "T-Mobile"). T-Mobile is a wholly owned subsidiary of Deutsche Telekom AG.

**Discussion**

The existing facility consists of an eighty-five foot (85'-0") monopole (see design drawing LE-2 attached as Exhibit B). The coordinates for the site are **41°-53'-52" N** and **72°-38'-38" W**. The tower is approximately eight hundred feet (800') west of Interstate 91 and eight hundred feet (800') south of Connecticut Route 20 in Windsor.

Currently, the tower holds the equipment of three carriers, VoiceStream at the seventy-three foot (73'-0") centerline above ground level ("AGL"), Sprint at the eighty-three foot (83'-0") centerline AGL, and AT&T at the ninety-six foot (96'-0") centerline AGL on a pipe mast extension. Sprint has a GPS antenna with the base at forty-nine feet (58'-0") AGL. VoiceStream's proposal calls for the removal of its existing two (2) panel antenna array, mounted close to the monopole in its present configuration. This configuration would be replaced by six (6) new panel antennas in the same location on a low profile platform. A tower elevation is shown in drawing LE-2, attached as part of Exhibit B. The model number for each new antenna is EMS-DR65-18-02DPL2Q. A structural analysis of the tower has been completed and is attached as Exhibit D. As stated in the structural analysis, the existing tower structure is capable of supporting the proposed VoiceStream installation. Three new Nortel S8000 equipment cabinets will be installed at the base of the tower, replacing the one existing VoiceStream cabinet (see pad detail on drawing LE-1, attached as part of Exhibit B). One of the new cabinets will be in the same location as the existing one on a four foot by five foot (4'-0" x 5'-0") concrete pad. The other two cabinets will be mounted on a new (4'-0" x 12'-0") concrete pad. The fenced compound area currently contains equipment buildings for Sprint and AT&T.

The planned modifications to the Windsor facility fall squarely within those activities explicitly provided for in R.C.S.A. § 16-50j-72(b)(2).

1. The proposed modification will not increase the height of the tower and will not extend the boundaries of the existing compound area. The enclosed tower drawings confirm that the planned changes will not increase the overall height of the tower or change the dimensions of the compound.

2. The installation of VoiceStream equipment, as reflected on the attached site plan, will not require an extension of the site boundaries. The fence surrounding the existing compound will not be altered in any way.

3. The proposed modification to the facility will not increase the noise levels at the existing facility by six decibels or more. VoiceStream's equipment is self-contained and requires no additional heating, ventilation or cooling equipment.

4. The operation of the additional antennas will not increase the total radio frequency (RF) power density, measured at the site boundary, to a level at or above the applicable standard. The "worst-case" RF power density calculations, for a point at the site boundary, are attached hereto as Exhibit E.

For the foregoing reasons, VoiceStream respectfully submits that the proposed addition of antennas and equipment at the Windsor facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2).

Thank you for your consideration of this matter.

Respectfully submitted,

VOICESTREAM WIRELESS CORPORATION

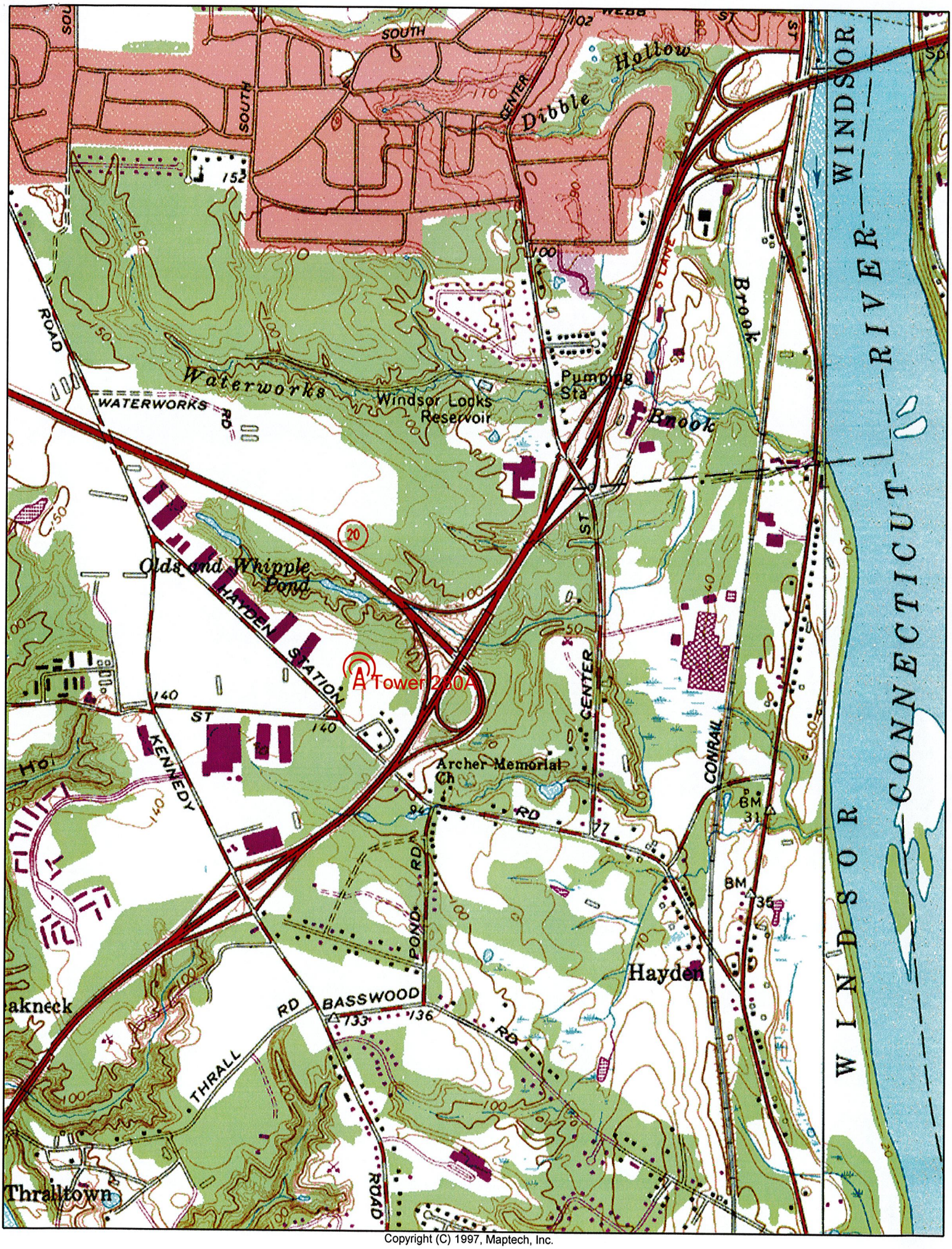
By: 

Its Counsel
Stephen J. Humes
Diane W. Whitney

Attachments
cc: Windsor Mayor, Mary B. Hogan, Jr.
Windsor Town Manager, R. Leon Churchill, Jr.

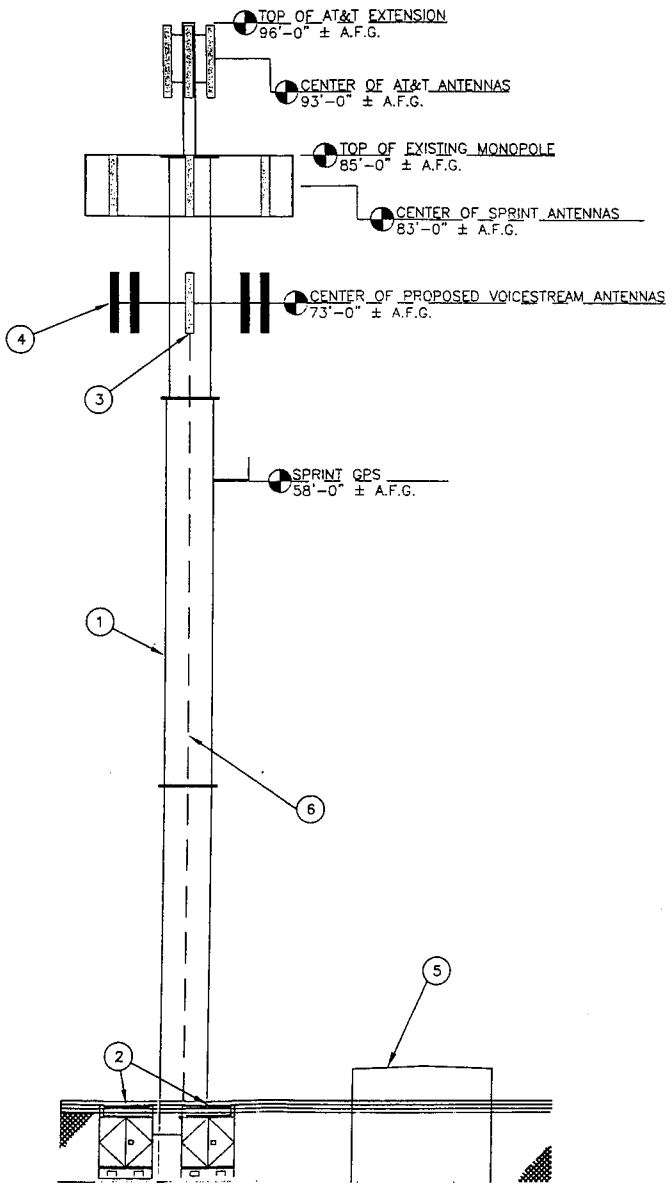
# Exhibit A

## Site Map
## 440 Hayden Station Road
## Windsor, Connecticut



# Exhibit B

# Design Drawings
# 440 Hayden Station Road
# Windsor, Connecticut




NOTES:

1. EXISTING 85 FT. MONOPOLE
2. PROPOSED VOICESTREAM EQUIPMENT CABINETS, 3 TOTAL (ONE BEYOND)
3. EXISTING VOICESTREAM ANTENNAS MOUNTED TIGHT TO MONOPOLE TO BE REMOVED
4. PROPOSED VOICESTREAM ANTENNAS (6 TOTAL) MOUNTED TO PLATFORM
5. EXISTING AT&T SHELTER
6. PROPOSED COAXIAL CABLES ROUTED INSIDE MONOPOLE

1 / LE-2 ELEVATION
SCALE: 1"=10'-0"

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FAX: (860) 692-7159

ON AIR ENGINEERING
201 WALNUT STREET
TWP. OF WASHINGTON, NJ 07676
OFFICE: (201) 358-9541
FAX: (201) 358-9542

CONSULTANTS

LICENSURE

| NO | DATE | SUBMISSIONS |
|---|---|---|
| 1 | 1.23.02 | CLIENT REVIEW |

APPROVALS

| | |
|---|---|
| PROPERTY OWNER | DATE |
| ZONING | DATE |
| CONSTRUCTION | DATE |
| RF ENGINEER | DATE |

| DRAWN BY | CHECKED BY |
|---|---|
| SI | DW |

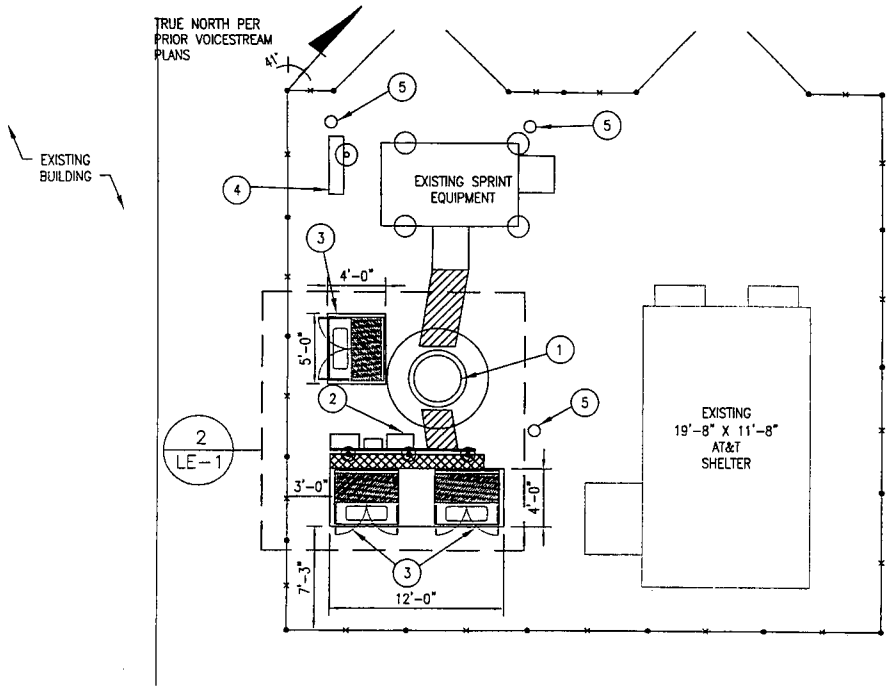


SITE #
CT-11-280-A

PROJECT INFORMATION
SPRINT POLE CT03XC065
440 HAYDEN STATION ROAD
WINDSOR, CT

DRAWING TITLE
ELEVATION

LE-2



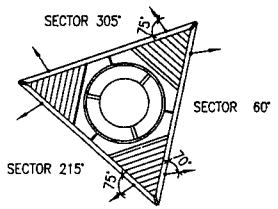

1 LE-1 COMPOUND PLAN
SCALE: 1/8"=1'-0"

1 LE-2

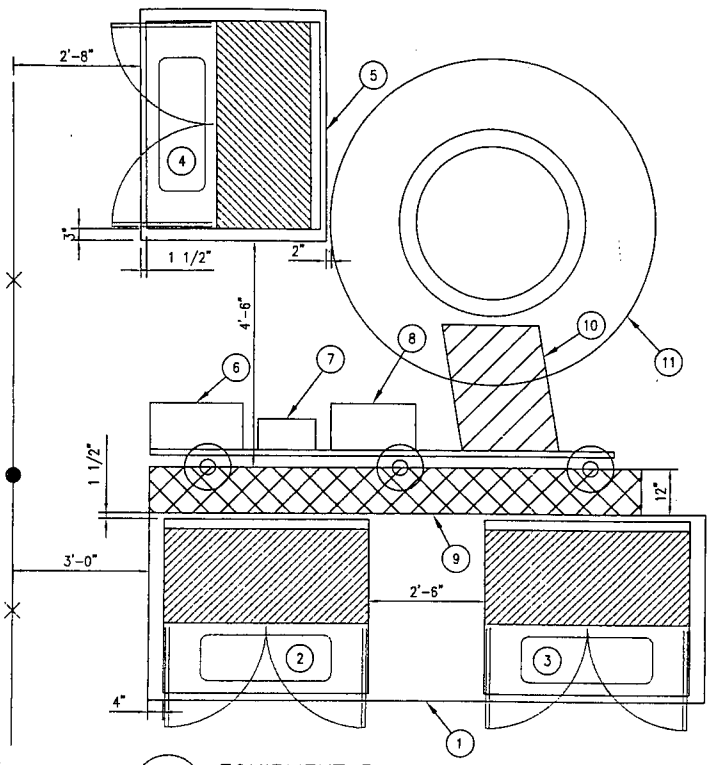
VOICESTREAM TOTAL
LEASE AREA
68 SQ. FT.

NOTES:

1. EXISTING 85 FT. MONOPOLE
2. EXISTING VOICESTREAM NORTEL S2000 RADIO CABINET TO BE REMOVED
3. PROPOSED VOICESTREAM EQUIPMENT CABINET ON CONCRETE PAD (3 TOTAL)
4. EXISTING SPRINT PPC CABINET
5. EXISTING GROUND TEST WELL




3 LE-1 ANTENNA PLAN
SCALE: 1/8"=1'-0"




2 LE-1 EQUIPMENT PLAN
SCALE: 3/8"=1'-0"

NOTES:

1. PROPOSED 12' X 4' CONCRETE PAD
2. PROPOSED VOICESTREAM MAIN CABINET
3. PROPOSED VOICESTREAM EXPANSION CABINET #1
4. PROPOSED VOICESTREAM EXPANSION CABINET #2
5. PROPOSED 5' X 4' CONCRETE PAD
6. EXISTING TELCO BOX TO REMAIN
7. EXISTING 100A ELECTRIC PANEL TO REMAIN
8. EXISTING NORTEL S2000 AND BATTERY INTERFACE MODULE (BENEATH) TO BE REMOVED
9. PROPOSED ICE BRIDGE ATTACHED TO EXISTING POSTS 3-4 FT. ABOVE GRADE
10. EXISTING ICE BRIDGE TO REMAIN
11. EXISTING FOUNDATION

VoiceStream
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ON AIR ENGINEERING
201 WALNUT STREET
TWP. OF WASHINGTON, NJ 07676
OFFICE: (201) 358-9541
FAX: (201) 358-9542

CONSULTANTS

LICENSING

| NO | DATE | SUBMISSIONS |
|---|---|---|
| 1 | 12.8.02 | CLIENT REVIEW |
| 2 | 2.11.03 | REVISED PER SPRINT/SITES COMMENTS |

APPROVALS

| | |
|---|---|
| PROPERTY OWNER | DATE |
| ZONING | DATE |
| CONSTRUCTION | DATE |
| RF ENGINEER | DATE |

| DRAWN BY | CHECKED BY |
|---|---|
| SI | DW |



SITE #
CT-11-280-A

PROJECT INFORMATION
SPRINT POLE CT03XC065
440 HAYDEN STATION ROAD
WINDSOR, CT

DRAWING TITLE
COMPOUND, EQUIPMENT
AND ANTENNA PLAN

LE-1

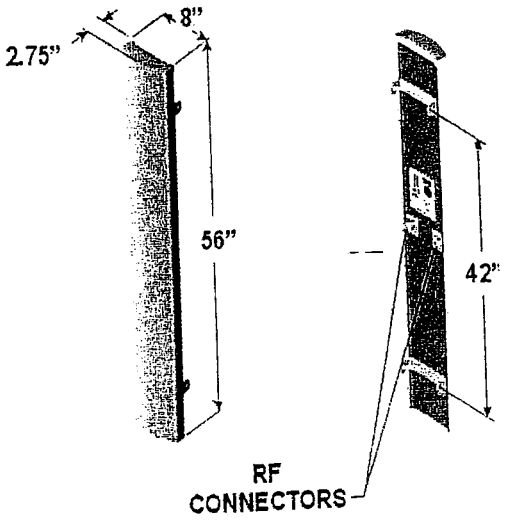
# Exhibit C

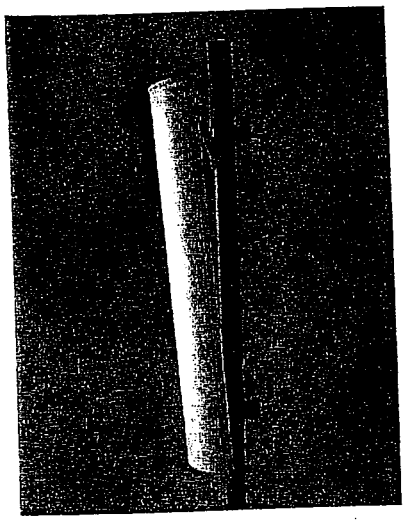
# Equipment Specifications
# 440 Hayden Station Road
# Windsor, Connecticut

EMS Wireless

# RR65-18-XXDPL2

1850 MHz - 1990 MHz (P)



65° beamwidth

17.5 dBi gain

±45° DualPol®

56 inch

## SPECIFICATIONS

### Electrical

| | |
|---|---|
| Gain | 17.5 dBi (15.4 dBd) |
| Azimuth Beamwidth (-3 dB) | 65° |
| Elevation Beamwidth (-3 dB) | 6° |
| Elevation Sidelobes (Upper) | >18 dB |
| Front-to-Back Ratio | >25 dB (≥ 30dB Typ.) |
| Polarization | Slant, ±45 |
| Port-to-Port Isolation | >30 dB |
| Electrical Downtilt Options | 0°, 2° |
| VSWR | 1.35:1 Max |
| Connectors | 2; 7-16 DIN (female) |
| Power Handling | 250 Watts CW |
| Passive Intermodulation | ≤ -147 dBc [2x20W (+43 dBm)] |
| Lightning Protection | Chassis Ground |

### Mechanical

| | |
|---|---|
| Dimensions (L x W x D) | 56in x 8in x 2.75in (142 cm x 20.3 cm x 7.0 cm) |
| Rated Wind Velocity | 150 mph (241 km/hr) |
| Equivalent Flat Plate Area | 3.1ft² (.29 m²) |
| Front Wind Load @ 100 mph (161 kph) | 90 lbs (400 N) |
| Side Wind Load @ 100 mph (161 kph) | 31 lbs (139 N) |
| Weight | 18 lbs (8.2 kg) |

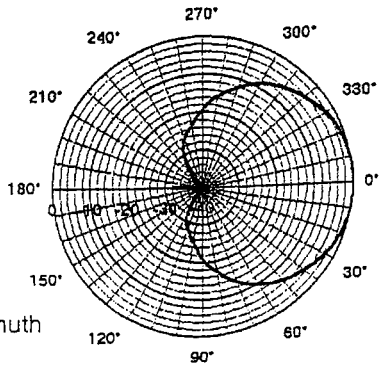
Note: Patent Pending and US Patent number 5, 757, 246.

Values and patterns are representative and variations may occur. Specifications may change without notice due to continuous product enhancements. Digitized pattern data is available from the factory or via the web site www.emswireless.com and reflect all updates.

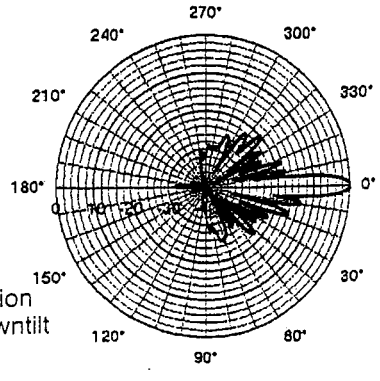
## MOUNTING OPTIONS

| Model Number | Description | Comments |
|---|---|---|
| MTG-P00-10 | Standard Mount (Supplied with antenna) | Mounts to Wall or 1.5 inch to 5.0 inch O.D. Pole (3.8 cm to 12.7 cm) |
| MTG-S02-10 | Swivel Mount | Mounting kit providing azimuth adjustment. |
| MTG-DXX-20* | Mechanical Downtilt Kits | 0° - 10° or 0° - 15° Mechanical Downtilt |
| MTG-CXX-10* | Cluster Mount Kits | 3 antennas 120° apart or 2 antennas 180° apart |
| MTG-C02-10 | U-Bolt Cluster Mount Kit | 3 antennas 120° apart, 4.5" O.D. pole. |
| MTG-TXX-10* | Steel Band Mount | Pole diameters 7.5" - 45" |

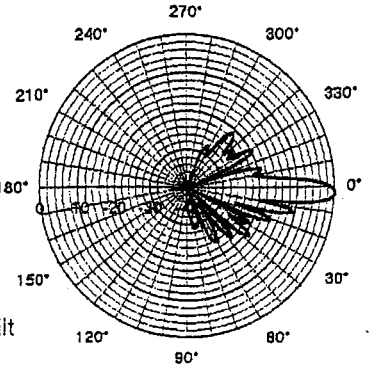
* Model number shown represents a series of products. See mounting options section for specific model number.




Azimuth




Elevation
0° Downtilt

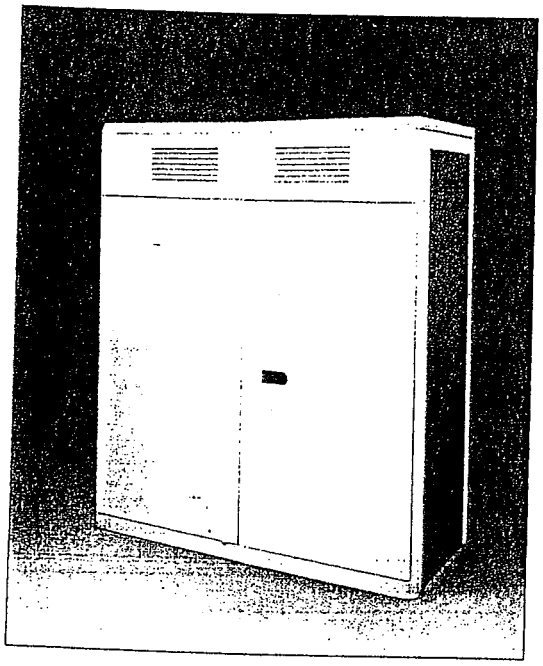



Elevation
2° Downtilt

GSM 900 / DCS 1800 / PCS 1900

NORTEL
NORTHERN TELECOM

# S8000 Outdoor Base Transceiver Station



*Nortel's S8000 Outdoor Base Transceiver Station has been designed to meet the economic and performance requirements of network operators. Based on a highly integrated RF and digital design, the S8000 Outdoor Base Transceiver Station represents a major technology advancement and delivers all the benefits of a compact, modular, high quality and high performance product.*

## Nortel's S8000 Outdoor BTS: Radio Performance Leadership - Reduced Site Acquisition and Operating Costs

### Installation

- The S8000 Outdoor Base Transceiver Station (BTS) offers compact packaging and requires minimal floor space, only .88 sq m (9.5 sq ft.). Front only access keeps total space required, including maintenance access, to only 1.8 sq m (19.4 sq ft ) per cabinet.

### Transmission

- Integrated drop and insert connection to the Base Station Controller (BSC) and signaling concentration on the A-bis interface provide significant transmission cost reduction.
- Optional integrated digital microwave radio.

### Maintenance

- Highly reliable technology, redundant architecture and integrated battery backup ensure high availability service.
- Front access and interconnections, as well as powerful fault detection, help reduce lifetime maintenance costs.

### Industry leading performance

- New RF technology and advanced digital processing techniques provide very high receive sensitivity (-108 dBm guaranteed) and improved diversity gain (up to 6 dB). This provides higher resistance to interference, as well as, improved speech quality and cell coverage.
- Nortel's proven experience in frequency hopping, 1*3 frequency reuse, sophisticated microcellular handover algorithms and support of half-rate vocoders enables the operator to maximize use of available spectrum and deploy fewer cell sites.

### Fast network deployment

- The S8000 BTS can be shipped fully equipped and tested, which provides fast network roll out to meet operator time to market requirements.

### Modular and flexible configuration

- The S8000 supports eight transceivers (TRX) per cabinet in Omni and sectored configurations. The typical one cabinet S222 configuration may be expanded up to S332 or S422 without an additional cabinet.

## Technical Data

| | | |
|---|---|---|
| • Frequency range | | 900 MHz GSM |
| | | 900 MHz GSM extended |
| | | 1800 MHz DCS |
| | | 1900 MHz PCS |
| • Receive sensitivity (guaranteed) | | -108 dBm |
| • Dimensions | Height | 1600 mm / 5 ft. 3 in. |
| | Width | 1350 mm / 4 ft. 5 in. |
| | Depth | 650 mm / 2 ft. 1 in. |
| • Weight | Fully equipped | 600 kg / 1300 lbs. |
| • Capacity | | 8 TRX per cabinet |
| | | up to 3 cabinets |
| • Configuration | Trisectorial | up to S888 |
| | Omnidirectional | up to O16 |
| • Amplifier output power | | 30 W (± 1.5 dB) |
| • Power control | Static | 6 steps of 2 dB |
| | Dynamic | 15 steps of 2 dB |
| • Frequency hopping | | RF synthesized |
| | | baseband |
| • Supported vocoders | | Full rate |
| | | Enhanced full rate |
| | | Half rate |
| • Encryption algorithms | | A5/1 A5/2 |
| • Power supply | | 230V AC 50/60 Hz |
| • Power back-up | | Integrated battery back-up plus optional battery cabinet allows provisioning up to 8 hours back-up time. |
| • Operating temperature range | | -40°C to +50°C |
| | | -40°F to +122°F |


Publication Reference S8O.INS.0696
Printed in France



Information subject to change. Northern Telecom reserves the right to make changes, without notice, in equipment design as engineering or manufacturing methods warrant.

NORTEL
NORTHERN TELECOM

For more information,
please contact your local Nortel account representative.

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Richardson TX 75082
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1-800-466-7838 or (214) 684-5935
http://www.nortel.com/wireless

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Mississauga ON L4W 4M7
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France
Telephone (33) (1) 34 52 52 52

Nortel Europe
12-12bis rue Jean Jaurès
92807 Puteaux
France
Telephone (33) (1) 46 96 15 15

# 3 CABINET DESCRIPTION

## 3.1 PHYSICAL CHARACTERISTICS

### 3.1.1 S8000 Outdoor BTS

#### 3.1.1.1 BTS cabinet

*Dimensions*

The BTS S8000 Outdoor has the following dimensions:

- height: 160 cm (63 in.)
- width: 135 cm (52.8 in.)
- depth: 65 cm (25.6 in.)

*Weight*

The weight of the cabinet when empty, that is, without its battery, fan units or boards, is 164 kg (361 lb). Depending on the configuration, a fully equipped cabinet weighs approximately 480 kg (1056 lb) with ACU unit or 440 kg (968 lb) with DACS unit.

These weights do not include the plinth.

*Operating temperature*

To operate correctly, the BTS requires a temperature greater than –40°C (–40°F) and less than +50°C (+122°F).

*Consumption*

BTS input voltage:

- GSM 900/1800
  - nominal voltage contained between 220V AC and 240V AC
  - minimum voltage: 220 – 10% = 198V AC
  - maximum voltage: 240 + 6% = 254V AC
- GSM 1900 (with DACS)
  - nominal voltage: 208V AC to 240V AC
  - minimum voltage: 208 – 10% = 187V AC
  - maximum voltage: 240 + 6% = 254V AC
- GSM 1900 (with ACU and/or the power system six–rectifier type)
  - nominal voltage: 240V AC
  - minimum voltage: 240 – 10% = 187V AC
  - maximum voltage: 240 + 6% = 254V AC

NON - PREMIUM BTS ONLY

# Exhibit D

# Structural Analysis
# 440 Hayden Station Road
# Windsor, Connecticut

ALL-POINTS TECHNOLOGY CORPORATION, P.C.

# STRUCTURAL ANALYSIS REPORT
# 85' MONOPOLE TOWER
# WINDSOR, CONNECTICUT

**VoiceStream Site #CT-11-280-A**

Prepared for
On Air Engineering, LLC

December 18, 2001


APT Project #CT132100

☐ 711 NORTH MOUNTAIN ROAD • NEWINGTON, CONNECTICUT 06111 • PHONE: 860-953-4444 • FAX: 860-953-1181
☒ 150 OLD WESTSIDE ROAD • NORTH CONWAY, NEW HAMPSHIRE 03860 • PHONE/FAX: 603-356-5214

**STRUCTURAL ANALYSIS REPORT**
**of**
**85' MONOPOLE TOWER**
**WINDSOR, CONNECTICUT**
**prepared for**
**On Air Engineering**

## EXECUTIVE SUMMARY:

All-Points Technology Corp., P.C. (APT) performed a structural analysis of this 85-foot ROHN monopole tower located in Windsor, Connecticut. The analysis was performed for VoiceStream Wireless' removal and replacement of two existing antennas and mounts with six DR65-18-XXDPL2Q panel antennas on a 14' low-profile platform at 75'. Existing waveguide cables are to be replaced with twenty-four 7/8" cables.

Our analysis indicates the tower and foundation are capable of supporting the proposed antennas.

## INTRODUCTION:

A structural analysis of this communications tower was performed by All-Points Technology Corp., P.C. (APT) for On Air Engineering. The tower is located at 440 Hayden Station Road in Windsor, Connecticut. APT did not visit the tower site. This analysis relied on information provided by On Air Engineering, which included existing antenna inventory, antenna changes proposed by VoiceStream Wireless, and ROHN design drawings

The structure is an 85-foot, galvanized steel monopole tower manufactured by ROHN Industries. The analysis was conducted using the following antenna inventory (antenna centerline elevations listed):

| Carrier | Antenna | Elev. | Mount | Coax. |
|---|---|---|---|---|
| Future by others | 12' whip (assumed) | 96' | 6' sidearm (assumed) | 7/8" |
| AT&T Wireless | (3) RR90-17-02DP | 93' | 11' pipe extension | (6) 1-5/8" |
| Sprint PCS | (9) DAPA 58000 | 83' | 14' full platform | (9) 1-5/8" |
| VoiceStream | (6) DR65-18-DPL2Q | 73' | 14' low-profile platform | (24) 7/8" |
| Sprint PCS | GPS | 58' | 3' sidearm | 1/2" |

## 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; and the American Institute of Steel Construction (AISC), Manual of Steel Construction, Allowable Stress Design, Ninth Edition.

The analysis was conducted using a wind speed of 85 miles per hour and one-half inch of radial ice over the entire structure and all appurtenances. The TIA/EIA Standard requires an 80-mph minimum wind speed for Hartford County, Connecticut.

Two analytical methods were used to evaluate the structure: a two-dimensional linear computer model developed by APT, and a P-delta analysis using finite element software distributed by Eaglepoint Software. The 2-D model was used to generate dead loads of the tower and all of its appurtenances, radial ice loads and the resultant wind loading. The maximum bending moments and axial loads were used to calculate combined axial and bending stresses on the monopole, which were compared to allowable stresses according to AISC and TIA/EIA.

Loads generated in the 2-D model were input into the finite element program to evaluate secondary bending moments induced during deflection of the structure under load and to independently evaluate stresses. Evaluation of secondary bending moments is required by EIA paragraph 3.1.15. Our analysis indicates that the secondary moments exceed those of the linear analysis, and therefore govern in determining the capacity of the structure.

EIA requires two loading conditions to be evaluated to determine the tower's capacity. The higher stresses resulting from the two cases is used to calculate the tower capacity:

- Case 1 = Wind Load (without ice) + Tower Dead Load (controls)
- Case 2 = **0.75** Wind Load (with ice) + Ice Load + Tower Dead Load

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

## ANALYSIS RESULTS:

Our analysis determined the tower will support the proposed antenna array. The following table summarizes the capacity of the tower based on combined axial and bending stresses:

**Tower Capacity**

| Elevation | Capacity |
|---|---|
| 0'-32.5' | **31%** |
| 32.5'-65' | **22%** |
| 65'-85' | **8%** |

The capability of the existing foundation to support the proposed load was evaluated by comparing design reactions with those imposed by the proposed loading. We calculated the reactions under the proposed loading to be less than design reactions, thus the existing foundation is adequate to support the proposed loads, provided it was designed and constructed to support original reactions.

Base reactions imposed with the proposed antennas were calculated to be as follows:

| | |
|---|---|
| Compression: | 26.9 kips |
| Shear: | 12.1 kips |
| Overturning Moment: | 737.5 ft-kips |

## CONCLUSIONS AND SUGGESTIONS:

As detailed above, our analysis indicates that the existing 85' ROHN monopole tower and foundation are capable of supporting VoiceStream Wireless' proposed antenna changes.

## 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. Tower is in plumb condition.
6. All members are galvanized.
7. All tower members were properly designed, detailed, fabricated, and installed and have been properly maintained since erection.
8. Record drawings accurately reflect tower dimensions and height.

All-Points Technology Corp., P.C. (APT) is not responsible for any modifications completed prior to or hereafter which APT is not or was not directly involved. Modifications include but are not limited to:

1. Adding or relocating antennas.
2. Installing antenna mounting gates or side arms.
3. Extending tower.

APT hereby states that this document represents the entire report and that it 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 and set forth 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 APT. APT disclaims all liability for any representation, recommendation, or conclusion not expressly stated herein.

# Exhibit E

# Power Density Calculations
# 440 Hayden Station Road
# Windsor, Connecticut

VOICESTREAM WIRELESS CORPORATION
100 Filley St, Bloomfield, CT 06002-1853
Phone: (860) 692-7100
Fax: (860) 692-7159

# Technical Memo

To: Karina Hansen
From: Giri Lakshmanan Radio Engineering Consultant
cc: Mike Fulton
Subject: Power Density Report for CT-11-280A
Date: 25-Feb-02

## 1. Introduction:

This report is the result of an Electromagnetic Field Intensities (EMF - Power Densities) study for the Voicestream Wireless Corporation PCS antenna installation on a Monopole at 440 Hayden Station Road, Windsor, CT. This study incorporates the most conservative consideration for determining the practical combined worst case power density levels that would be theoretically encountered from several locations surrounding the transmitting location.

## 2. Discussion:

The following assumptions were used in the calculations:

1) The emissions from Voicestream Wireless transmitters are in the 1930-1950 MHz frequency band.
2) The antenna cluster consists of three sectors, with 2 antennas per sector. The model number for each antenna is EMS DR65-18-02DPL2Q.
3) The antenna height is 73 feet Center Line.
4) The maximum transmit power from each sector is 3116.45 Watts Effective Radiated Power (EiRP). assuming 8 channels per sector.
5) All the antennas are simultaneously transmitting and receiving, 24 hours a day.
6) Power levels emitting from the antennas are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.
7) The average ground level of the studied area does not significantly change with respect to the transmitting location.

Equations given in "FCC OET Bulletin 65, Edition 97-01" were then used with the above information to perform the calculations.

## 3. Conclusion:

Based on the above worse case assumptions, the power density calculations from the VoiceStream Wireless Corporation PCS antenna installation on a Monopole at 440 Hayden Station Road, Windsor, CT, is 0.128302 mw/cm^2. This represent only12.8302% of the standard and other carriers such as Sprint and AT&T both represents 8.485% of the standard.Thus, the "Worst case" power density for the combined operations at the site is 21.3152 % of the Maximum Permissible Emission (MPE)standard of 1000 microwatts per square centimeter(uw/cm^2) set forth in the FCC/ANSI/IEEE C95. 1-1991.
Furthermore, the proposed antenna location for VoiceStream Wireless will not interfere with existing public safety telecommunications, AM band and FM band radio broadcast, TV, Police Communication, HAM Radio communications and other signals in the area.

## Worst Case Power Density

**Region 11 - Connecticut**
**Power Density Calculation**

**Site:** CT-11-280A
**Site Address:** 440 Hayden Station Road
**Town:** Windsor
**Pole Height:** 85FT
**Tower Style:** a Monopole

| | | |
|---|---|---|
| Base Station TX output | 17 | W |
| Number of channels | 8 | |
| Antenna Model | DR65-18-02DPL2Q | |
| Cable Size | 1 5/8 | " |
| Cable Length | 93.00 | ft |
| Antenna Height | 73.00 | ft |
| Ground Reflection | 1.6 | |
| Frequency | 1930.00 | MHz |
| Jumper & Connector loss | 2.62 | dB |
| Antenna Gain | 17.3 | dBi |
| Cable Loss per foot | 0.0116 | Loss per/ft |
| Total Cable Loss | 1.0788 | dB |
| Total Attenuation | 3.6988 | dB |
| Total EIRP per channel | 55.91 | dB |
| (In Watts) | 389.56 | W |
| Total EIRP per sector | 64.94 | dB |
| (In Watts) | 3116.44 | W |
| nsg | 13.6012 | |
| **Power Density (S) =** | **0.128302** | **mW / cm$^2$** |
| **% MPE =** | **12.8302%** | |

*Equation Used :*

$$S = \frac{(1000)(grf)^2(Power)*10^{(nsg/10)}}{4\pi(R)^2}$$

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