

**PREFILED TESTIMONY OF ERIC FINE**

**Q. Please state your name, title, and business address.**

A. Eric Fine  
Implementation Engineer/Project Manager  
Northeastern Communications, Inc.  
7 Great Hill Road  
Naugatuck, CT 06770

**Q. Please describe your current responsibilities and professional experience.**

A. I assist with system pre-sales design and engineering, manage system site installation team, site development and oversee all tower related projects. I worked for 27 years in public safety communications for the town of Westport CT Fire Department. In 2008, I retired from my position as Chief Technical Specialist to join the Northeastern Communication management team.

**Q. Have you ever appeared as a witness before the Connecticut Siting Council?**

A. Yes, numerous times over the last 20 years.

**Q. What has been your involvement in this project?**

A. I have worked with the Town of Cheshire through the years on its emergency services communications network. Chief Jack Casner asked me to assist the Town as it sought not only to improve its current radio frequency (RF) coverage for emergency services communications but also to ensure that the Town was provided with the technical information that it would need for its discussions with the tower developer for the Town's transition to a point-to-point back (PTP) haul network to support its public safety emergency communications system. I am responsible for the analysis and report that is included in the application to the Siting Council at Attachment 2, designated by the applicants as "Town of Cheshire Public Safety Radio System Need with RF Propagation Surveys."

**Q. Before we get to the details of your analysis and report, do you have any corrections, modifications or corrections to that Attachment 2 to bring to the Council's attention?**

A. I do, for some reason attachment 2 is missing key components that support the Town's request for the 170' elevation for municipal use. I have supplied additional documents that support the Town's position and should be added to attachment 2, a full set of which is attached to my testimony.

**Q. Do you adopt that exhibit known as Attachment 2 to the application as your sworn testimony in this proceeding?**

A. Yes, I do with my added attachments.

**Q. Thank you, Mr. Fine. Let's discuss the benefits to the Town of Cheshire's emergency communications if the Town is able to deploy a point-to-point communications system?**

A. The proposed PTP system will most likely be a 4.9 GHz. dual polarized microwave system that will utilize two, two foot high performance dish antennas for wireless back haul connectivity to police and fire headquarters. The proposed PTP system can be configured to support the present analog radio technology utilized by Cheshire and also the next generation of digital IP communications technology that is being installed in many other communities in Connecticut as systems are upgraded. The PTP system removes the necessity of relying on leased telephone circuits to connect remote sites back to the headquarters, dispatch locations. Telephone circuits are problematic in times of power loss and sever storm conditions and are also costly to maintain. A PTP system provides for more fault tolerant and reliable back haul connectivity needed to support wireless two way radio communications in both analog and digital systems.

**Q. Would you please walk us through Attachment 2 and the conclusions you draw from it concerning the height of the monopole tower for purposes of Cheshire's planned point-to-point back haul communications system?**

A. Presently there are two public safety communications systems in place with in Cheshire one system services the police department and a second system services the fire department. Both systems presently utilize the treatment plant site. The Link Planner path serve report supports our finding that treatment plant tower would need to have an elevation of 170' to support a unobstructed PTP path back to the 100 foot tower located at fire department headquarters along with a second path to tower located at police headquarters. The report took into consideration the terrain along with an average tree height of 75 feet and also allows for a small amount of growth factored in. Both paths are identified in the



attached link planner report on pages 6 & 8 and provide for 100% reliability with maximum IP through put.

**Q. Attachment 2 also includes "RF coverage propagation maps". Please explain why those are included and how those maps don't necessarily have any impact on your evaluation for the needed height of the proposed tower.**

A. The 170' elevation is minimum needed height to support the PTP paths. The attached RF coverage maps show the additional RF coverage benefits the 170' elevation would yield both systems once a simulcast system is installed as part of a system upgrade. The present site only serves as a receive site but the tower certainly lend benefits for future RF coverage enhancements both as transmit and receive site. The coverage improvements are identified and referenced in the present system configuration along with adding transmit capabilities at either 105' or at 170' on both systems.

**Q Is there anything else that you wish to add at this time to your testimony?**

A. Yes, in recently years PTP back haul communications systems have become the preferred method of providing remote site connectivity when designing public safety two way wireless communications system. To date the towns of Greenwich, Stamford, Darien, Stratford, New Fairfield, New Milford, Trumbull, Rocky Hill, Milford and Old Saybrook along with the State of Connecticut Department of Public Safety have all implemented PTP systems to support their connectivity requirements. Many of the sites are co-located sites and this proposal follows previously approved philosophies and concepts.

**Q. Does this conclude your testimony?**

A. Yes.

# Project Cheshire PD-FD 04-03-2014 EF

## PTP LINKPlanner Proposal Report

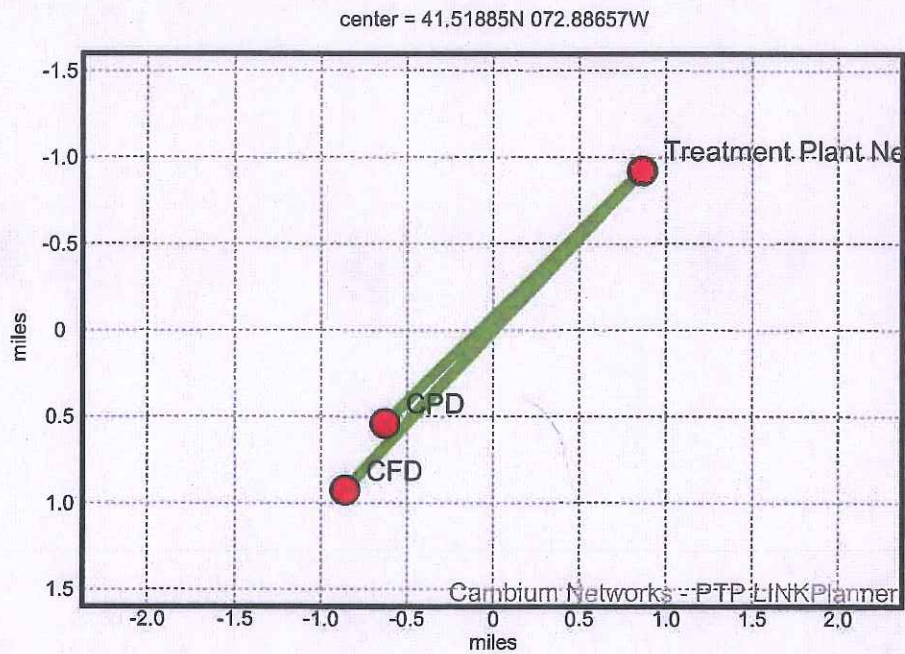
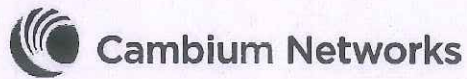
03 April 2014

Eric Fine

Organization: Northeastern Communications Inc

Phone: 203-568-6950

Email: [efine@norcomct.net](mailto:efine@norcomct.net)





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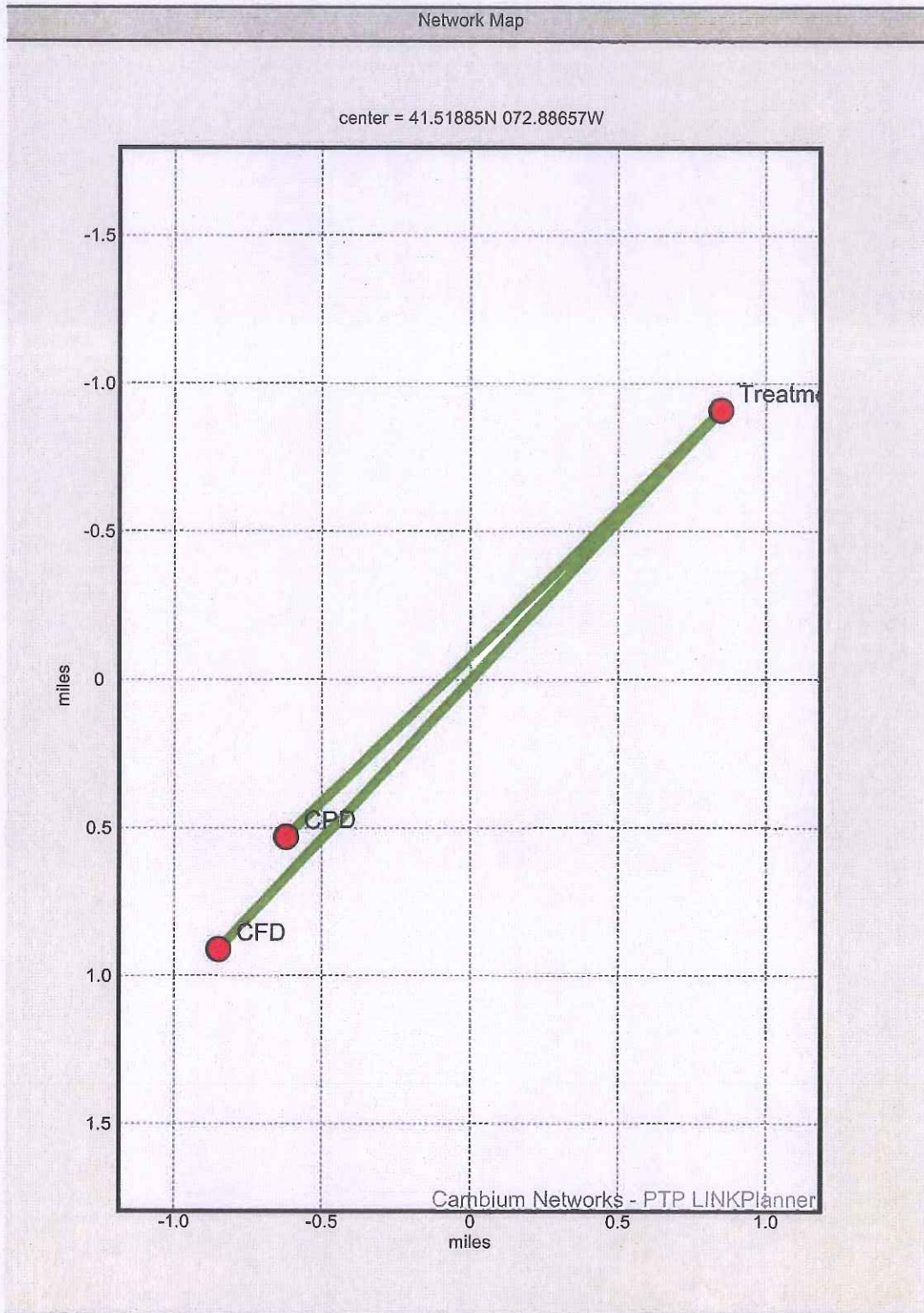


# 1. Project Summary

**Project:** Cheshire PD-FD 04-03-2014 EF  
**Description:** PTP Link Cheshire PD to new AT&T tower at Treatment Plant

General Information	
Customer Name	Cheshire PD/FD
Company Name	Northeastern Communications Inc
Address	7 Great Hill Road Naugatuck, CT 06770
Phone	203-568-6950
Cell Phone	
Email	efine@norcomct.net





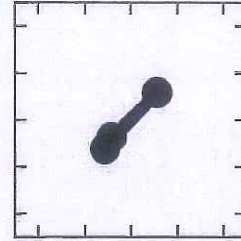
Link name	Product	Local antenna	Remote antenna	Max aggregate IP throughput (Mbps)
CPD to Treatment Plant New Tower	PTP49600	Radio Waves 2ft High Performance Dual-Polar Parabolic HPD2-4.7	Radio Waves 2ft High Performance Dual-Polar Parabolic HPD2-4.7	99.65
CFD to Treatment Plant New Tower	PTP49600	Radio Waves 2ft High Performance Dual-Polar Parabolic HPD2-4.7	Radio Waves 2ft High Performance Dual-Polar Parabolic HPD2-4.7	99.65

Part Number	Qty	Description
(no part number)	4	Radio Waves 2ft High Performance Dual-Polar Parabolic HPD2-4.7
WB2907	4	LPU End Kit PTP 600 (2 kits required per Link)
WB3176	4	328 ft (100 m) Reel Outdoor Copper Clad CAT5E (Recommended for PTP)
WB3226	2	PTP 49600 (5 MHz) Connectorised - Link Complete
WB3262	2	PTP 49600 Software Key 5 --> 10 MHz Link





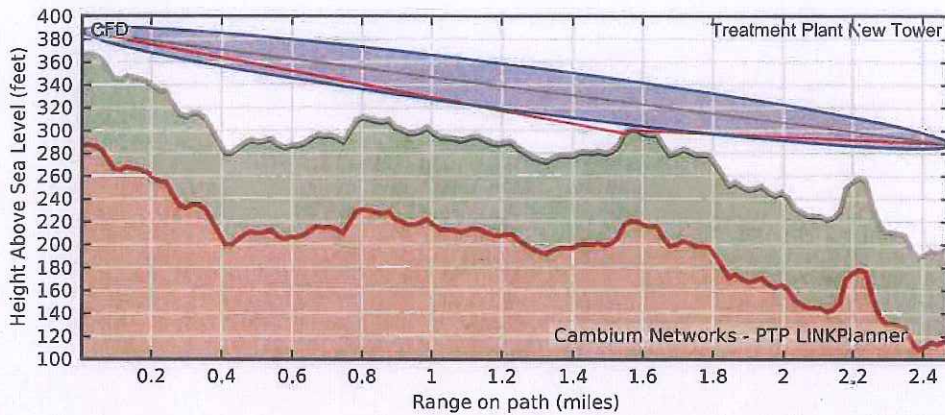
## CFD to Treatment Plant New Tower



Equipment: Cambium Networks PTP49600 Connectorized

Radio Waves 2ft High Performance Dual-Polar  
Parabolic HPD2-4.7 @ 100 ft

Radio Waves 2ft High Performance Dual-Polar  
Parabolic HPD2-4.7 @ 170 ft

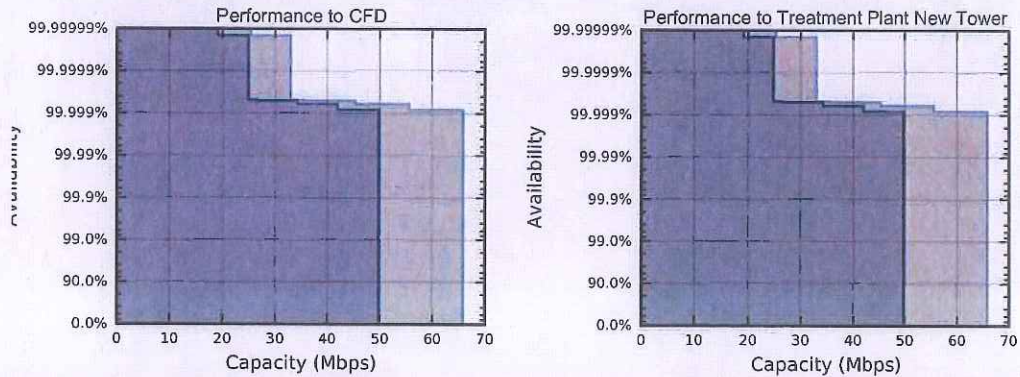


	Performance to CFD	Performance to Treatment Plant New Tower
Mean IP	49.8 Mbps	49.8 Mbps
IP Availability	100.0000 % for 1.0 Mbps	100.0000 % for 1.0 Mbps

Link Summary			
Link Length	2.479 mi.	System Gain	164.43 dB
Band	4.9 GHz	System Gain Margin	46.01 dB
Regulation	USA, Canada	Mean Aggregate Data Rate	99.6 Mbps
Modulation	Adaptive	Annual Link Availability	100.0000 %
Bandwidth	10 MHz	Annual Link Unavailability	0 secs/year
Total Path Loss	118.42 dB	Prediction Model	Vigants-Barnett



Performance Charts



- High Capacity, assumes there is no load in the other direction
- Symmetrical Capacity, assumes a saturated load in the other direction

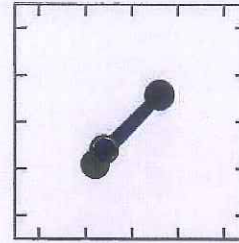
Climatic Factors, Losses and Standards			
Terrain Roughness	23.93 feet	Link Type	Line-of-Sight
Climatic Factor	1.0	Excess Path Loss	0.00 dB
C Factor	2.61	Atmospheric Gasses	ITU-R P.676-7, ITU-R P.835-4
Temperature	46.7° F	Diffraction Loss	ITU-R P.526-10
0.01% Rain rate	41.95 mm/hr	Propagation	Vigants-Barnett
Free Space Path Loss	118.38 dB	Rain Rate	ITU-R P.837-5
Gaseous Absorption Loss	0.04 dB	Refractivity Index	ITU-R P.453-9

Part Number	Qty	Description
(no part number)	2	Radio Waves 2ft High Performance Dual-Polar Parabolic HPD2-4.7
WB2907	2	LPU End Kit PTP 600 (2 kits required per Link)
WB3176	2	328 ft (100 m) Reel Outdoor Copper Clad CAT5E (Recommended for PTP)
WB3226	1	PTP 49600 (5 MHz) Connectorised - Link Complete
WB3262	1	PTP 49600 Software Key 5 --> 10 MHz Link





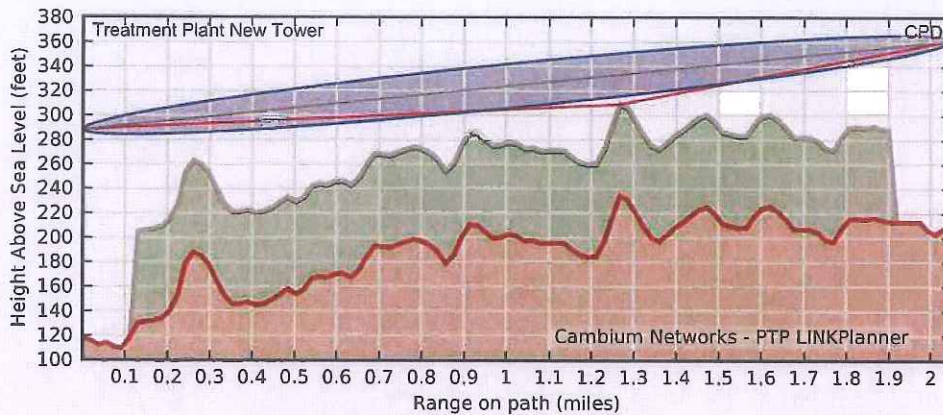
## CPD to Treatment Plant New Tower



Equipment: Cambium Networks PTP49600 Connectorized

Radio Waves 2ft High Performance Dual-Polar  
Parabolic HPD2-4.7 @ 170 ft

Radio Waves 2ft High Performance Dual-Polar  
Parabolic HPD2-4.7 @ 150 ft

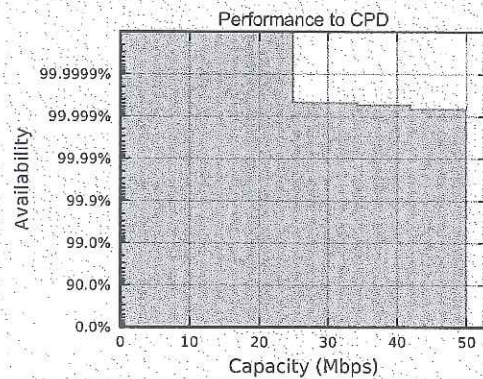
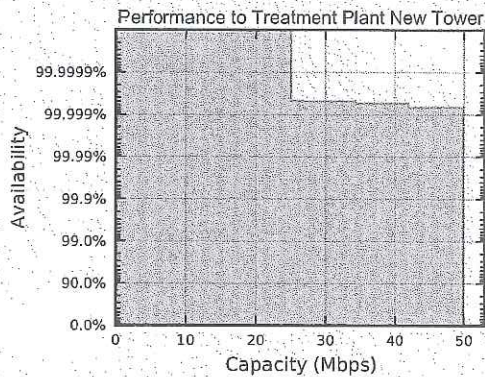


	Performance to Treatment Plant New Tower	Performance to CPD
Mean IP	49.8 Mbps	49.8 Mbps
IP Availability	100.0000 % for 1.0 Mbps	100.0000 % for 1.0 Mbps

Link Summary			
Link Length	2.049 mi.	System Gain	162.72 dB
Band	4.9 GHz	System Gain Margin	45.96 dB
Regulation	USA, Canada	Mean Aggregate Data Rate	99.6 Mbps
Modulation	Adaptive	Annual Link Availability	100.0000 %
Bandwidth	10 MHz	Annual Link Unavailability	0 secs/year
Total Path Loss	116.76 dB	Prediction Model	Vigants-Barnett



Performance Charts



Climatic Factors, Losses and Standards			
Terrain Roughness	23.20 feet	Link Type	Line-of-Sight
Climatic Factor	1.0	Excess Path Loss	0.00 dB
C Factor	2.71	Atmospheric Gasses	ITU-R P.676-7, ITU-R P.835-4
Temperature	46.7° F	Diffraction Loss	ITU-R P.526-10
0.01% Rain rate	41.95 mm/hr	Propagation	Vigants-Barnett
Free Space Path Loss	116.73 dB	Rain Rate	ITU-R P.837-5
Gaseous Absorption Loss	0.03 dB	Refractivity Index	ITU-R P.453-9

Part Number	Qty	Description
(no part number)	2	Radio Waves 2ft High Performance Dual-Polar Parabolic HPD2-4.7
WB2907	2	LPU End Kit PTP 600 (2 kits required per Link)
WB3176	2	328 ft (100 m) Reel Outdoor Copper Clad CAT5E (Recommended for PTP)
WB3226	1	PTP 49600 (5 MHz) Connectorised - Link Complete
WB3262	1	PTP 49600 Software Key 5 --> 10 MHz Link

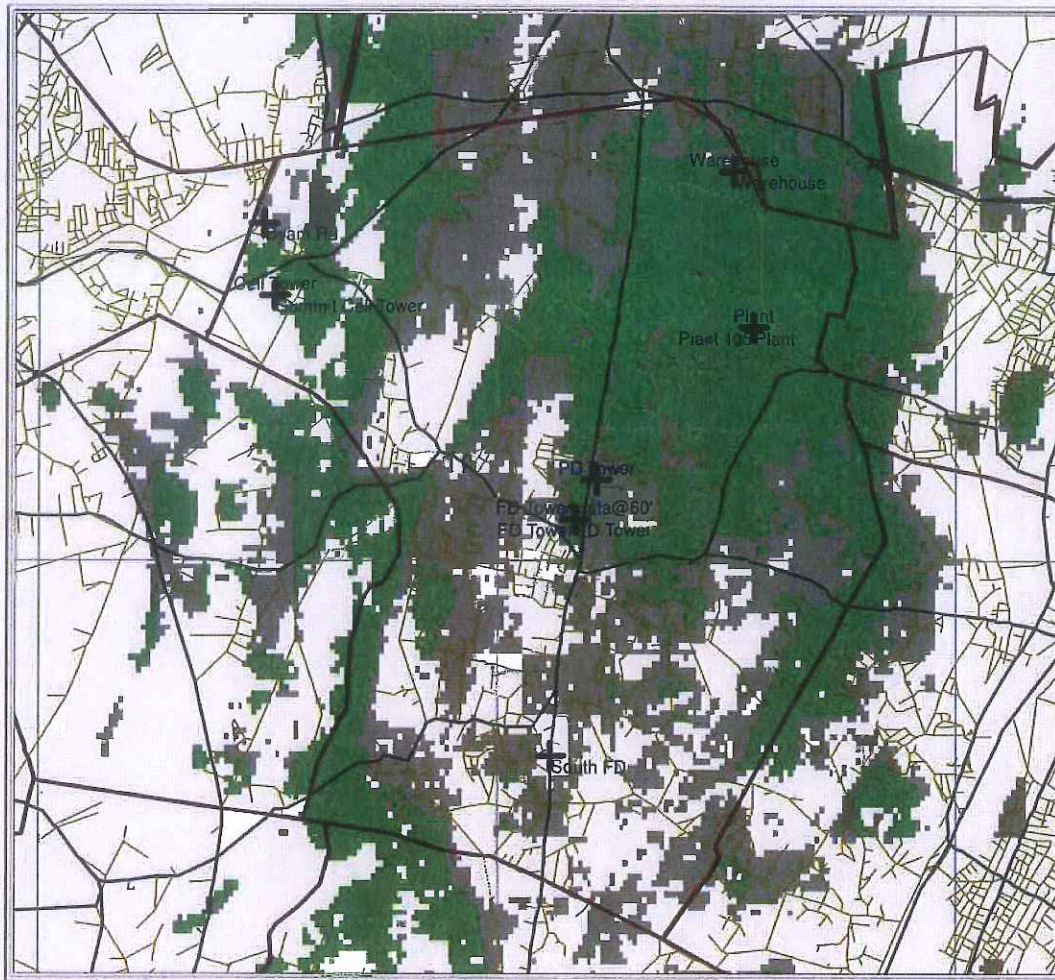


## Disclaimer

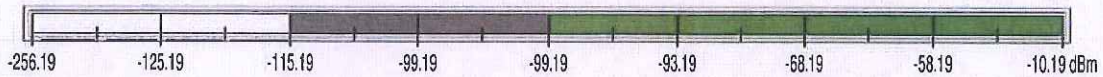
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### Treatment Plant Talk Out to Portable Medium Building (170') PD



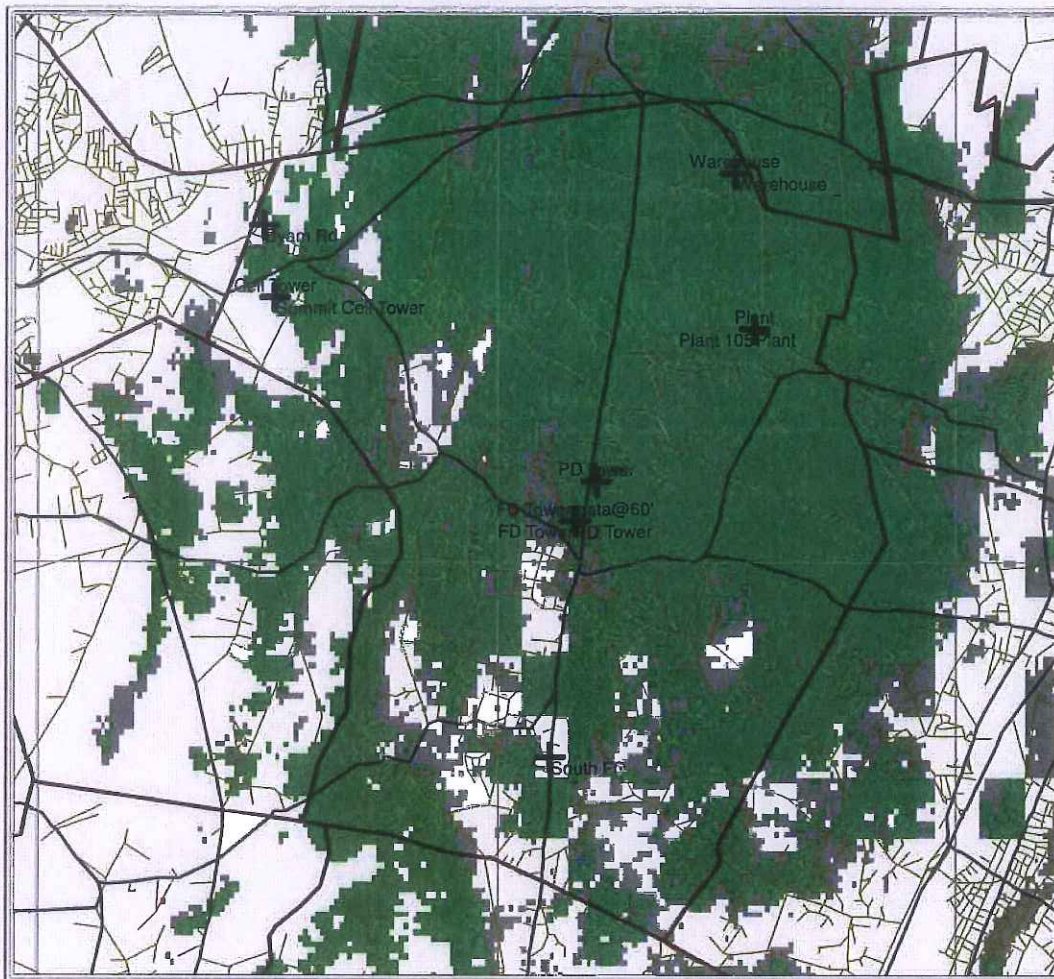
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- County Borders
- State Borders
- City Borders
- Highways
- Streets
- Lat/Lon Grid









### Treatment Plant Talk Out to Portable Medium Building (170') FD



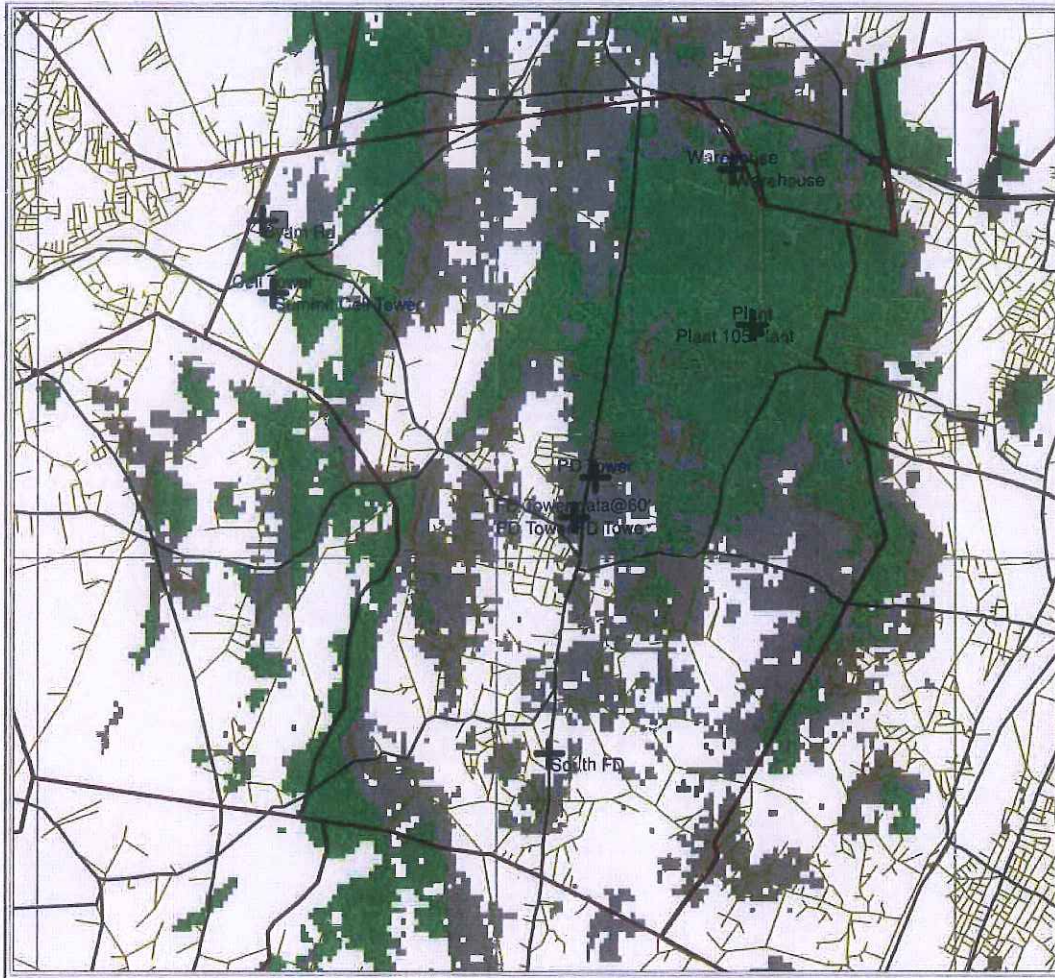
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-  County Borders
-  State Borders
-  City Borders
-  Highways
-  Streets
-  Lat/Lon Grid



Treatment Plant Talk Out to Portable Medium Building (105') PD



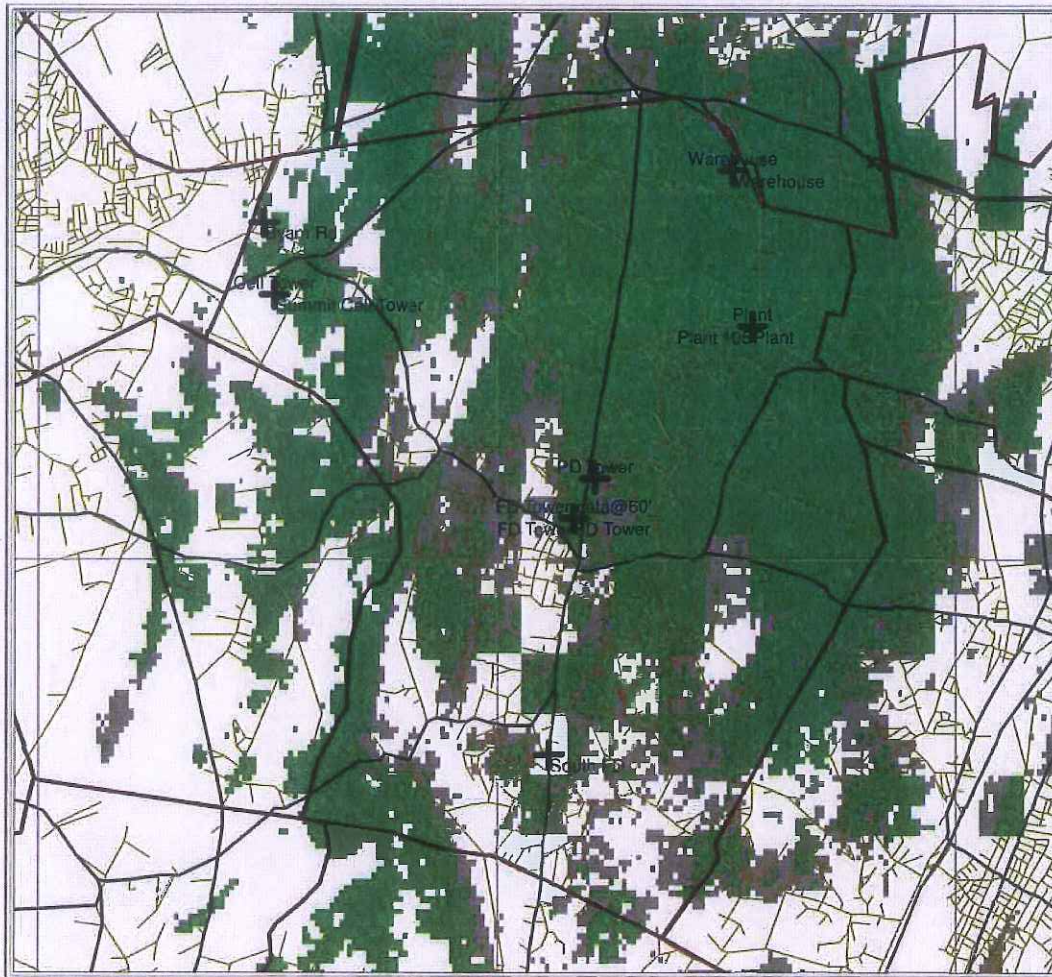
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- County Borders
- State Borders
- City Borders
- Highways
- Streets
- Lat/Lon Grid



### Treatment Plant Talk Out to Portable Medium Building (105') FD



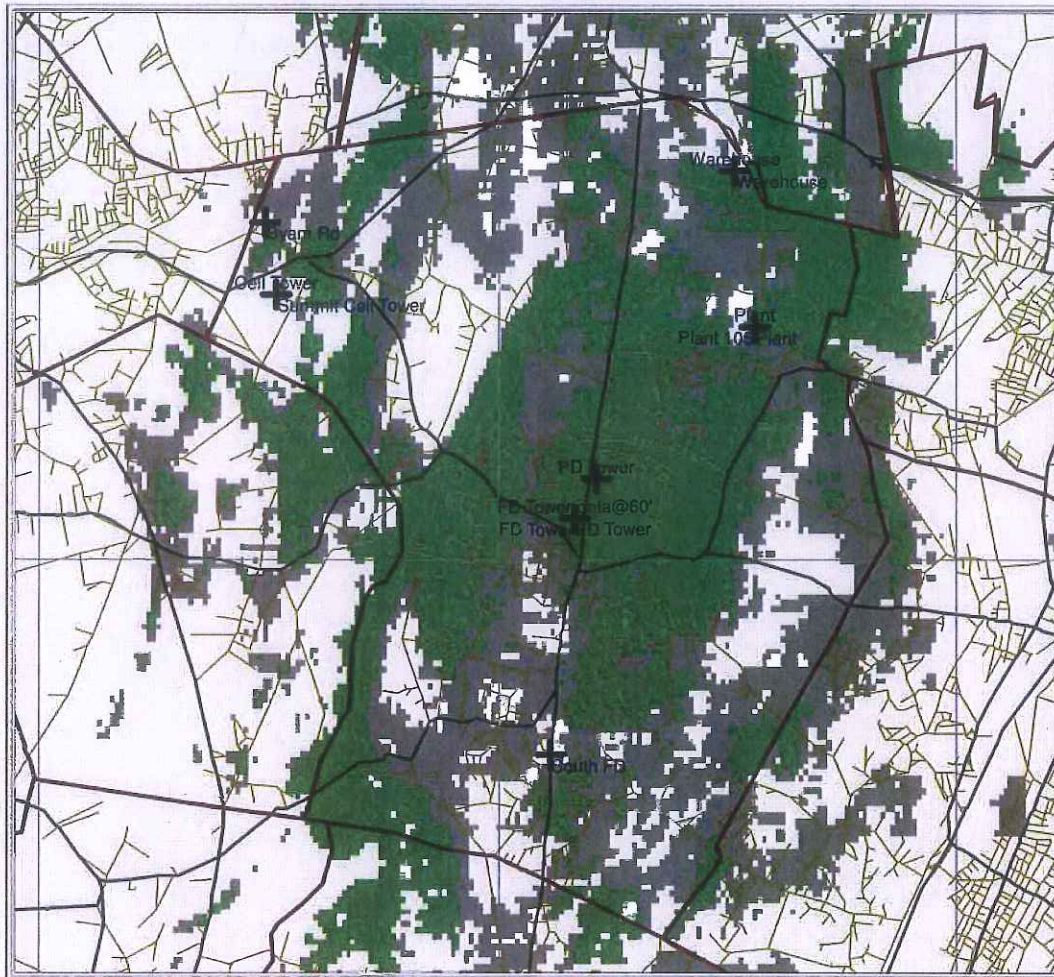
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- County Borders
- State Borders
- City Borders
- Highways
- Streets
- Lat/Lon Grid



### Police HQ Talk Out to Portable Medium Building PD



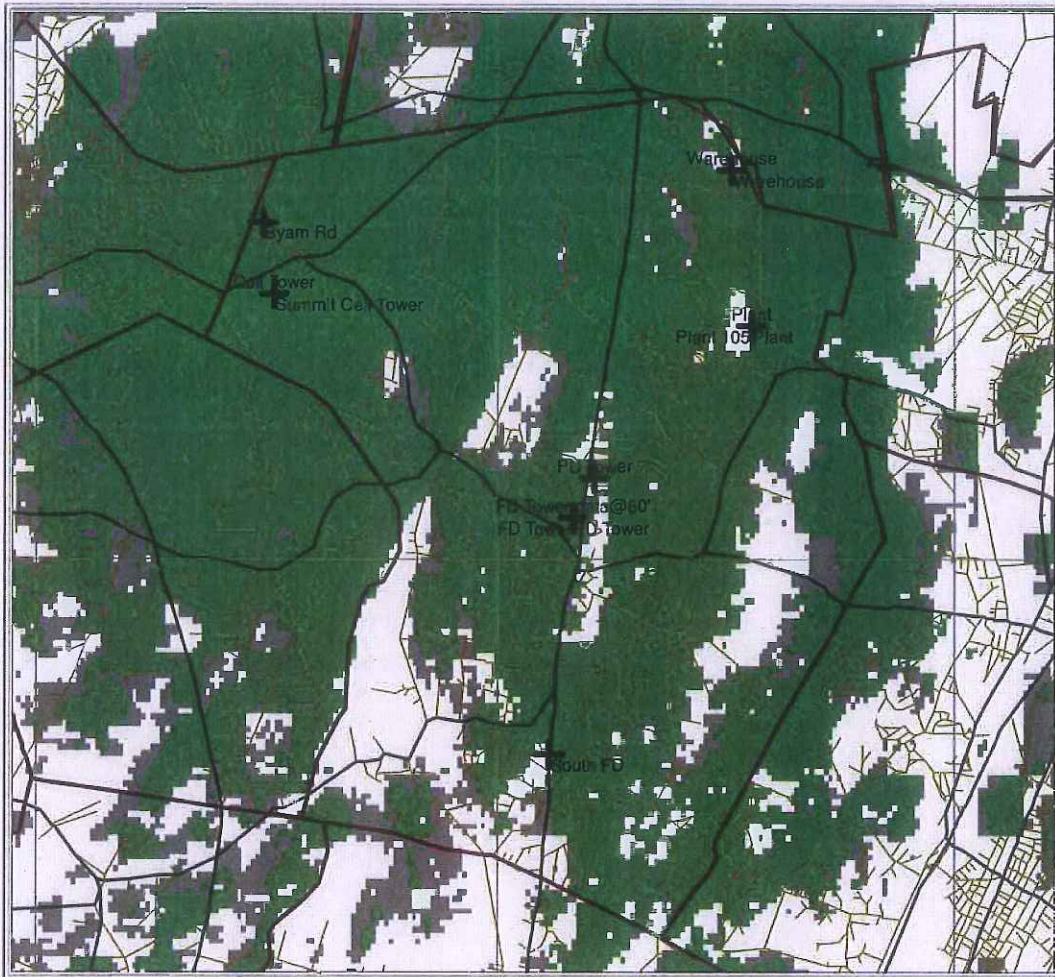
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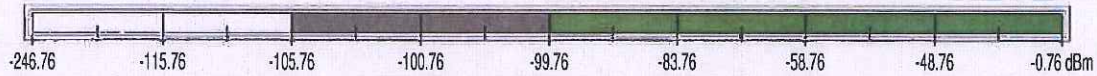
- |                |               |              |          |
|----------------|---------------|--------------|----------|
| County Borders | State Borders | City Borders | Highways |
| Streets        | Lat/Lon Grid  |              |          |



### Summit Road Talk Out to Portable Medium Building FD



*FOR REFERENCE ONLY - This document does not imply coverage or performance guarantees.*



- |                |               |              |          |
|----------------|---------------|--------------|----------|
| County Borders | State Borders | City Borders | Highways |
| Streets        | Lat/Lon Grid  |              |          |

Map Scale: 1:102457 1" = 1.62 mi V/H Size: 8.94 x 9.73 mi



# **NORTHEASTERN Communications Inc.**

7 Great Hill Road  
Naugatuck, Connecticut 06770

Phone 1-800-223-9008 • Fax (203) 753-1739  
www.norcomct.com

June 5, 2014

Mr. Vincent Xavier  
Site Development Manager  
Homeland Towers LLC  
22 Shelter Rock Lane Building C  
Danbury, CT 06810

Dear Mr. Xavier

I am writing you on behalf of the Town of Cheshire, CT in regards to the Homeland Towers LLC tower site development at the Waste Water Treatment Plant on Cheshire Street. The Town is very much in support of the Homeland Towers LLC proposal to construct a 170' monopole tower at this location. This site currently supports the Town of Cheshire's public safety radio system with antennas mounted on a building. The proposed monopole will provide space at the top to install RF antennas as well as the capability to install Point to Point (PTP) backhaul communications equipment. The proposed tower will help to improve the town's radio system coverage and remove reliance on leased telephone circuits for connectivity at this site increasing public safety.

After close investigation we have determined that the tower would require a minimum height of 170' to support a 4.9 GHz line of sight point to point RF link back to Cheshire Police and Fire Headquarters for system backhaul connectivity. We have also run base line RF coverage propagation surveys that demonstrate RF coverage improvements from this site at two elevations on the tower: the 105' elevation provides noticeable improvement and the 170' elevation provides significant improvement on both the Police and Fire Department radio systems and also supports the needed height for the utilization of PTP connectivity. Please see the enclosed PTP backhaul survey and engineering documentation along with RF coverage propagation maps that show the improvements this site would provide to the towns public safety radio system.

Please feel free to contact me directly should you have any further questions.

Sincerely,

*Eric Fine*

Eric Fine  
Implementation Engineer/Project Manager

## **NORTHEASTERN Communications, Inc.**

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