



**SPOTSYLVANIA COUNTY, VA
TECHNICAL REVIEW**

NEW 150-ft MONOPOLE TOWER

Tower Owner: Milestone Communications

Carrier: T-Mobile

Site: DVP Chancellor Substation

**11100 Gordon Road
Fredericksburg, VA 22407**

Submitted by:

ATLANTIC TECHNOLOGY CONSULTANTS, INC.

A Member of The Atlantic Group of Companies

ATC PROJECT #: 1047-20

March 1, 2017



THE ATLANTIC GROUP
OF COMPANIES INC.

EXECUTIVE SUMMARY

Milestone Communications (Milestone), T-Mobile Wireless (T-Mobile), and Dominion Virginia Power (Dominion) have made application to the County for the issuance of a Special Use Permit to construct a 150-ft monopole tower (with a 6-ft lightning rod) for a total of 156-ft AGL on property owned by Dominion Virginia Power at the Chancellorsville Substation located at 11100 Gordon Road, Fredericksburg, VA 22407.

Milestone Communications is a tower owner/developer, Dominion is a Virginia Regulated Utility provider of electric power service for this region, and T-Mobile is an FCC licensed wireless provider authorized to provide wireless communications services in the Spotsylvania County area.

Milestone is proposing to construct **outside** of the sub-station a 150-ft monopole type tower to enhance service delivery in the surrounding area.

This report outlines the specific areas of evaluation with respect to this proposal. Supporting and clarifying evidence regarding the suitability of the proposed design in meeting the specified coverage goals is included.

It is the opinion of this consultant that the Applicant's plans conform to accepted design and construction practices for the construction of telecommunications support structures.

This Consultant recommends that the request for issuance of a Special Use Permit to allow construction as proposed be approved.



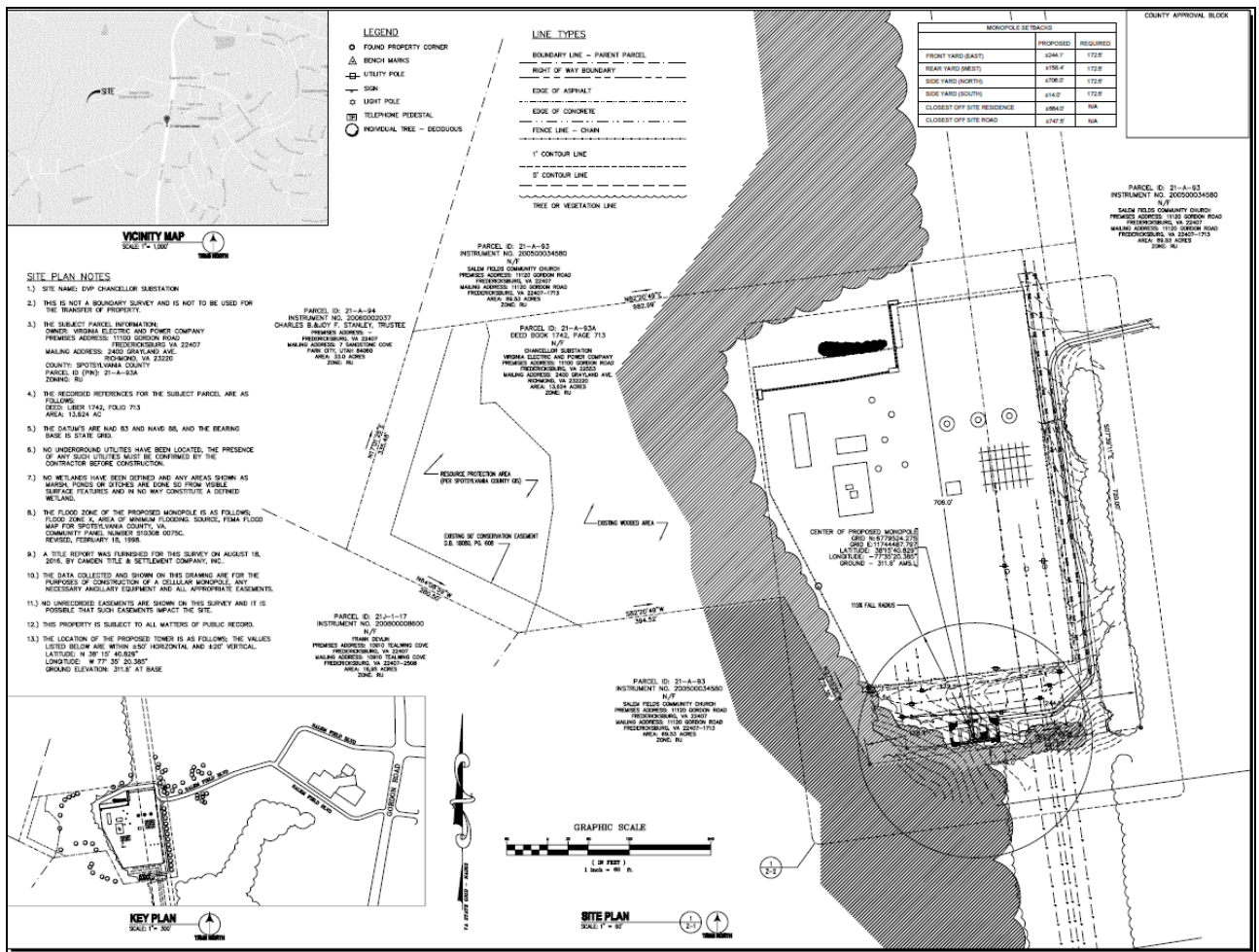
George N. Condyles, IV CPM
President and COO
Atlantic Technology Consultants, Inc.

1.0 TECHNICAL

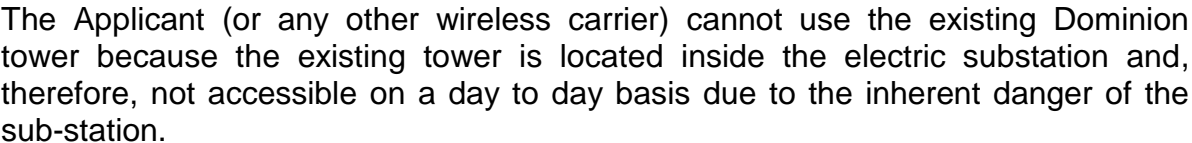
1.1 Siting

The proposed tower site (approximately 35' x74') is within the existing property boundary of the substation compound footprint. The property is zoned RU (Rural) and located on Tax Map 21-A-93A on a 13.6244 acre tract. The proposed site can be accessed from Gordon Road and is physically located at 38° 15' 40.6" N and 77° 35' 20.38" W with a ground elevation of 312' ±.

Dominion maintains a 50' wide ingress/egress easement with a 12' wide gravel access road. The proposed easement will run approximately 2,000 feet to Gordon Road. (See Below)



Site Plan



As stated in the Application:

Use of County Owned Properties

Page 4 of 29

1.2 Setbacks

Spotsylvania County's Zoning Ordinance, Chapter 23 Zoning, Article 7A Division 1-PURPOSE, Section 23-7A.1.2.6 Wireless Communication Facilities goals states the following:

The goals of this section are:

6. (a) *Promote the public health, safety and general welfare of the community. To avoid potential damage to adjacent properties from tower failure and falling objects through engineering structural standards and setback requirements. Sec.23-7A.4.1.2.*

2. The following setback requirements shall apply:

- (a) *All antenna support structures must maintain a minimum setback of one hundred and ten percent (110%) of the ANSI collapse zone standard from the nearest legally occupied structure and from all adjoining property lines. In the event that the same person(s) own several parcels, the setback shall be to the peripheral property lines created by the aggregate of the parcels.*

The centerline of the proposed monopole tower will be approximately 110' from the nearest property line, which **does meet** the County's zoning requirement for towers collapsing within the lot lines recommended guideline of 110% of the height of the tower from the nearest property line.

The nearest occupied dwelling is approximately 1,500'+ from the centerline of the proposed monopole tower.

1.3 Co-location

Co-location on any existing tower would not work for this project.

The scope which was discussed in the **Tower Purpose** above discusses the importance and mission of this tower.

Milestone states:

Encourage co-location of antennae on towers and/or alternative support structures.

The Telecommunication Tower monopole is one hundred fifty feet (150') in height to accommodate T-Mobile and four (4) additional carriers and to provide adequate coverage for topography of the immediate vicinity.

Dominion Virginia Power also has stated that they do not allow non power company personnel into the substations as company policy stated in the letter below:

Dominion Technical Solutions, Inc.
One James River Plaza, 701 East Cary Street, Richmond, VA 23219
Mailing Address: P.O. Box 26666
Richmond, VA 23261
Web Address: www.dom.com



STATEMENT OF SUPPORT

October 17, 2016

Spotsylvania County Planning Office
Attn: Wanda Parrish, Director

Re: Spotsylvania County Zoning Application (Chancellor Substation) (VP3091)

Dear Ms. Parrish:

This letter serves as support on behalf of Milestone Communications' application for rezoning in order to construct a new telecommunications monopole on Dominion Virginia Power property, located at 11100 Gordon Road, Fredericksburg, Virginia 22401; also referred to as Dominion Virginia Power Chancellor Substation.

Per company policy, no outside carriers can be permitted to collocate on structures within Dominion Virginia Power Substations, due to both security and safety concerns. The existing telecom structure is located within a secured access area within the Dominion Virginia Power Substation compound. Allowing outside carriers to collocate on the structure would potentially expose untrained workers to a variety safety hazards, as well as, pose a threat to substation security.

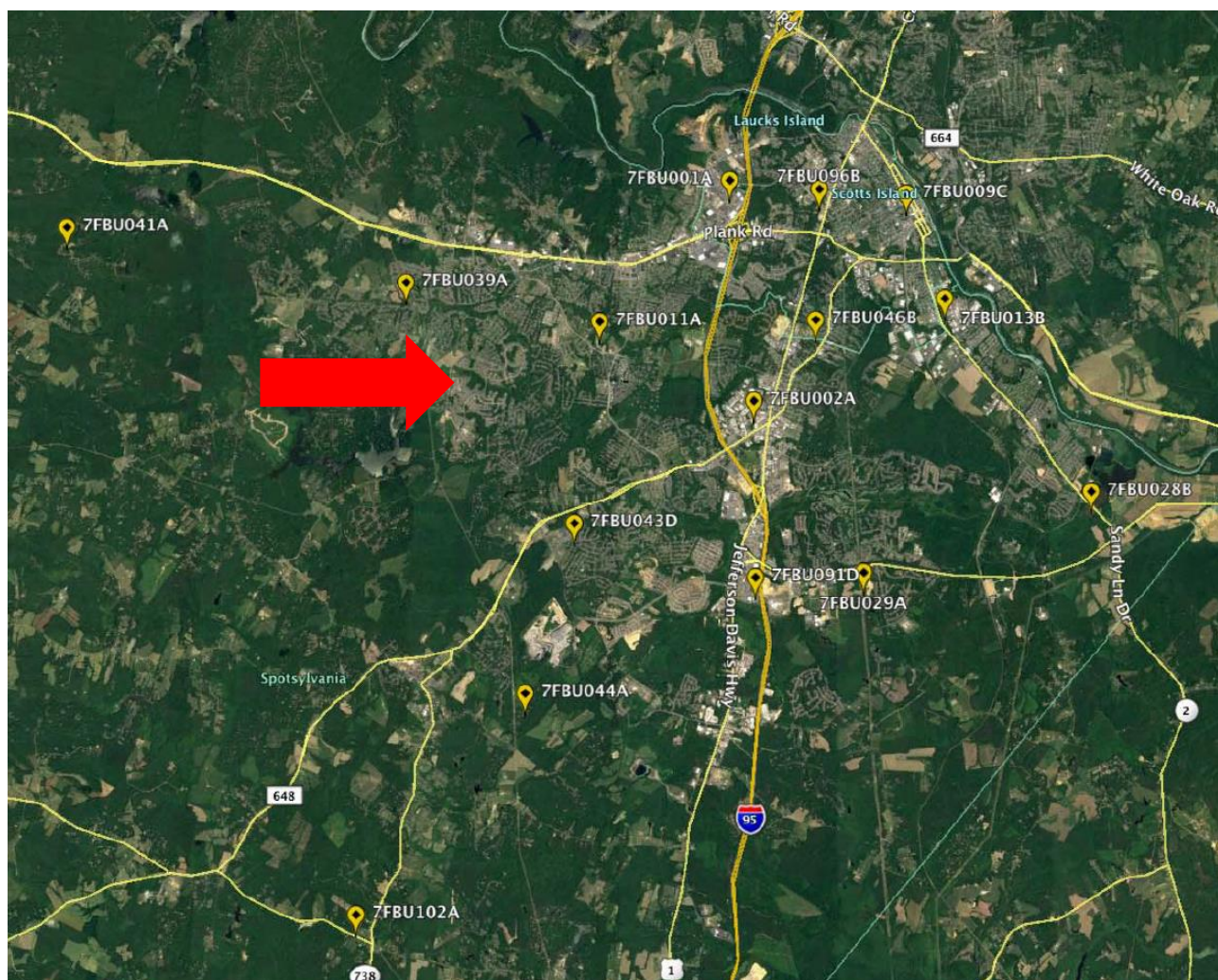
In addition, the existing telecom structure was only designed to support Dominion Virginia Power internal communications equipment and is at full capacity with the existing and proposed future appurtenances.

Please address any questions relating to this project to Milestone Communications.

Thank You,

Bob McGuire, P.E.
Dominion VA Power
Director - Electric Transmission Project Development and Execution

In addition, there are no communication towers or elevated structures (such as the power lines) with which this tower would create duplicity and thus not be in alignment with the County's policy of utilization of existing structures.



The weight of the five (5) wireless carrier's antennas and cables would far exceed the design standards for the closest kVA power line structure and thus would not make it an alternative.

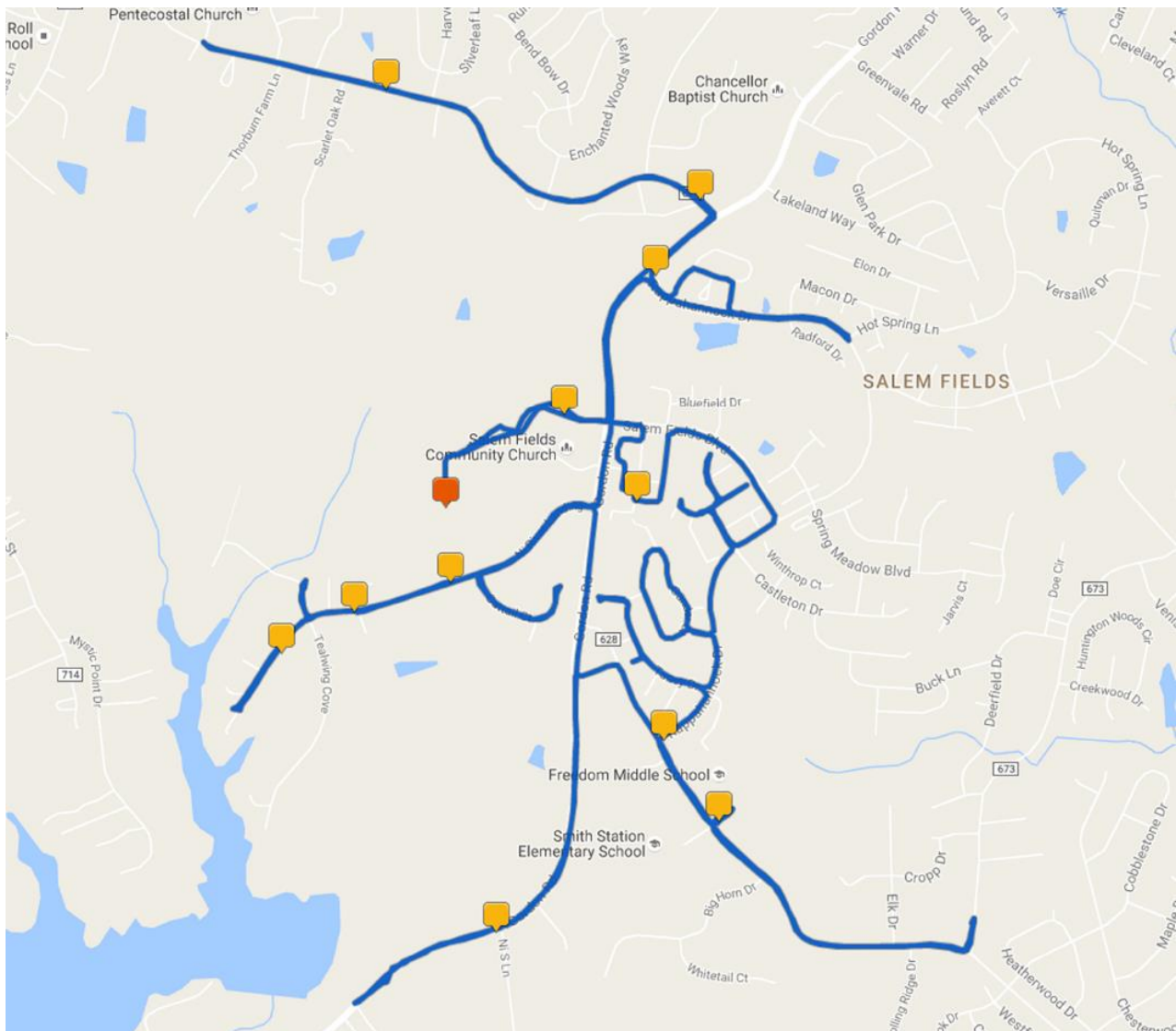
The Consultant concurs with the Milestones design and data concerning no other towers in the area would provide the coverage objectives that T-Mobile is seeking.

1.4 Landscape Buffer

The Substation lies in a natural valley in what is known topographically as a "saddle." It cannot be seen from Gordon Road. Dominion designed it this way purposely.

The proposed site is surrounded by a buffer of 70-ft to 90-ft soft and hardwood trees on two sides. The buffer is approximately 100-ft from the fence of the proposed compound.

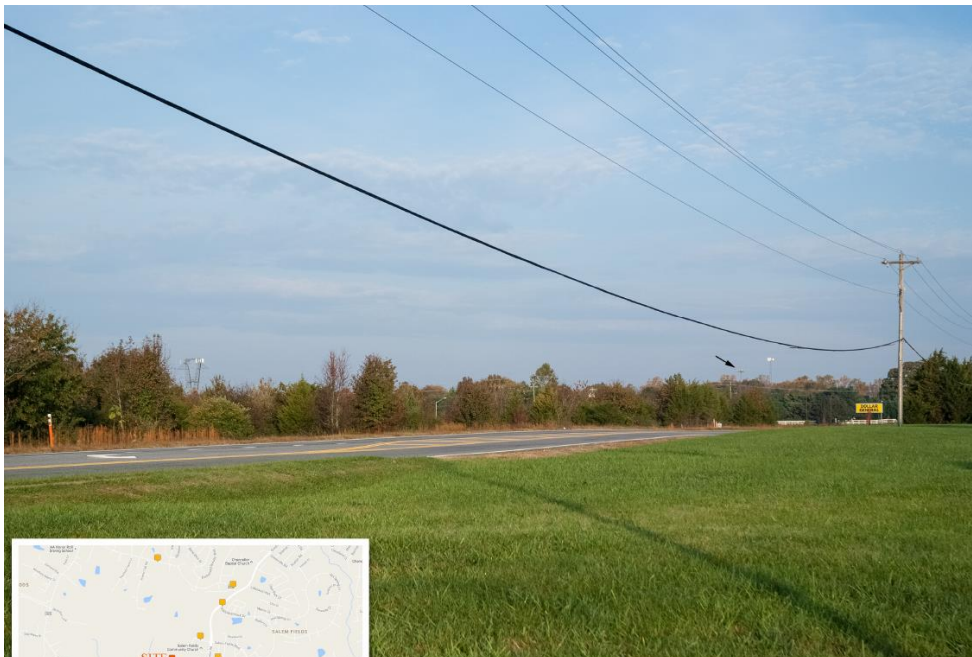
The Applicant has submitted photo simulations from various locations and directions. Upon review of these photos, the Consultant concurs with the “estimated” view.



Location Map of Directions of Photo simulations



DVP CHANCELLOR
PROPOSED MONOPOLE



DVP CHANCELLOR
PROPOSED MONOPOLE



DVP CHANCELLOR
PROPOSED MONOPOLE



DVP CHANCELLOR
PROPOSED MONOPOLE



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PROPOSED MONOPOLE



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PROPOSED MONOPOLE



DVP CHANCELLOR
PROPOSED MONOPOLE

The proposed site will have limited view from any neighborhoods.

1.5 **Structural**

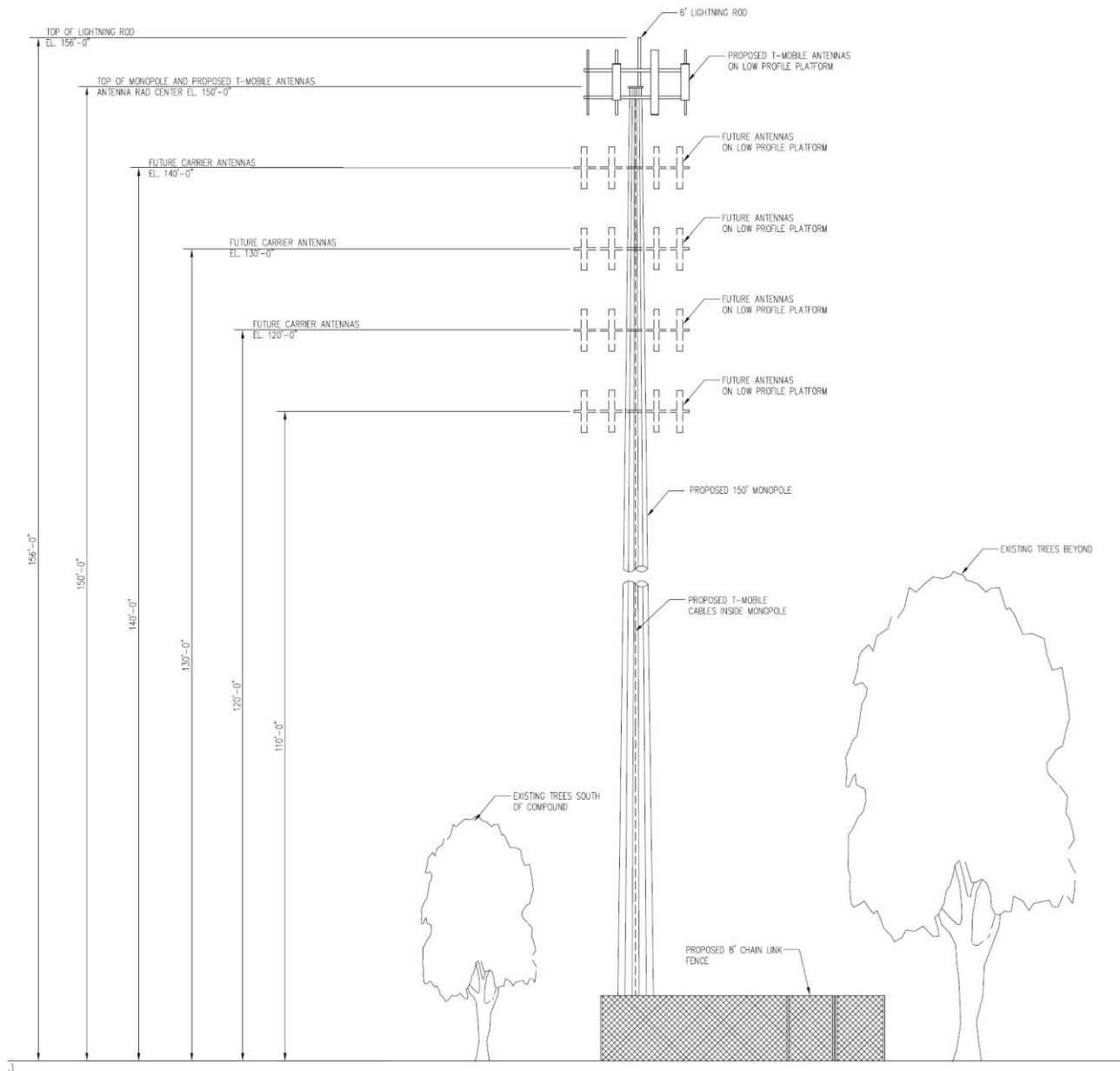
The proposed 150-ft monopole tower is designed with the ability to support equipment operated by multiple Land Mobile Radio carriers, microwave dishes, and antennas.

The supplied site plans are signed and sealed by John Caborgoudy, PE, a professional engineer licensed in the Commonwealth of Virginia.

A structural analysis was included in the application sent to ATC. The manufacturer Sabre Industries, Inc. is an international tower manufacturer in communications towers. This tower was designed as a heavy load tower, thus able to meet the loading requirements.

This tower was designed by Mr. Robert E. Beacom, P.E. of Sabre Industries, Inc. on November 18, 2016.

Profile View of Proposed 150' Monopole Tower



A structural analysis takes into account the structural loading of the tower's own weight, that of the proposed appurtenances, and that of various iterations of wind, ice, and other environmental loading.

It is noteworthy that this model of tower is designed to support appurtenances for multiple microwave dishes and antennas and remain within EIA/TIA-222-G structural guidelines (the accepted industry standard) for structures, which

mandates the ability to withstand the structural loading of all appurtenances, plus additional wind and ice loading.

Furthermore, in conformance with County ordinances, work at this site will remain in compliance with ALL federal, state, and local building codes and regulations if work proceeds as outlined in the application.

1.6 RF Exposure

FCC bulletin OET-65 provides guidance for a licensee proposing to construct a telecommunications support structure in calculation of RF exposure limitations, including analysis of the cumulative effect of all transmitters on the structure.

Documentation of a Radio Frequency exposure study was included with this application. It was performed by Mr. Klaus Bender, PE, of Site Safe, Inc.

Mr. Bender has evaluated the Radio Frequency plan and has rated it: **Compliant** for T-Mobile.

Appropriate steps, including warning signage at the site, must be taken to protect both the general public and site workers from unsafe RF exposure in accordance with federal guidelines.

RF site exposure warning signage shall be appropriately placed at this site, in conformance with FCC regulations and industry standards.

The Consultant concurs with this assessment.

(See full Letter Below)

RF EMISSIONS COMPLIANCE REPORT

Milestone Communications on behalf of T-Mobile

Site ID: 7WAW371A
Site Name: DVP Chancellor Substation
Address: 11120 Gordon Road
Fredericksburg, VA 22401
11/22/2016

Report Status:

T-Mobile Is Compliant.



Klaus Bender, P.E.
Professional Engineer
Commonwealth of Virginia, 0402039384
Sitesafe, Inc. (License#: 0407004659)

Date: Tuesday, November 22, 2016

Prepared By:

Sitesafe, Inc.

200 North Glebe Road, Suite 1000

Arlington, VA 22203

Voice 703-276-1100
Fax 703-276-1169

1.7 Grounding

Grounding of all structures and equipment at an RF site is critically important to the safety of both personnel and equipment at the site. Even a single component not meeting this standard places all other site components at risk for substantial damage. All structures and equipment at the site should maintain a ground potential difference of less than 5 ohms.

The Applicant, Milestone, understands the importance of Grounding especially at this facility and will ensure that all structures and equipment is grounded to standard.

1.8 General Safety

The consultant concurs with the Applicant's proposed site security and safety plans. They are:

1. This site compound will be surrounded by the designed eight (8) foot tall security fence with three strands of barbed wire on top to prevent unauthorized access to the tower site.
2. Safety measures to be placed at this site include RF exposure warning signage, site identification information, and routine and emergency contact information.
3. Include the installation of an OSHA-approved style of fall prevention cable.

1.9 Interference

An interference study, taking into account all proximally located transmitters and receivers known to be active in the area are advisable prior to any deployment of antennae.

A full interference study of potential adverse effects of the county's 700/800 MHz Public Safety Communications system has been included with the Applicant's submission package.

The Consultant sees no evidence of interference.

2.0 PROCEDURAL

2.1 FAA Study: 2016-AEA-8927-OE

The approved Federal Aviation Administration study and report was performed on October 20, 2016.

The findings are: "This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation".

The tower, if approved, does **not** require lighting.



Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2016-AEA-8927-OE

Issued Date: 10/20/2016

COLLEEN KHAN
ENTREX
6600 ROCKLEDGE DR STE 550
BETHESDA, MD 20817

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Monopole MILESTONE AT DVP CHANCELLOR SUBSTATION
Location:	FREDERICKSBURG, VA
Latitude:	38-15-41.10N NAD 83
Longitude:	77-35-20.20W
Heights:	322 feet site elevation (SE)
	156 feet above ground level (AGL)
	478 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

☐ At least 10 days prior to start of construction (7460-2, Part 1)
☒ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

Based on this evaluation, marking and lighting are not necessary for aviation safety. However, if marking/ lighting are accomplished on a voluntary basis, we recommend it be installed and maintained in accordance with FAA Advisory circular 70/7460-1 L Change 1.

This determination expires on 04/20/2018 unless:

- (a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
- (b) extended, revised, or terminated by the issuing office.
- (c) the construction is subject to the licensing authority of the Federal Communications Commission (FCC) and an application for a construction permit has been filed, as required by the FCC, within 6 months of the date of this determination. In such case, the determination expires on the date prescribed by the FCC for completion of construction, or the date the FCC denies the application.

2.2 FCC Antenna Site Registration

This site is **not** required to have an antenna site registration number.

TOWAIR Determination Results

*** NOTICE ***

TOWAIR's findings are not definitive or binding, and we cannot guarantee that the data in TOWAIR are fully current and accurate. In some instances, TOWAIR may yield results that differ from application of the criteria set out in 47 C.F.R. Section 17.7 and 14 C.F.R. Section 77.13. A positive finding by TOWAIR recommending notification should be given considerable weight. On the other hand, a finding by TOWAIR recommending either for or against notification is not conclusive. It is the responsibility of each ASR participant to exercise due diligence to determine if it must coordinate its structure with the FAA. TOWAIR is only one tool designed to assist ASR participants in exercising this due diligence, and further investigation may be necessary to determine if FAA coordination is appropriate.

DETERMINATION Results

Structure does not require registration. There are no airports within 8 kilometers (5 miles) of the coordinates you provided.

Your Specifications

NAD83 Coordinates

Latitude	38-15-40.6 north
Longitude	077-35-20.3 west

Measurements (Meters)

Overall Structure Height (AGL)	47.5
Support Structure Height (AGL)	45.7
Site Elevation (AMSL)	95.1

Structure Type

MTOWER - Monopole

Tower Construction Notifications

Notify Tribes and Historic Preservation Officers of your plans to build a tower.

CLOSE WINDOW

2.3 Environmental Impacts

The National Environmental Policy Act of 1969 (NEPA), delineated in Title 47 of the Code of Federal Regulations, Part 1, Subpart I, sections 1.1301-1.1319, requires federal agencies to incorporate environmental considerations into their decision-making process when evaluating new construction proposals.

As a licensing agency, the Federal Communication Commission (FCC) requires all licensees to consider the potential environmental effects from their construction of antenna support structures, and to disclose those effects in an Environmental Assessment (EA) that must be filed with the FCC for review.

A Phase I NEPA report was submitted with this Application.

Typically, a NEPA Phase I Report should include the following items:

- NEPA Checklist
- NEPA Summary Report
- Associated documentation
 - Figures, Drawings, Maps
 - Tribal Correspondence
 - Land Resources Map and FEMA Floodplain Map
 - SHPO Correspondence (See next Section 2.4 “Historic Impacts)
 - Department of Game and Inland Fisheries Response
 - Department of Conservation and Recreation Response

The NEPA Phase I Assessment is a report that is submitted to the FCC only if requested by the FCC.



The NEPA Study was conducted by Milestone’s consultant, Aarcher Inc. Their November 9, 2016 report states **“No Impact”** to any category of the NEPA and Section 106 criteria.

(See Conclusions below)

2.4 Historic Impacts

Section 106 of the National Historic Preservation Act of 1966 (NHPA) requires that State Historic Preservation Offices (SHPO) and the President's Advisory Council on Historic Preservation be given a reasonable opportunity to comment on all undertakings with the potential to affect historic properties.



The NEPA Study was conducted by Milestone's consultant, Aarcher, Inc. Their November 9, 2016 report states (in Section 3.0 Conclusion) "**No Impact**" to any category of the NEPA and Section 106 criteria.

2.5 Results of NEPA Phase 1 and SHPO

As mentioned above, the Environmental and Historic Consultant (Aarcher, Inc.) sees **“No Impact”** to the area if this Application is approved.

Note: The original Environmental Study for the placement of the Substation was the same criteria as the NEPA and Section 106 for the requested communications tower, thus it has been completed for this parcel of land.

The consultant concurs with these findings and position of Milestone.

Phase I Environmental Site Assessment
Chancellor Substation



1.0 EXECUTIVE SUMMARY

On May 14, 2016, AARCHER, Inc. (AARCHER) was contracted by Entrex, on behalf of Milestone Communications, to conduct a Phase I Environmental Site Assessment (assessment) of a proposed tower leasehold area (the Subject Property) located at 11100 Gordon Road, Fredericksburg, Spotsylvania County, Virginia. Milestone Communications is the potential lessee of ground and access/utility ground space on the parent tract. T-Mobile proposes to place antennae on the proposed 150-foot monopole tower and install prefabricated equipment cabinets within a proposed 74-foot by 35-foot fenced compound. T-Mobile will utilize the proposed approximate 565-foot long road which will lead southward from a private gravel drive, to the Subject Property. The overall areal extent of the project will be less than one acre. The ground space and access/utility areas will be part of the proposed leasehold. Milestone Communications designated the Subject Property as site “Chancellor Substation”.

The purpose of the assessment documented in this Report is to permit Milestone Communications to satisfy one of the requirements to qualify for the innocent landowner defense to CERCLA liability: “all appropriate inquiry into the previous ownership and uses of the property consistent with good commercial or customary practice” as defined in 42 USC Section 9601(35)(B).

The scope of the assessment is generally guided by *ASTM Practice E1527-13 Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process* (ASTM Practice E1527-13). Any exceptions to, or deletions from, this practice are described in Section 2.2 and 2.3 of this Report.

This assessment revealed no evidence of Recognized Environment Conditions (RECs) as defined by ASTM Practice E1527-13, in connection with the Subject Property.

This assessment revealed no evidence of Historical Recognized Environment Conditions (HRECs) as defined by ASTM Practice E1527-13, in connection with the Subject Property.

This assessment revealed no evidence of Controlled Recognized Environment Conditions (CRECs) as defined by ASTM Practice E1527-13, in connection with the Subject Property.

2.0 INTRODUCTION

2.1 Reference to Detailed Scope-of-Work and ASTM Standard Practice E1527-13

The scope of the assessment is generally guided by *ASTM Practice E1527-13 Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process* (ASTM Practice E1527-13). Any exceptions to, or deletions from, this practice are described in Section 2.2 and 2.3 of this Report.

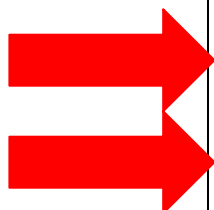
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This assessment is not intended to include *de minimis* conditions that generally do not present a material risk of harm to the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies.

ENVIRONMENTAL SITE ASSESSMENT REPORT - PRIVILEGED DOCUMENT

AARCHER, Inc.

Page 1

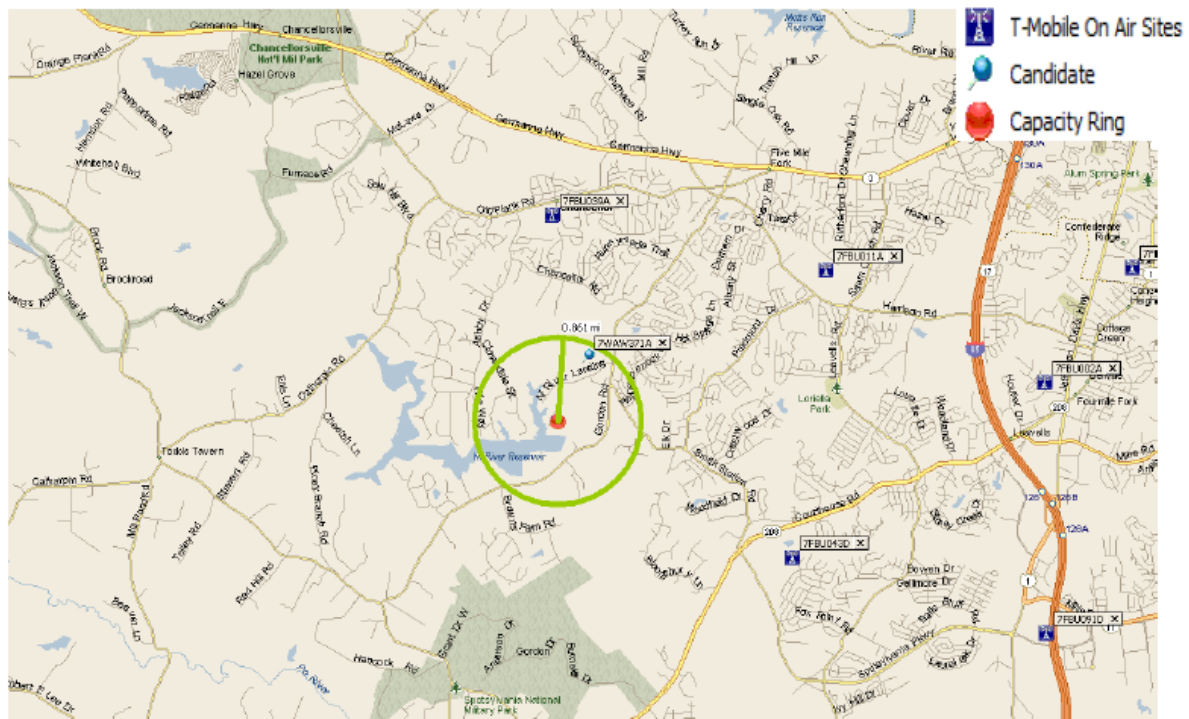


2.6 T-Mobile Network

T-Mobile is the co-applicant searching for vertical structures to attach their antennas and electronics. This area is a growing area demographically, and with new retail, residential housing, commercial real estate, this area has become a busy location.

T-Mobile desires to expand their LTE service in this area. To do so, they must deploy this site to “fill in” the data/broadband services.

7WAW371A Search Ring & Candidate

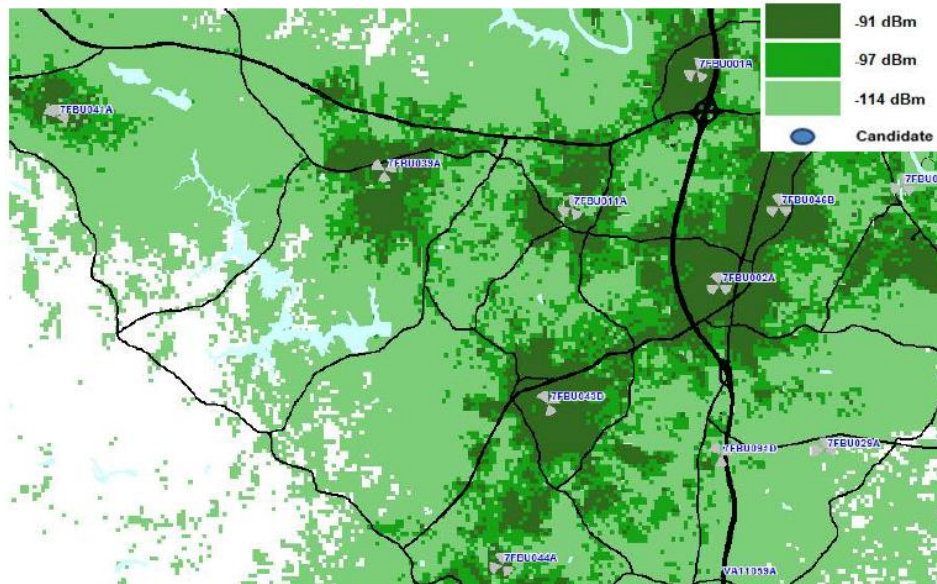


T-Mobile Confidential

T-Mobile

Mid Band - Current on-air plot without 7WAW371A

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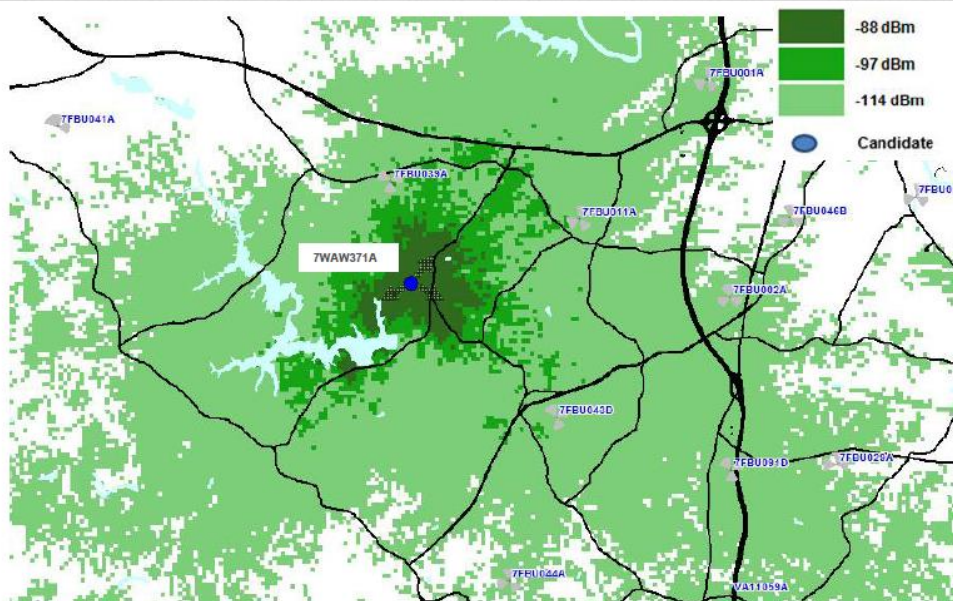


T-Mobile Confidential

T-Mobile

L700 - Proposed new coverage

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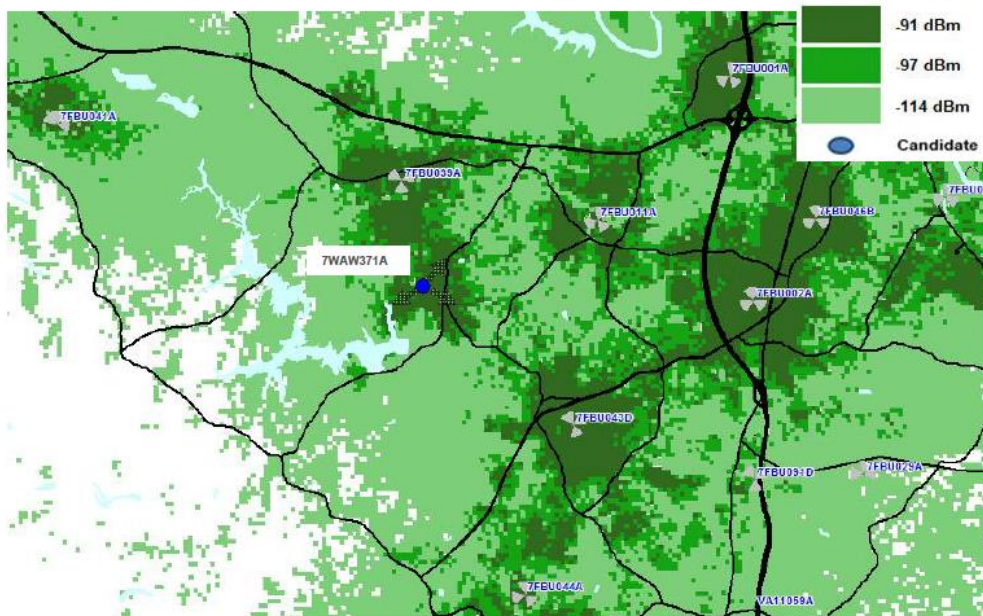


T-Mobile Confidential

T-Mobile

Mid Band - Current on-air plot with 7WAW371A

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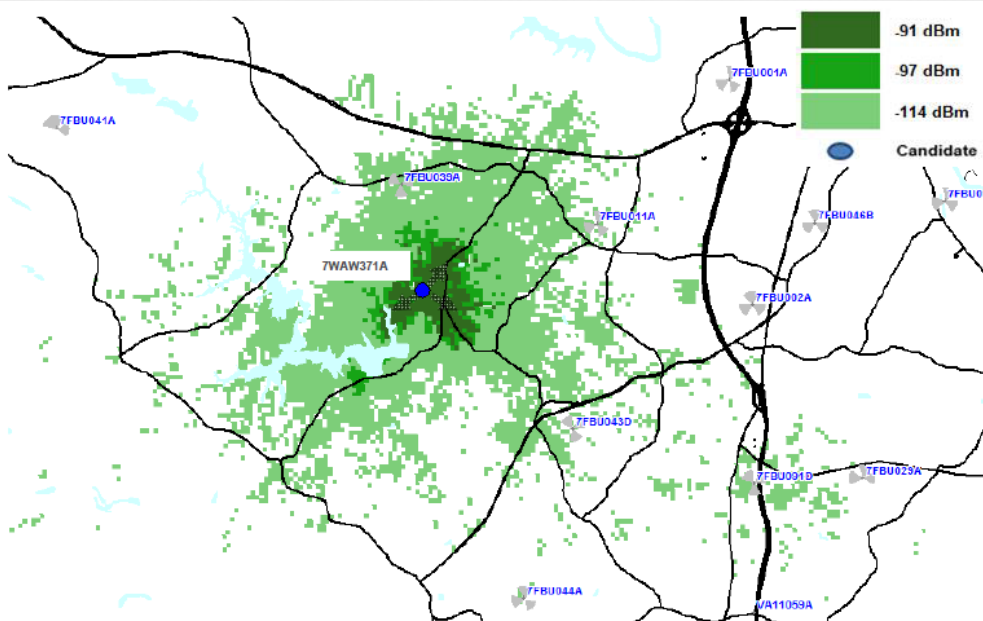


T-Mobile Confidential

T-Mobile

Mid Band - Proposed new coverage

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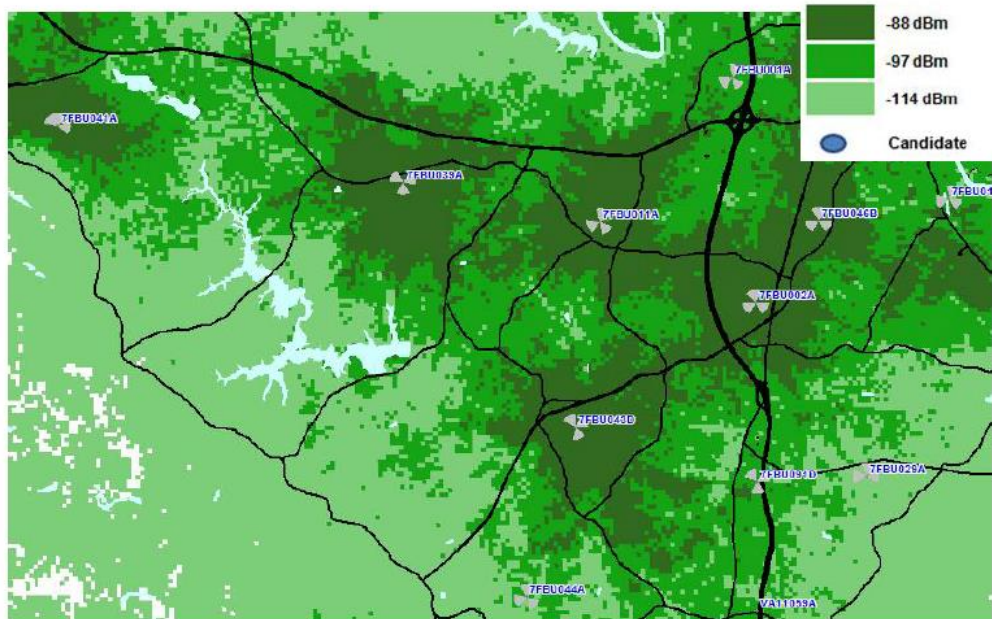


T-Mobile Confidential

T-Mobile

L700 - Current on-air plot without 7WAW371A

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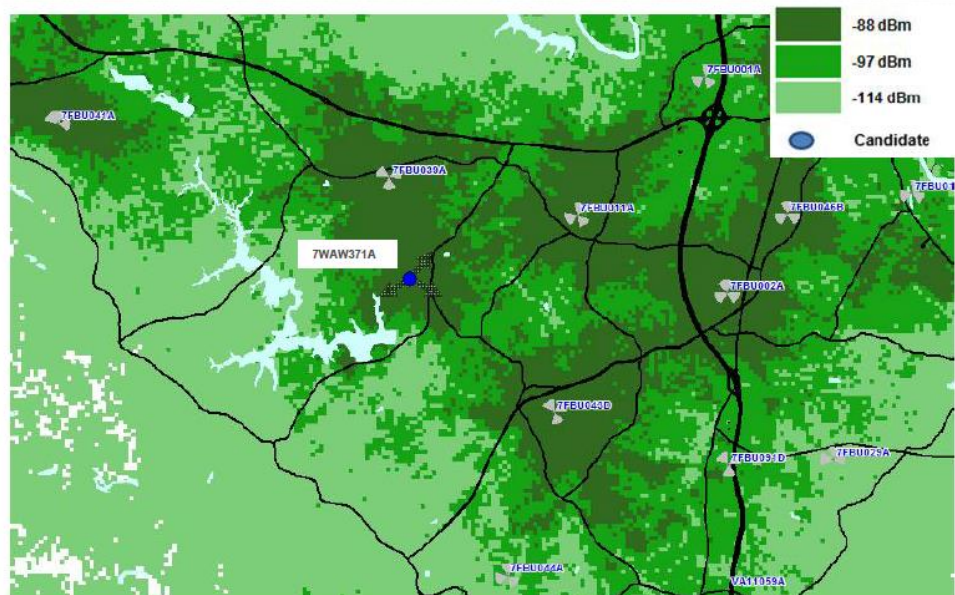


T-Mobile Confidential

T-Mobile

L700 - Current on-air plot with 7WAW371A

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T-Mobile Confidential

T-Mobile

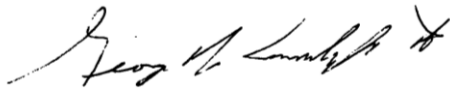
3.0 RECOMMENDATIONS

This request for approval to construct a 150-ft monopole tower (with a 6-ft. lightning rod) as proposed represents an appreciable intent on the part of the Applicant to conform to all applicable federal, state, and local regulations, accepted industry practices, and specific County ordinances regarding telecommunications towers.

It is therefore the recommendation of this Consultant that the request for issuance of a Special Use Permit be approved.

In closing, this consultant remains available to address any comments or questions which may arise following review of this report. Any interested party with such comments or questions may feel free to contact this firm, which remains committed to delivering independent, objective, unbiased, and thorough consulting services.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "George N. Condyles, IV", followed by a stylized flourish or checkmark.

George N. Condyles, IV, CPM
President & COO



Entrance Gate from Gordon Road



Safety Signage required by OSHA



Chancellorsville Substation with Dominion MW Tower



Power Line Structures-South



Power Line Structures-North



Approximate location of Tower compound