

3.2 Data Collection and Network Devices

Provide a discussion of the following items related to the data collection and network devices:

- *Provide an RF propagation study summarizing network design and redundancy. List the quantity of data collectors/repeaters required, site locations, and mounting heights. Note dimensions of DCUs and mounting specifications; provide photos.*

Please see Appendix 13_RF Propagation Study for complete details on the RF propagation study conducted for Naperville.

The proposed solution includes 3 base stations at the sites listed below:

Base Station Site Name	Latitude	Longitude	Basestation Equipment	Mandatory Antenna Centerline (Feet)
Northeast Standpipe	41.799302	-88.121292	M400B2	98
Southwest Elevated Tank	41.701272	-88.165801	M400B2	199
West Elevated Tank	41.768831	-88.189198	M400B2	145

The M400B2 base station is typically mounted at the base of the pole or tower, with the antenna mounted at the height called out in the RF design.

The M400B2 base station has dimension of 22" height x 22" width x 10.5" depth.

The FlexNet M400B2 Base Station is packaged in an outdoor enclosure for pole-mounting or wall-mounting. Mounting brackets for each mounting option are included with the M400B2. Documentation with installation diagrams and instructions is also provided.

Typically, the M400B2 is mounted at the base of the pole or tower, with the antenna mounted at the height called out in the RF design. Each base station location requires a suitable structure to mount the antenna per the RF propagation design.



FIGURE 19: M400B2 BASE STATION

- *Indicate the anticipated network construction time as well as any support required from the City (e.g., easements, permitting, licensing, etc.).*
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Our propagation study determined a total of three (3) Basestations which will give the City the coverage as outlined in the RFP. Once a proposer is awarded the project, the City will be responsible for signing a Base Terms Agreement, basically outlining roles and responsibilities of all parties involved and assigning a FCC License. Please see Appendix 7_AMI Sample Agreement.

Once the agreement is signed by the City, Core & Main will order the material necessary to complete the installation. The lead time is approximately 6 weeks. During the lead time, the Basestation installer will perform a job site visit and develop a detailed SOW for work to be performed. Once the SOW has been agreed upon and signed by City, the installer will proceed with installation. A copy of a sample SOW is provided as Appendix 15_Site Installer SOW. The City will be responsible for providing a network or an existing backhaul network for Sensus/City to communicate. The assumption for this RFP is that an existing fiber network will be available to use for this project.

The actual construction time, assuming everything signed, will be five (5) working days for installation/commissioning of Basestations. The City will be responsible for providing access to antenna sites and inform contractor as to any permits/licenses required before work to be started.

- *List the backhaul options available. If the protocol is not to store and immediately forward, describe the default transmission interval for sending data from the DCU to the control computer. Describe any programmable features, such as data reporting schedules, for DCUs, and procedures for programming or configuring them.*
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We designed our FlexNet Base Stations to be as flexible as possible in dealing with backhaul communication and provide numerous backhaul options. This interoperability helps utilities work within its infrastructure to meet their long-term technical and financial goals.

Base stations support Transmission Control Protocol/Internet Protocol (TCP/IP) using a standard Register Jack 45 (RJ-45) Fast Ethernet connection. Common backhaul options used with the FlexNet system include:

- Ethernet
- Frame Relay
- Multiprotocol Label Switching (MPLS)
- Integrated Services Digital Network (ISDN)
- Digital Subscriber Line (DSL)
- Very Small Aperture Terminal (VSAT)
- 3G/4G cellular
- Microwave

FlexNet Design

Propagation Analysis

8166 - NAPERVILLE CITY OF
Naperville, IL

RF Engineer: Dena Reszczynski
Date: 09/18/2019

Proposed Site Details

Total Site Locations: 3

Total Base station Counts: 3

M40082 = 3

Design Factors

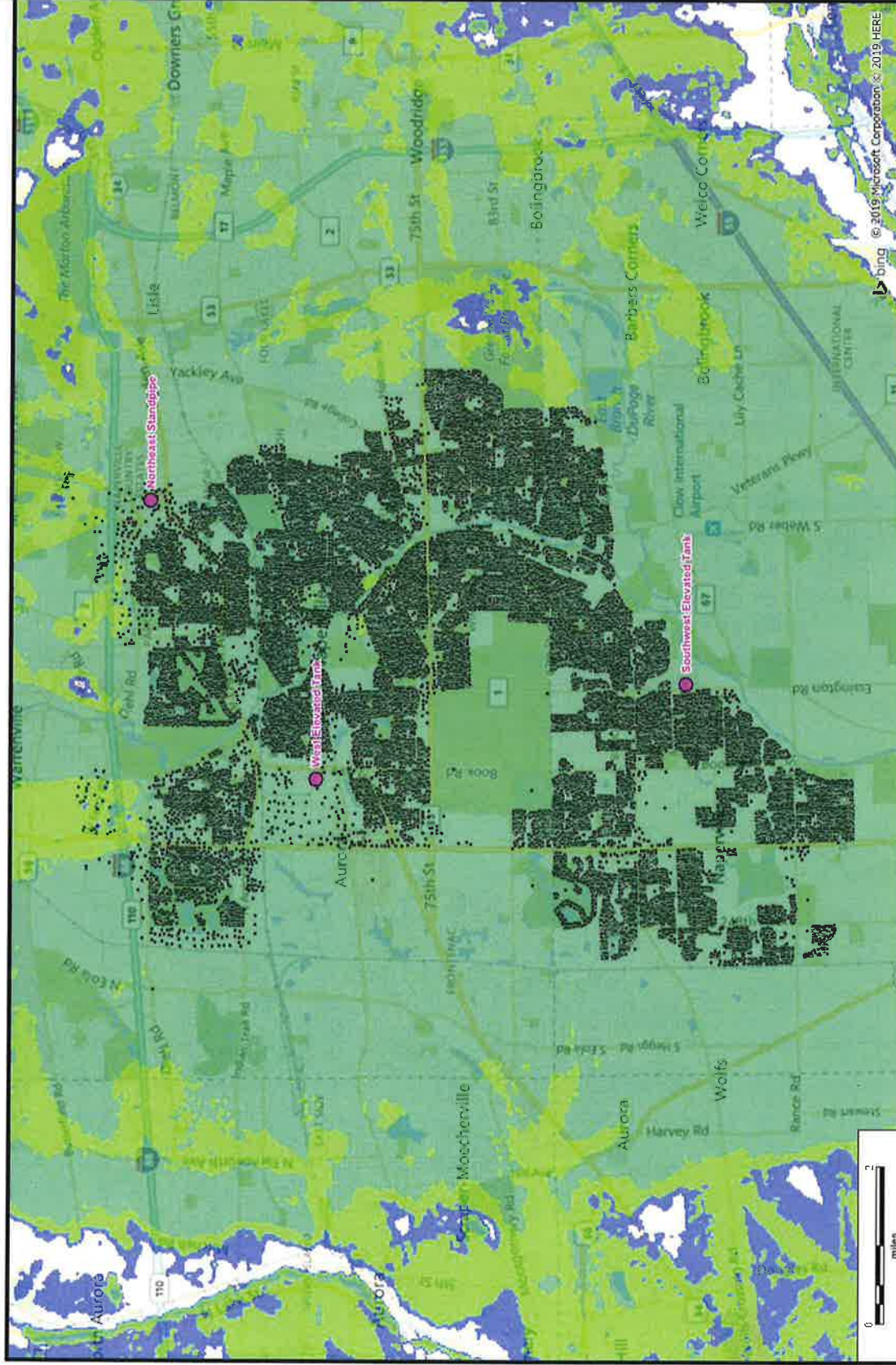
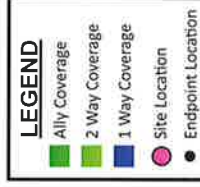
Flex Net Version: V1

Endpoint Type: Water

Smart point Location: Outdoor

Attenuation: 0dB

	Count	%
Total Endpoints Covered	43,719	100.00%
Ally Coverage	43,560	99.64%
2 Way Coverage	157	0.36%
1 Way Coverage	2	0.00%
Total Endpoints Analyzed	43,719	



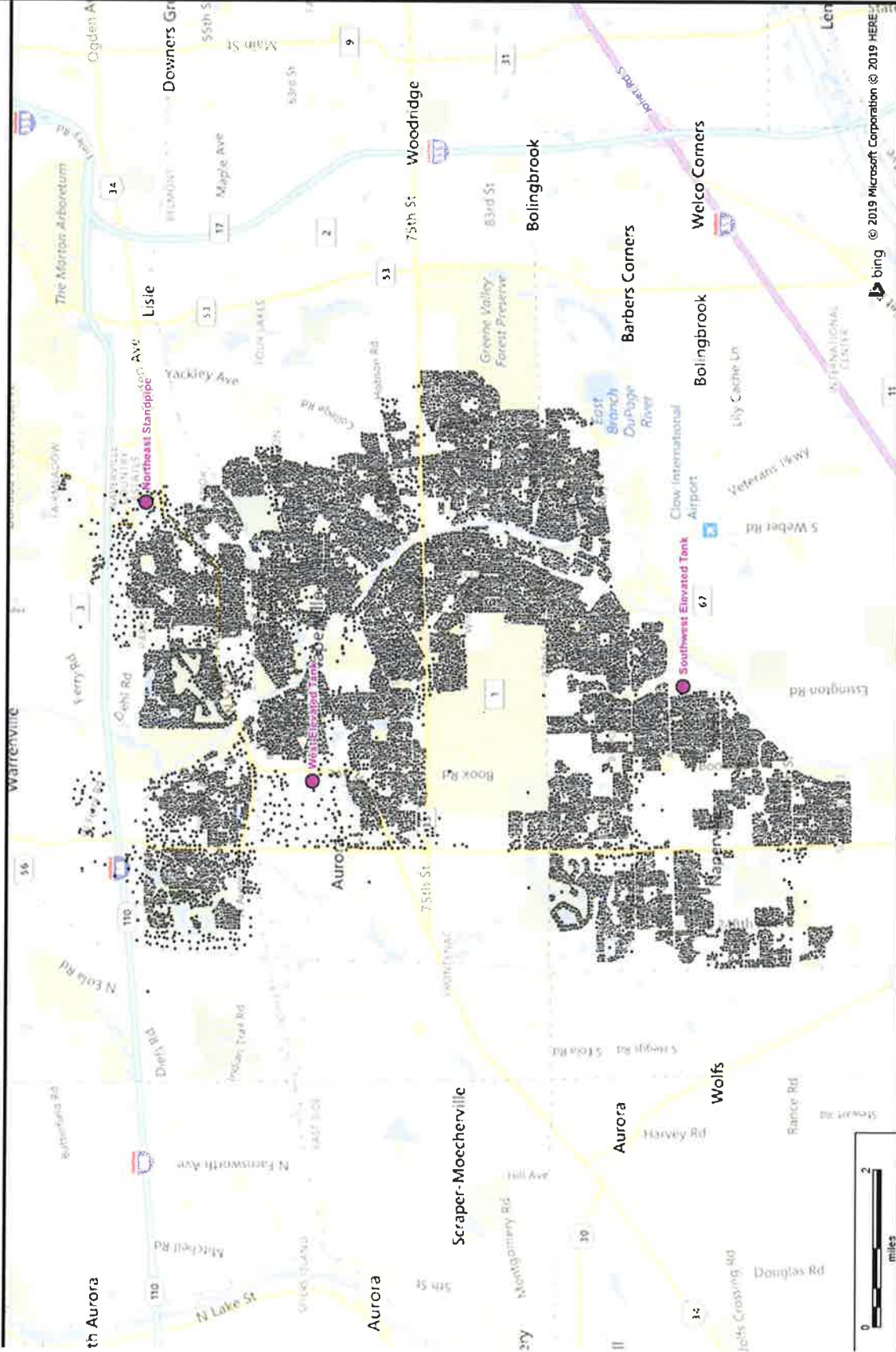
This propagation study is based on actual information provided by the utility pertaining to meter type, Smart point Location, potential antennae height on structure, structure height, and structure location. Any changes, deletions and/or additions that are not provided to the design engineers during the creation of this design may result in a study that does not correlate to actual field conditions.

FlexNet Design

Propagation Analysis

8166 - NAPERVILLE CITY OF
Naperville, IL

RF Engineer: Dena Resczynski
Date: 09/13/2019



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Propagation Analysis

8166 - NAPERVILLE CITY OF
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LEGEND

● Site Location

High Density Urban

Commercial - Industrial

Suburban Fr: Trees

Suburban With Trees

Airports

Major Transportation

Open

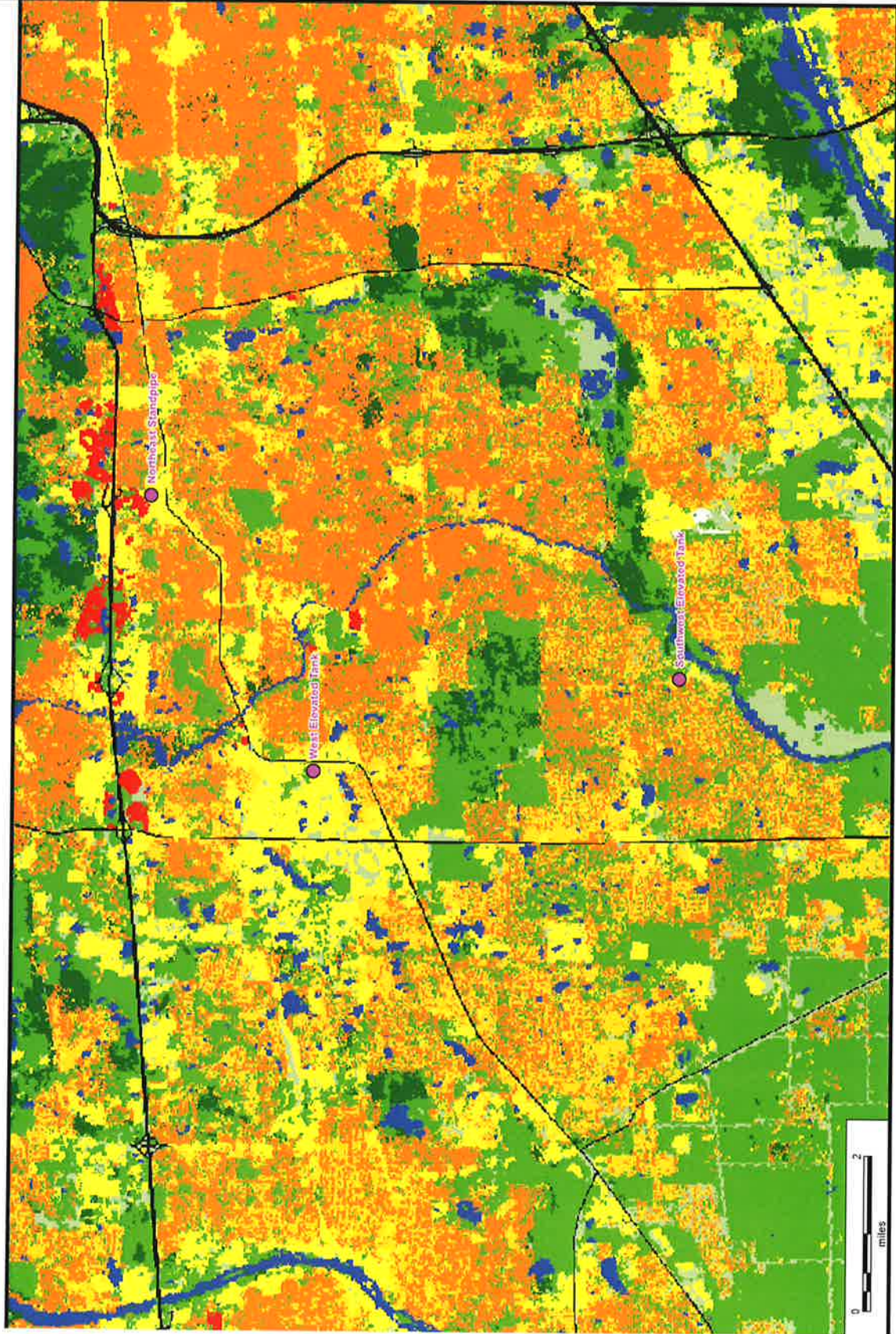
Grass - Agriculture

Forest

Wetland

Inland Water

Sea Water



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