

CT11841 B&C Ledyard Drive Test Results

Test Date: June 12, 2006



Purpose

A drive test was performed at the proposed T-Mobile location at 12 Orchard Drive, Ledyard, CT. The purpose of the drive test was to gather accurate signal strength measurements along the objective routes at various heights. The results allow for T-Mobile Radio Frequency (RF) Engineering to determine the minimum height required to achieve the coverage objective and further fine tune the propagation prediction model for this area.

Procedure

To gather the required data, a simulated test site was constructed at the location of the proposed facility. To construct the test site, a crane was used to lift an omni-directional antenna to the desired height. The omni-directional antenna was chosen for its ability to direct a signal equally in all directions along the horizontal plane extending away from the antenna, eliminating any nulls between antennas as typically seen with directional panel antennas. A test transmitter is then attached to feed the desired signal to the omni-directional antenna. A watt meter was installed in-line between the test transmitter and the antenna. The purpose of the watt meter is to measure the forward power sent from the transmitter to the antenna and to check for the presence of reflected power which would indicate either a faulty antenna or coax feedline system. Once the power levels were recorded, the watt meter was removed and the transmitter was attached directly to the test antenna. All values were entered into the attached T-Mobile drive test form (Addendum A)

With the transmitter attached to the antenna and the test channel broadcasting, the crane lifted both to the first desired height of 147 feet above ground level (AGL) to the center of the test antenna.

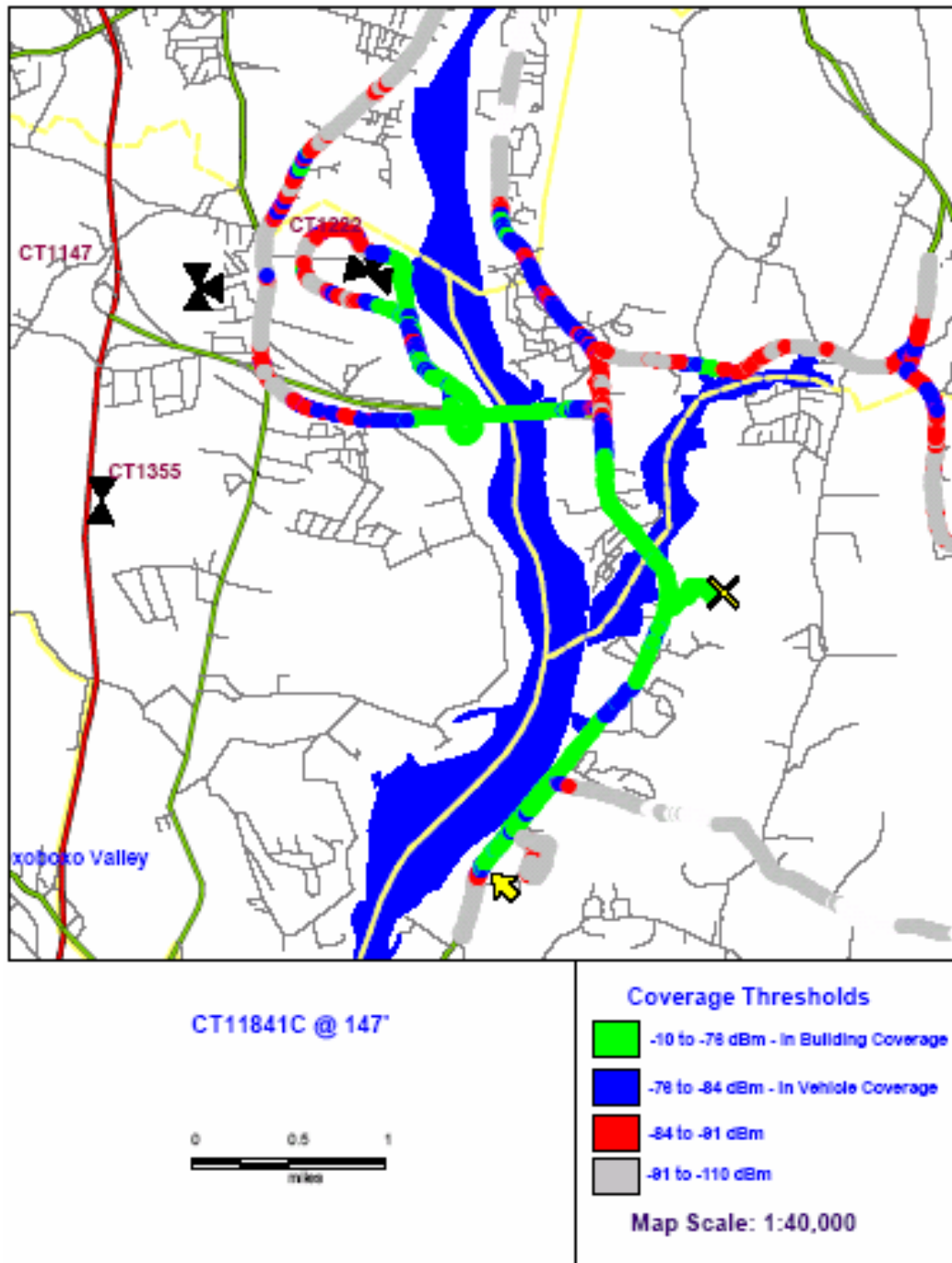
For the collection process, a Grayson scan receiver, Model# GMR 203, was used to sample the signal levels. The Grayson receiver was installed in a vehicle with the receive antenna and GPS antenna roof mounted. The purpose of roof mounting the receive antenna is to eliminate any additional attenuation in signal strength from the material composition of the vehicle (vehicle penetration loss) and the location of the receive antenna inside the vehicle. With the receiver scanning, a predetermined route was driven surrounding the proposed facility. The collected samples were stored in Grayson format log files to be exported and processed following the test. This process was repeated for antenna heights of 147, 137, 127, 117 and 107 feet AGL.

Following the test, all log files were processed into text files using the Grayson log file converter and analyzed in MapInfo. These results are shown in the “Results” section.

Results

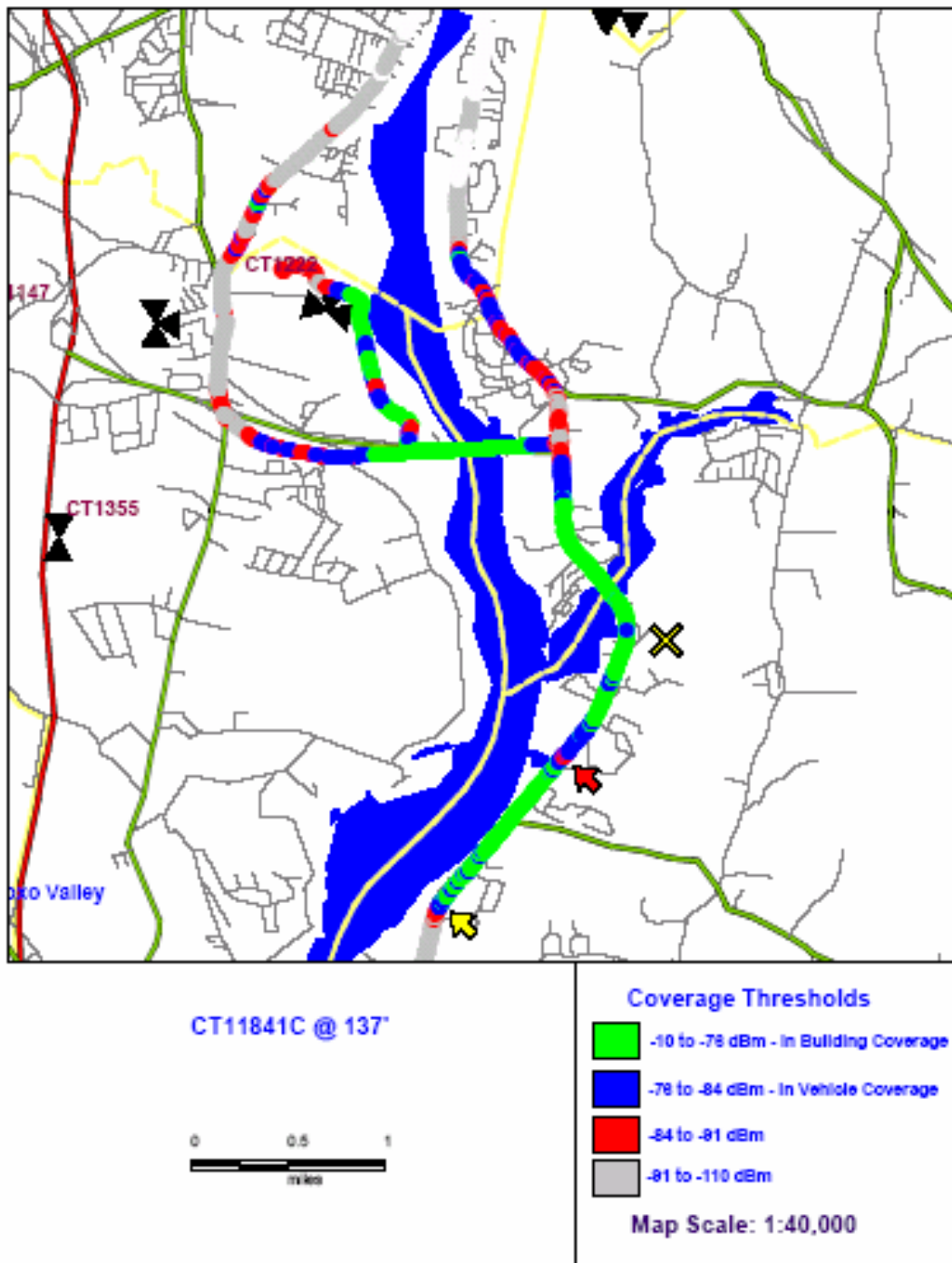
The following plots show the result from the drive test at the T-Mobile proposed facility at 12 Orchard Drive in Ledyard, CT. For these, signal levels ranging from -10 dBm to -115 dBm are shown. T-Mobiles required lower limit threshold is -84 dBm, which is required for in vehicle coverage. The higher threshold level of -76 dBm is the minimum required to provide reliable in-building coverage. Levels below the -84 dBm threshold are shown to demonstrate routes driven and to show areas of unacceptable signal degradation

Plot 1



Plot 1 shows the test results from an antenna centerline height of 147'. The objective area of Route 12 from the junction with Route 2a to approximately 2 miles south of the site is covered at this height. The end of the objective area is indicated on the plot with a yellow arrow. Past this point to the south, the road wraps around terrain and drops in elevation. This point is the end of the objective area. At 147', the coverage produced satisfactorily achieves the objective levels in this area. The proposed facility is shown as an "X" on the plot.

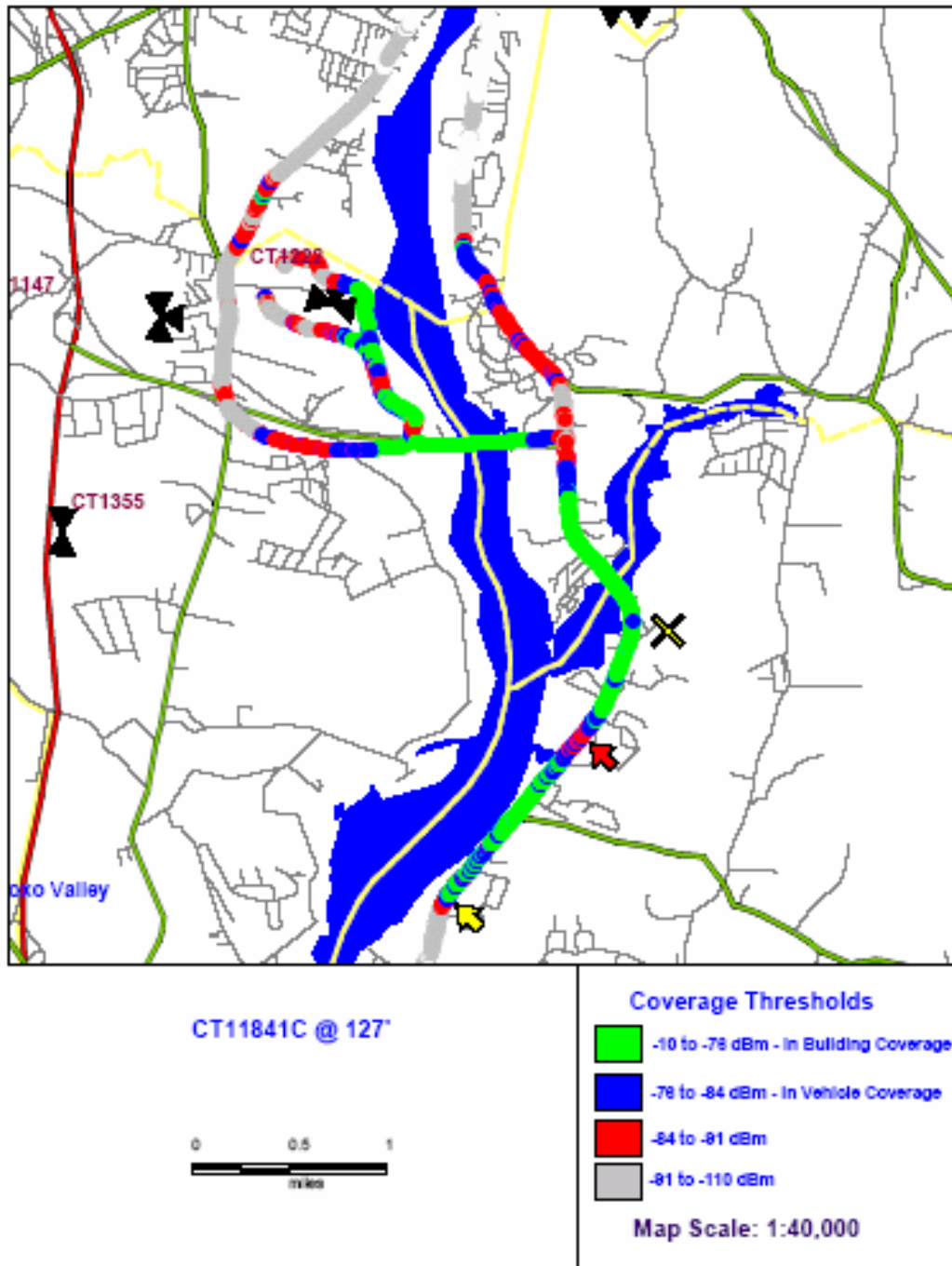
Plot 2



Plot 2 shows the test results from an antenna centerline height of 137'. At this height, the coverage along Route starts to break apart and fall below the T-Mobile minimum required threshold of -84 dBm. The point where the signal falls below the required -84 dBm level is shown with a red arrow on the plot. The distance along Route 12 which falls

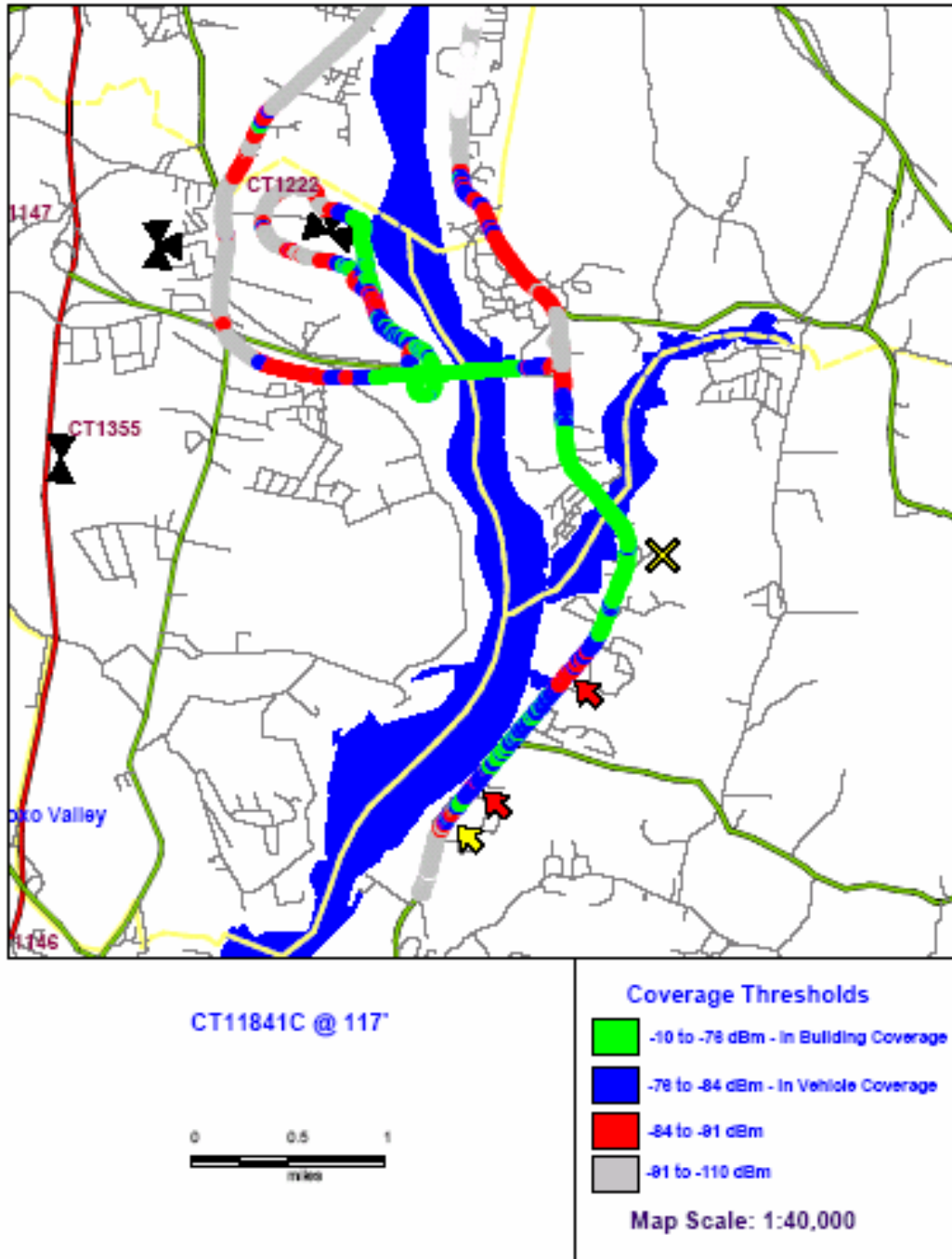
below the -84 dBm is approximately 0.06 Miles. Although this may not have a major impact, T-Mobile users are likely to briefly experience poor service quality in this area. The end of the objective area is still shown with a yellow arrow and the site is shown as an "X".

Plot 3

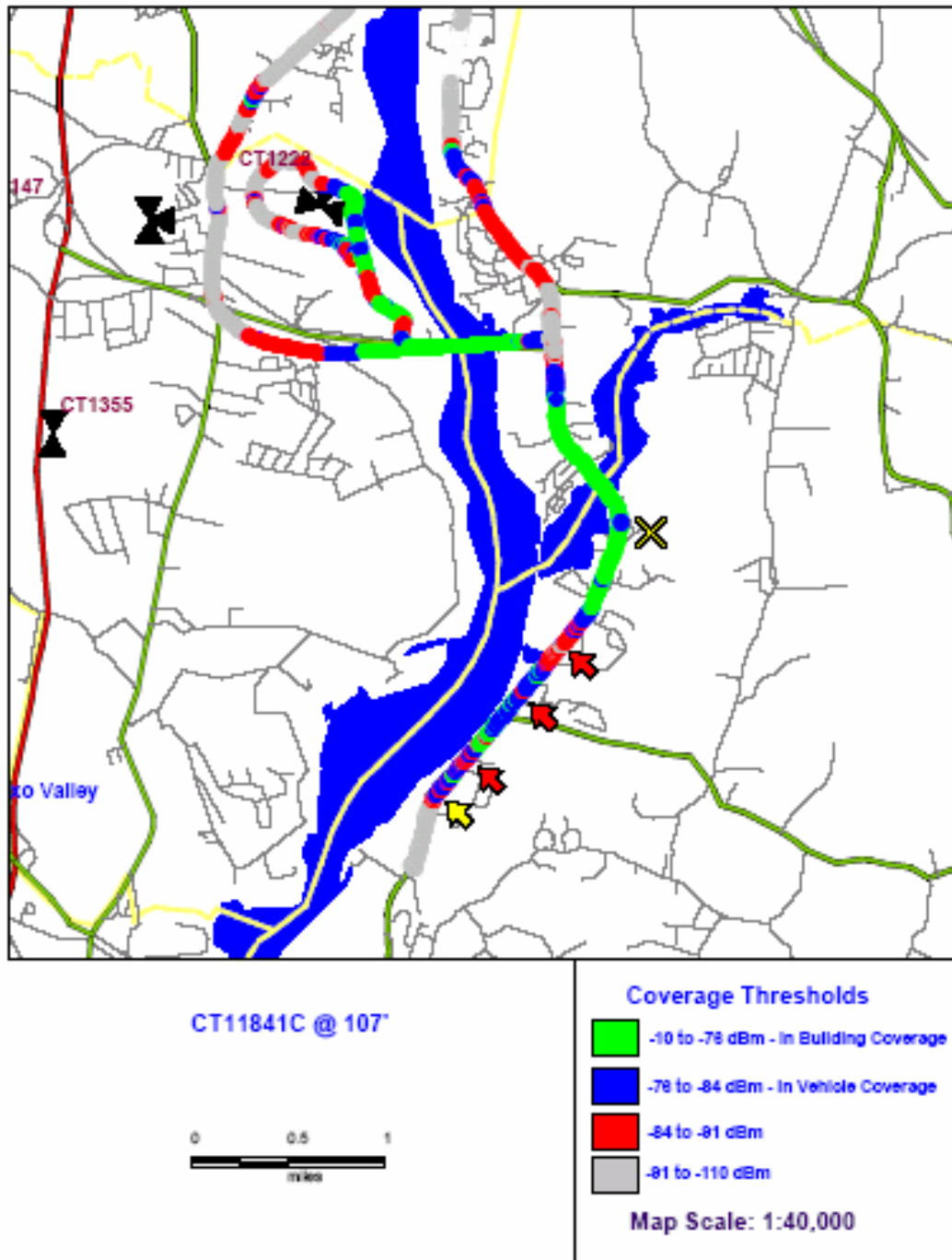


Plot 3 shows the test results from an antenna centerline height of 127'. At 127', the area along Route 12 within the targeted area which falls below the -84 dBm threshold continues to widen. This area is again shown with a red arrow. The end of the objective area is shown with a yellow arrow and the site is shown as an "X". The distance along Route 12 which falls below the -84 dBm is approximately 0.25 Miles. This is a significant gap and T-Mobile users will experience poor service quality with a much higher chance for dropping calls.

Plot 4



Plot 5



Plots 4 and 5 show the results of test heights at 117 and 107 feet AGL. The results confirm increased degradation in the area south of the proposed facility along Route 12.

In both plots, areas falling below the minimum -84 dBm are shown with a red arrow. Clearly, the reliability of the T-Mobile coverage would be severely compromised at these heights. The proposed site is shown as an "X" and the end of the objective area south of the proposed site is shown with a yellow arrow.

Conclusion

Based upon the coverage plots produced from the drive test conducted at the proposed T-Mobile Ledyard facility, the minimum height required to fully cover the intended coverage objective is 147 feet AGL. At heights below 147 feet AGL, the coverage within the objective area, defined as the stretch of Route 12 from the junction of Route 2a south to the point identified in the plots with the yellow arrow, totaling 2.9 miles, starts to fall below the required minimum T-Mobile coverage threshold of -84 dBm. Points below the T-Mobile minimum threshold of -84 dBm will yield areas of unreliable service to T-Mobile customers for voice and data services and additionally will not allow T-Mobile to provide reliable E-911 services as mandated by the federal government.

These results are applicable to both candidate locations at the 12 Orchard Drive property. The slight difference in elevation between the two candidates will not reduce or increase the required antenna height for this site.