Network Engineering
1275 John Street
West Henrietta, New York 14586

July 24, 2020

Chairperson Bruce Flower
And Members of the Town of Wappinger Planning Board
20 Middlebush Road
Wappingers Falls, NY 12590

RE: Orange County-Poughkeepsie Limited Partnership d/b/a Verizon Wireless "Castle Point Application"

Dear Chairman Flower:

This Verizon RF response letter is provided to address suggestions of two alternate locations for the proposed Castle Point site location.

The two locations are Castle Point Park (41.546679°, -73.967421°) and AW Scrap Processor (41.552775°, -73.942109°).

The Castle Point project area is subject to significant terrain challenges that impact the ability to provide RF coverage throughout the requisite areas. The search ring is created at the beginning of the development process to help focus efforts in the area that works (at a certain ground elevation and antenna center line) to achieve objectives while minimizing community impact. Both of these alternate locations are not properly situated, they are not within the search ring or within a reasonable distance of the project area to provide benefit in resolving the identified coverage objectives. A site properly situated will have the ability to overcome area terrain challenges, achieve its objectives as well as minimize the supporting structure height required to do so. A site that is not properly situated will require a significantly taller structure resulting with a much greater visual and community impact and potentially a negative impact on the existing network.

The Castle Point Park location is approximately 60' AMSL (about 115' lower in ground elevation than the proposed location). This means if no other factors influenced site selection that the required structure height would be (at a minimum) 265' which would require mandatory FAA marking and lighting. Additionally the type of tower would be self-support or guyed, monopoles are not capable of this ACL requirement. The AW Scrap Processor location is about 213' AMSL (about 38' higher in ground elevation). While the increased ground elevation by itself is good, unfortunately, like the Castle Point Park site it is not centrally located to the project area which creates multiple issues.

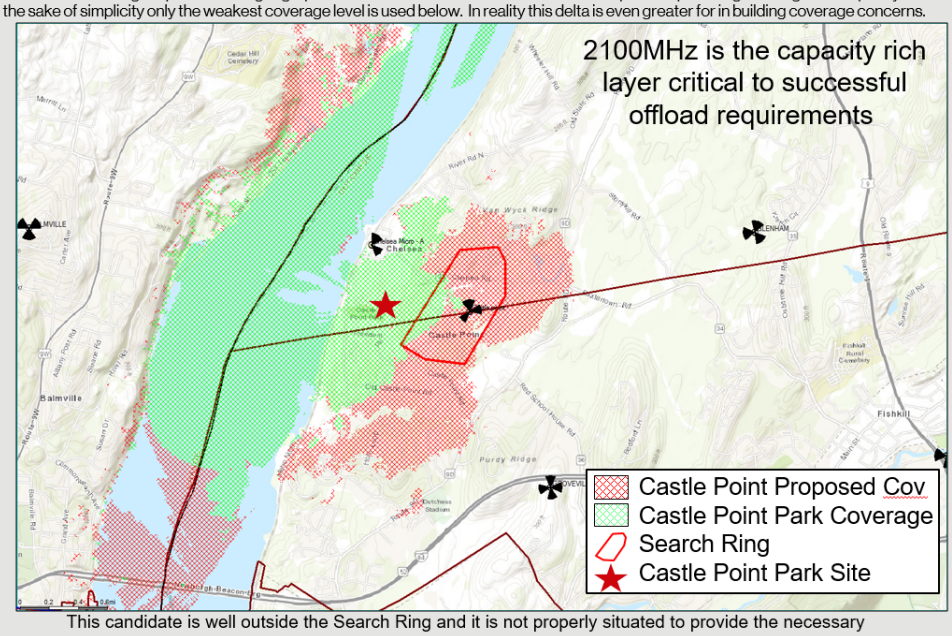
- The first is distance, when a site it too far away signal strength is lost degrading site capabilities by the time the signal reaches the objective area. This reduces coverage improvement as well as capacity offload capabilities. Both Castle Point Park and AW Scrap Processor are about one half mile away from the area where they would need to be in order to be capable of providing useful benefit. This is a significant distance for modern networks. 20+ years ago discussions in rural areas to move a site one half mile would have been common however, by today's network density conditions considered not realistic.
- The second is proximity to other existing sites and geographic features. The AW Scrap Processor location is directly in front (in the main beam) of the existing Glenham site (too close) and in an area of significant overlap which would result with compromised value from new coverage and create significant interference and network degradation to existing service provided by the Glenham site. Additionally there are areas of terrain in between the AW Scrap Processor location and the objective area which results with compromised coverage capabilities.
- Both sites would have only one or two sectors serving into the objective area rather than the intended and required three sectors necessary to distribute the traffic effectively mitigating the need for additional new tower sites in this area. It is predictable that due to poor location these sites would become overloaded on the sector or sectors that serve the project area and require an additional site (likely at the proposed site location) to provide capacity relief. The Castle Point Park's location (close to the river) is subject to additional RF challenges as

without a further compromised design could result with interference in the Newburgh area due to minimal signal losses inherent to over water RF signal propagation.

The maps below provide a delta plot analysis which shows areas where each alternative is not capable of serving. Comparing locations is a detailed and complex process as differences in where one site vs another is capable of serving in building, in car and at various frequencies becomes confusing to those not accustom with this evaluation process. These alternate locations shown below are extremely substandard and significantly failing in the needed coverage area so much so that only one threshold for each representative frequency band is used (-105dBm) which helps simplify the comparison review between locations. For additional details and explanation regarding signal strength and coverage capabilities please refer to the RF Justification document which provides additional and more detailed explanation.

Supplemental – Castle Point Park 2100MHz -105dBm Cov Comparison

This coverage map shows the delta between the proposed coverage footprint (red) and the alternate Castle Point Park coverage (Green). The red hashed coverage represents the geographic area where the alternate location is not capable of providing coverage and capacity relief. For the sake of simplicity only the weakest coverage level is used below. In reality this delta is even greater for in building coverage concerns.



This candidate is well outside the Search Ring and it is not properly situated to provide the necessary coverage and capacity relief necessary. This candidate is also located in an area of lower ground elevation compromising potential coverage and capacity capabilities due to area terrain and foliage.

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Castle Point Park – **RF Rejected**

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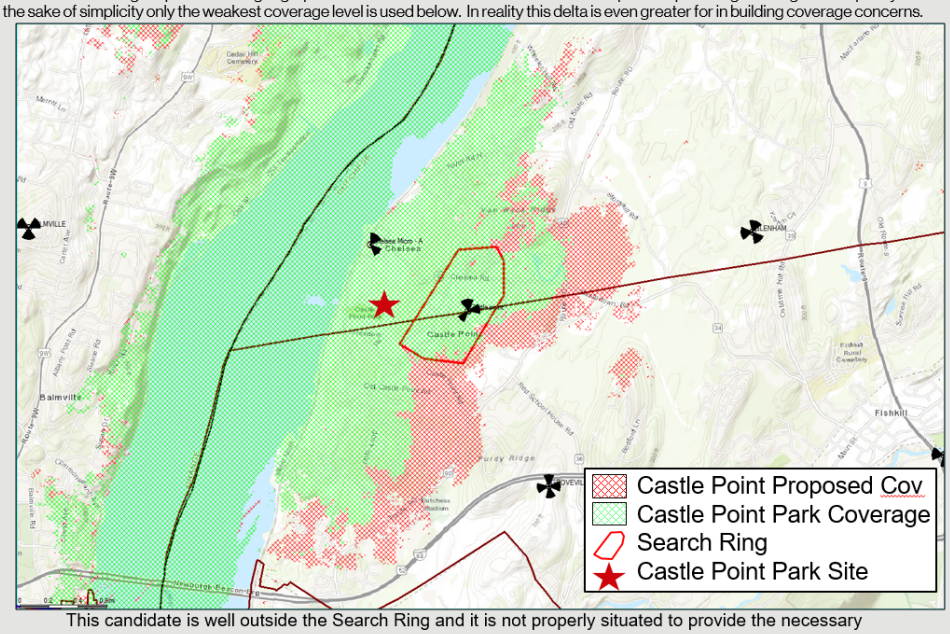
Supplemental – Castle Point Park 700MHz -105dBm Cov Comparison

This coverage map shows the delta between the proposed coverage footprint (red) and the alternate Castle Point Park coverage (Green). The red hashed coverage represents the geographic area where the alternate location is not capable of providing coverage and capacity relief. For the sake of simplicity only the weakest coverage level is used below. In reality this delta is even greater for in building coverage concerns.



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Castle Point Park – **RF Rejected**

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Supplemental – AW Scrap Processor 2100MHz -105dBm Cov Comparison

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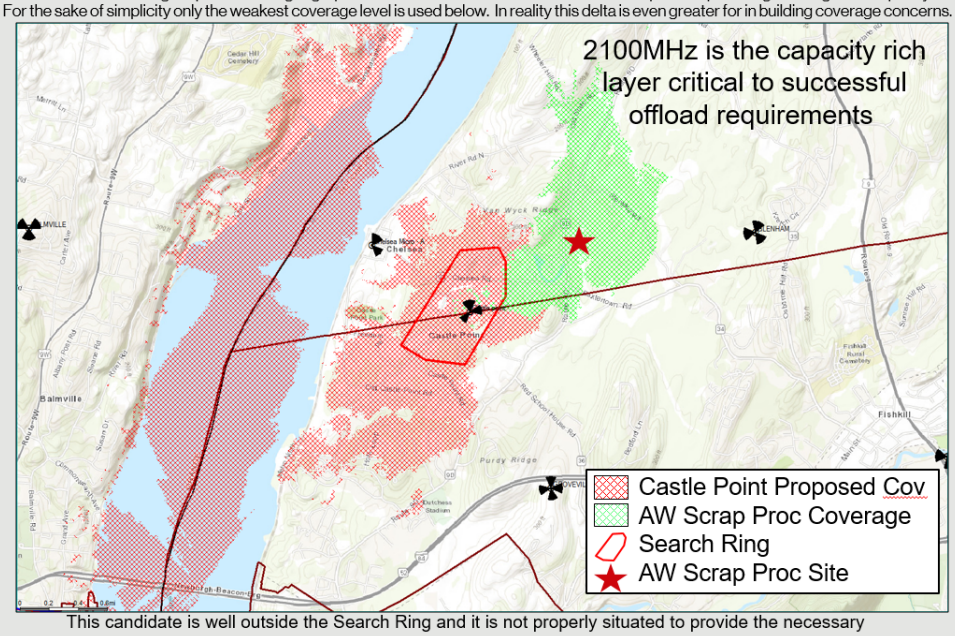

This candidate is well outside the Search Ring and it is not properly situated to provide the necessary coverage and capacity relief necessary. This candidate's distance combined with area terrain and foliage relative to coverage objectives also compromises potential coverage and capacity capabilities.

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AW Scrap Processor– **RF Rejected**

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Supplemental – AW Scrap Processor 700MHz -105dBm Cov Comparison

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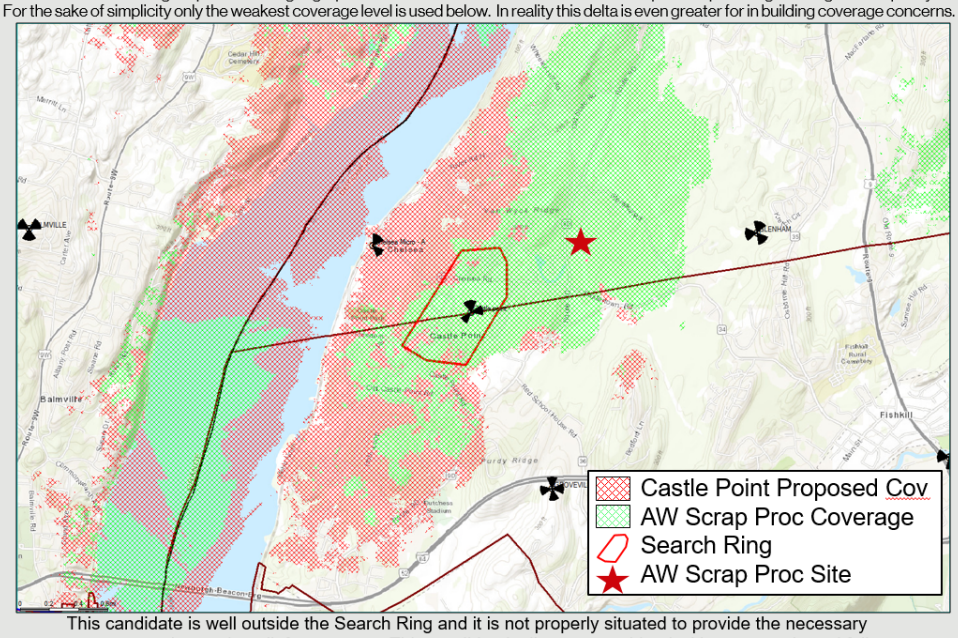

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AW Scrap Processor– **RF Rejected**

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Very truly yours,

Michael R. Crosby

Michael R. Crosby
Engineer IV – RF Design
Verizon Wireless