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Multnomah County
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I have done network design for Verizon for 20 years and am the person who prepared the Updated RF Usage and Facility Justification. This letter is in response to a few issues raised in the Statement on Proposed Verizon 'POR Stringer' Cell Phone Tower, submitted by Dr. Fulks, dated October 16, 2020, in opposition to Verizon's proposed tower located at 29421 E. Woodard RD. in Troutdale that we call POR STINGER.

Dr. Fulks raised questions about the methodology used to prepare the Updated RF Usage and Facility Justification maps. The Updated RF Usage and Facility Justification propagation maps for this site are standard industry propagation maps that are used by Verizon and other wireless carriers for siting new wireless facilities. Verizon uses a worldwide industry leading tool with proprietary modules that utilize many inputs like antenna height, antenna gain and pattern in addition to channel width, frequencies and power, to name a few. These proprietary factors are used in combination with the other factors, such as the terrain and clutter (i.e. trees, buildings, etc.) in the surrounding area. The propagation analysis is created by using clutter models that have been developed and tuned to simulate the morphology of the area and how the RF signals travel through it. While there are many calculations that go into this prediction tool to handle known data, there are several general values that are used where specific values are not consistent, like buildings and treed areas, different construction types will create different losses through structures and different types of trees will have different losses for different frequencies. These propagation maps are industry standard, credible and reliable tools that Verizon has been using for many years to determine where there are coverage deficiencies in areas, and to identify sites for new wireless communication facilities and the height of the antennas necessary to address these coverage deficiencies. Dr. Fulks likely was unable to reach the same results in reviewing these propagation maps because he does not have access to all of the proprietary modules and information that go into creating these propagation maps.

Dr. Fulks suggested that the propagation maps are not accurate because he has a good signal in his house and the propagation maps show in-car coverage in the surrounding area. The mere fact that Dr. Fulks has a good signal in his house does not mean that the propagation maps are inaccurate. The propagation maps use specific data based on transmitters and terrain in the calculations but there are some variables that make assumptions like how much loss there is from buildings, or a clump of trees. These assumptions are validated by comparing the clutter models to actual drive data during the creation of our clutter models. While there is some deviation it is kept to a minimum. The fact

that his coverage is a little better than what I predicted with our tool only indicates to me that he sees a signal a little better than predicted. At the end of the day these are the tools that are used today and we as a company wouldn't use them to design our network if they were not very accurate.

Dr. Fulks agreed that most of the alternative collocation sites we evaluated will not address the coverage deficiency and provide comparable coverage to the POR Stinger site, but he suggested one option may do so – the Cabbage Hill water tank site. Dr. Fulks suggested that the Cabbage Hill water tank could provide similar coverage if a “short tower” was added given that the water tank is partially buried. Based on the height of the water tank, I evaluated this option and determined that a tower of approximately 60 feet would need to be added to the top of the water tank in order to raise the antennas towards the top of the surrounding trees. Even after increasing the height of this location the RF signals are blocked by the terrain and doesn't provide comparable coverage to the proposed POR Stinger site. Based on my experience, Verizon does not construct wireless communication towers of this height on top of water tanks and adding a wireless communication tower on top of a water tank or similar structure is not considered a collocation.

Regards,



Jeff Culley

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