Alternatives Analysis

San Domenico

1500 Butterfield Road, Sleepy Hollow
Marin County

March 10, 2022

Summary of Site Evaluations
Conducted by Verizon Wireless

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I. Executive Summary

In Spring 2018, the Sleepy Hollow Homes Association ("SHHA"), through the County, asked Verizon Wireless to investigate the gap in its local service coverage, based on concerns raised after recent devastating fires in similar single-access communities in Northern California. To fill the significant gap in service in the Sleepy Hollow area of Marin County, Verizon Wireless has reviewed 10 specific alternatives and a small cell network, as set forth in the following analysis. Verizon Wireless believes that placing a new facility camouflaged as a 30-foot water tower on a hillside (the "Proposed Facility") constitutes the least intrusive feasible alternative to serve the identified gap in network service based on the values expressed in the 1998 Marin County Telecommunications Facilities Policy Plan (the "TFPP").

II. Significant Gap

There is a significant gap in Verizon Wireless network service in the Sleepy Hollow area. Reliable in-building and in-vehicle coverage is entirely lacking in the residential neighborhoods along the valley floor, with only limited in-vehicle coverage on hillside slopes where roads have little traffic (Collectively, the "Significant Gap").

To remedy the Significant Gap, Verizon Wireless must place a new facility to ensure reliable network service. The Proposed Facility will provide new, reliable in-building coverage where lacking in a broad residential area of Sleepy Hollow west of Sleepy Hollow Drive, including residential neighborhoods around Butterfield Road, Van Winkle Drive and Irving Drive, and stretching south to upslope residential areas around Raven Road and Ledger Road. It also will provide new in-vehicle coverage in a larger area, including along Butterfield Road extending east to Deer Hollow Road. Coverage maps showing the existing and proposed coverage are provided on Page 15. The Significant Gap and Proposed Facility coverage are more fully described in the *Statement of Verizon Wireless Radio Frequency Design Engineer Ravijot Randhawa* (the "RF Engineer's Statement").

III. Methodology

Once a significant gap has been determined, Verizon Wireless seeks to identify a location and design that will provide required network service through the "least intrusive means" based upon the values expressed by local regulations. In addition to seeking the least intrusive alternative, sites proposed by Verizon Wireless must be feasible. In this regard, Verizon Wireless reviews the available height, equipment space, radio frequency propagation, proximity to end users, access, terrain, environmental impacts and other factors such as a willing landlord in completing its site analysis.

TFPP Requirements

The TFPP was adopted in July 1998 and includes policies addressing location and visual impacts for wireless facilities.

Preference for co-location. The TFPP requires that new wireless facilities be co-located or clustered at an existing or planned telecommunication site, unless that is infeasible, would have the effect of prohibiting wireless service, or would result in more adverse land use effects. TFPP Program LU 1.4.4, Policy LU 2.1.

Discouragement in ridge and upland greenbelt areas. The TFPP discourages new facilities in the County's designated ridge and upland greenbelt areas if there are available and technically feasible sites outside that area, or available capacity at existing sites. TFPP Programs LU 1.1.1, LU 1.1.4.

Limitations on ridgetops, visually prominent ridgelines. The TFPP distinguishes "ridgetop" locations from "hillsides" and "upland areas." TFPP Program VIS 2.1.2, Introduction Page I-5. New facilities are discouraged on ridgetops, unless no other technically feasible site is available to provide adequate coverage. TFPP Program LU 1.1.1. Notably, the TFPP encourages siting below "visually prominent ridgelines" to the extent feasible. TFPP Program VIS 2.1.1. "Visually prominent ridgeline" is defined as "A line connecting the topographic highpoints within the Countywide Plan's Ridge and Upland Greenbelt along a ridge that separates watersheds and is visible from public viewpoints from open space areas, parks, trailheads, highways, arterial roads, the bay and other waterbodies." Marin County Municipal Code § 22.130.030(V).

Site location preferences. The TFPP lists seven location preferences for new wireless facilities, in order: 1) Industrial sites, 2) Commercial sites, 3) Public facilities sites, 4) Agricultural sites, 5) Mixed use sites (e.g., commercial and residential area), 6) Open space and recreational sites, and 7) Residential sites. An applicant may use a less-preferred site if there are no higher-priority sites within a coverage area, or if requiring a priority site would prohibit or have the effect of prohibiting wireless service or result in more adverse land use effects. TFPP Program LU 1.4.2.

Design. Towers should be the minimum height required. TFPP Program VIS 2.2.5. Facilities should visually blend with surrounding natural and built environments. TFPP Policy VIS 2.2.1. Placement of facilities within a particular site should avoid or minimize impacts on scenic views and adverse visual effects, as viewed from adjacent residential development or public viewpoints. TFPP Program VIS 2.2.8.

Coverage Map Explanation

Coverage maps are provided to illustrate why certain alternatives cannot serve the Significant Gap. Coverage maps depict the anticipated level of signal, and therefore the projected LTE coverage provided by a wireless facility at a given location. The coverage maps in this analysis have been prepared using the 700 MHz frequency band. 700 MHz frequencies travel farther than higher-frequency bands and provide the broadest coverage

Referenced signal receive power (RSRP) is a measurement of signal level in decibel milliwatts (dBm), which is a negative number that decreases due to distance and other factors.

The RSRP coverage thresholds are:

In-building >= -85 dBm. Green depicts good coverage that meets or exceeds thresholds for reliable network coverage in homes and in vehicles.

In-vehicle >= -95 dBm. Yellow depicts reliable in-vehicle coverage only.

Outdoor >= -105 dBm. Red depicts reliable outdoor service only.

Unshaded areas do not receive reliable service levels.

IV. Analysis

Summary

Verizon Wireless first sought to collocate or cluster with existing wireless facilities, but found no existing wireless carrier facilities within the Sleepy Hollow valley.

Next, Verizon Wireless reviewed the area on the valley floor outside the local ridge and upland greenbelt areas, seeking properties not in residential use. Within that area, there are no preferred industrial or commercial sites, but Verizon Wireless identified three properties in use as public facilities (a church, community center and public school), where a new facility could not serve the gap or would be more intrusive than the Proposed Facility.

Next, Verizon Wireless reviewed locations within the ridge and upland greenbelt areas, but below ridgetops, readily identifying three locations on the San Domenico School property. While zoned residential, the San Domenico school property is primarily an educational facility, and student housing occupies only a small area 0.3 miles west of the Proposed Facility. Most of the property is hillside open space. Verizon Wireless and the school agreed on an open space location where a facility only 30 feet tall can serve the Significant Gap with minimal visual impact.

Elsewhere in the ridge and upland greenbelt area, Verizon Wireless reviewed three ridgetop water tank properties and one private property site, but these are on visually prominent ridgelines, and so less-preferred under County regulations. Water tanks are utility uses, and in many jurisdictions, including Marin County, water tank properties are used for placement of wireless facilities due to their elevated locations.

Verizon Wireless also considered a network of small cells to serve the Significant Gap, but the location restrictions of the County's 2019 Small Cell Policy render this alternative to be more intrusive.

Collocation Review

Verizon Wireless first searched for existing wireless facilities within the Sleepy Hollow area and on the surrounding ridges where a new facility could be collocated or clustered, but found no existing wireless carrier facilities.

The closest existing wireless facility identified is a short Sprint tower 1.4 miles northeast of the Proposed Facility on the water tank property at 999 Old Lucas Valley Road, with an elevation of 330 feet. Signal from a tower at that location would be blocked from reaching the gap area southwest by the steep topography in between, Terra Linda Ridge, which rises to 650 feet.

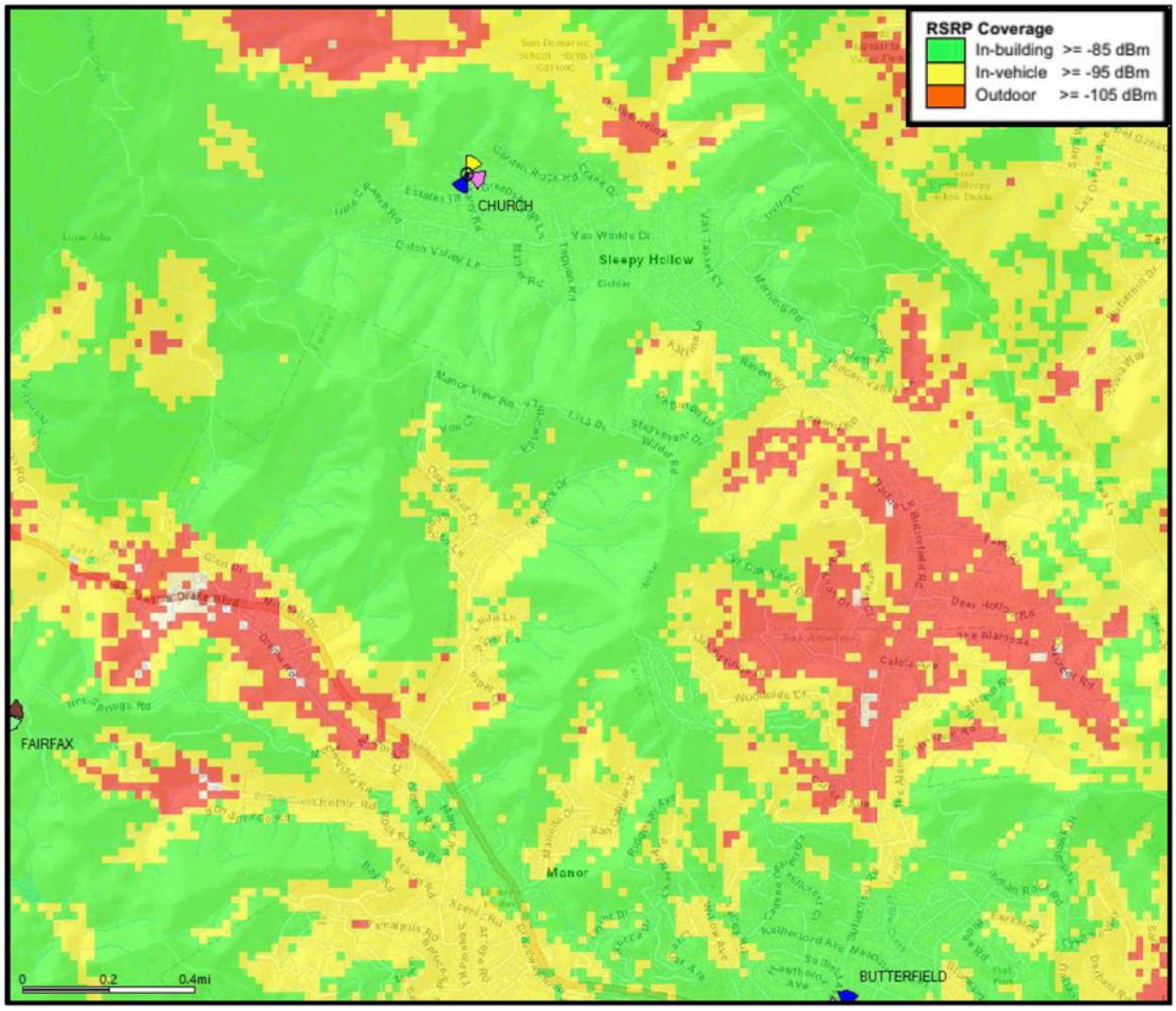
Locations outside Ridge and Upland Greenbelt Area

Lacking a feasible collocation or clustering opportunity, Verizon Wireless next reviewed locations in Sleepy Hollow outside the County's designated ridge and upland greenbelt areas that surround the valley floor. While zoning on the valley floor is entirely residential, Verizon Wireless sought to avoid properties in residential use, identifying the following three public facilities.

1. **Sleepy Hollow Presbyterian Church**
   Address: 100 Tarry Road
   APN: 176-251-55
   Zoning: R1-BD–Residential Single Family
   Elevation: 240-280 Feet

Verizon Wireless reviewed this church property 0.5 miles southwest of the Proposed Facility with a varying elevation 75 to 115 feet lower. Verizon Wireless engineers determined that a facility at this location at the far west end of the valley could not serve the Significant Gap, even with a 50-foot antenna centerline (twice the height of the Proposed Facility centerline). As shown in the following coverage map, in-building coverage would be lacking in residential areas around Katrina Lane and Legend Road, as well as much of the San Domenico School property, and in-vehicle service would be lacking along Butterfield Road east of Legend Road. This is not a feasible alternative to the Proposed Facility.

Coverage from Facility at Sleepy Hollow Presbyterian Church
50-foot Antenna Centerline



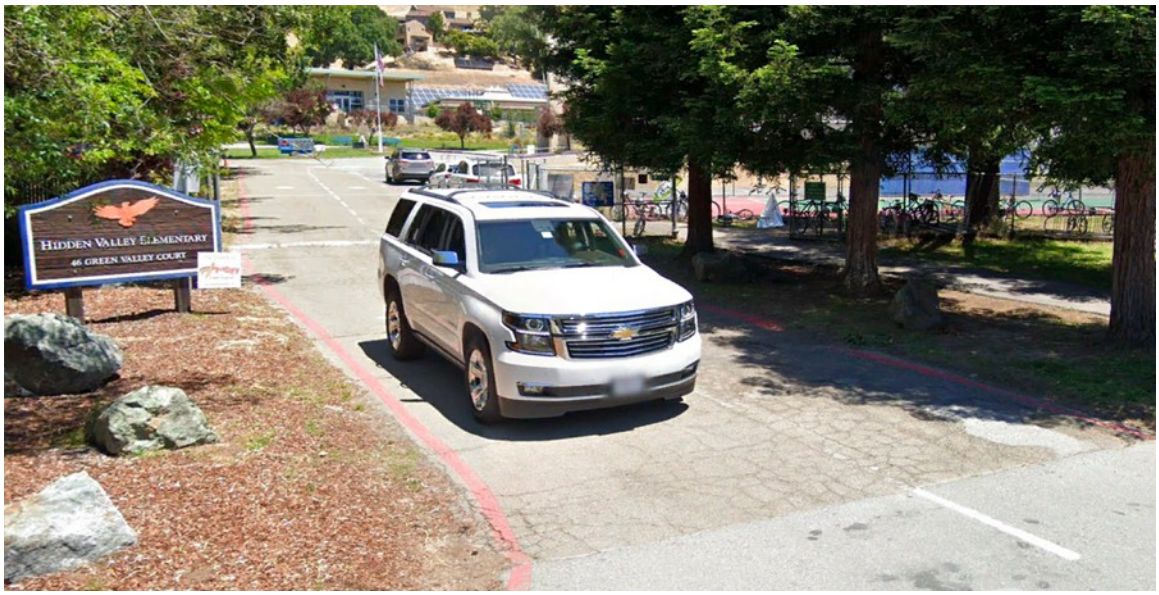
2. SHHA Community Center

Address: 1317 Butterfield Road
APN: 176-162-07
Zoning: R1-BD–Residential Single Family
Elevation: 195 Feet

Verizon Wireless reviewed this property owned by the SHHA, 0.4 miles south of the Proposed Facility and 160 feet lower in elevation. Though this location is near the center of the gap area, Verizon Wireless engineers determined that due to much lower elevation, a minimum functional antenna centerline of 120 feet would be required to serve the gap as well as the Proposed Facility. Such a tall tower facility on this narrow parcel directly adjacent to residential properties would pose significant technical challenges for construction and effective stealth design, and it would not visually blend with the surrounding residential neighborhood. In contrast, the Proposed Facility is only 30 feet tall, fully concealed as a water tower, and distant from residences. This is neither a feasible nor a less intrusive alternative to the Proposed Facility.

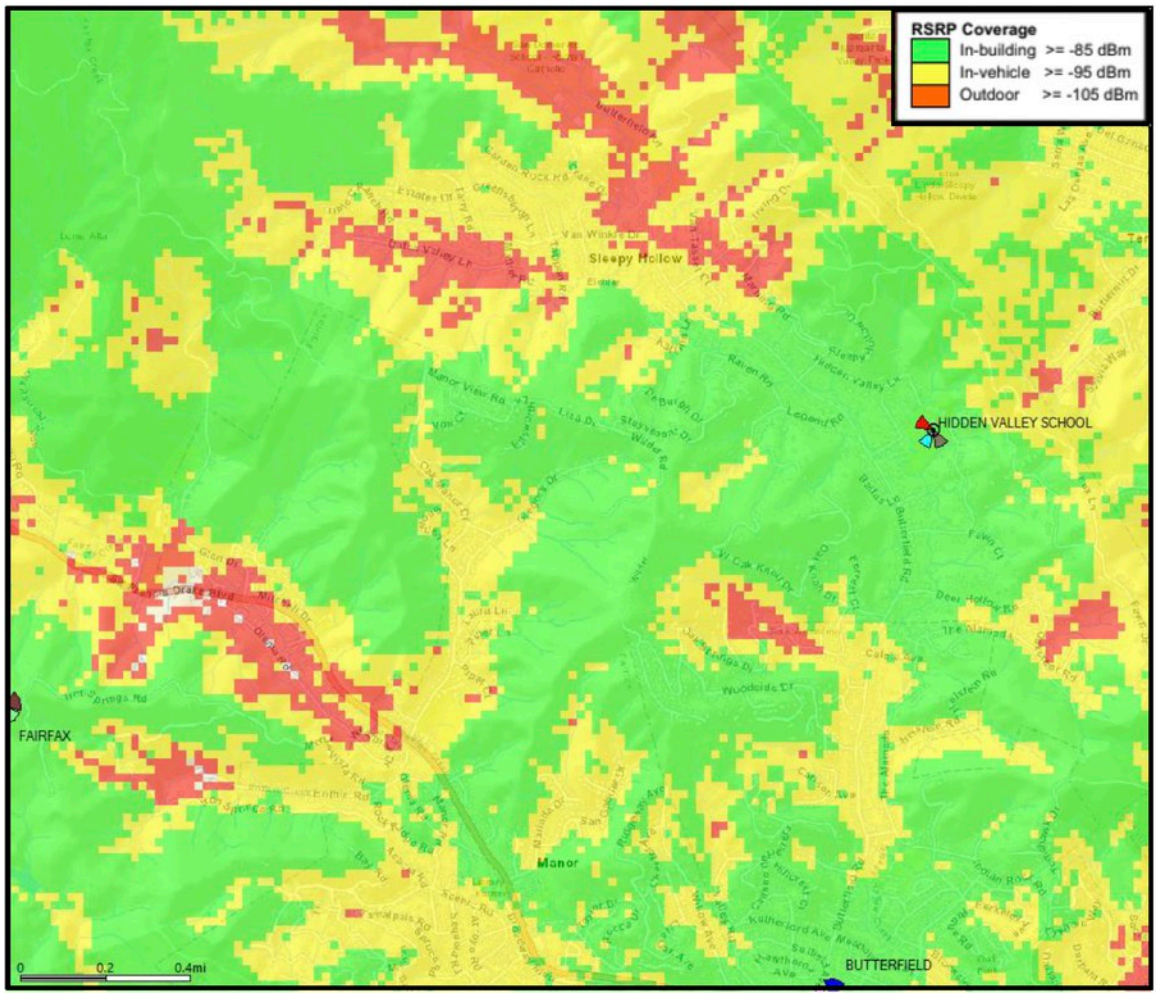
3. Hidden Valley Elementary School

Address: 46 Green Valley Court
APN: 177-031-01, 177-031-02, 177-011-13
Zoning: PF-RSP-2–Residential Single Family Planned
Elevation: 150-180 Feet



Verizon Wireless reviewed this public school property 0.9 miles southeast of the Proposed Facility with a varying elevation 175 to 205 feet lower. Verizon Wireless engineers determined that a facility at this location near the east end of the valley could not serve the Significant Gap, even with a 50-foot antenna centerline (twice the height of the Proposed Facility centerline). As shown in the following coverage map, in-building coverage would be lacking in a broad area west of Sleepy Hollow Drive, including the residential neighborhoods along Irving Drive and Van Winkle Drive and the San Domenico School property. Some of these areas would lack in-vehicle coverage. This is not a feasible alternative to the Proposed Facility.

Coverage from Facility at Heavenly Valley Elementary School
50-foot Antenna Centerline



Locations within Ridge and Upland Greenbelt Area, but Not on Ridgetops

With no feasible or less intrusive alternative outside the ridge and upland greenbelt area, Verizon Wireless next looked for locations within, readily identifying the 512-acre San Domenico School property with an elevation varying from 215 to 1,120 feet. On this large property, a new wireless facility could be placed on a hillside well below the ridgetop to the north, and away from residences. Verizon Wireless worked with San Domenico School administration to identify three potential locations on the property, described below.

4. Proposed Facility – San Domenico School Location 1
Address: 1500 Butterfield Road
APN: 176-300-30
Zoning: RMP–Residential Multiple Planned
Elevation: 355 Feet

The Proposed Facility has been thoughtfully designed to minimize any impact to the adjacent community. Verizon Wireless proposes to conceal its antennas within a 30-foot facility disguised as a water tower, placed next to an existing access road with a backdrop of established trees. The square faux tank structure will be covered with gray slats, fully concealing antennas and the underlying structure. Associated network equipment will be placed within a 425-square foot equipment area located 310 feet downslope and 110 feet lower in elevation, also next to the access road. The equipment area will contain network cabinets and a generator to provide continued service during power outages and emergencies. It will be surrounded by an eight-foot wood fence.

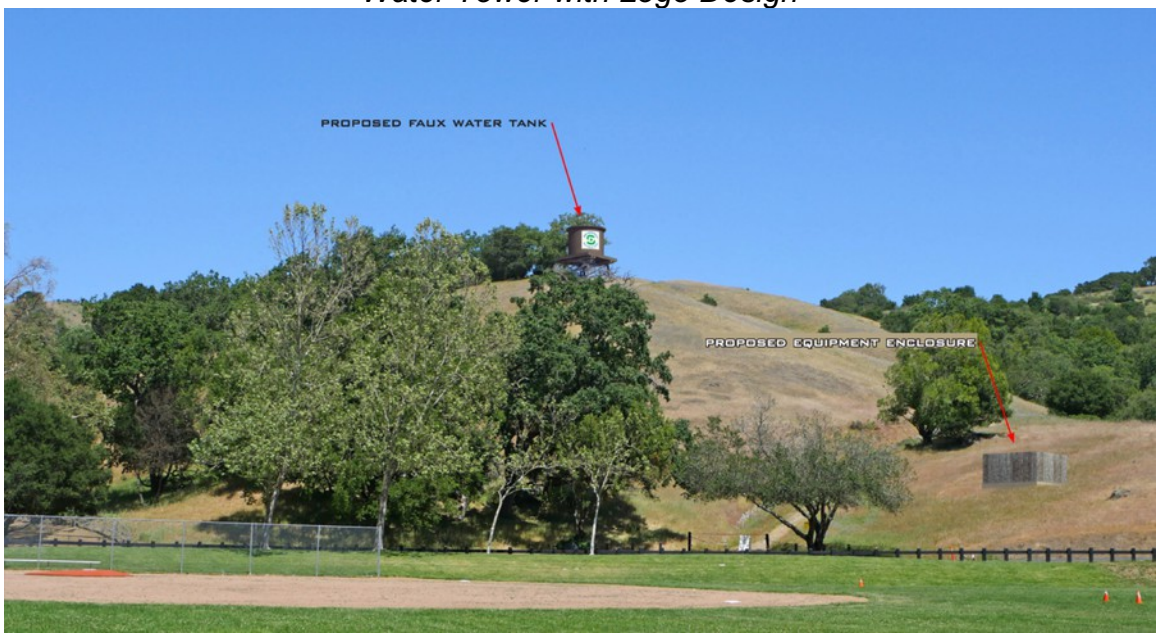
The Proposed Facility water tower will be over 750 feet from the closest residence southwest. The location is approximately 1,250 feet southwest of the visually prominent ridgeline upslope that connects topographic highpoints, and well over 125 feet lower in elevation.

With panel antennas placed at this elevated location, the Proposed Facility will provide new, reliable Verizon Wireless service to the Significant Gap, as shown in the coverage maps below. This is Verizon Wireless's preferred location and design for the Proposed Facility.

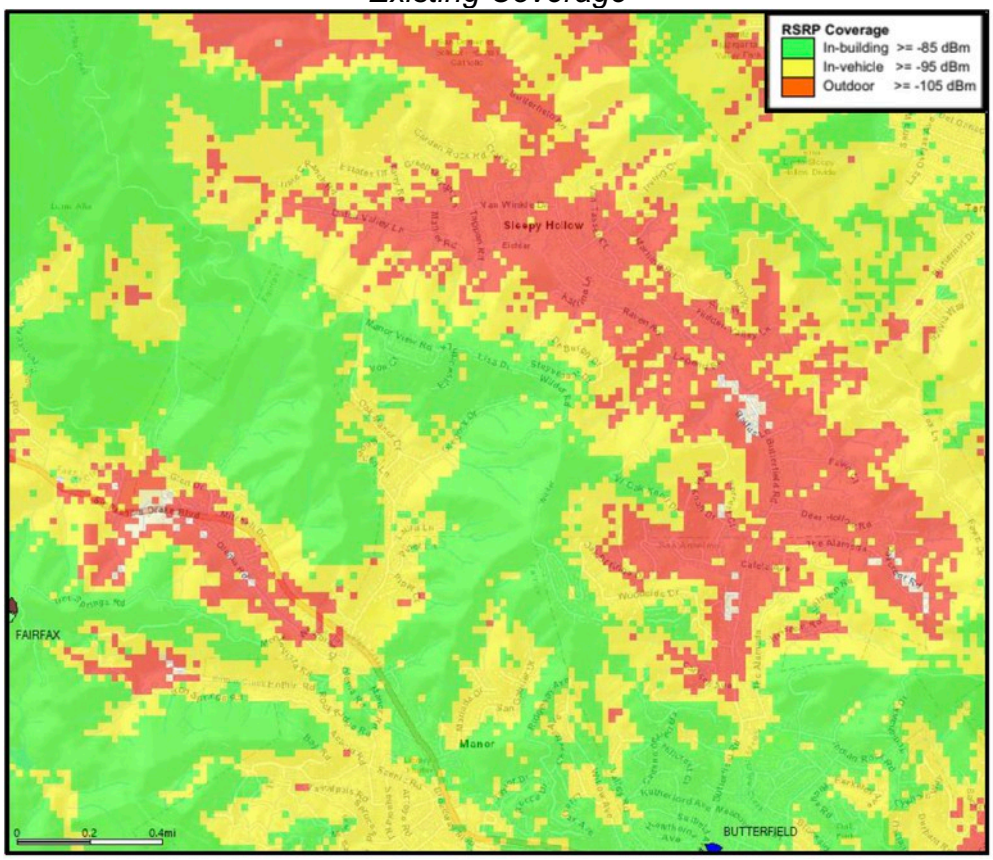
Verizon Wireless offered three water tower designs, and received input from the school administration and the SHHA. All parties agreed on the square water tower design of the Proposed Facility shown above. The other two designs not chosen are shown in the following photosimulations.

Cylindrical Water Tower Design

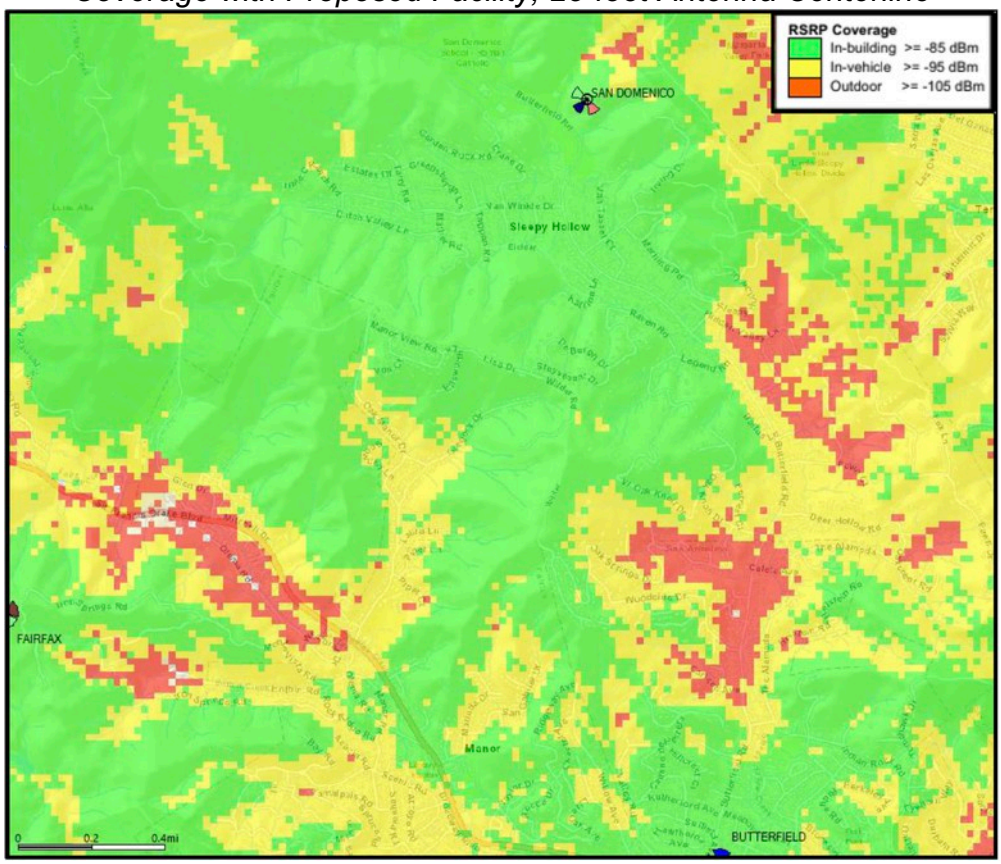
Water Tower with Logo Design



Existing Coverage



Coverage with Proposed Facility, 25-foot Antenna Centerline



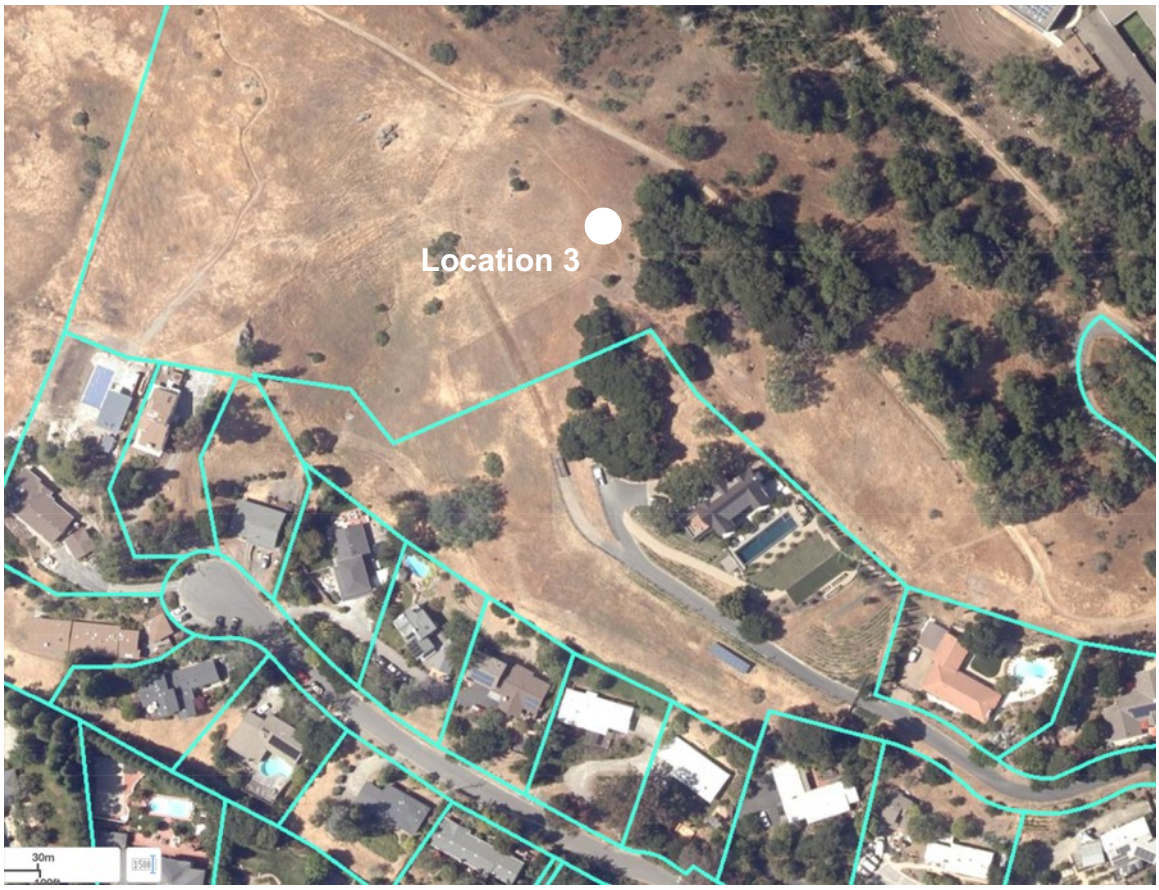
5. San Domenico School – Location 2

Address: 1500 Butterfield Road
APN: 176-300-30
Zoning: RMP–Residential Multiple Planned
Elevation: 375 Feet

Verizon Wireless and the San Domenico School also considered this location for the tower that is 135 feet north of the Proposed Facility and 20 feet greater in elevation, slightly uphill and next to the same access road. However, the school administration ultimately chose the Proposed Facility site due to superior coverage to the school property from the Proposed Facility location.

6. San Domenico School – Location 3

Address: 1500 Butterfield Road
APN: 176-300-30
Zoning: RMP–Residential Multiple Planned
Elevation: 395 Feet



Verizon Wireless and the San Domenico School also considered this hilltop location on the "South Ridge" across the school's main access road, 0.4 miles west of the Proposed Facility and 40 feet greater in elevation. However, this location is much closer to numerous residences, with homes as close as 280 feet. A facility here would pose more visual effect as viewed from adjacent residential development than the Proposed Facility, which is located well below a ridgeline and 750 feet from any homes. This is not a less intrusive alternative to the Proposed Facility.

Ridgetop/Visually Prominent Ridgeline Locations

Verizon Wireless also examined locations upslope within the ridge and upland greenbelt area, identifying three Marin Municipal Water District ("MMWD") water tank properties and a private property, all on ridgetops, as follows.

7. Smith Saddle Water Tanks
Address: Smith Ridge Fire Road
APN: 174-070-15
Zoning: OA–Open Area
Elevation: 490 Feet

Verizon Wireless reviewed this small water tank property 1.1 miles southwest of the Proposed Facility and 135 feet greater in elevation. The TFPP disfavors a new wireless facility at this ridgetop site because the Proposed Facility is a technically feasible non-ridge option to serve the coverage gap. Further, a facility here would be located on a visually prominent ridgeline between topographic highpoints, which the TFPP discourages because the Proposed Facility is a feasible alternative well below a visually prominent ridgeline. This is not a less intrusive alternative to the Proposed Facility.

9. Oak Manor Road Water Tank

Address: Oak Manor Fire Road
APN: 174-070-05
Zoning: RMP–Residential Multiple Planned
Elevation: 565 Feet

Verizon Wireless reviewed this small water tank property 0.9 miles southwest of the Proposed Facility and 210 feet greater in elevation. The TFPP disfavors a new wireless facility at this ridgetop site because the Proposed Facility is a technically feasible non-ridge option to serve the coverage gap. A facility here would be located near a visually prominent ridgeline between topographic highpoints, which the TFPP discourages because the Proposed Facility is a feasible alternative well below a visually prominent ridgeline. Further, this location is much closer to residences, with homes as close as 250 feet southeast, posing more visual effect as viewed from adjacent residential development than the Proposed Facility, which is located 750 feet from any homes. This is not a less intrusive alternative to the Proposed Facility.

9. Wilder Road Water Tank

Address: 51 Wilder Road
APN: 174-190-08
Zoning: RSP–Residential Single Family Planned
Elevation: 710 Feet

Verizon Wireless reviewed this small water tank property 1.0 mile south of the Proposed Facility and 355 feet greater in elevation. The TFPP disfavors a new wireless facility at this ridgetop site because the Proposed Facility is a technically feasible non-ridge option to serve the coverage gap. A facility here would be located on top of a visually prominent ridgeline, which the TFPP discourages because the Proposed Facility is a feasible alternative well below a visually prominent ridgeline. Further, this location is much closer to residences, with homes as close as 240 feet southeast, posing more visual effect as viewed from adjacent residential development than the Proposed Facility, which is located 750 feet from any homes.

Verizon Wireless engineers determined that a facility on this ridgetop cannot serve the Significant Gap, as described under Alternative 10 below regarding the immediately adjacent site due west. This is neither a feasible nor less intrusive alternative to the Proposed Facility.

10. Cappe Property

Address: 41 Wilder Road
APN: APN 174-190-07
Zoning: RSP–Residential Single Family Planned
Elevation: 710 Feet

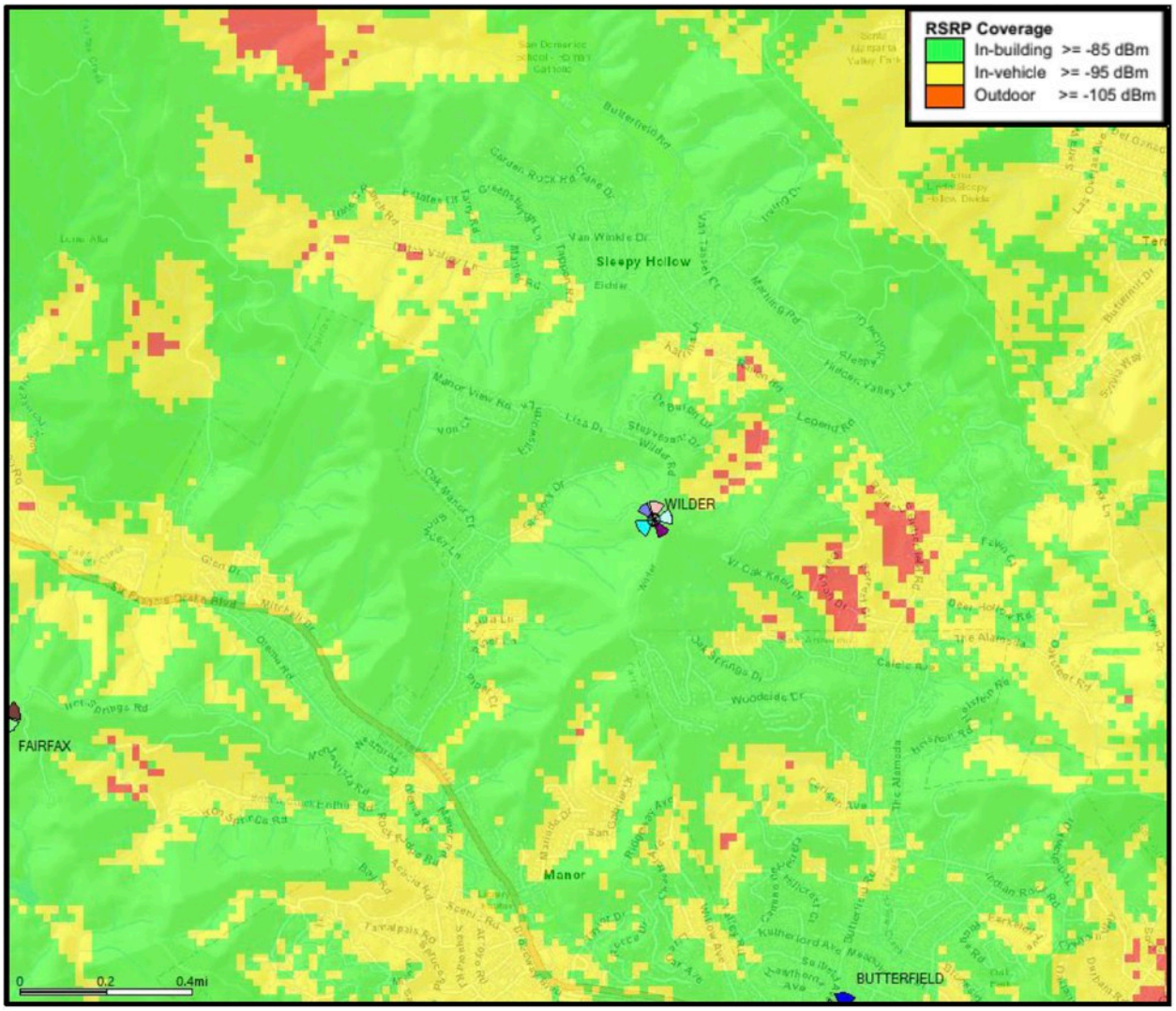
Verizon Wireless reviewed placement of a new facility on the northeast corner of this 60.6-acre parcel, 1.0 mile south of the Proposed Facility and 355 feet greater in elevation. At this location, which is due west of the water tank on the adjacent MMWD property (Alternative 8), there is an abandoned telecommunications facility. While the 1998 TFPP listed this as a clustered location, it is not, because the TFPP also confirmed that the two 1997 applications for this site were "withdrawn." The Viacom/TCI dish antenna located on the tower in 1997 was abandoned. Presently, there are no antennas on the short lattice tower, only abandoned pipe mounts. Because the tower is not used by any service provider for telecommunications, this abandoned facility is not a wireless communications facility as defined in the TFPP, nor could it qualify as for clustering or colocation as defined. *See* TFPP Glossary.

The TFPP disfavors a new wireless facility at this ridgetop site because the Proposed Facility is a technically feasible non-ridge option to serve the coverage gap. A facility here would be located on top of a visually prominent ridgeline, which the TFPP discourages because the Proposed Facility is a feasible alternative well below a visually prominent ridgeline. Further, this location is much closer to residences, with homes as

close as 300 feet southeast, posing more visual effect as viewed from adjacent residential development than the Proposed Facility, which is located 750 feet from any homes.

Verizon Wireless engineers determined that a facility at this location cannot serve the Significant Gap. As shown in the following coverage maps, in-building coverage would be lacking in residential areas along the western stretch of Van Winkle Drive and Dutch Valley Lane, as well as around Raven Road. Further, a ridgetop site here would be a source of interference for Verizon Wireless's existing Fairfax facility located at a higher elevation 1.6 miles southwest. This is not a feasible alternative to the Proposed Facility.

Coverage from Facility at 41 Wilder Road Ridgetop Site
25-foot Antenna Centerline



Small Cells in the Right-of-Way

Verizon Wireless also considered placement of small cell wireless facilities in Sleepy Hollow rights-of-way to serve the Significant Gap. In 2018, RF engineers commenced work designing a small cell network to serve the area. However, in 2019, the County adopted a new policy for small cells in the right-of-way with several restrictions that render a small cell network to be infeasible in Sleepy Hollow. *See Small Cell Wireless Facilities* policy (the "Small Cell Policy").

The Small Cell Policy prefers rights-of-way in industrial, commercial, public facilities and agricultural sites. Less-preferred are rights-of-way within residential zones, adjacent to mixed-use sites, or within 1,500 feet of a day care or school. Small Cell Policy § 6.1(a). In fact, the policy prohibits facilities within a 1,500-foot setback of any school. Small Cell Policy § 7.1(g). The policy allows small cells only on steel streetlight poles, steel utility poles, and steel traffic light poles. Small Cell Policy § 7.5(a). The policy does not allow siting on wood utility poles. *Id.* Small cells must be separated by 1,000 feet. Small Cell Policy § 7.1(f).

A 1,500-foot setback around the two school properties in Sleepy Hollow (Hidden Valley Elementary School and San Domenico School) would exclude most rights-of-way within the gap area. In the remaining areas outside those setbacks, small cells would need to be separated at least 1,000 feet, further reducing siting options.

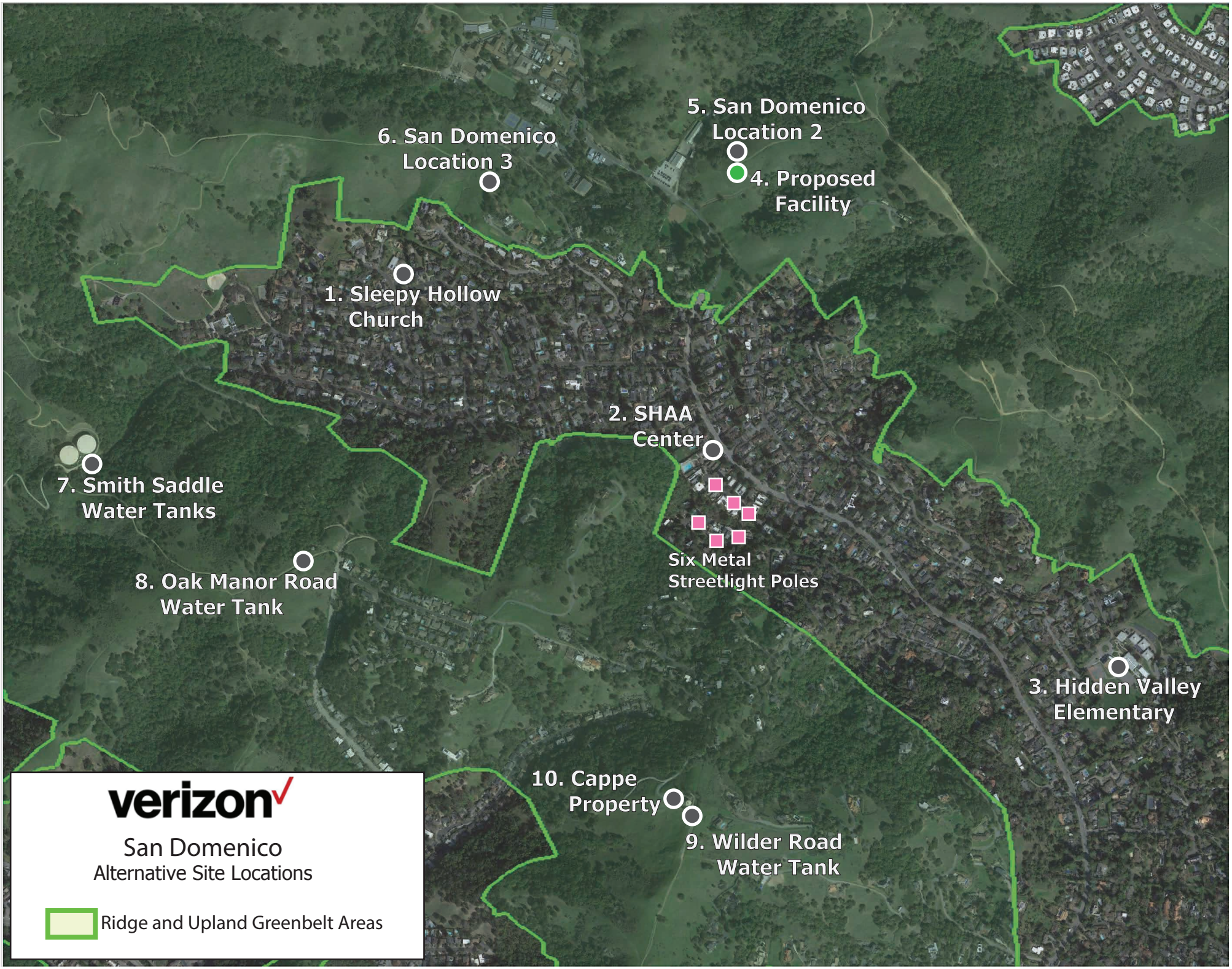
Within Sleepy Hollow, the only poles in the right-of-way are wood utility poles, except for six metal streetlight poles within a small area along Katrina Lane and Catskill Court south of the SHAA Community Center, shown on the map of alternatives at the end of this analysis. A small cell on one of these metal streetlights could not provide the broad coverage required to serve the Significant Gap. The highest-elevation streetlight pole at the end of Katrina Lane is at only 195 feet, which is 160 feet lower than the Proposed Facility, and small cells have a limited coverage footprint.

All of the other existing poles along other Sleepy Hollow rights-of-way are wood utility poles, where wireless facilities are not allowed per the Small Cell Policy. Some rights-of-way lack any poles, such as a long stretch of Butterfield Road east of Katrina Lane.

Due to several restrictions of the County Small Cell Policy, a small cell network in Sleepy Hollow would be more intrusive than the Proposed Facility under applicable County regulations. Note, the Small Cell Policy is preempted by federal and state law.

V. Conclusion

Verizon Wireless has considered 10 specific alternatives and a small cell network to fill the Significant Gap in service in the Sleepy Hollow area of Marin County. Based upon the values expressed in Marin County regulations, the Proposed Facility clearly constitutes the least intrusive feasible location for Verizon Wireless's new facility.


5. San Domenico Location 2
6. San Domenico Location 3
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2. SHAA Center
7. Smith Saddle Water Tanks
Six Metal Streetlight Poles
8. Oak Manor Road Water Tank
3. Hidden Valley Elementary
10. Cappe Property
9. Wilder Road Water Tank
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