

Dog Bar

Nevada County Board of Supervisors

August 20, 2024

Pete Shubin, Sequoia Deployment Services, Inc.

Don Carmickle, Previsualists, Inc.

Ehab Elaidy, Verizon Wireless RF Design Engineer

David Witkowski, CEO of Oku Solutions LLC

Paul Albritton, Mackenzie & Albritton, LLP

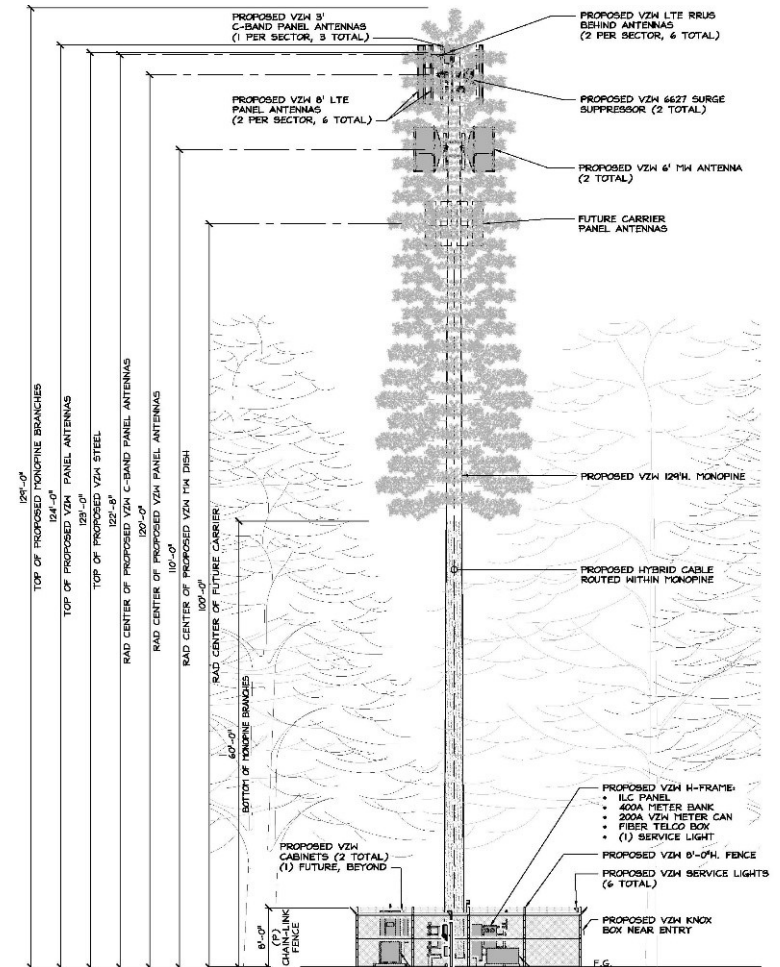
Yvonne Pinto, Verizon Wireless Municipal Engagement Partner



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Facility Design

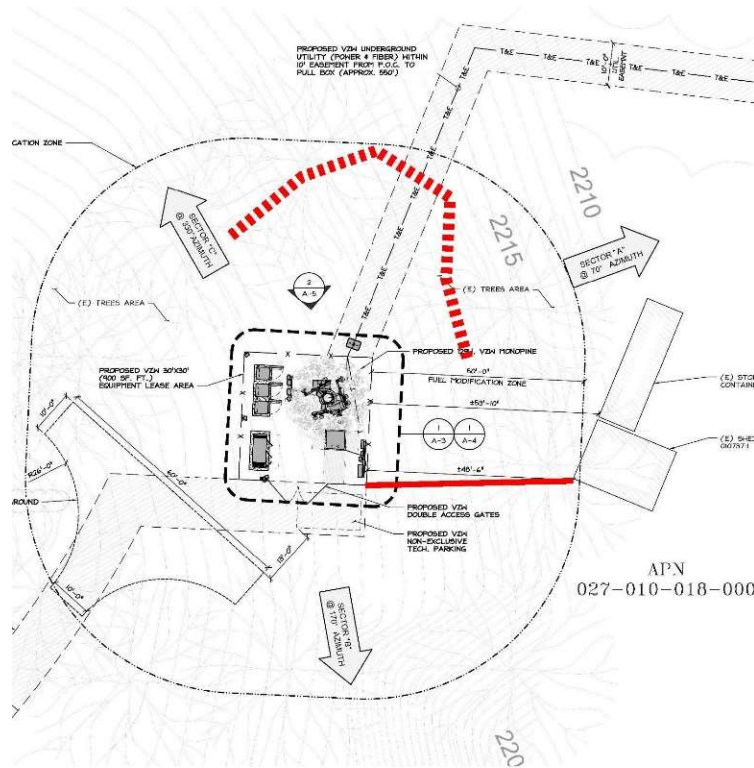
- 129-foot tall faux pine tree
- 900-square foot lease area
- Surrounded by 8-foot chain link fence with slats
- Standby generator for emergency electrical power
- No tree removal needed or proposed



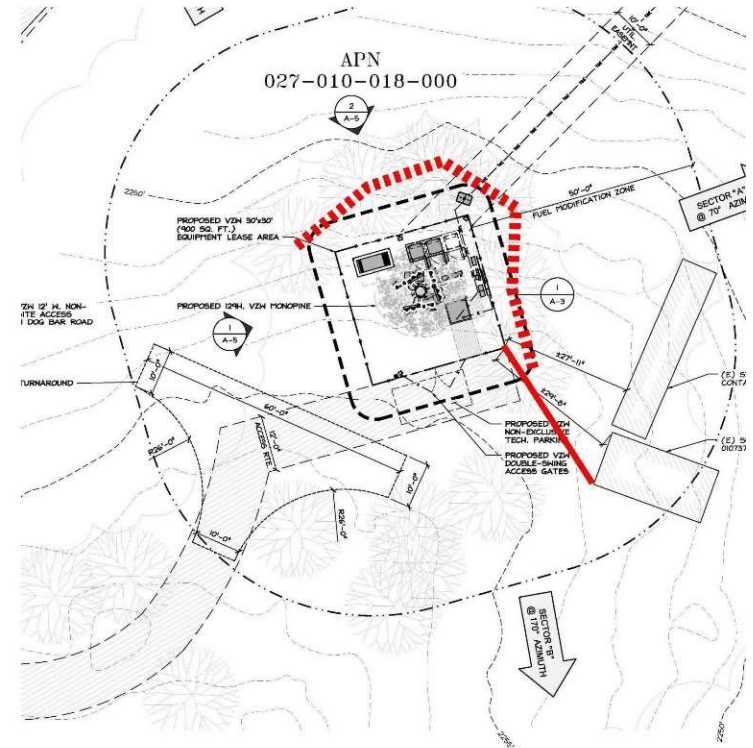
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Revised Layout

- Corrected reference points.
- Site still complies with required County setbacks.
- Reconfigured Lease Area. Generator now at north end.
- No tree removal needed or proposed.



Zoning Administrator Approved Plans



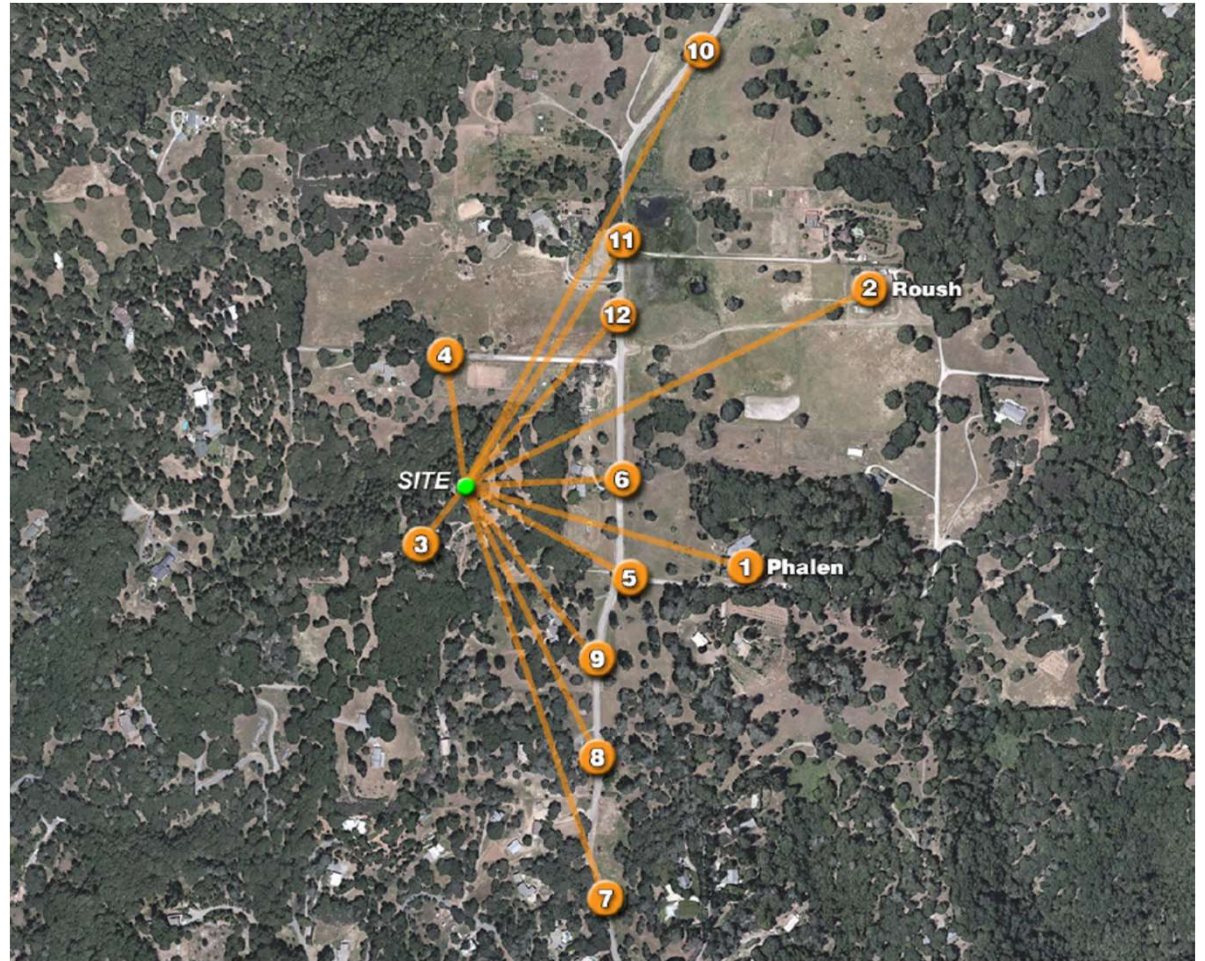
Current Plans



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Photosimulations

Revised to increase number of views and demonstrate accuracy.



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Process for Photosimulations

- **Pre-Visit Analysis**

- Using Google Earth, identify view corridors and potential viewpoints.

- **Locate the Precise Proposed Tower Location**

- Locate the Lease Area using GPS, maps and the Zoning Drawings.
- Confirm adjacent landmarks, photograph the lease area.

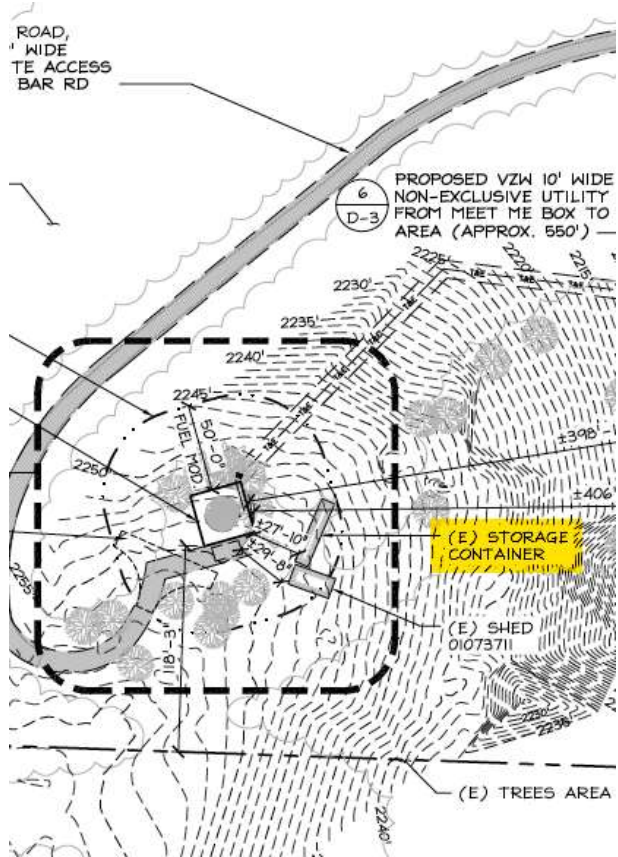
- **Launch the Drone, Lock in at Proposed Monopine Height**

- Using on board sensors and 4k video feed, confirm height and placement.

- **Photograph the Site from All Nearby Public Viewpoints**

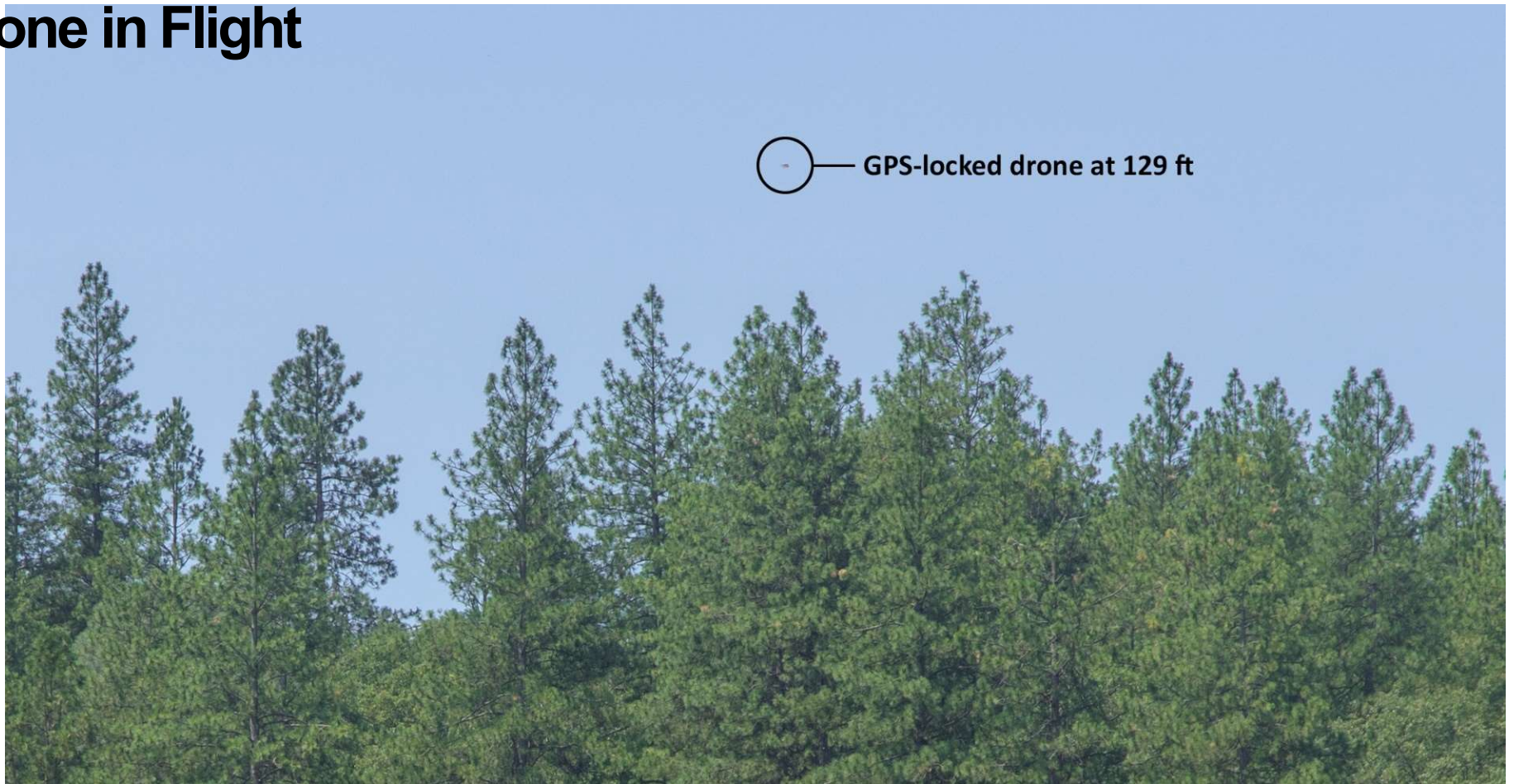
- Drive the area roads and take photographs from all potential viewpoints.
- Look for and photograph the drone from every location in which it is visible.

Locate Landmarks



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Drone in Flight



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Controller Screen



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Photosimulations

Photosimulation of the view looking west from the Phalen residence, camera viewpoint is 1200 ft from the site.



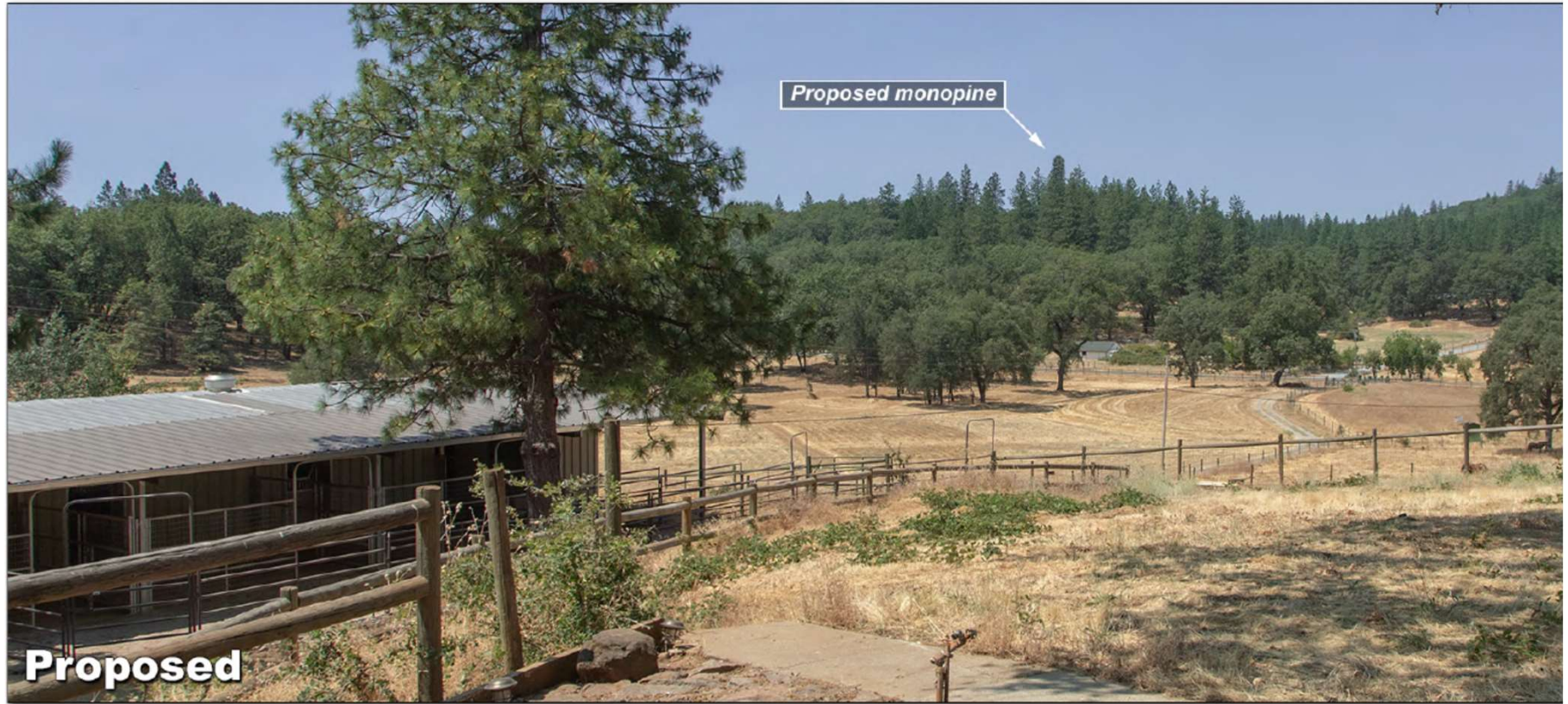
Proposed



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Photosimulations

Photosimulation of the view looking west-southwest from the main picture-window view at the Roush residence, 1880 ft away.



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Photosimulations

Photosimulation of the view looking northwest from the mailboxes on Amber Street at Dog Bar Road, 750 ft from the site.

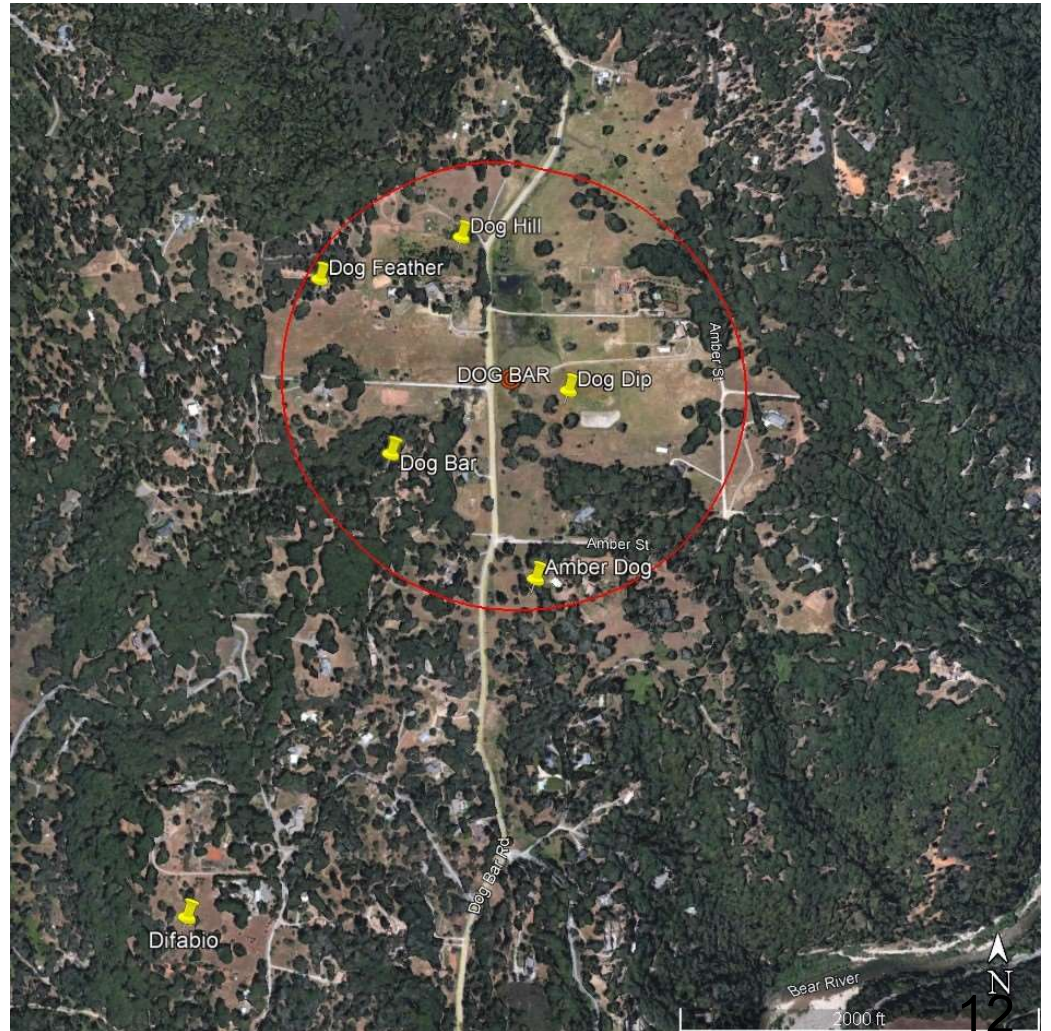


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Best of 6 Alternatives

Other locations discounted because of:

- Lack of proper function
- Inferior natural screening
- No other wireless carrier facilities for collocation identified within 2.2 miles



Principal Factors to Discount Other 5 Alternatives

		Could Not Meet Objective	Design Issues
1	Amber Dog	X	X
2	Dog Dip	X	X
3	Dog Feather	X	X
5	Dog Hill	X	X
	Difabio	X	

Complies with FCC Guidelines

- **Engineer with Dtech Communications confirmed that radio frequency exposure will be less than FCC general population limit**
 - 0.3% at ground level
 - 0.4% at adjacent structures
- **Denial based on RF exposure concerns preempted by federal law**
(47 U.S.C. § 332(c)(7)(B)(iv))



4.3 Statement of Compliance

Based on the above results, analysis and recommendation(s), it is the undersigned's professional opinion that Verizon's site is compliant with the FCC's RF Safety Guidelines.

4.4 Engineer Certification

This report has been prepared by or under the direction of the following Registered Professional Engineer: Darang Tech, holding California registration number 16000. I have reviewed this report and believe it to be both true and accurate to the best of my knowledge.

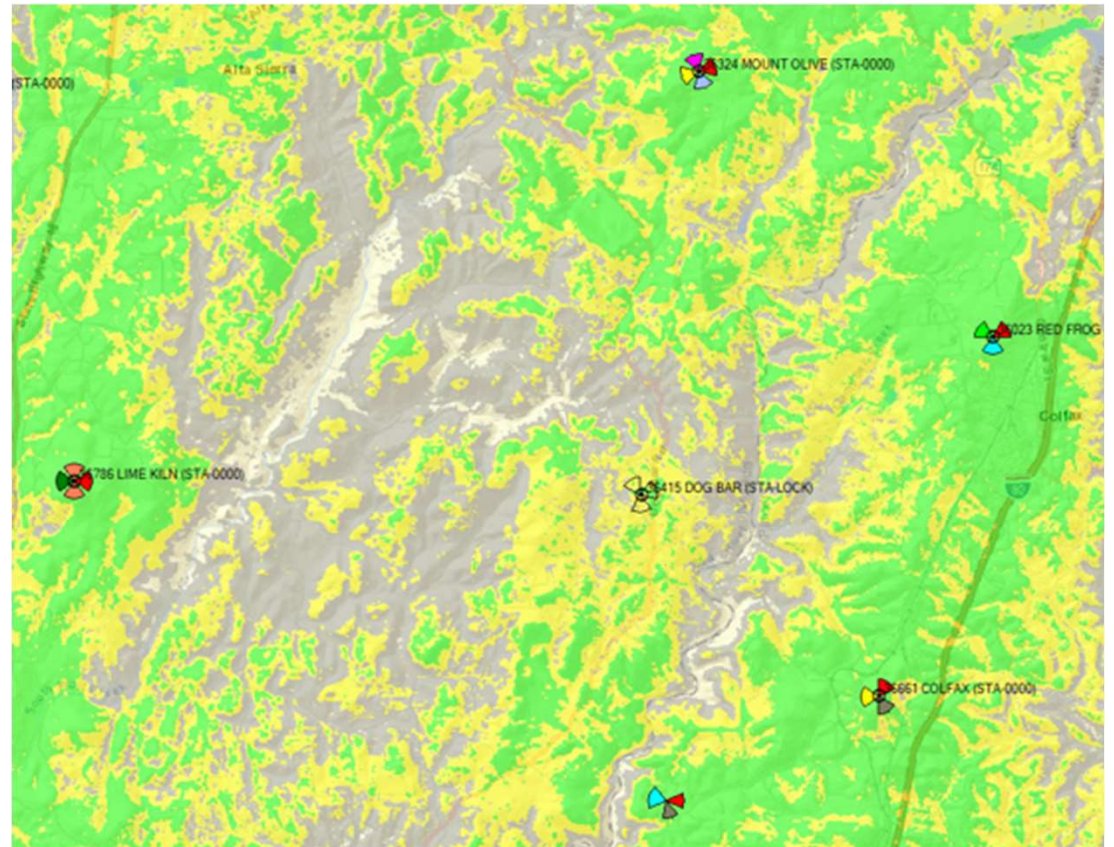


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Service Gap

- No reliable in-building coverage in residential areas west or east of southern Dog Bar Road
- No reliable in-vehicle coverage along stretches of Dog Bar Road, Lodestar Drive, and other local roads

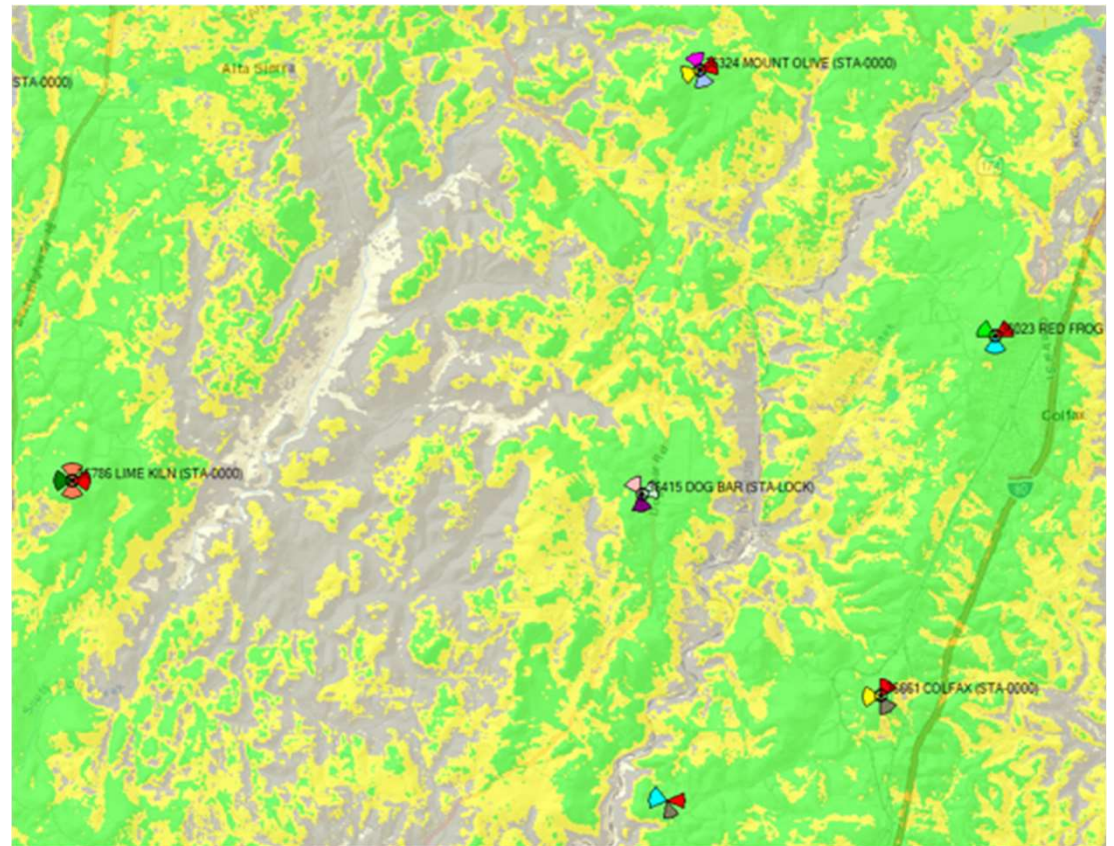
Existing Low-Band Coverage



Improved Service

- New in-building coverage to 1.4 square miles where lacking
- Total coverage of 21.7 square miles, with population 6,990
- New in-vehicle coverage to Dog Bar Road, Lodestar Drive, and other local roads

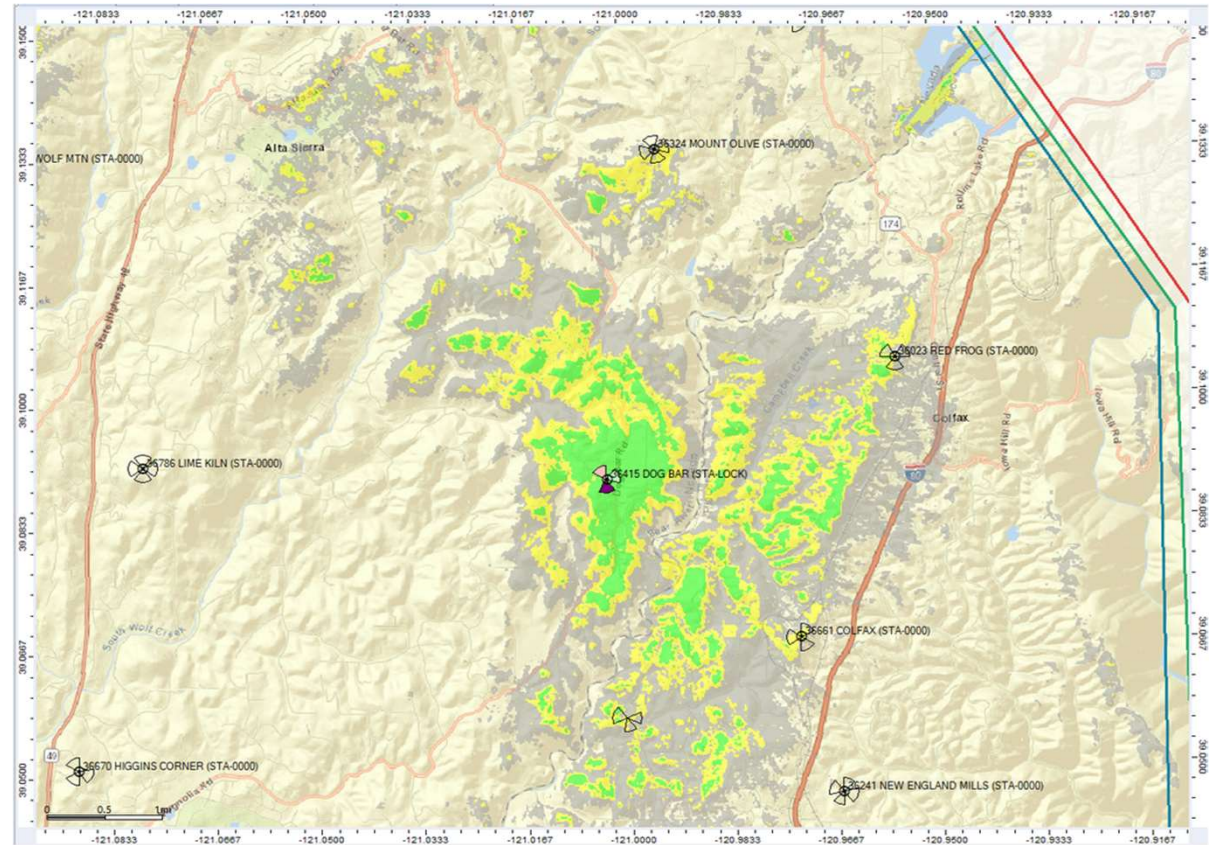
Proposed Low-Band Coverage



Proposed Facility Only (without Existing Facilities)

Dog Bar Only Low Band Coverage

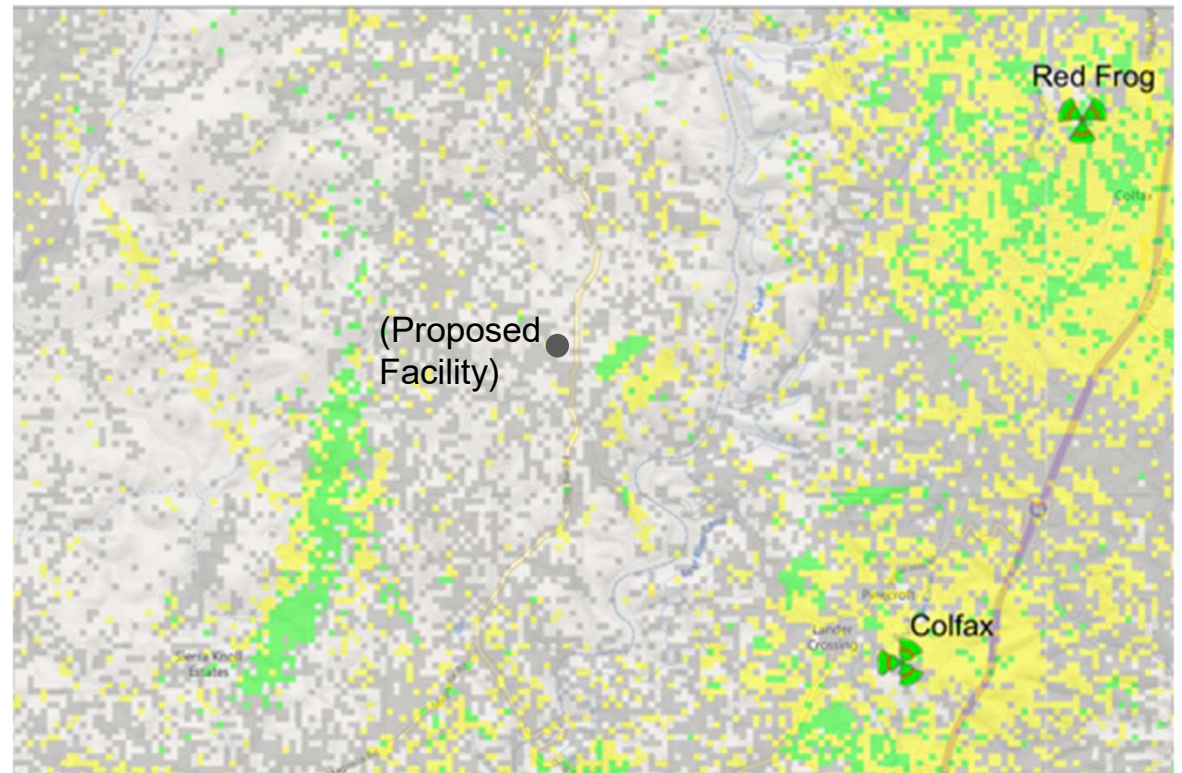
- Total coverage from Dog Bar facility 21.7 sq. miles, with population 6990



User Data Confirms Gap

User Data, June 27-30, 2024

- User data collected with TrueCall tool confirms coverage gap along southern Dog Bar Road

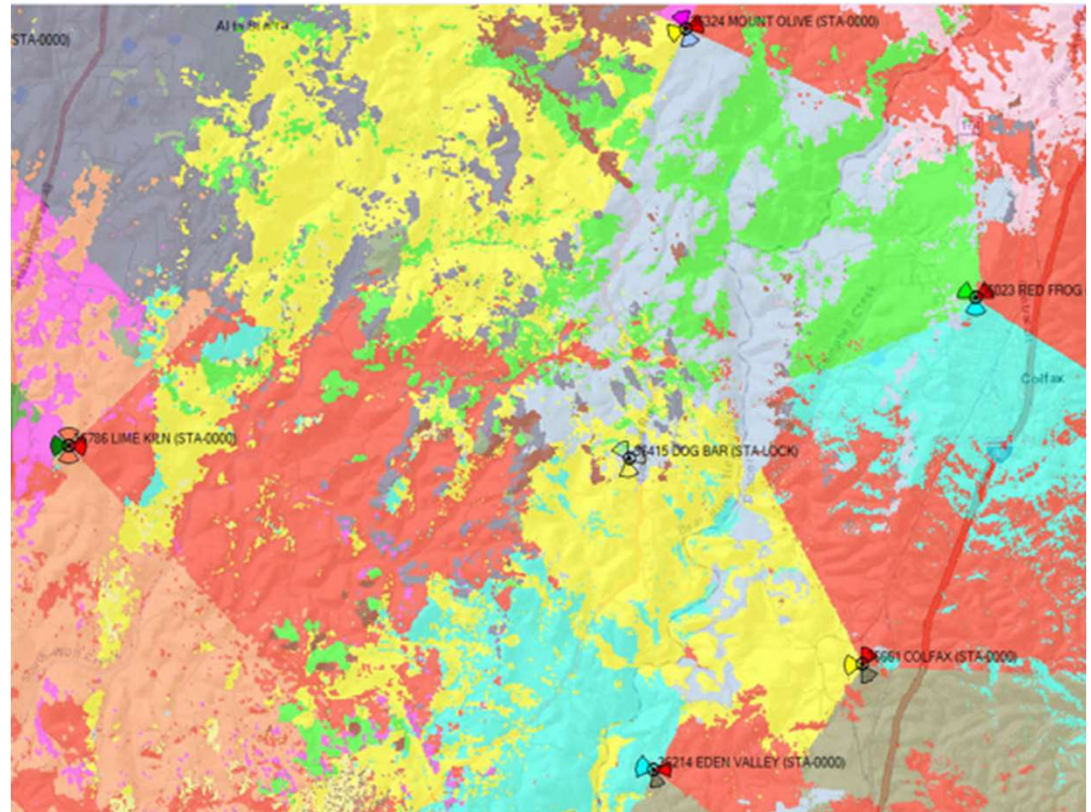


Lack of Dominant Signal

- Distant existing Verizon Wireless facilities provide only weak signal to gap area
- Inadequate service to faraway users in gap area

- Mount Olive – 3.1 miles north
- Red Frog – 2.7 miles northeast
- Colfax – 2.2 miles southeast

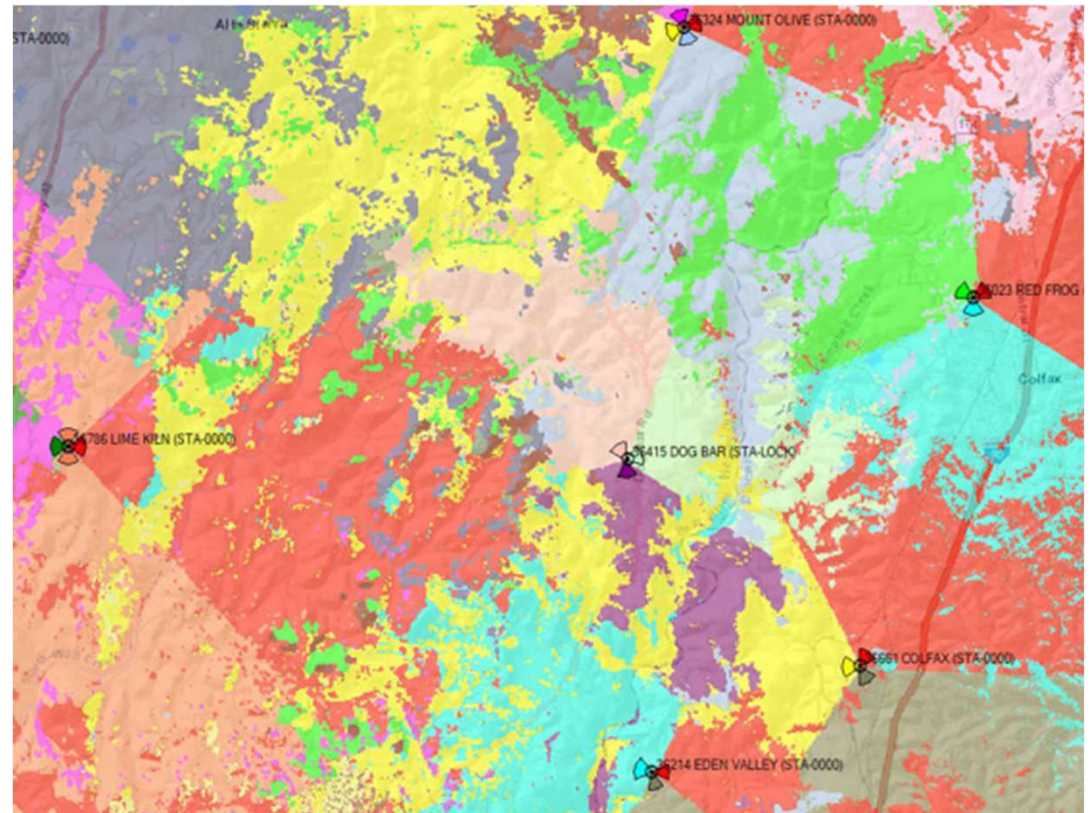
Existing Low-Band Best Server



New Dominant Signal

- Proposed facility provides new dominant signal to gap area
- Relieves distant existing facilities so they can devote their resources to their nearby users

Proposed Low-Band Best Server



Network Exhaustion

- Increasing demand on existing network leading to data capacity exhaustion
- As TTI occupancy increases, data speed drops

TTI Occupancy
Percent of data resources used

Downlink Throughput
Data speed in megabits/second

Colfax Facility
West Antenna Sector
Low-Band 700 MHz Frequency
July 13-19, 2024



Complies with County Code

- **Wireless facility allowed in AG–General Agricultural zone with conditional use permit**
- **Pine tree design conceals and camouflages antennas (§ L-II 3.8(E)(4))**
- **Placed between established trees to blend with surrounding forested environment (§ L-II 3.8(E)(1)(b))**
- **Space available on tower for collocation by another carrier, minimizing need for additional towers in area (§ L-II 3.8(G)(1))**
- **Satisfies use permit findings, including compatibility with surrounding uses, because facility is set back 1:1 from closest property line and over 500 feet from Dog Bar Road (§ L-II 5.5.2(C))**

Response to Appeal

- **OBJECTION: Appearance of facility**

- Drone PhotoSims confirmed that Pine tree design and surrounding established trees minimize visual impact

- **OBJECTION: No need for facility**

- Engineer's Statement submitted August 13, 2024, provides drive test and additional comprehensive network user data confirming a significant gap in service in area
- Significant gap unrelated to use permit findings for the facility
- Drive Tests accepted in 9th Circuit to demonstrate gap Los Angeles SMSA Limited Partnership v. City of Los Angeles, 2021 WL 374153 (C.D. Cal. 2021)
- High-band frequencies travel only a short distance and could not reach the gap area

- **OBJECTION: Impact on property values**

- Not a factor in County Code for a wireless facility use permit
- Generally, a proxy for concern over RF emissions, which is preempted because facility will comply with FCC exposure limits (47 U.S.C. § 332(c)(7)(b)(4))

Conclusion: Affirm Zoning Administrator approval and Staff Recommendation

- **New facility needed for reliable service and public safety in Dog Bar**
- **Complies with all County requirements for approval**



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Summation



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Dog Bar: Electromagnetic Safety

Prepared for the County of Nevada, August 20th 2024

David Witkowski, CEO, Oku Solutions LLC

www.okusolutions.com

My Bio



CEO & Founder, Oku Solutions LLC

3rd Party Review, Expert Witness, RF Safety Studies & Measurements

U.S. Coast Guard: Electronics, High-power comms & RADAR

University of California, B.Sc. Electrical Engineering, w/ focus on microwave/RF, electromagnetic applied physics.

IEEE: Institute of Electrical and Electronic Engineers

Senior Member

Life Member: Microwave Theory and Techniques Society

Member: IEEE Standards Association, International Committee on Electromagnetic Safety (C95 Standards Family)

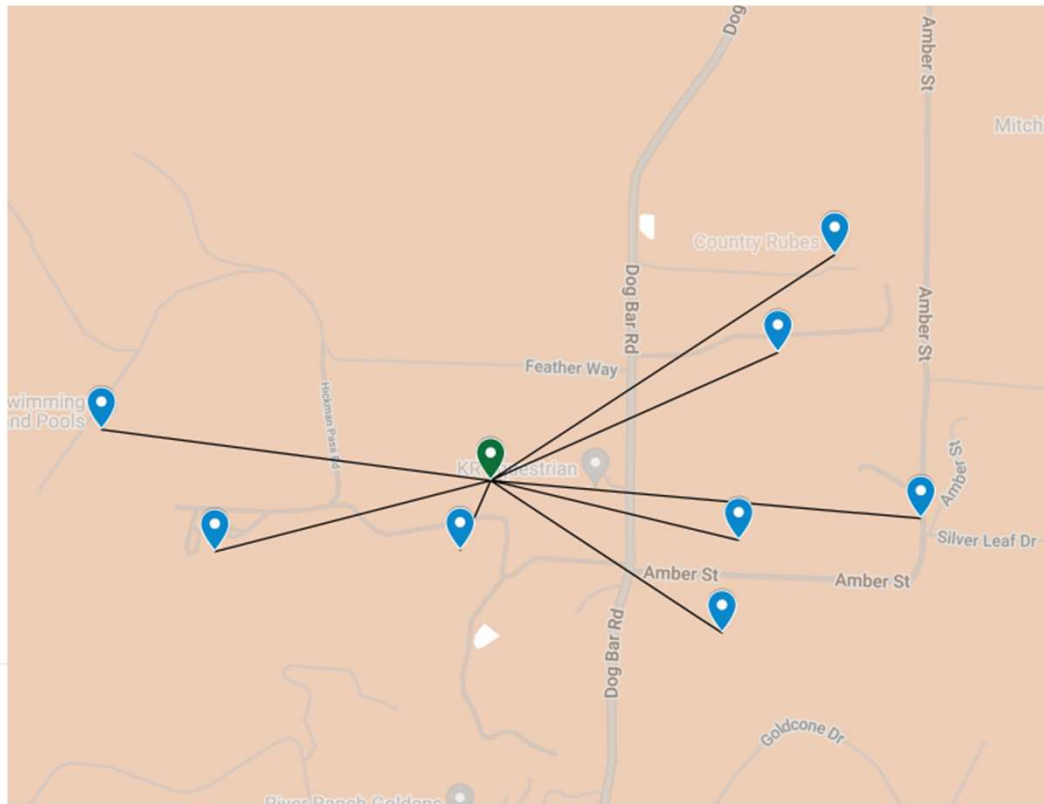
Member: Engineering in Medicine and Biology Society, Committee on Man and Radiation

Area Map: Free Space Path Loss

Dog Bar Grass Valley CA

Free Space Path Losses

- Proposed Site (Corrected)
- Phalen Res.
- RF Loss = 80.6 dB
- Roush Res.
- RF Loss = 82.4 dB
- Brisson Res.
- RF Loss = 84.8 dB
- Parr Res.
- RF Loss = 81.3 dB
- Permenter & Krecek Res.
- RF Loss = 70.1 dB
- Mallory Res.
- RF Loss = 85.2 dB
- Krewson Res.
- RF Loss = 81.6 dB
- Boan Res.
- RF Loss = 84.4 dB



Presumptions:

Height diff: 0 feet
Frequency: 751 MHz

No foliage or geologic obstacles

No walls/ceilings

Area Map: Free Space Path Loss

Free Space Path Loss Calculations			
Site: Dog Bar, VZW			
Frequency (worst-case): 751 MHz			
Height Difference: Level (0 feet)			
Appellant's Last Name	Distance (feet)	Path Loss (dB)	Loss Ratio (1/x)
Permenter / Krecek	334	70.1	10.26 million
Krewson	1248	81.6	143.18 million
Boan	1721	84.4	272.27 million
Parr	1214	81.3	135.48 million
Phalen	1118	80.6	114.90 million
Roush	1378	82.4	174.56 million
Mallory	1890	85.2	328.37 million

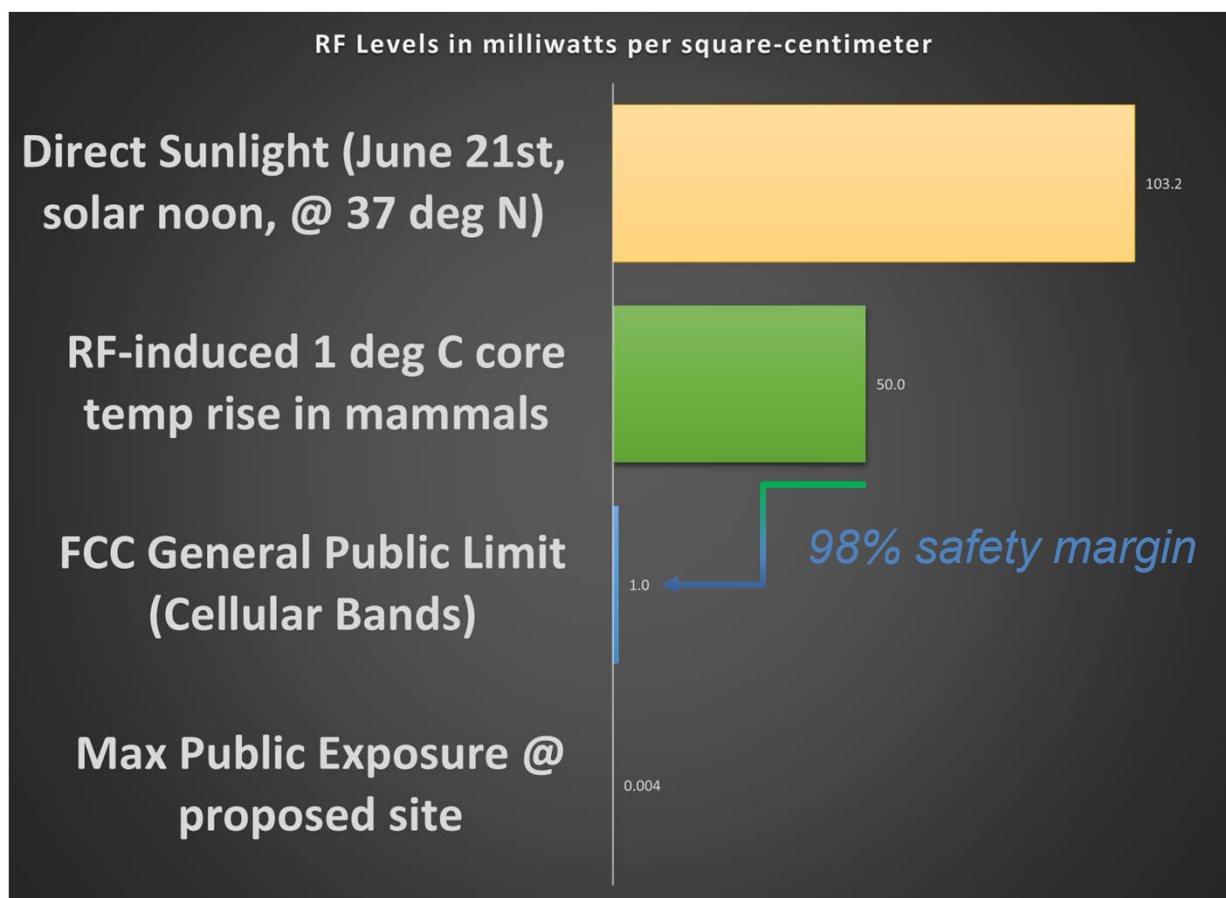
Presumptions:

Height diff: 0 feet
 Frequency: 751 MHz

No foliage or geologic obstacles

No walls/ceilings

Reviewed levels for proposed site



Per the EME Report:
DTech, 12-Aug-2024
PE: C. Stollar

- Max 0.3% Public MPE on ground
- Max 0.4% Public MPE on closest building/structure

Predictive EMEs are always worst-case – actual levels will measure 5x to 10x lower.

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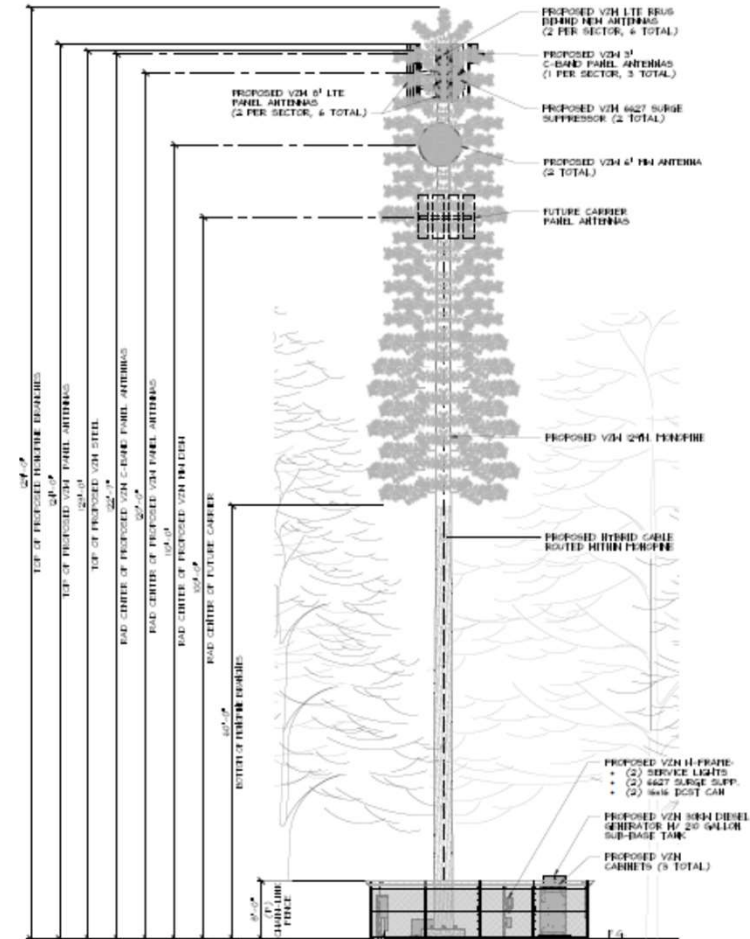
Ehab Elaidy, Verizon Wireless RF Design Engineer



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Facility Design

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Available Verizon Bands

- 700/850 MHz provide the minimum coverage layer.
- PCS/AWS MHz provide the capacity layer.

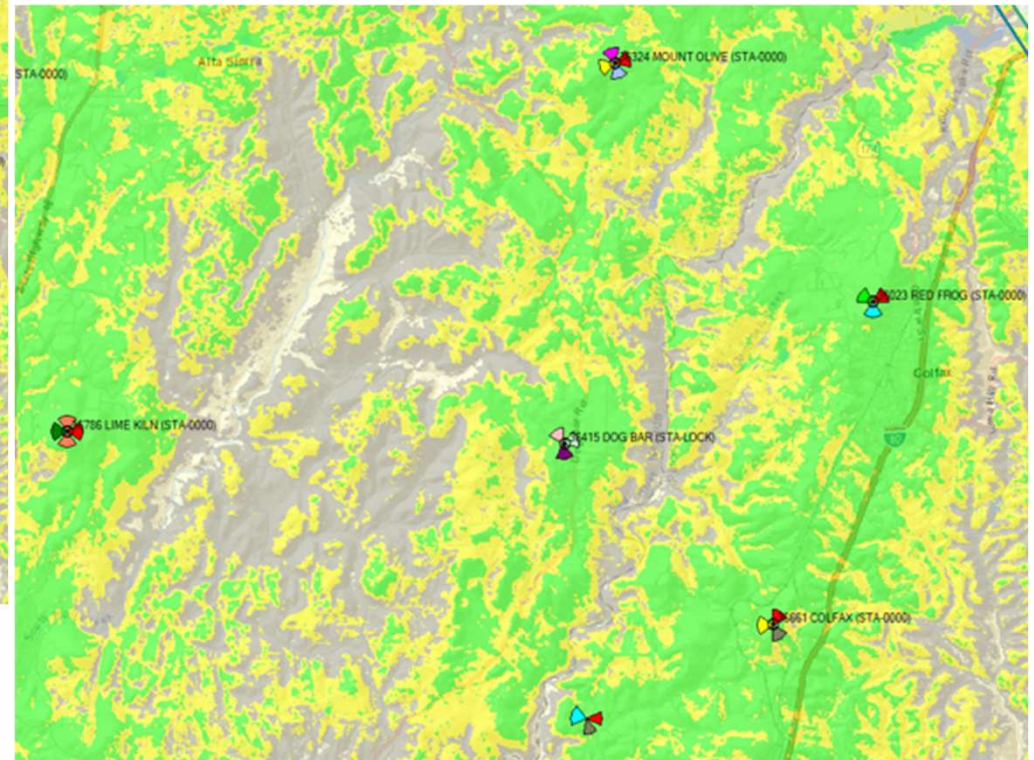
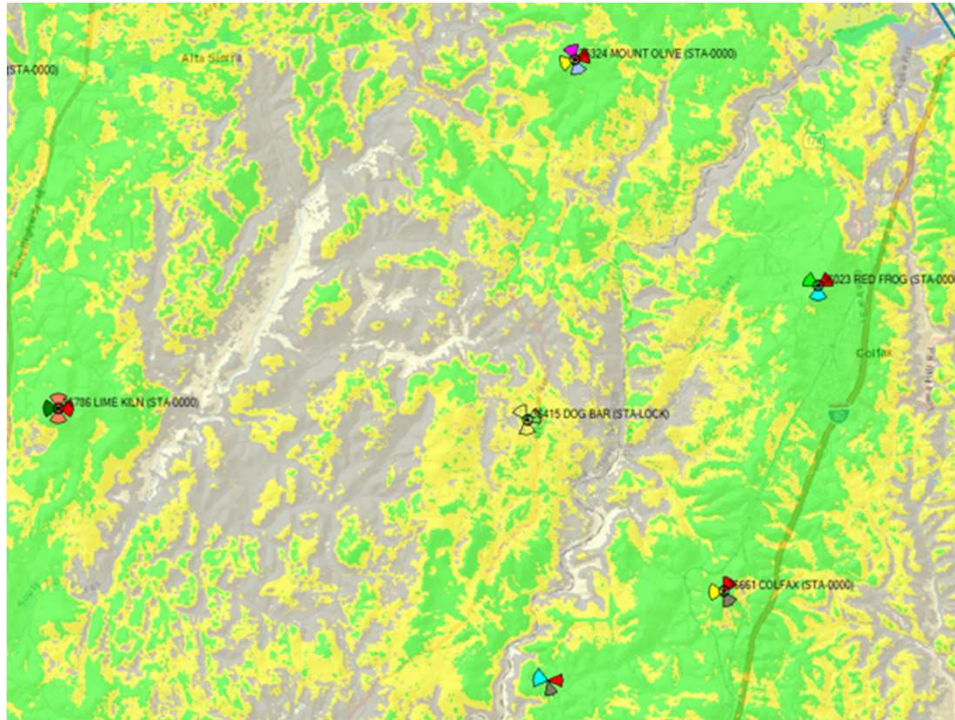
Band	FCC Designation	Frequency Band	Bandwidth
700 MHz	UHF Low Band	700 MHz	10 MHz*
850 MHz	Cellular	850 MHz	10 MHz*
PCS	Personal Communications Service	1900 MHz	5 MHz*
AWS	Advanced Wireless Service	2100 MHz	30 MHz*
CBRS	Citizen's Broadband Radio	3550 MHz	20-40 MHz* Shared
C-Band	C-Band	3700-4000 MHz	160 MHz

* Downlink only



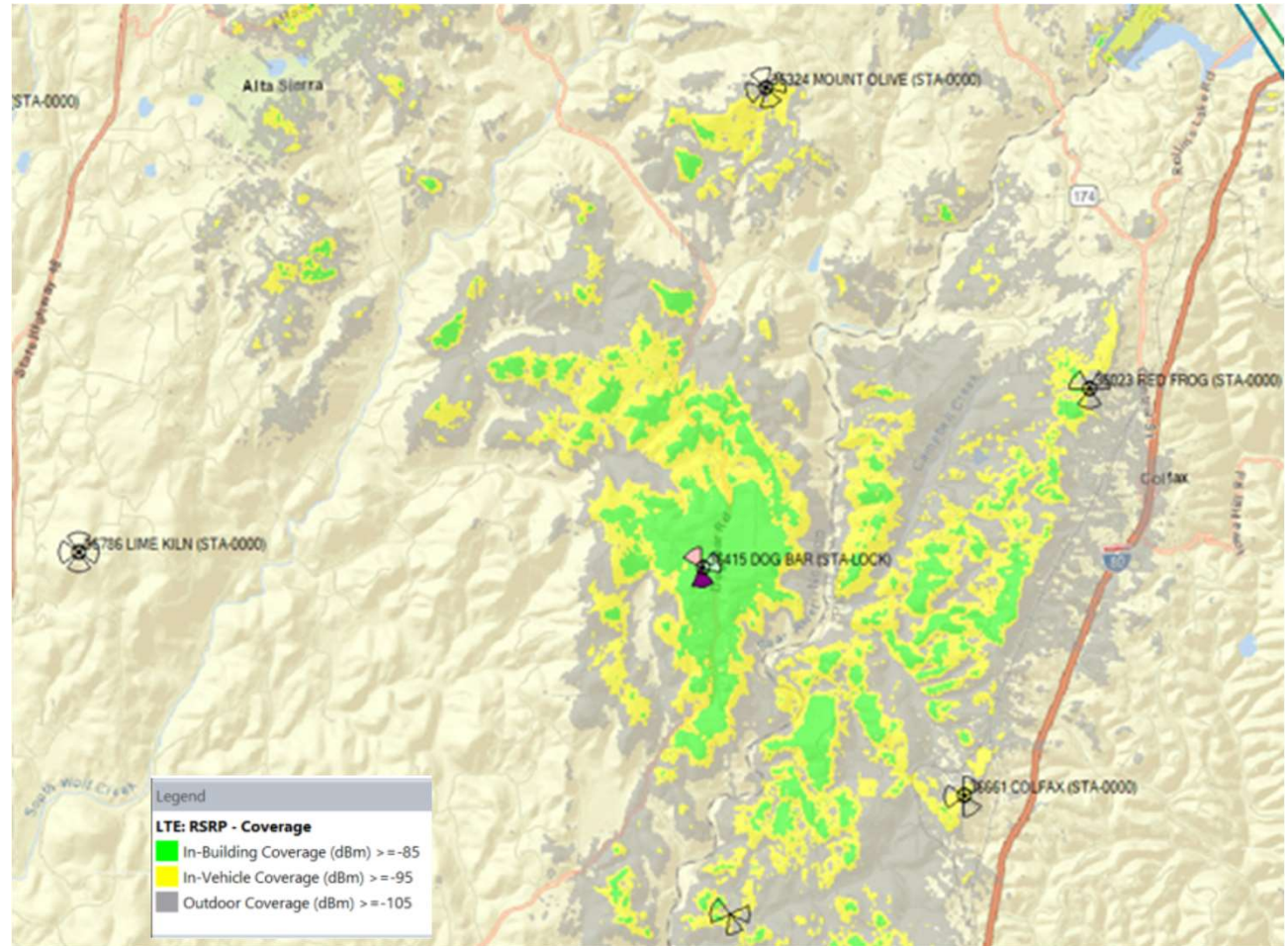
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Low Band Service Gap

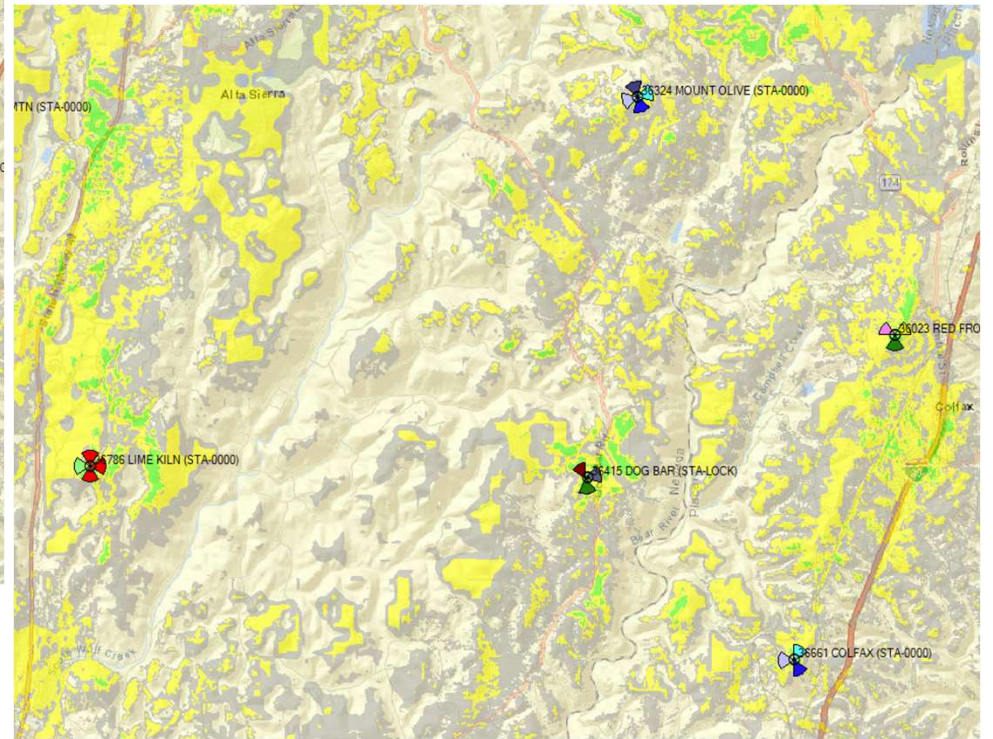
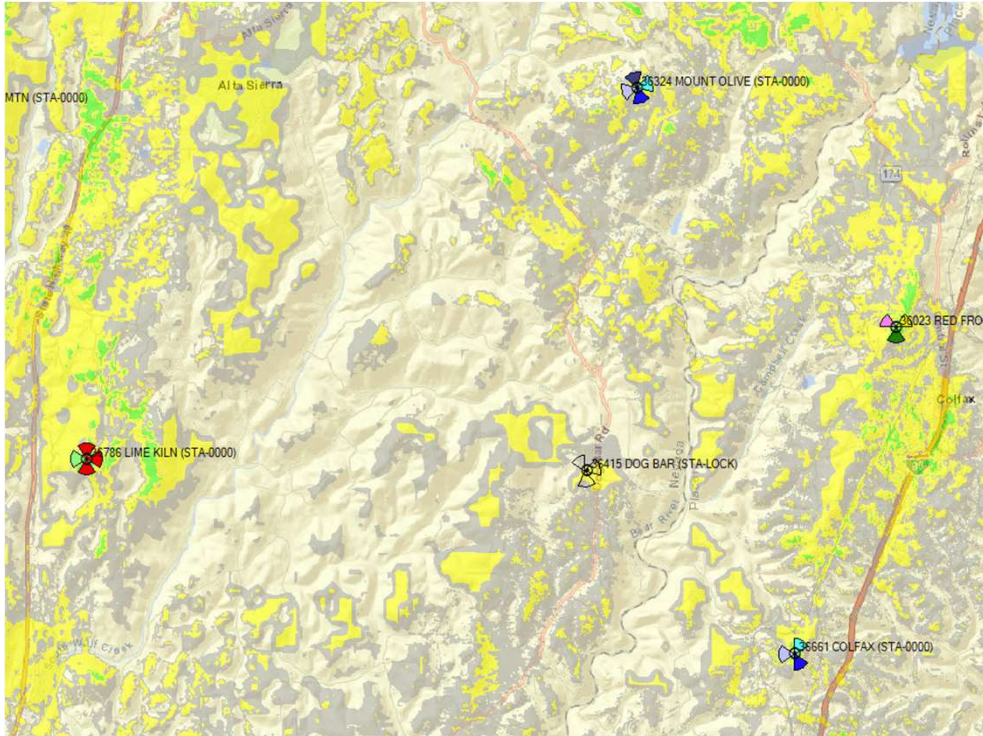


Improved Low-Band Service

- New in-building and in-vehicle coverage in vicinity
- New, reliable coverage to an area of 2.6 square miles where currently lacking

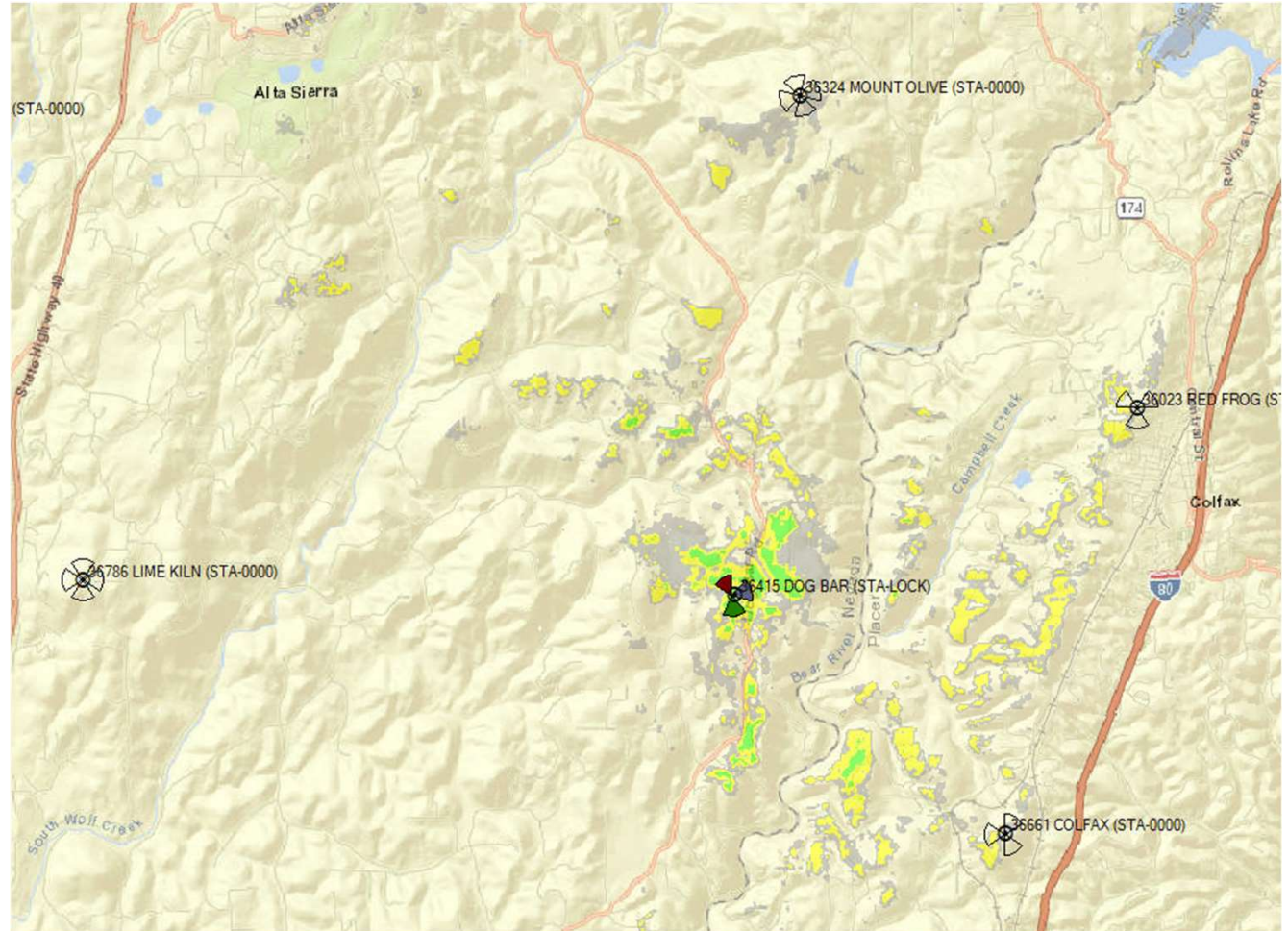


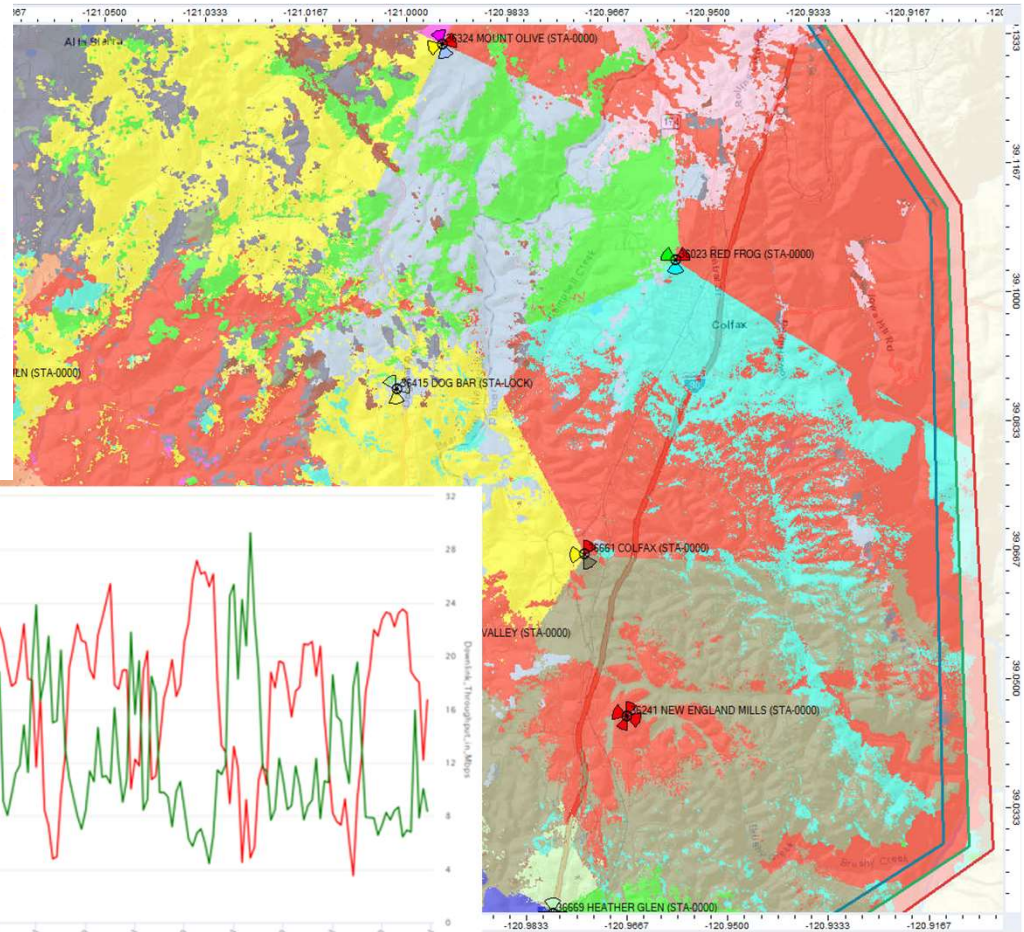
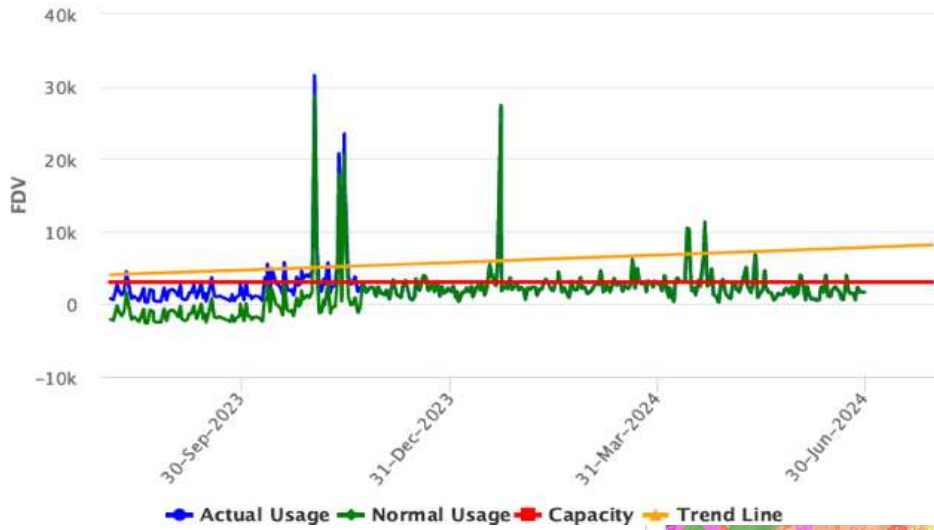
Mid-Band Service Gap



Improved Mid-Band Service

- New, reliable coverage with improved capacity to an area of 1.1 square miles where currently lacking

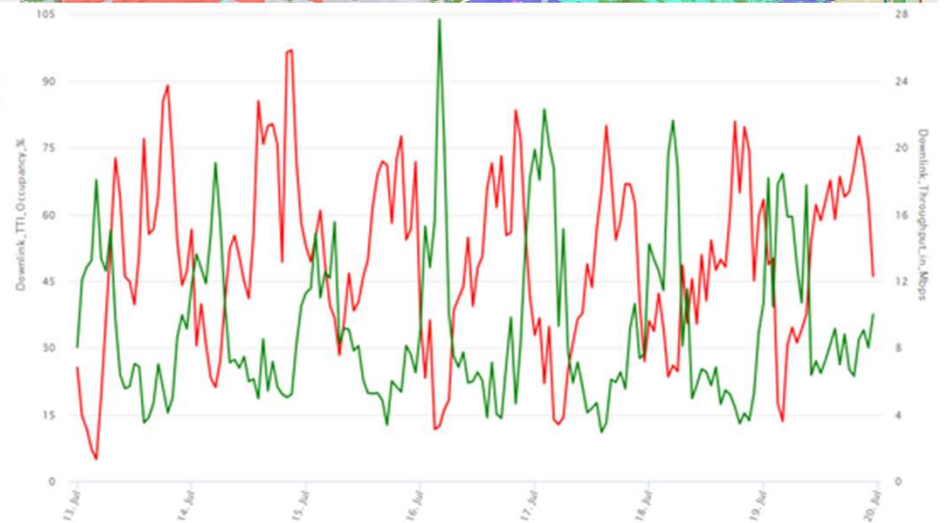
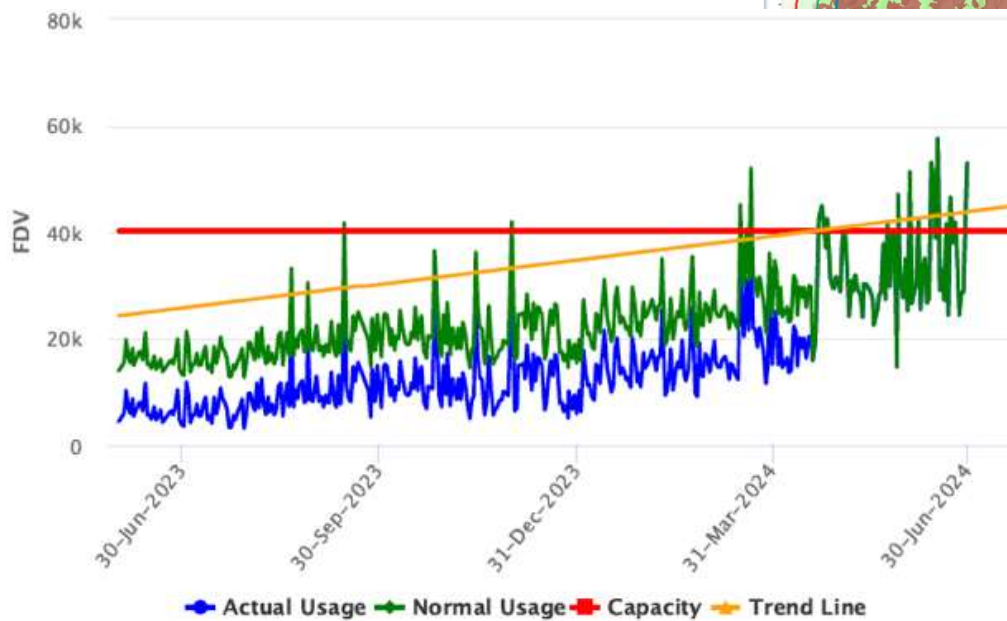
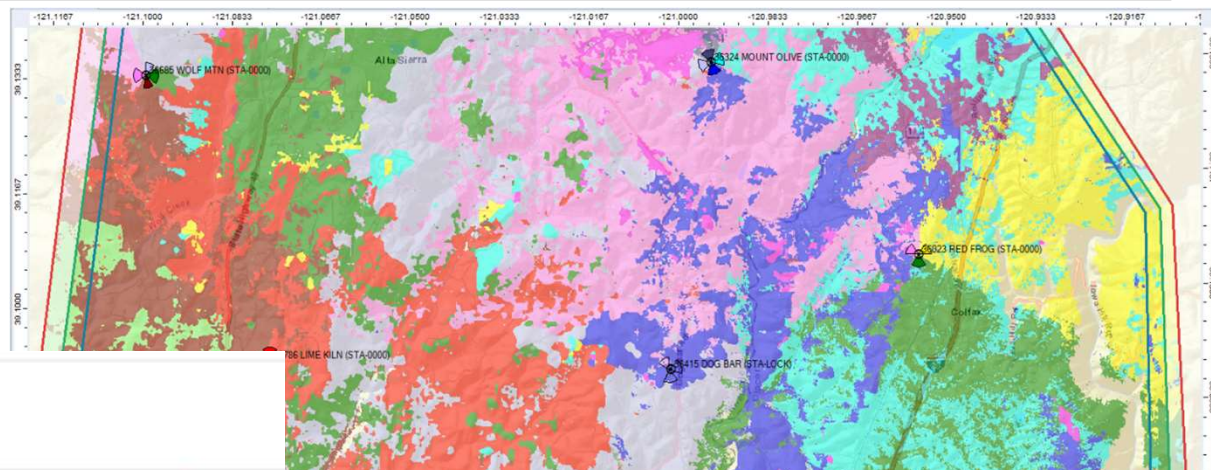




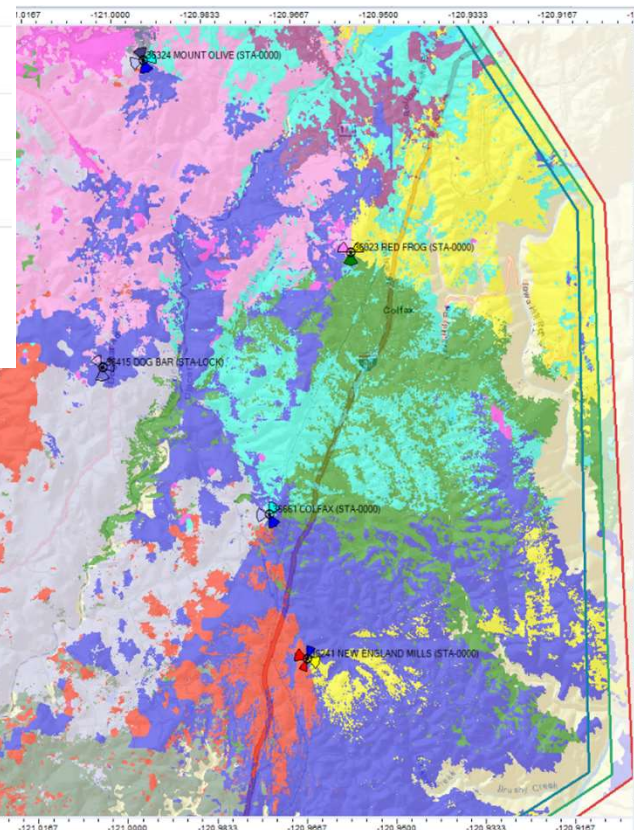
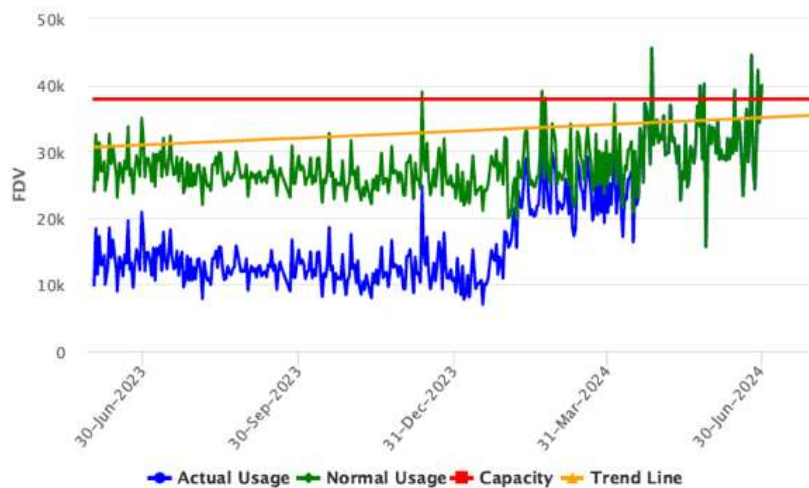
**Mount Olive Facility,
Southeast-Facing
Antenna Sector
Low-Band Frequencies
July 2023-June 2024**



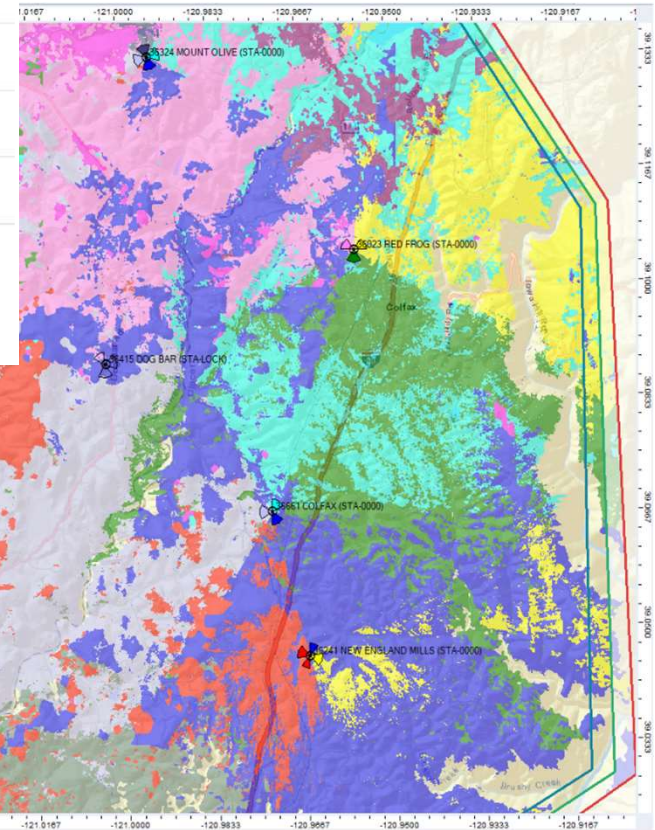
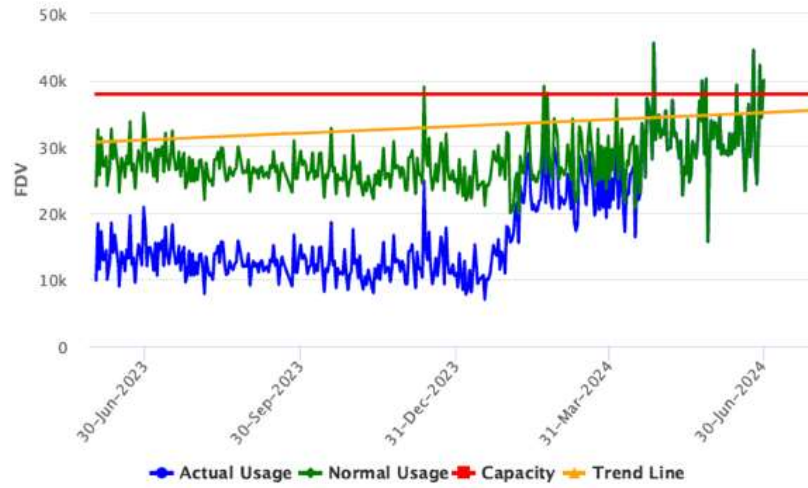
- Red Frog Facility, Northwest-Facing Antenna Sector
- Mid-Band Frequencies
- July 2023-June 2024



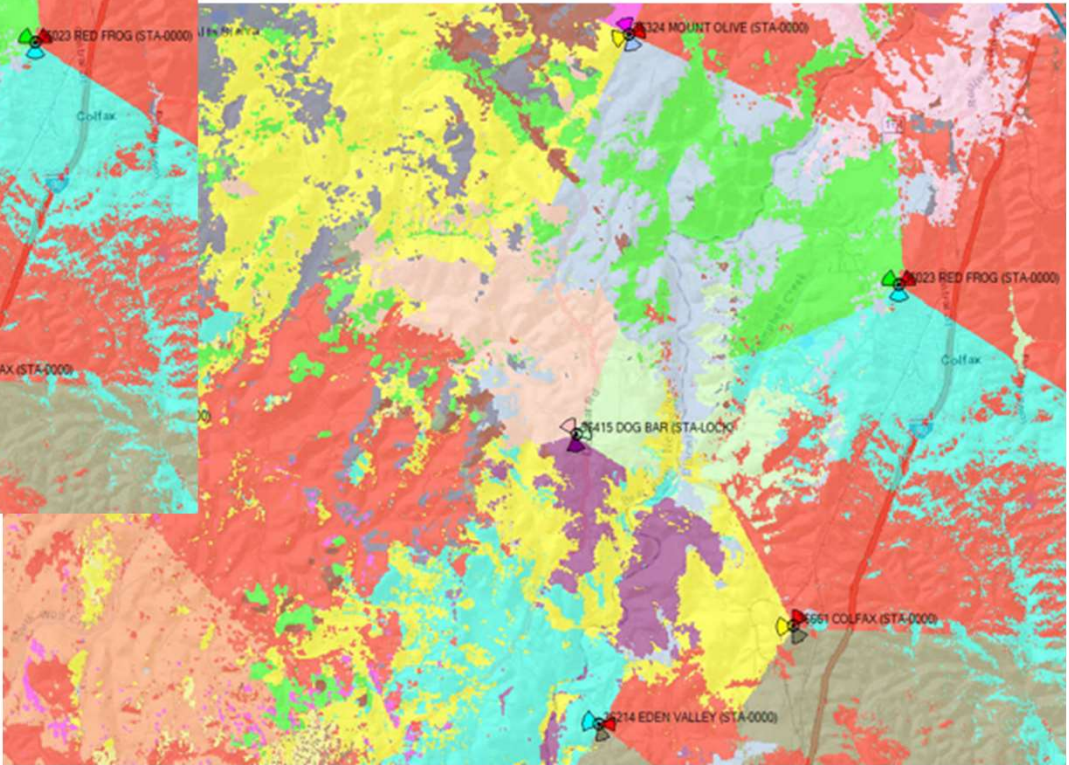
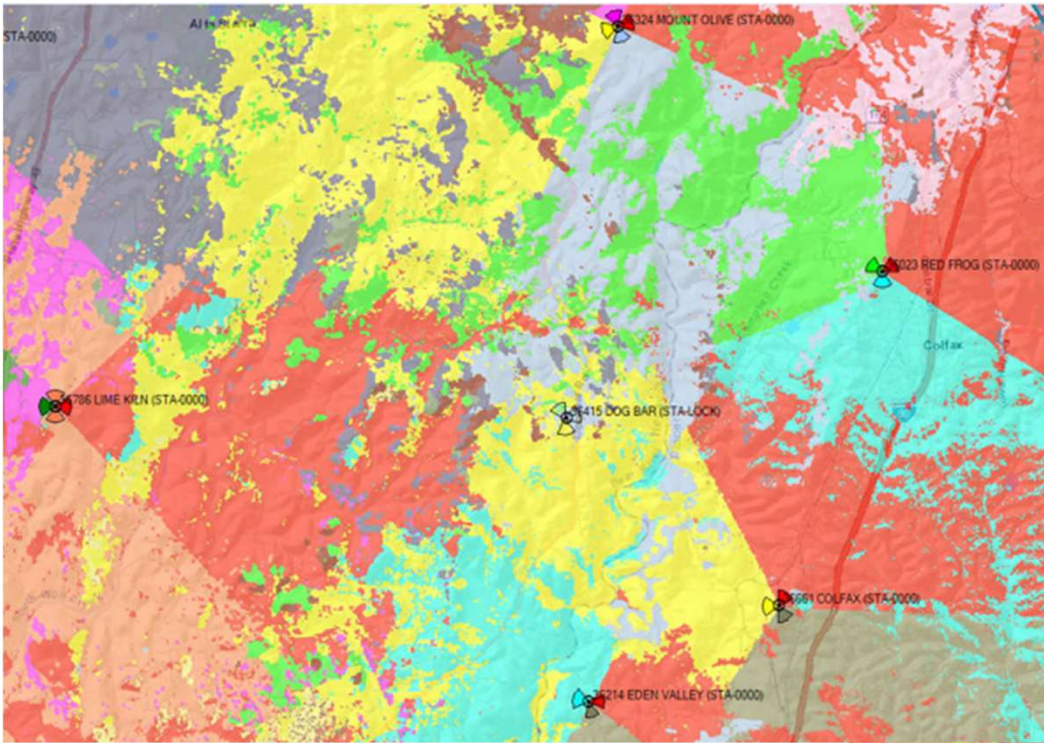
-Colfax Facility,
Northwest-Facing
Antenna Sector
-Mid-Band
Frequencies
-July 2023-June
2024



**-Colfax Facility,
Northwest-Facing
Antenna Sector
-Mid-Band
Frequencies
-July 2023-June
2024**



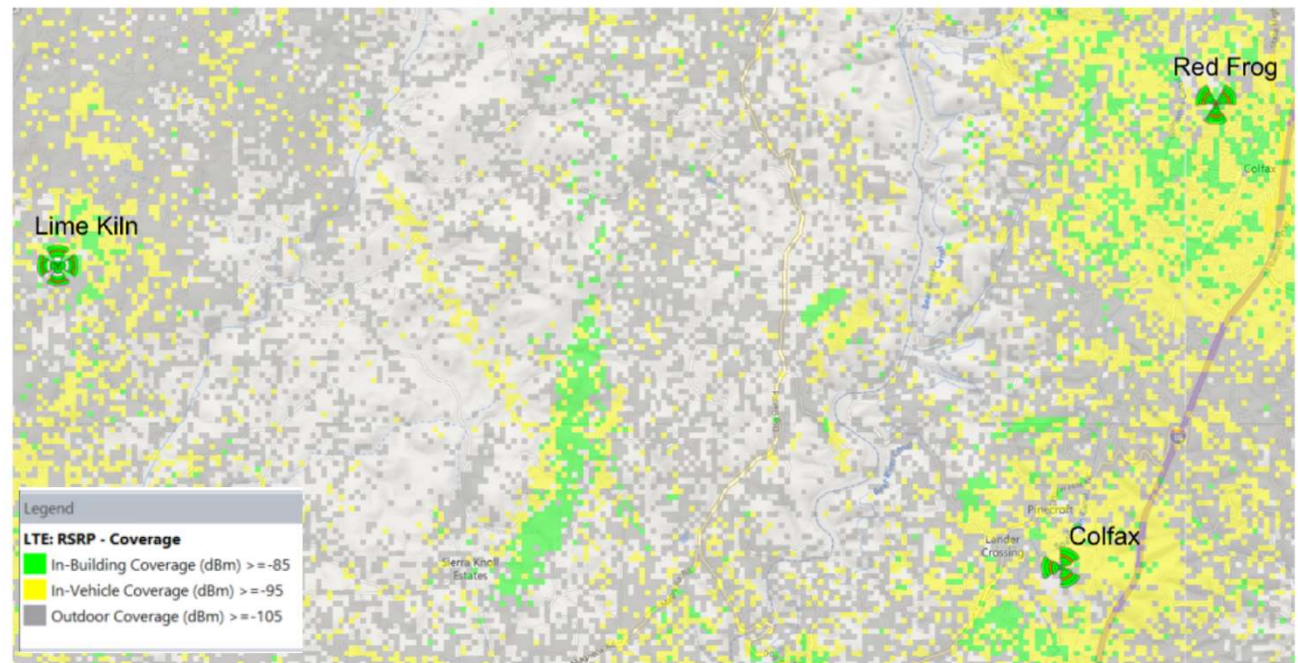
Low-Band with Dog Bar @120 feet centerline, before and after plots.



TrueCall Data Map

- Map based on network user data confirms service gap in areas along Dog Bar Road near Feather Way
- Every pixel is showing where voice & data calls were made.

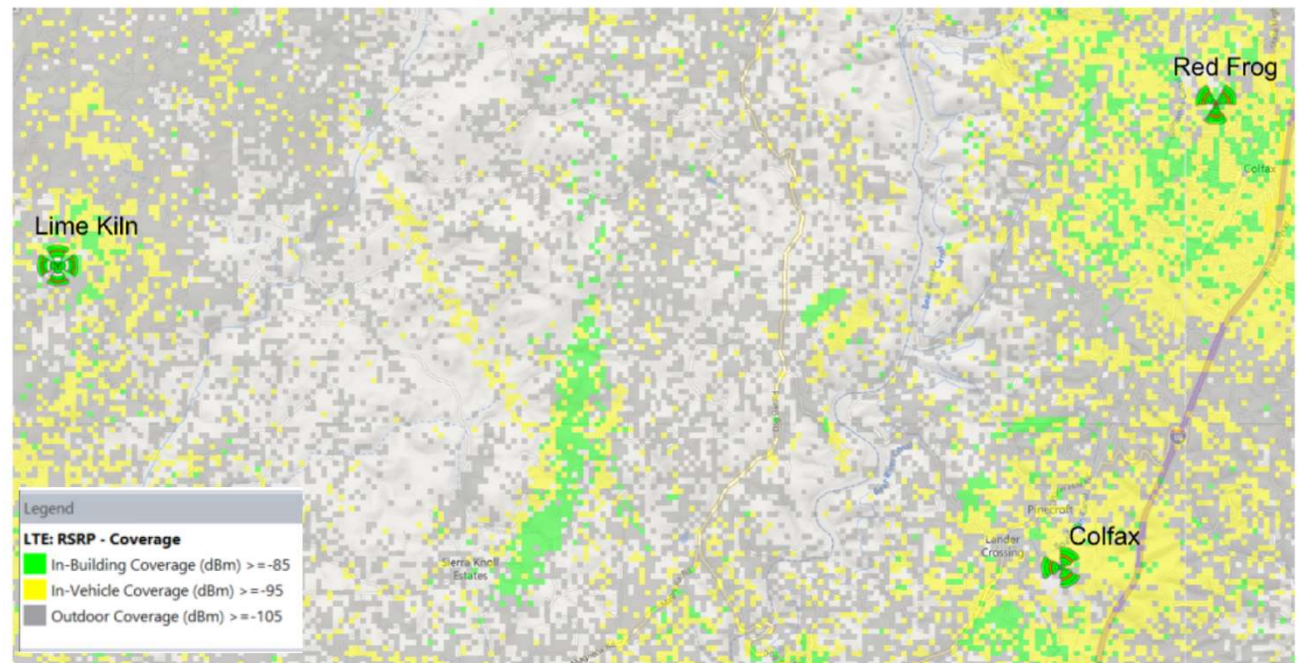
Dog Bar TrueCall Data Map



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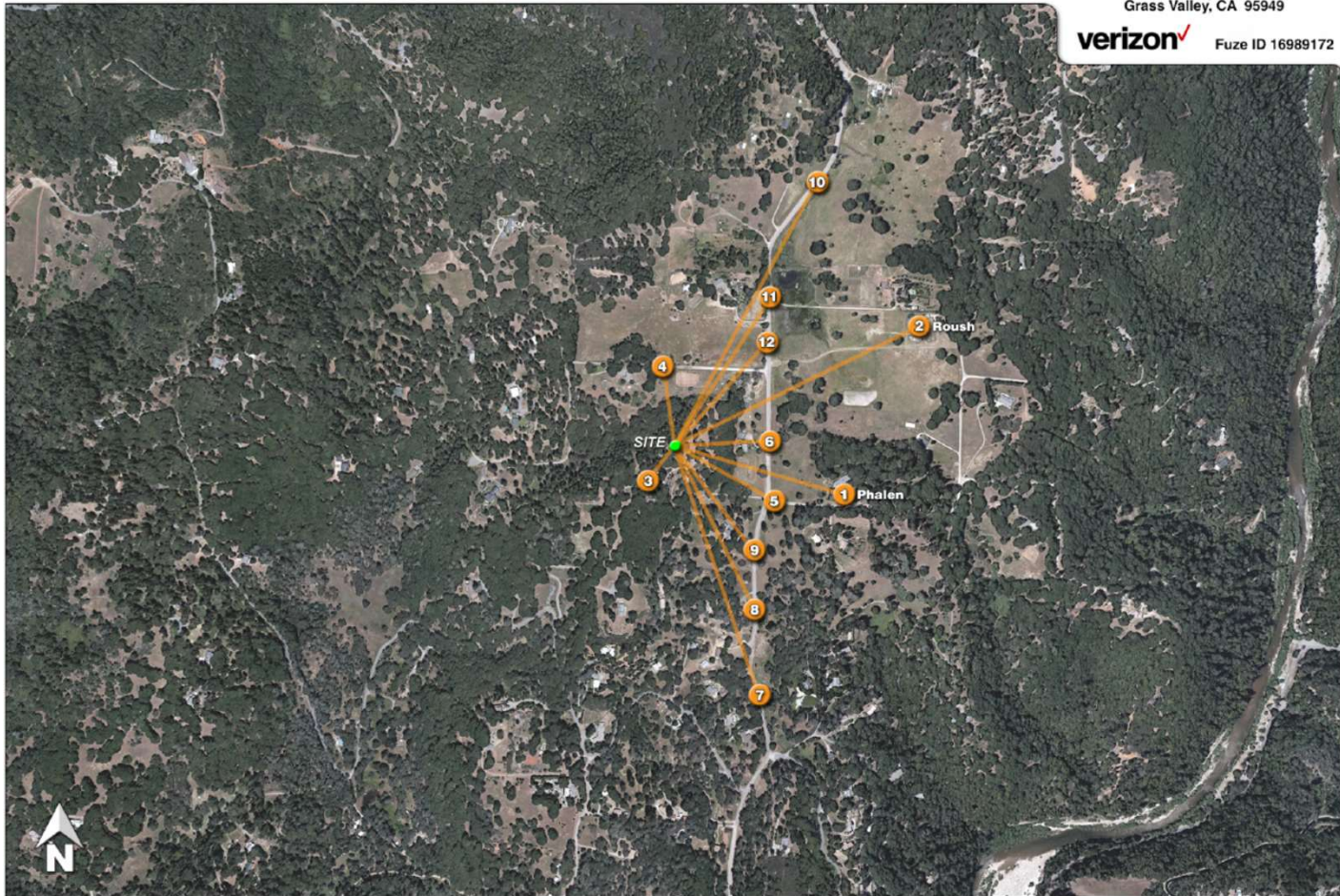
Dog Bar TrueCall Data Map



Aerial photograph showing the viewpoints for the photosimulations.

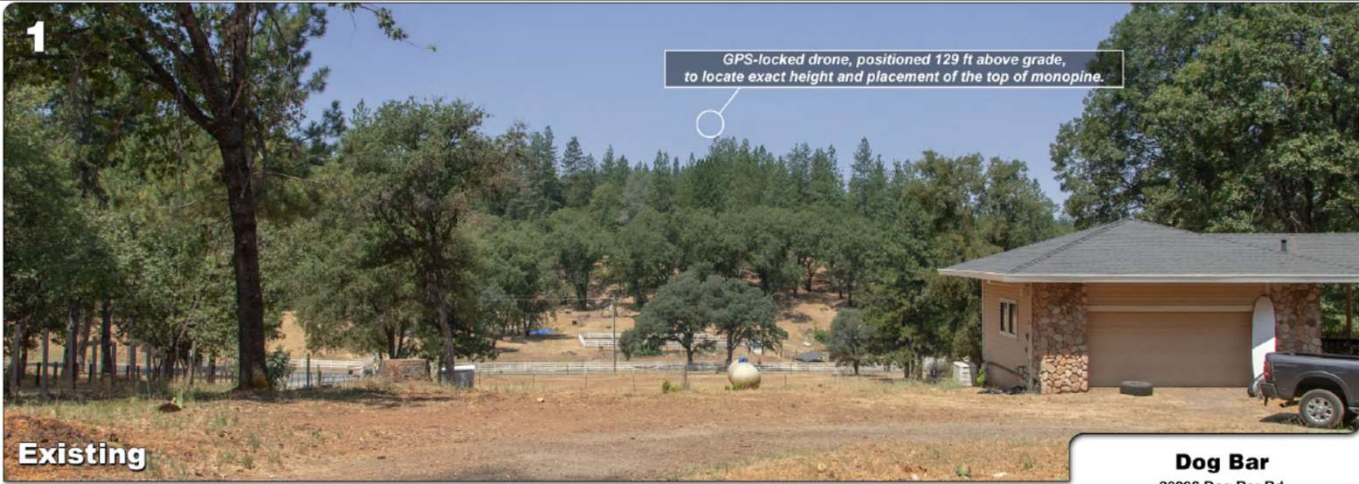
Dog Bar
20896 Dog Bar Rd
Grass Valley, CA 95949

verizon Fuze ID 16989172



verizon

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1

GPS-locked drone, positioned 129 ft above grade, to locate exact height and placement of the top of monopine.

Existing

Photosimulation of the view looking west from the Phalen residence, camera viewpoint is 1200 ft from the site.

Dog Bar

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Grass Valley, CA 95949

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Proposed

Proposed monopine



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2



Existing

Photomontage of the view looking west-southwest from the main picture-window view at the Roush residence, 1880 ft away.

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verizon Fuze ID 16989172

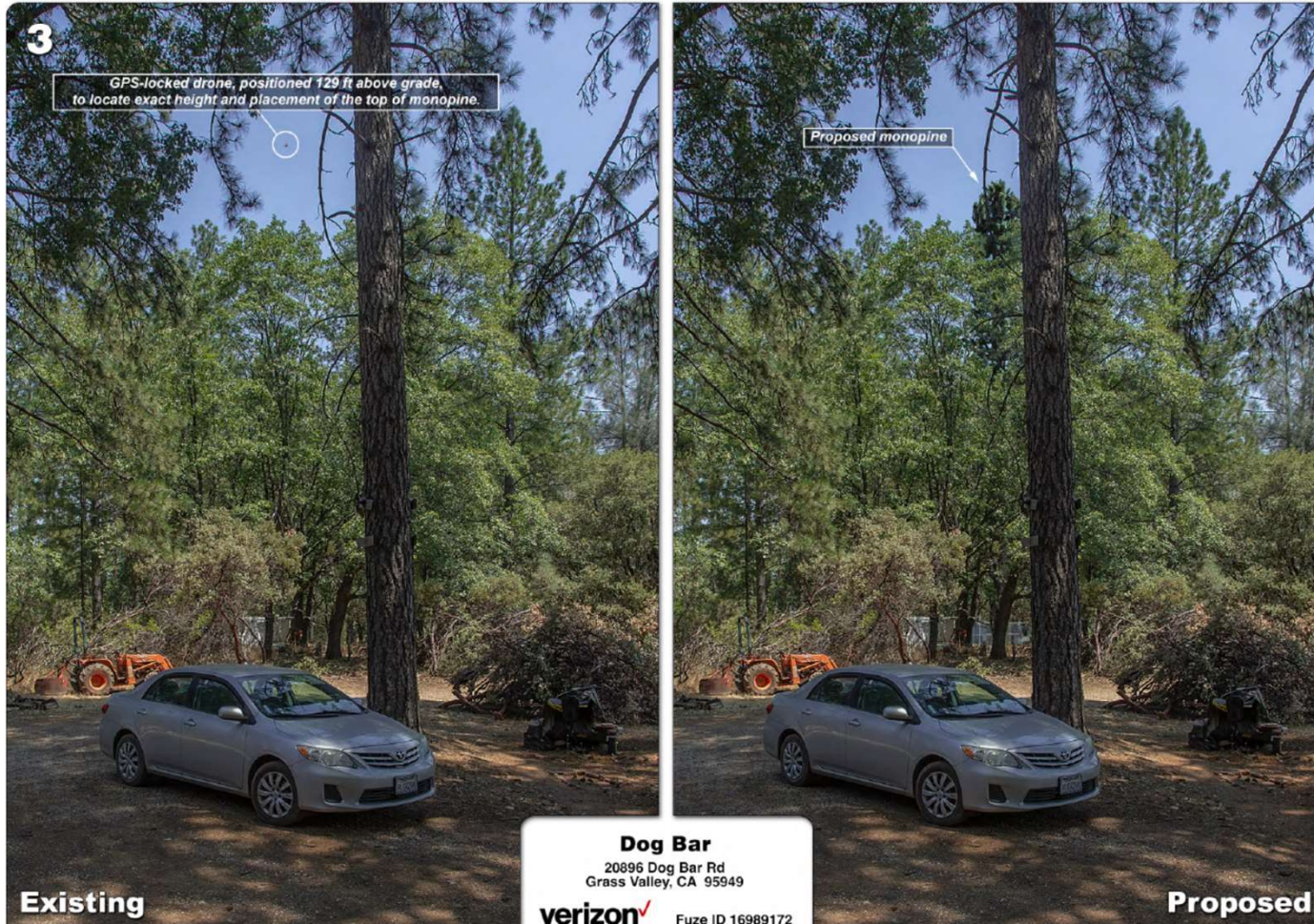


Proposed

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Photosimulation of the view looking northeast from the nearest neighbor to the site, camera viewpoint is 250 ft from the proposed monopine.



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Photosimulation of the view looking northeast from the nearest neighbor to the site, camera viewpoint is 225 ft from the proposed monopine.



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4

GPS-locked drone, positioned 129 ft above grade, to locate exact height and placement of the top of monopine.

Existing

Photosimulation of the view looking south from the nearest point along Feather Way, 525 ft from the site.

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Proposed monopine

Proposed



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5

Existing

Photosimulation of the view looking northwest from the mailboxes on Amber Street at Dog Bar Road, 750 ft from the site.

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 20896 Dog Bar Rd
 Grass Valley, CA 95949

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Proposed

Proposed monopine

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6



GPS-locked drone, positioned 129 ft above grade, to locate exact height and placement of the top of monopine.

Existing

Photomontage of the view looking west from the nearest point along Dog Bar Rd, directly in front of the landowner's house.

Dog Bar

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Grass Valley, CA 95949



Fuze ID 16989172



Proposed monopine

Proposed



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Photograph of the view looking north-northwest along northbound Dog Bar Rd, 1750 ft from the site. Monopine is not visible.

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Grass Valley, CA 95949

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Existing and Proposed (no visible change)

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Photograph of the view looking north-northwest along northbound Dog Bar Rd, 1500 ft from the site. Monopine is not visible.

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Existing and Proposed (no visible change)

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Photograph of the view looking northwest along northbound Dog Bar Rd, 1200 ft from the site. Monopine is not visible.

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Photograph of the view looking south-southwest along southbound Dog Bar Rd, 2000 ft from the site. Monopine is not visible.

Dog Bar
20896 Dog Bar Rd
Grass Valley, CA 95949

verizon  Fuze ID 16989172

10



Existing and Proposed (no visible change)

verizon 

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11



Existing

Photomontage of the view looking southwest along Dog Bar Road, through a gap in the trees, 1100 ft from the site.

Dog Bar
 20896 Dog Bar Rd
 Grass Valley, CA 95949
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Proposed



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12

GPS-locked drone, positioned 129 ft above grade, to locate exact height and placement of the top of monopine.

Existing

Photosimulation of the view looking due south along Dog Bar Road, approaching Feather Way, 950 ft from the site.

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Proposed

Proposed monopine



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Photograph of the actual drone used.

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Drone locked in place.



Flight controller screen during all site photography, showing the view looking out FROM the drone.



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