

North Shore Chelan Substation Update

10/24/2017

Process

- More than 2 years
- 20 public meetings
- Focus group
- Selection Criteria
- 18 sites
- Evaluated areas outside of load center
- Evaluated undergrounding
- Sought willing property sellers
- Identified and took two options on properties
- Most transparent and highest cost for any substation

What do we know?

- There is a need for this substation – lots of growth since 1981
- No site without challenges
- Unique challenges associated with lake views
- Eliminated many sites

Purpose

- Staff recommendation/why
- Answer questions
- Hear your comments

No Board decision tonight

The Board will act based on staff recommendation and your
input

Process

- Staff presentation/recommendation
 - New information
 - Allow everyone to get information
- Clarifying questions
 - Blue index cards
 - 2 minute responses
- Your comments
 - Focus group first
 - 3 minutes per comment per round
 - Written comments can be provided on white index cards
 - Stay until we are done

Let's Go!

Public Input Themes

- Since Sept. 25:
 - Views are/will be negatively impacted by overhead lines and the new substation
 - All new lines should be put underground
 - Existing lines should be put underground
 - Explore funding options for underground lines
 - Substation site should be located away from view corridors and residential areas
 - Concerns about noise and light of the substation
 - Concerns about adding infrastructure in established residential areas
- Sept. 25th - Request to select Hellyer site with following conditions:
 1. Underground transmission
 2. Locate station further away from Boyd Road
 3. Underground distribution

Transmission Construction Comparison

	Overhead double circuit, varied terrain	Underground double circuit, varied terrain *
Estimated NPV cost per mile, installation plus maintenance	\$1.028M – \$2.029M	\$7.122M - \$13.429M
Estimated life	80+ years	80+years (with a re-conductor at year 40)

* Would require new standards, construction, materials, etc.

- **Cost range for 6/10 mile of underground transmission (double circuit) for Hellyer site: \$4.3M-\$8M**
- **There are substantial public and private property impacts, construction disturbances, and special operational requirements**

Staff conclusion: Underground transmission is not recommended due to financial and operational impacts



Engineering and Operational Comparison

Site Differential	Selection Criteria	Hellyer	Henderson	Notes
Mobile Substation and Operational Access	Land Consideration	X		Hellyer has preferable substation access
Distribution Line Route Options	System Consideration		X	Henderson site has more options
Proximity to Transmission	System Consideration		X	Henderson adjacent to existing transmission
Transmission Redundancy	System Consideration		X	Henderson provides looped transmission
Proximity to Load Center	System Consideration		X	Henderson closer to load center (blue line)
Substation Site View Impacts	Aesthetics	X		Hellyer has natural land barriers
Transmission Line View Impacts	Aesthetics		X	Henderson requires shorter transmission line tap

Cost & Aesthetics Comparisons

	Hellyer (Sept. 25)	Henderson (Sept. 25)
Cost Comparison	\$10,300,000	\$8,500,000
Lake View Impact Estimate	11	9
Total View Impact Estimate	61	94
Total Transmission Line Miles	0.6	0.1
Total Distribution Line Miles	2.9	2.2
Estimate of Easements Needed	12	8

*Note: All costs are assumed unit costs for comparison, actual cost determined following design

Henderson Substation Site

New Above Ground Features



Henderson Substation Site

New Underground Distribution



No overhead distribution lines will be constructed under this approach

New Underground Distribution Lines Option

	Hellyer (Sept. 25)	Henderson (Sept. 25)	Henderson Underground Distribution Lines Option
Cost Comparison	\$10,300,000	\$8,500,000	\$8,200,000
Lake View Impact Estimate	11	9	4
Total View Impact Estimate	61	94	74
Total Transmission Line Miles	0.6	0.1	0.1
Total Distribution Line Miles	2.9	2.2	1.8
Estimate of Easements Needed	12	8	4

*Note: All costs are assumed unit costs for comparison, actual cost determined following design

Substation design variables

- Lighting – LED, down-lighting, motion sensors
- Landscaping – visual buffers, blend with existing/natural
- Fencing/walls – color, material, visual buffer, blend to existing
- Noise – latest technologies, similar to residential heat pump, sound buffers
- Profile – heights and set backs
- Orientation – equipment placement, access roads
- Timing and impact of construction

Staff Recommendation Summary

- Staff recommendation to purchase Henderson site:
 - Engineering & operational comparison
 - Cost & aesthetics comparison
- Design to include new distribution lines underground
- Take into account aesthetic concerns

Recommended Timeline & Next Steps

- Nov. Board Meeting - Commissioner action
- If staff recommendation is approved:
 - End of Nov. - Property purchase complete (options expire)
 - Q4/17:
 - Begin working with neighboring property owners on design variables
 - Initiate Conditional Use Permit process (Chelan County)
 - Initiate engineering design
 - Q4/18 – Substation and transmission design complete
 - 2019-2020 – Construction




Q&A

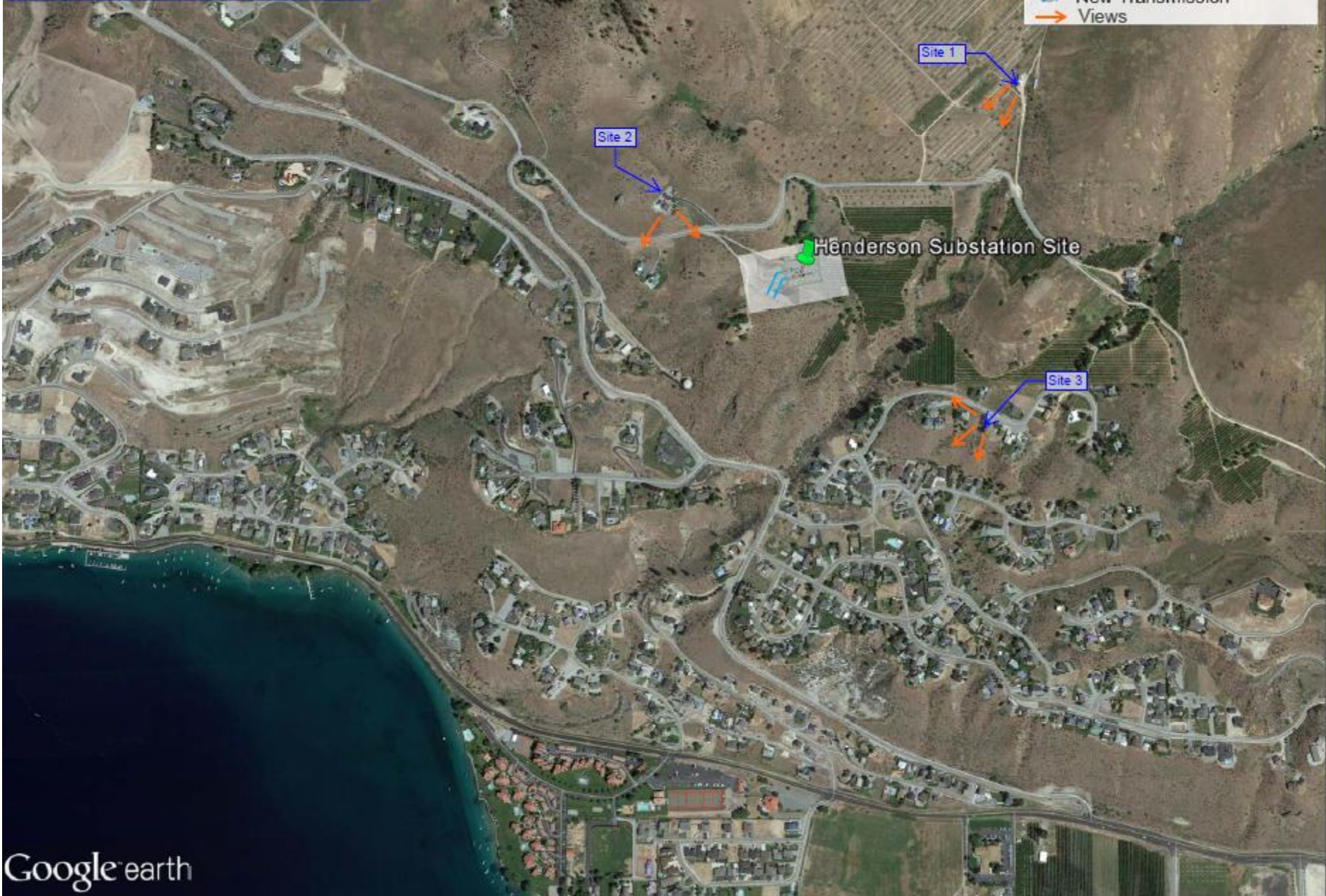
Public Comment

Henderson Substation
Property Owner Views



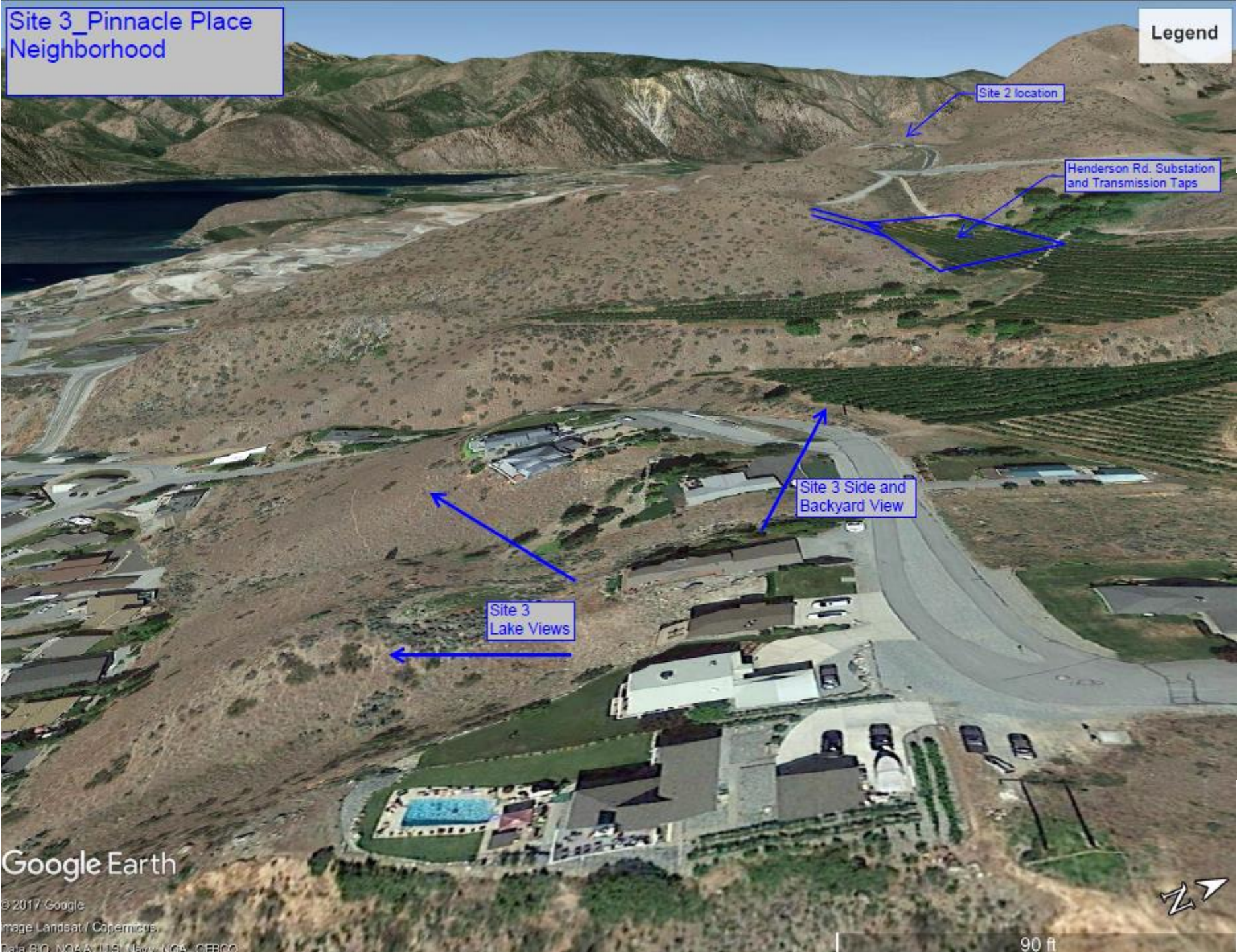
Legend

-  Henderson Substation Site
-  New Transmission Views
-  Views



Site 3_Pinnacle Place
Neighborhood

Legend



Site 2 location

Henderson Rd. Substation
and Transmission Taps

Site 3 Side and
Backyard View

Site 3
Lake Views

Google Earth

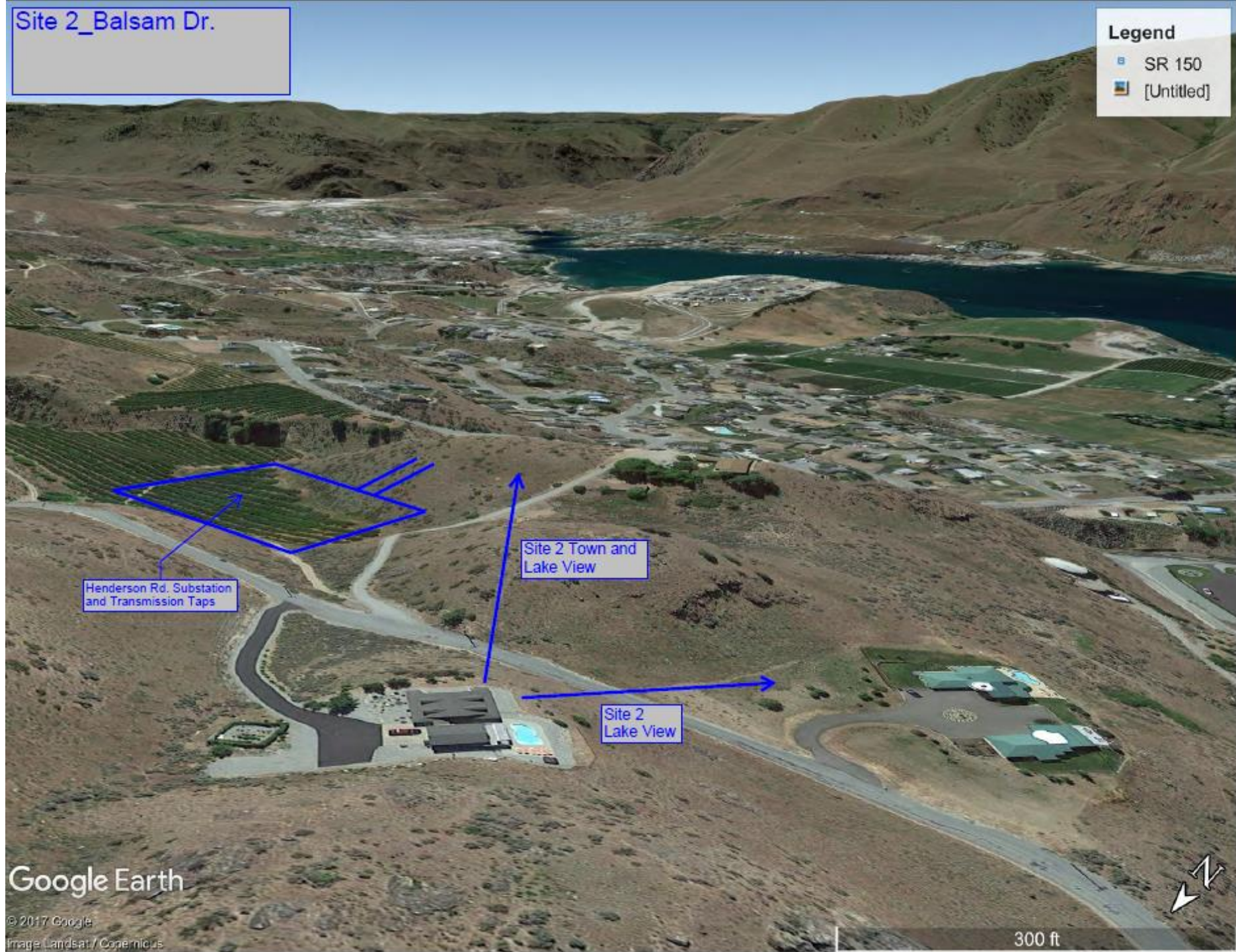
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Data SIO, NOAA, U.S. Navy, NGA, GEBCO

90 ft

Site 2_Balsam Dr.

Legend

- SR 150
- [Untitled]



Google Earth

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300 ft

Site 1_Henderson Rd.

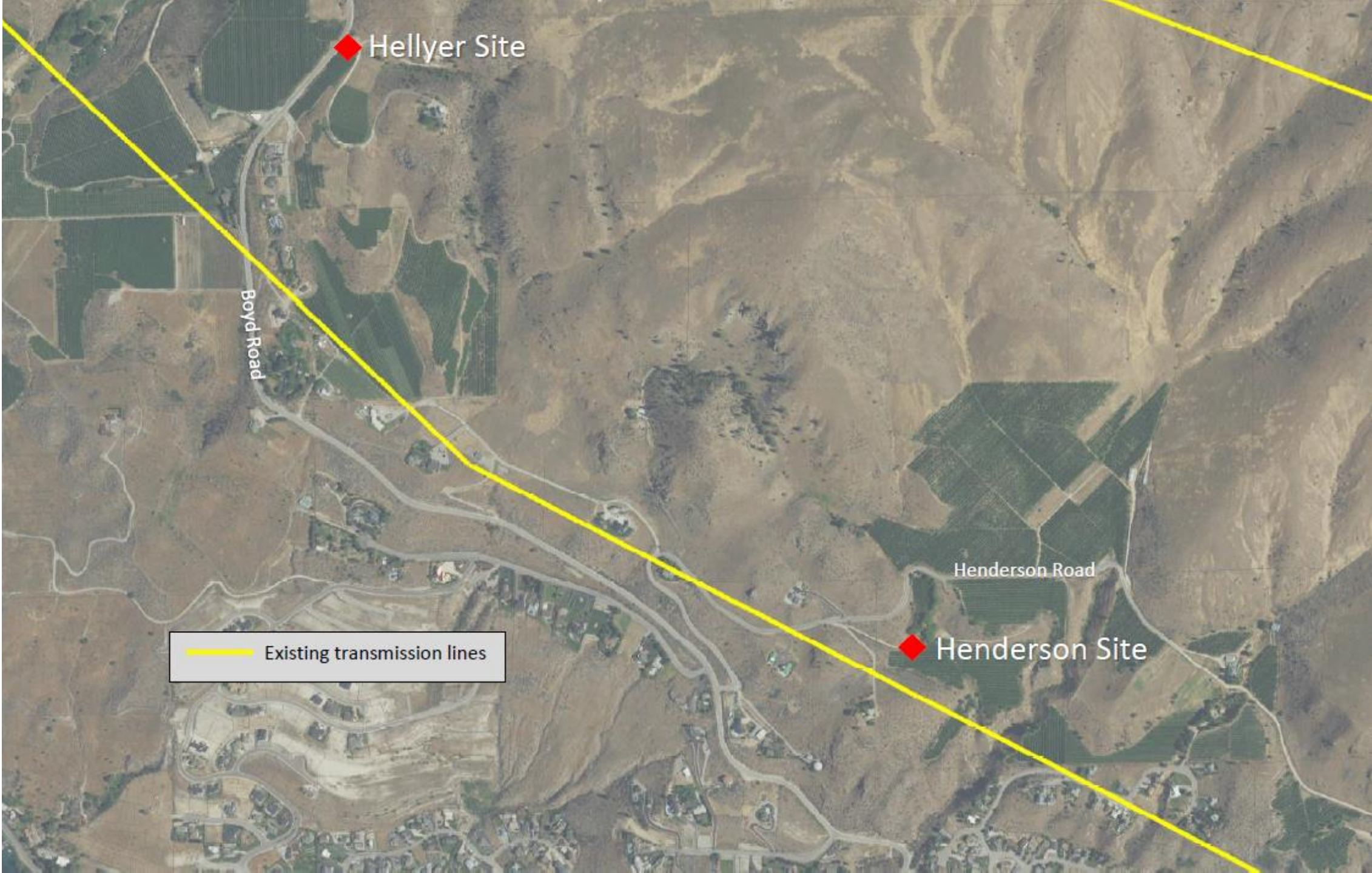
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Google Earth

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60 ft



◆ Hellyer Site

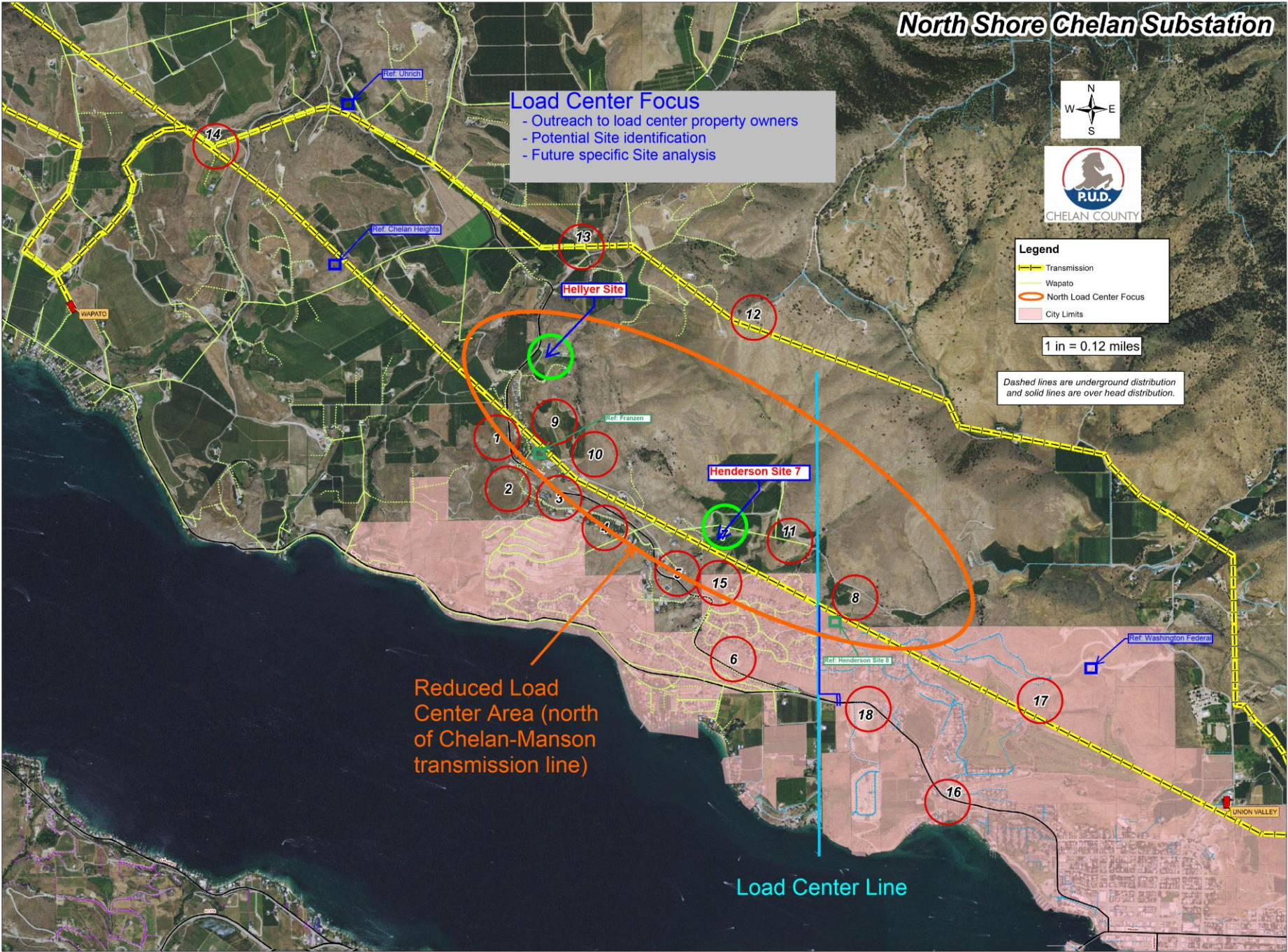
Boyd Road

Henderson Road

◆ Henderson Site

Existing transmission lines

North Shore Chelan Substation



Load Center Focus

- Outreach to load center property owners
- Potential Site identification
- Future specific Site analysis

Reduced Load Center Area (north of Chelan-Manson transmission line)

Load Center Line