

# North Shore Chelan Substation Update

10/24/2017

# Tonight's Meeting

- Review details on two sites under consideration
- Review what we've heard from the public
- Present staff's recommendation
- Gather additional public input

# Overview

- New substation needed to maintain service level and reliability in the north shore area
- Last substation serving this area was built in 1980 – load has grown since and significant growth continues
- Union Valley and Manson substations peaked at 80% capacity in January 2017
- Extensive search has not identified a site without challenges

# Site Selection Process

- Focus group includes 10 community representatives – meeting since Oct. 2015
- Created Site Selection Criteria and evaluated 18 areas
- Sought willing property sellers
- Evaluated sites outside load center and underground transmission
- Refocused on willing property sellers closer to the load center and near Chelan-Manson transmission line
- Property options secured on two sites under consideration – Henderson & Hellyer

# 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. 25<sup>th</sup> - 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

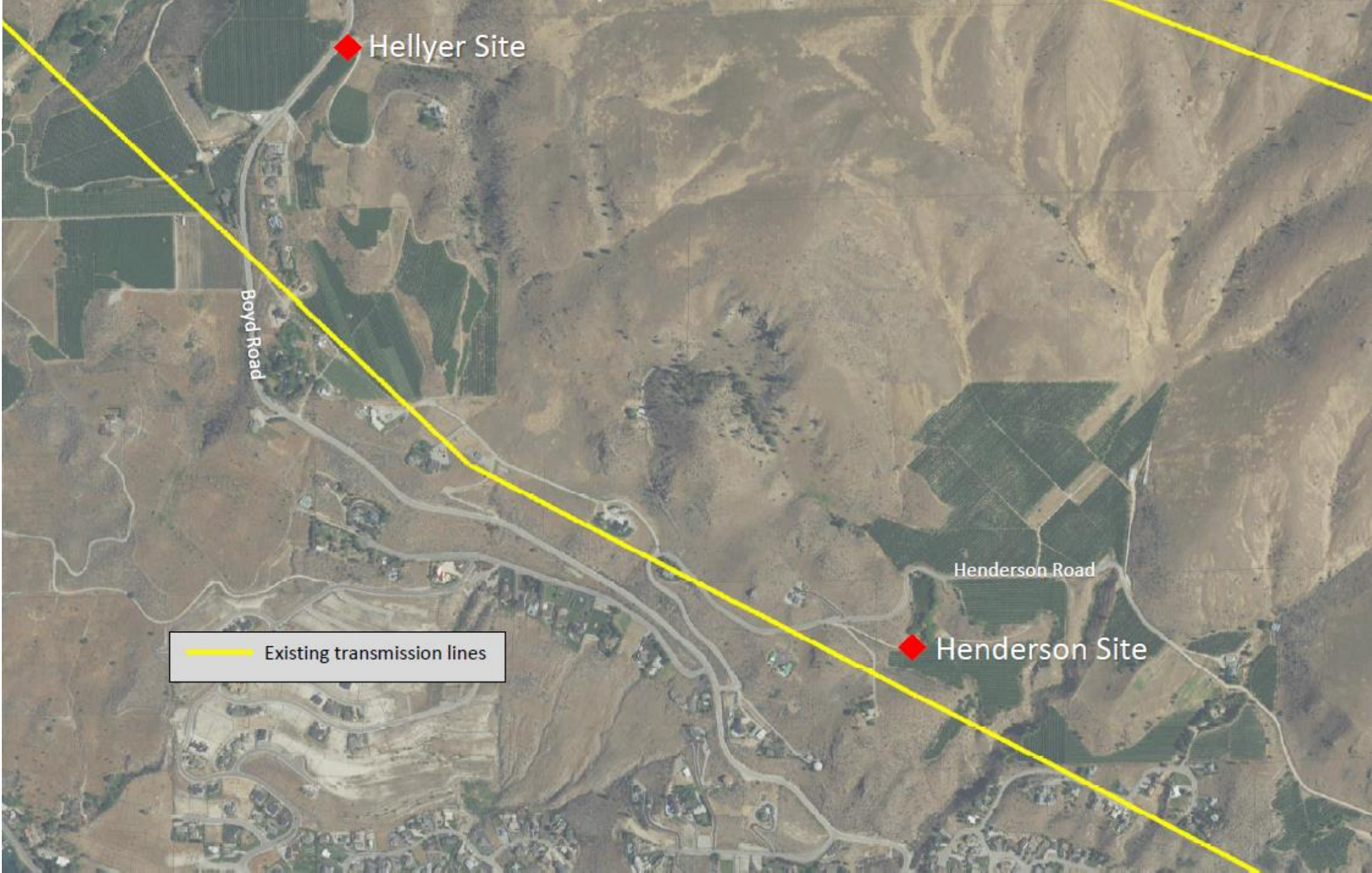
- Nov. Board Meeting - Commissioner action
- If staff recommendation is approved:
  - End of Nov. - Property purchase complete (options expire)
  - Q4/17:
    - Begin working with neighboring property owners on design variables
    - Initiate Conditional Use Permit process (Chelan County)
    - Initiate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



# Q&A

## Public Comment





◆ Hellyer Site

Boyd Road

Henderson Road

◆ Henderson Site

Existing transmission lines



# North Shore Chelan Substation

