

Wind Energy is not a panacea...  
It's a Tool in the Toolbox



Non-renewable versus  
**RENEWABLE**

# Wind Energy has environmental impacts



Birds? ..... Bats?

Habitat Impacts – shrub steppe





PUGET SOUND ENERGY

WILD HORSE WIND FACILITY

# Wild Horse Project

Building Wind Power  
in High Quality Shrub-steppe  
on Basalt Ridges with Shallow Soils



# Wild Horse differs from wind farms on CRP or Agricultural Ground.



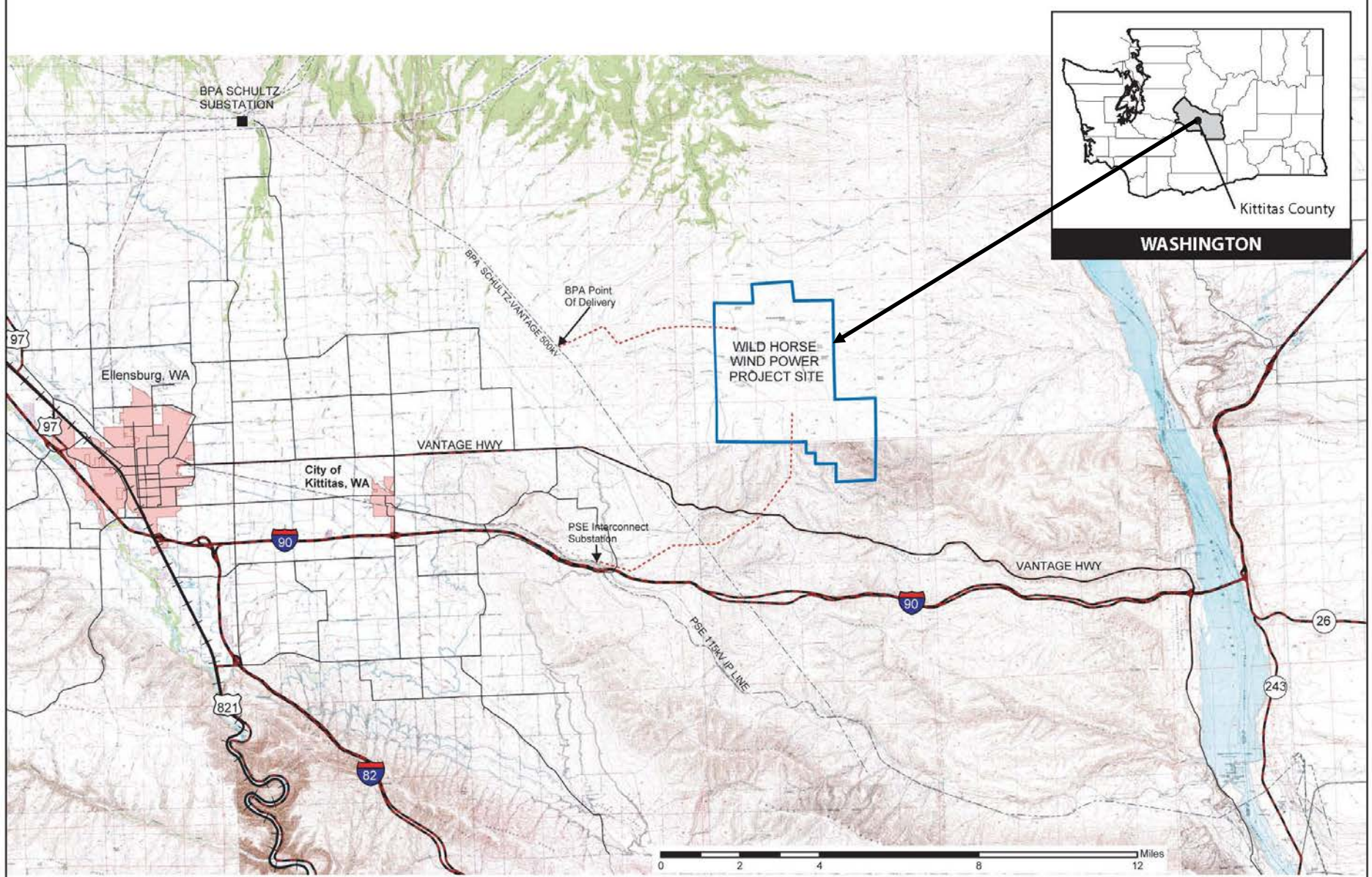
Deep Soils with  
robust plant  
community



Shallow Soils with  
fragile plant  
community



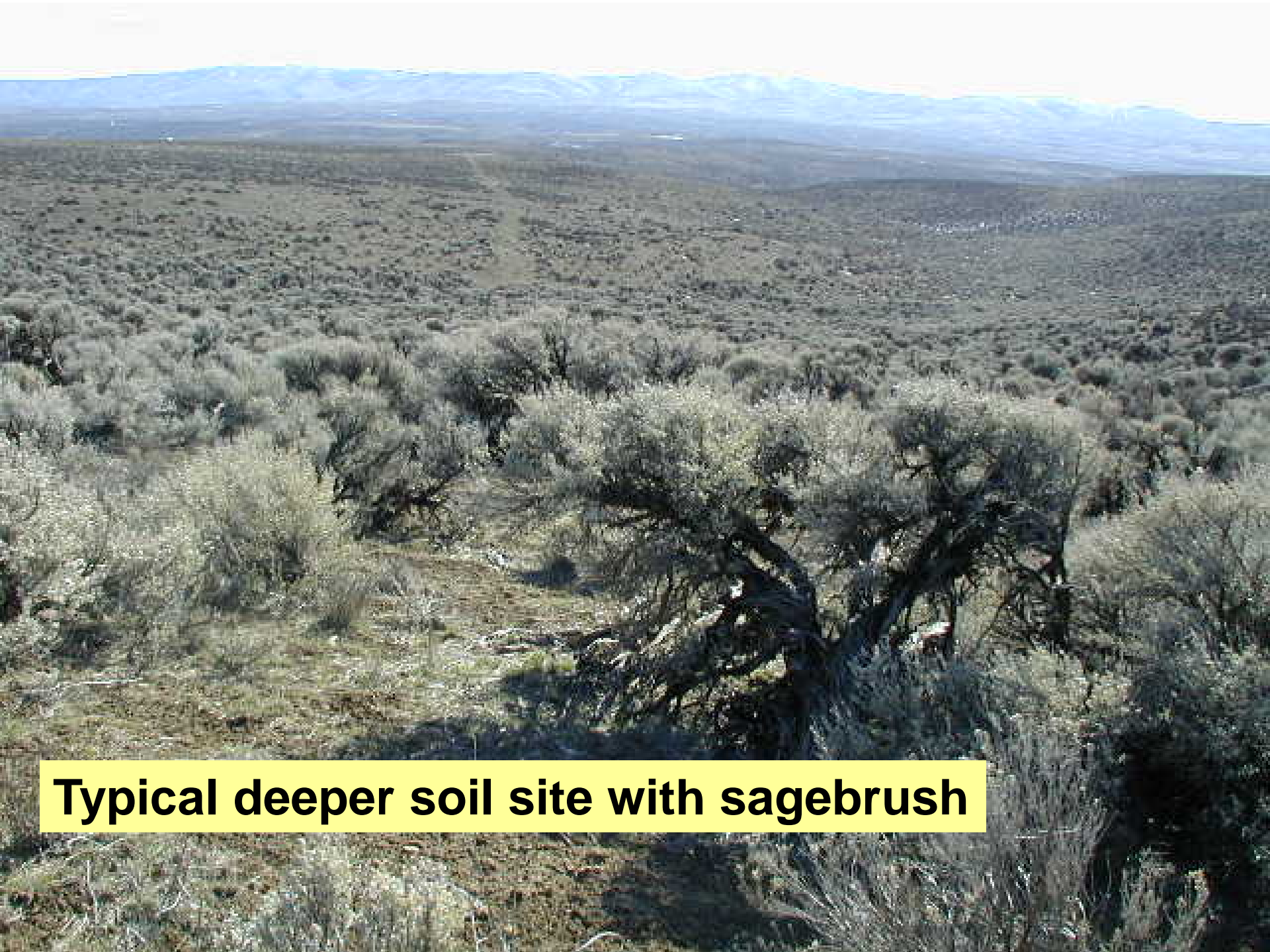
# Vicinity Map





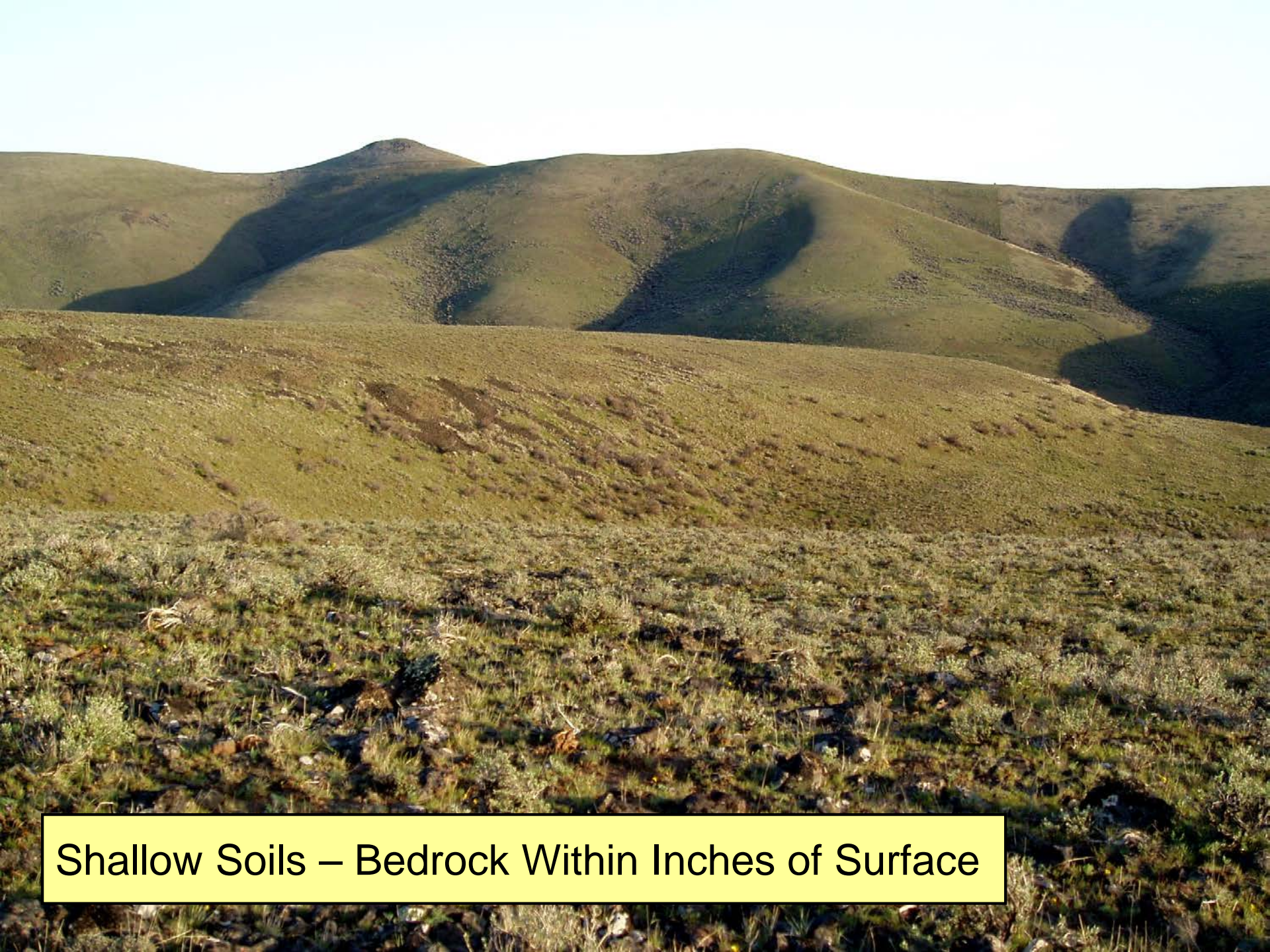






**Typical deeper soil site with sagebrush**





Shallow Soils – Bedrock Within Inches of Surface



**Typical pre-project road – shallow soil ridge top**





# Description

- 127 Wind Turbines
  - 1.8MW each, total of 229MW
  - 55,000 homes
- 9,000 acres
  - ~6,000 owned by PSE
  - ~3,000 owned by DNR/WDFW
- Commercial Operations
  - December 2006



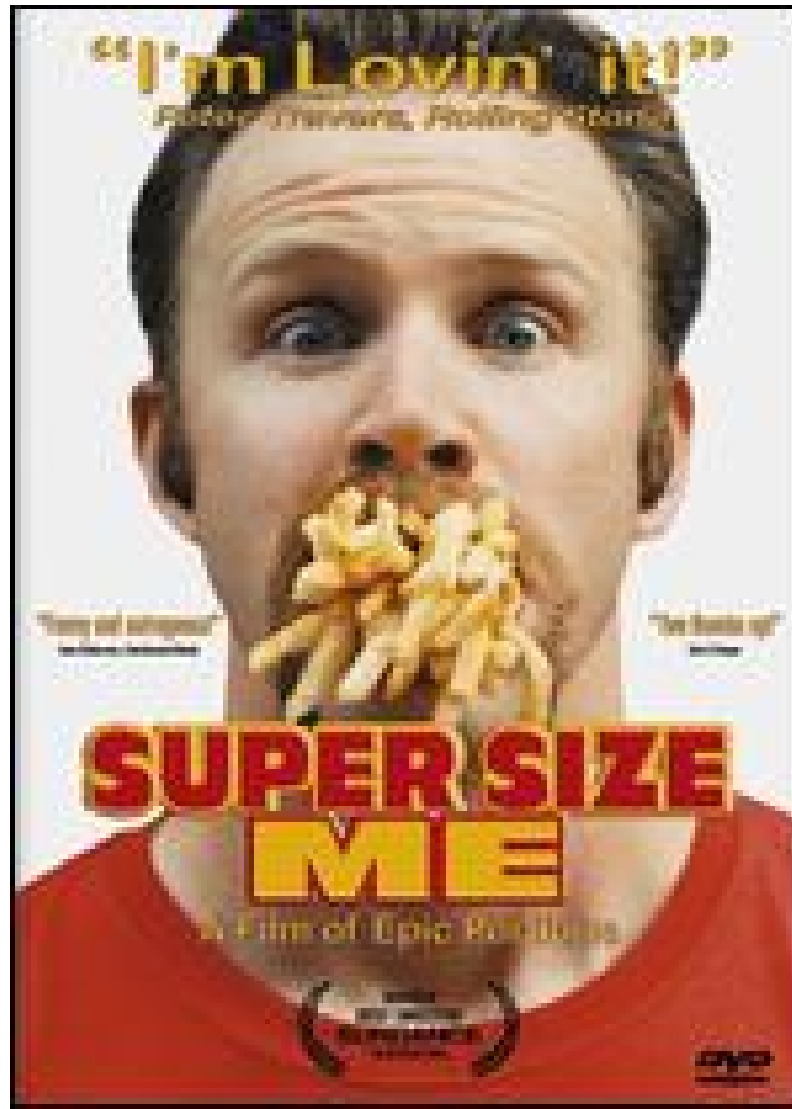


# **Not just 127 turbines !!**

- **34 miles of improved or new roads**
- **90 miles of underground electrical cables**
- **On-site electrical step-up substation**
- **8 miles of overhead transmission lines**
- **Interconnection substation**
- **Maintenance Bldg, REC, parking**

With Wind Power

# Everything is Supersize!



# 2006 Construction

- 250 workers/equipment operators
- 2 onsite rock quarries with crusher/screen
- Onsite concrete batch plant at 2 locations





# Upgrade Existing Roads





- Wide Loads – need lots of clearing
- Long Loads – need large curve radius
- Heavy Loads – need high standard road
- Unstable Loads – need flat smooth road







Each Blade is 129 feet long





Each nacelle weighs 69 Tons (138,000 lbs.)





Road is 34 feet wide; Crane is 32.5 feet wide





Cut and Fill increases impacts



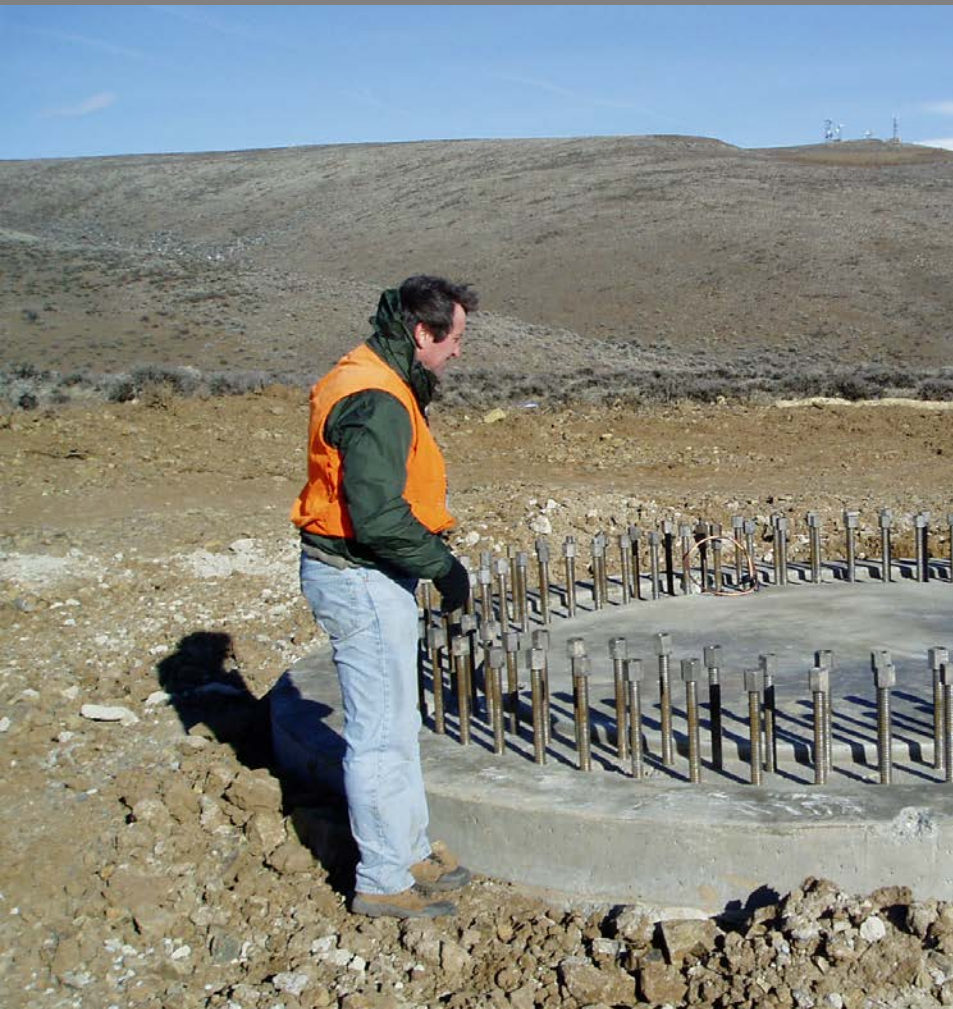






# Tower Foundations





28-ft long bolts each weighing 150 lbs.





# Trenching for power cables





# Trenching Through Bedrock











All soil horizons and bedrock mixed by belt trencher













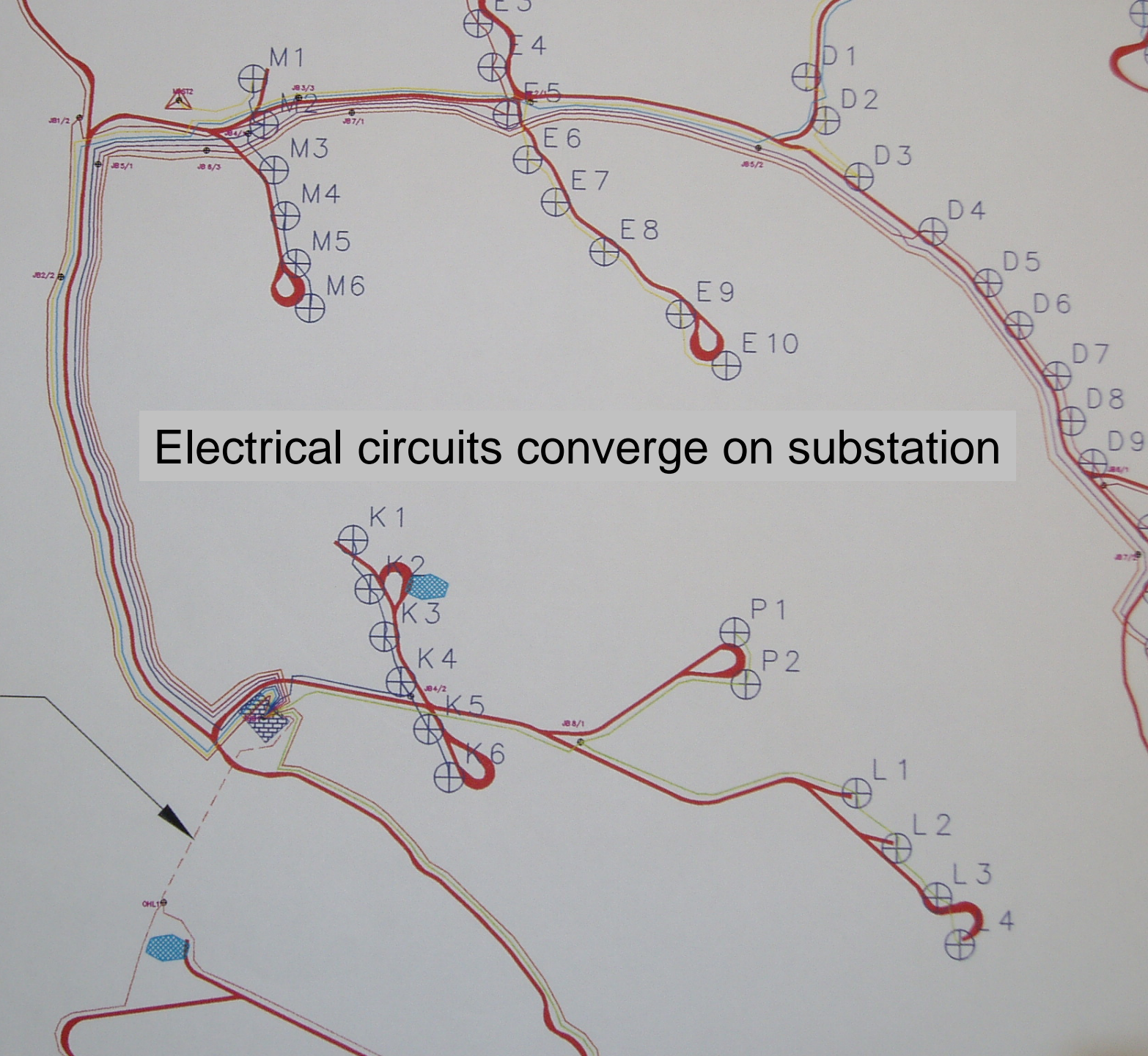




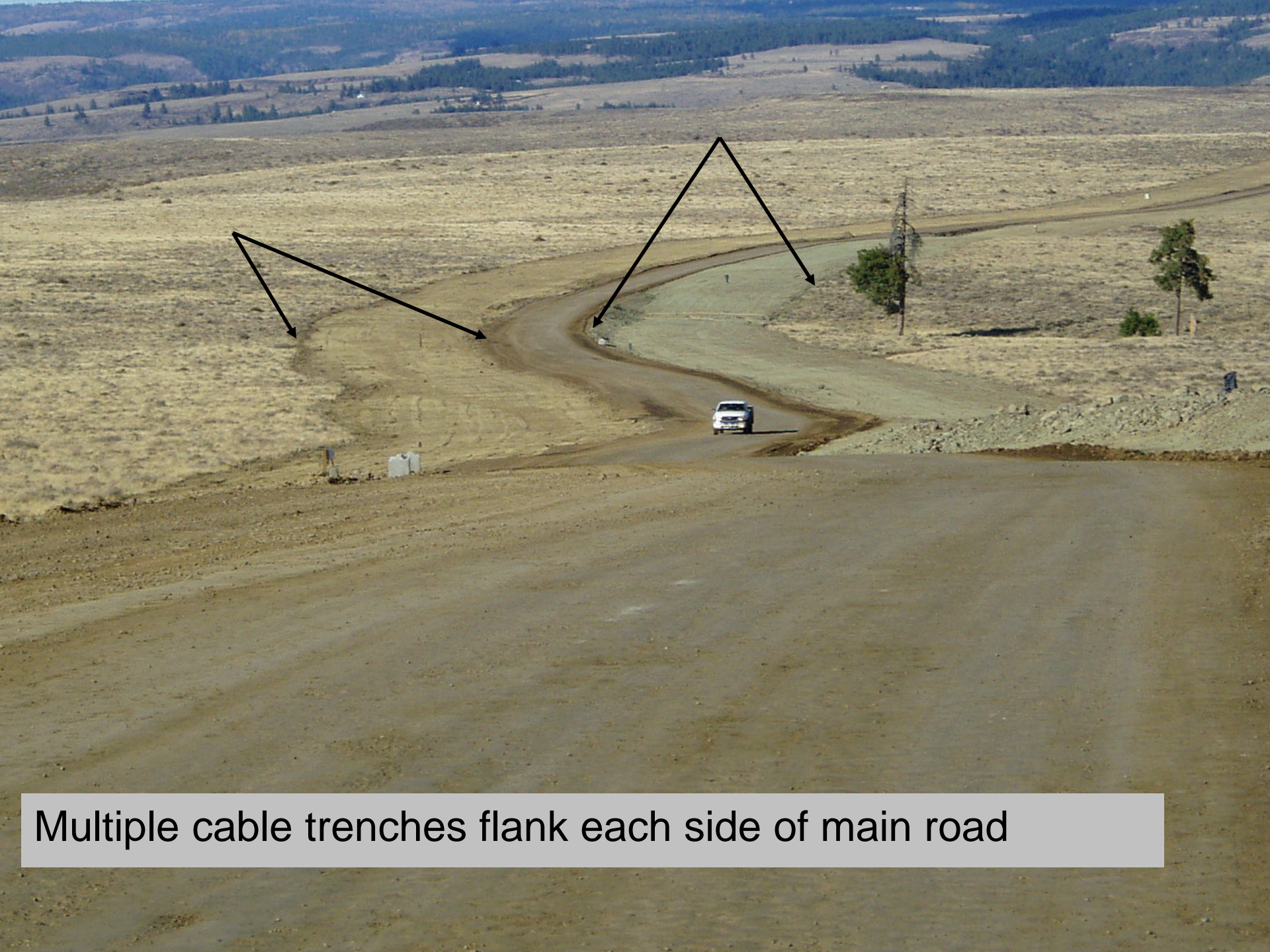


Electrical circuits converge on substation

35kV OHL  
Feeder Circuit  
No. 10







Multiple cable trenches flank each side of main road





**230 KV Overhead Feeder Line Pole Site**









Erecting Tower





**Crane Pad in Use**





Installing Blade

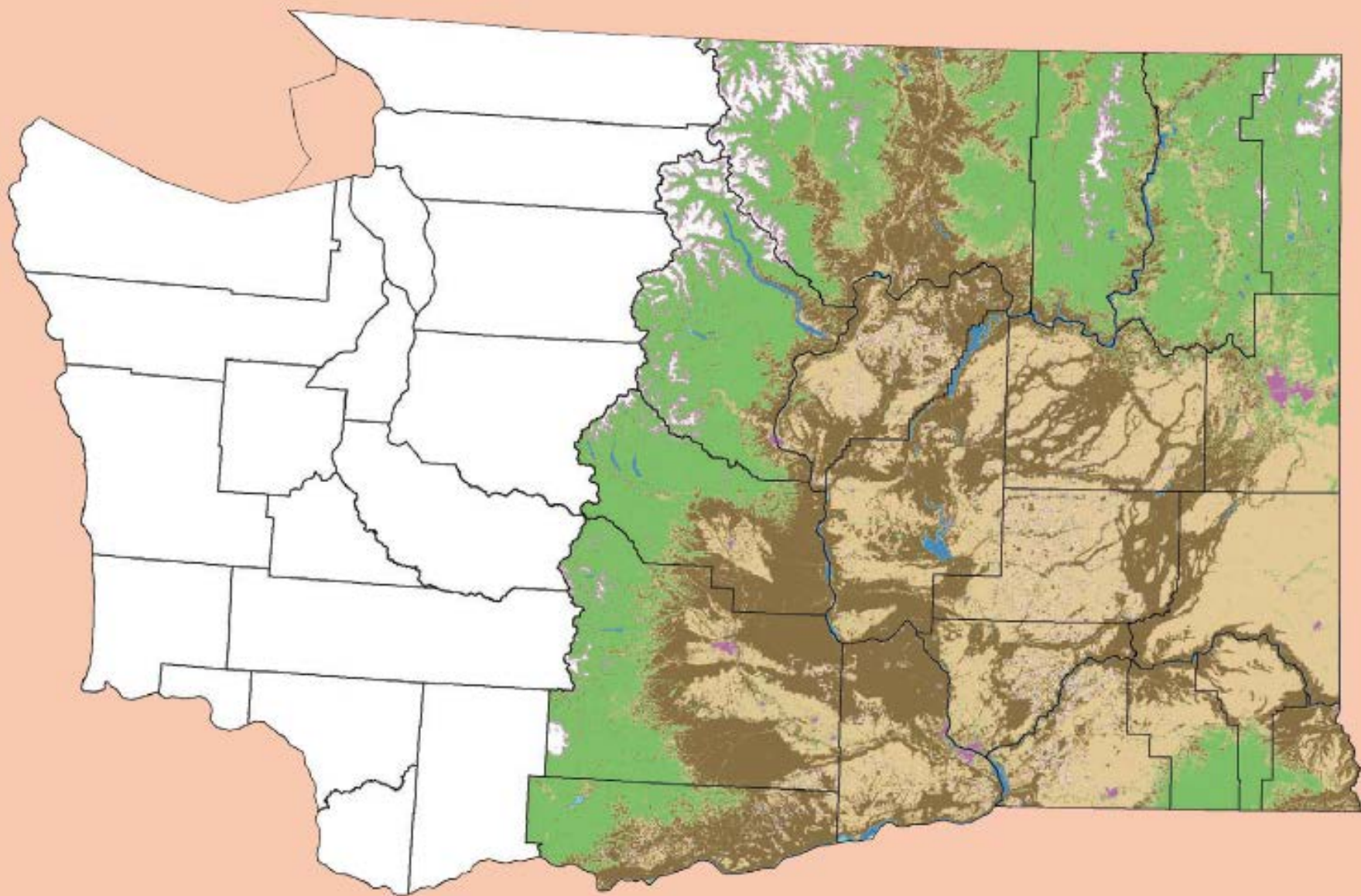


# Construction

- ~One Year
  - 127 foundations
  - 34 miles of access roads
  - Laydown yard
  - 2 substations
  - 90 miles of underground 34.5kV cable
  - 8 miles of overhead 230kV transmission line
  - 2 quarry sites
  - Temporary Batch Plant
  - Maintenance Building
  - 165 acres – permanent disturbance
  - 450 acres – temporary disturbance

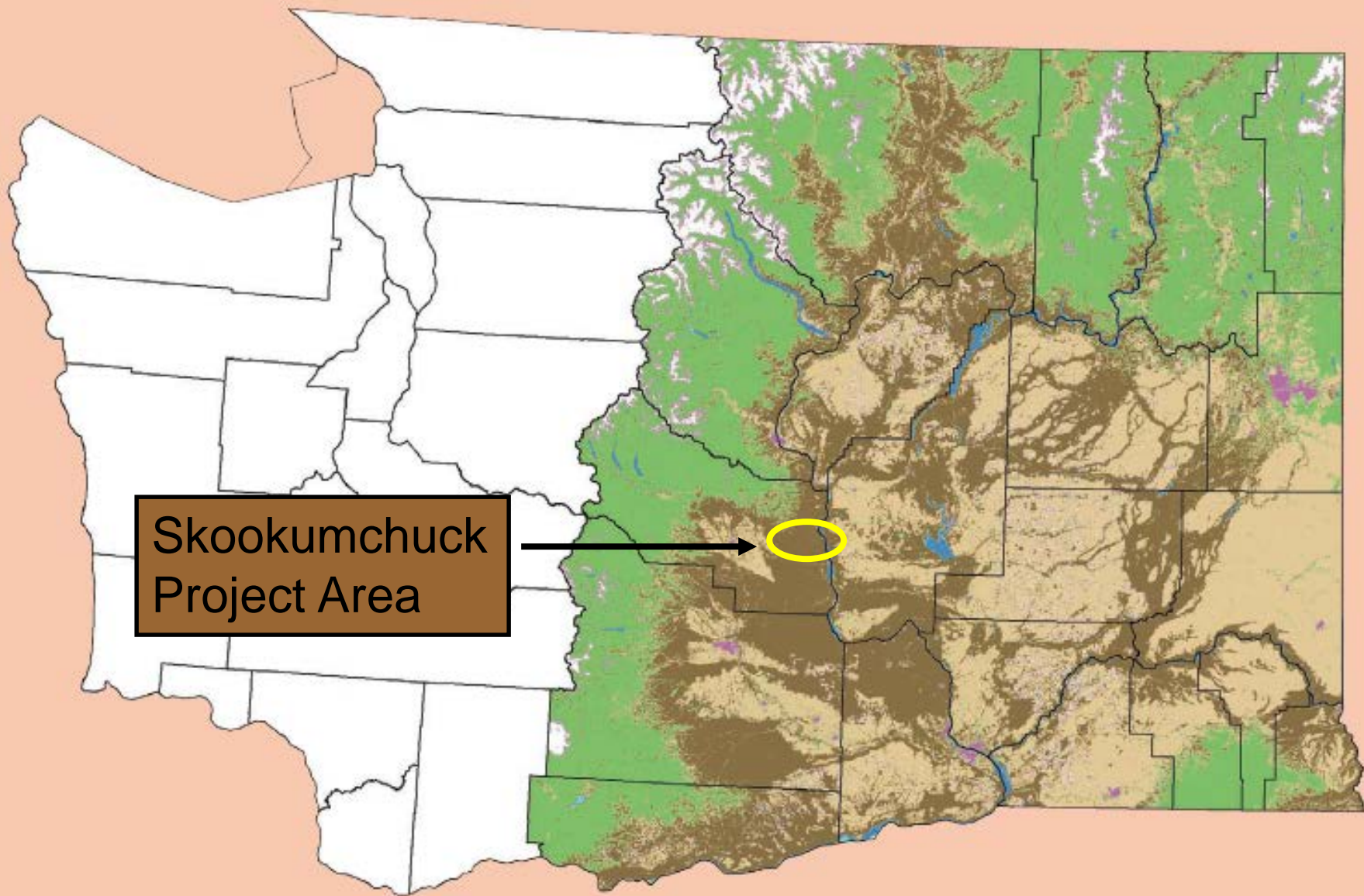






Current Shrub Steppe

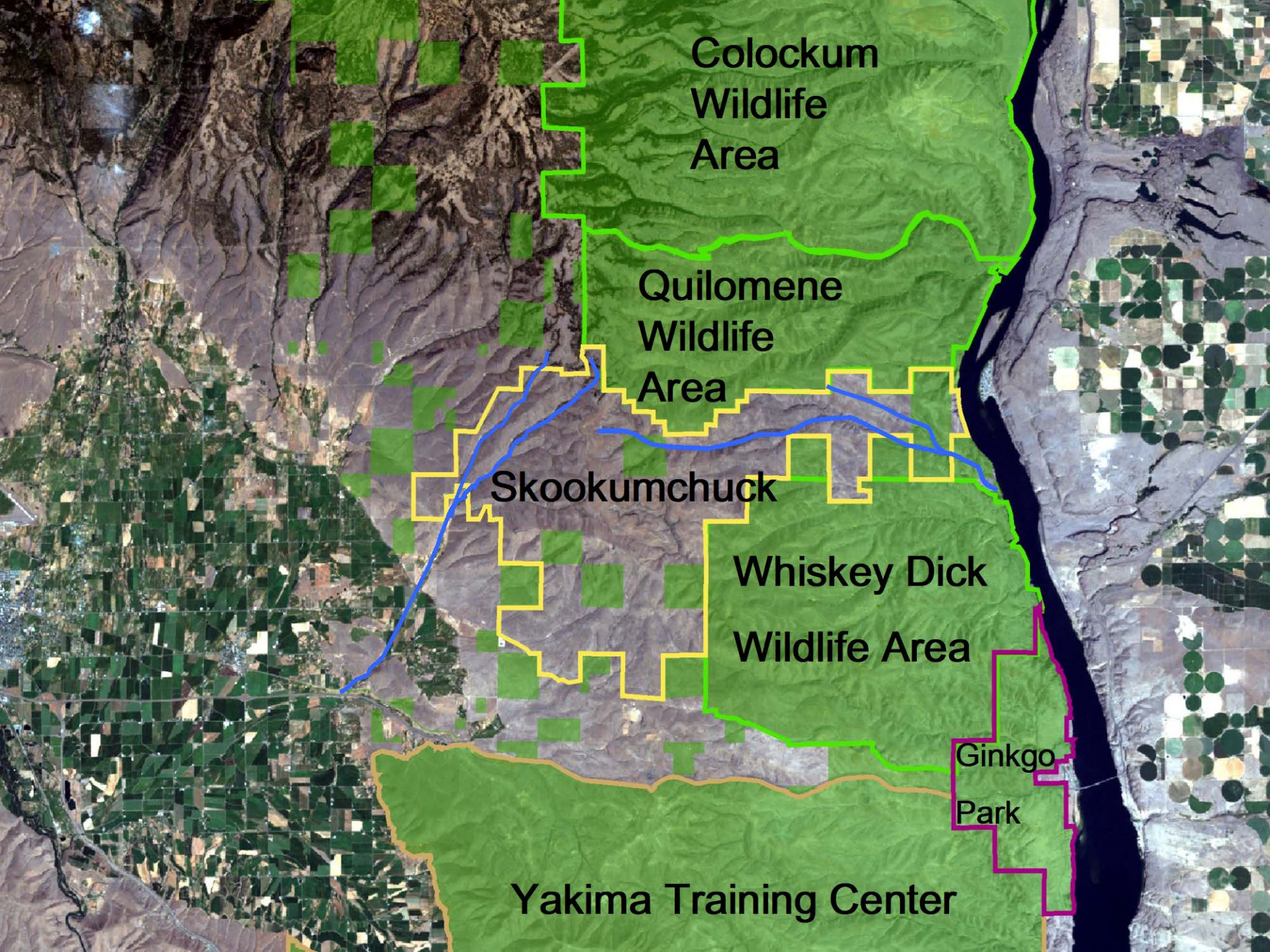




Skookumchuck  
Project Area

Current Shrub Steppe





Colockum  
Wildlife  
Area

Quilomene  
Wildlife  
Area

Skookumchuck

Whiskey Dick  
Wildlife Area

Ginkgo  
Park

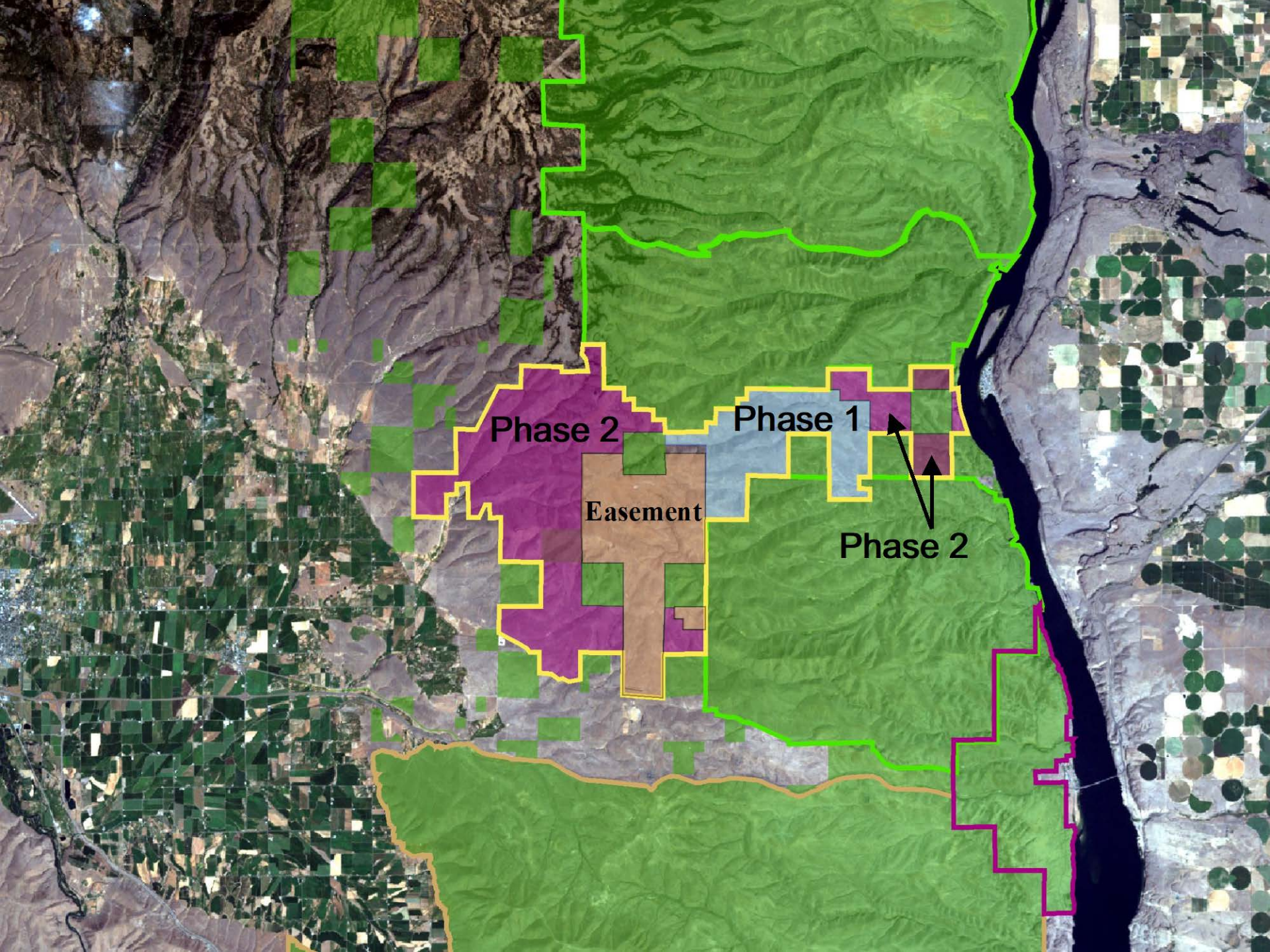
Yakima Training Center



# Partners & Supporters

- Trust for Public Land
- Puget Sound Energy
- Horizon Wind Energy
- WDFW & WDNR
- Conservation groups (11)
- Cattlemen
- Economic Development Group
- Yakima Nation





Phase 2

Phase 1

Easement

Phase 2



**17,500 acres added to Wildlife Area**

**7,500 acres Conservation Easement (Wind Project)**

**Total = 25,000 acres**







Elk grazing under turbine



