HAIWEE PUMPED STORAGE PROJECT

VIRTUAL OPEN HOUSE

Developed by:

PREMIUM ENERGY

Engineered by:

PTE INCORPORATED

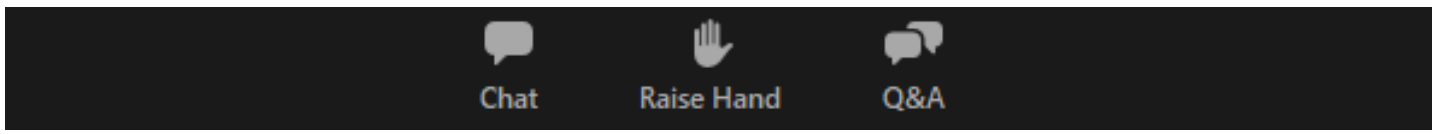
WATER, POWER, INFRASTRUCTURE
MINI RATNA-1
WAPCOS

HAIWEE PUMPED STORAGE PROJECT

General Guidelines

- **First hour:** Project overview and preliminary study outcomes.
- **Second hour:** Answer to questions received from the audience.

- All participants will be muted during the presentation
- Questions can be submitted through Zoom platform or at info@pehllc.net.



A copy of the presentation will be available on PEH website:

www.premiumenergyholdings.com/

** This Open House will be recorded **

HAIWEE PUMPED STORAGE PROJECT

Agenda

Overview of FERC License Process

Closed-loop Pumped Storage

Project Overview

Ongoing Efforts (conceptual)

- Project Layout – Lower Alternatives
- Faults and Geology
- Reservoir's Filling and Returning
- Flood Management Plan
- Transmission AC Systems Interconnections
- Power Flow: Pumping and Generating
- Next Steps – PAD & NOI

Q&A

HAIWEE PUMPED STORAGE PROJECT

Related Business Organizations

Premium Energy Holdings, LLC

Established in 2010

www.pehllc.com

4 FERC Preliminary Permits approved.

10 year of experience.

Power-Tech Engineers, Inc.

Established in 1992

www.ptei.net

Over 30 years of experience.

Participation in 10 hydro power projects.

WAPCOS Limited

Established in 1969

www.wapcos.gov.in

12 pump storage projects over the past 10 years.

Over 50 hydro power projects overseas.

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Overview of FERC License Process

The Federal Energy and Regulatory Commission (FERC) has permitting and licensing jurisdiction over hydroelectric projects such as IPSP.

FERC Preliminary Permit:

- Does not authorize construction.
- Maintains priority of application for the license while the site is studied.
- Permittee files periodic status reports on the studies.

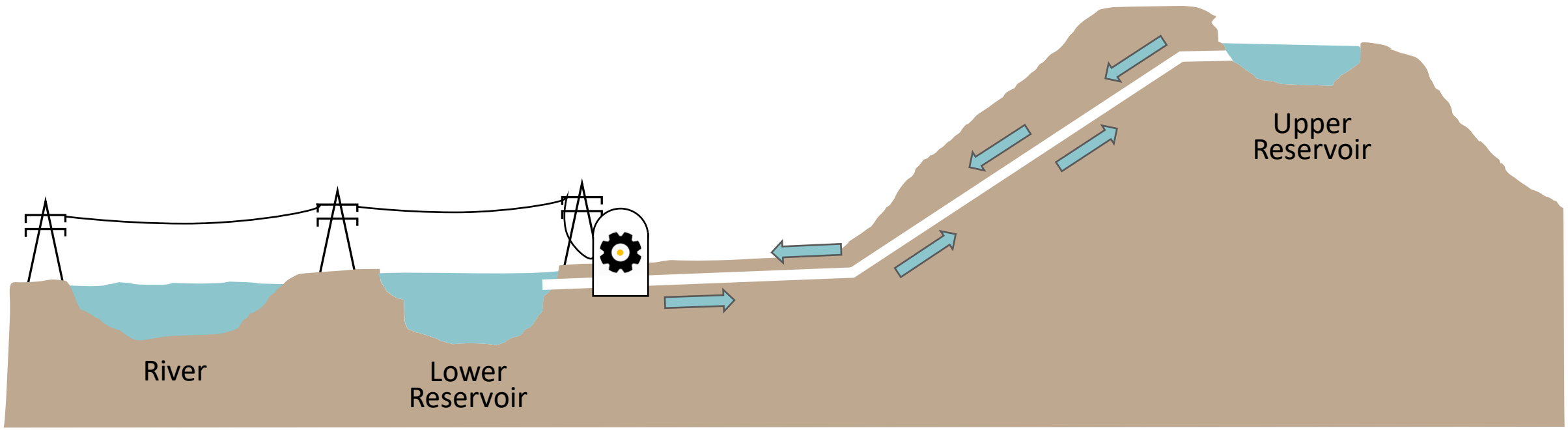
The Integrated Licensing Process (ILP) provides a predictable, efficient, and timely licensing process to ensure adequate resource protections.

- Early issue identification and resolution of studies needed.
- Integration of other stakeholder permitting processes.
- Time frames for each step for stakeholders and FERC.

CLOSED-LOOP PUMPED STORAGE

What Is It?

- Pumped storage is a method to store renewable energy by pumping water to an upper reservoir, to use when needed.
- Closed-Loop is a configuration that does not rely on a natural water body, but on a controlled water reservoir (forebay).



HAIWEE PUMPED STORAGE PROJECT

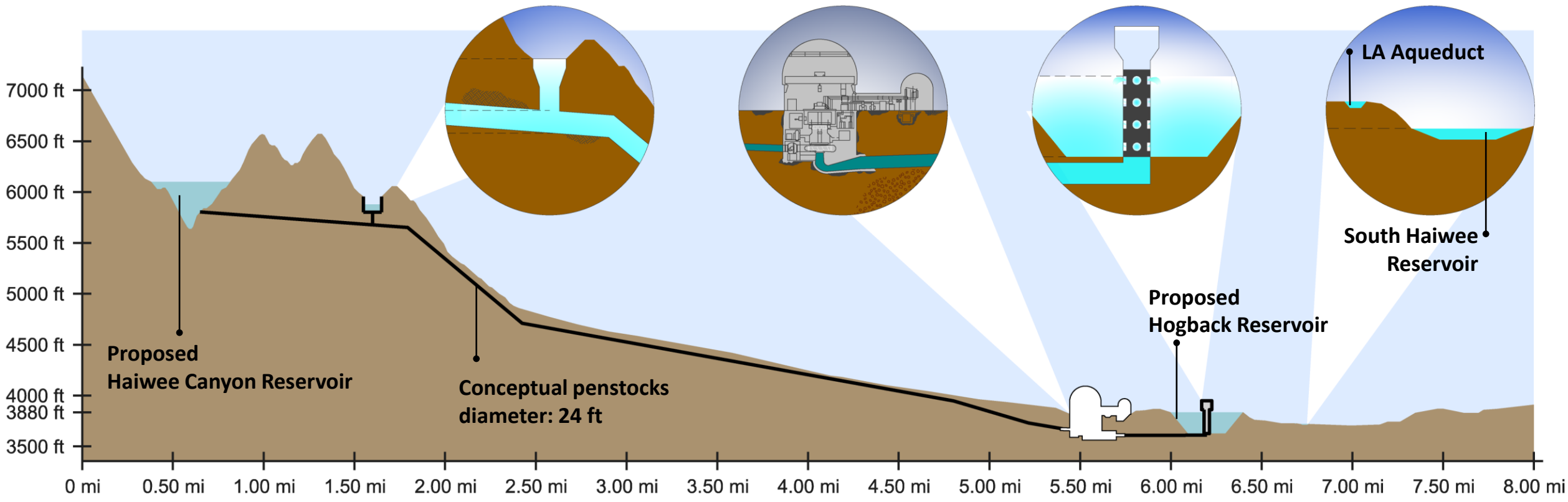
Project Description

The FERC issued the Preliminary Permit on March 19, 2020. Project No. 14991-001.

The system operation will consist of a **Closed-loop** between the upper and lower reservoirs.

1,200 MW Pumped Storage Plant, 12 hours of continuous output could produce 14,400 MWh of energy.

The Powerhouse will operate with a five-turbine of 300 MW each.



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Project Features (1/2)

Supports the plan to retire fossil fuel plants.

Benefits from excess renewable generation during daytime for pumping.

Makes up for the lack of renewable resources at night, providing nocturnal base load dispatchable generation.

Reduces emissions from cycling gas turbine units.

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Project Features (2/2)

Facilitate frequency regulation in the power grid.

Provides additional reservoir water storage capacity for consumption.

Energy storage addresses the intermittence and volatility of renewable energy. Stored energy is dispatchable - ready when needed.

It will help and improve the overall energy mix.

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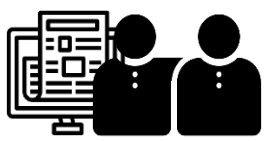
Expected Timeline

2020 → 2021 - 2023 → 2023 - 2025 → 2025 - 2026 → 2026 - 2028 → 2029

Preliminary Permit Application Filing

- Preliminary Permit Application Document
- Newspaper Notice of Filing
- Open House Meeting



Pre-Filing Process

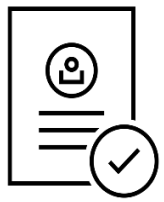
- Notice of Intent
- Pre-Application Document
- Pre-Feasibility Studies
- Hold Public Meeting
- Proposed Study Plan
- Consult with Agencies and Local tribes about Studies & Results
- Conduct Feasibility Studies
- File FERC License Application

Post-Filing Process

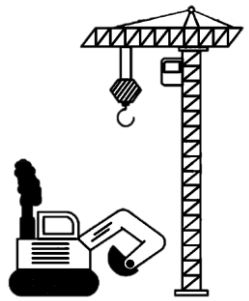
- NEPA Environmental Scoping
- CEQA Requirement
- Issue draft EA or EIS
- Final EA or EIS
- License Compliance and Administration
- Dam Safety and Inspections
- Interconnection Agreements, PPAs, Water Agreements
- Site control

Project Engineering

- Additional Surveys and Research
- Detailed Design Engineering
- Preparation of Construction Drawings
- Numerical and Physical Model Studies
- Bid Engineering for selection of contractor/vendor



Project Procurement & Construction



Commissioning and Commercial Operation

- Reservoirs filling
- Partial Commissioning (Unit 1)
- 45 days interval between remaining Units Commissioning
- Project Full Commissioning

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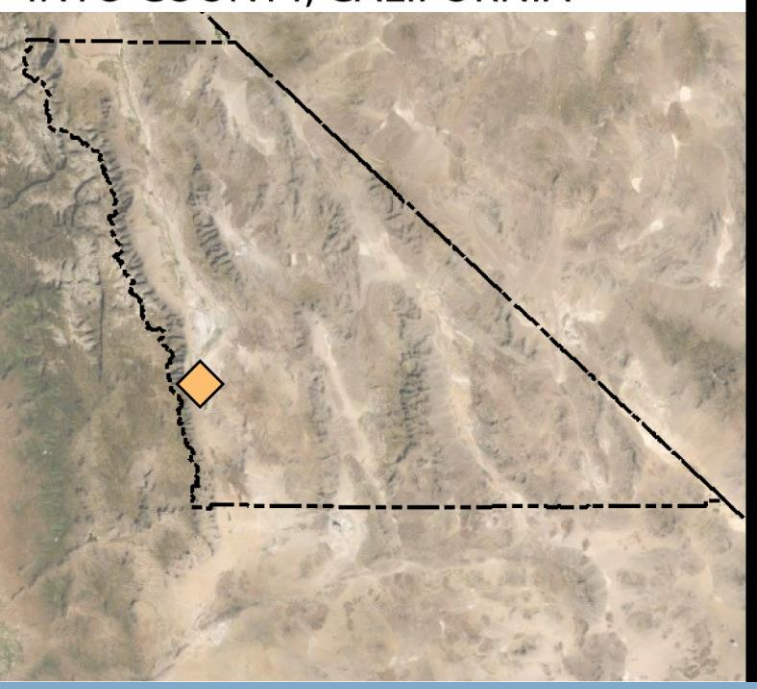
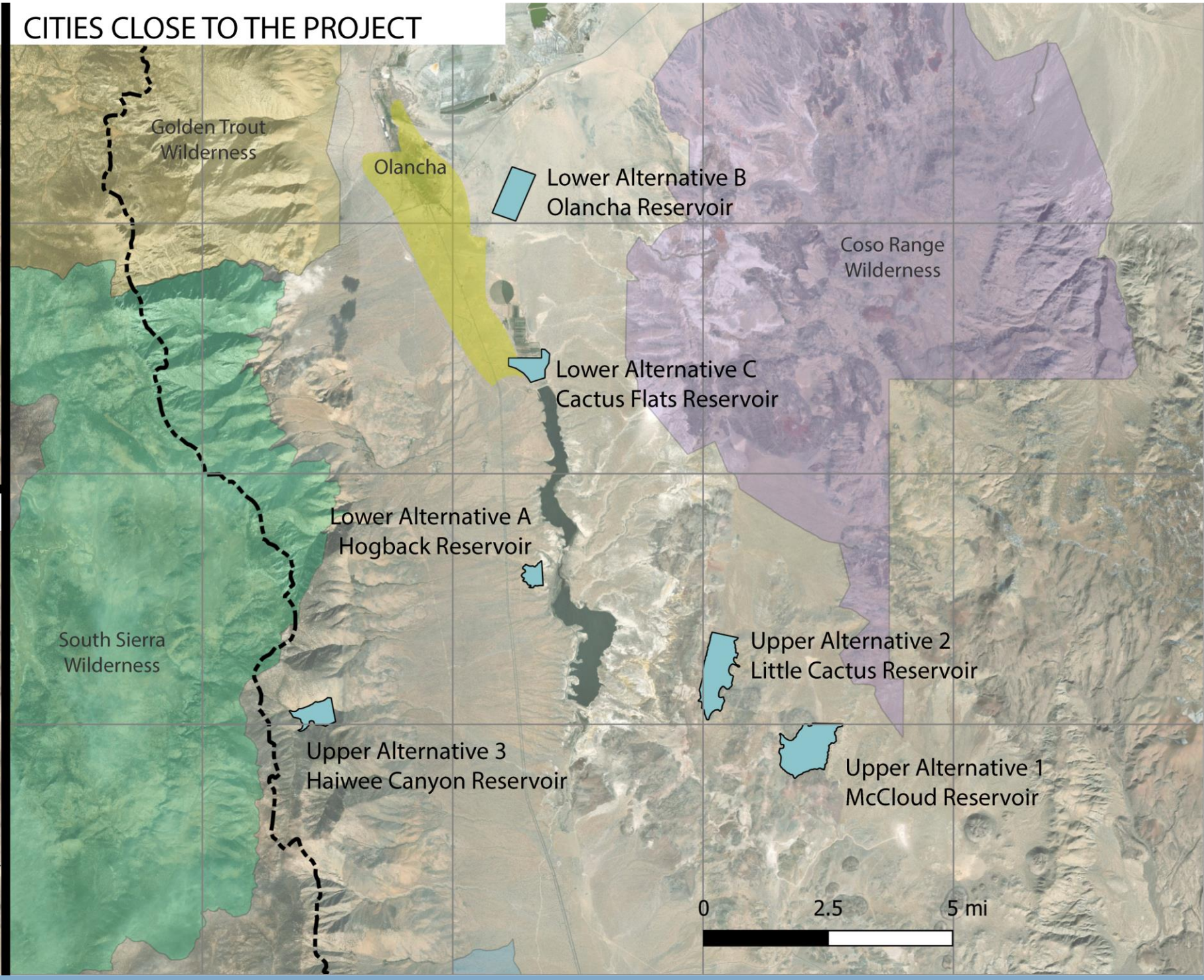
Project Location

CALIFORNIA, USA

INYO COUNTY, CALIFORNIA



CITIES CLOSE TO THE PROJECT



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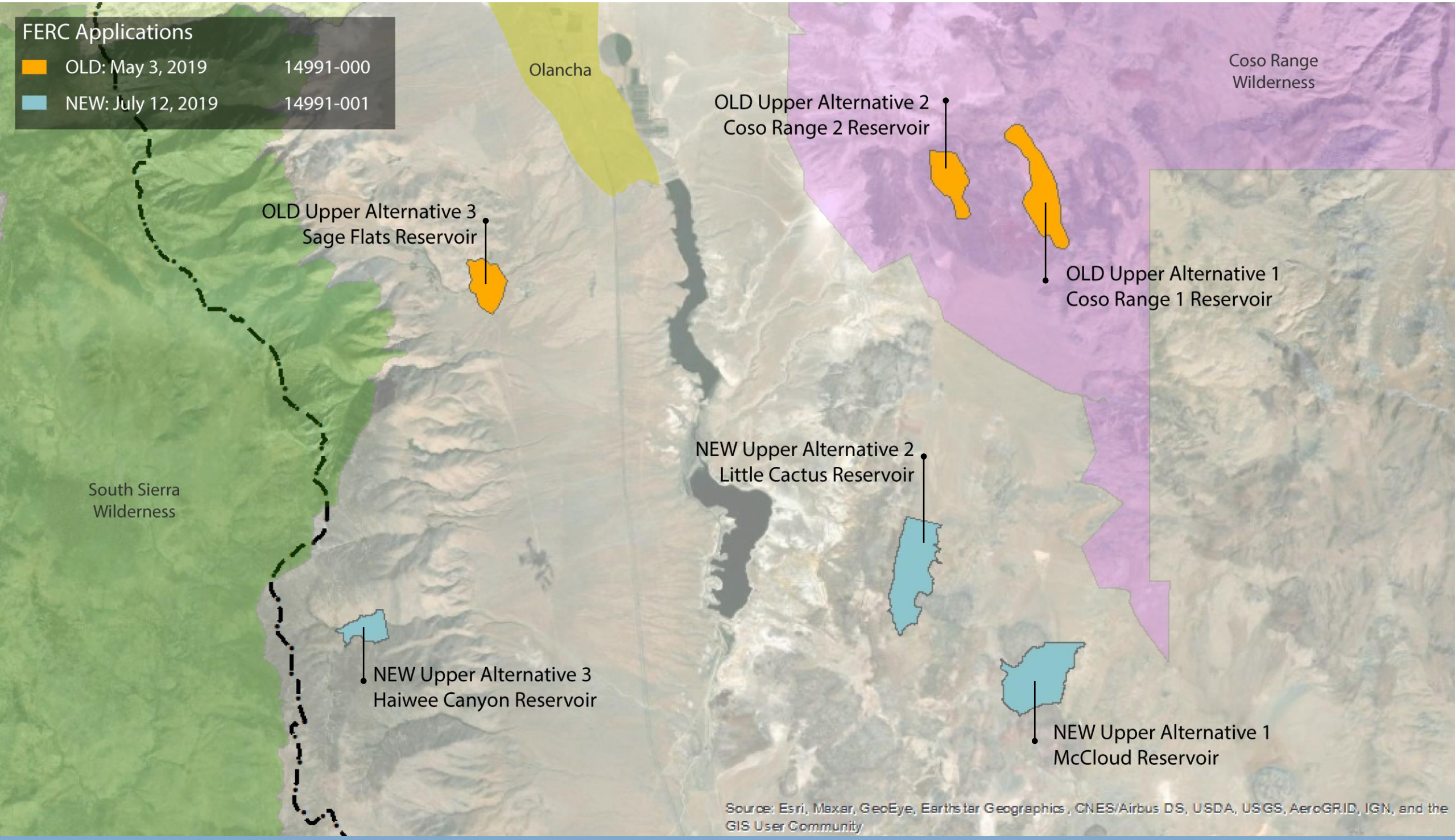
Relocation of Proposed Upper Reservoirs



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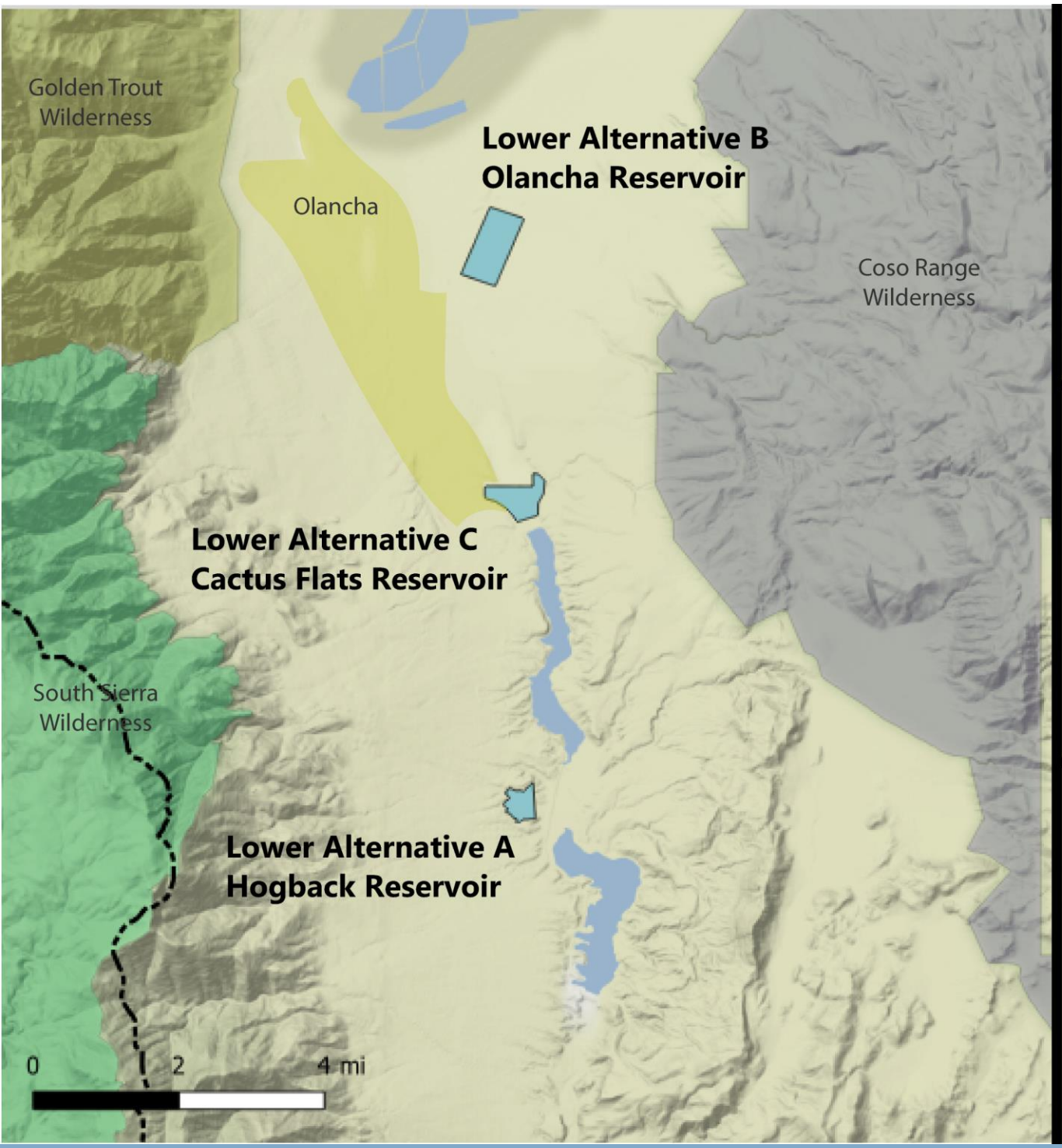
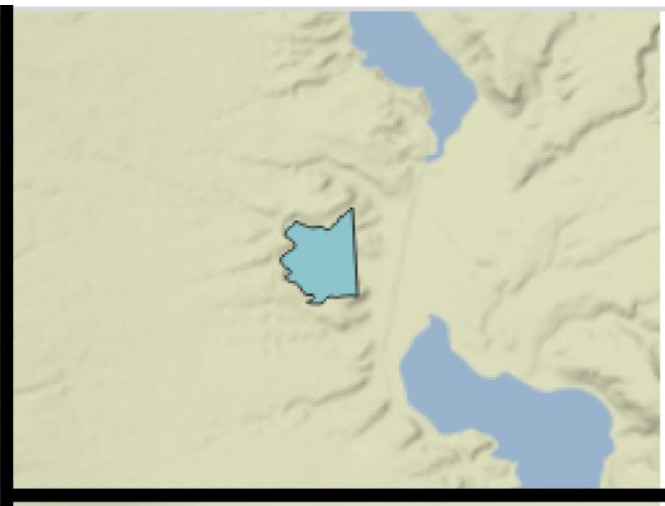
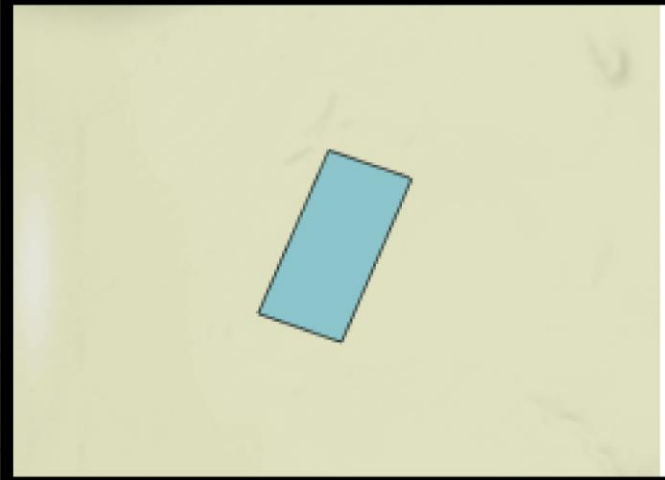
Proposed Lower Reservoirs - Alternatives and Characteristics





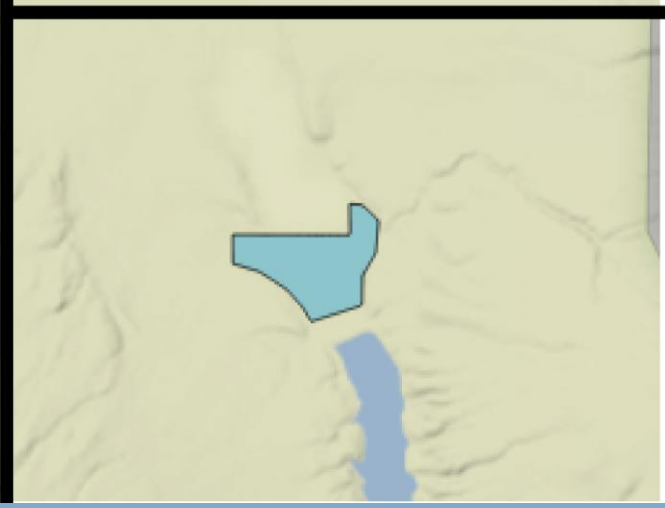
Lower Alternative A
Hogback Reservoir

Area:
100 acres
Water Storage:
14,000 acre-ft
Elevation:
3,880 ft max.



Lower Alternative B
Olancha Reservoir

Area:
320 acres
Water Storage:
16,000 acre-ft
Elevation:
3,628 ft max.



Lower Alternative C
Cactus Flats Reservoir

Area:
180 acres
Water Storage:
18,000 acre-ft
Elevation:
3,714 ft max.

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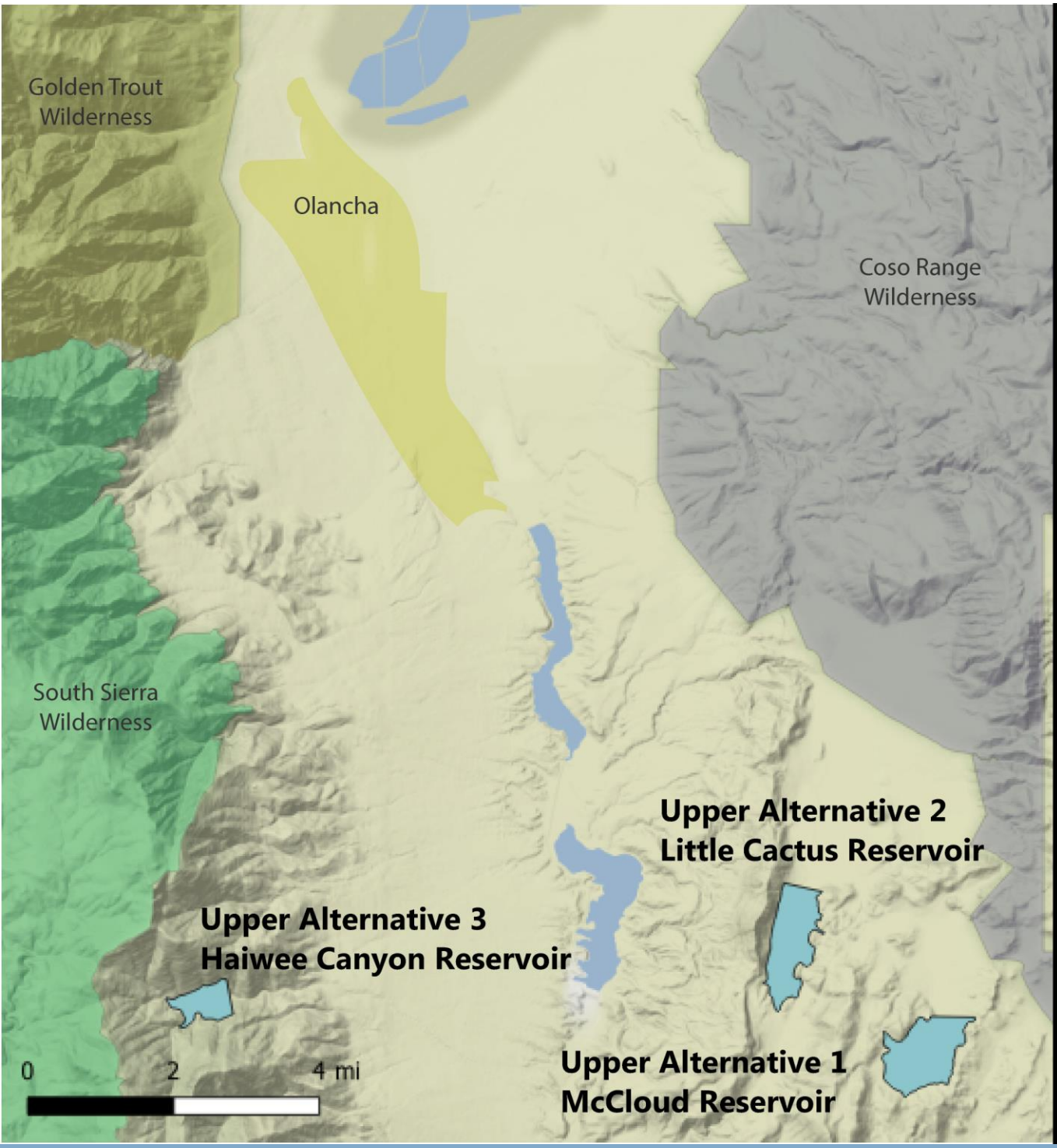
Proposed Upper Reservoirs - Alternatives and Characteristics



Upper Alternative 1
McCloud Reservoir

Area:
550 acres
Water Storage:
54,000 acre-ft
Elevation:
5,280 ft max.

Upper Alternative 2
Little Cactus Reservoir

Area:
520 acres
Water Storage:
51,000 acre-ft
Elevation:
4,990 ft max.

Upper Alternative 3
Haiwee Canyon Reservoir

Area:
210 acres
Water Storage:
52,000 acre-ft
Elevation:
6,300 ft max.

ONGOING EFFORTS

Project Layout – Lower Alternatives

Faults and Geology

Reservoir's Filling and Returning

Flood Management Plan

Transmission AC Systems Interconnections

Power Flow: Pumping and Generating

Next Steps – PAD & NOI

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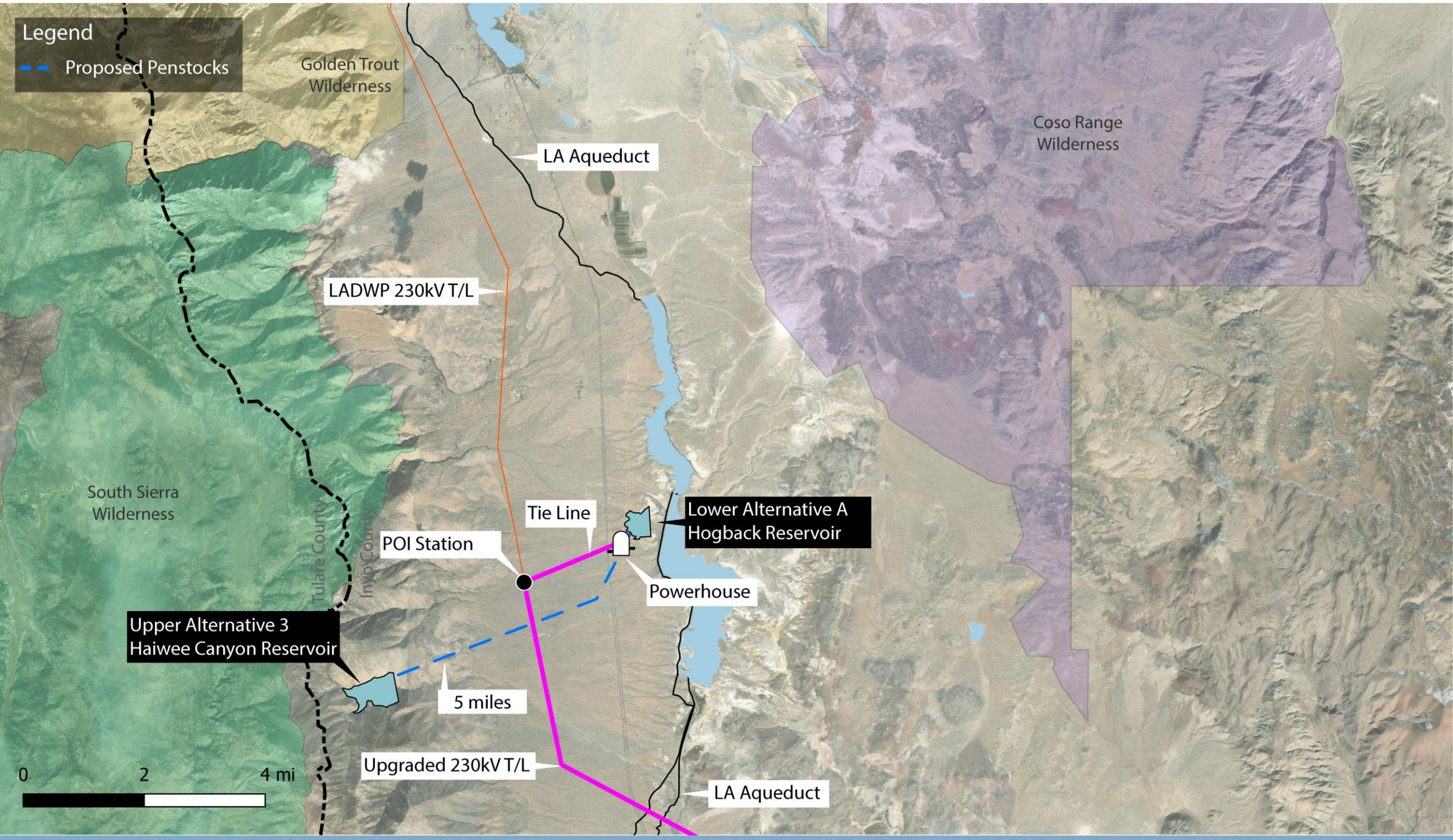
Lower Alternative A – Layout plan (Conceptual)



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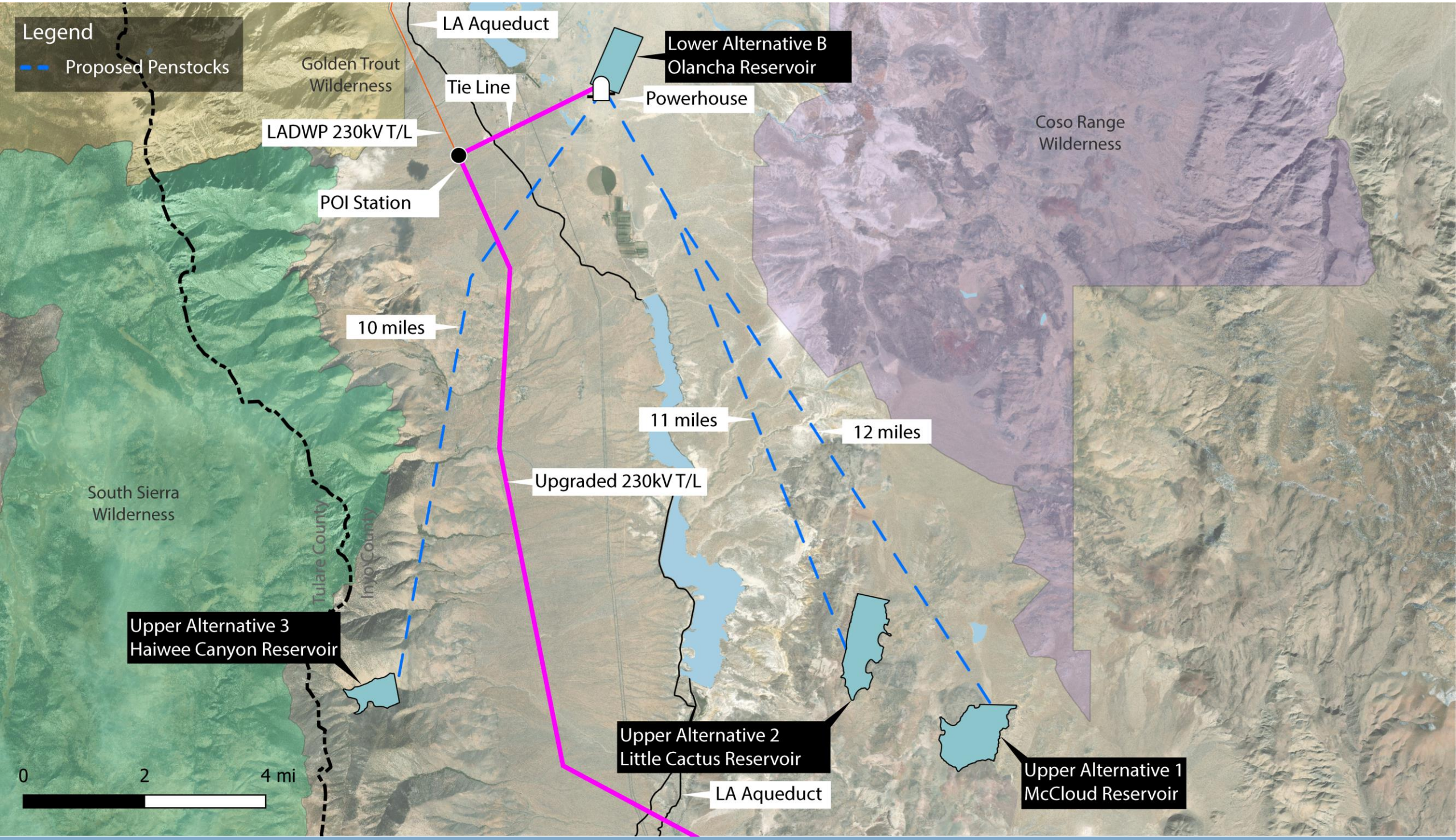
Lower Alternative B – Layout plan (Conceptual)



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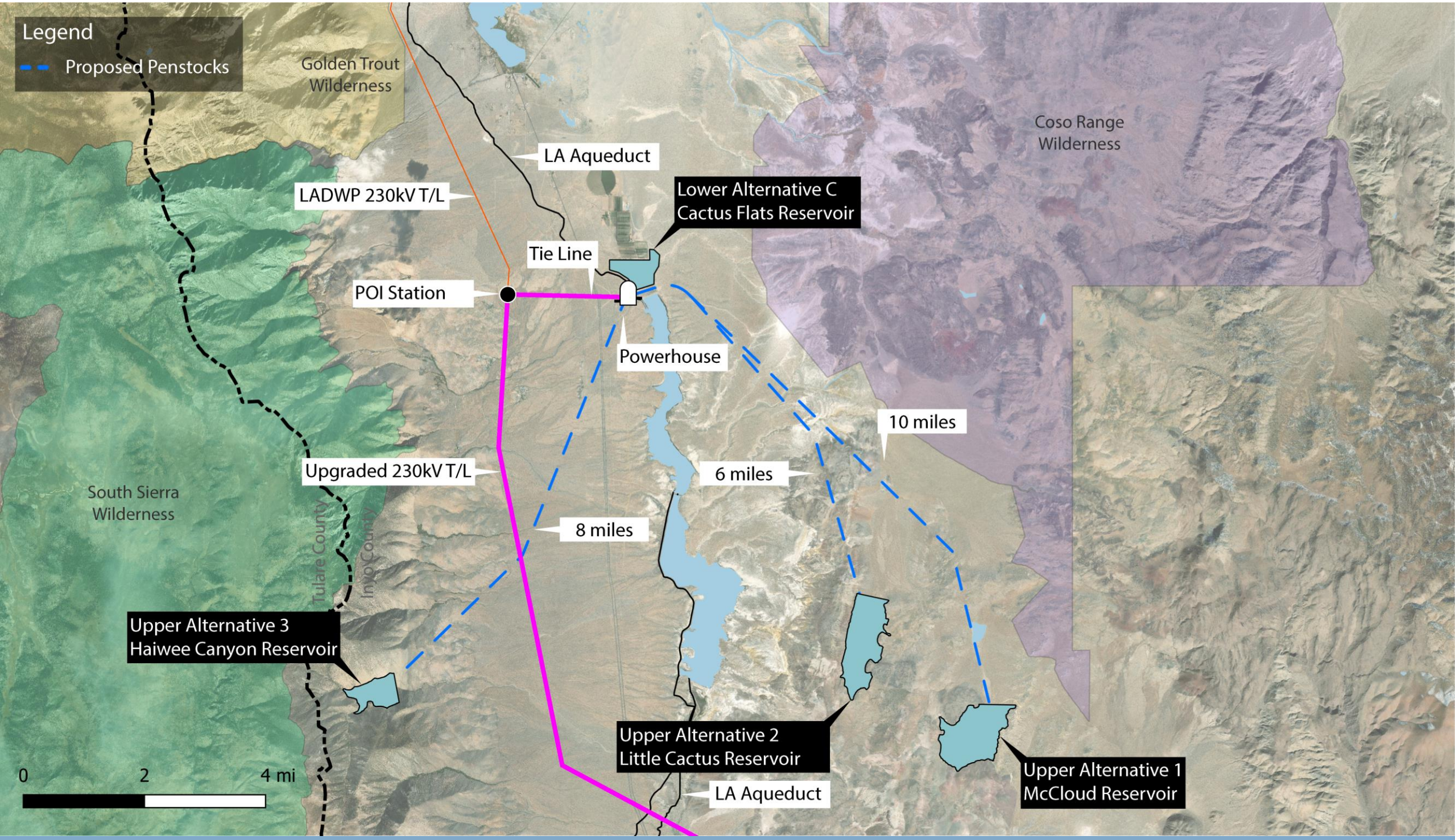
Lower Alternative C – Layout plan (Conceptual)



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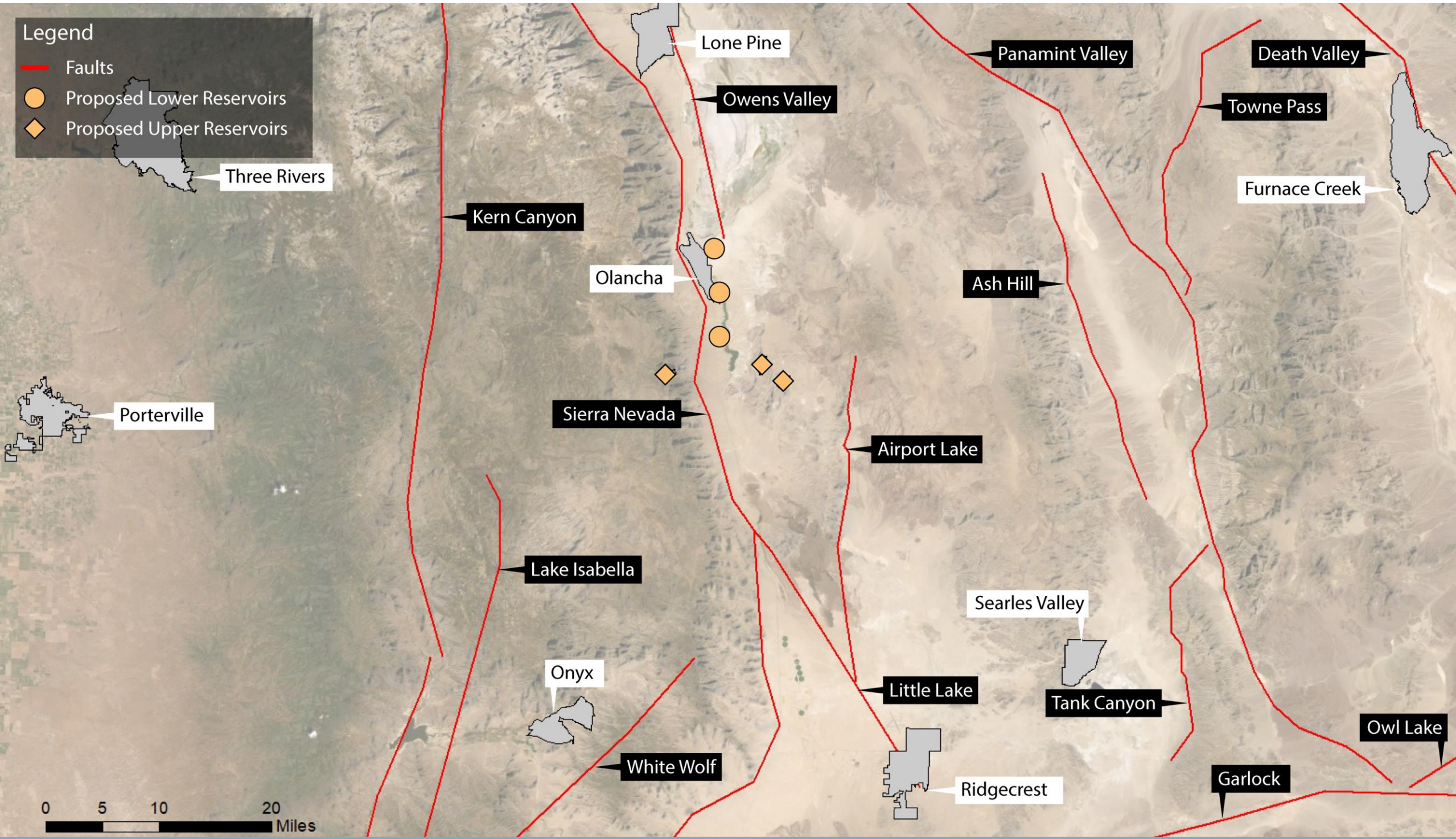
Faults Location (Preliminary research)



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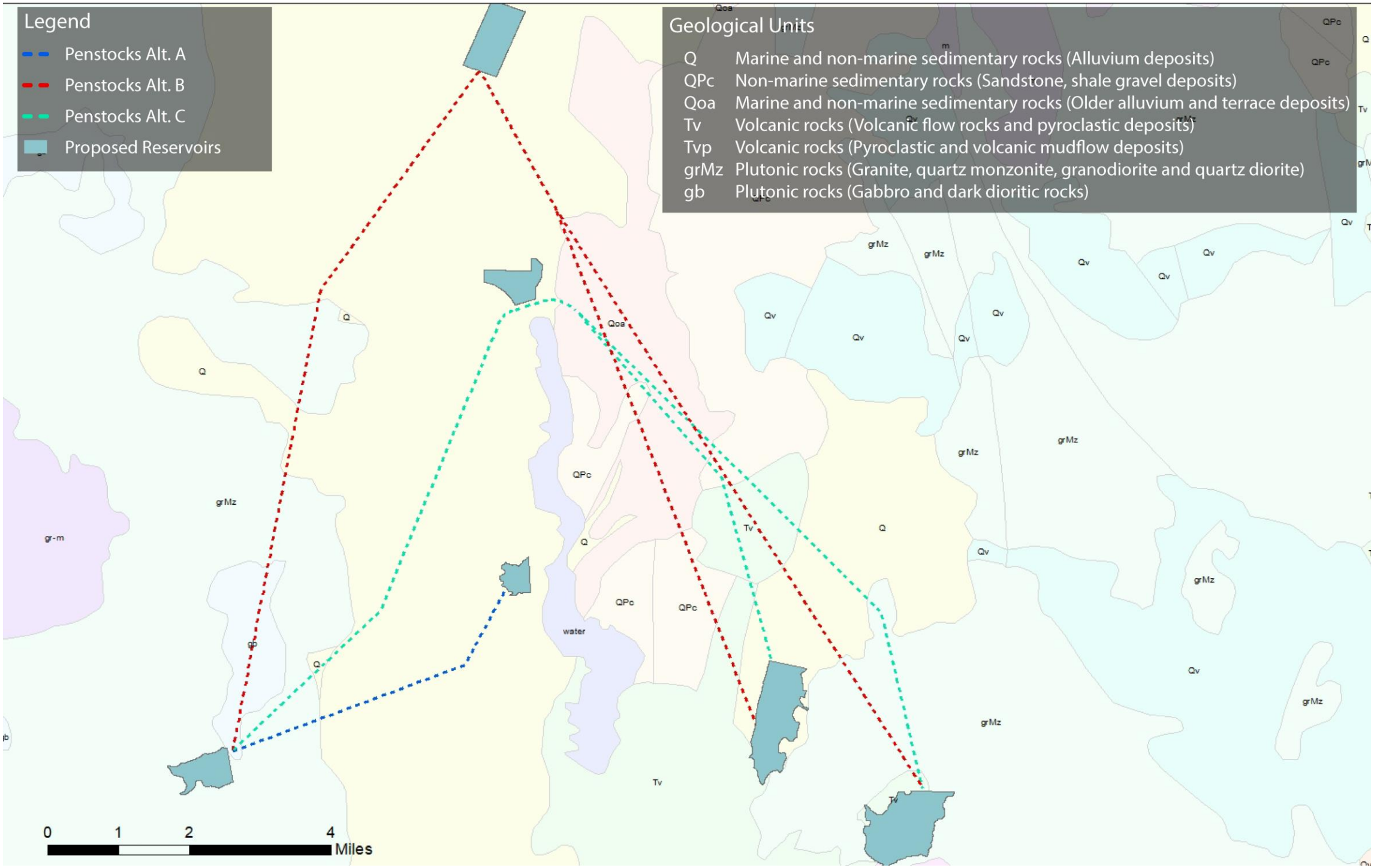
Geological Units (Preliminary research)



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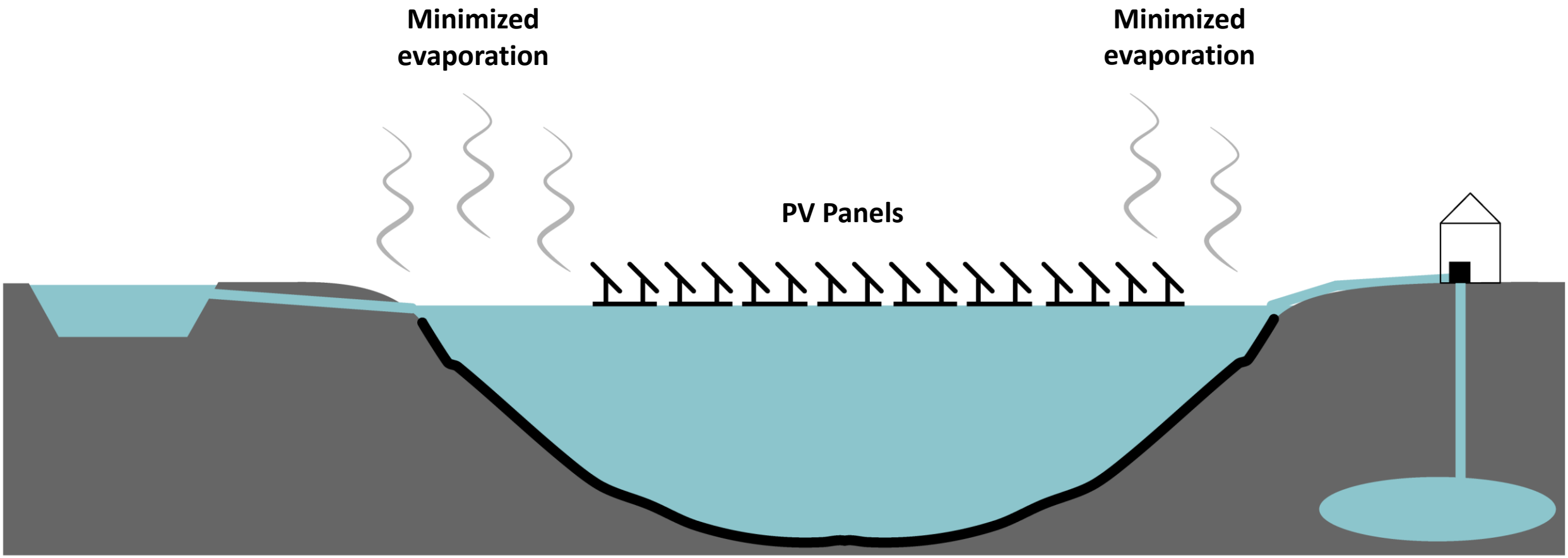
FILLING AND RETURNING



Filling of the Reservoirs

- Excess water from LA Aqueduct and underground water (if possible)

Challenges

- Percolation and evaporation

Possible solutions

- Geo-membrane and PV Panels

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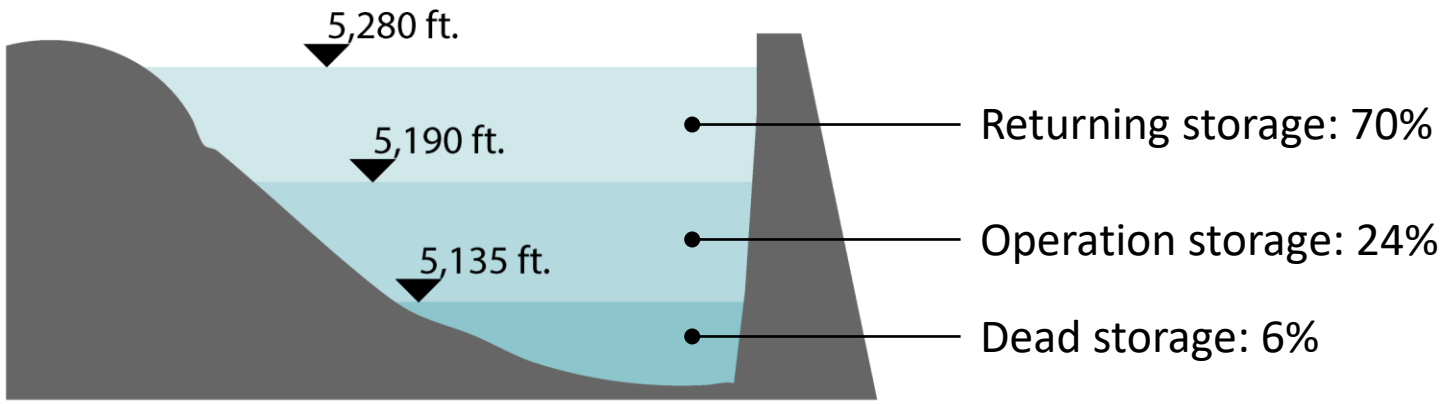
FILLING AND **RETURNING**

Upper Alternative 1
McCloud Reservoir

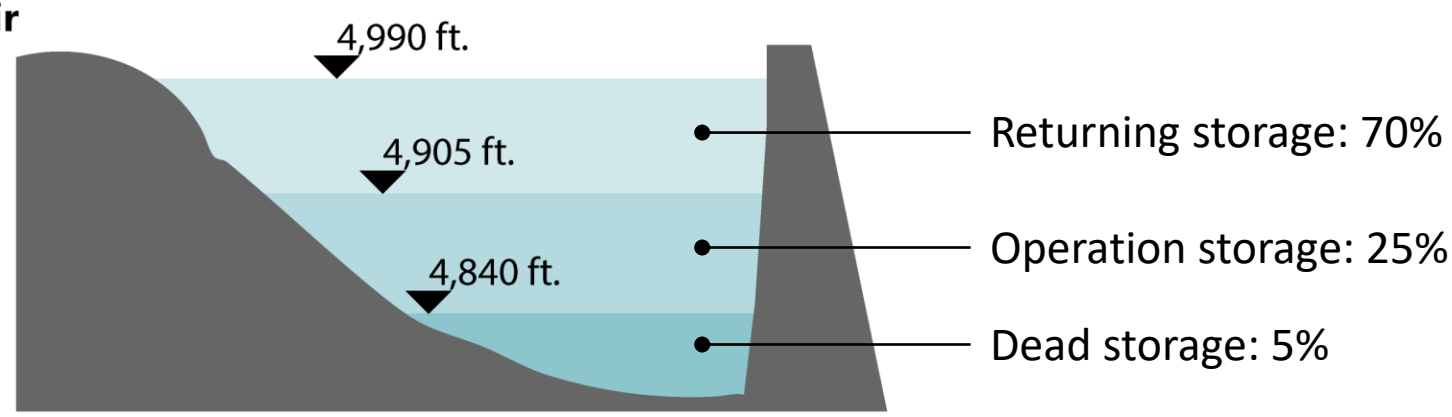
Total Water Storage:
54,000 acre-ft



→ x16
Silver Lake Capacity

Upper Alternative 2
Little Cactus Reservoir

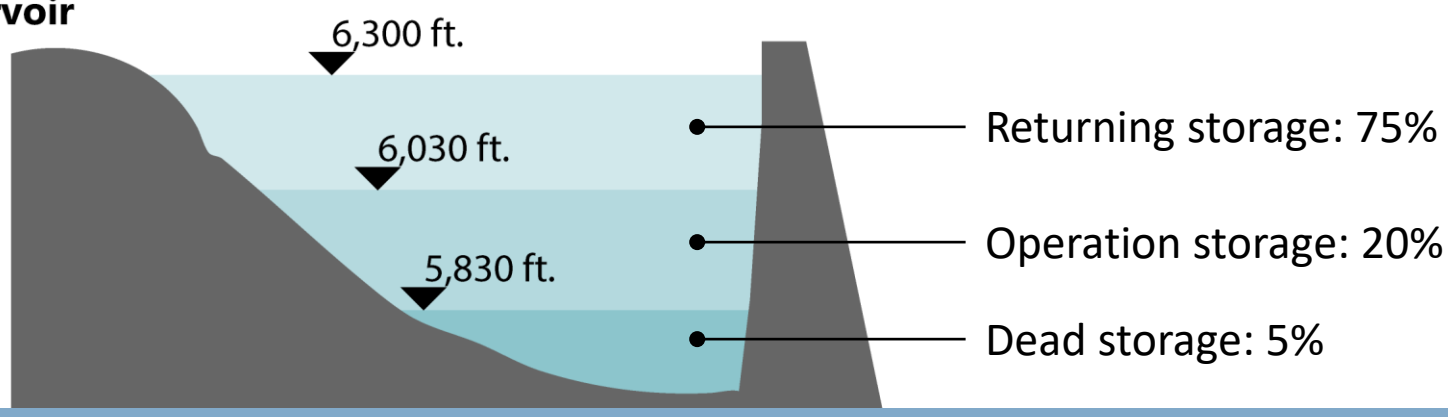
Total Water Storage:
51,000 acre-ft



→ x14
Silver Lake Capacity

Upper Alternative 3
Haiwee Canyon Reservoir

Total Water Storage:
52,000 acre-ft



→ x16
Silver Lake Capacity

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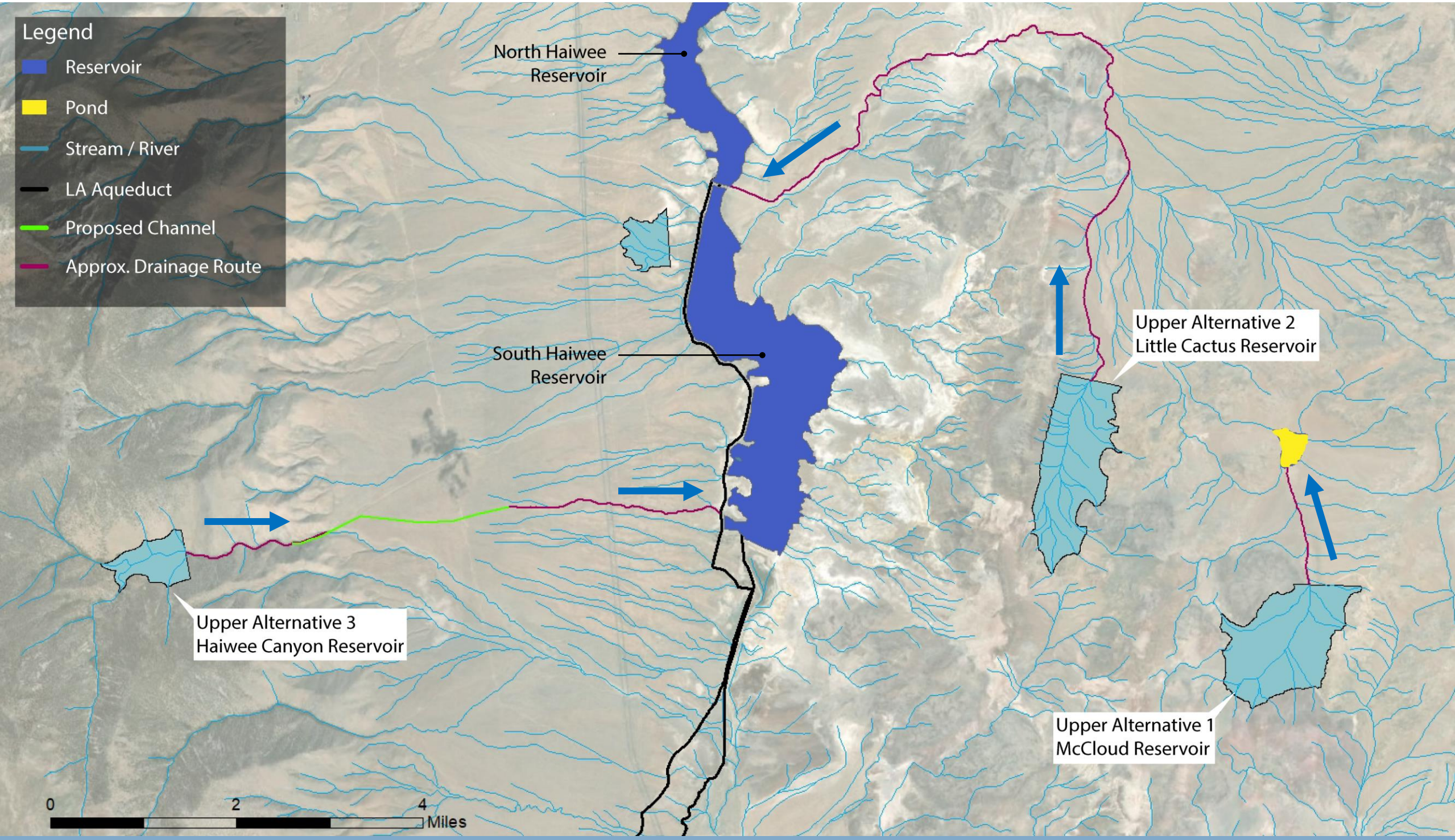
Flood Management Plan (Conceptual)



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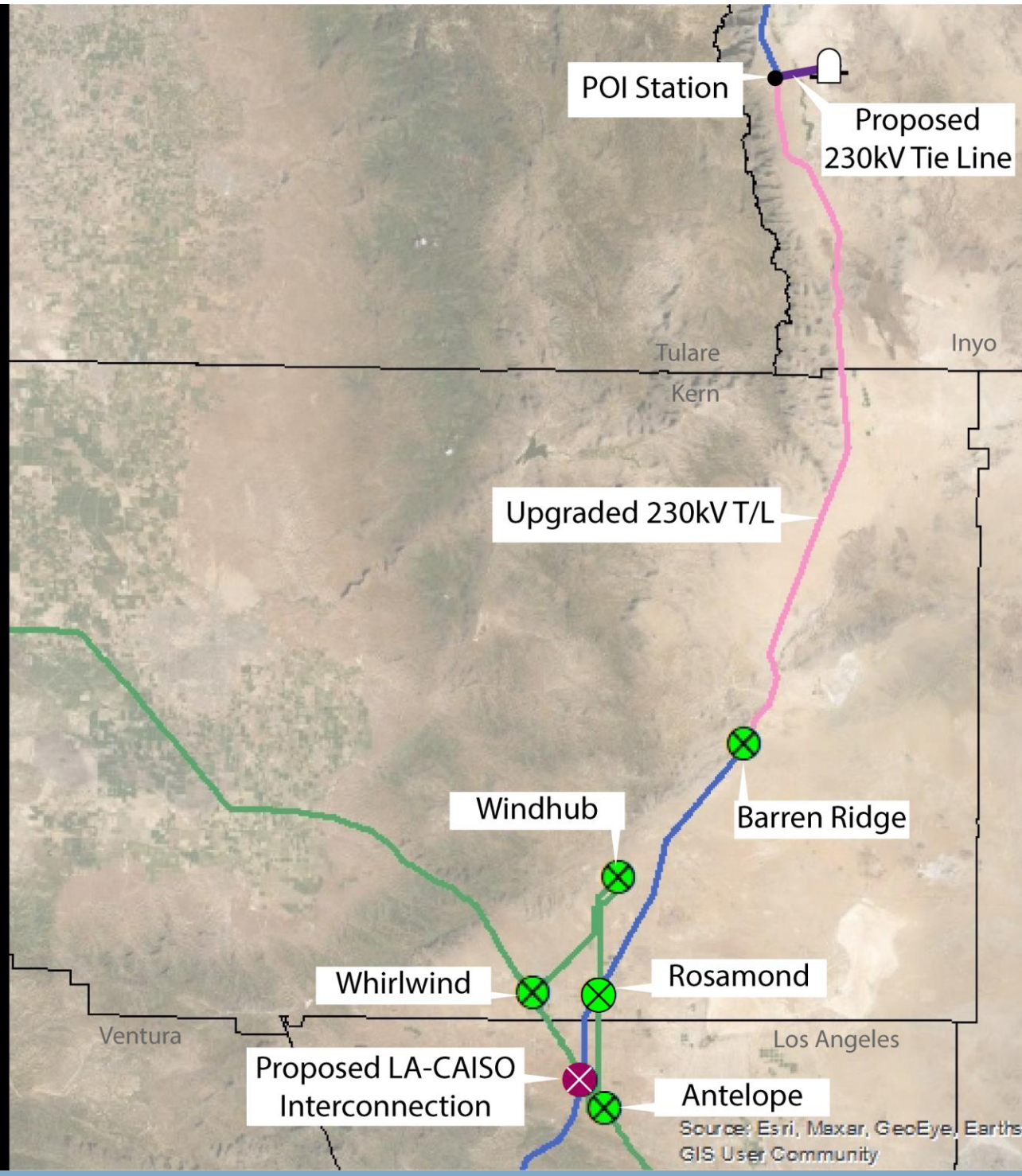
Transmission AC Systems Interconnections (Conceptual)



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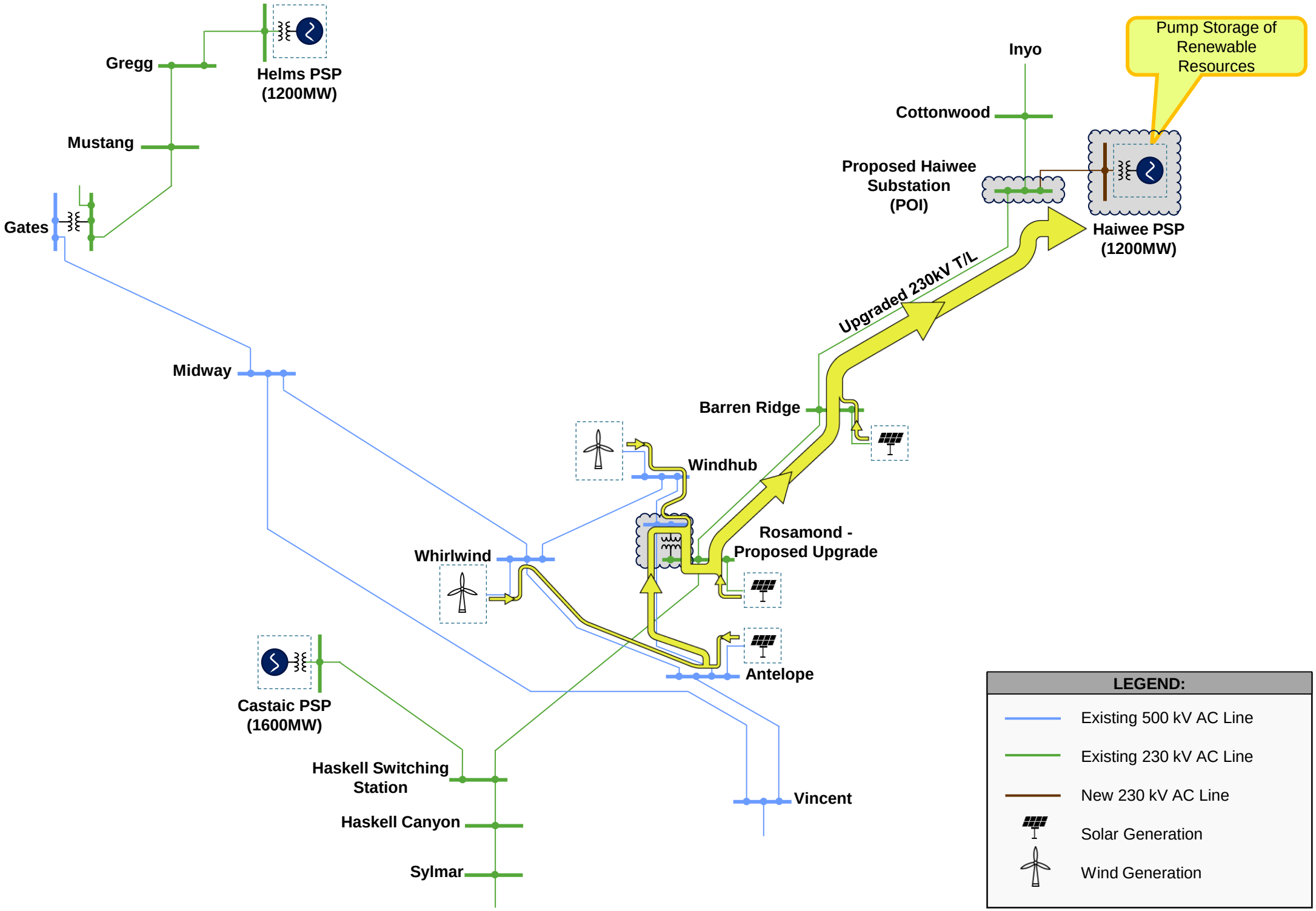
Power Flow: Pumping Operation Mode



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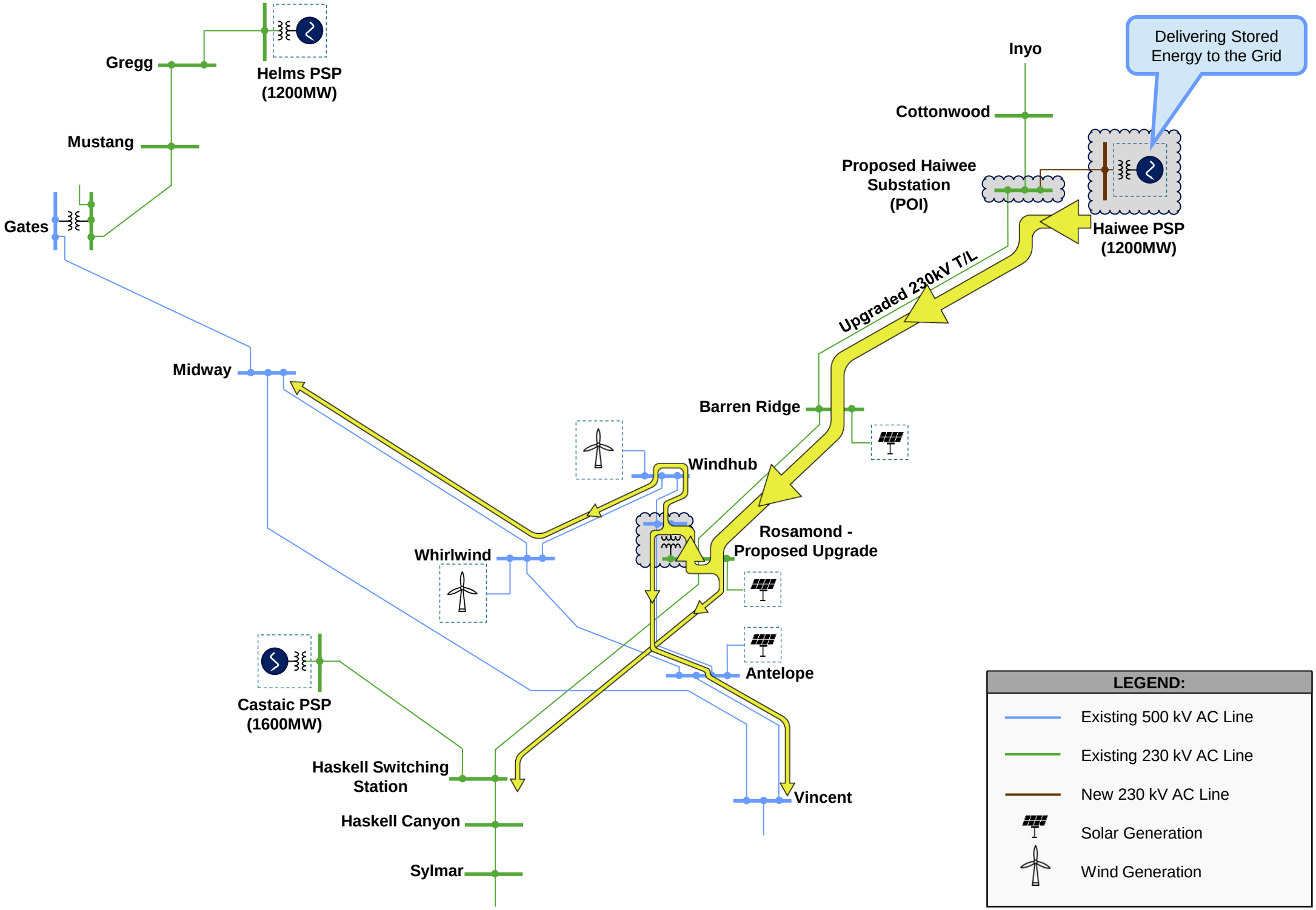
Power Flow: Generating Operation Mode



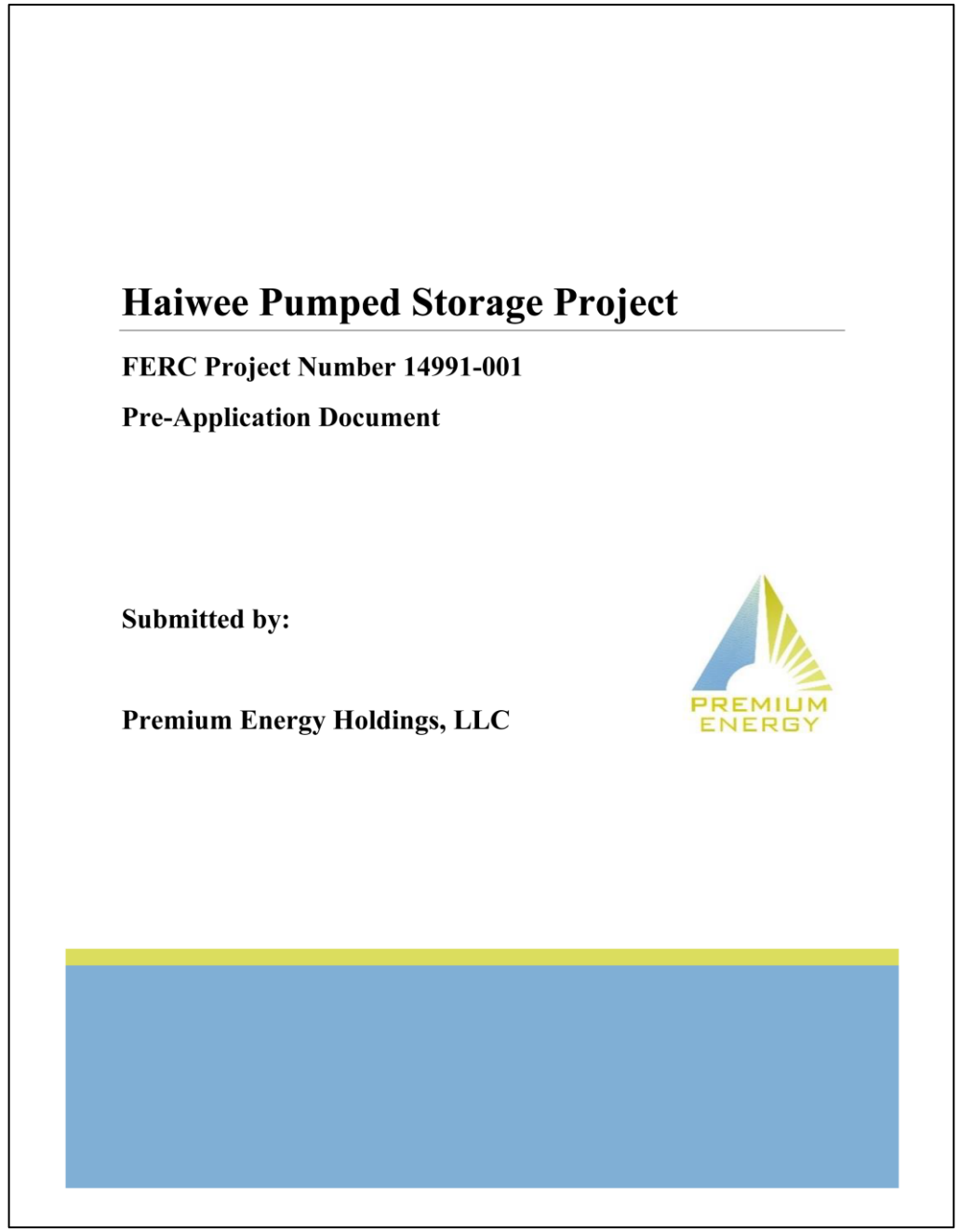
HAIWEE PUMPED STORAGE PROJECT

Next Steps

Preparation of Pre-Application Document (PAD) & Notification of Intent (NOI).

- Solicitation to interested parties.
- Proposed facilities.
- Existing environment and resource impacts
  - Geology and Soils
  - Water resources
  - Fish and aquatic resources
  - Wildlife and botanical resources
  - Rare, threatened and endangered species
  - Recreation and land use
  - Aesthetic resources
  - Cultural resources
  - Socio-economic resources
  - Tribal resources
  - River basin description
- Preliminary issues and studies

Consultation with agencies and Native American groups and interested parties.



QUESTIONS & ANSWERS

Thanks for your participation!

Contact Information

info@pehllc.net

(909) 595-5314

www.premiumenergyholdings.com

Haiwee Pumped Storage Project

FERC No. P-14991-001

QUESTIONS & ANSWERS

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Haiwee Pumped Storage Project

FERC No. P-14991-001

Victor M. Rojas, P.E., PMP

Managing Director @Premium Energy Holdings, LLC

Mr. Rojas has over 40 years of electrical power engineering experience in the design, construction, commissioning, operation and maintenance of facilities for electric and water utilities, as well as large industrial and institutional facilities.

QUESTIONS & ANSWERS

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Haiwee Pumped Storage Project

FERC No. P-14991-001

John R. Dennis, P.E.

Project Manager @Power-Tech Engineers, INC.

Mr. Dennis has 35 years of experience with LADWP in all aspects of design, procurement, construction, and commissioning of Water and Power facilities, including engineering, field design, quality assurance, contract negotiations & administration.

QUESTIONS & ANSWERS

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FERC No. P-14991-001

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