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SACRAMENTO MUNICIPAL UTILITY DISTRICT

The Power To Do More.

PUMPED-STORAGE LICENSING CHALLENGES

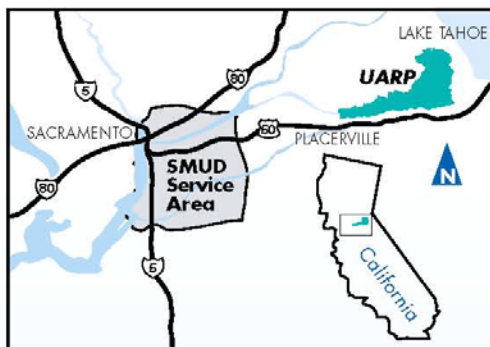
Presentation by:

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Hydro Licensing & Compliance
Sacramento Municipal Utility District**

**NHA Annual Conference
Session 1B – Regulatory Hot Topics:
Current Issues in Licensing Today**

Monday, April 26, 2010





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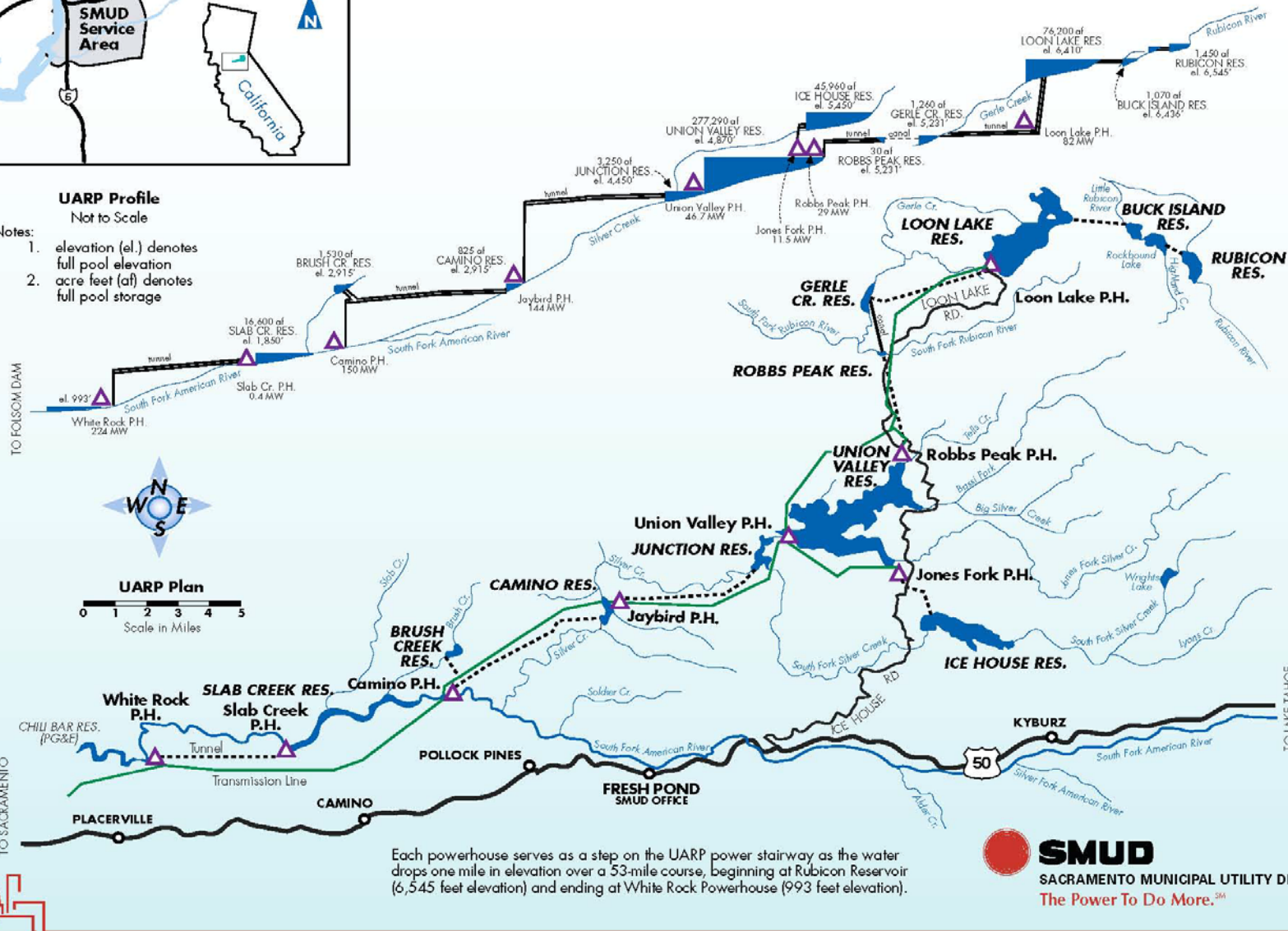
Upper American River Project

Federal Energy Regulatory Commission Project No. 2101

UARP Profile

Not to Scale

- Notes:
1. elevation (el.) denotes full pool elevation
 2. acre feet (af) denotes full pool storage



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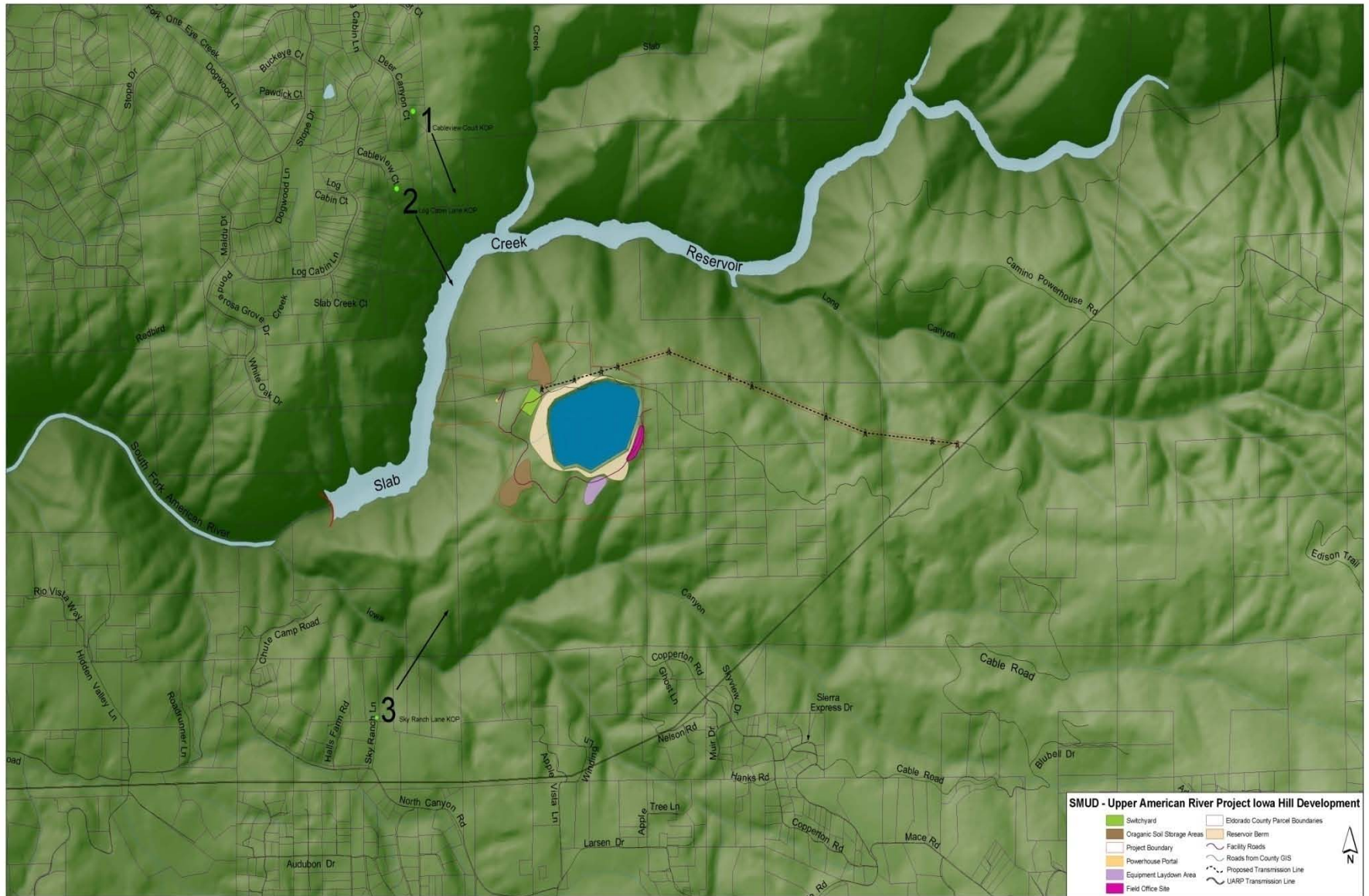
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IOWA HILL PUMPED-STORAGE PROJECT DESCRIPTION

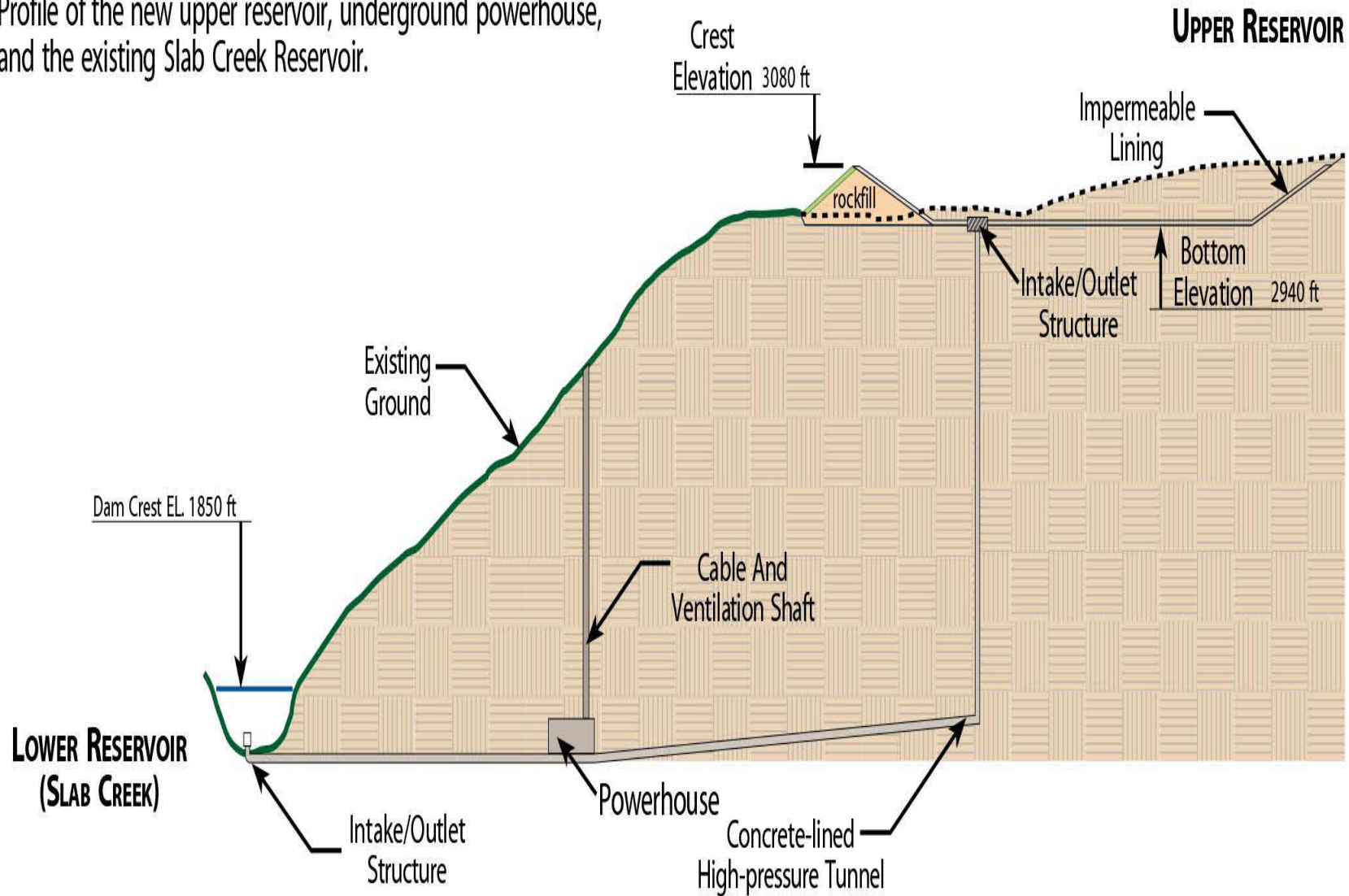
- Integrated into Existing UARP
- Located in Rural Sierra Nevada Foothills
- 400 MW (three 133-MW turbines)
- 1,200-ft Head
- 6,400 acre-feet New Upper Reservoir
- 16,600 acre-feet Existing Lower Reservoir
- 2.5-mile Transmission Gen-Tie

PLAN VIEW



WATERWAY PROFILE

Profile of the new upper reservoir, underground powerhouse, and the existing Slab Creek Reservoir.



IOWA HILL SIMULATION



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IOWA HILL VALUE

- 400 MW of New Capacity
- Firming of Intermittents (wind, solar)
- Regulation (variable-speed turbines)
- Eases Conflict Between Energy Goals
 - SMUD Sustainable Goal: GHG @ 10% of 1990 Levels by 2050
 - SMUD Renewable Goal: 33% Renewables by 2020

LICENSING CHALLENGES

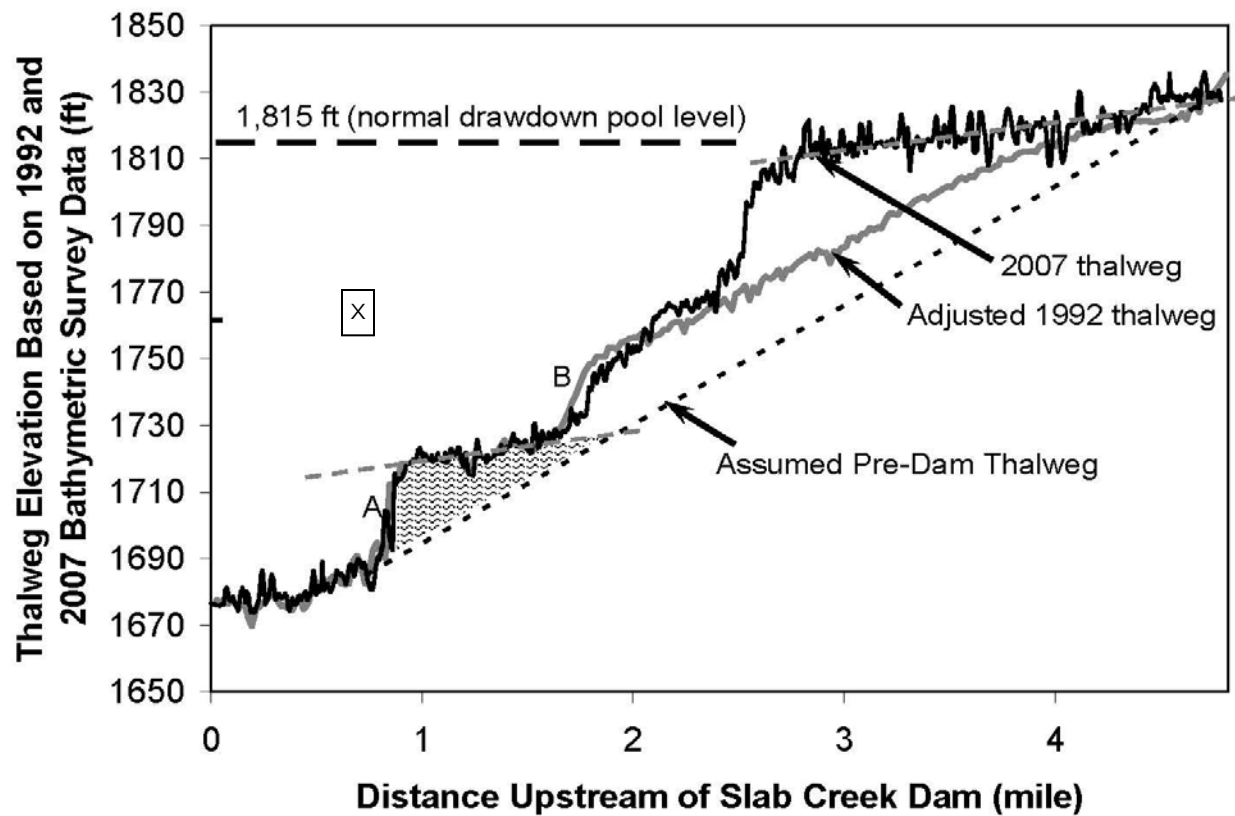
- Adding Iowa Hill to the Relicensing Process
 - Saved time
 - Saved costs
 - “Second bite of the Settlement Apple”
- Stakeholder Resistance
 - UARP relicensing already complicated
 - Mixture of licensing and relicensing
- Solution: Perseverance and Careful Explanation

COST CHALLENGES

- Wide-range of Construction Costs
- Long Construction Period
- Capacity / Ancillary Services Markets Uncertain
- Potential Increase on Rates
- Alternative Combustion Turbine Peaker Units Less Expensive, Built Quickly and Incrementally
- Solution: Bullet Loans / Partners

ENVIRONMENTAL CHALLENGES

- Minimal Environmental Effect
 - New upper reservoir does not dam a waterway
 - No effect on streamflows, fish migration, recreation
 - 2.5-mile Gen-Tie to existing UARP transmission line
 - Utilizes existing Slab Creek Reservoir
- Terrestrial Habitat Loss
- Fish Entrainment
- Turbidity



ENVIRONMENTAL CHALLENGE SOLUTIONS

- Terrestrial – Timber Clearing and Wildlife Habitat Replacement
- Fish Entrainment/Turbidity – Agency Consultation on Design of Multi-port Intake/Outlet Facility

EXAMPLE OF INTAKE STRUCTURE DESIGN



SOCIAL CHALLENGES

- Town of Camino and Apple Hill Tourism
- Transportation – Workers, Heavy Equipment, Narrow Roads
- Noise – Blasting, Machinery, Truck Traffic
- Fire – Fire Starts, Fire Suppression
- Visual – Upper Reservoir Berm, Transmission Gen-tie



SOCIAL SOLUTIONS

- Formed Iowa Hill Joint Advisory Committee (IHJAC)
- IHJAC Developed 246 Separate Measures

Transportation Plan

Build Connector Road Between
Construction Sites
Staging Areas
Vanpools for Workers
Multiple Routes to Construction Site
Avoid School Buses

Noise Attenuation Plan

Noise Hotline
Surface Blasting, 7AM-7PM, M-F
Noise Attenuation Devices (blast
curtains, land backfill)

Fire Protection Plan

Build Connector Road to Improve
Site Evacuation
Standard BMPs
Water Tank Trucks Dedicated to
Fire Suppression

Visual Plan

Preserve Trees Close to Berm
Color/Camouflage Berm
Minimize Linear Feature of Berm
Top



Height Above Ground: 497.4ft



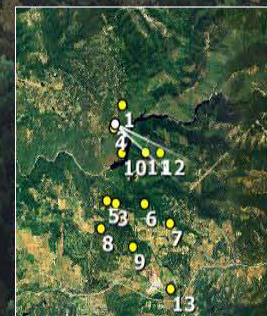
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Tree Clear Radius: 500ft
Height Above Ground: 652.6ft





Tree Clear Radius: 1000ft
Height Above Ground: 6.0ft





Tree Clear Radius: 1000ft
Height Above Ground: 6.0ft





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THANK YOU

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