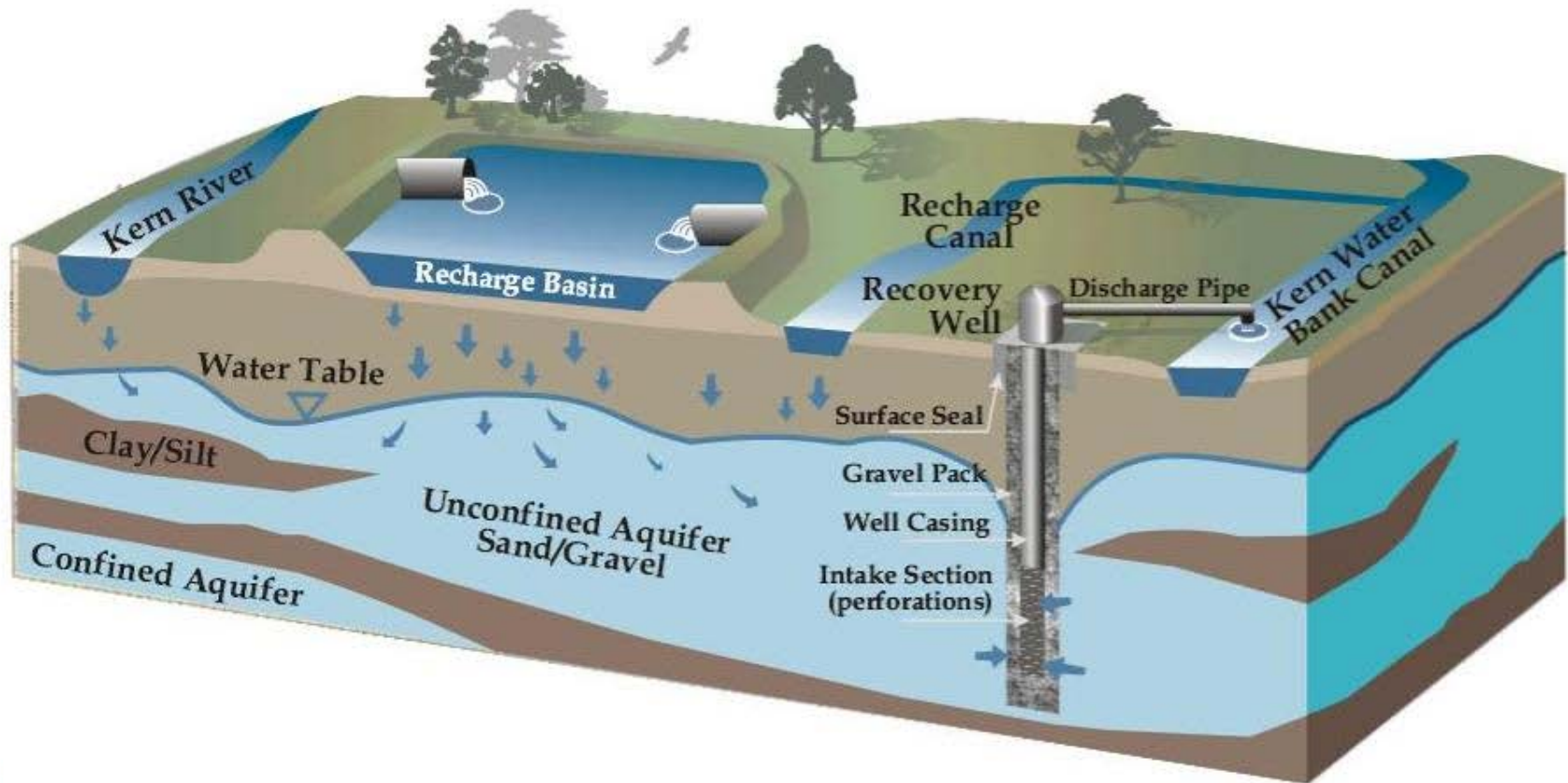


# **GROUNDWATER** **BANKING** CONCEPT

# What is Groundwater Banking?

- Storage of excess available water underground for later withdrawal.



# Why Water Banking at Owens Lake?

- To provide operation flexibility
- Help ensure successful dust mitigation
- Optimize use of water
- Protect dust mitigation infrastructure
- Concepts being evaluated:
  - Water banking ON the lakebed
  - Water banking OFF the lakebed



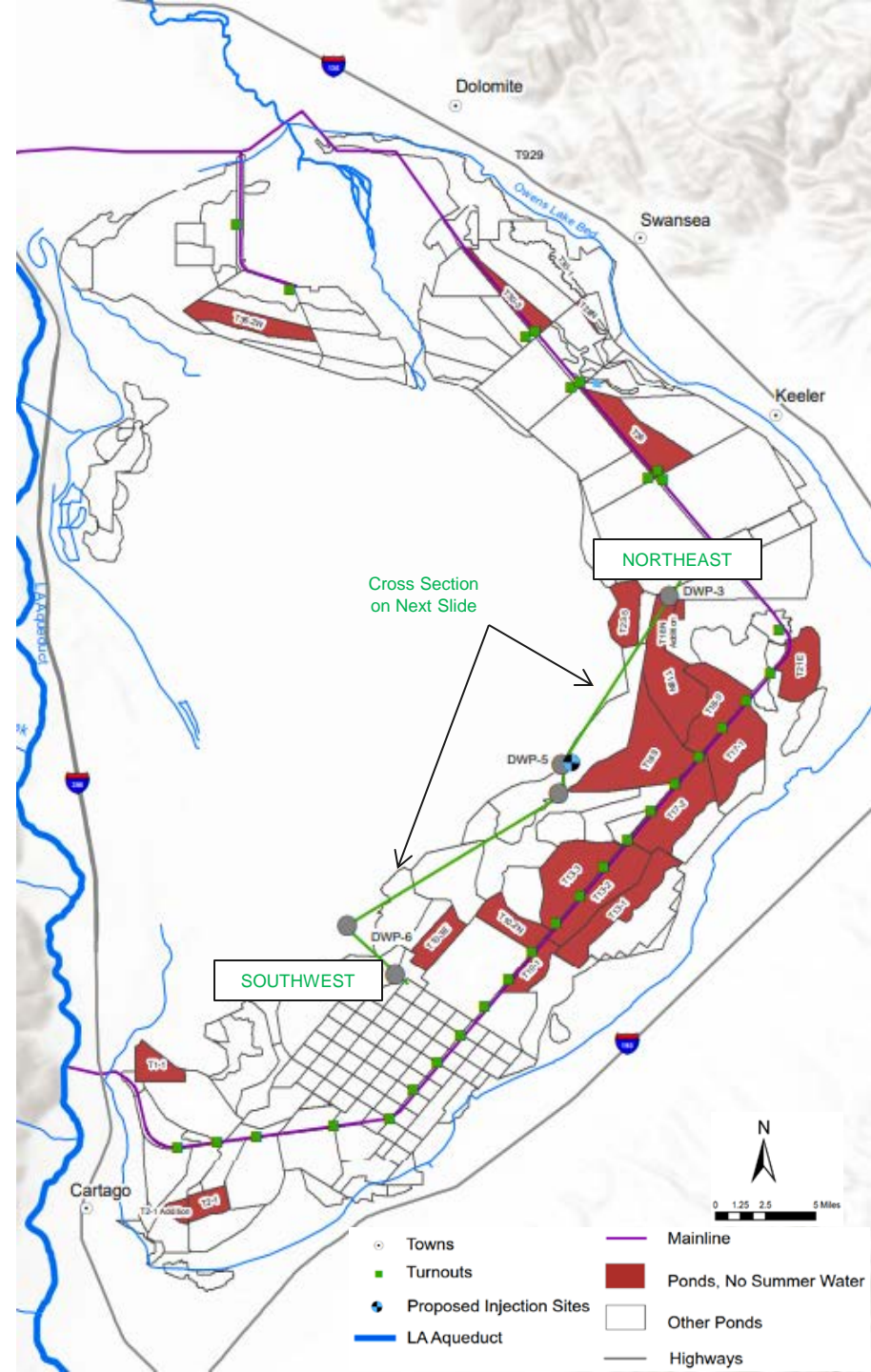


## Banking on Owens Lakebed

- At the end of wind season 4,000-8,000 AF of pond water is lost to evaporation
- Currently evaluating storing pond-water at the end of wind season and pumping back in the following season.
- Banking provides redundancy during emergencies, when the mainline is shut off, groundwater can provide a temporary water supply for dust mitigation

## Pond Water Conservation

- Adjacent ponds that are left to evaporate after wind season concentrate to the southeast of Owens Lake
- Due to thick sequences of impermeable clay layers, an injection well/wells into confined aquifers may be used

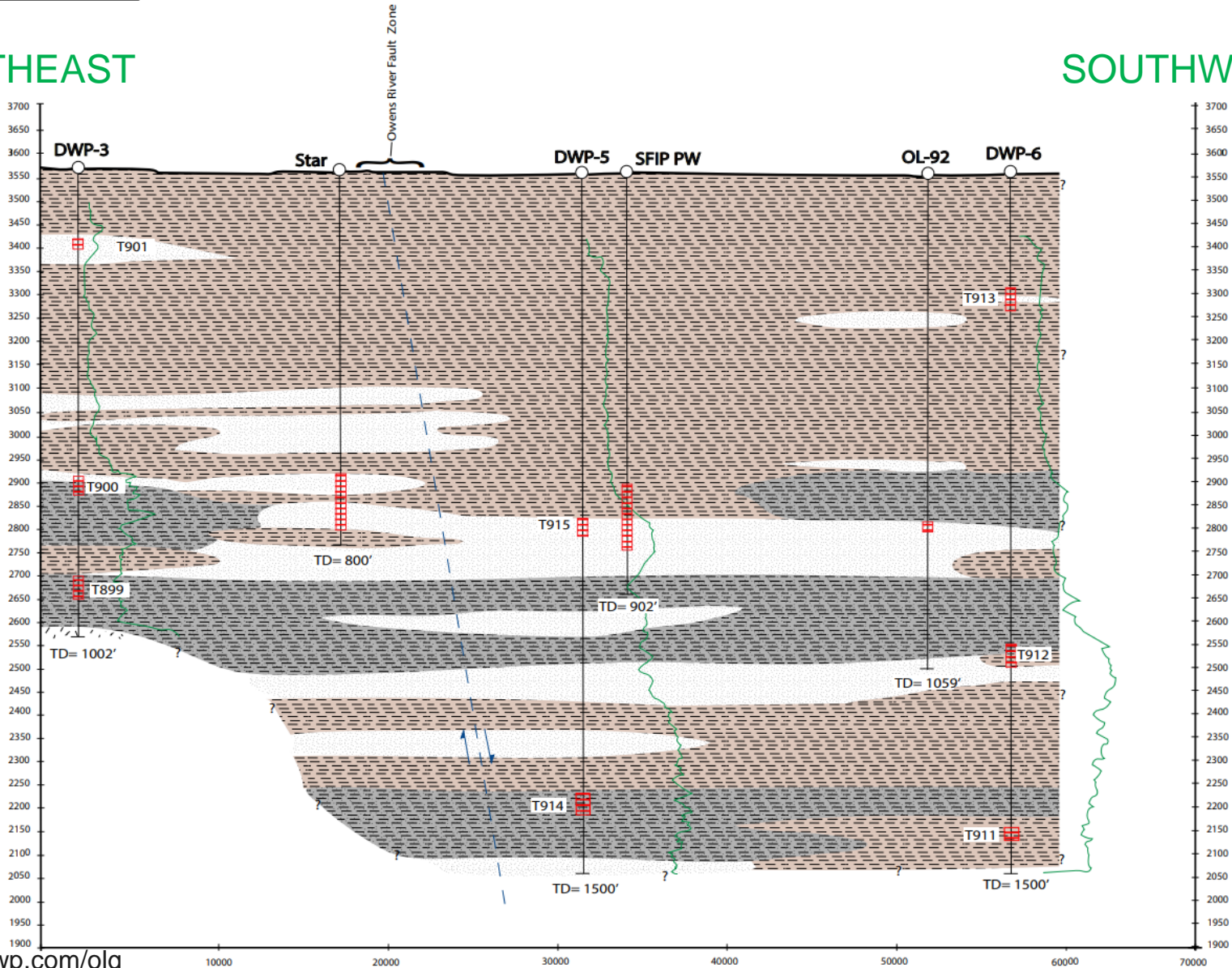


groundwater  
banking

# Geologic Cross Section View Below Ponds

NORTHEAST

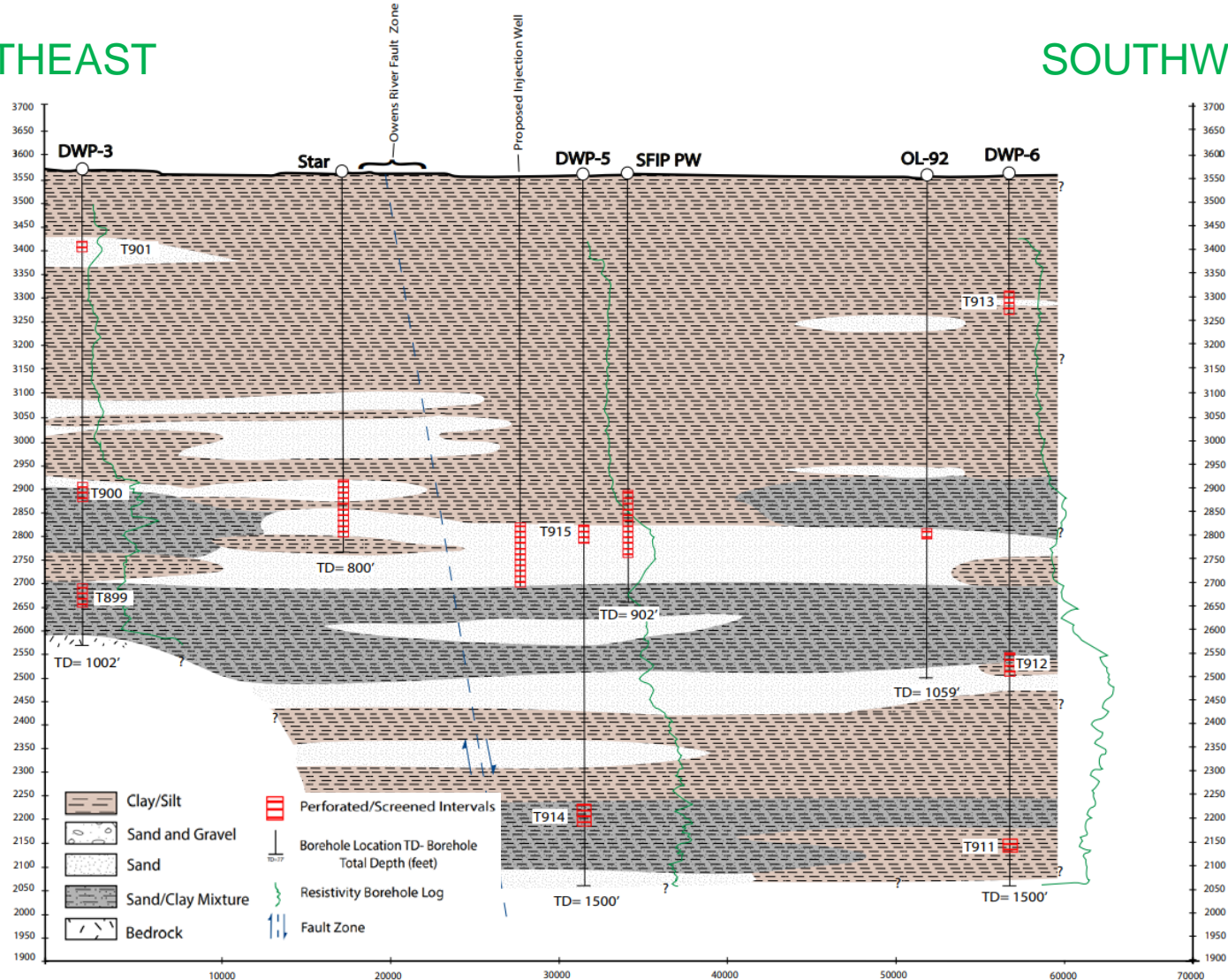
SOUTHWEST



# Geologic Cross Section View Below Ponds with Injection Well

NORTHEAST

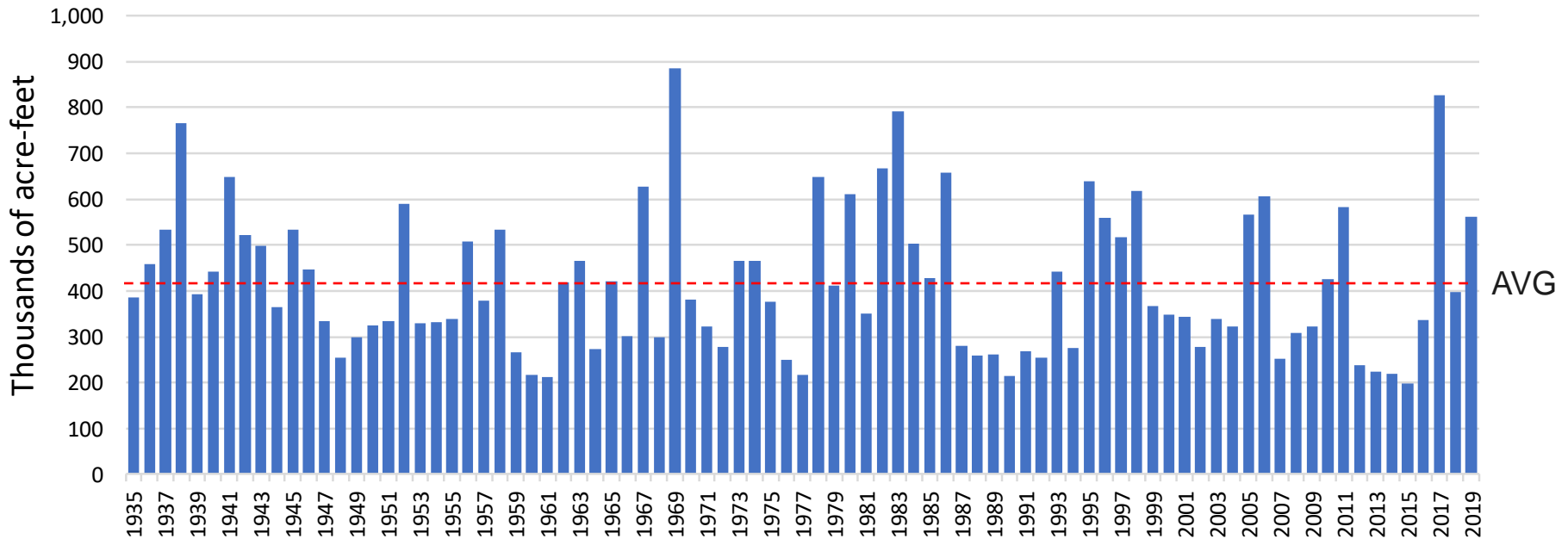
SOUTHWEST



# Why Off Lakebed Banking?

- Variability of Owens Valley runoff
- Potential for high runoff on Owens Lake to damage dust control measures infrastructure

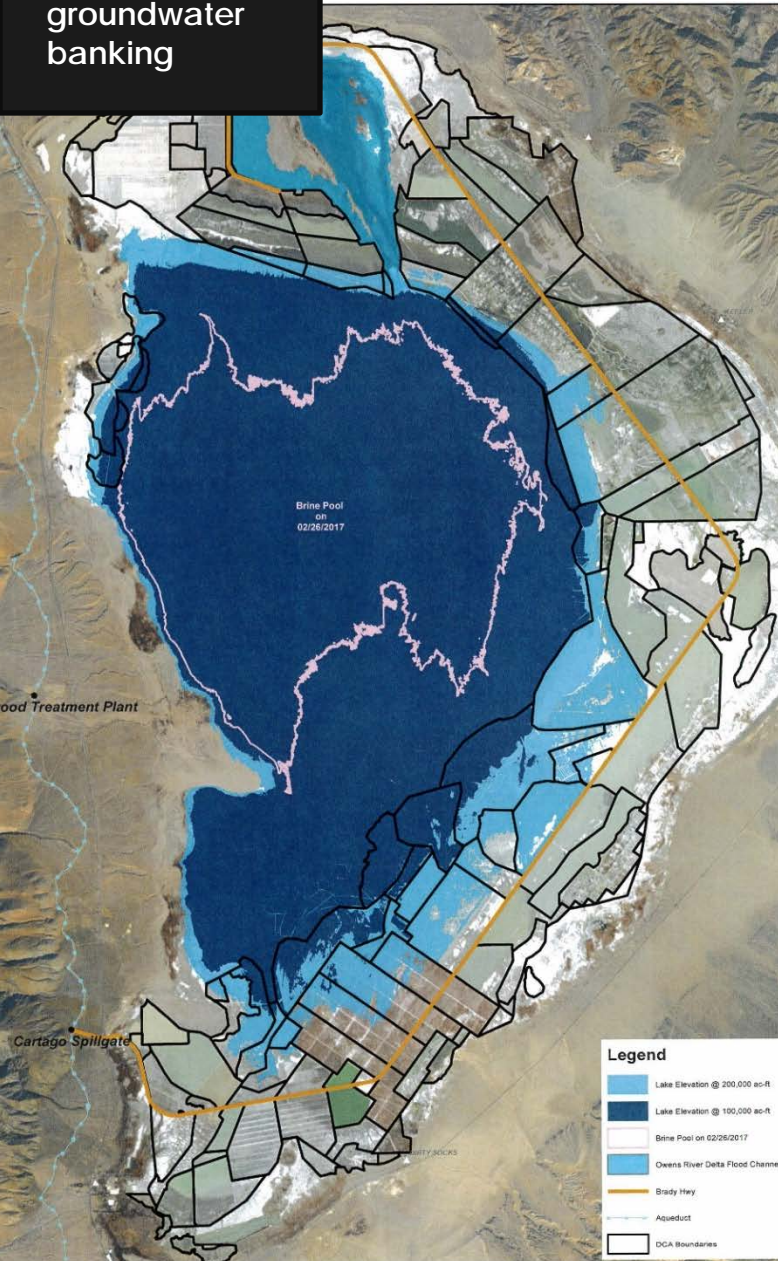
### Owens Valley Runoff (AF)



AVG



groundwater  
banking



# Potential Lake Elevation

- Based on 2016/2017 Runoff Projections
- Dust Mitigation Infrastructure at risk
- Wet season in 2017 after several dry seasons resulted in higher than normal runoff and damage to infrastructure
- Cost of protecting infrastructure approximately \$25,000,000

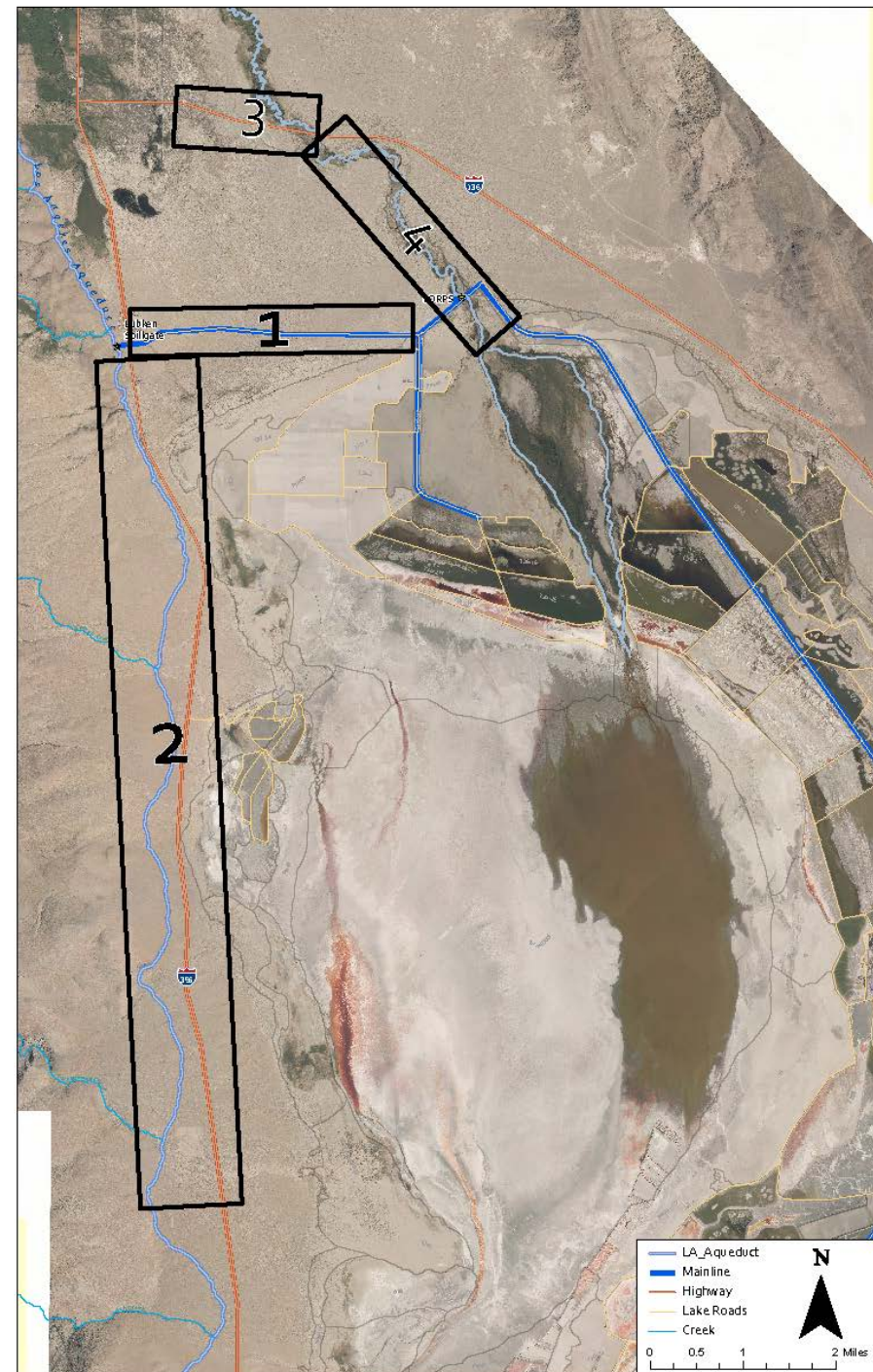
# Considered Areas for Banking Around Owens Lake

**Area 1:** from Lubkin turnout along the mainline,

**Area 2:** the western alluvial fans between the Lubkin turnout and Cottonwood Creek,

**Area 3:** north of Owens Lake along Highway 136, and

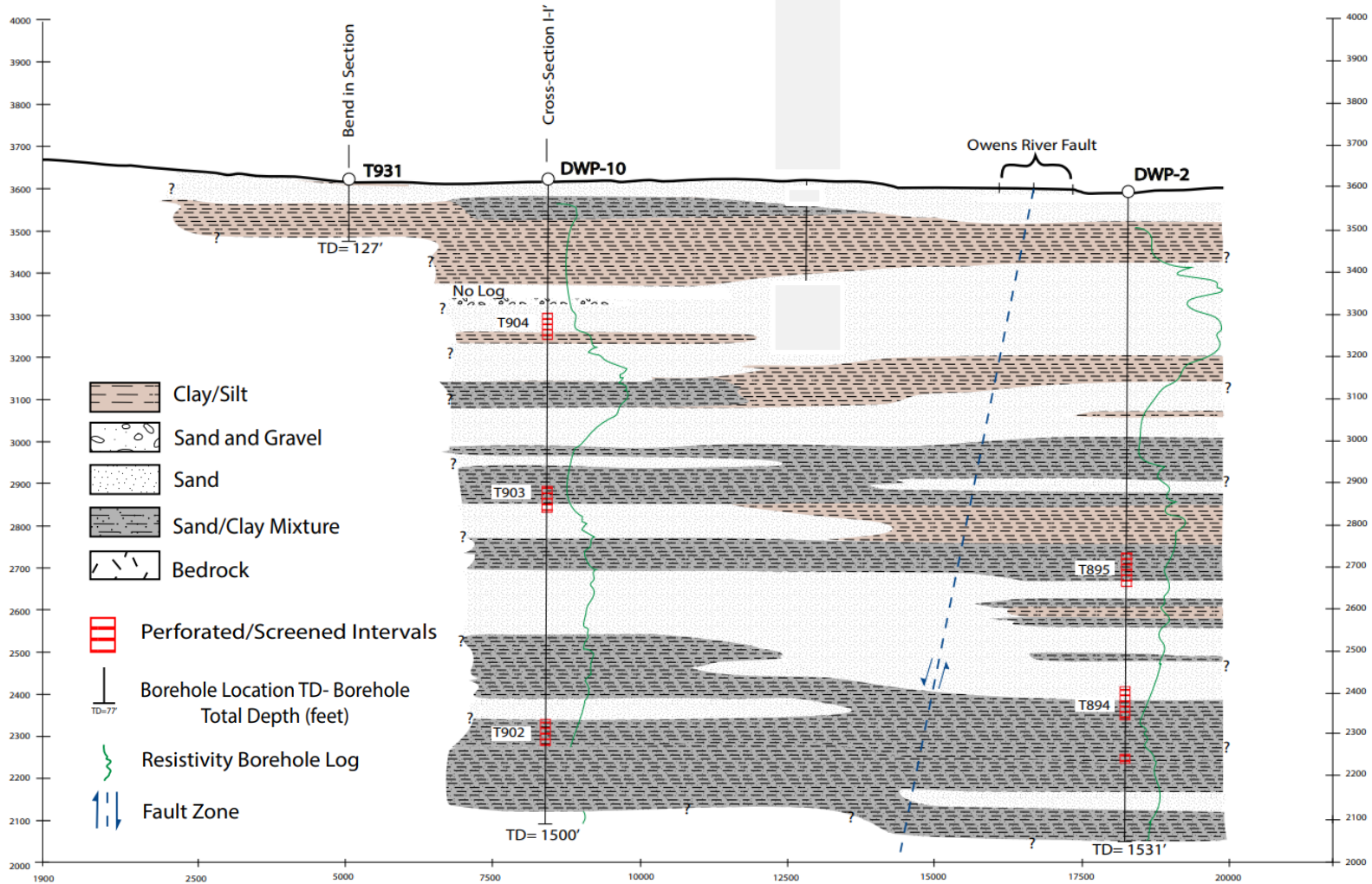
**Area 4:** the area between Highway 136 and pump back station along the Owens River



# Geologic Cross Section View Along Mainline Under Area 1

WEST

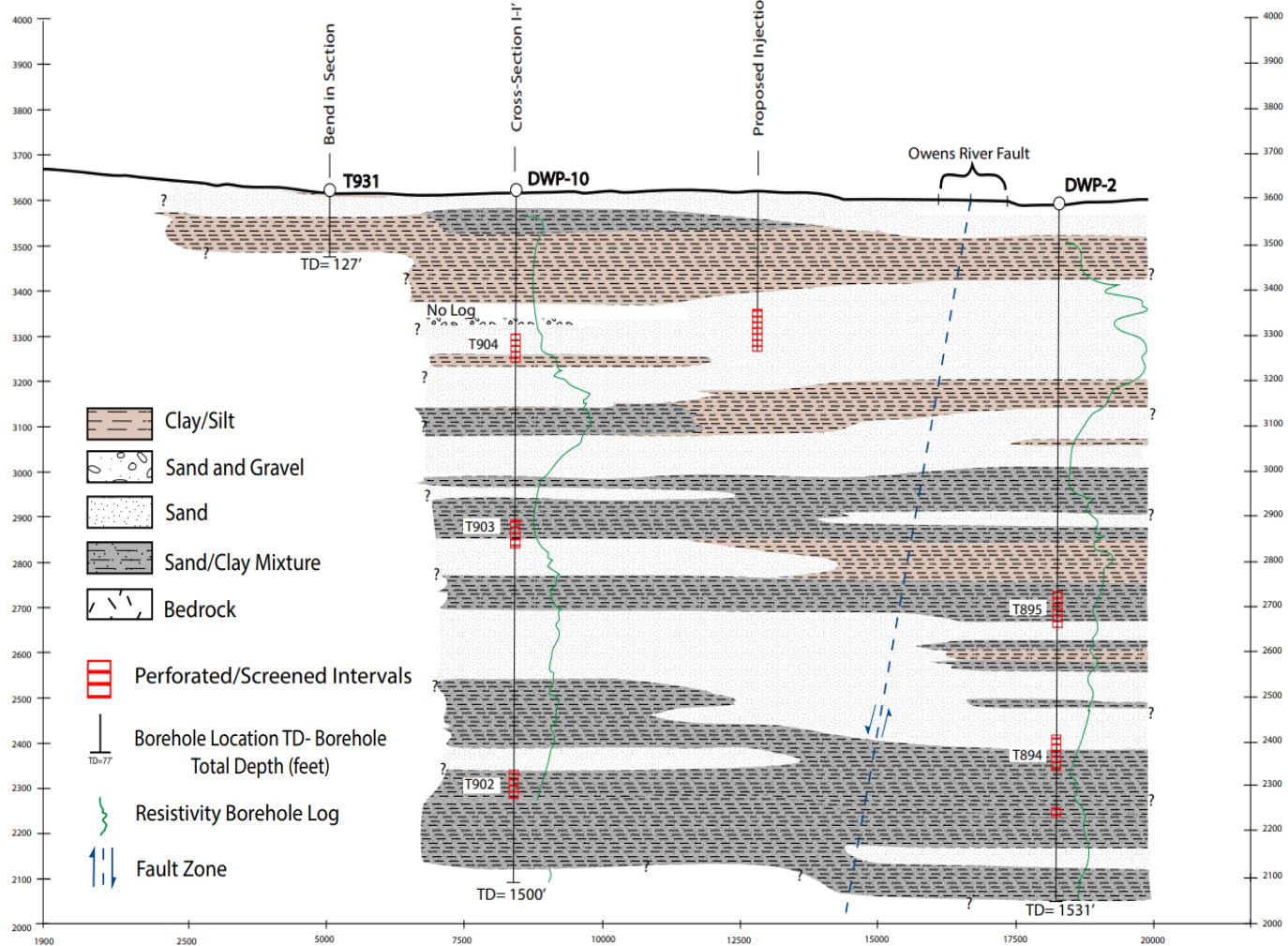
EAST



# Geologic Cross Section View Along Mainline Under **Area 1** with Injection Well

WEST

EAST



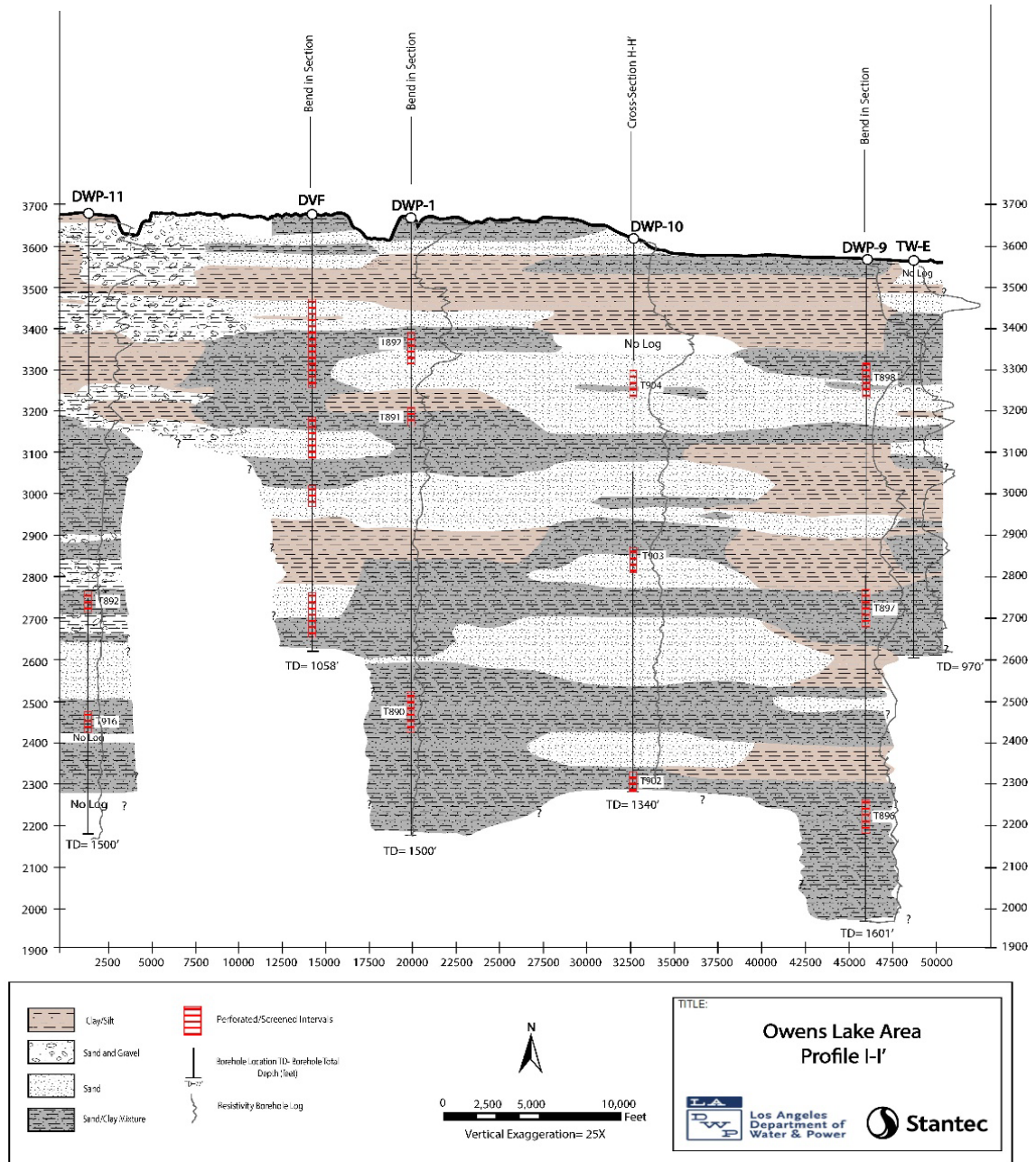
groundwater banking

NORTH

SOUTH

# North-South Cross Section for Area 1

- Several confined aquifer available for banking
- Opportunities to bank in down valley flow aquifer:



# Groundwater Banking Evaluation



- Hydrology
- Geology
- Engineering
- Regulatory
  - Permitting
  - Lease
- Environmental evaluation
- Planning