Interlake Tunnel
WRA Board Workshop

August 25, 2014

Agenda

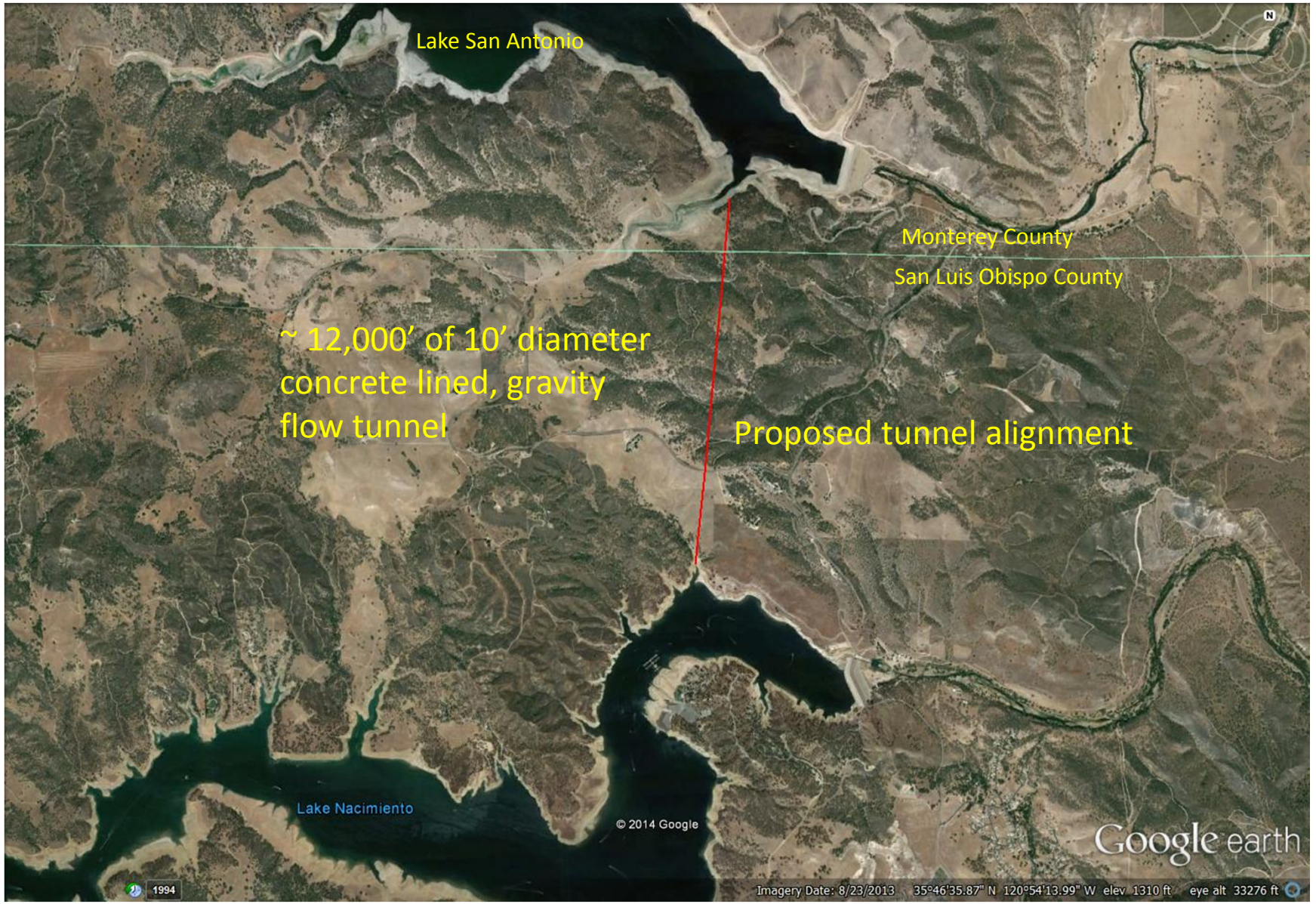
- Introduction
- Project Description
- Background
- Concept of tunnel operations
- Engineering and analysis performed to date
- Preliminary modeling results
- Permitting approach
  - Preliminary environmental impacts
  - Preliminary biological impacts
- Project development schedule and budget
- 3 month look ahead
- Questions from Board and Public

Introduction

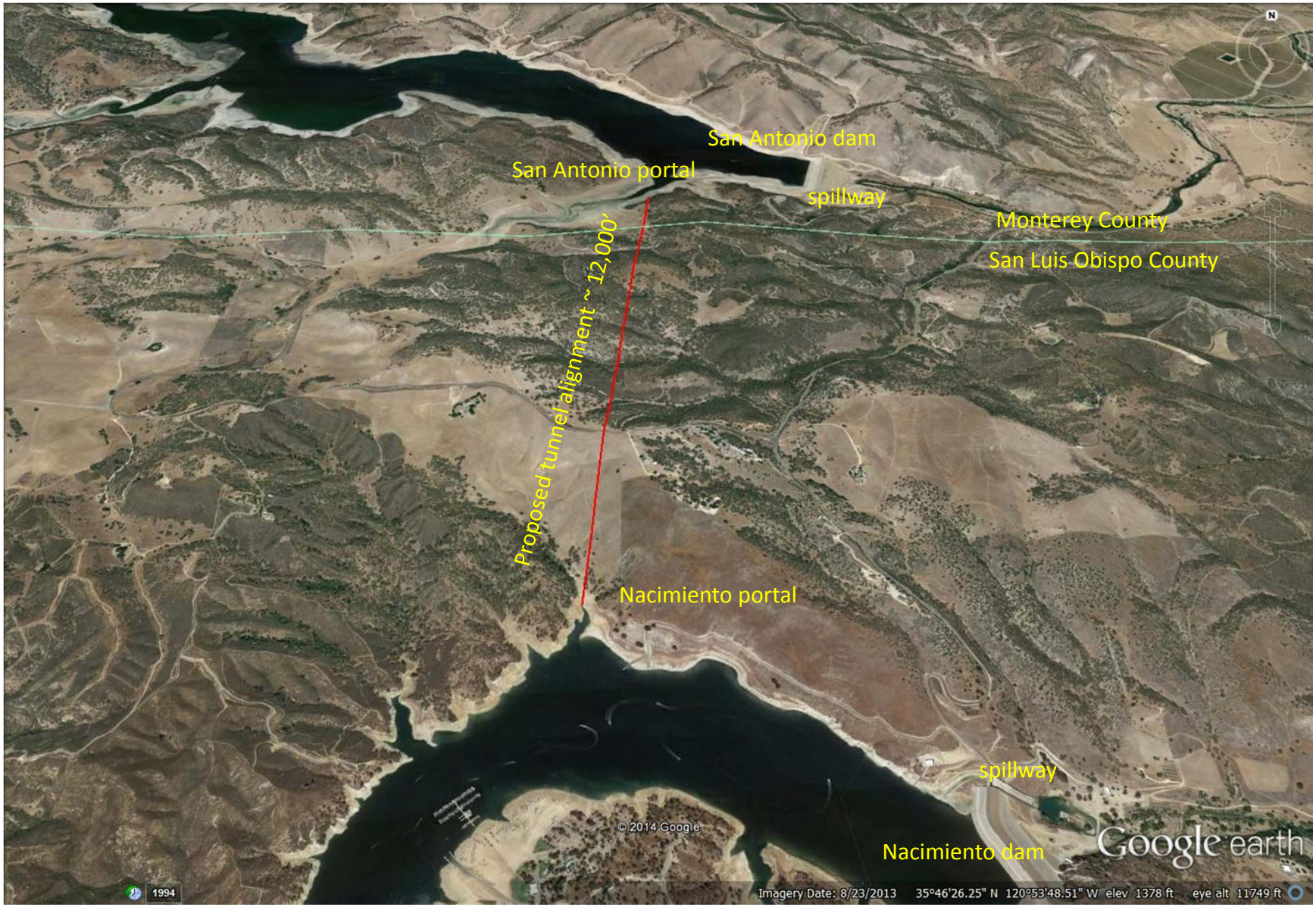
EPC Consultants, Inc

- Program and Construction Management (PM/CM) firm
- Based in San Francisco – 26 years in business
- Specialty is management of public infrastructure projects:
  - Tunnels and underground construction ($7 Bil, 70 miles of tunnels)
  - Water and wastewater
  - Airports
  - Rail Transit
- California clients include:
  - San Francisco PUC
  - San Francisco MTA – Central Subway
  - Los Angeles MTA – Regional Connector
- Program Manager – Ron Drake, PE
  - 38 years experience
  - Registered professional civil engineer in CA

Interlake Tunnel Introduction



Tunnel alignment concept



Interlake Tunnel
Project Benefits

- Adds additional water storage in Lake San Antonio collected during wet years and available to release in dry years.
- Provides additional flood control measures for the Nacimiento and Salinas Rivers.
- Maintains a higher, longer-term, lake level for recreational use in both Lake Nacimiento and Lake San Antonio.
- Negligible impacts from tunnel construction and operations.

Background

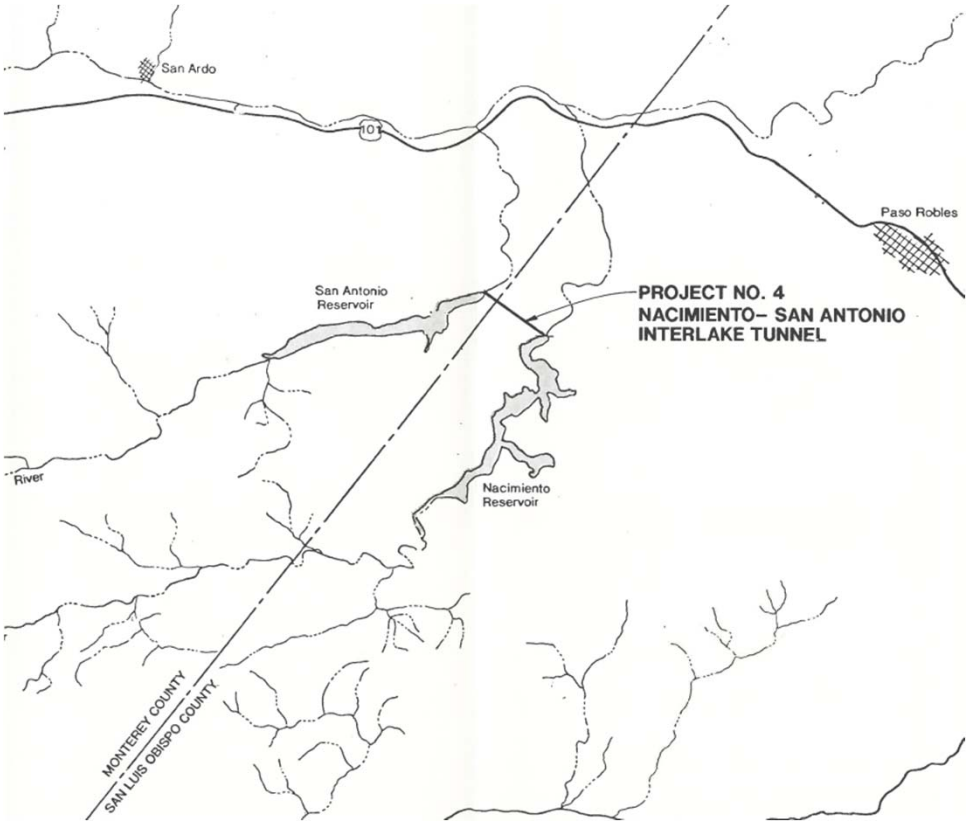
MONTEREY COUNTY
WATER RESOURCES AGENCY

WATER CAPITAL FACILITIES PLAN

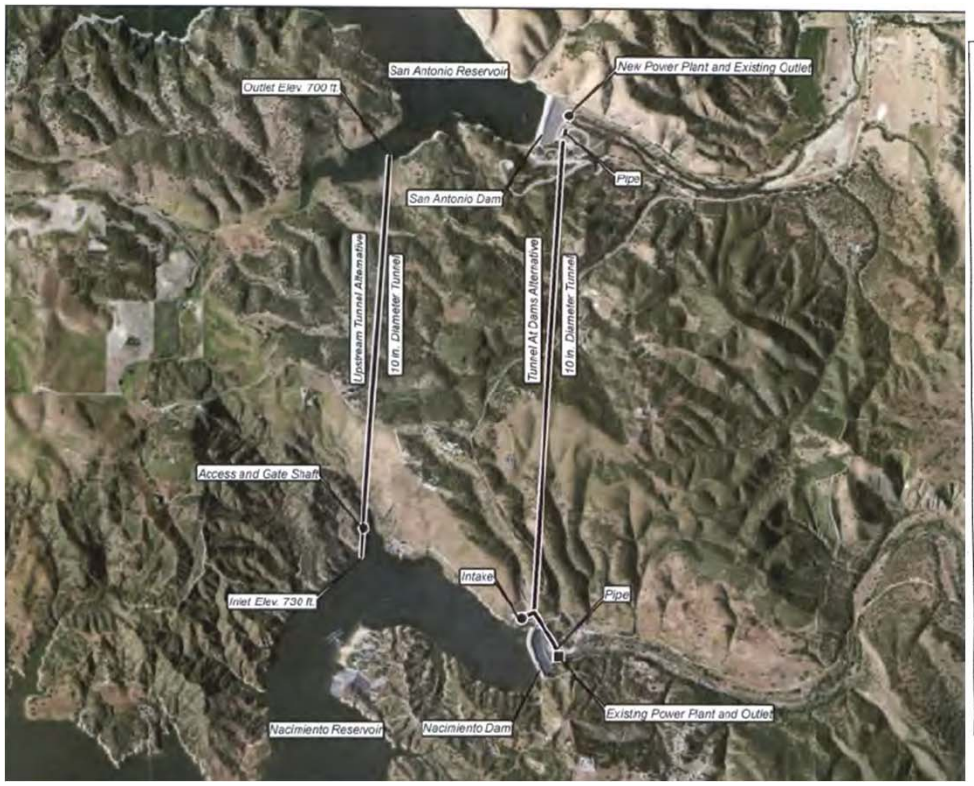
JULY 1991

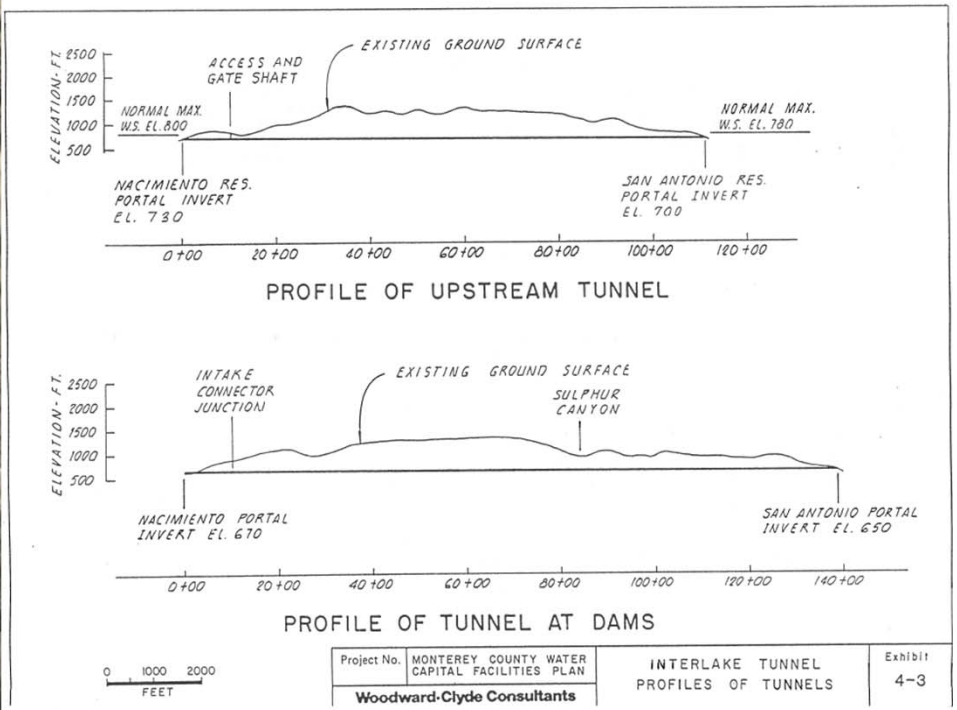
VOLUME I REPORT

BOYLE ENGINEERING CORPORATION

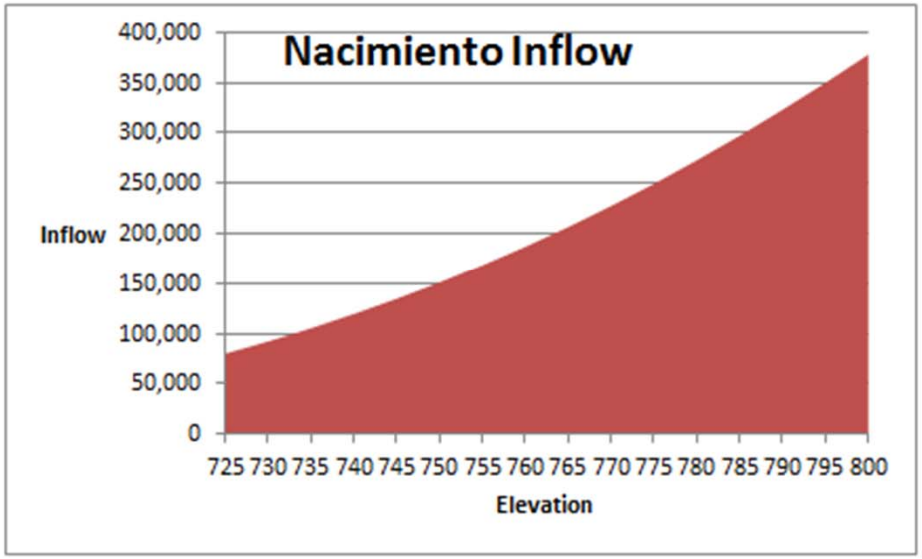


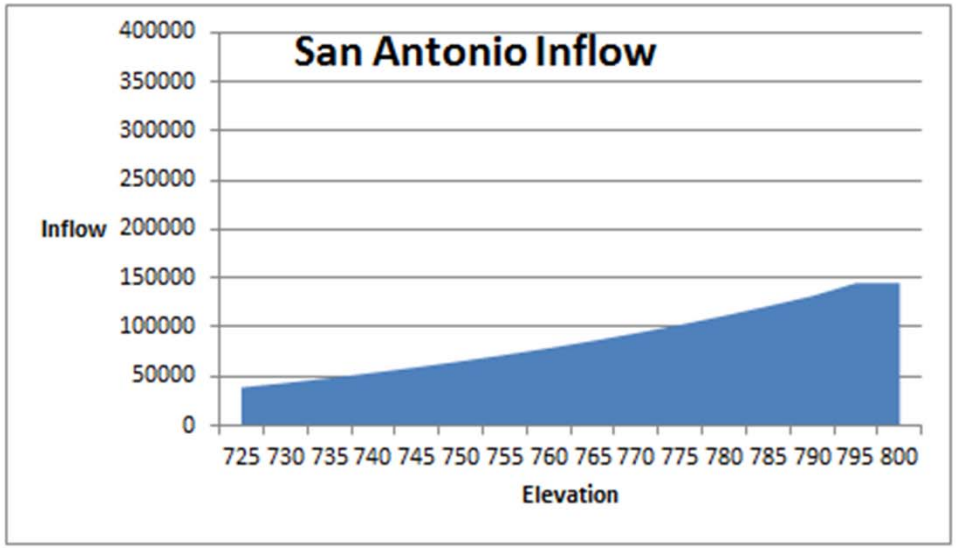
1991 tunnel studies





Concept of tunnel operations

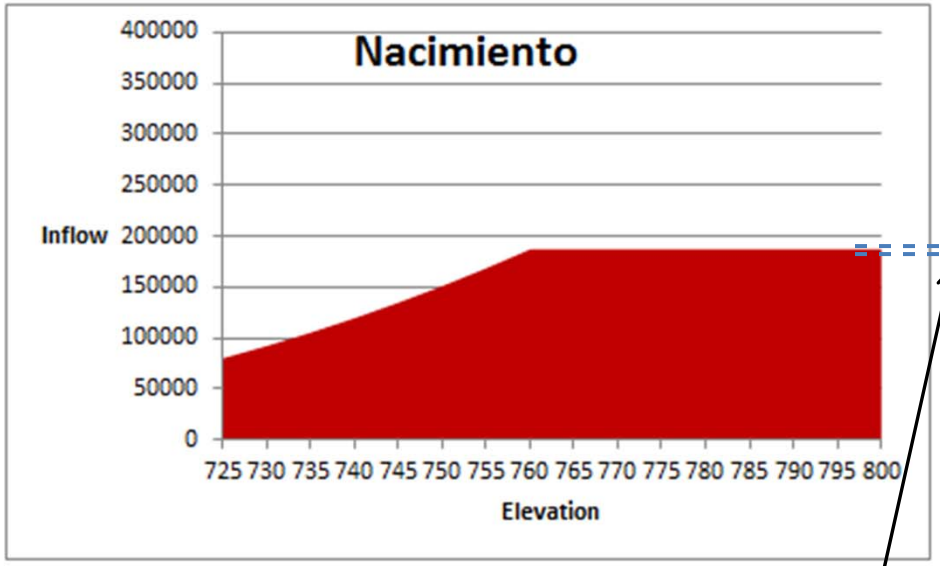


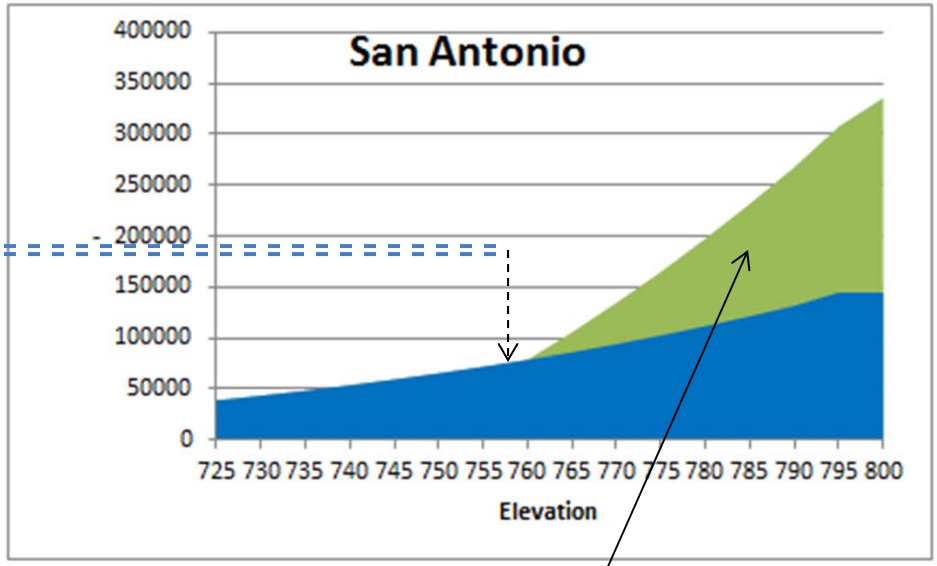


Nacimiento Reservoir Receives About Three Times More Inflow Than San Antonio Reservoir

Interlake Tunnel Transfers Water to San Antonio Reservoir

- Capturing Additional Water Otherwise Lost to Flood Control Releases
- Reducing Flood Control Releases from Nacimiento Reservoir

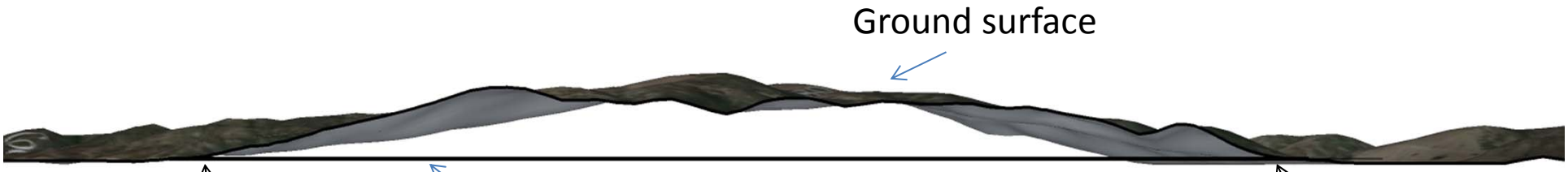




Interlake Tunnel

Captured additional water

Portals and tunnel profile (conceptual)



Nacimiento portal

Portal Elevation (TBD)
Spillway elevation ~ 800’

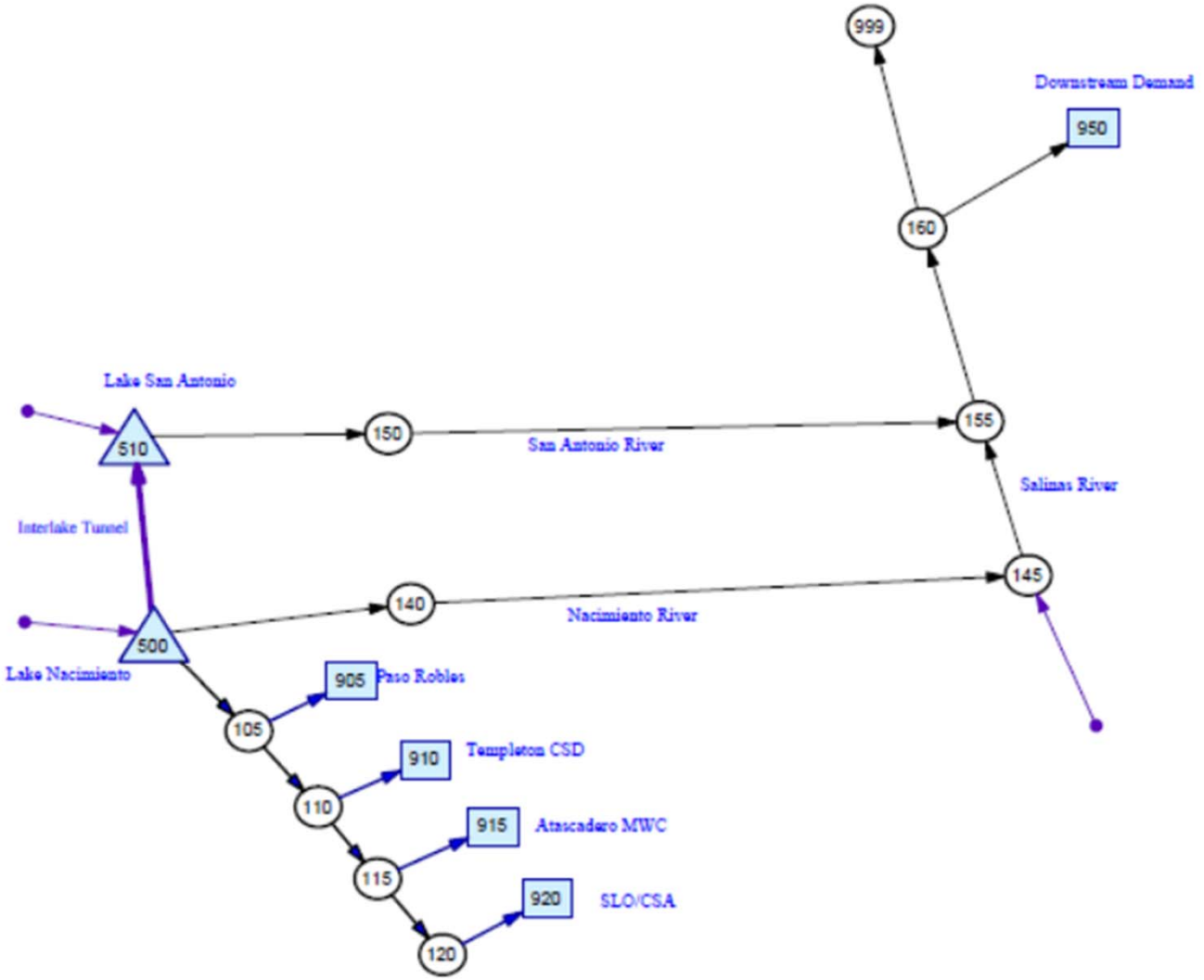
San Antonio portal

Portal Elevation (TBD)
Spillway elevation ~ 780’

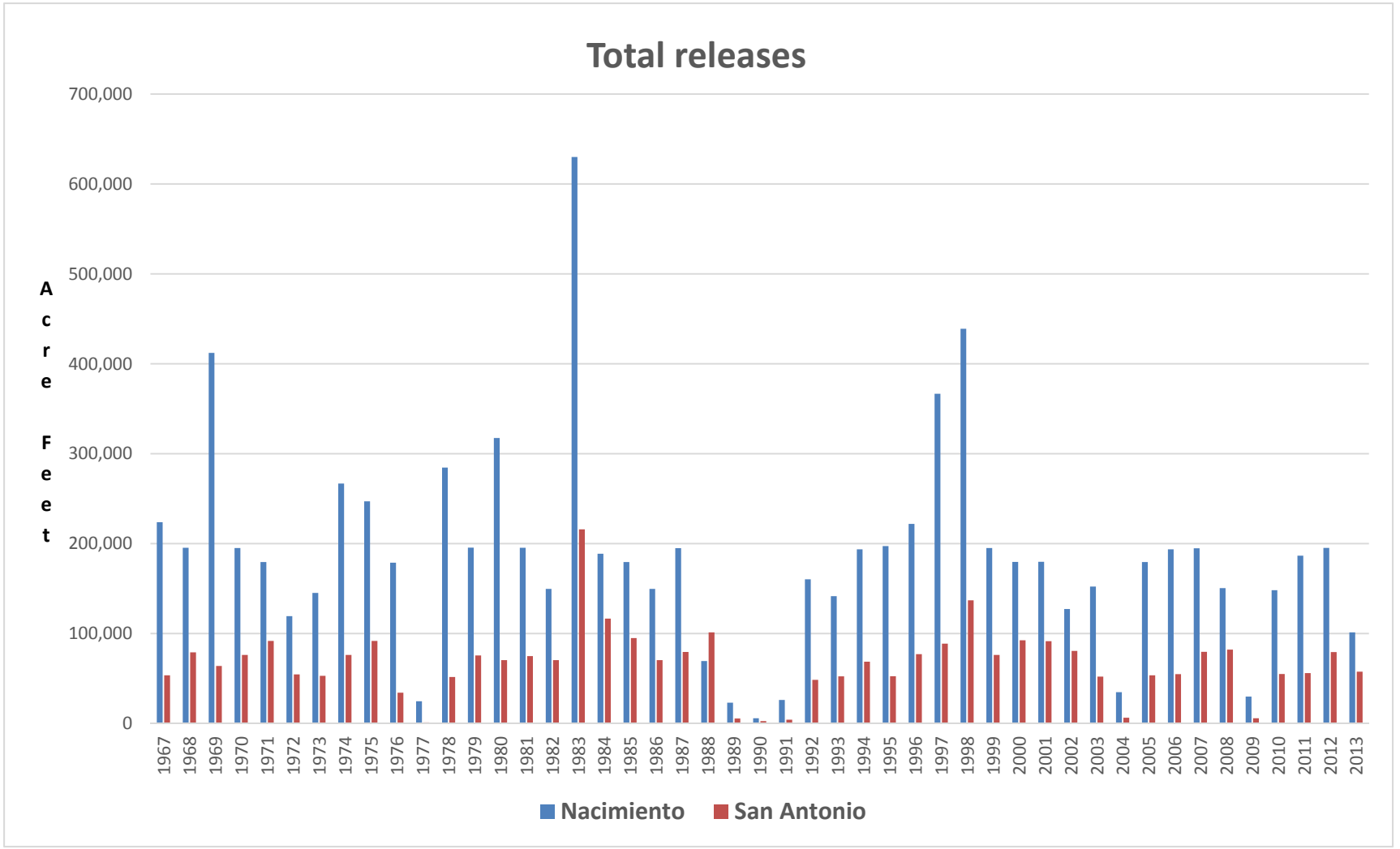
Engineering analysis performed to date

- Collection of information and data
- Preliminary feasibility assessment and data analysis
- Initial reservoir simulation modeling and tunnel concepts testing
- Identification of environmental permitting requirements
- Refinement of data
- Baseline reservoir modeling

Preliminary reservoir modeling
ECORP Consulting, Inc

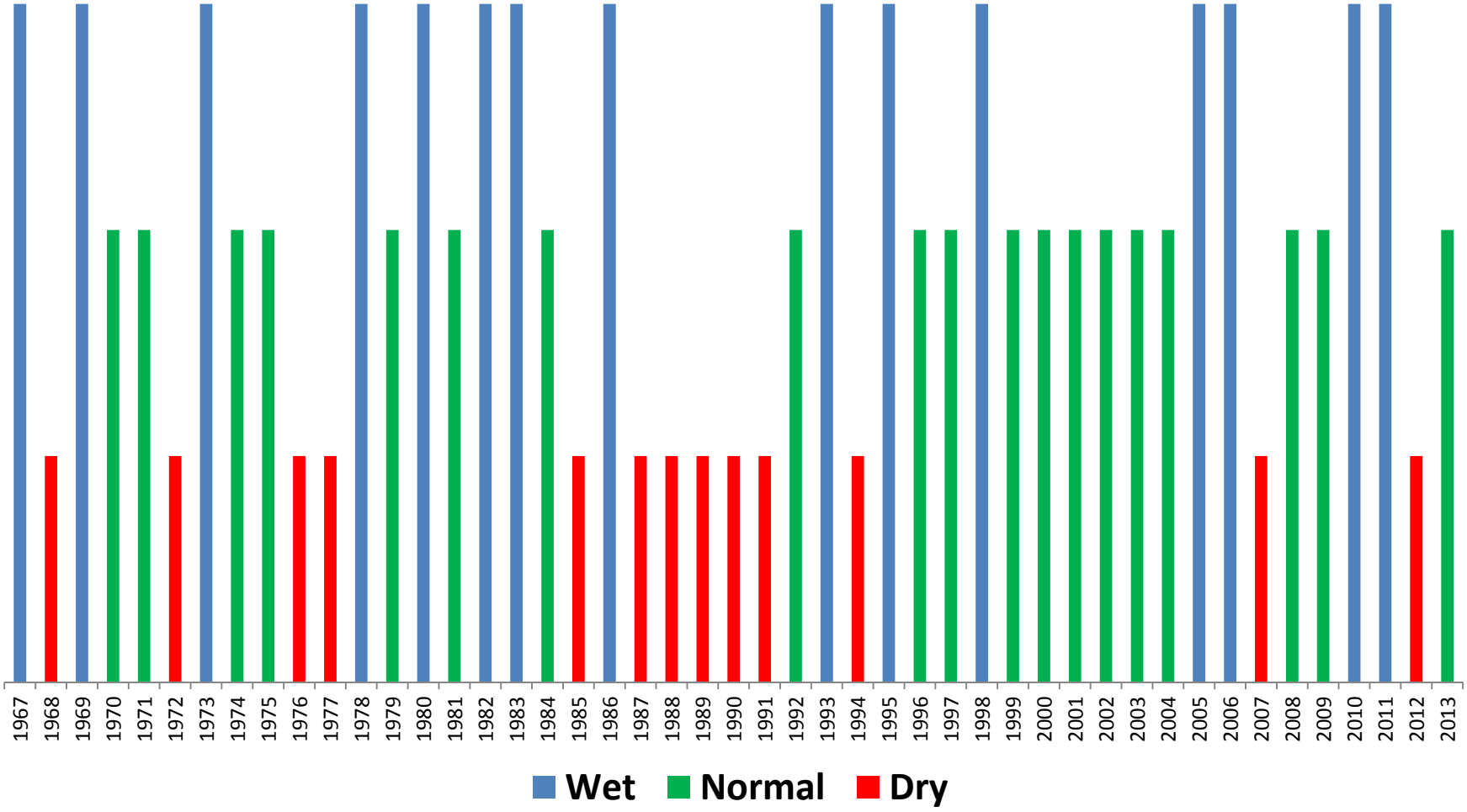


Modeled 47 year history

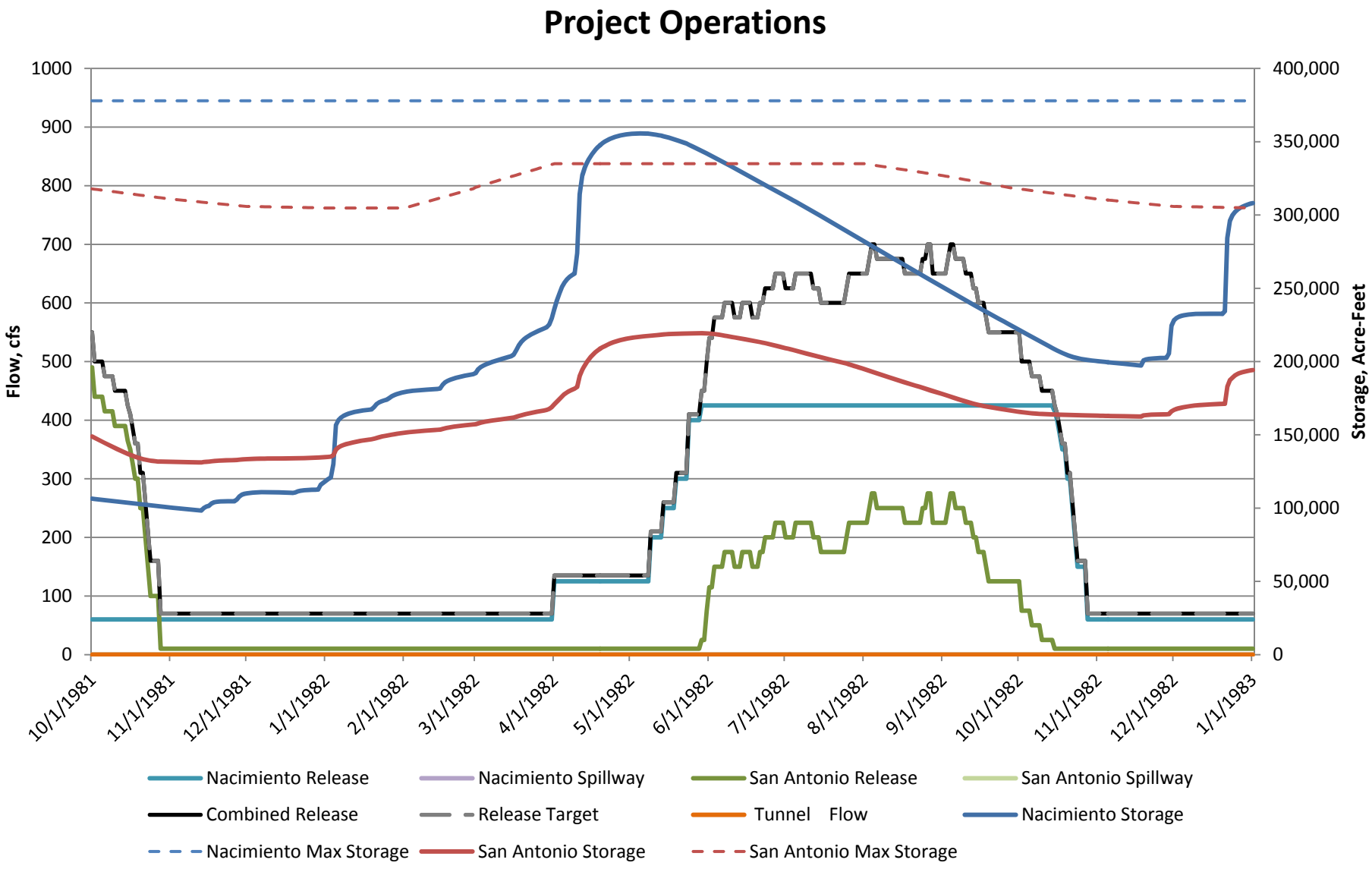


47 year water year history

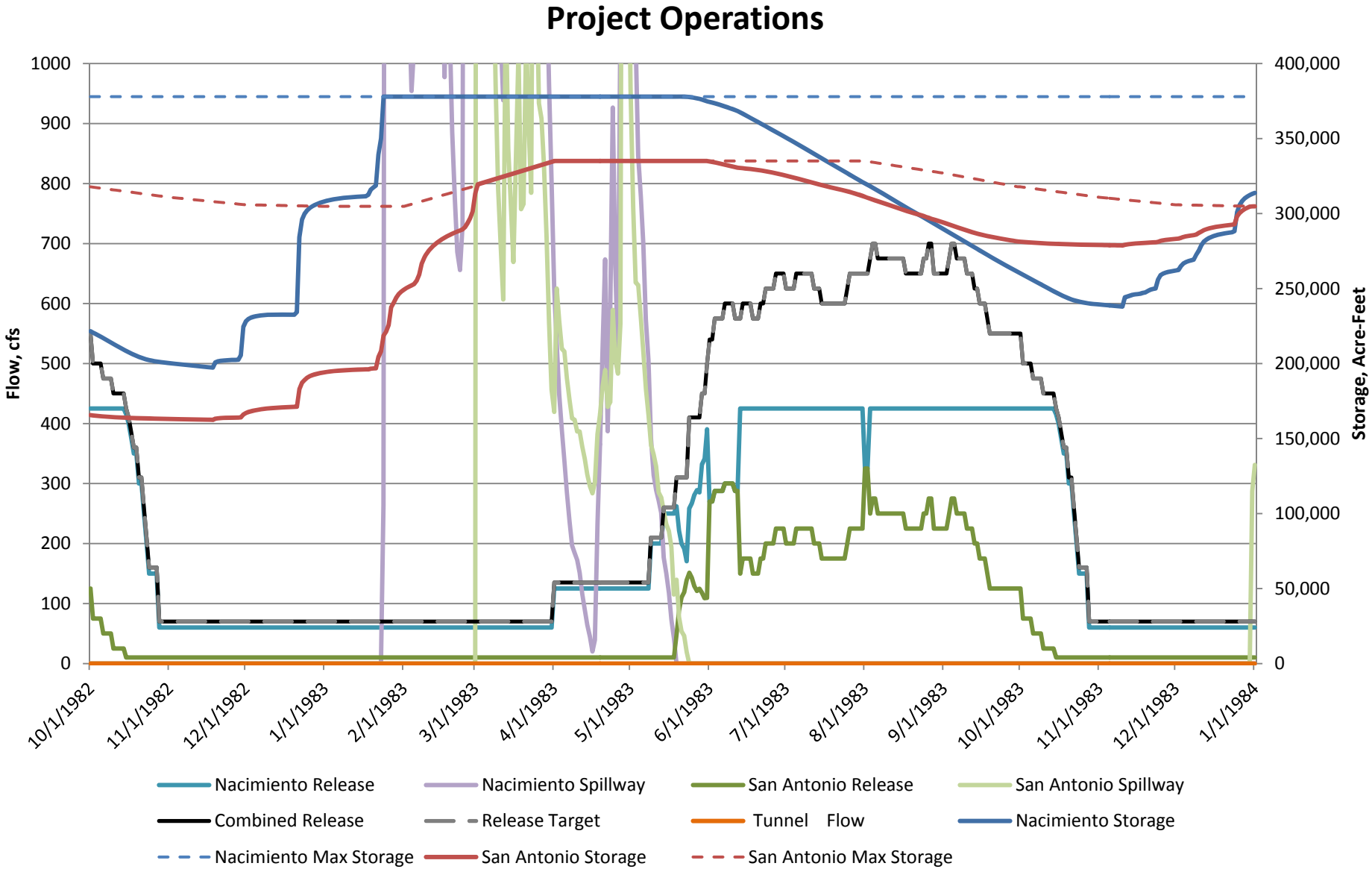
Wet	15
Normal	19
Dry	13



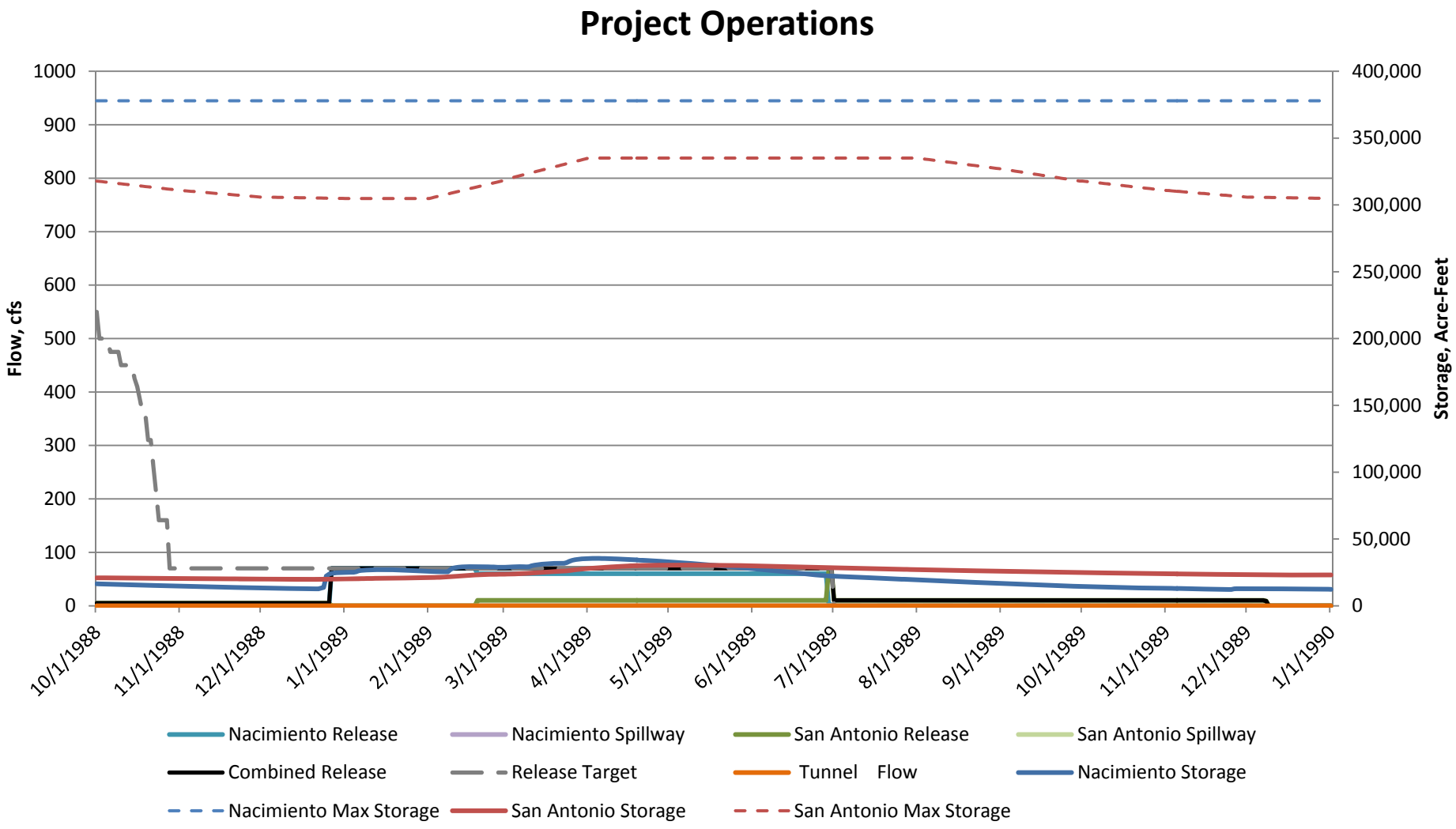
Normal year hydrograph



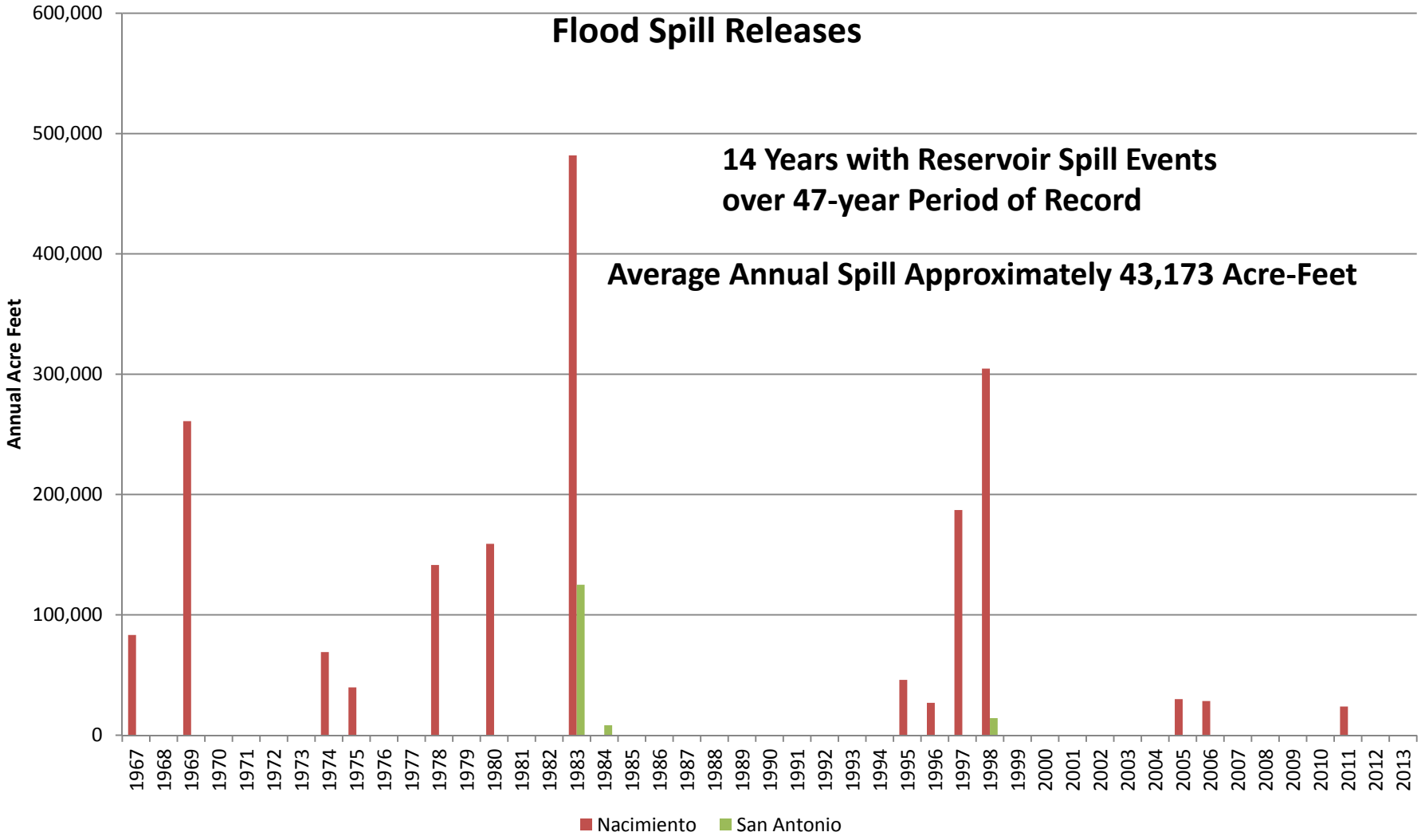
Wet year hydrograph



Dry year hydrograph



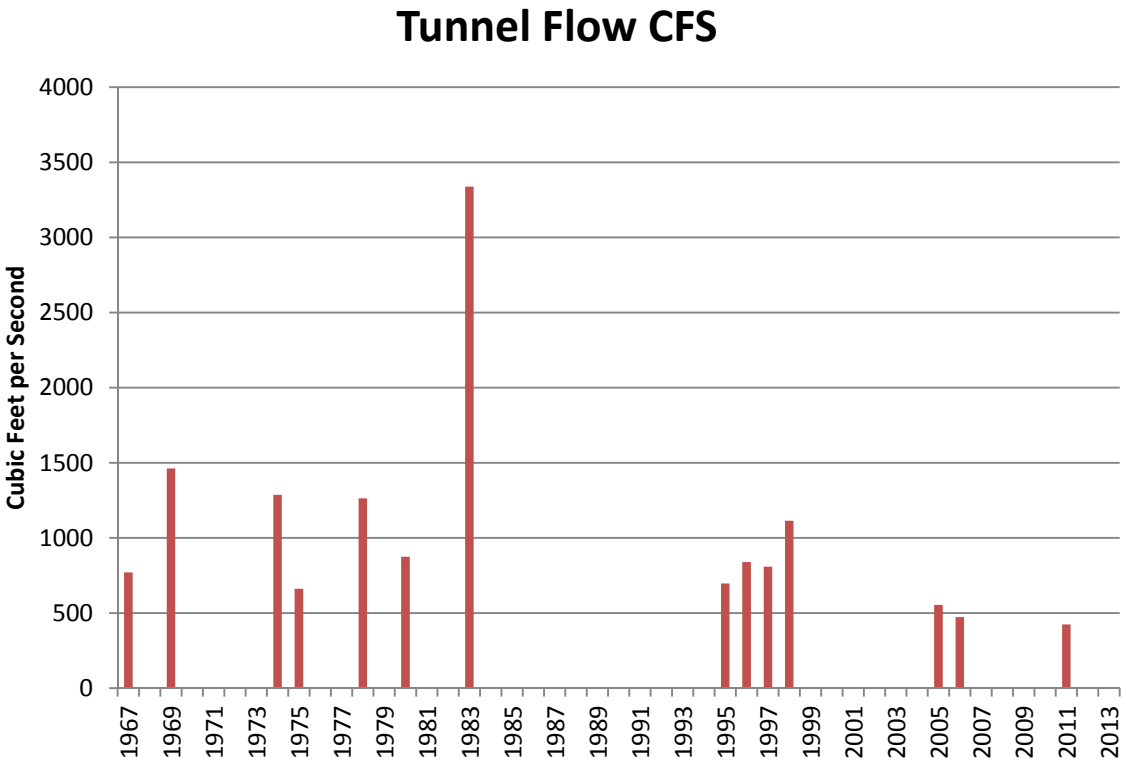
Flood releases



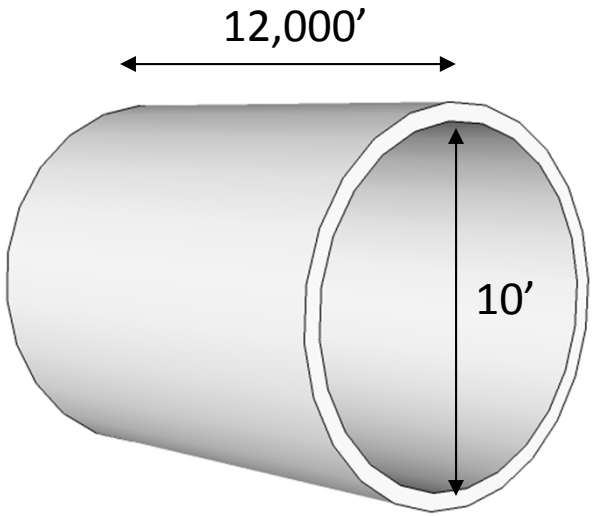
Baseline model results

Average Annual Spills, AF	**Baseline**
Total, both reservoirs	43,173
Naciamento	40,038
San Antonio	3,135
Years of spill	14

Potential Flows Available for Transfer

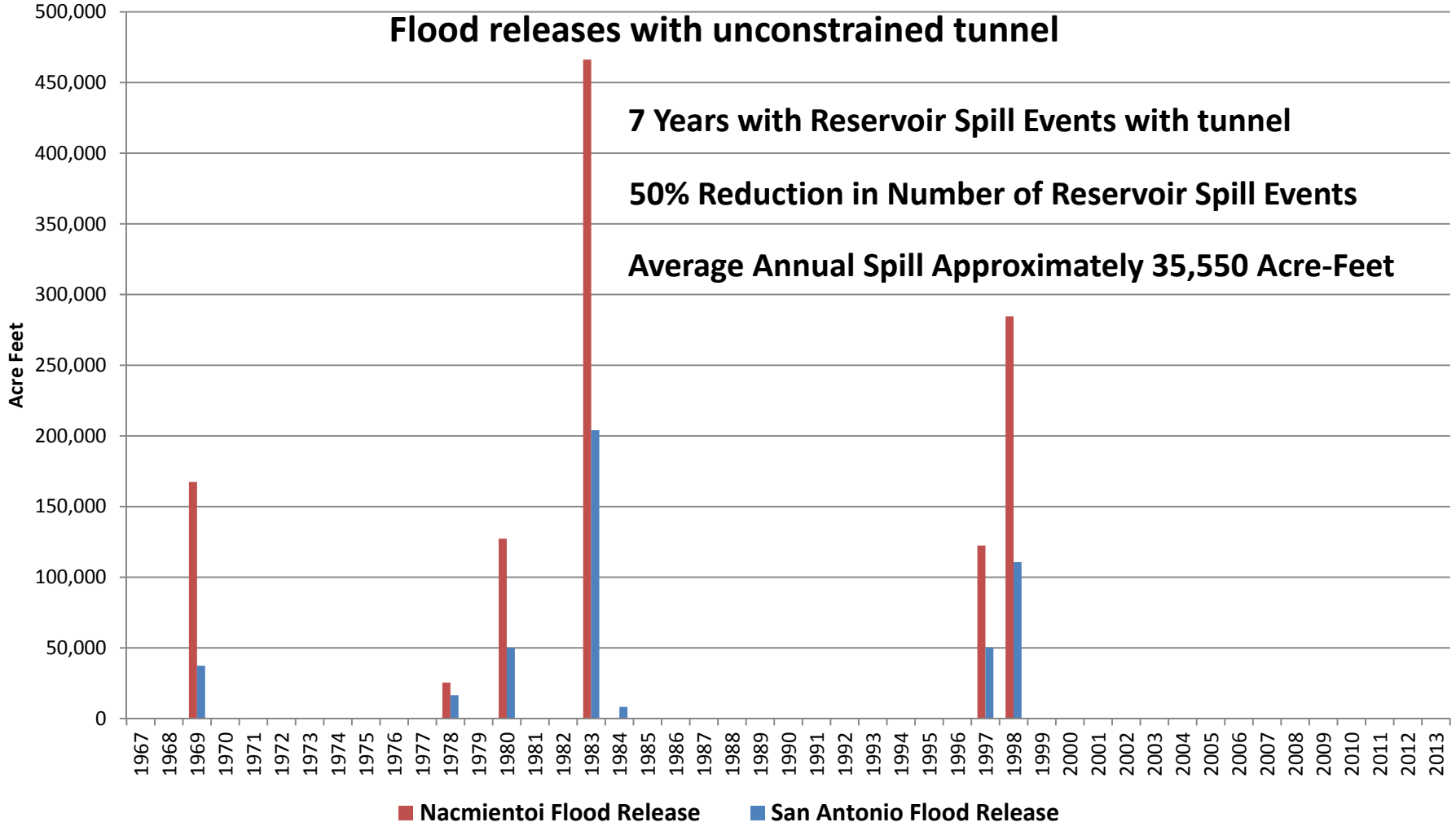


Tunnel hydraulics

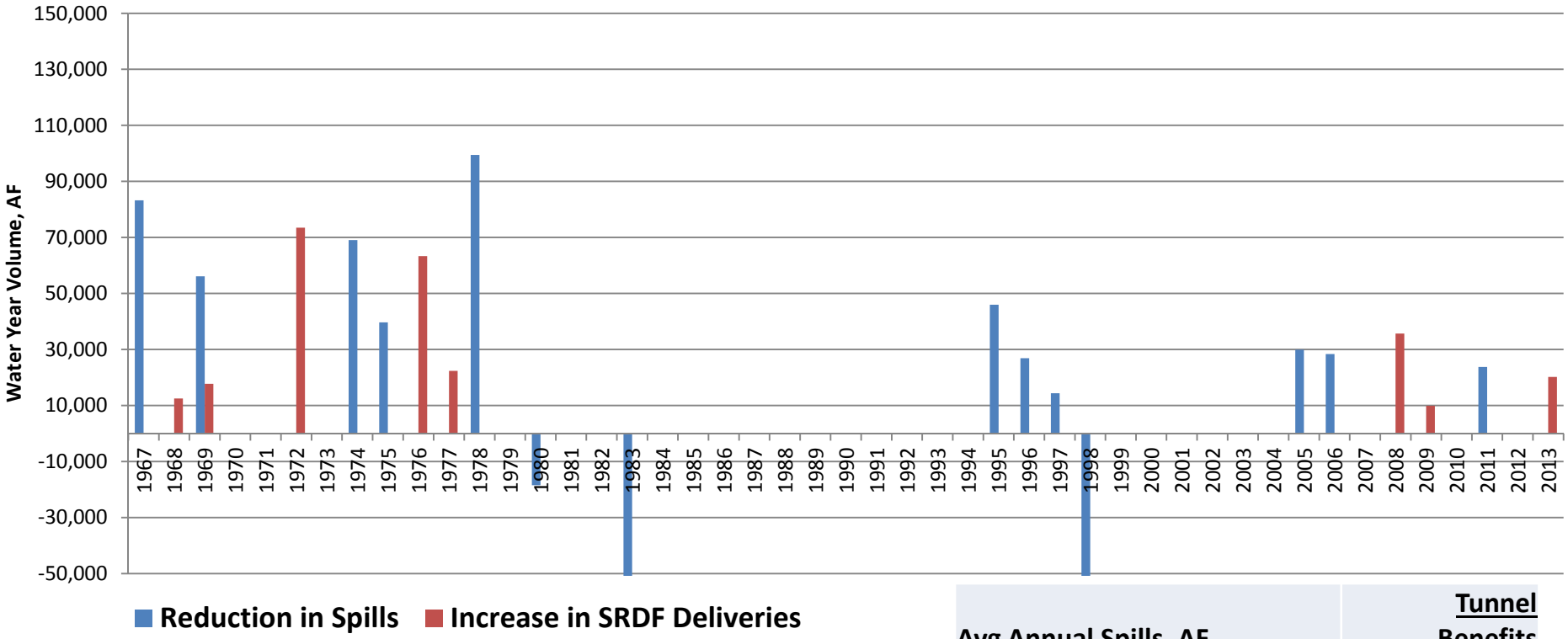


Tunnel maximum flow capacity = 1,500 CFS

Interlake Tunnel Will Reduce Number of Flood Events



Interlake Tunnel Annual Benefits, study period 1967-2013, with unconstrained tunnel



11 years with reduction in flood spills

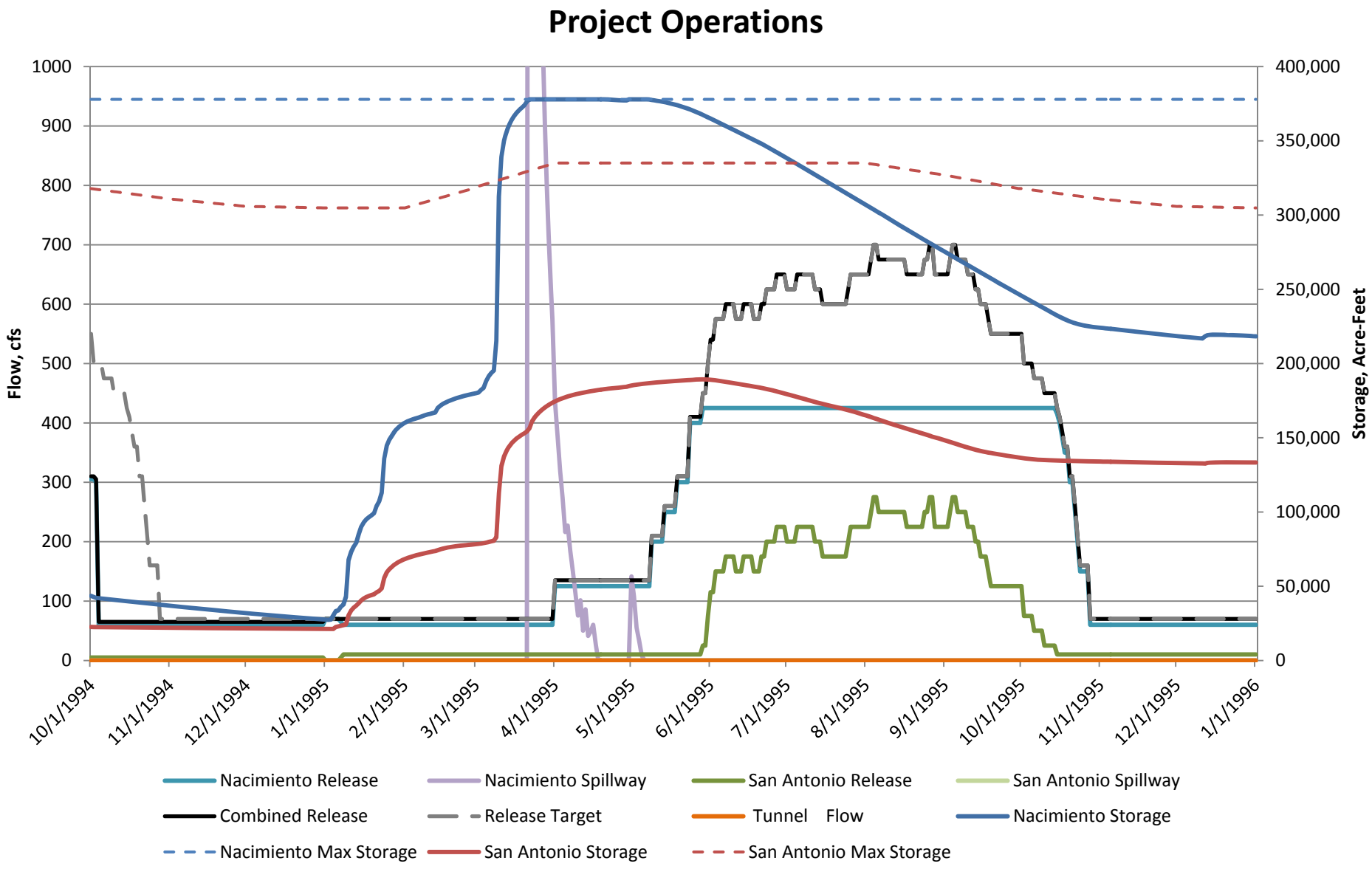
8 years with increased SRDF deliveries

Avg Annual Spills, AF	**Tunnel Benefits**
Total, both reservoirs	-7,624
Naciamento	-14,644
San Antonio	7,021
Years of spill	-7
Average Downstream Deliveries, AF	
Deliveries, All Years	5,548
Dry	14,570
Normal	3,462
Wet	0

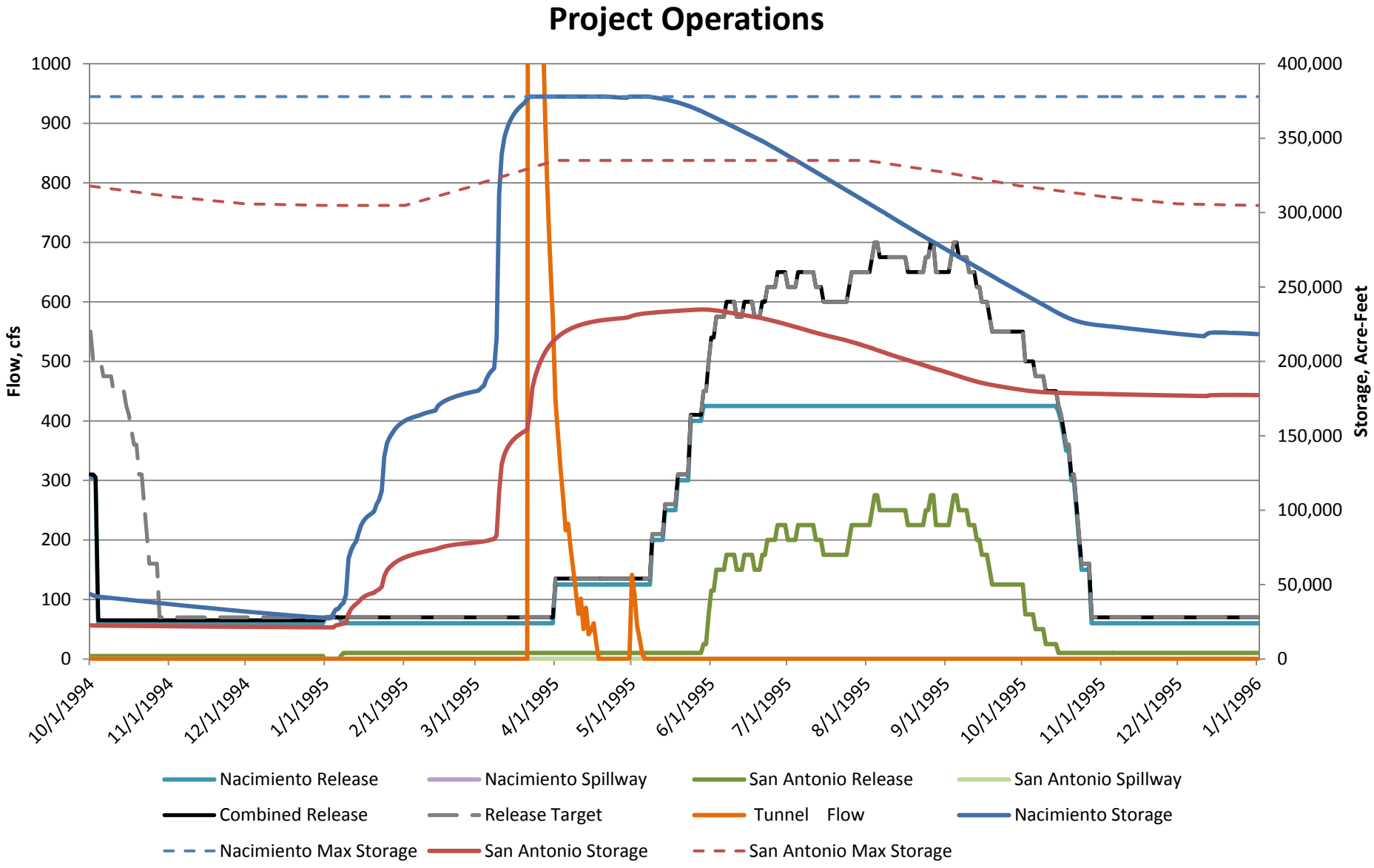
Summary

	Baseline	unconstrained tunnel	Difference
Average Annual Spills, AF			
Total, both reservoirs	43,173	35,550	-7,624
Naciamento	40,038	25,393	-14,644
San Antonio	3,135	10,156	7,021
Years of spill	14	7	-7
Average Downstream Deliveries, AF			
Deliveries, All Years	205,725	211,273	5,548
Dry	164,822	179,392	14,570
Normal	224,483	227,945	3,462
Wet	218,250	218,250	0

1995 example



1995 with tunnel



Next steps - engineering / modeling

- Hydraulic engineering analysis of tunnel options
- Iterative modeling scenarios to optimize reservoir operations and determine “sweet spot” for tunnel location, elevation, and diameter
- Preliminary engineering and development of project description

Permitting approach

- Land Use permit application with Monterey County as lead agency.
- Mitigated Negative Declaration under CEQA rules. (Federal nexus TBD)

Preliminary environmental impacts

- **Surface impacts**: minimal grading at portal sites, intake structure at Lake Nacimiento, and headwall tunnel portal structure at Lake San Antonio. Tunnel muck disposed at site near San Antonio Dam.
- **Noise impacts**: Minimal at receptors adjacent to the tunnel construction portal at San Antonio and the intake structure at Lake Nacimiento.
- **Biological impacts**: TBD. Related to water diversion from Lake Nacimiento to Lake San Antonio.
- **Paleontological impacts**: TBD. Impact zone at tunnel portals only.
- **Geologic/Seismic Hazards**: TBD
- **Water resources/Flooding impacts**: TBD. All water rights and water discharge agreements will not be affected. Project assists with flood control.
- **Recreational /Public Facilities impacts**: TBD

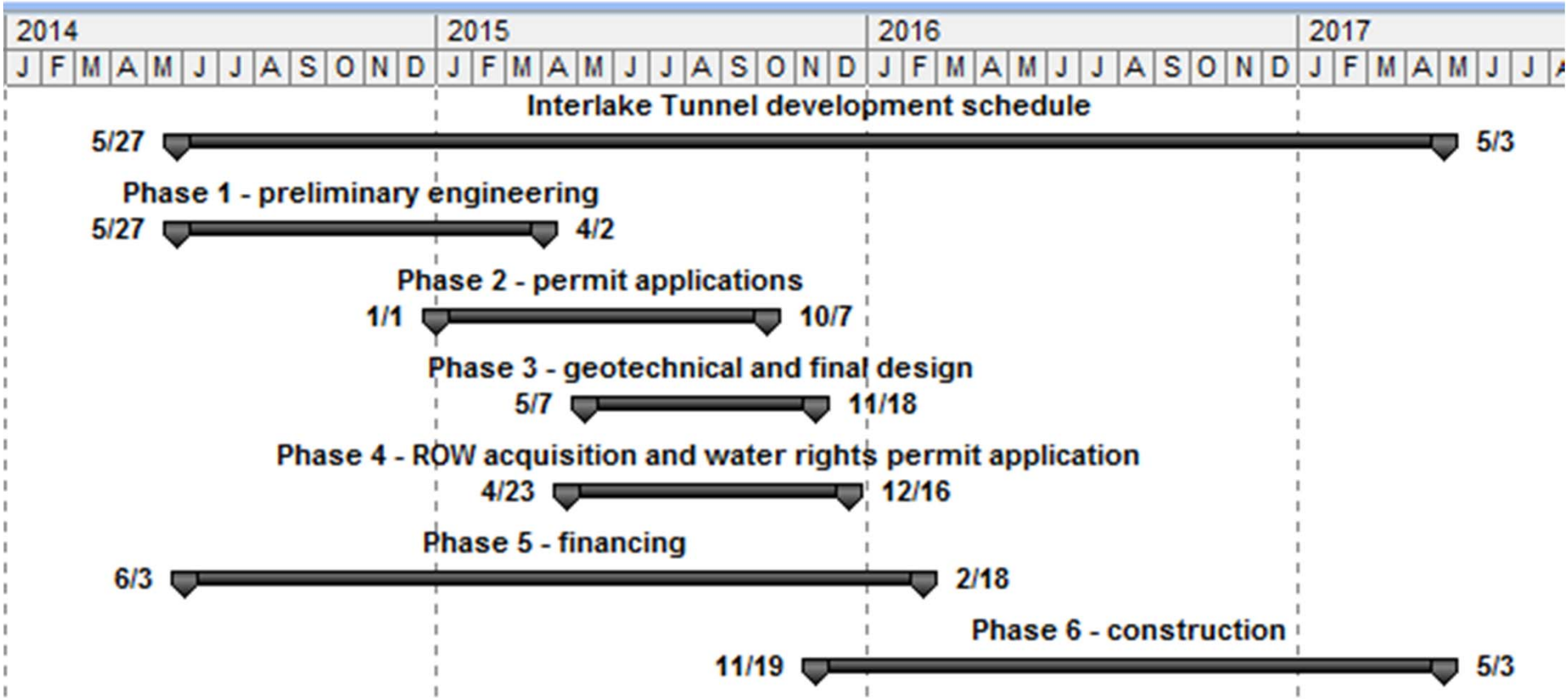
No impacts expected relative to:

- Aesthetics/visual resources
- Agricultural resources
- Air Quality
- Cultural resources
- Energy
- Fire Protection
- Hazardous materials
- Historic resources

Preliminary biological impacts

- White bass – predator sport fish prohibited from export (alive) from Lake Nacimiento
- Quagga and Zebra Mussels transfer from Nacimiento to San Antonio
- mercury in Lake Nacimiento
- Bald eagle habitat
- Downstream releases to maintain steelhead migration (NOAA Fisheries)

Project schedule



Procurement of services

- Environmental consultants (Jan – Mar 2015)
- Final design consultants (May – July 2015)
- Contractor (Nov 2015 – Mar 2016)

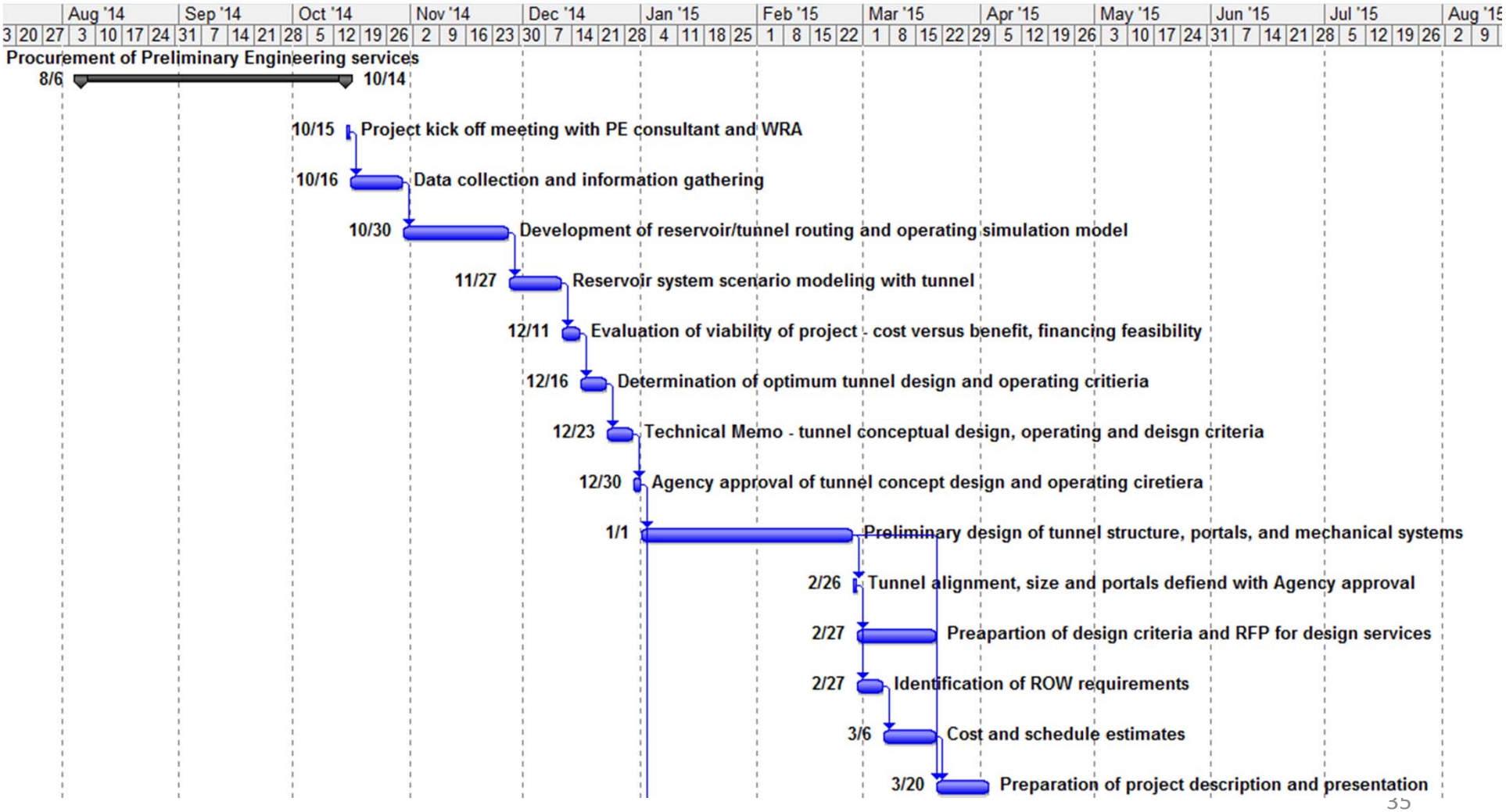
Project Budget

Description	Current Forecast
Phase 1 - preliminary engineering	$317,461.40
Phase 2 - permit applications	$341,600.00
Phase 3 - geotechnical and final design	$939,600.00
Phase 4 - ROW acquisition / water rights permit	$208,000.00
Phase 5 - financing	$250,000.00
Phase 6 - construction	$17,412,000.00
Program Management & Constructon Management	$3,528,909.52
Contingency	$3,400,000.00
Total	**$26,397,570.92**

3 month look ahead

Preliminary Engineering

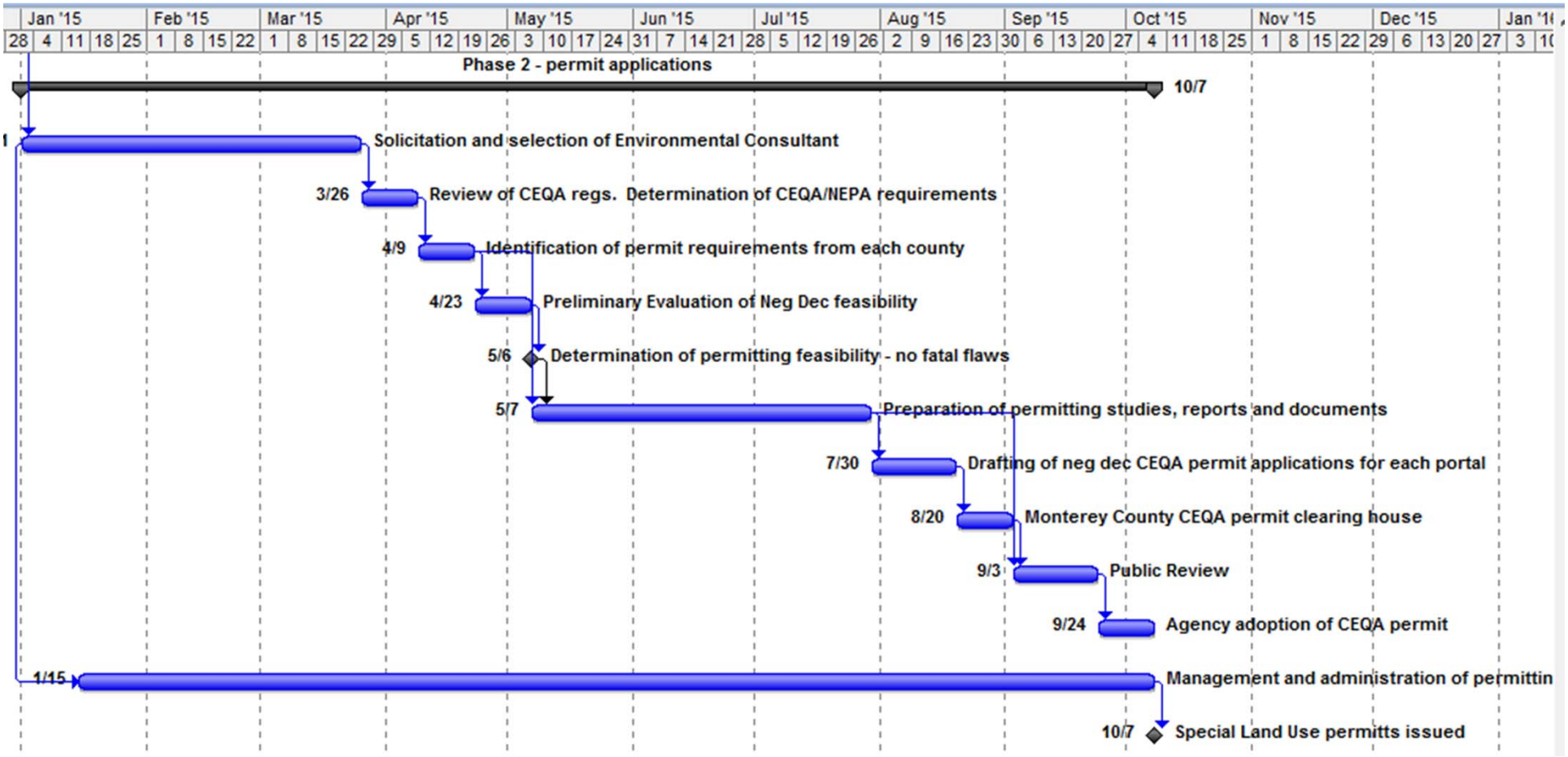
Project Description



Permitting schedule

Environmental studies

CEQA Neg Dec Application



Questions

- What is the solution to the white bass problem?
- Will the lake levels be lower with the tunnel?
- How do you stop the transgression of mussels to Lake San Antonio?
- How do you protect the tunnel from intruders (people and animals)?
- How do you prevent bio fouling (mussels clogging the tunnel).
- How do you build the tunnel when lake levels are high?
- How and when will the tunnel operate?
- What are the seismic concerns for the tunnel and potential for collapse?
- How will power production at the Nacimiento Hydroelectric plant be affected?