Total Dissolved Gas (TDG) Abatement

Avista's Solution for TDG Reduction on the Spokane River

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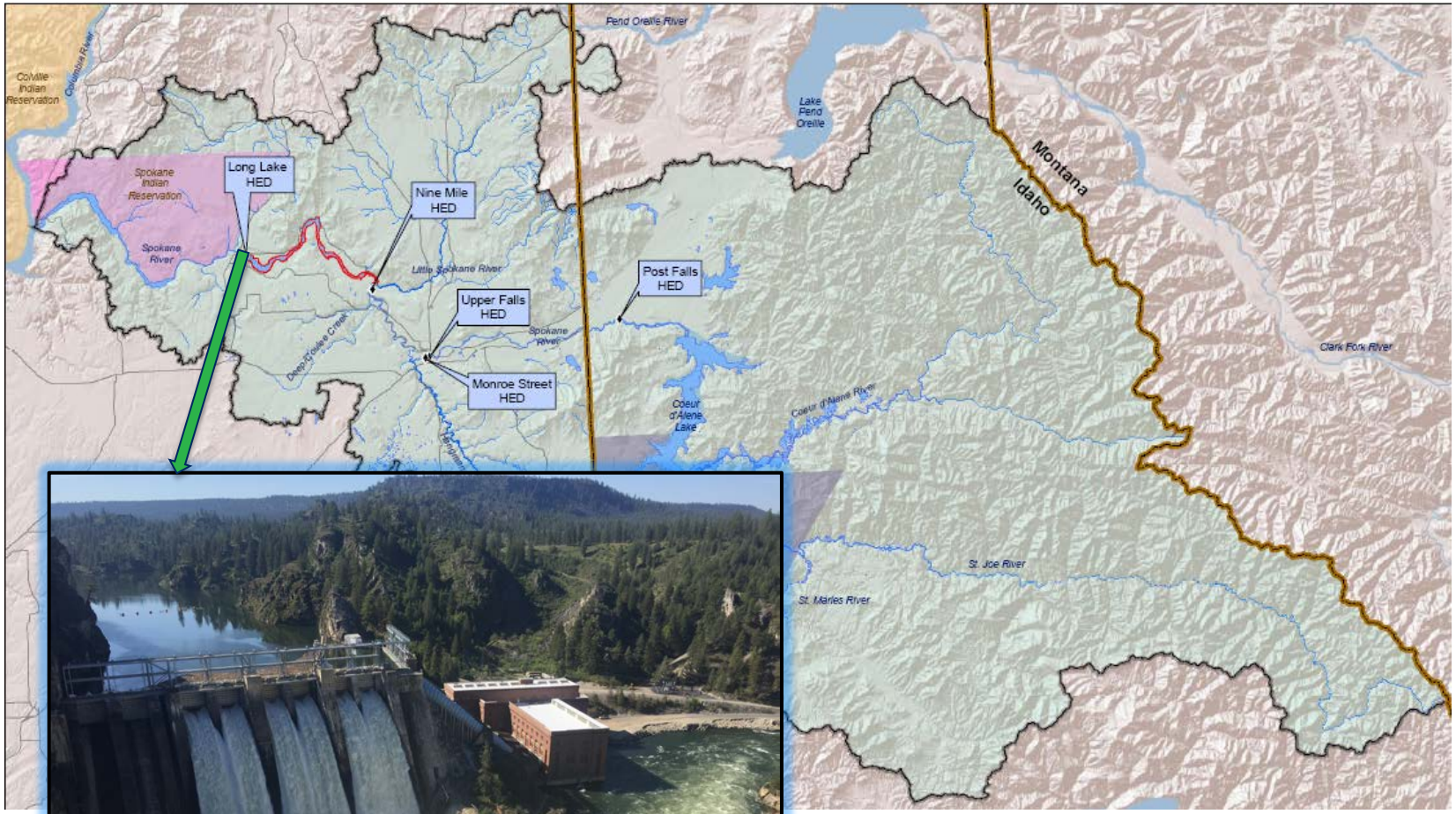
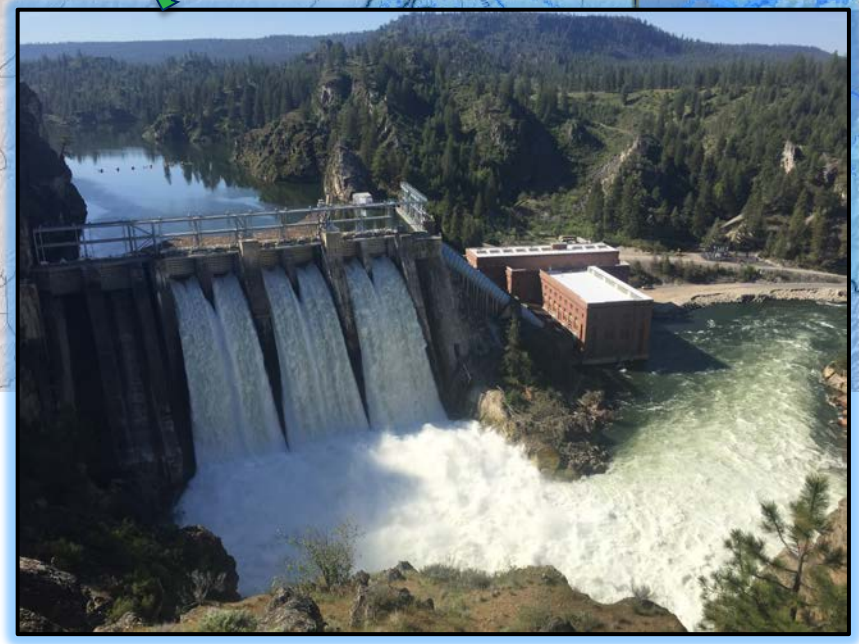
May 17, 2017

Spokane River Watershed





Long Lake HED

Total Dissolved Gas Regulation

DEPARTMENT OF ECOLOGY
State of Washington

WAC 173-201A-200

7Q10

25,200 CFS

TDG Baseline Testing

2003-2004 Spill Season

6,300 cfs Spill

Single gate - 130’s % saturation

5,000 cfs Spill

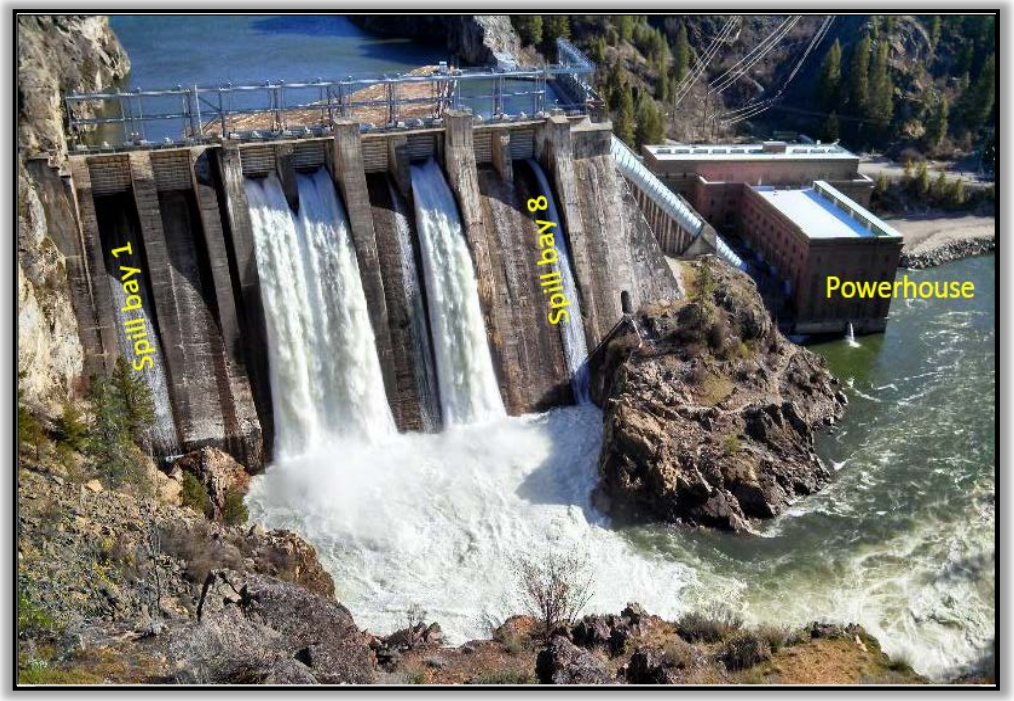
Multiple gates - 120’s % saturation

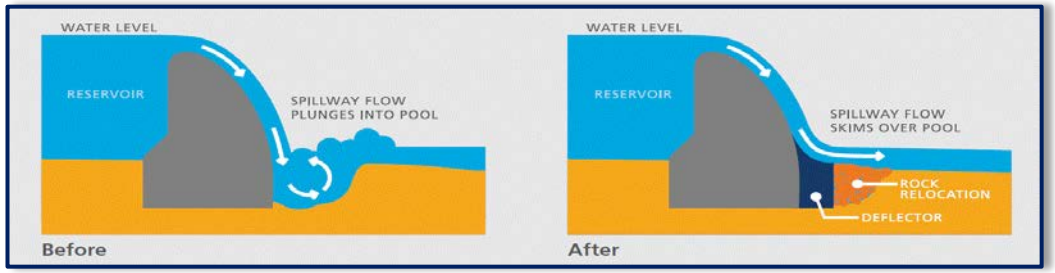
TDG Reduction Alternatives (2006)

- Spill Bay 7-8 Toe Deflectors *
- Spill Bay 7-8 Elevated Spillway Extension
- Spill Bay 1-2 Toe Modification w/ Deflector
- Cut of Dam Chute Spillway
- New Second Powerhouse
- Stepped Spillway *
- Spillway Splitters *

* Alternatives that were physically modeled (NHC)

Project Background





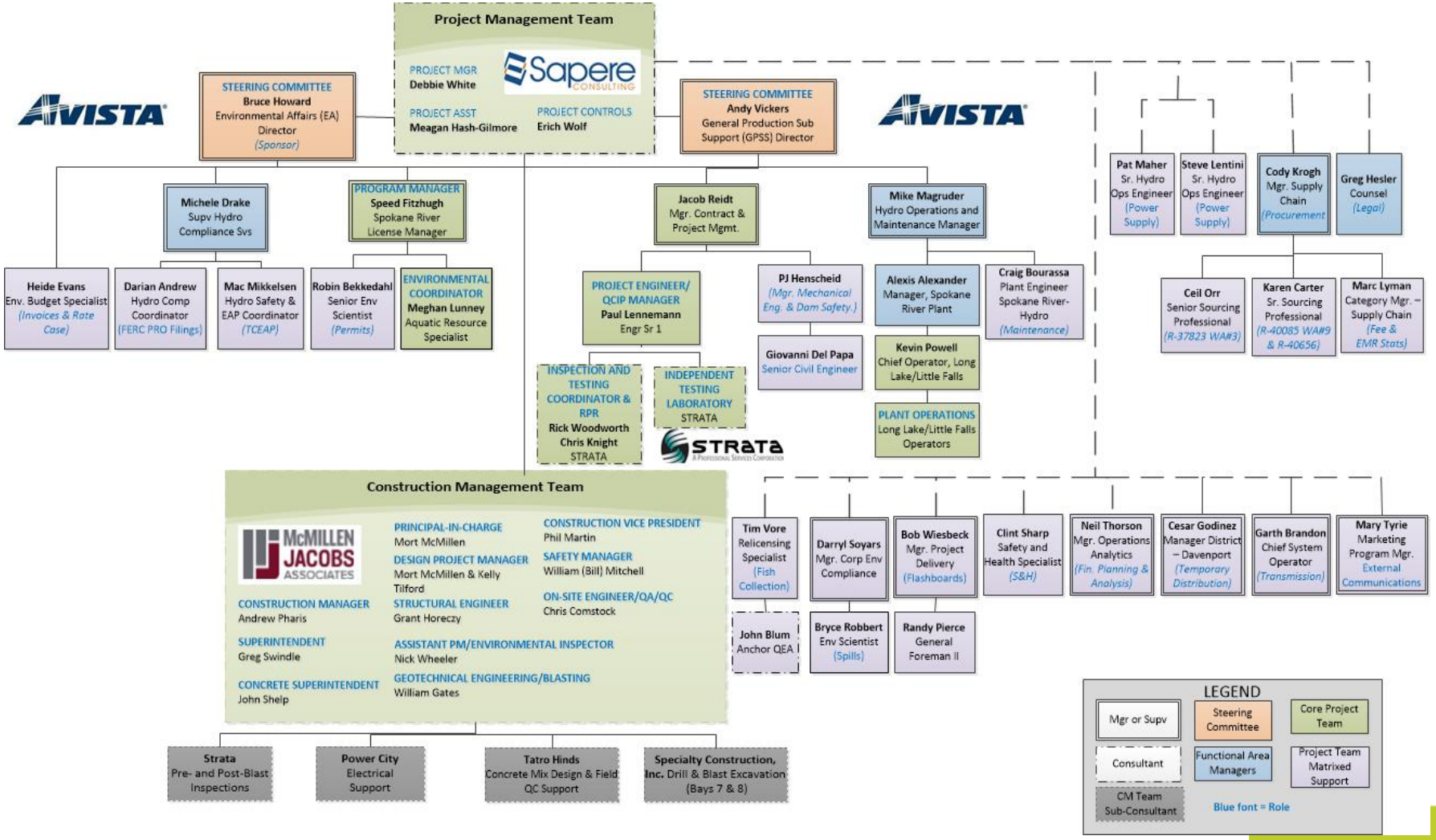
Key Project Complexities

- 100-year old structure;
- Limited footprint for equipment;
- Remote location with limited delivery and communication services;
- Limited flexibility in location of temporary road to dam;
- Power to construction site with temporary river crossing;
- Construction completion necessary in a single season;
- 20 permits with federal, state, tribal & local agencies; and
- Largely conceptual, except for deflector design.

Planning/Management

- Guaranteed Maximum Price (GMP) contract
- Planning component conducted before construction contract awarded
  - Integrated project team
  - Risk registry development
  - Mitigation planning

Integrated Project and Core Team



Risk Registry Development

- Expected conditions
- Potential deviations
- Technical implementation impact
- Cost impact
- Schedule impact
- Time to respond
- Probability of occurrence (high/moderate/low and %)

RISK IDENTIFICATION			RISK EVALUATION				
Risk #	Expected Conditions	Potential Deviations	Technical Implementation Impact	Cost Impact	Schedule Impact	Time to Respond	Probability of Occurrence
10	Expect quantity of onsite borrow material to be sufficient for all fill requirements of our proposed plan.	Insufficient borrow material onsite for fill requirements of our proposed plan requires import of material.	Import material.	$18/cy delivered price for up to 20,000 cy	Up to 8 days delay	Immediately. Adjustment to hauling procedures and source availability	Low 20%

~20 identified project risks

>$6M when cost impact column summed

Project Execution

Staging/Mobilization — APR, MAY, JUN, JUL

- Mobilization from Boise
- Laydown yard/staging area
- Mile long access road
- Temporary electrical distribution

(Maintenance Projects)

In-Water Work — JUL, AUG, SEP, OCT, NOV

- Access in river
- Dewatering
- Blasting
- Spillway demolition
- 500,000 lbs of rebar
- 5,000 cy of concrete
- Plunge pool fill
- Restoration of river

(Right Abutment)

Restoration — NOV, DEC

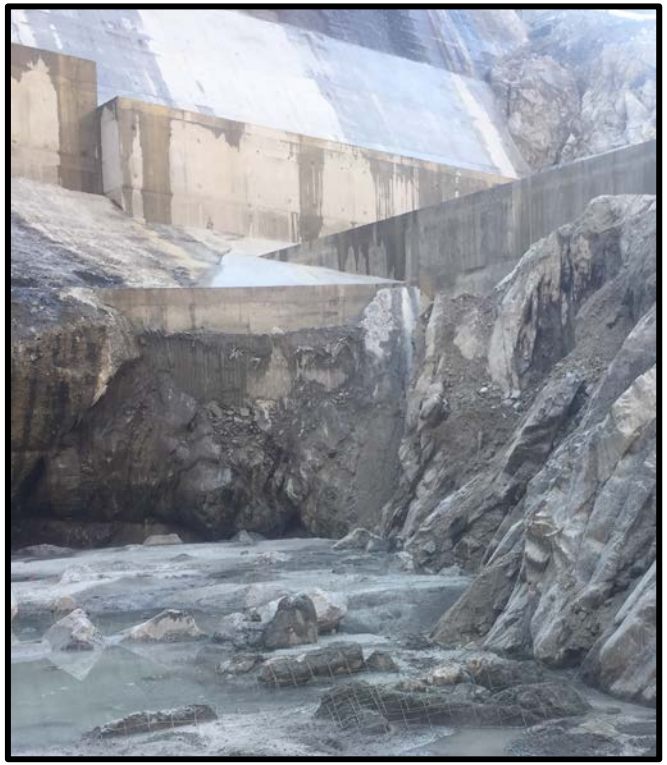
- Remove power
- Remove road
- Contour/reclaim
- 3,000 plants
- Trailhead parking

Construction Progress

Left Abutment

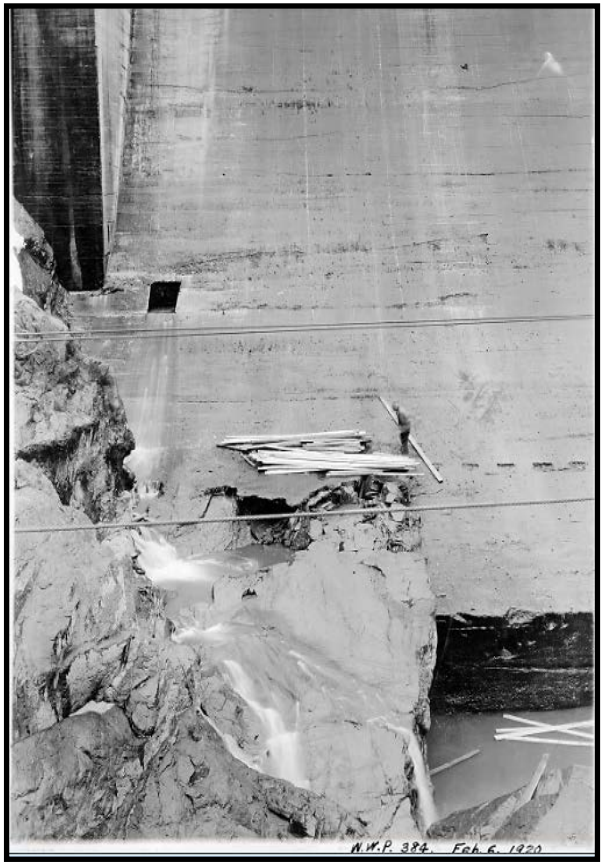
1920

2016



Right Abutment

1920



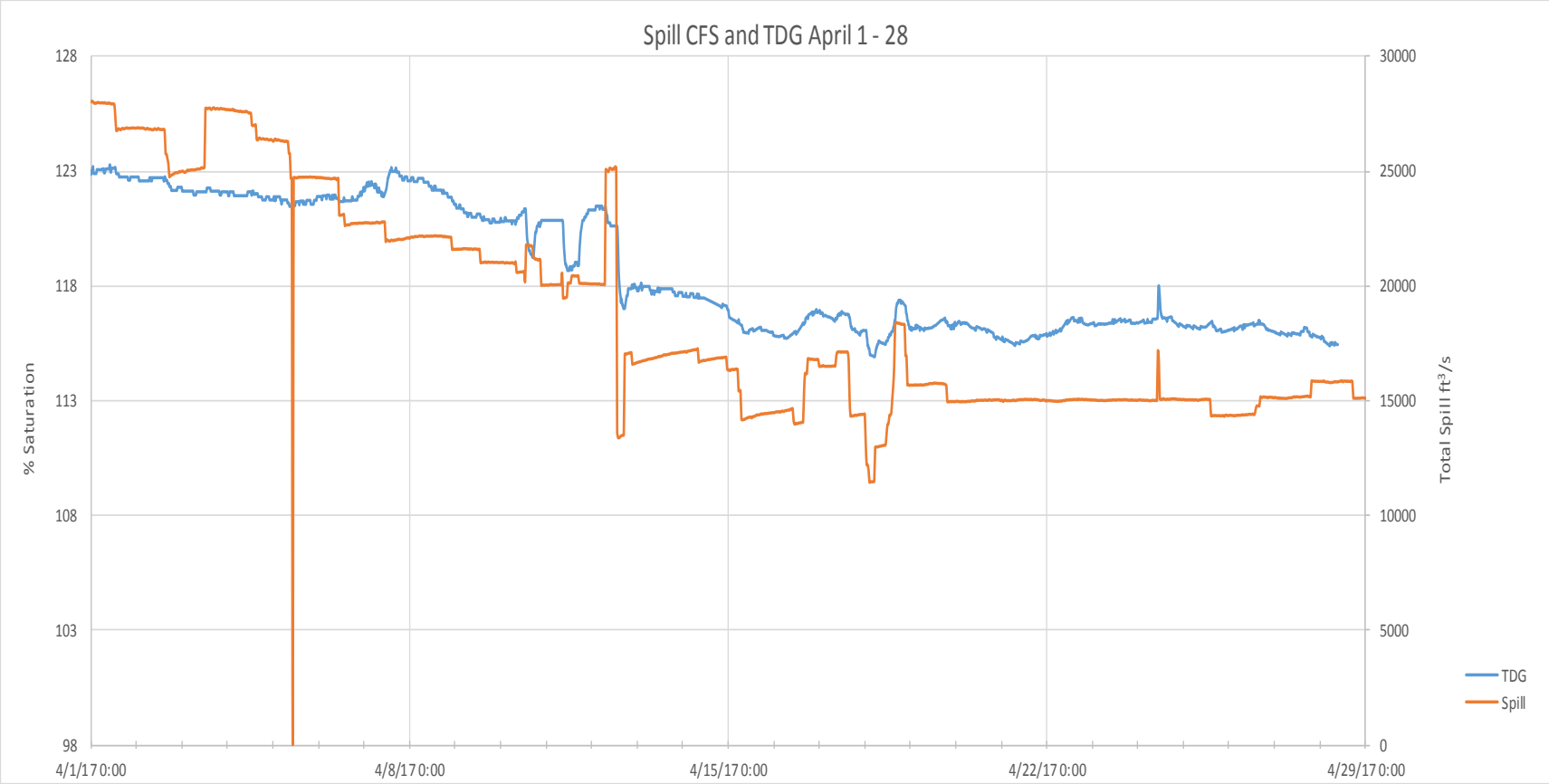
2016

Spillway

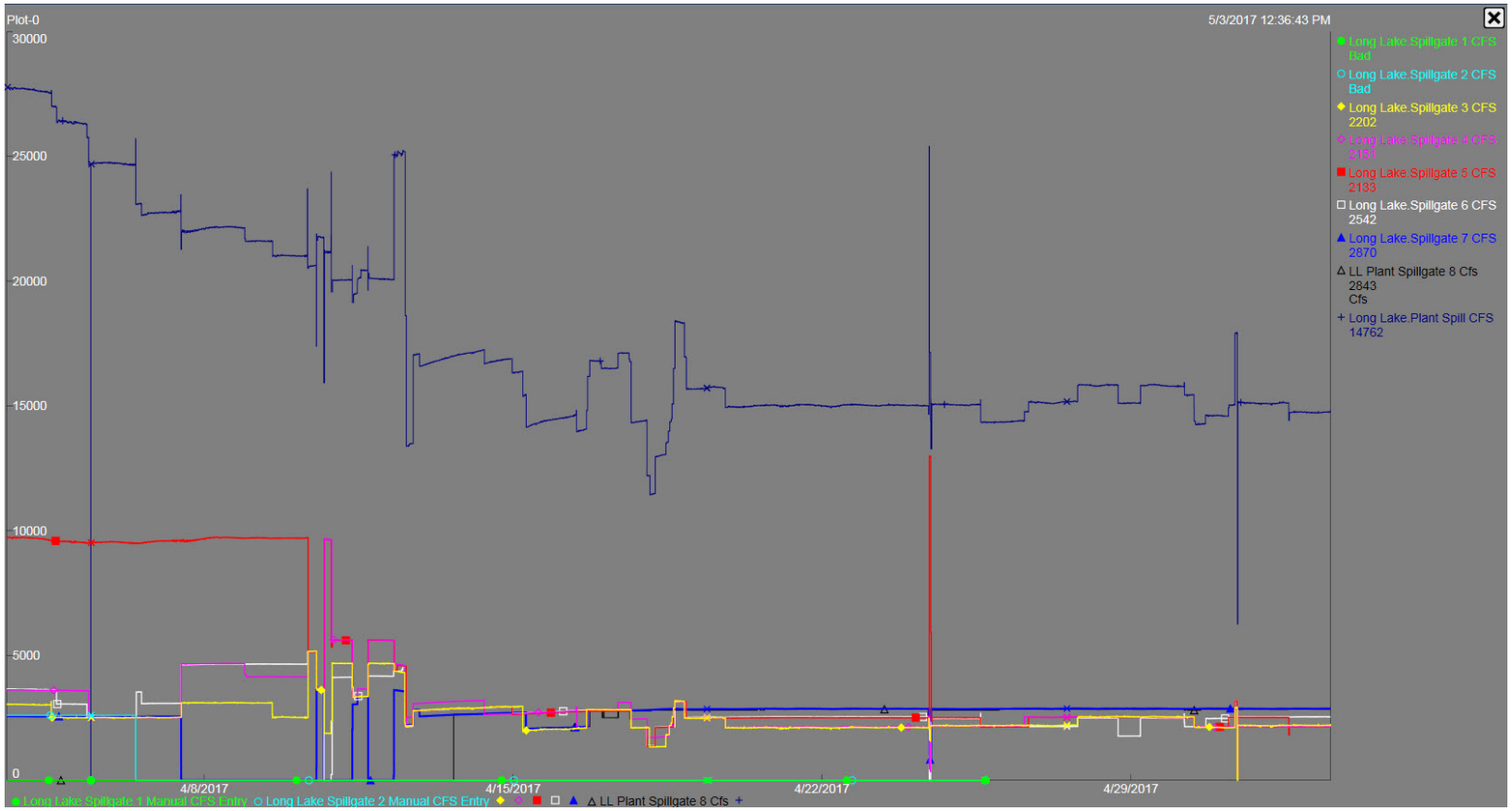
Spillway Flow

AVISTA

TDG Reduction Results



TDG Reduction Results



Thank you