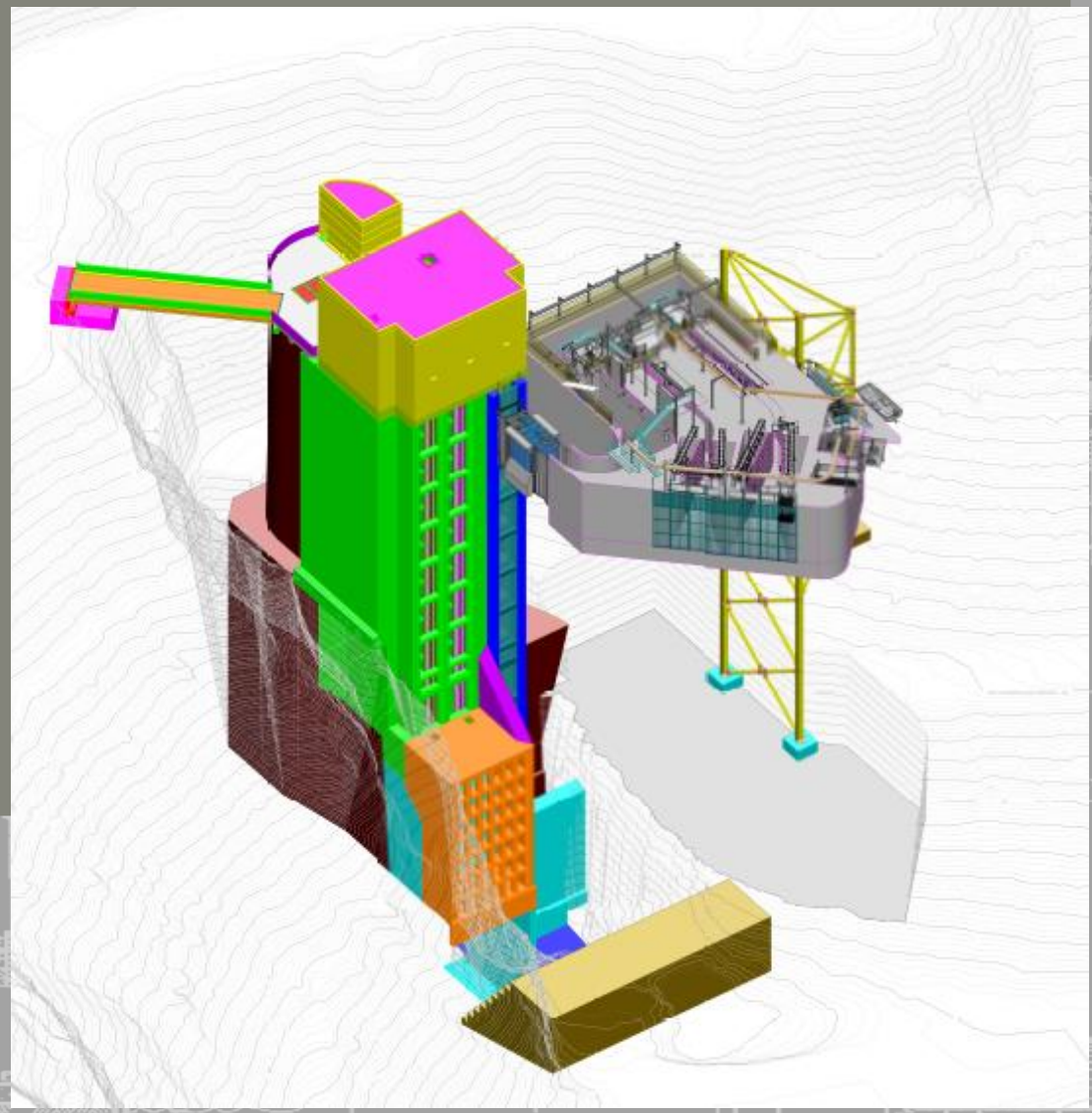
COUGAR DAM DOWNSTREAM FISH PASSAGE
WFFDWG REVIEW OF 90% DDR AND EA

Chris Budai, Jeremy Britton, Ryan Souders, Scott Fielding,
Kelly Janes, and Marie Phillips
Portland District
6 November 2018



AGENDA

90% DDR review timeline

- WFFDWG review period: 11/5 – 11/30
- Comment response, DDR update, and back-checks period: 12/3 – 12/31

Today's purpose

- Introduce the 90% DDR and EA to WFFDWG to improve the review process.

Presentation outline

1. Overview of project features, with focus on changes/progress since 60%.
2. FSS physical model.
3. Follow flow, fish, and debris through system.
4. Fish release site.
5. EA highlights.

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1. OVERVIEW OF PROJECT FEATURES

- Drawing volumes.
- Pods for fish transport (Ryan will describe during follow the fish).
- Naval architecture concept design.
- FSS to WTCT hydraulic connection.
- Closure of penstock bypass.
- Geotechnical explorations – SOR for December and January.
- Consideration of North Sunnyside site for FSS assembly and launch.
- Flexibility for potential future piped bypass.

DRAWING VOLUMES

VOLUME	DESCRIPTION
01	GENERAL
02	ANCILLIARY SITES
03	WATER TEMPERATURE CONTROL TOWER, (WTCT), STRUCTURE MODIFICATIONS
04	FSS DOCKING AREA
05	FLOATING SCREEN STRUCTURE, (FSS)
06	FLOATING CUP STRUCTURE, (FCS)

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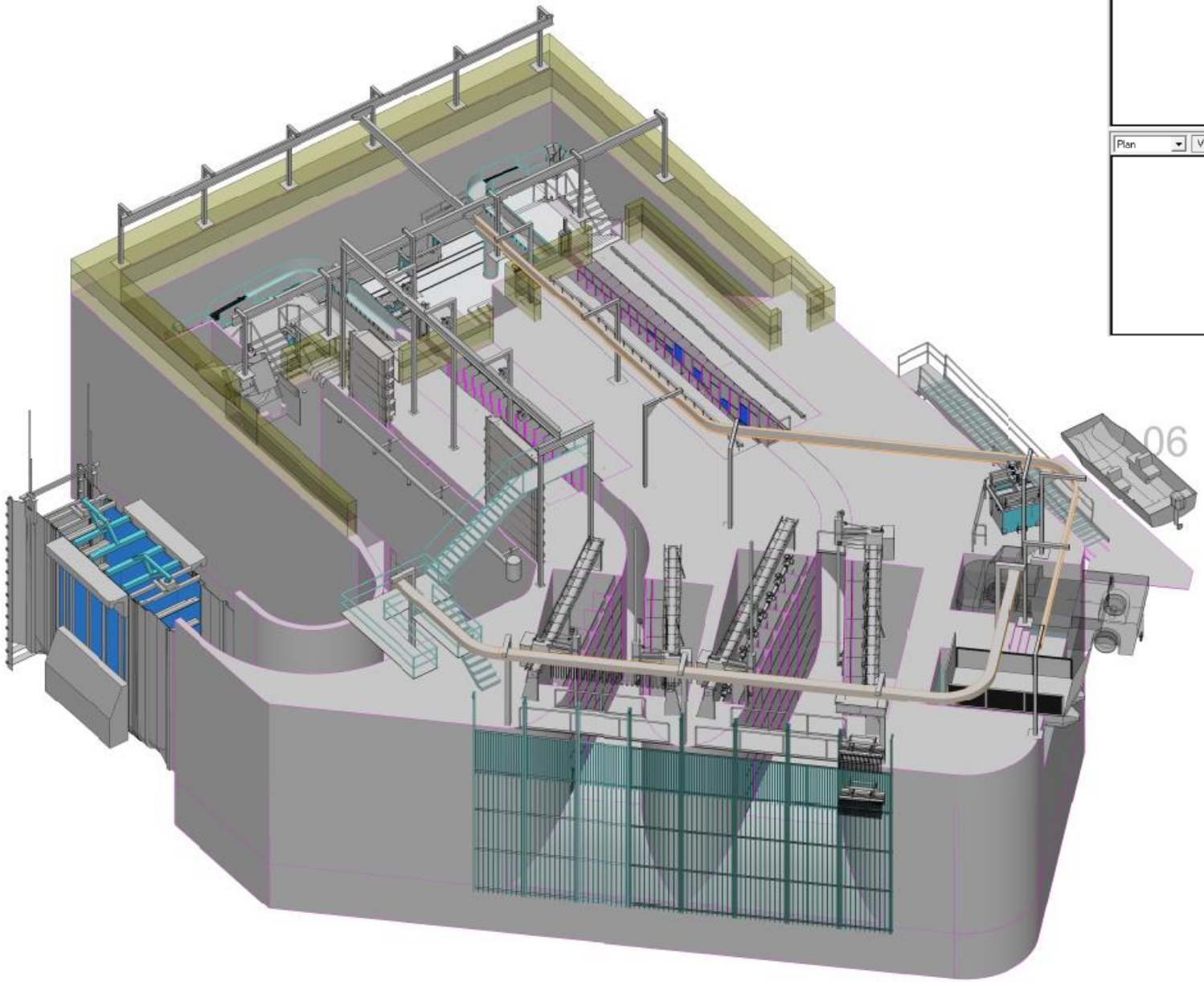
NAVAL ARCHITECTURE CONCEPT DESIGN



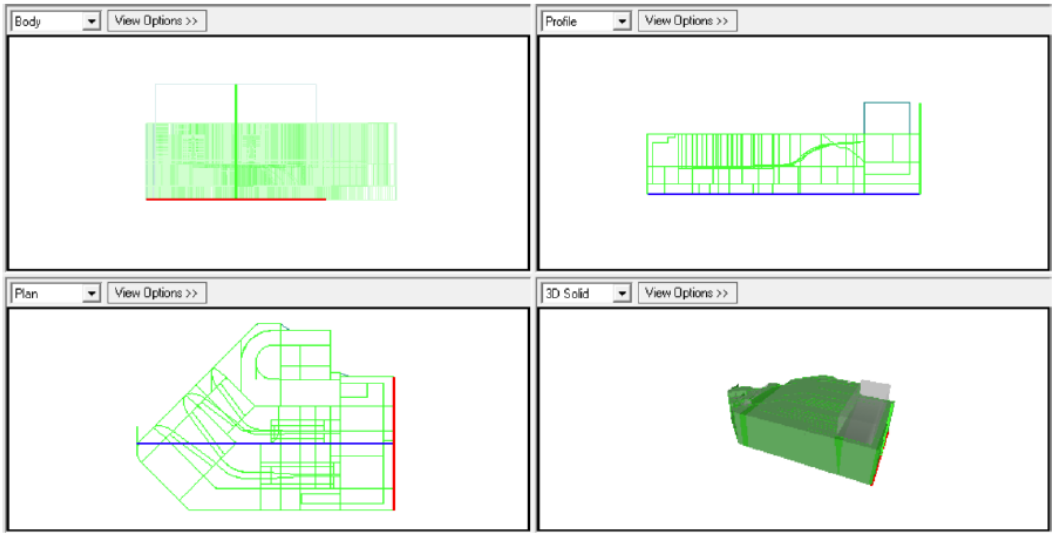


Figure 7-1. FSS 3-D Hull Model

Naval architect AE joined team from 60% to 90% DDR.

We have a workable design heading into P&S phase.

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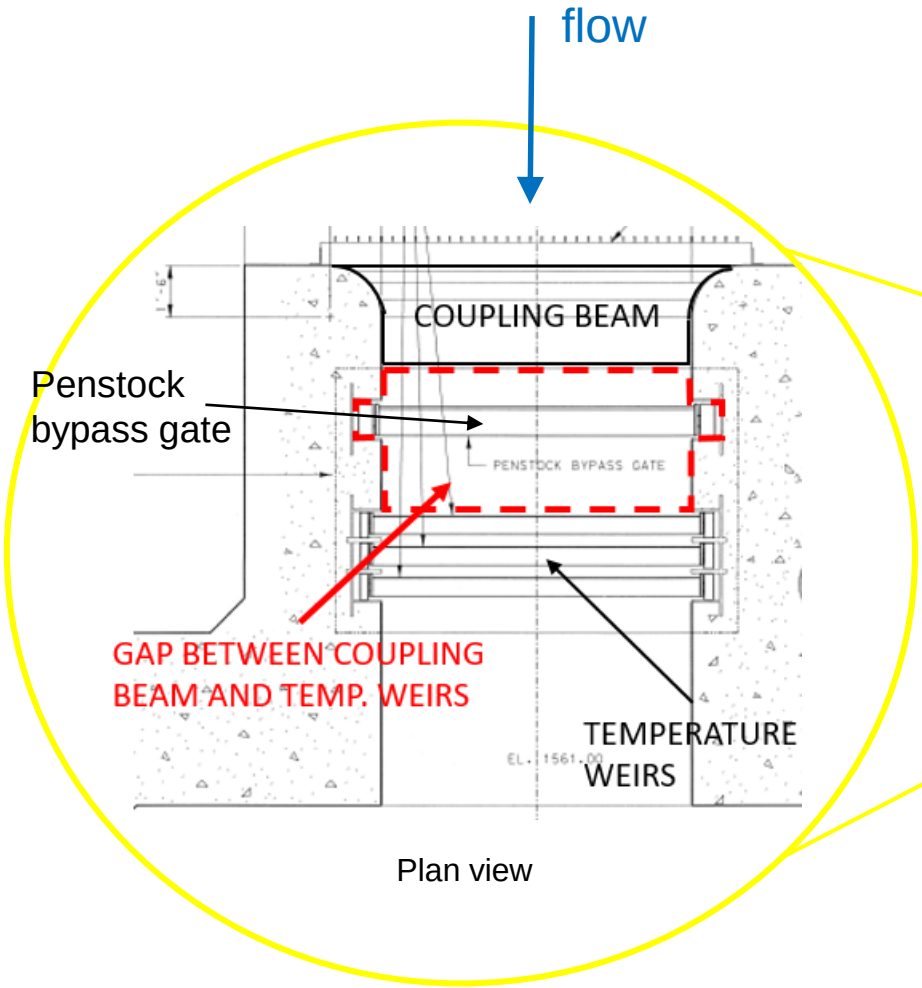
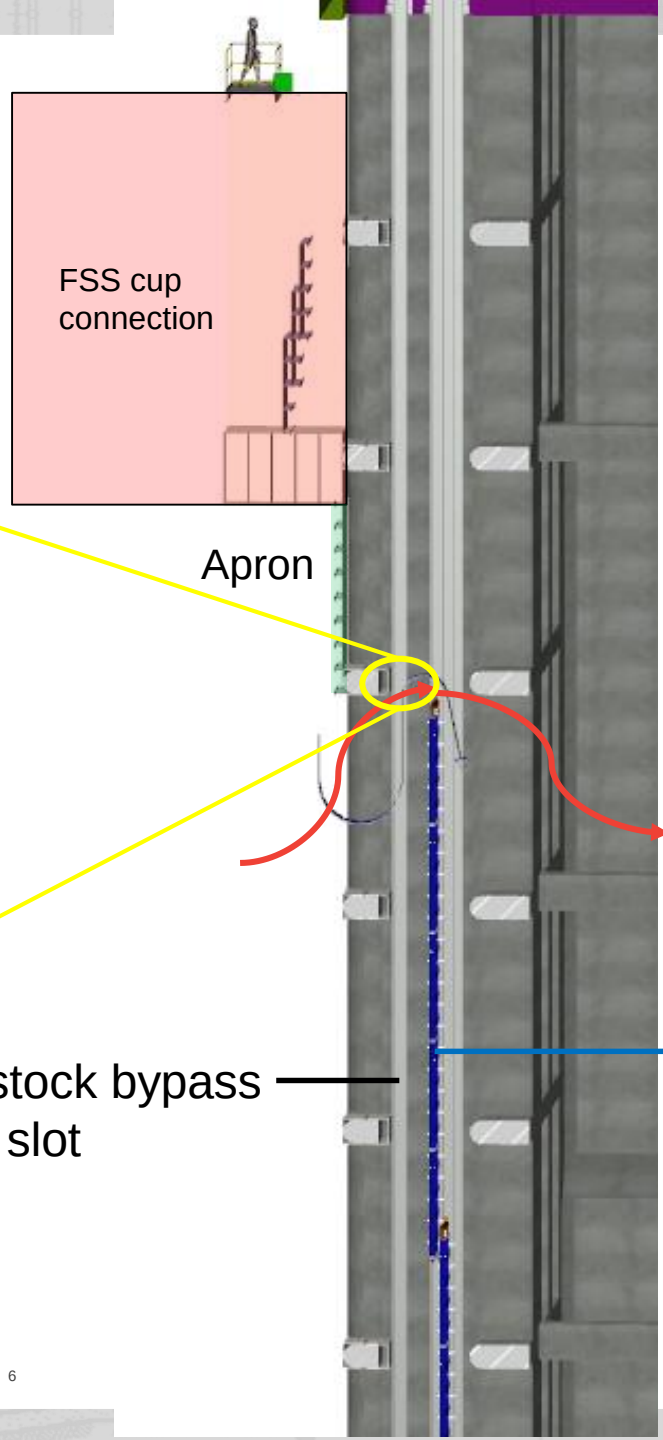
FSS CONNECTION



Plan view



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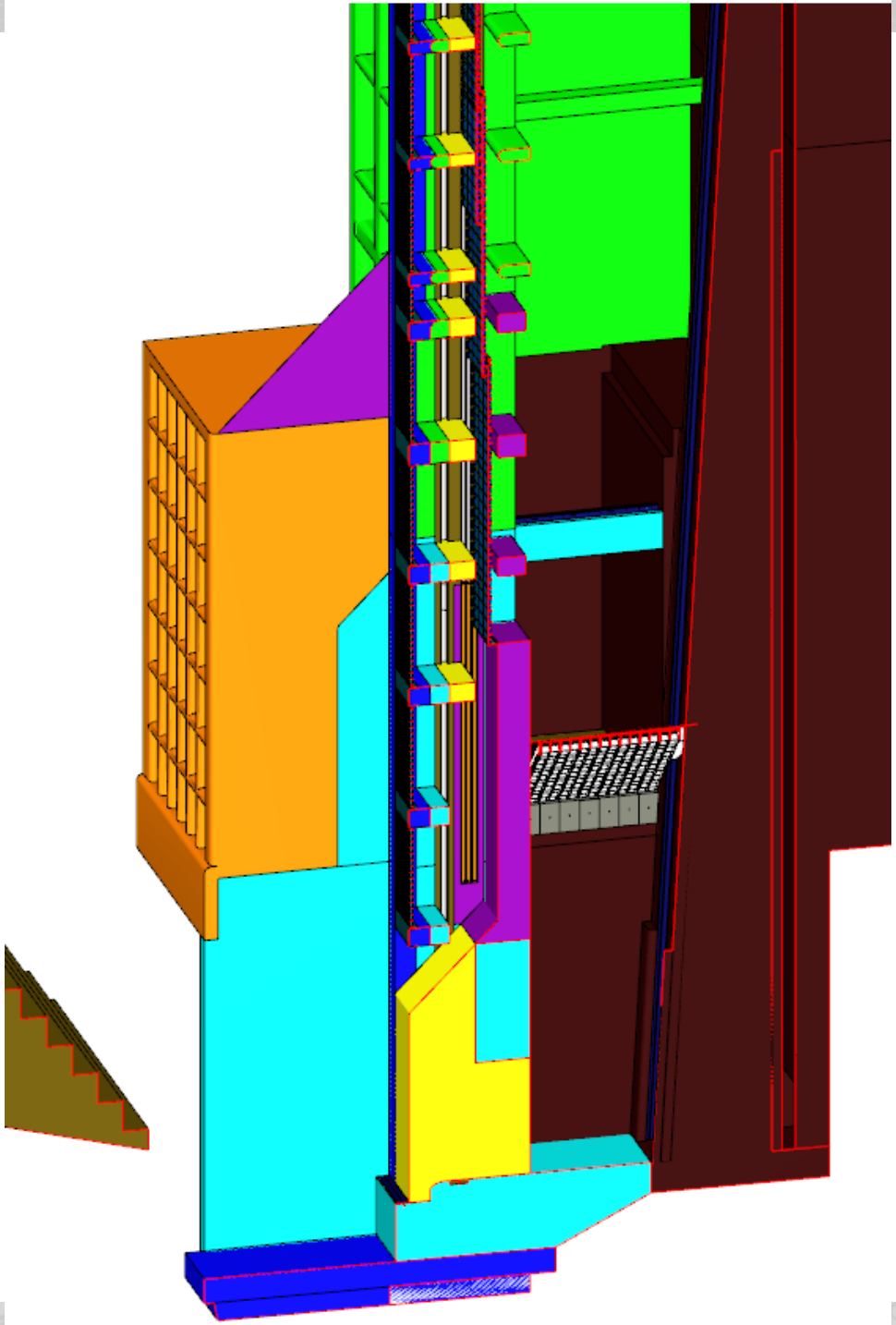
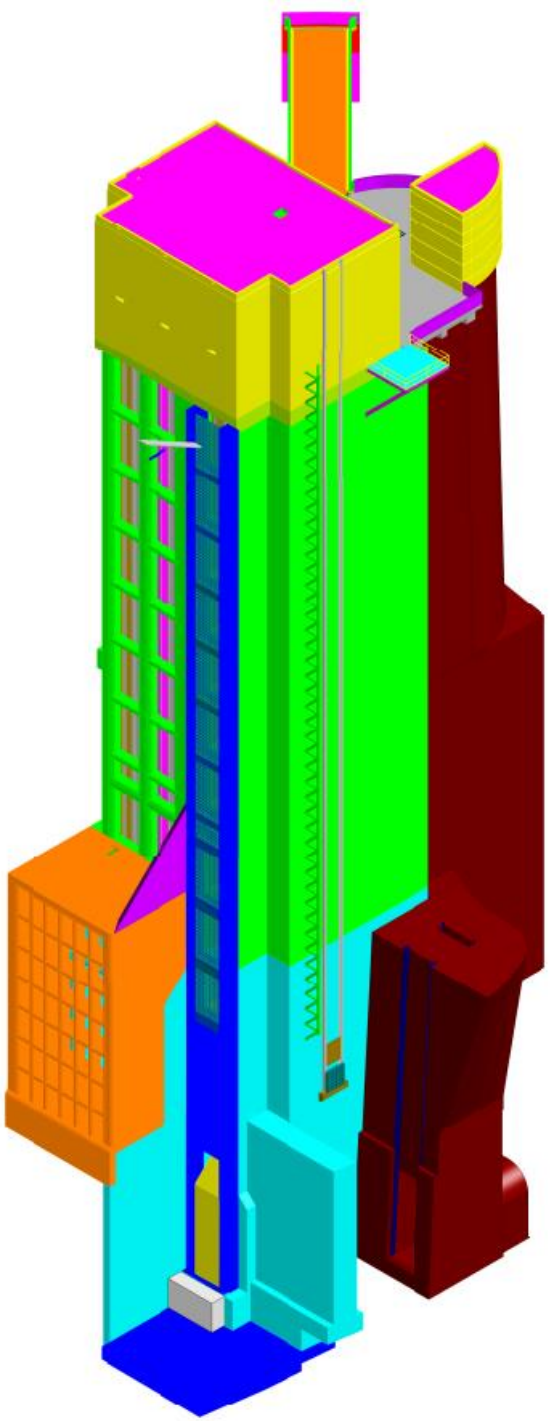
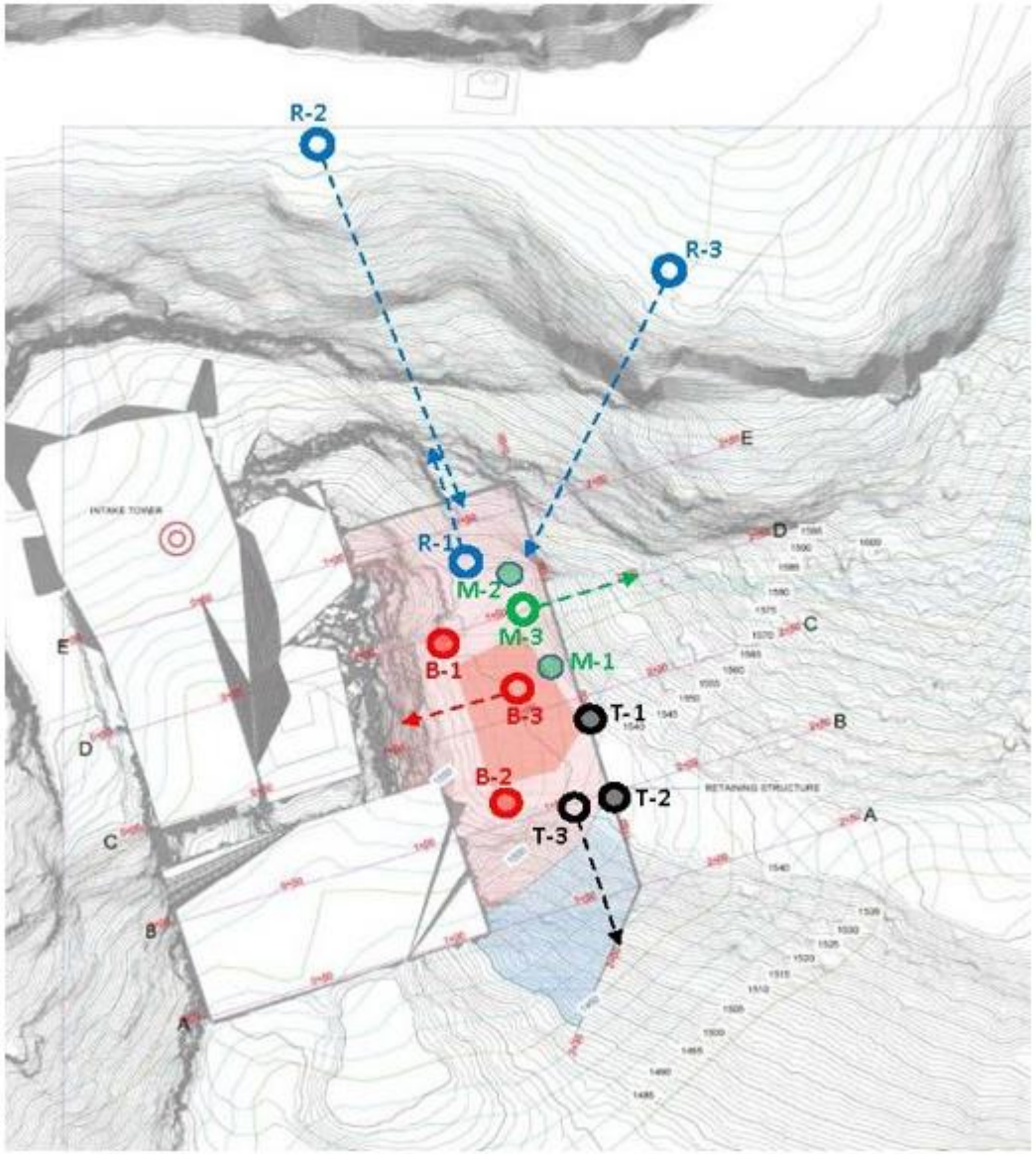
CLOSURE OF PENSTOCK BYPASS GATE





GEOTECHNICAL EXPLORATIONS – SOR FOR DEC. AND JAN.



Pool will be lowered to 1516 ft, which is minimum power pool, for December and January.

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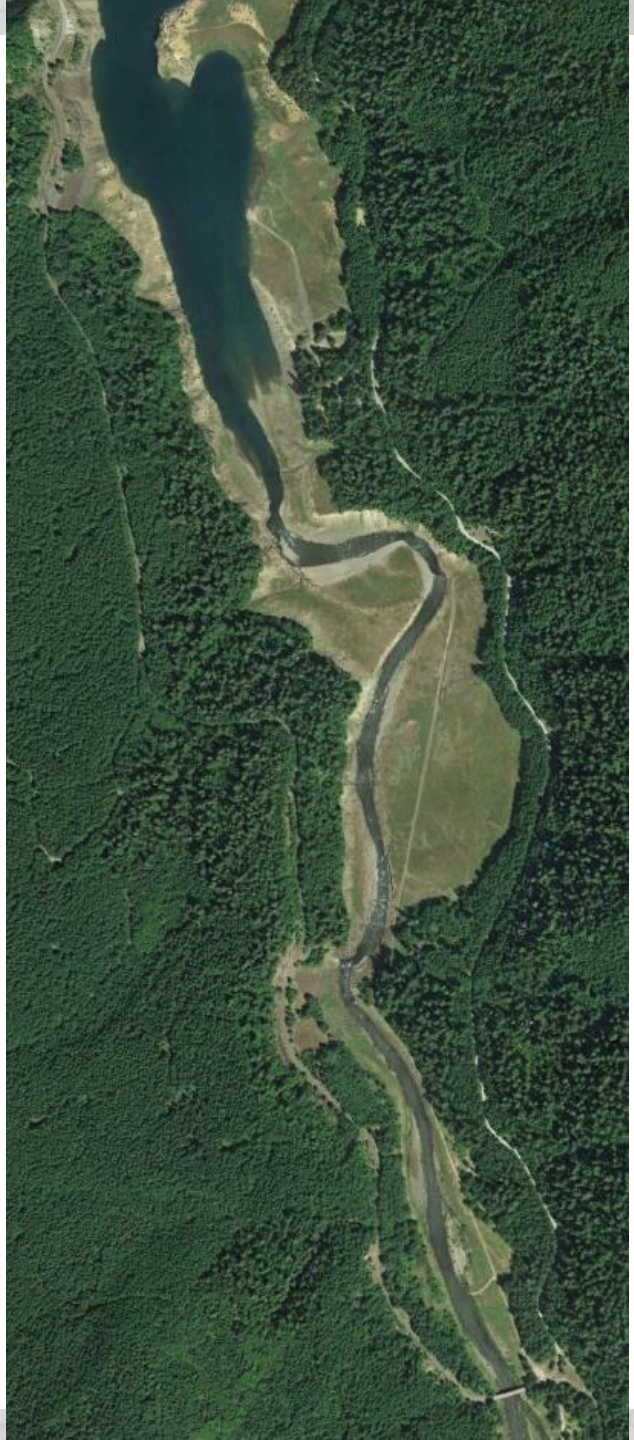
CONSIDERATION OF NORTH SUNNYSIDE SITE FOR FSS ASSEMBLY AND LAUNCH



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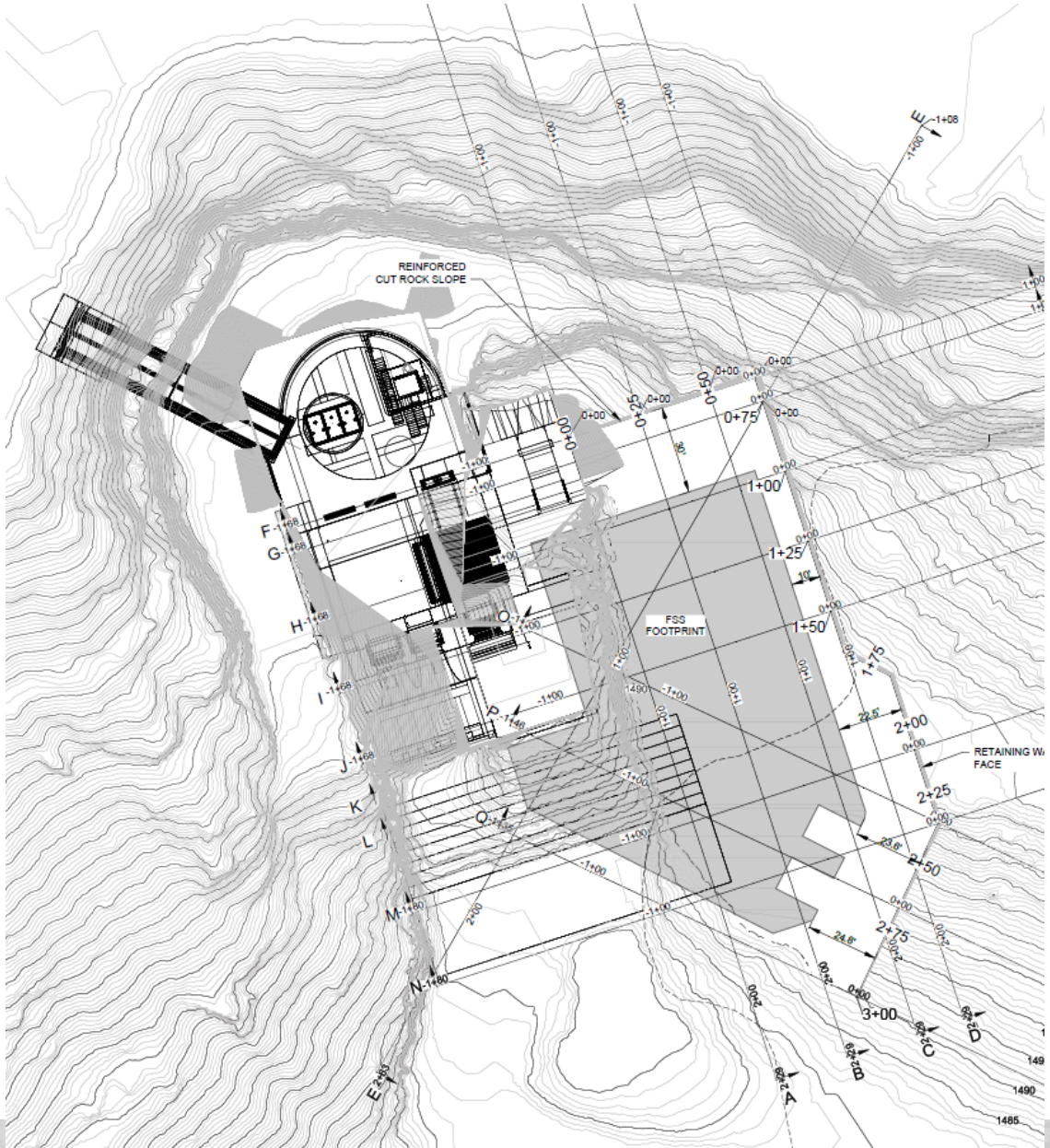
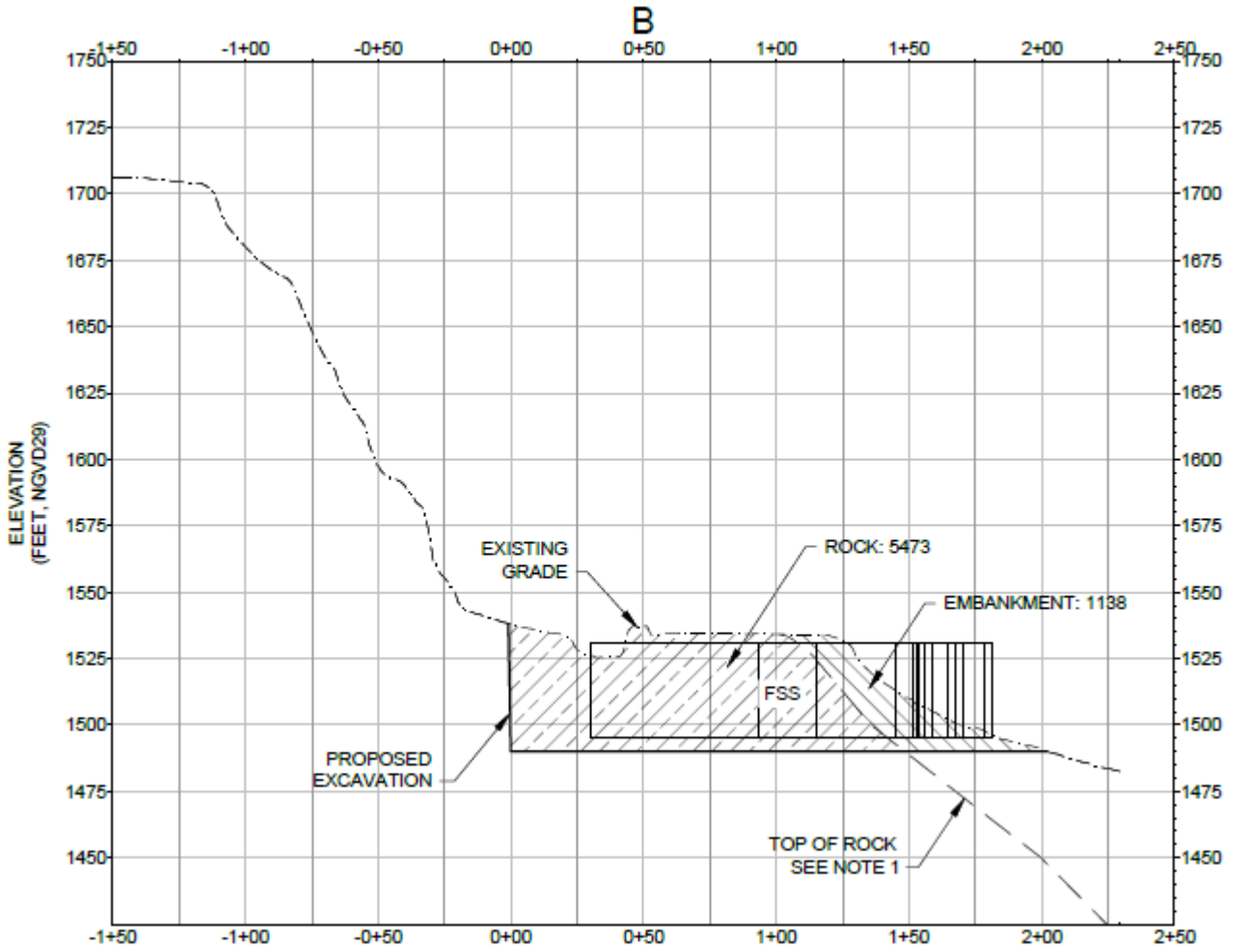
FLEXIBILITY FOR POTENTIAL FUTURE PIPED BYPASS





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COUGAR FSS PHYSICAL MODEL

Main Goals of the Model:

- Verify computed head losses
- Opportunity to look at biologically beneficial entrance modifications in a physical model

Schedule:

- Model under construction - Alden Labs, Everett, WA
- Testing begins mid-December
- Model demonstration visit with agency partners mid to end of March 2019

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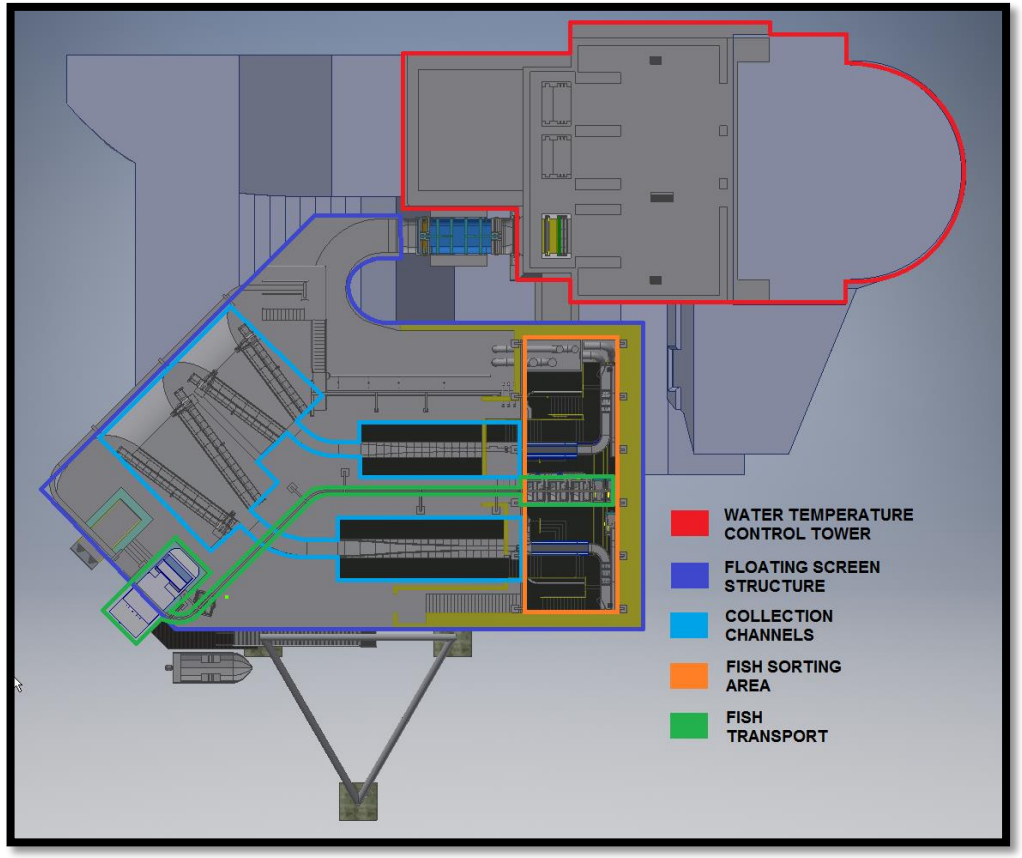
FSS DESIGN WALKTHROUGH

FLOATING SCREEN STRUCTURE (FSS):

- Water Path
- Fish Path
- Debris Path



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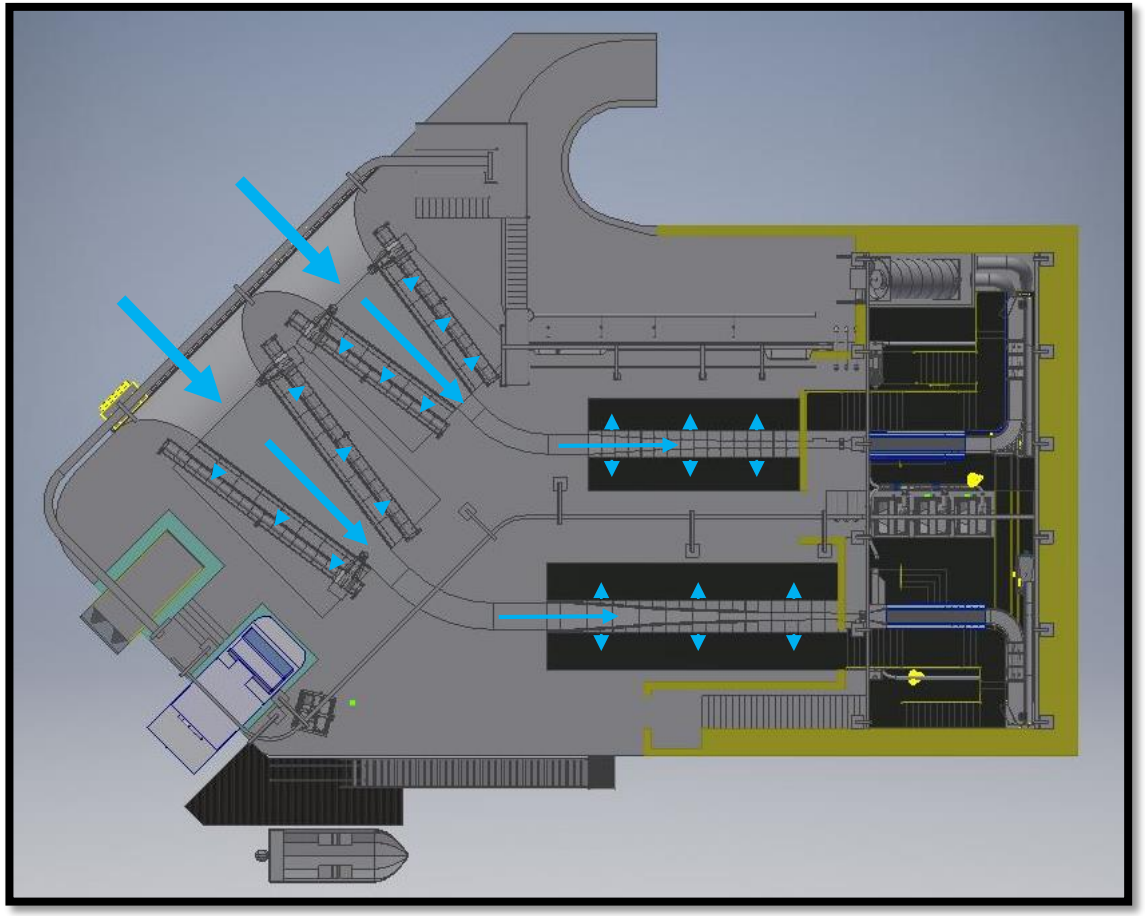
FSS DESIGN WALKTHROUGH

- Water Path:
  - Primary Screen Area
  - Secondary Screen Area



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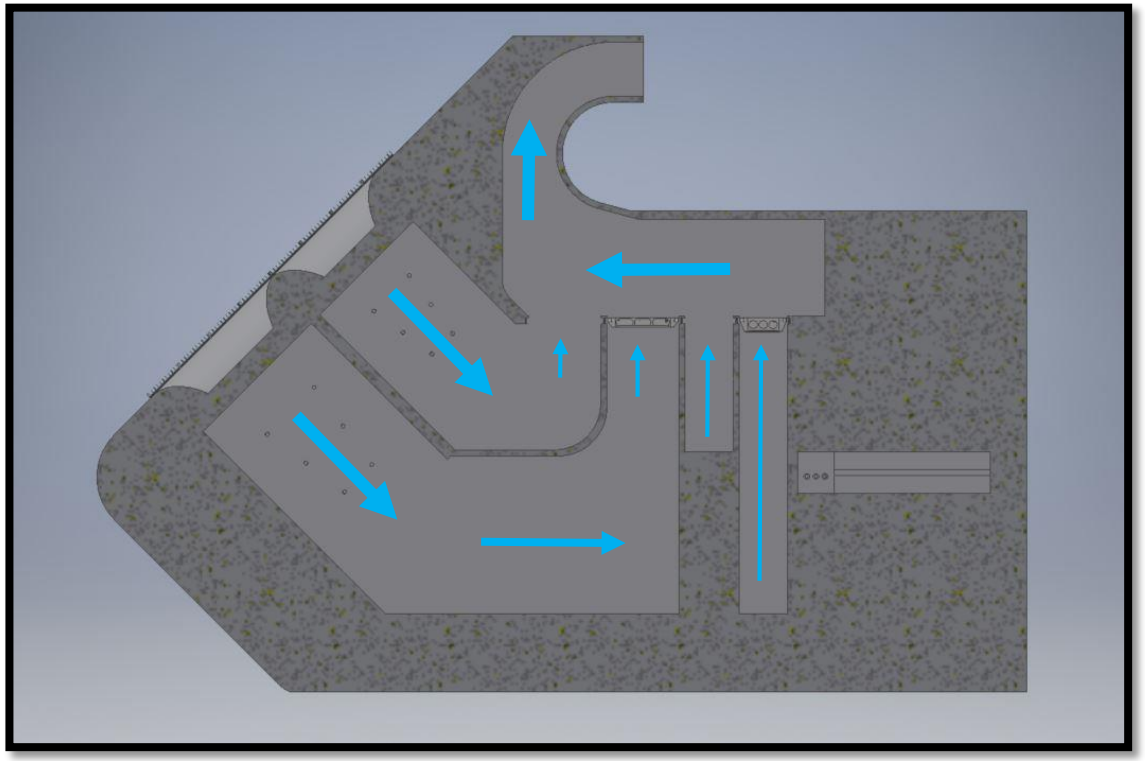
FSS DESIGN WALKTHROUGH

- Water Path:
  - Plenum Areas
  - Junction Pool



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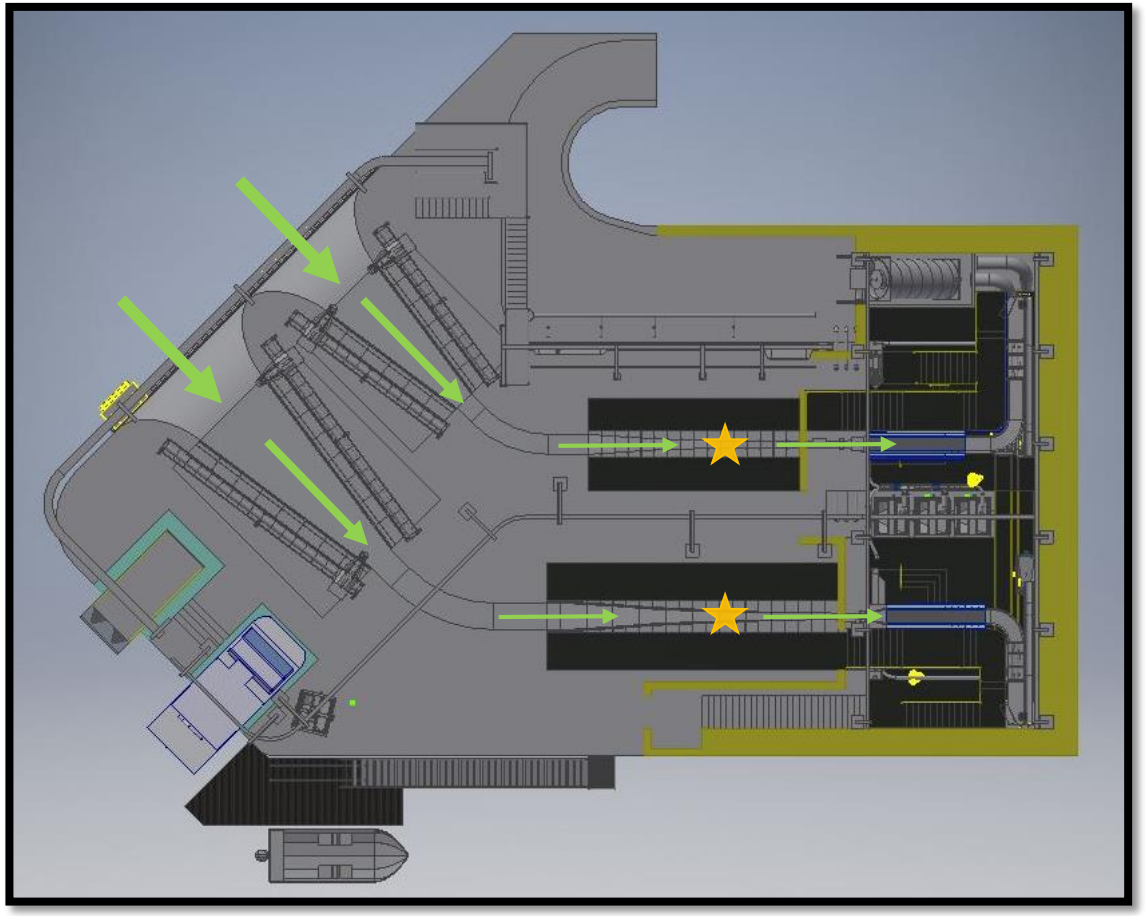
FSS DESIGN WALKTHROUGH

- Fish Path:
  - Gradual Acceleration
  - Capture Velocity within Secondary Screen Area



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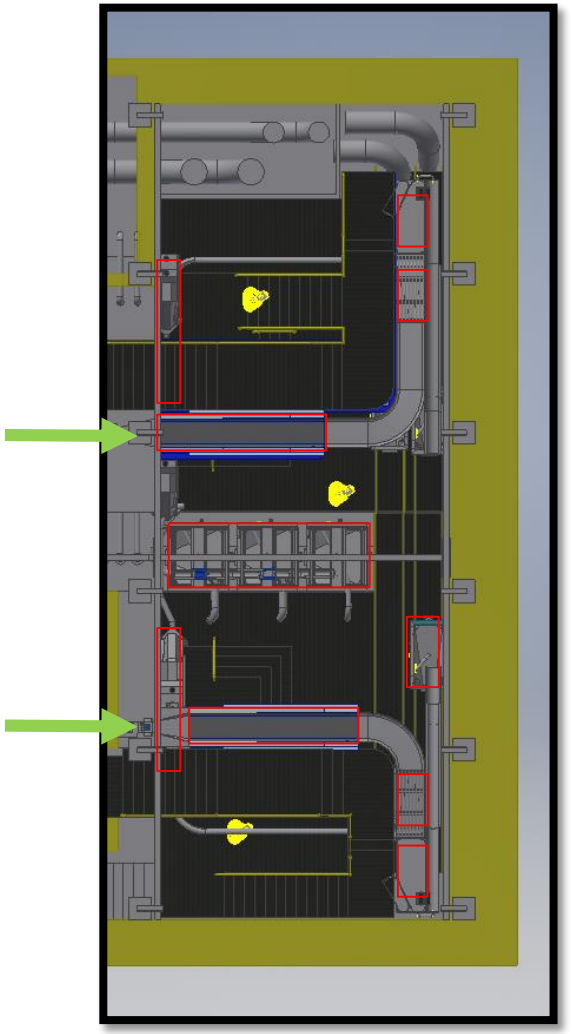
FSS DESIGN WALKTHROUGH

- Fish Path:
  - Tertiary Dewatering Screens
  - Separator Bars
  - Adult Fish and Debris Collection Tank
  - Fish Counter
  - Fish Sampling Station
  - Fish Transport Pods
  - Adult and Debris Pods (only one shown)



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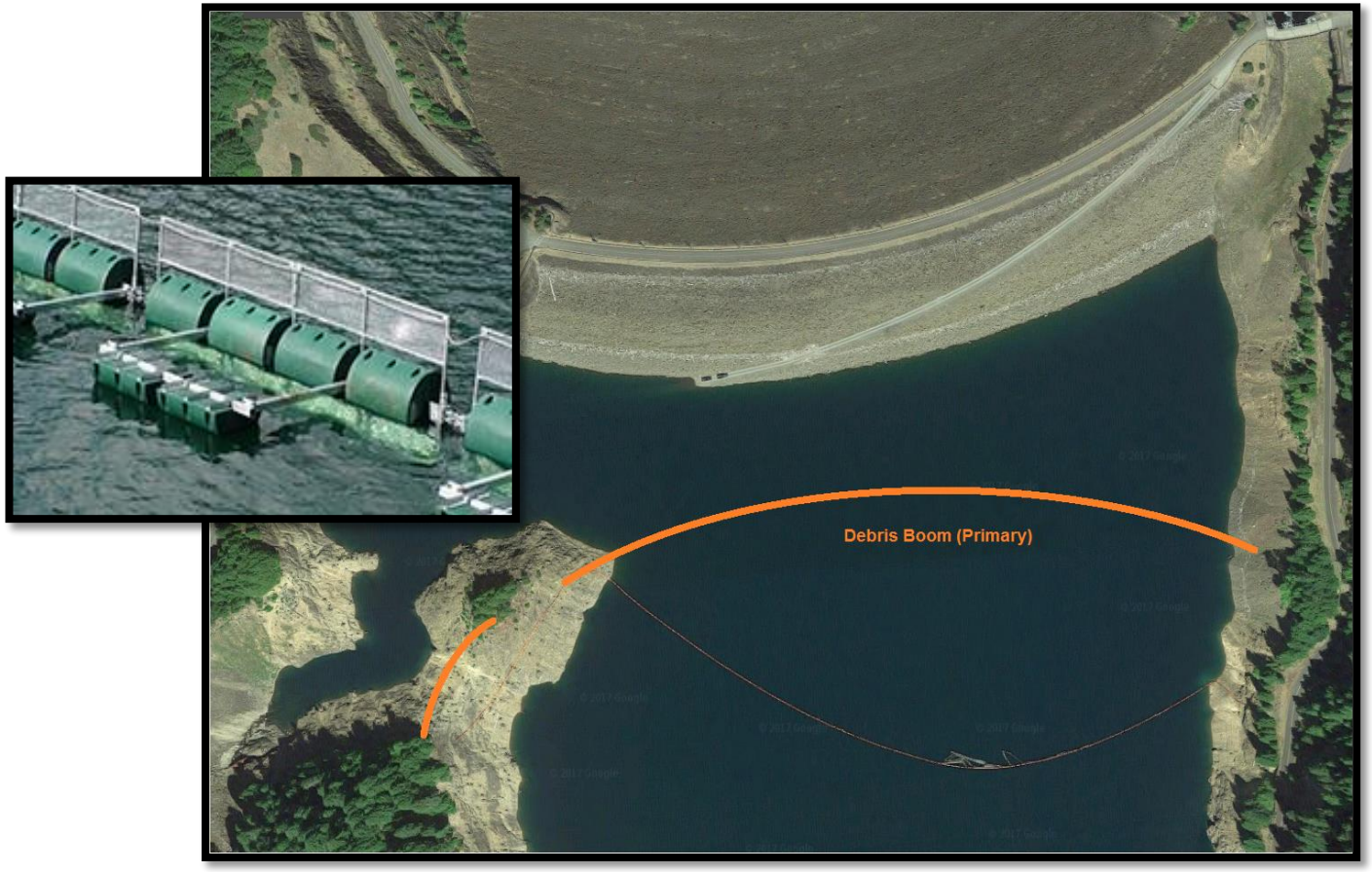
FSS DESIGN WALKTHROUGH

- Debris Path:
  - Debris Boom



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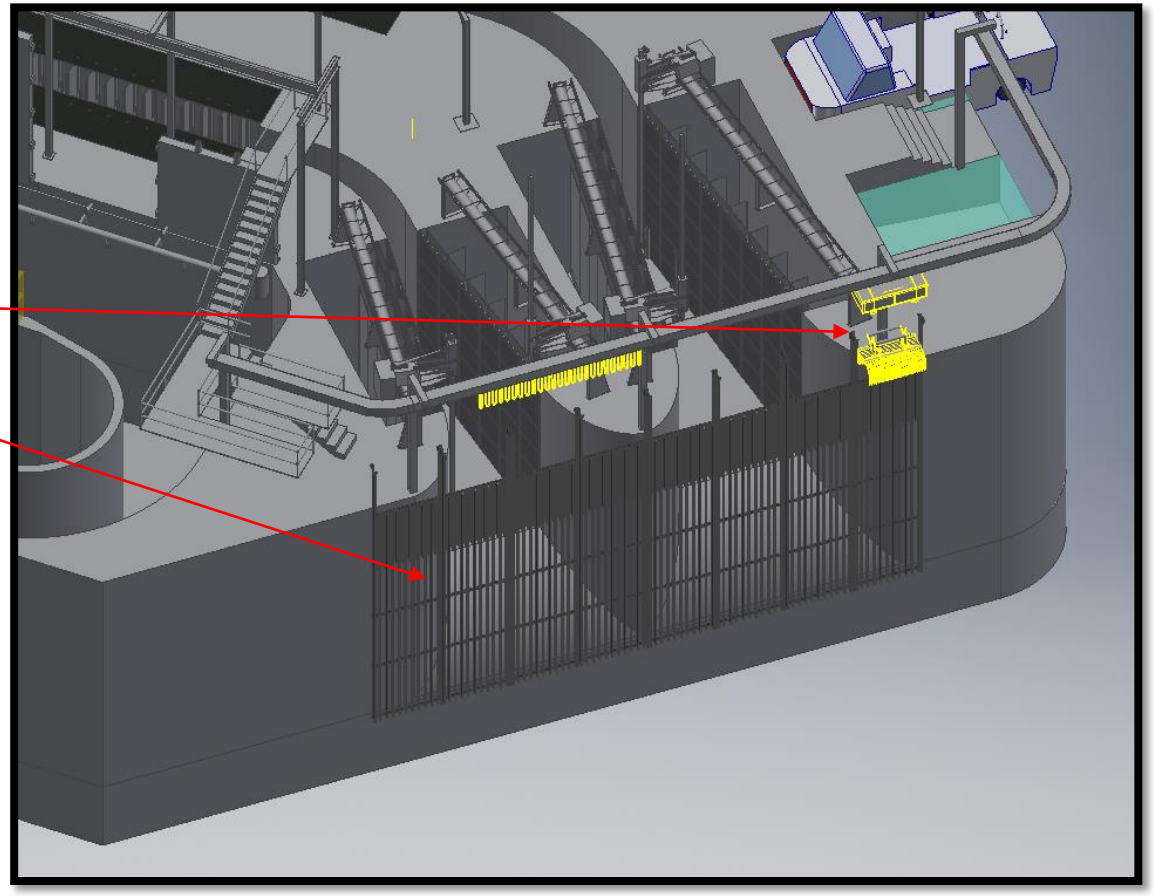
FSS DESIGN WALKTHROUGH

- Debris Path:
  - Debris Boom
  - Entrance Trash Rack and Rake
  - Primary Screen Cleaners (Brush Cleaners)
  - Secondary Screen Cleaners (Water Burst)



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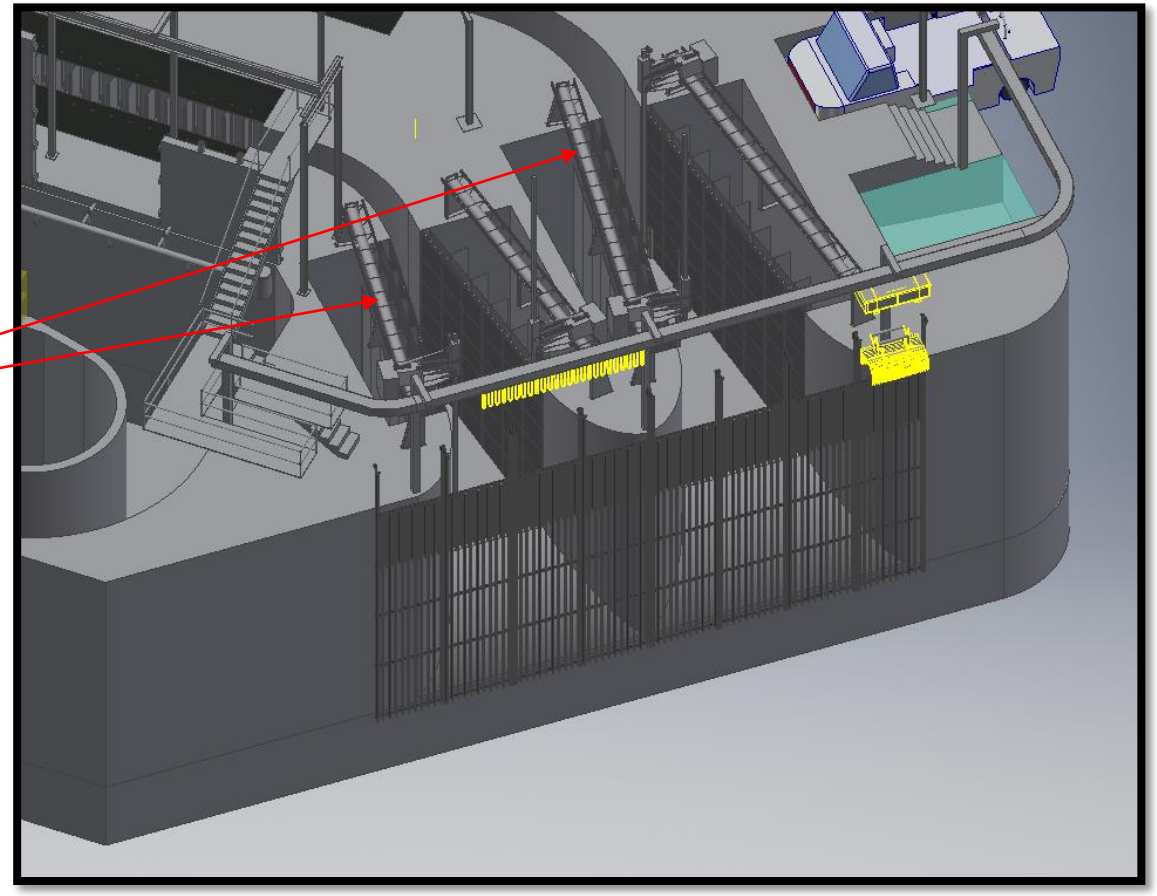
FSS DESIGN WALKTHROUGH

- Debris Path:
  - Debris Boom
  - Entrance Trash Rack and Rake
  - Primary Screen Cleaners (Brush Cleaners)
  - Secondary Screen Cleaners (Water Burst) (not shown)



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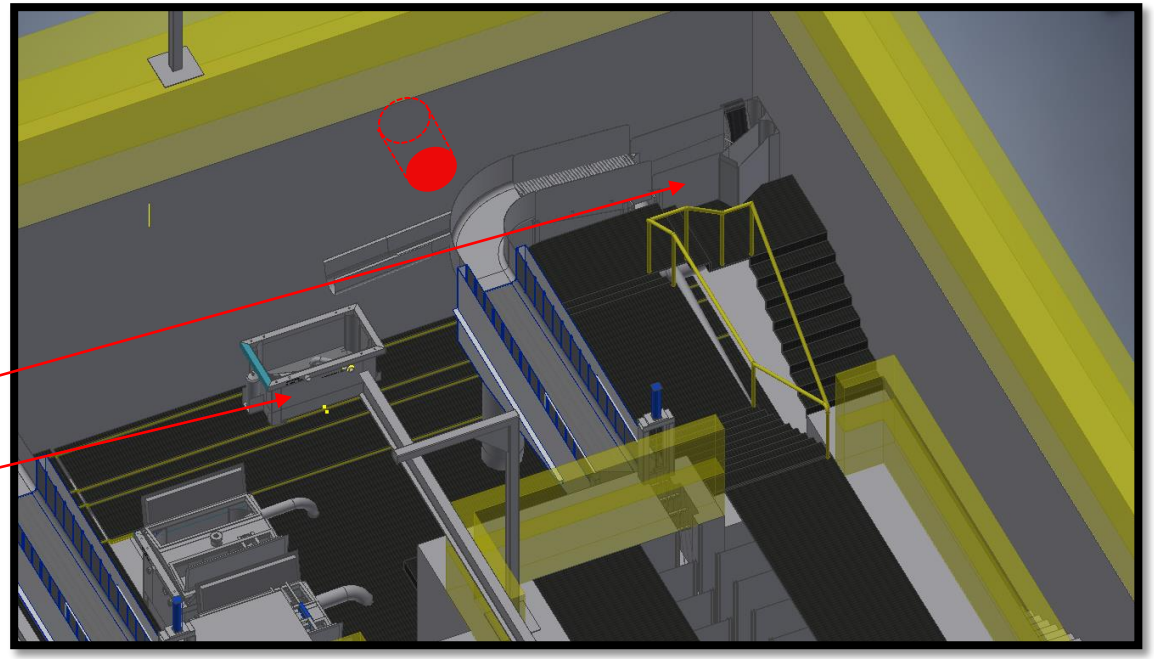
FSS DESIGN WALKTHROUGH

- Debris Path:
  - Debris Boom
  - Entrance Trash Rack and Rake
  - Primary Screen Cleaners (Brush Cleaners)
  - Secondary Screen Cleaners (Water Burst) (not shown)
  - Debris Collection Tank
    - ➢Debris Pods



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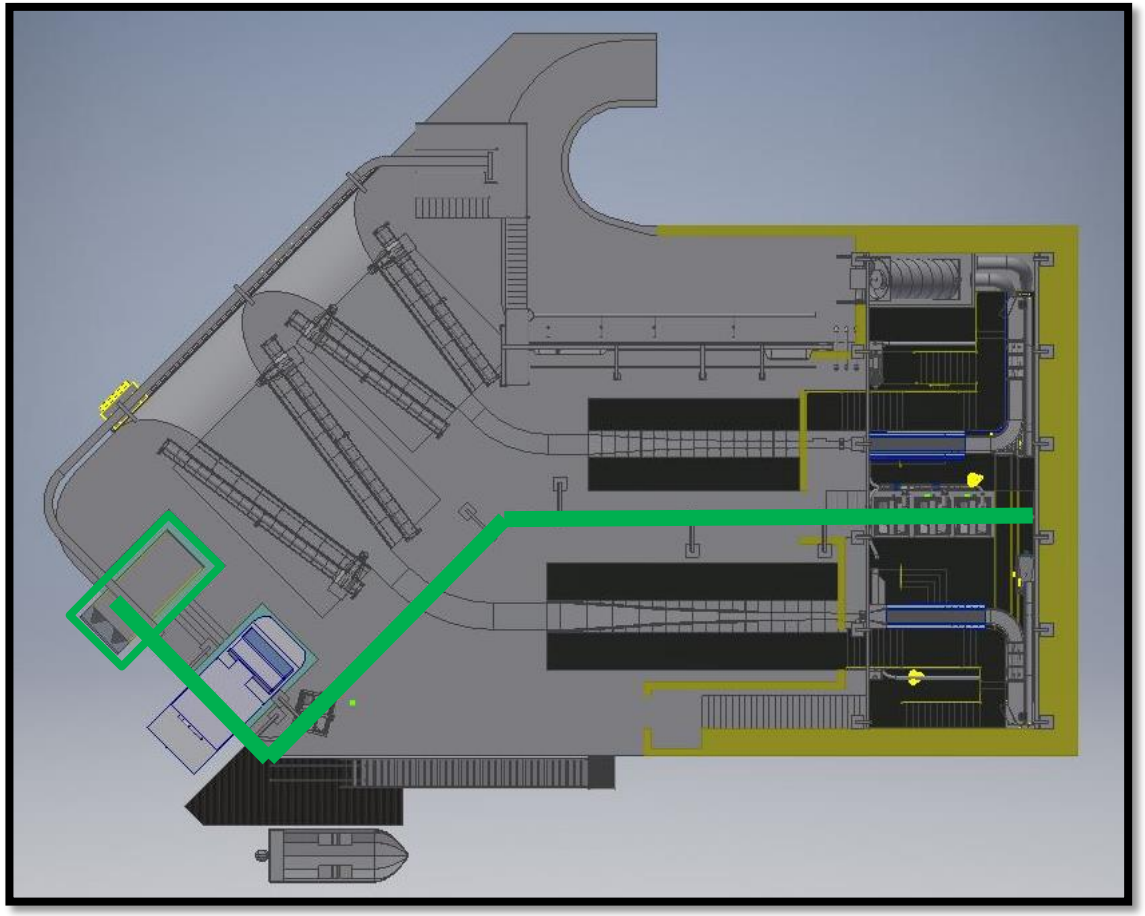
FSS DESIGN WALKTHROUGH

- Debris Path:
  - Debris removed from FSS via monorail, and loaded onto a debris barge near the bow of the vessel.
  - Debris barge is floated to dam access road for debris removal when full.



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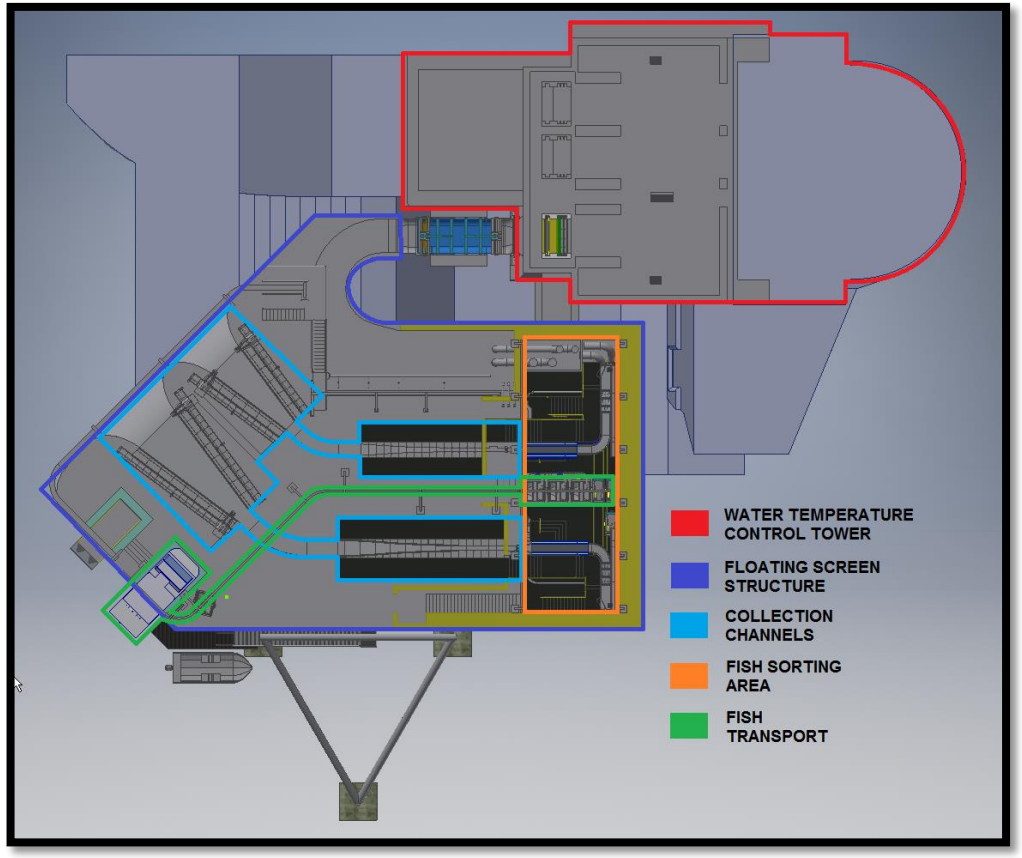
FSS DESIGN WALKTHROUGH

- Questions?



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COUGAR DAM FSS FISH TRANSPORT AND RELEASE

WFFDRWG MEETING
06 November 2018

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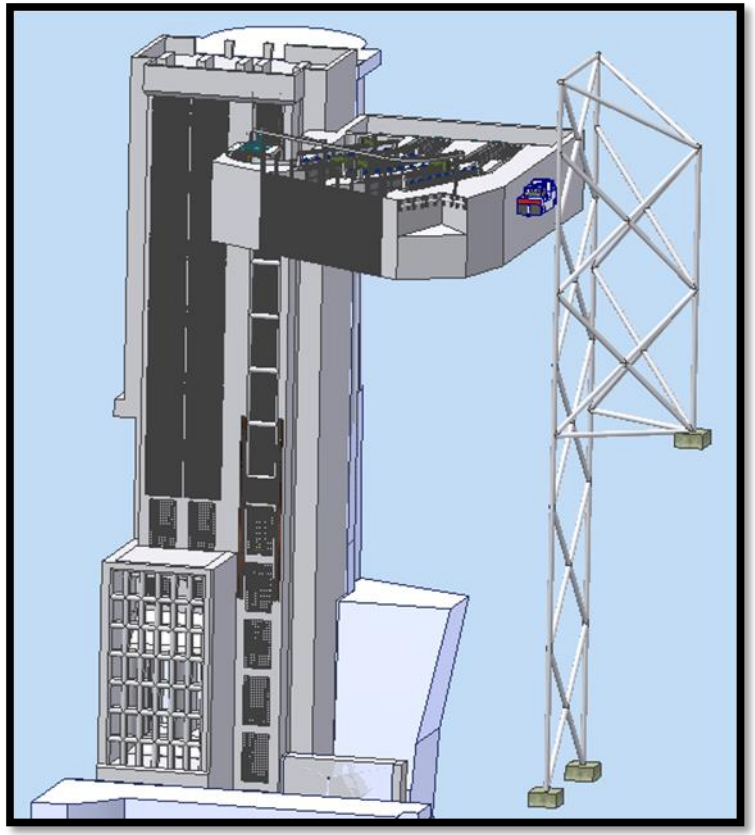
FISH COLLECTION

- Fish will be collected on the FSS:
  - 750 gallon pods for juvenile
  - 250 gallon pods for adult fish



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AMPHIBIOUS VEHICLE

- Amphibious vehicle will transport fish from the FSS to the release location
- The AV is capable of transporting a 750 and 250 gallon pod
- Multiple trips may be required during high collection period
- The AV provide crew access to the FSS

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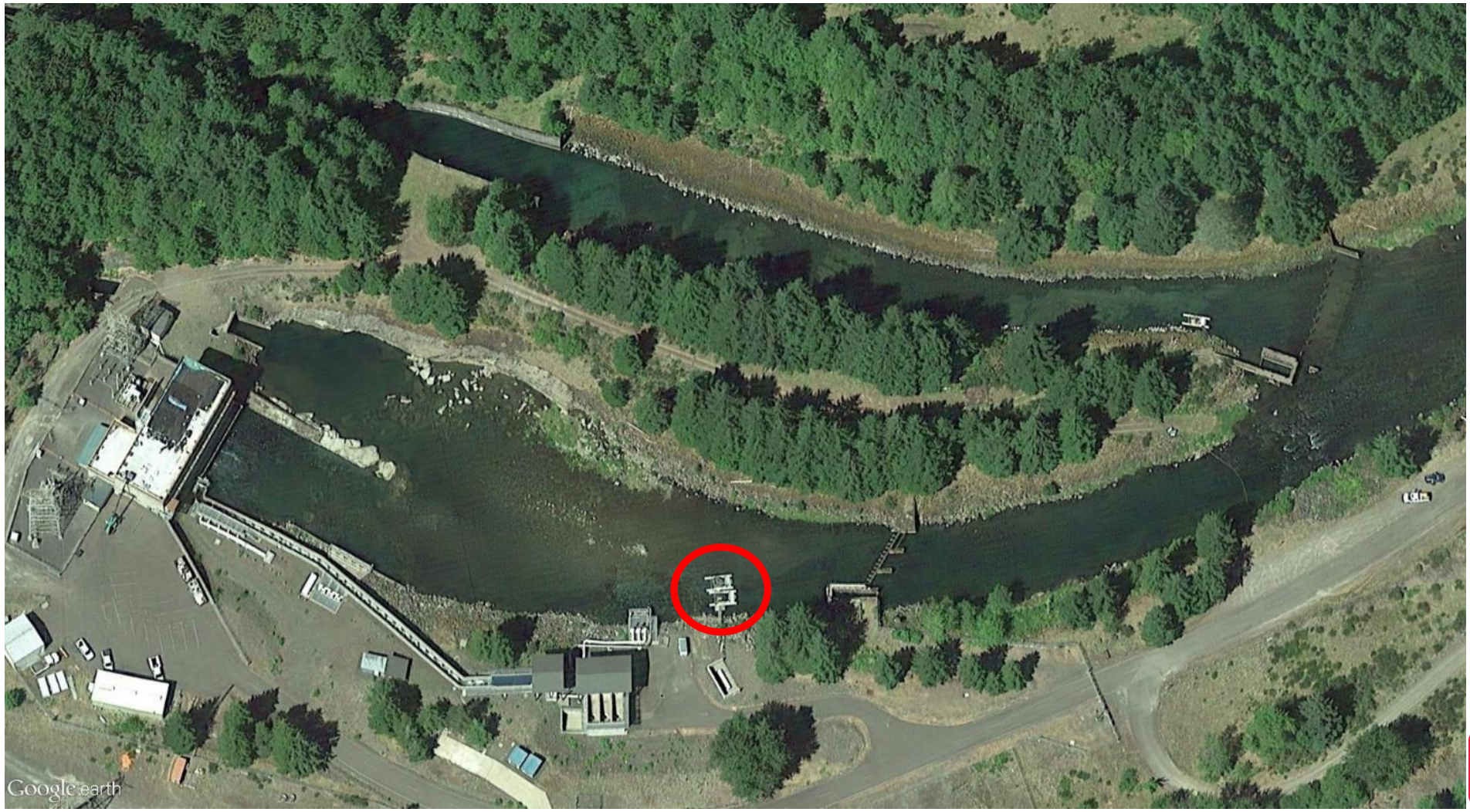
FISH RELEASE LOCATION



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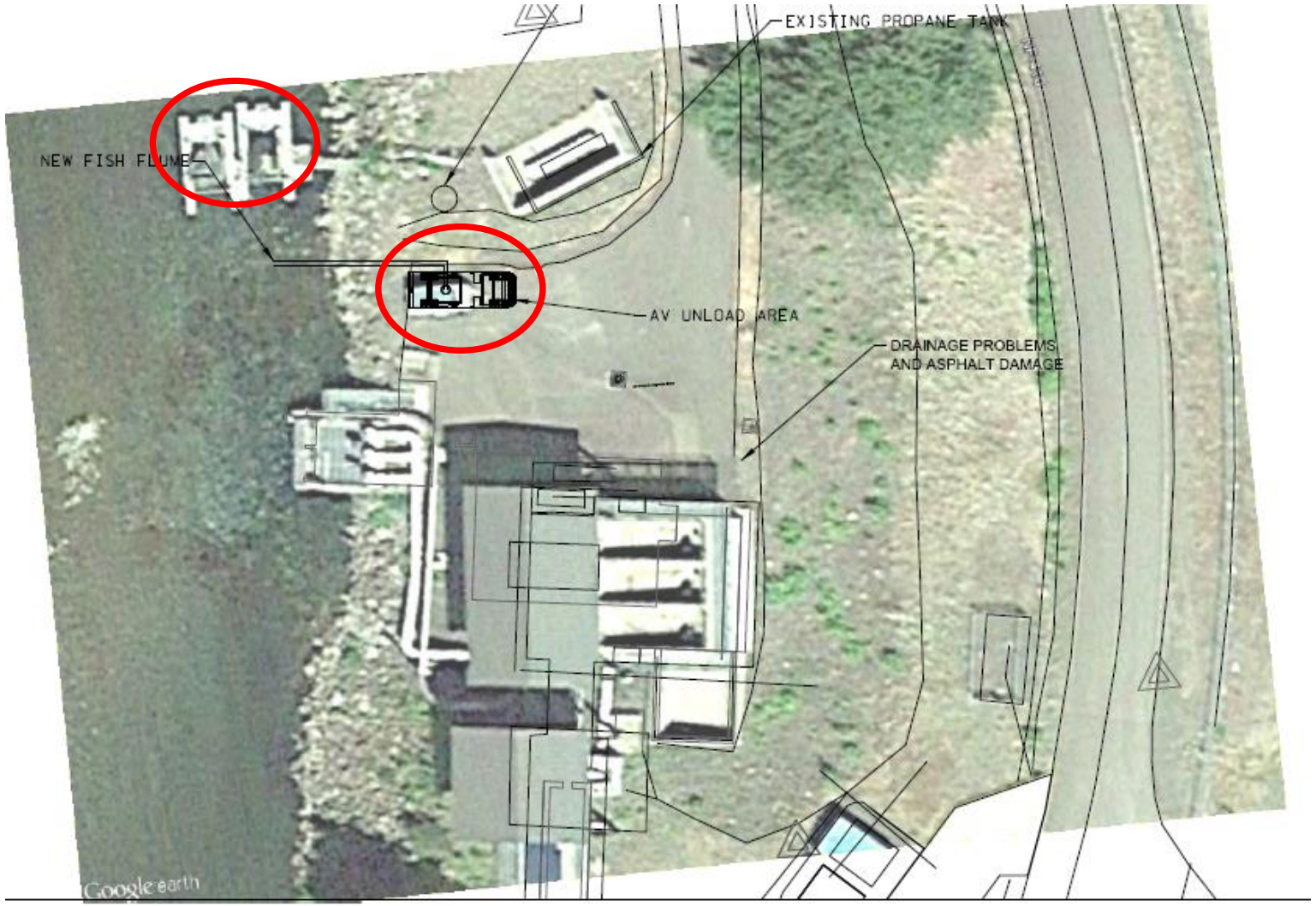
RELEASE LOCATION



- Area is already developed so only minor changes are anticipated
- Flushing flow is available from the adult facility
- Release location is behind a locked gate
- The design of the release pipe and the location is ongoing

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FISH RELEASE LOCATION

- Measurements at proposed release location
  - July 17, 2018
  - 3 location measured
  - 5, 10, and 15 feet from the north shore
- Results
  - 5 feet from north shore
    - Velocity=0.57 fps
    - Depth=1.8 feet
  - 10 feet from north shore
    - Velocity=1.9 fps
    - Depth=2.1 feet
  - 15 feet from north shore
    - Velocity=3.4 fps
    - Depth=3.4 feet

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QUESTIONS?

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COUGAR DAM DOWNSTREAM FISH PASSAGE PROJECT

DRAFT ENVIRONMENTAL ASSESSMENT BRIEFING

COOPERATING AGENCY REVIEW

Kelly Janes
Environmental Resource Specialist
US Army Corps of Engineers, Portland District
06 November 2018 WFFDWG

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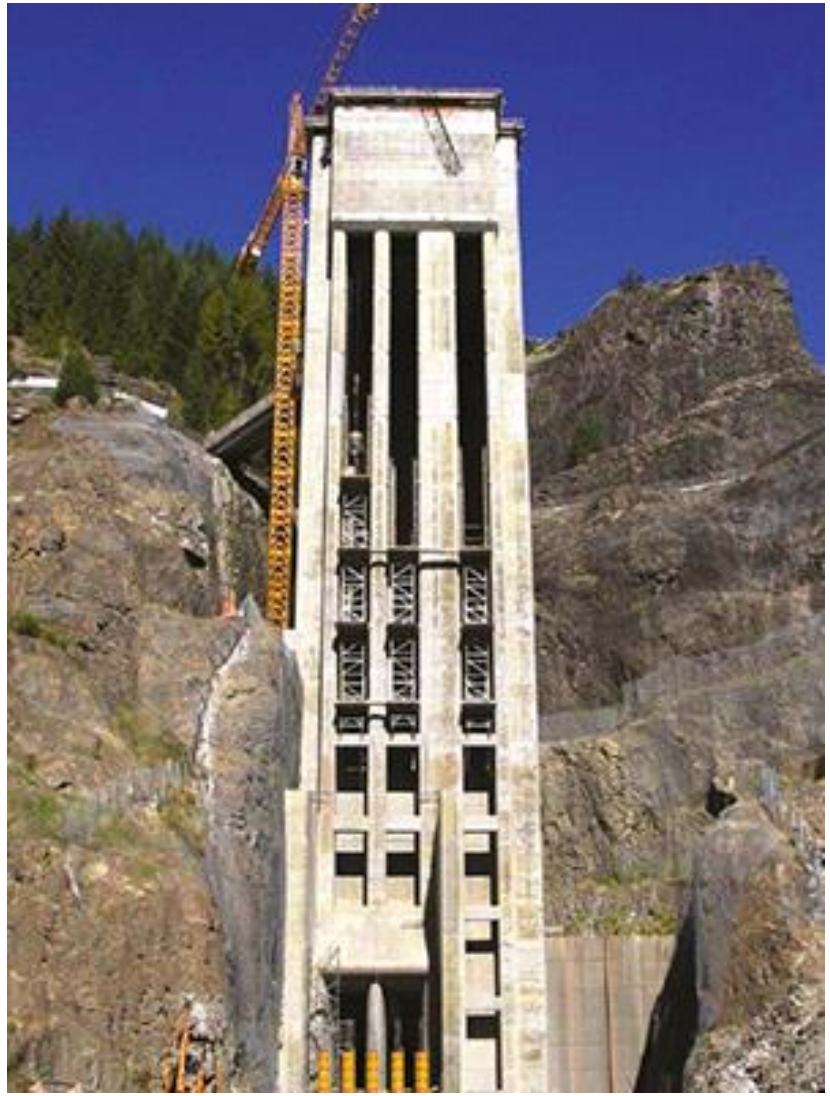
ENVIRONMENTAL ASSESSMENT BRIEFING

Purpose: to introduce the document structure and major findings

1. Document structure
2. Preferred Alternative
3. Environmental Effects
   a) Hydrology
   b) Water Quality
   c) Endangered and Threatened Species
4. NEPA Schedule



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DOCUMENT STRUCTURE – 8 PARTS

1. Introduction: background, lead agency, action area, purpose and need, and objectives and constraints.
2. Alternatives:
   - Alternative formulation history
   - Summary of alternatives considered but eliminated (incorporates EDR by reference)
   - No Action
   - FSS with Trap and Haul
3. Affected Environment & Environmental Effects
4. Cumulative Impacts
5. Agencies and Persons Consulted.
6. Compliance with Laws and Regulations
7. List of Preparers: provides a list of the EA's contributing individuals.
8. References

Appendices

A. Cougar Dam Downstream Fish Passage Engineering Documentation Report
B. Cougar Dam Downstream Fish Passage Design Documentation Report No. 24
C. Hydropower Impacts Analysis
D. Recreation Analysis
E. Socio-Economic Analysis
F. 2016 Fish Salvage Plan for the Debris Removal and Intake Tower Trash rack Repairs at Cougar Dam on the South Fork McKenzie River
G. 2016 Performance Criteria for Cougar Dam Floating Screen Structure (FSS)
H. 2011 Cougar Adult Fish Facility Operations and Maintenance Manual

ALTERNATIVES 2: FSS WITH TRAP AND HAUL

- Operations during construction
- Construction During Drawdown: excavation, material disposal in reservoir to improve dam road, retaining wall, mooring foundations, dam road improvements, Rush Creek trashrack and routing, FSS construction pad (Slide Creek or North Sunnyside)
- Fish Release Site Improvements: surface drainage, curb, water supply, and flume improvements
- Access Road Improvements
- Power house area site improvements
- Staging
- Construction access and traffic
- Temporary environmental controls
- FSS Operations: period of operations, trucking and release, FSS maintenance, continued operations of Adult Facility, road maintenance, and debris management
- Monitoring & Evaluation:
  - Continued water quality monitoring (turbidity, TDG, & temperature), flow, and lake depth.
  - During construction monitoring of fish stranding for salvage similar to 2016 Fish Salvage Plan for trash rack repairs.
  - Operations monitoring: Fish #s, species composition, fish health, and water quality on the FSS

ENVIRONMENTAL EFFECTS – RESOURCES ASSESSED

3.1 **Basin Overview** - includes basin overview and current Cougar Dam and Fish Facilities operations

3.2 **Physical Environment**:

- air quality
- geology/seismology/soils
- hydrology
- water quality
- climate change

3.3 **Biological Environment**:

- vegetation
- wildlife

3.3 **Biological Environment con't**:

- fish & aquatic species including fisheries and hatchery operations
- threatened & endangered species

3.4 **Social Environment**:

- water supply
- hydropower (including EWEB facilities)
- transportation/circulation
- aesthetic resources
- cultural/archeological/historical resources
- recreation
- socio-economics

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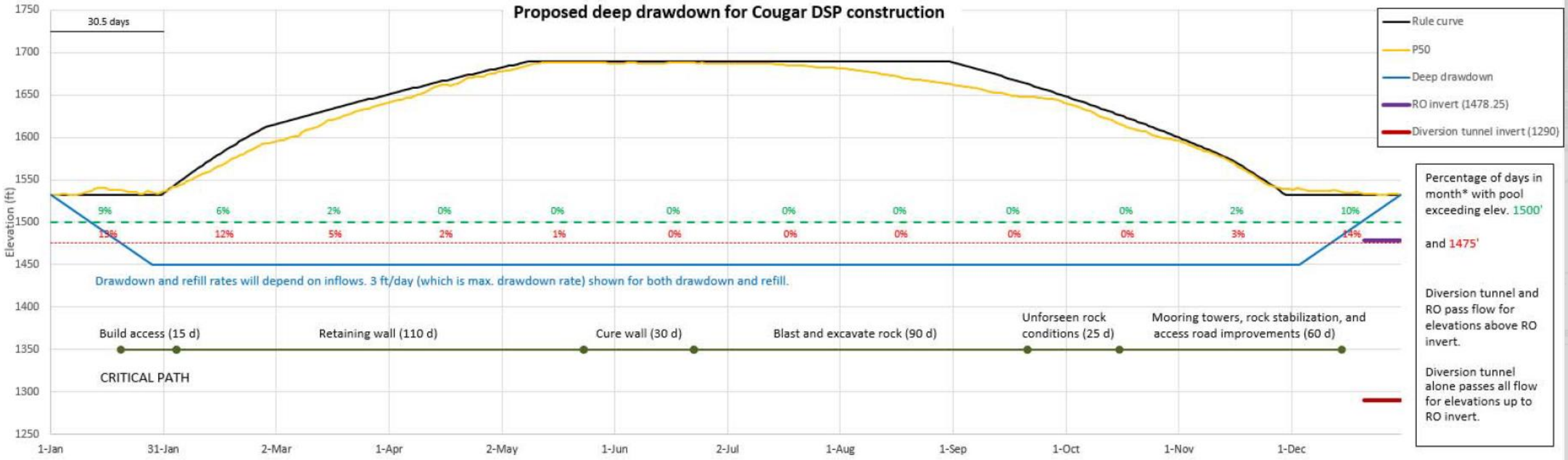
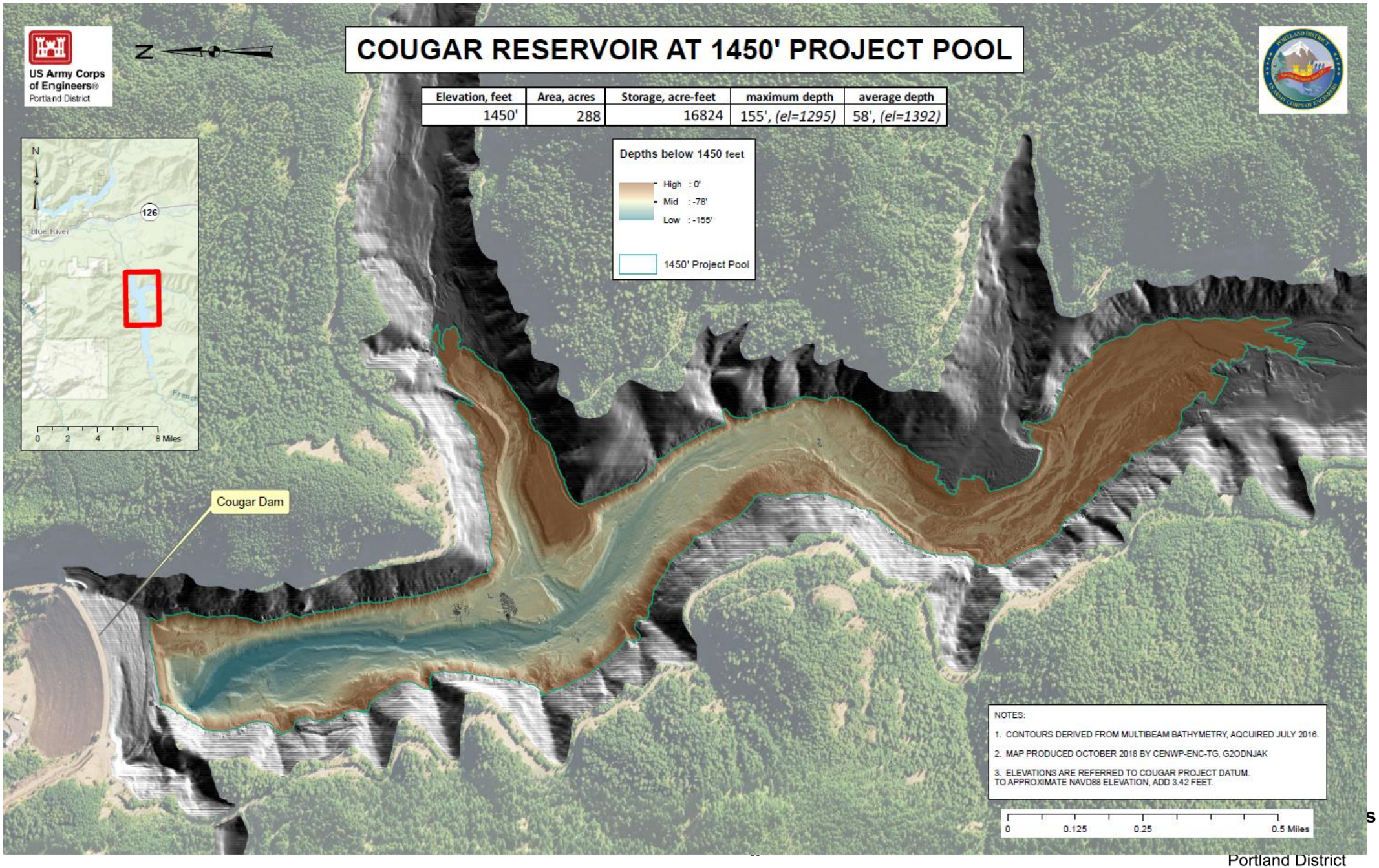
DRAWDOWN SCHEDULE

- 12 month drawdown starting in January
- Only using diversion tunnel during drawdown

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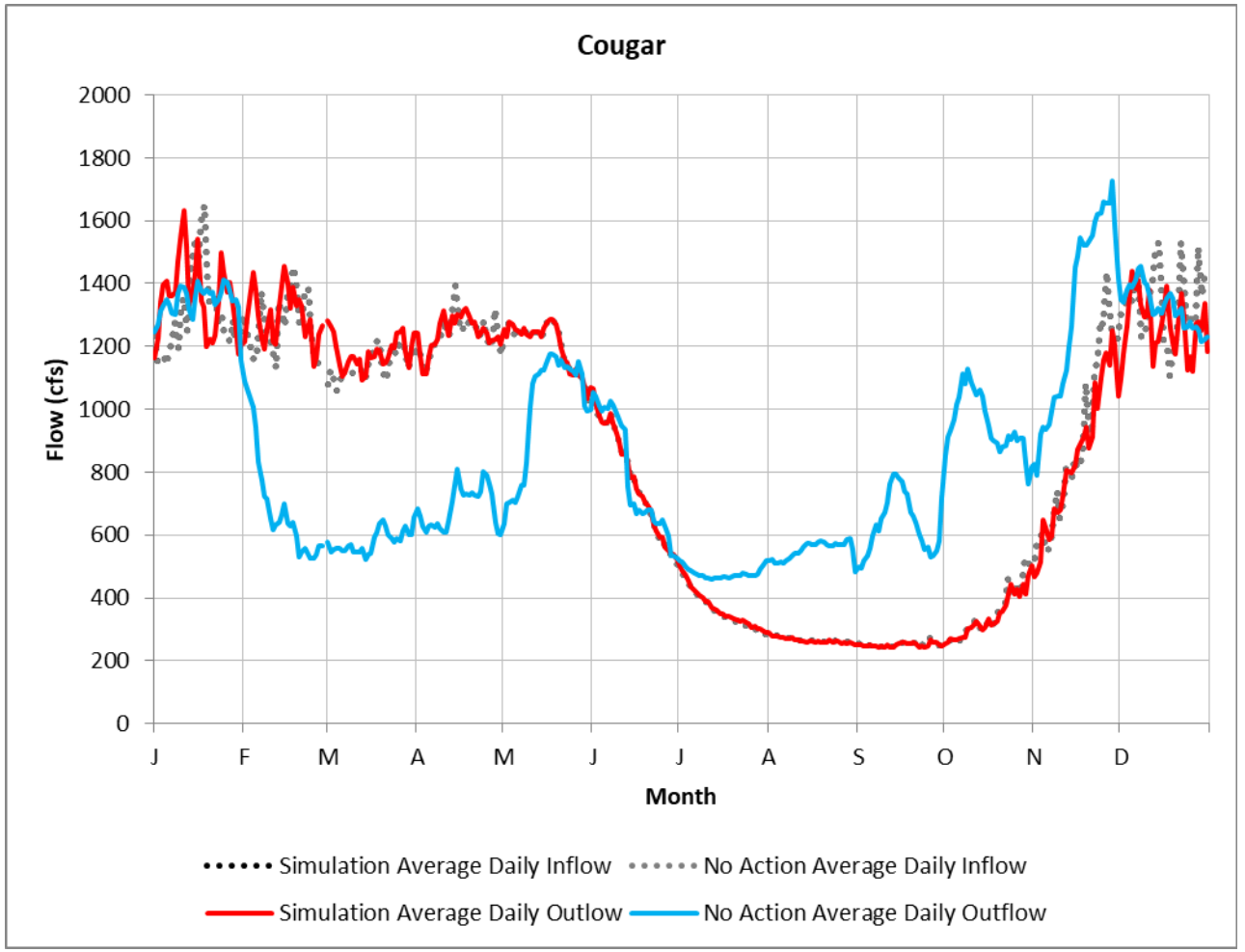
COUGAR RESERVOIR AT 1450' PROJECT POOL
Elevation, feet | Area, acres | Storage, acre-feet | maximum depth | average depth
1450' | 288 | 16824 | 155', (el=1295) | 58', (el=1392)
Depths below 1450 feet
High : 0'
Mid : -78'
Low : -155'
1450' Project Pool
N
126
Blue River
0 2 4 8 Miles
Cougar Dam
NOTES:
1. CONTOURS DERIVED FROM MULTIBEAM BATHYMETRY, AQCUIRED JULY 2016.
2. MAP PRODUCED OCTOBER 2018 BY CENWP-ENC-TG, G2ODNJAK
3. ELEVATIONS ARE REFERRED TO COUGAR PROJECT DATUM.
TO APPROXIMATE NAVD88 ELEVATION, ADD 3.42 FEET.
0 0.125 0.25 0.5 Miles

HYDROLOGICAL EFFECTS

Preferred Alternative - During Drawdown:

Cougar average outflow

- exceeds No Action in spring (February through May).
- lower than No Action during the summer and fall (July through November).



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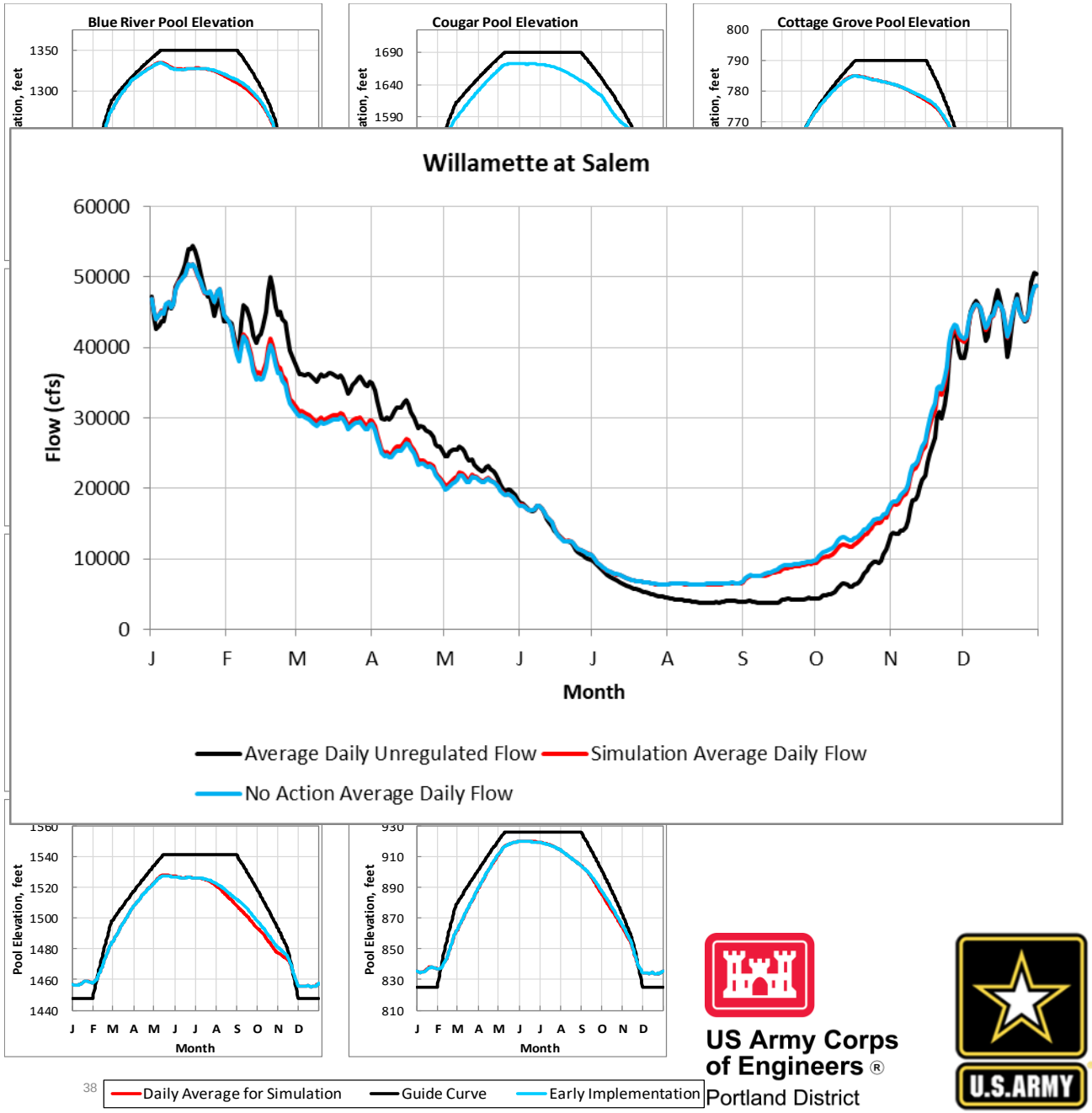
HYDROLOGICAL EFFECTS

Preferred Alternative - During Drawdown:

Cougar's ability to meet WV system objectives limited.

Blue River, Dorena, Fall Creek, Hills Creek, and Lookout Point will operate in response –

- outflow from will be increased to enable the system to reach minimum flow targets at Albany and Salem with success similar to the No Action
- Reservoir levels will be slightly lower (ex. avg change of 4.1ft at Hills Creek in September)



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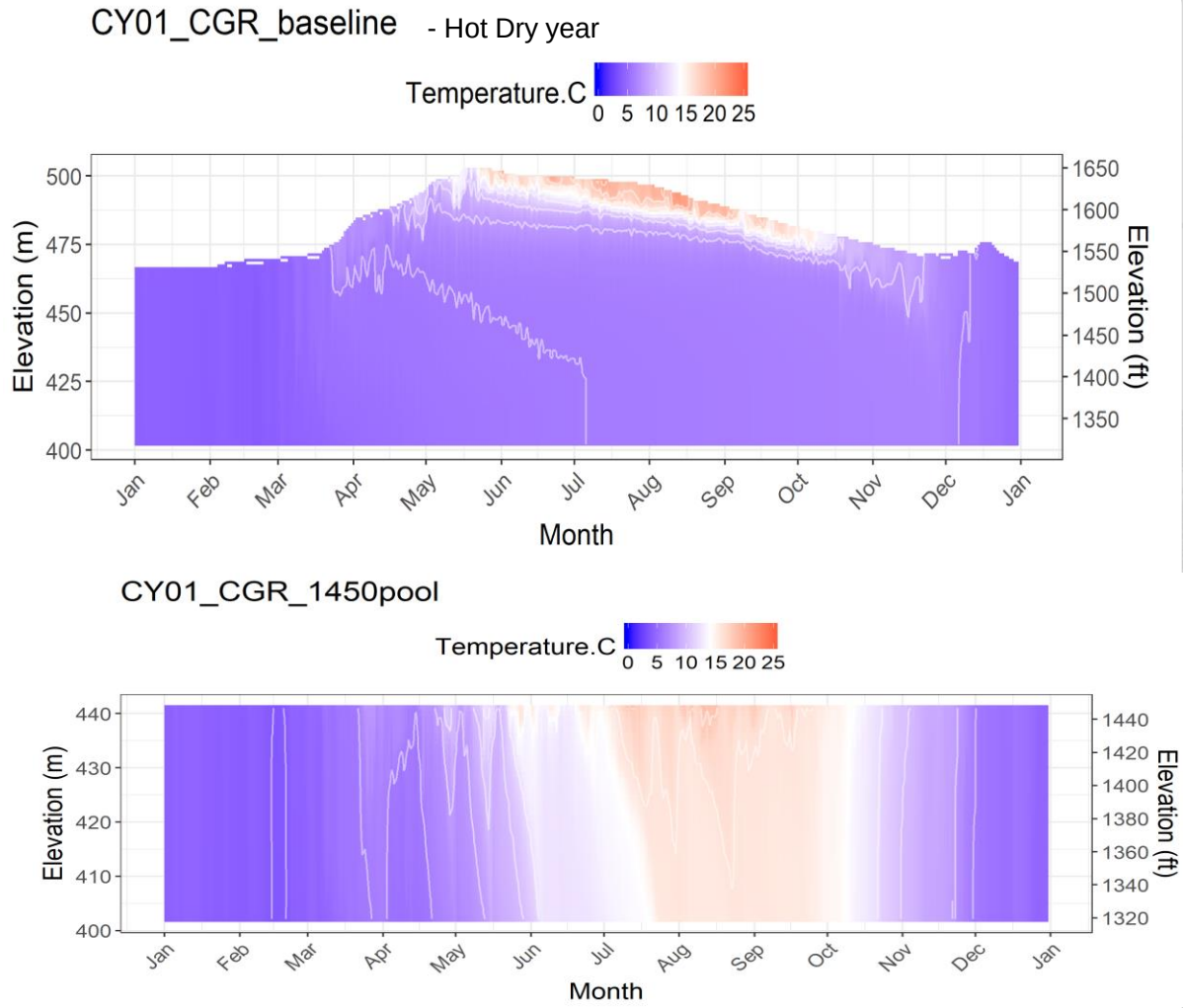
WATER QUALITY EFFECTS
TEMPERATURES

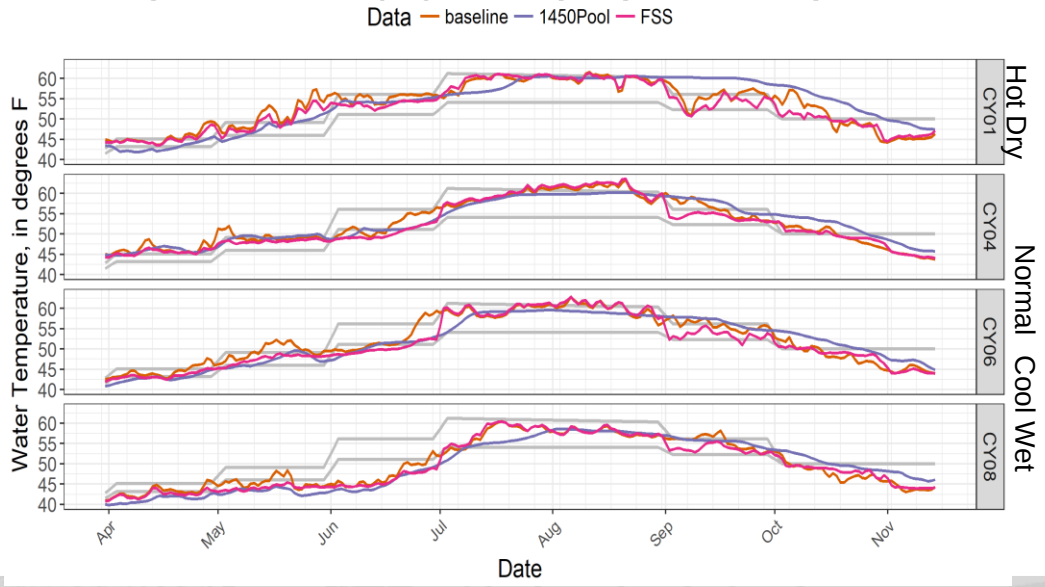
Preferred Alt - During Drawdown:

- Cooler outflow temperatures during June-July compared to “baseline” (No Action).
- Warmer outflow and reservoir temperatures during late September-November compared to “baseline” (No Action), especially during a hot-dry year (e.g., 2001).

Reservoir Temperatures



Outflow Temperatures



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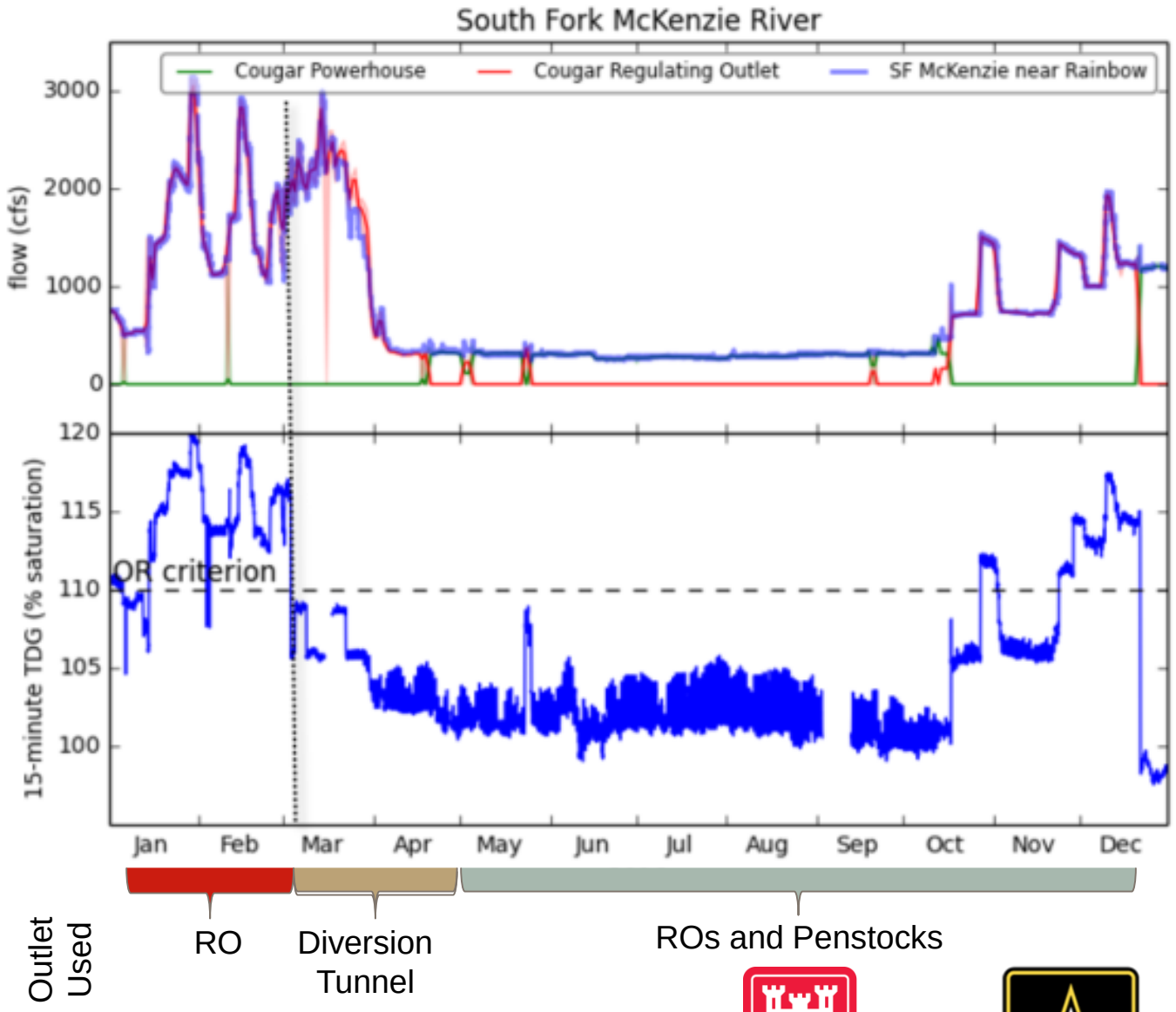
WATER QUALITY EFFECTS
TOTAL DISSOLVED GAS

TDG exceedances not expected*

*exceedances shown to be tied to the use of the RO releases

Preferred Alternative - During Drawdow

- Drawdown will exclusively use Diversion Tunnel
- 2016 trash rack drawdown provides support for assumption that the Diversion Tunnel will not result in TD exceedance
  - exceedances experienced from January 1 through March 03
  - used ROs until March 3 followed by exclusive use of Diversion Tunnel until April 20



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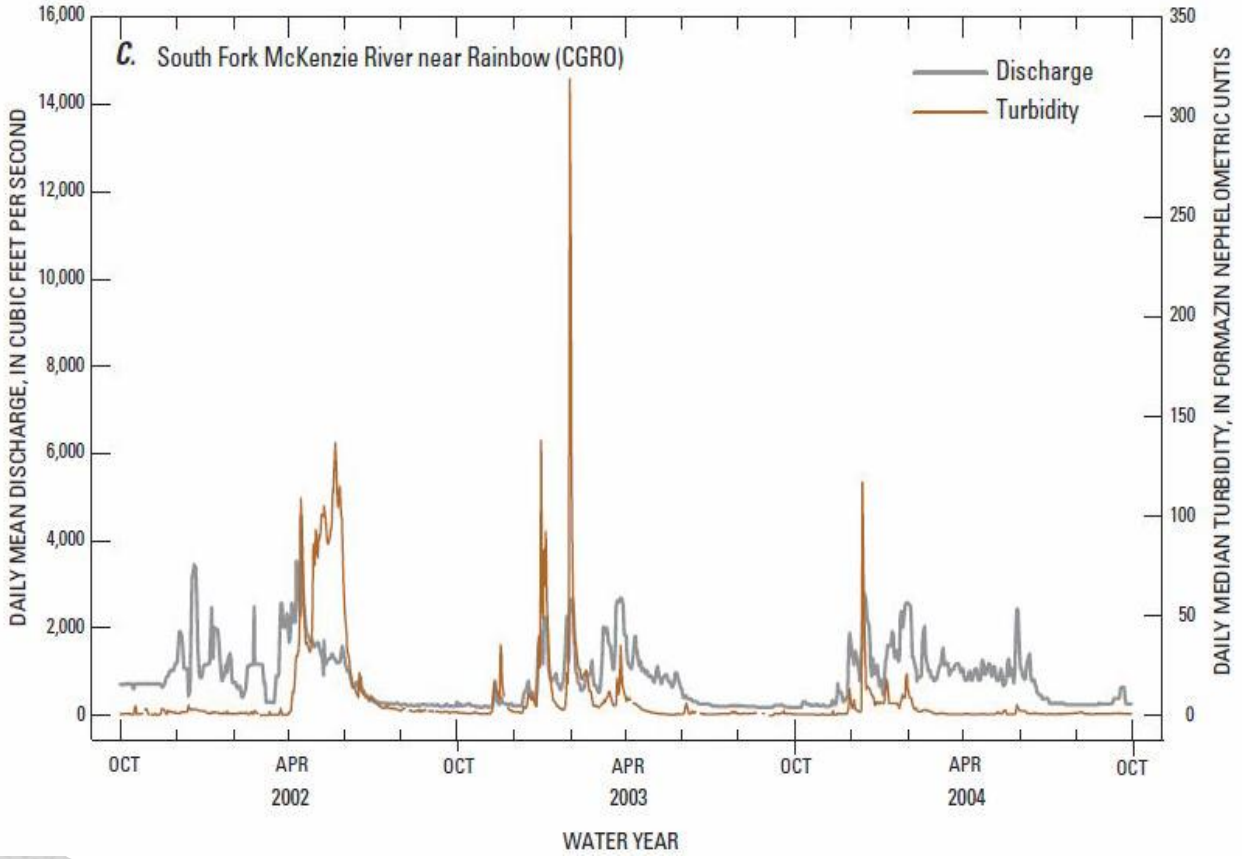
WATER QUALITY EFFECTS
TURBIDITY

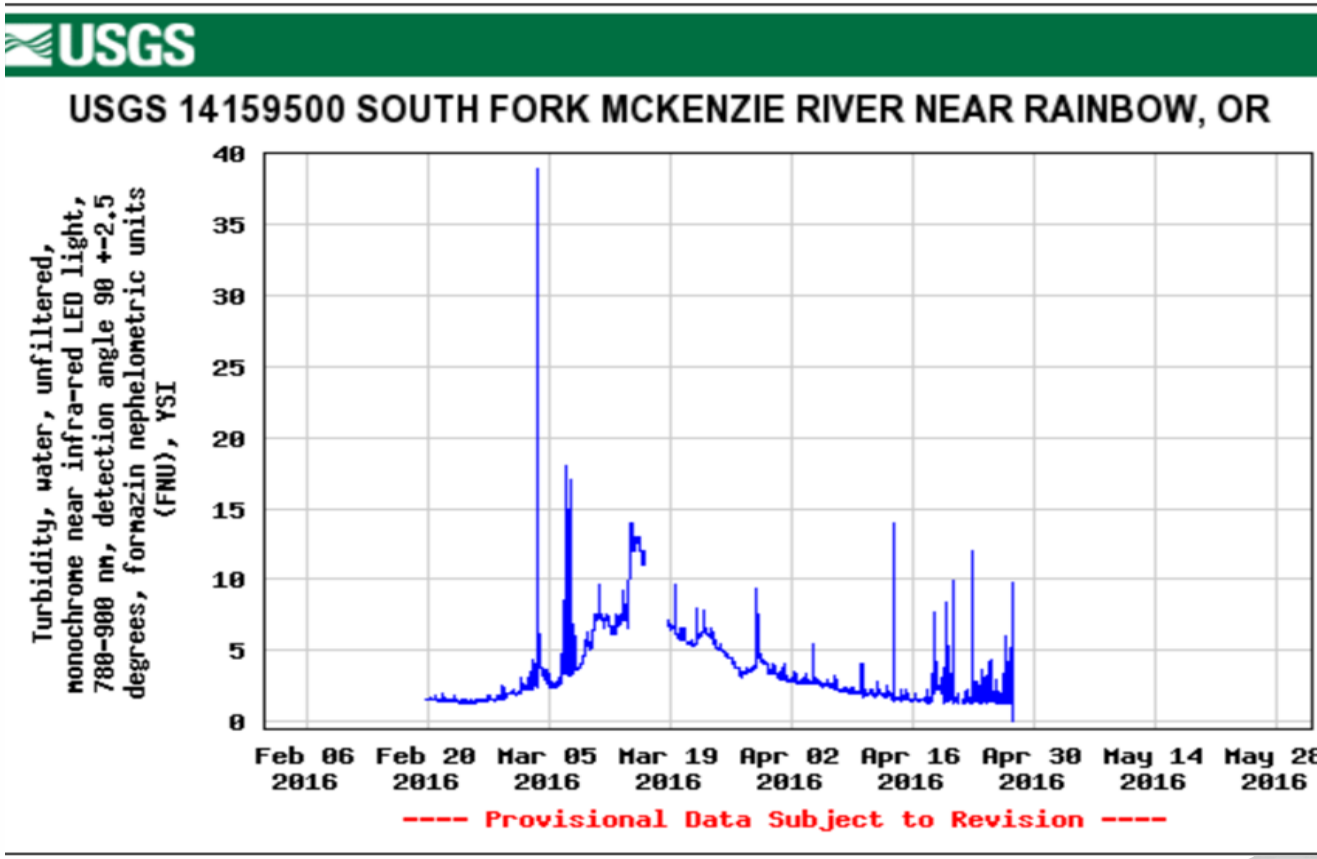
Preferred Alternative - During Drawdown:

- **Drawdown limited to elevation 1450’**

2002 drawdown to 1400’ – large area of deltaic sediments, highest FNU = ~350



2016 drawdown TO 1455’ – lower area of deltaic sediments, highest FNU = ~39 during storm event



UWR CHINOOK EFFECTS

Preferred Alternative - During Drawdown:

Effect	Assessment
May not be able to meet minimum BiOp flows (300 cfs) in July-September - base flow could be near 200 cfs.	- Single season - Decrease in available habitat in SF McKenzie similar to pre-dam conditions (passing inflow)
Cooler summer temperatures - ~20% less time exceeding 60°F	- Not likely to effect holding
Higher fall temperatures →18-22 days early fry-emergence in winter/spring following drawdown	- Single season 2-2.5 months natural variability - Egg mortality not expected - Migration barrier not expected
Increased turbidity	- Equivalent to winter storm event - Fines shown to mobilize with next high flow event

Risk of Stranding	- Fish Salvage Plan
	  - Larger pool then WTCT construction pool
	  - No Chinook salvaged or observed in 2016

Risk of Diversion Tunnel Entrainment	- Low passage rates due to depth (160') of diversion tunnel outlet (1290')

BULL TROUT EFFECTS

Preferred Alternative - During Drawdown:

Effect	Assessment
Higher Reservoir Temperatures in Fall	- Temperature refuge at depth in residual reservoir - survival of age-0 bull trout was at least 98% up to 18°C (Selong et al 2001)
Risk of Stranding	- Fish Salvage Plan - Larger pool then WTCT construction pool - Many pools connected to river during WTCT construction - 2016: no tagged bull trout present in the residual pool directly in front of the WTCT. The ODFW crew described the nearest detection was located in the reservoir, which is outside of the cul-de-sac area and is safe from any dewatering or stranding
Risk of Diversion Tunnel Entrainment	- Low passage related depth of diversion tunnel outlet (1290')

SCHEDULE

Nov 6 – Dec 6	ATR/Cooperating Agency (NMFS, USFWS, ODFW) review of Draft EA **(1 month)**
Jan 5 – Jan 19	Cooperating Agency back check updates to Draft EA **(2 weeks)**
Jan 14	Public Notice for Draft EA public meetings
Jan 30	Draft EA for Public Review & Comment **(30-45 days)**
Jan 30 – Feb 3	Public meetings on Draft EA (**2-3 open house style meetings** - presentation on preferred alternative and impacts assessment)
Apr 14 – Apr 28	ATR/Cooperating Agency Review of Final EA (**2 weeks**)
June 11	Public Notice for Final EA/FONSI (**30 days**)
July 11	FONSI signed

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