DETROIT TEMPERATURE CONTROL AND DOWNSTREAM PASSAGE – SWS 90% DDR

Jeff Ament, PM
Kristy Fortuny, TL
Jon Rerecich, Fish Biologist
Norm Buccola, Water Quality Engineer
Kelly Janes, Environmental Resource Specialist

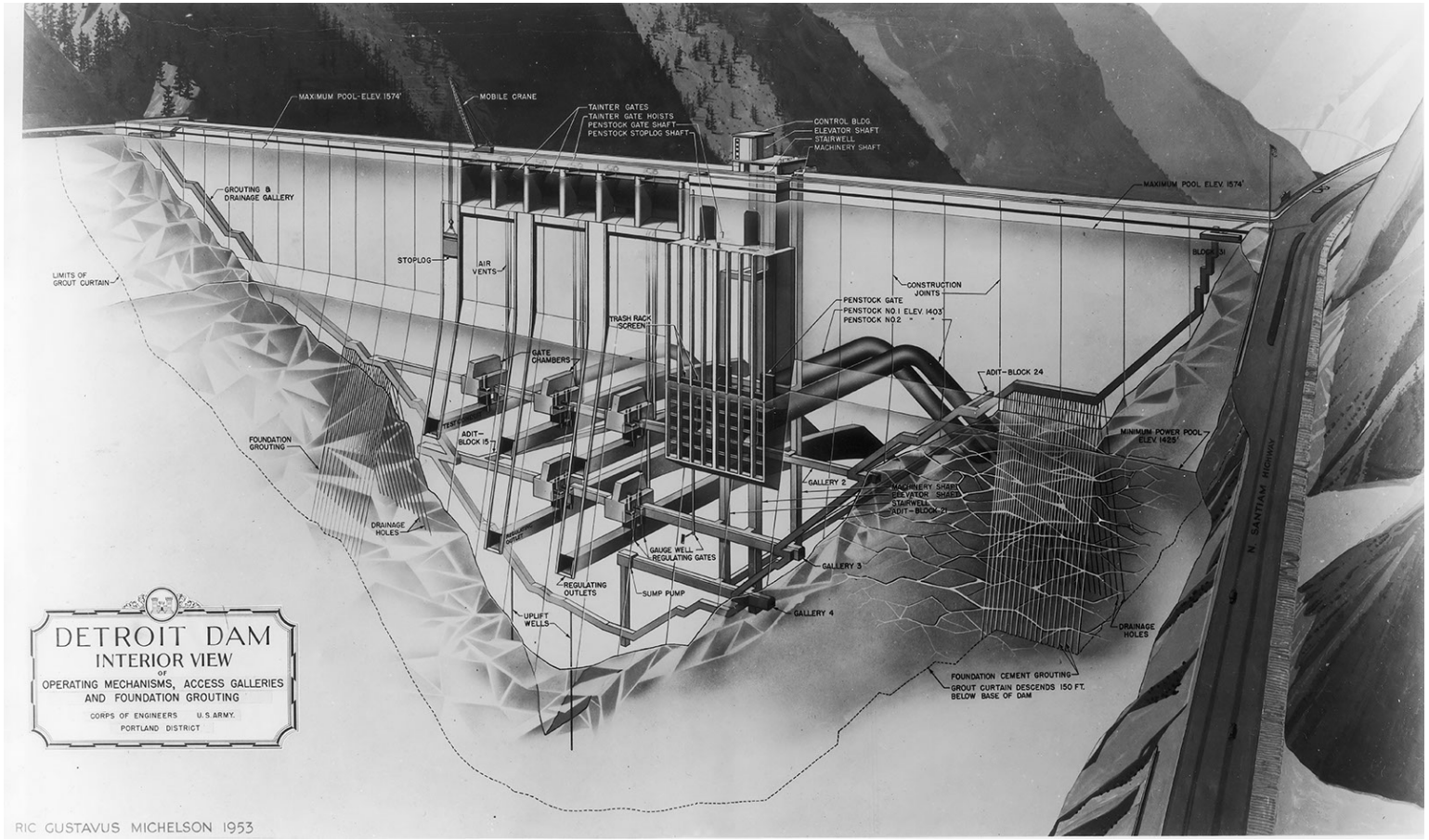
02 April 2019

US Army Corps of Engineers ®
Portland District

U.S.ARMY

AGENDA

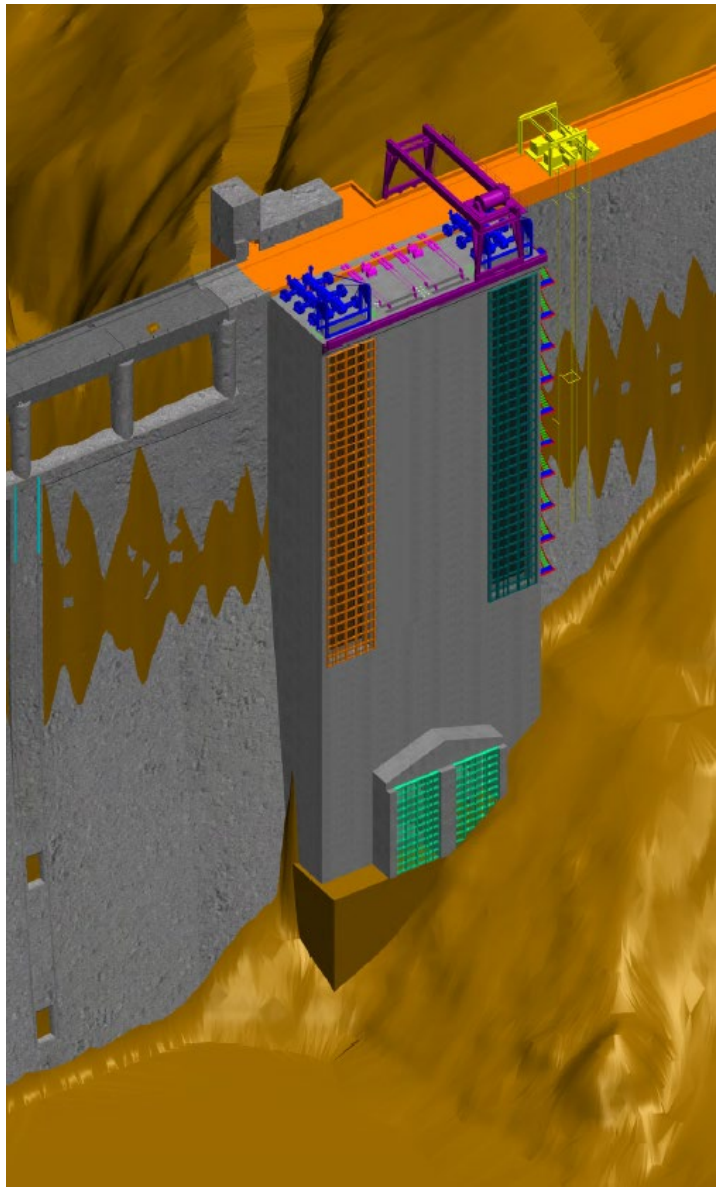
90% SWS DDR Update



US Army Corps of Engineers ®
Portland District

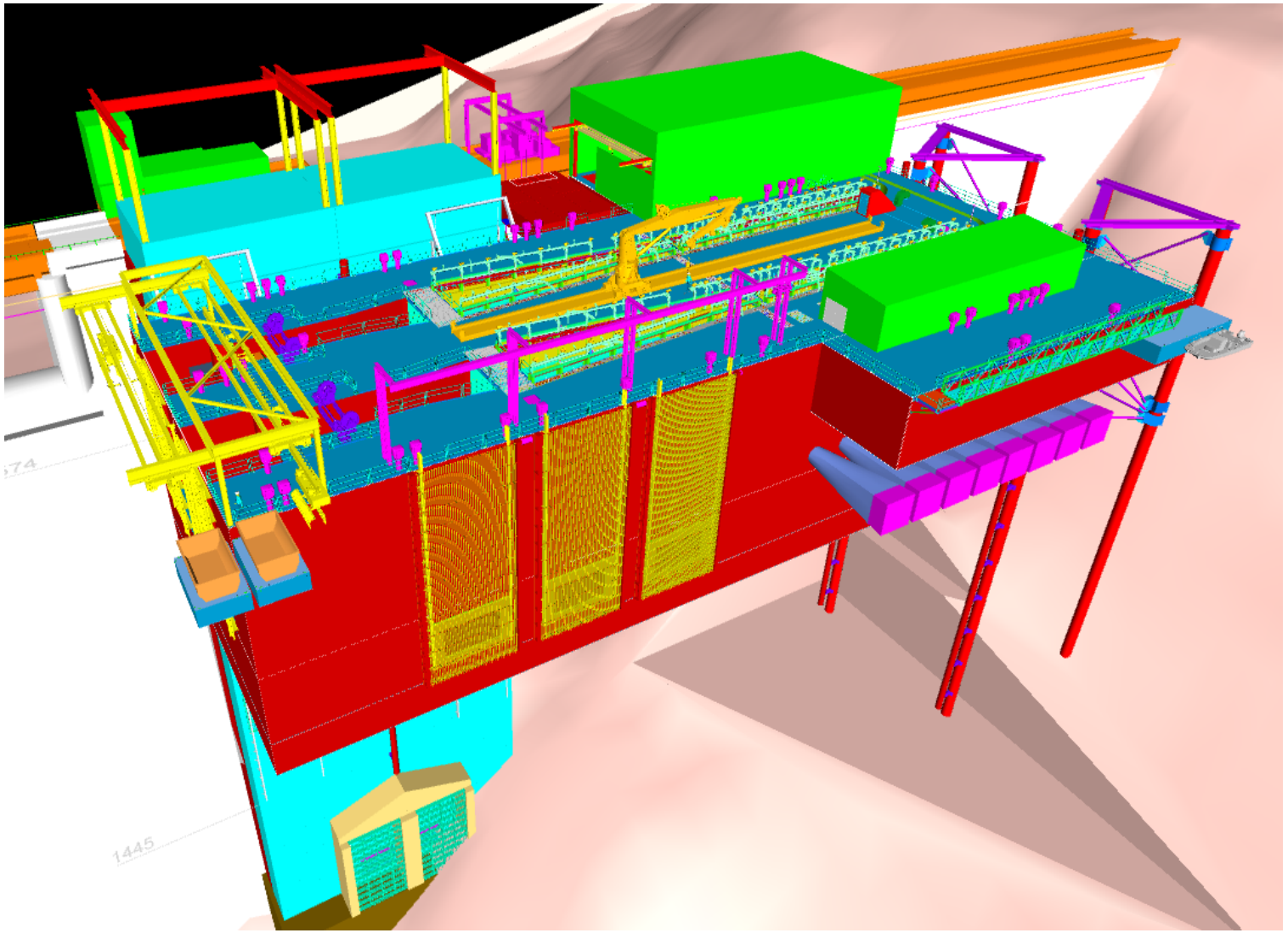
U.S.ARMY

SWS – ISOMETRIC



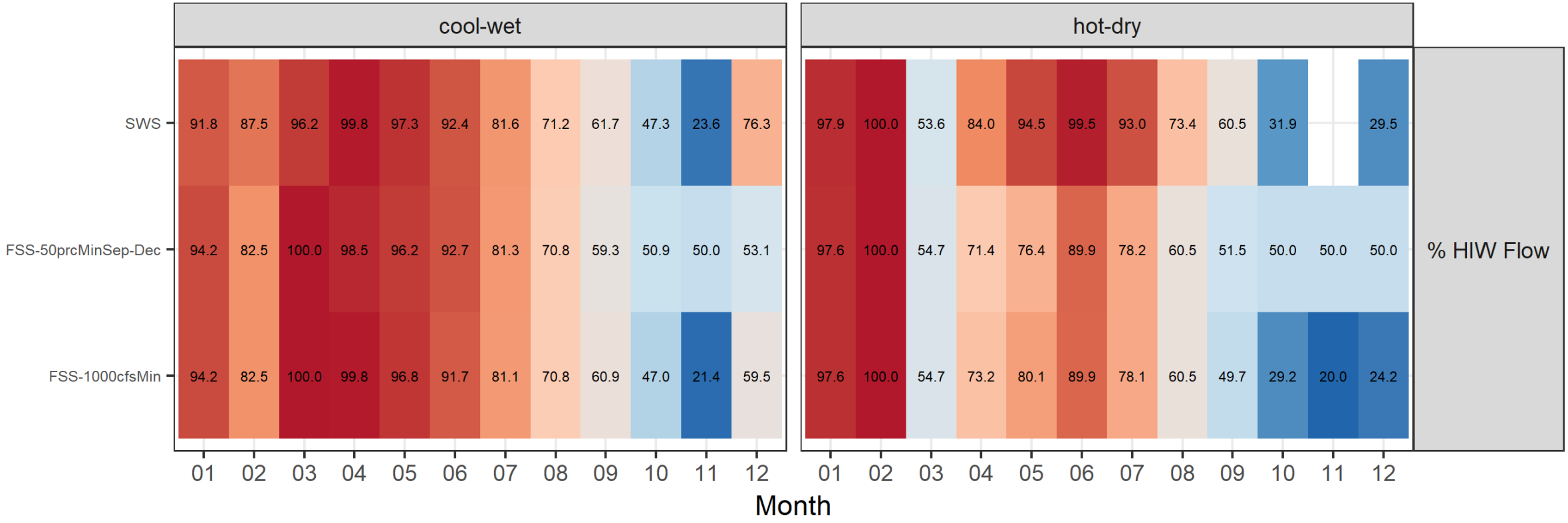
US Army Corps of Engineers ®
Portland District

SWS AND FSS - ISOMETRIC



US Army Corps of Engineers ®
Portland District

TEMPERATURE MODELING: PERCENT HIGH INTAKE WEIR OUTFLOW



Existing: spillway, power penstocks, upper RO (Maximum spill of 60%)

SWS: 14 ft weir depth (April-Sep); 28 ft weir depth (Sep-April)

FSS_1000cfsMin: 10.8 ft weir depth (April-Sep); 22.1 ft weir depth (Sep-May)

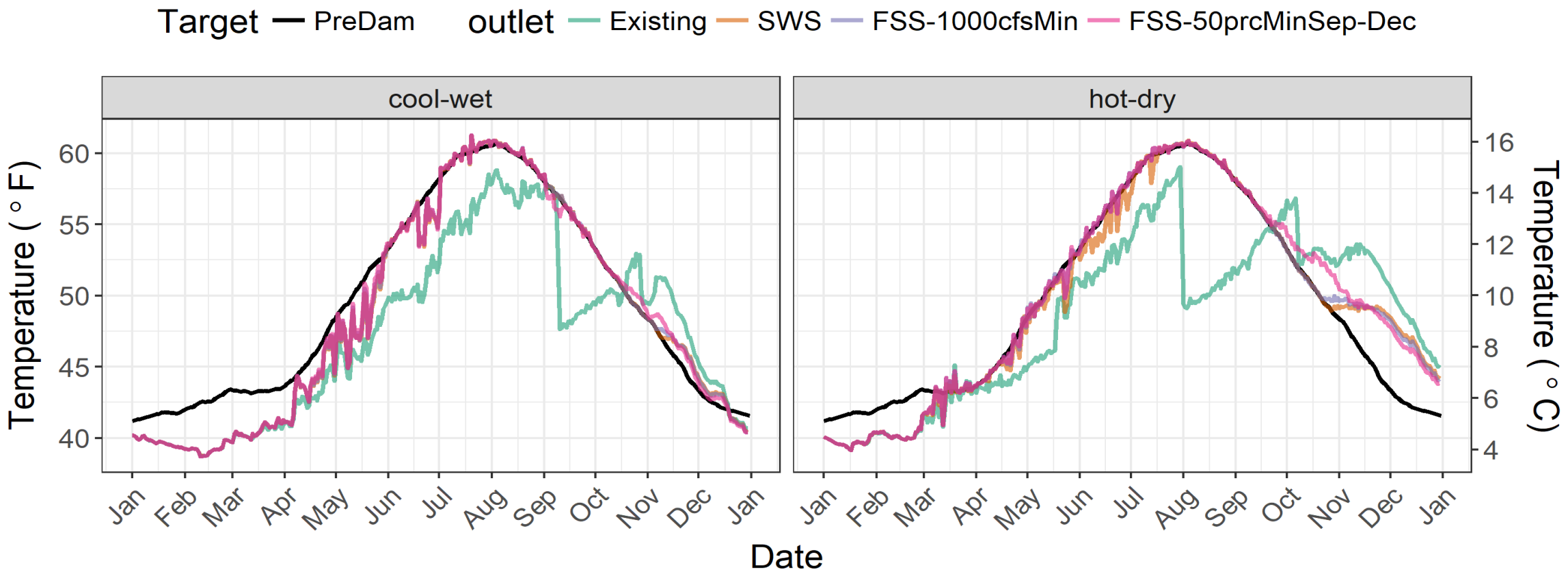
Minimum 1000 cfs year-round surface flow to Max 5600 cfs

FSS_50prcMinSep-Dec

Same as above but additional flow (>50% of total) through FSS September-December

US Army Corps of Engineers ®
Portland District

TEMPERATURE MODELING

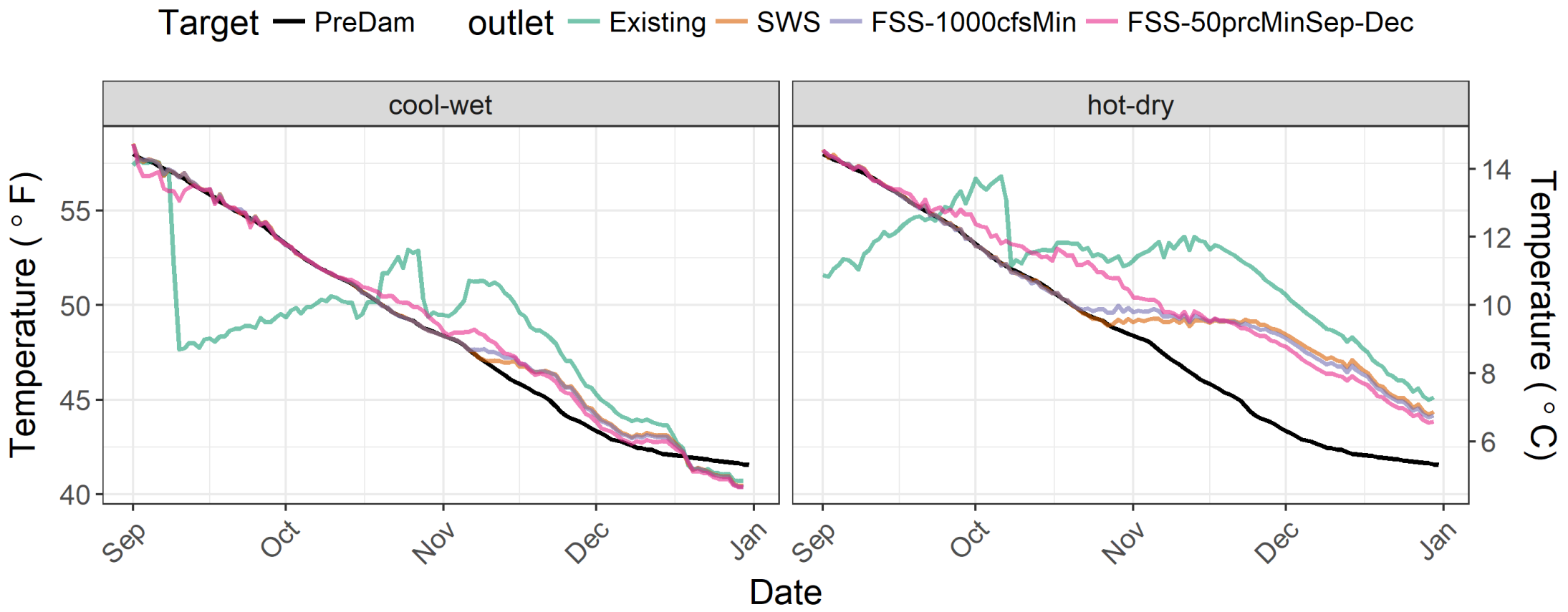


Simulated Detroit Dam release temperature in cool-wet and hot-day design years. The temperature target used for each scenario is the 30-day maximum of the long-term average without-dam temperatures at Detroit Dam ("PreDam")

US Army Corps of Engineers ®
Portland District

U.S.ARMY

TEMPERATURE MODELING

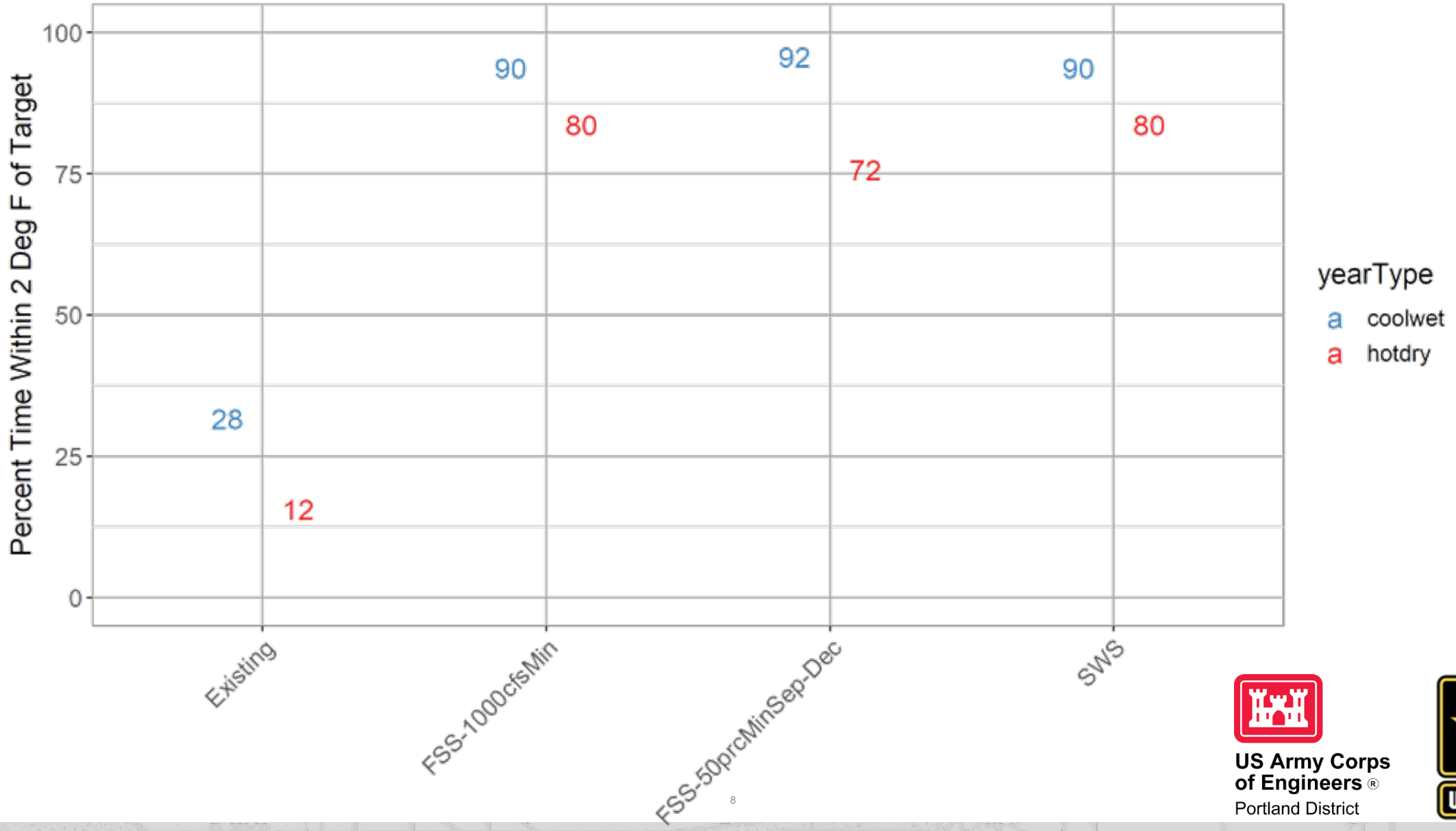


Simulated Detroit Dam release temperature in cool-wet and hot-day design years. The temperature target used for each scenario is the 30-day maximum of the long-term average without-dam temperatures at Detroit Dam ("PreDam")

US Army Corps of Engineers ®
Portland District

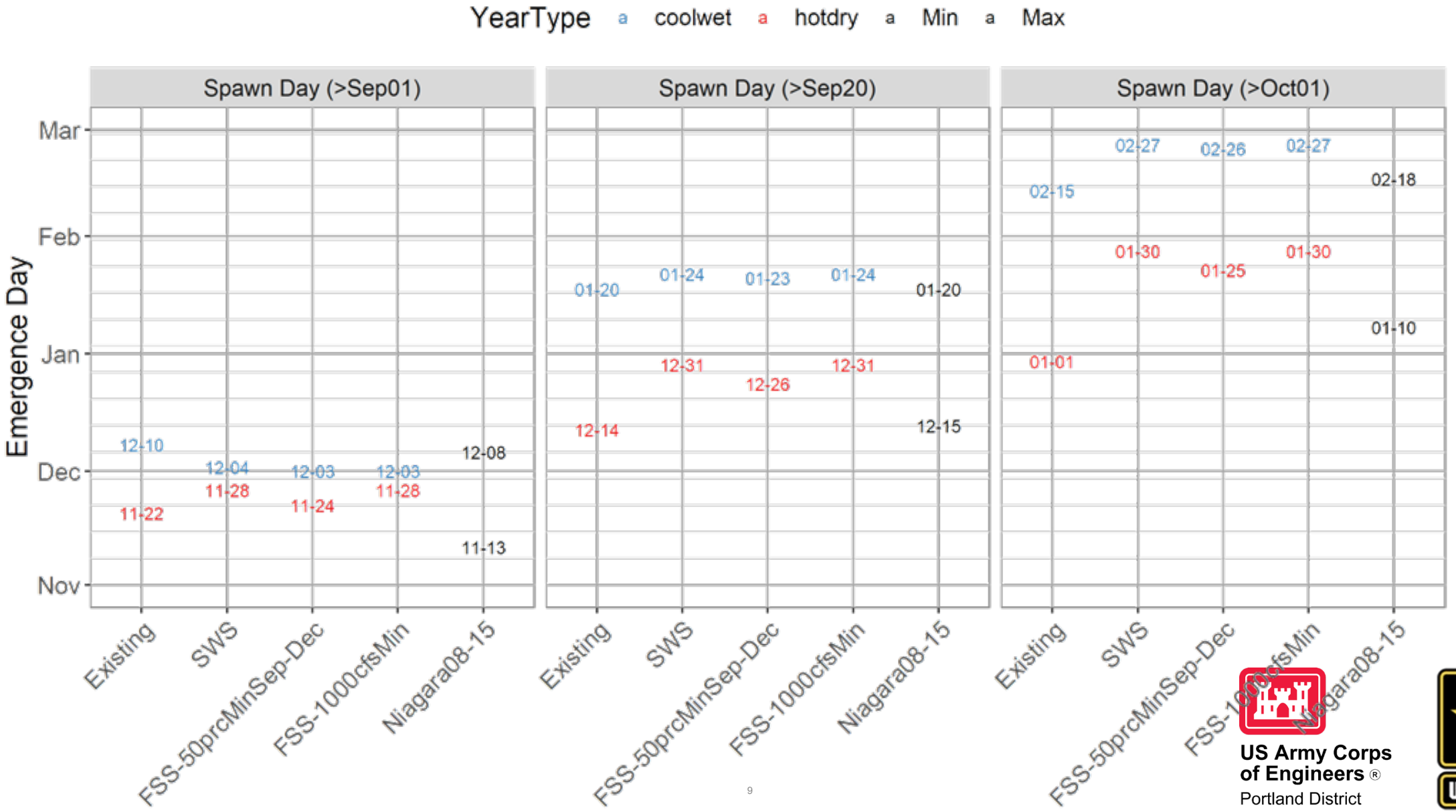
U.S.ARMY

PERCENT TIME ON TEMPERATURE TARGET



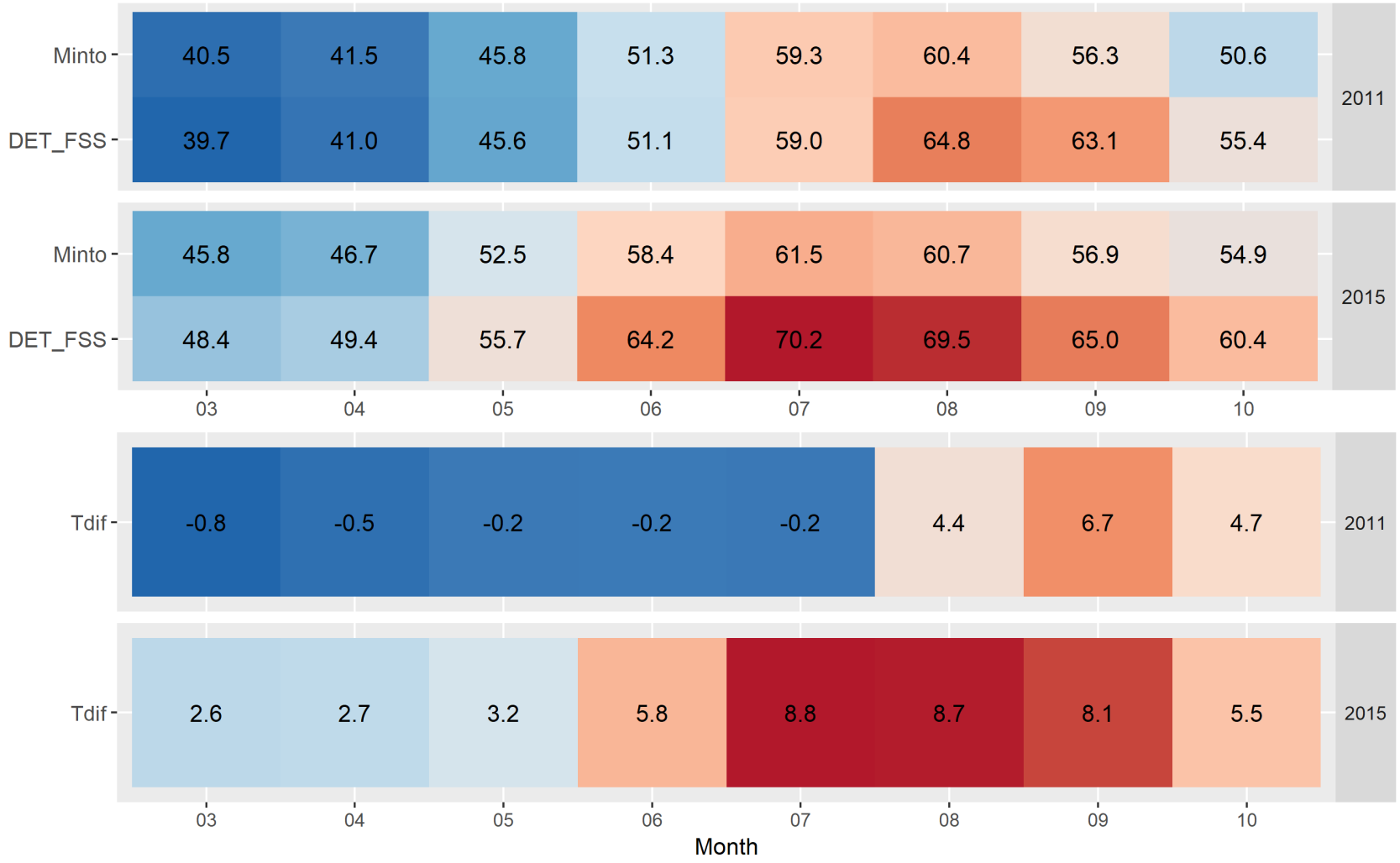
US Army Corps of Engineers ®
Portland District

ESTIMATED EMERGENCE TIMING



US Army Corps of Engineers ®
Portland District

ACCLIMATION ANALYSIS

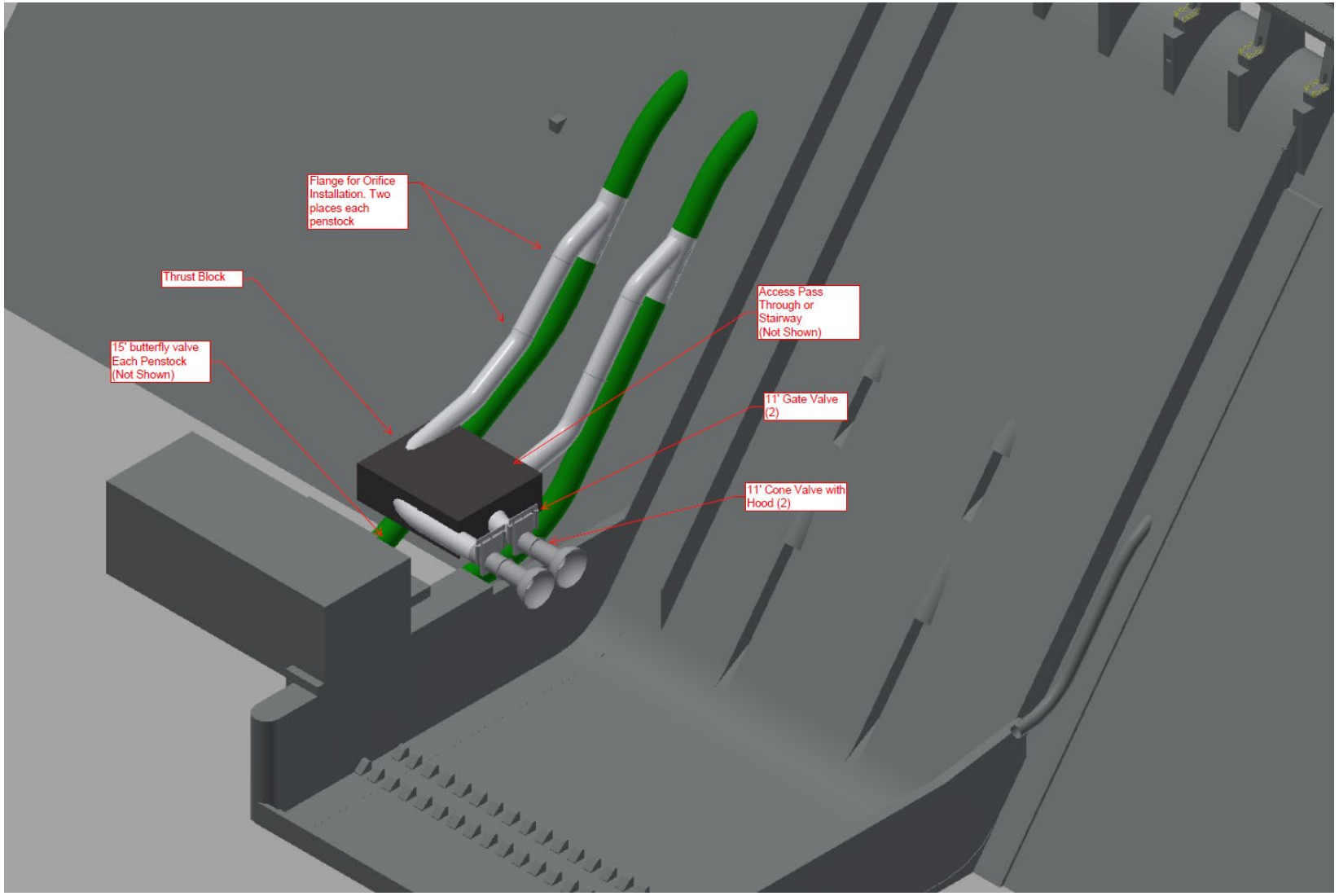


Temperature [°F] difference between FSS and Minto

US Army Corps of Engineers ®
Portland District

U.S.ARMY

PENSTOCK BIFURCATION



US Army Corps of Engineers ®
Portland District

EIS TIMELINE

EIS Timeline	
Draft EIS Cooperating Agency/Tribal/ATR concurrent review	April 1 – April 30 2019
Draft EIS updated based on review comments	May 1 – May 15
Draft EIS Public Comment Period (60 days)	May 24 – July 23 2019
Draft EIS Type I IEPR (30 days, overlaps with public review)	July 8 – August 7 2019
Finalize EIS and complete other Environmental Compliance (**ESA**, CWA, NHPA, etc.)	August – December 2019
ESA Section 7 Consultation	August – December 2019
Final EIS Public Review Period	December 2019 – January 2020
Record of Decision	January 2020
SWS Construction (ECI Option) Award	October/November 2020

US Army Corps of Engineers ®
Portland District

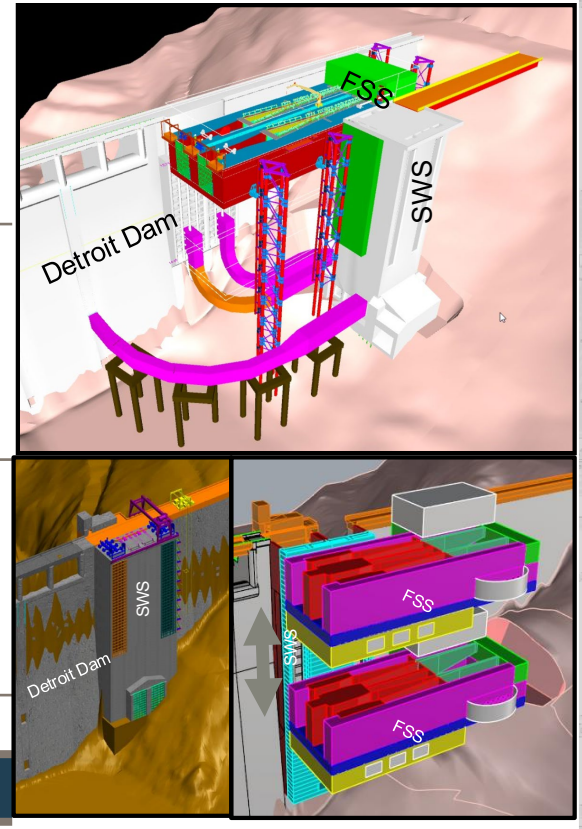
U.S.ARMY

ENVIRONMENTAL ASSESSMENT DOCUMENT STRUCTURE – 7 PARTS

1. **Introduction**: background, **purpose and need,** lead agency, cooperating agencies, and action area.
2. **Alternatives**:
   - Alternative formulation history
   - Summary of alternatives considered but eliminated
   - Construction Alternatives (different drawdown scenarios)
   - Assembly Staging Area Alternatives
   - Construction and Operation under All Alternatives
3. **Affected Environment & Environmental Effects**: within each section, the effects of the Alternative 1 (No Action Alternative) provides a baseline for evaluation and comparison to the action alternative referred to as Alternative 2 or the Preferred Alternative.
   - Air Quality & Noise
   - Geology/Soils/Seismology
   - Hydrology
   - Sediment Transport
   - Water Quality
   - Threatened/Endangered Species
   - Wildlife
   - Fish and Aquatic Species
   - Adult Fish Facilities, Hatcheries, & Fisheries
   - Vegetation
   - Water Supply
   - Hydropower
   - Transportation
   - Aesthetics
   - Cultural, Archeological, and Historical Resources
   - Recreation
   - Economics
   - Sociological Effects
   - Environmental Justice
   - Health and Safety
   - Climate Change
4. **Cumulative Effects**
5. **Public Engagement**
6. **Compliance with Applicable Federal Environmental Laws And Regulations**
7. **List of Principle Preparers**

ALTERNATIVES

Construction Alternatives	Significant Impacts
1. No Action	None
2. Build in the Dry – 2 Year Drawdown to 1300’	Low summer flows and prolonged high turbidity • High economic impacts, • Threatens water supply for 180K people & 17,000ac of ag land, • Significant impacts to aquatic habitat and ESA listed species
3. Build in the Dry – 1 Year Drawdown to 1300’	Low summer flows and prolonged high turbidity • High economic impacts, • Threatens water supply for 180K people & 17,000ac of ag land, • Significant impacts to aquatic habitat and ESA listed species
4. Build in the Wet – 1 Year Variable Drawdown (maintain 1000cfs through summer)	Prolonged high turbidity • High economic impacts • Threatens water supply for 180K people, • Significant impacts to aquatic habitat and ESA listed species
5. Build in the Wet – No Drawdown	None
Staging Alternatives	
Mongold State Park Day Use Area	Significant impacts to recreation
Oregon Parks and Recreation Maintenance Yard	None
Detroit Lake Recreation Area Campground	Significant impacts to recreation



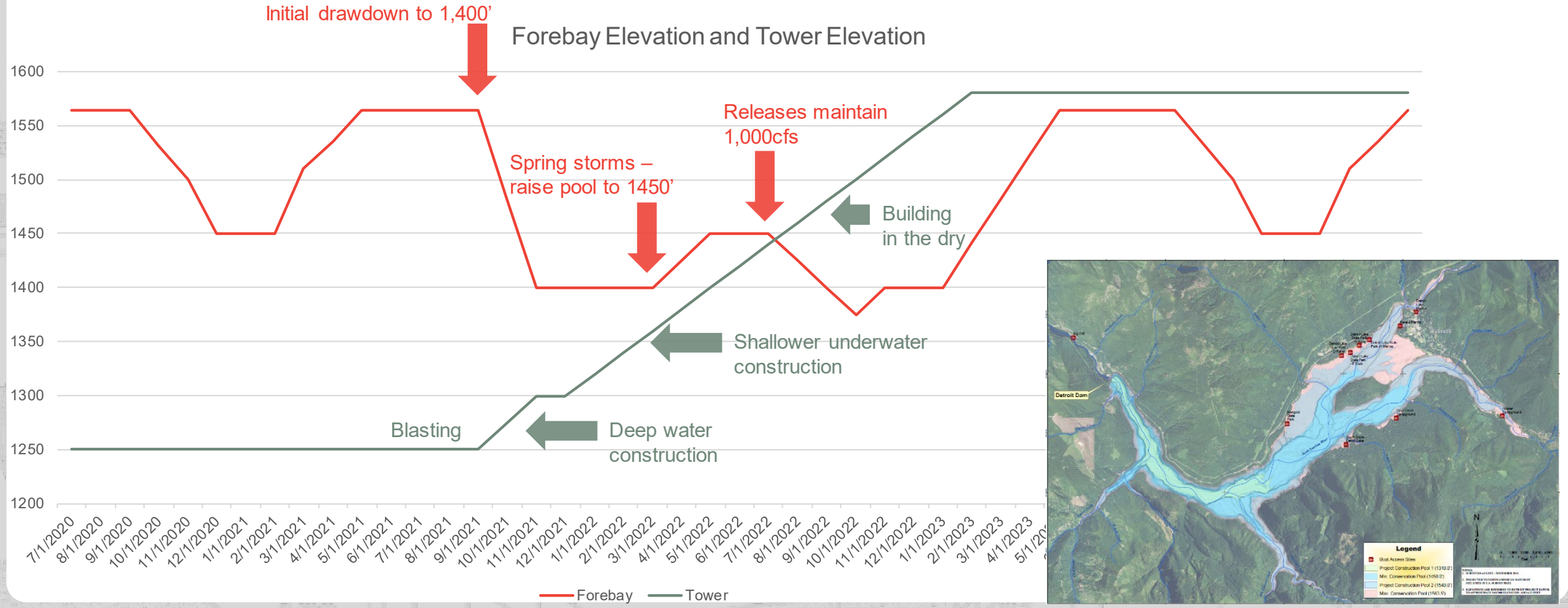
US Army Corps of Engineers ®
Portland District

U.S.ARMY

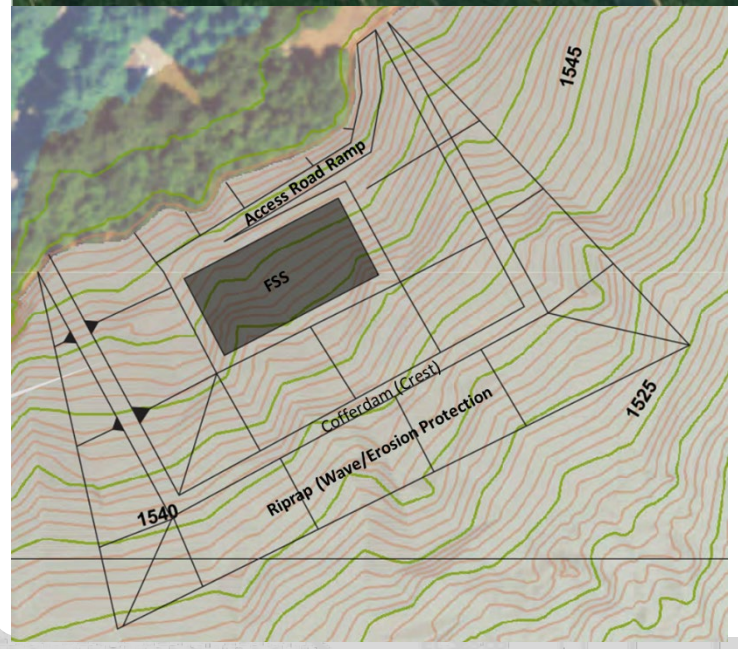
IN THE WET ALTERNATIVE 4 – VARIABLE DRAWDOWN

1 year with reservoir levels between 1450 and 1350' elevation

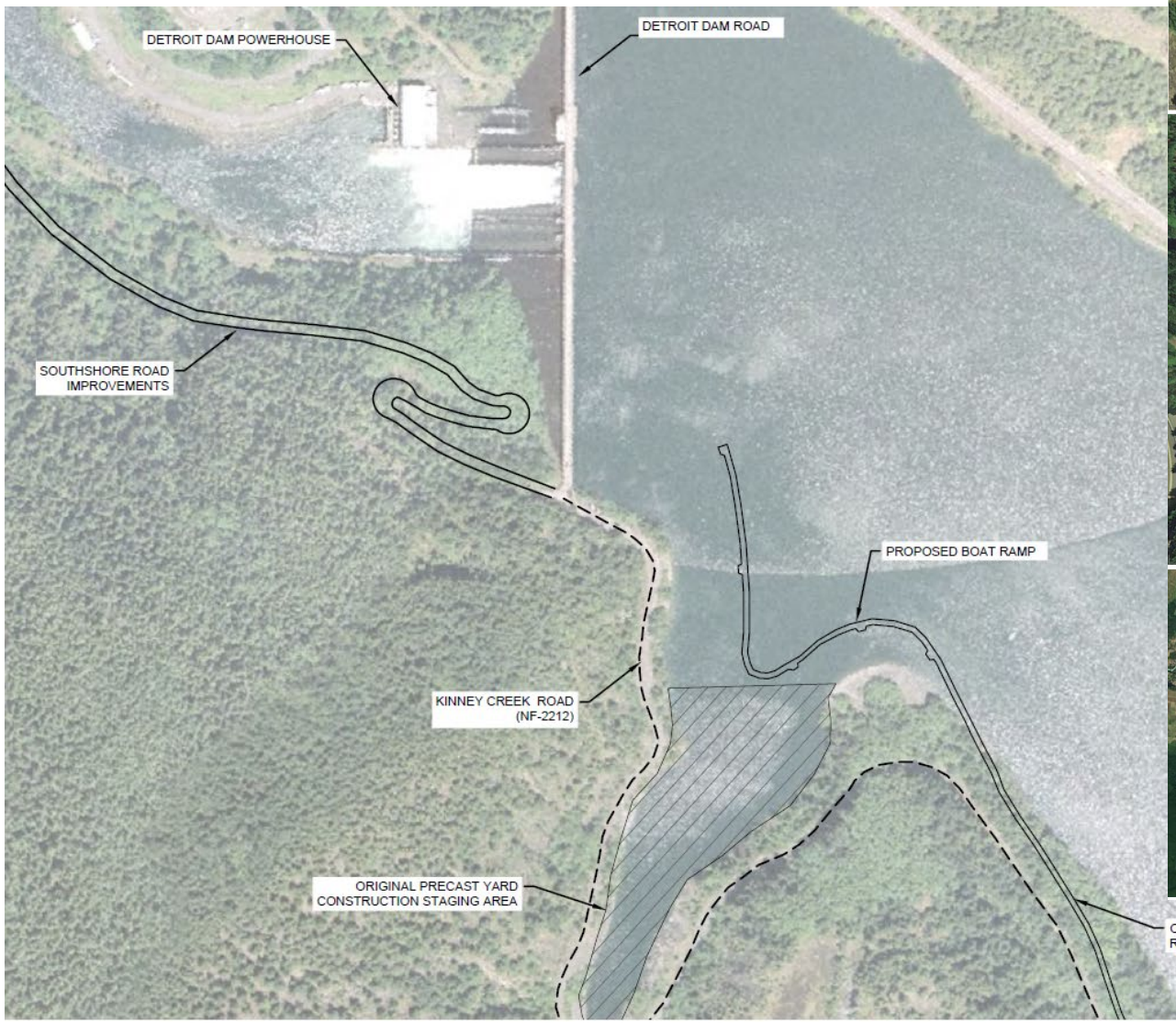
- Drawdown maintains 1,000cfs in dry summer months (BiOp minimums)
- Drawdown limits the depth and duration of the underwater construction
- No hydropower production during construction.

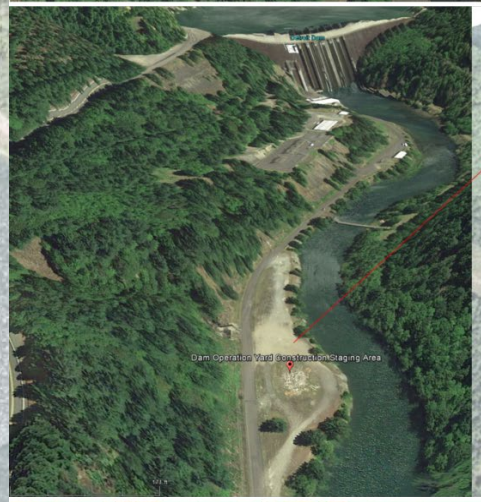


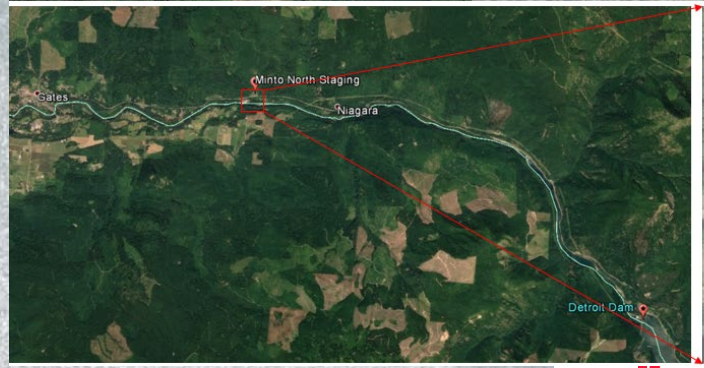
ASSEMBLY STAGING AREA ALTERNATIVES

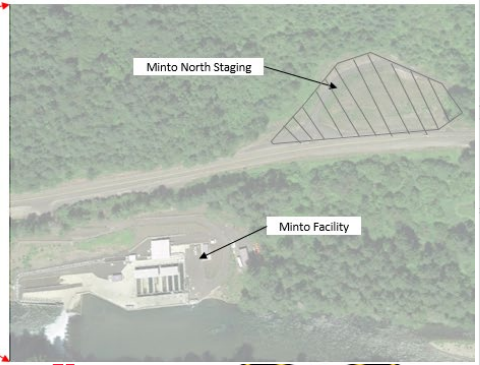


OTHER CONSTRUCTION AND STAGING









US Army Corps of Engineers ®
Portland District

U.S.ARMY

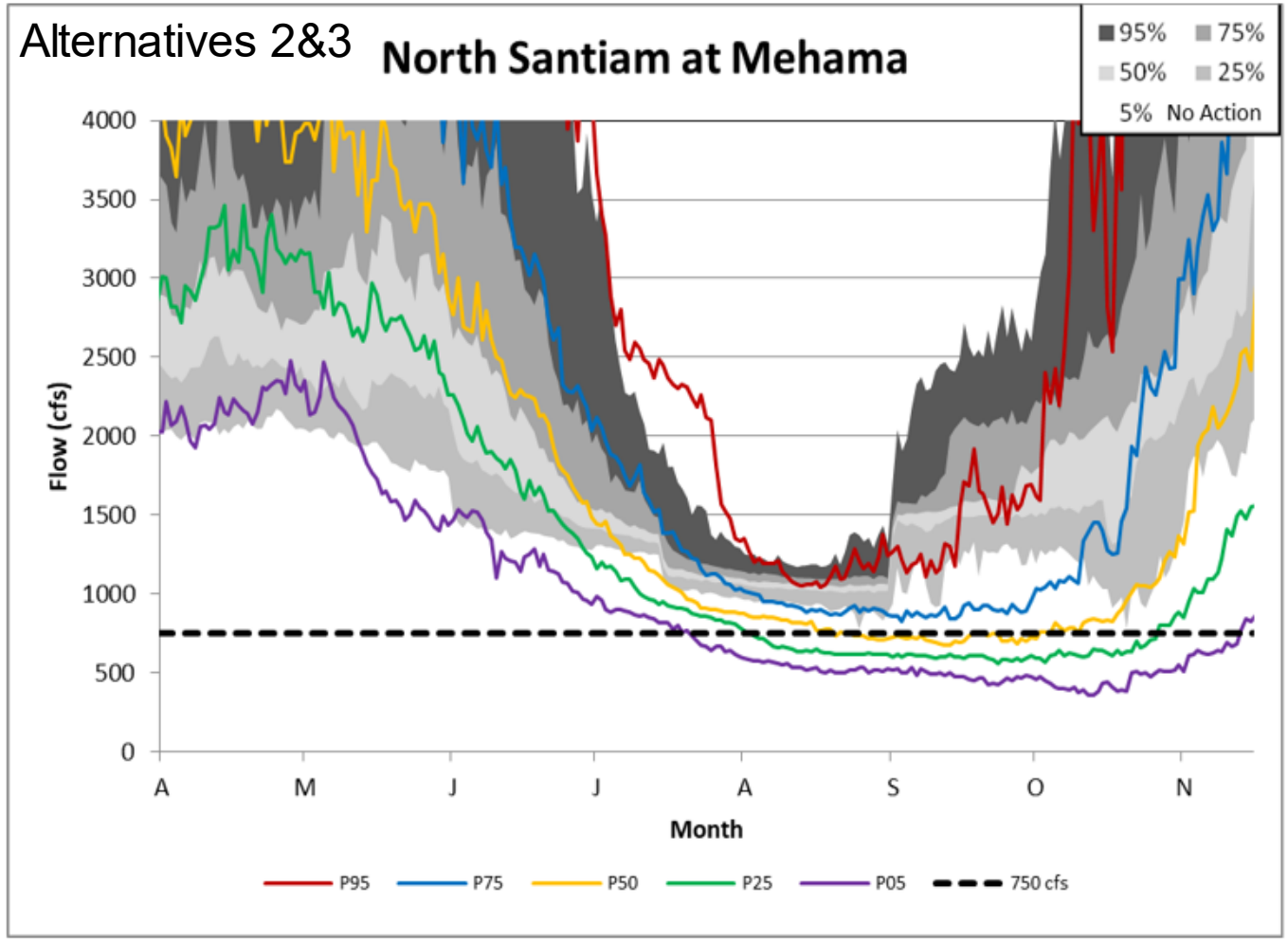
MAJOR ECONOMIC IMPACTS

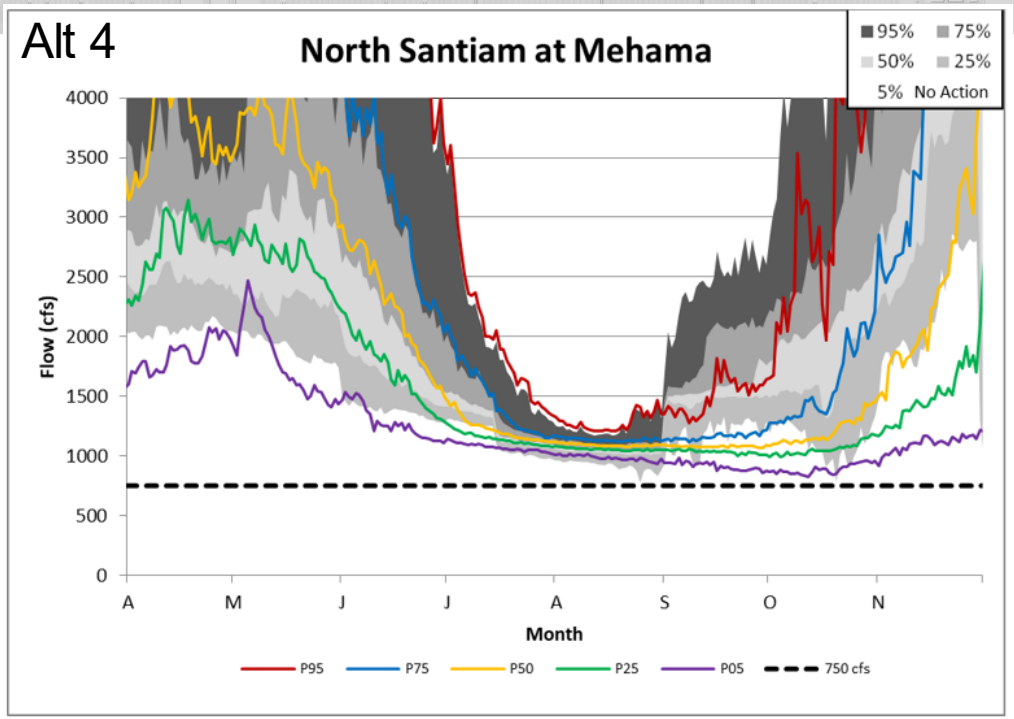
Alternative	Recreation	Agriculture	M&I Water	Total Economic Impact
1. No Action	None	None	None	None
2. Build in the Dry – 2 Year Drawdown to 1300’	$22,542,000	$139,000,000	$56,000,000	$217,542,000
3. Build in the Dry – 1 Year Drawdown to 1300’	$11,271,000	$50,014,000	$28,000,000	$89,285,000
4. Build in the Wet – 1 Year Variable Drawdown (maintain 1000cfs through summer)	$11,271,000	$6,426,000	$28,000,000	$45,697,000
5. Build in the Wet – No Drawdown	None	None	None	None

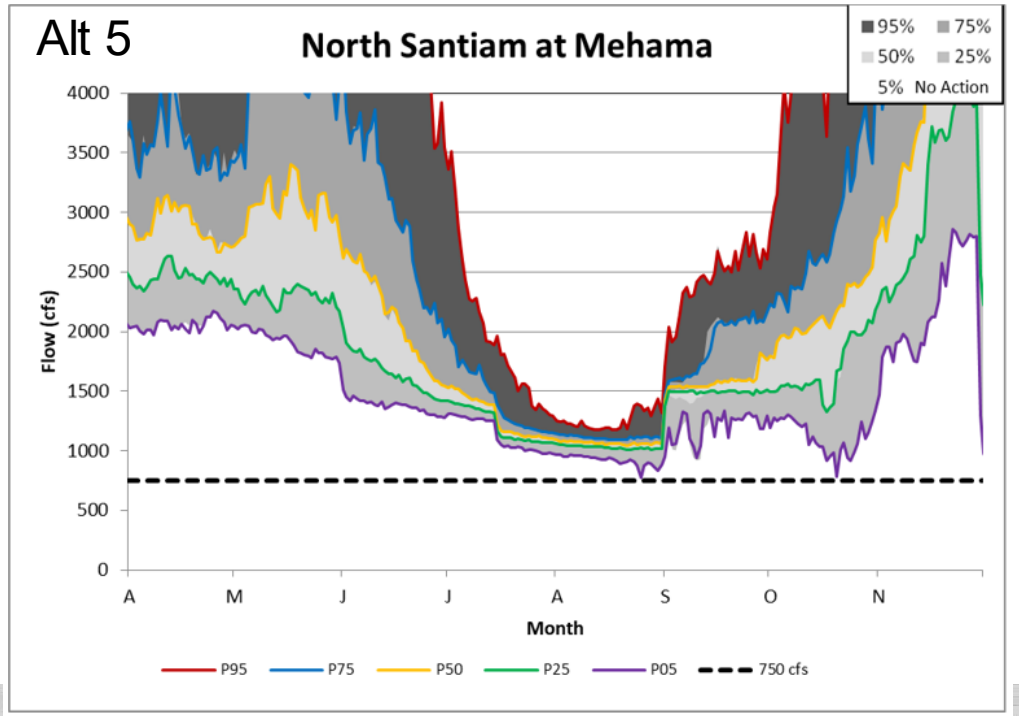
US Army Corps of Engineers ®
Portland District

U.S.ARMY

FLOW IMPACTS







TURBIDITY IMPACTS

Alts	Description	SSC		Persistent Turbidity		Sediment Discharge	
		Mean (ppm)	Max (ppm)	Max (FTU)	Duration (days)	Average Mass Rate (tons/day)	Total Outflow Mass (tons)
2 & 3	Drawdown	758	3211	400	65-70	2900	242,000
	Flood Control Operations	45	278	37	5	718	19,900
4	Drawdown	690	3610	440	65-70	2900	242,000
	Summer outflow exceeds inflow (dry year)	83	2230	290	18,40,17	1800	109,000
	Winter storm event	17	36	5	NA	280	4,900
	Summer storm event (wet year)	42	166	23	4	580	16,000
5	Normal rule curve sediment event	17	36	5	NA	280	4,900

Typical Turbidity

MAJOR F&W IMPACTS

Action Alternative	Effect	Impact/Risk to community
2&3	Summer flow = run of river 1-2 years: flows as low 50cfs downstream of water supply intakes (only 50cfs instream water right)	• Significantly reduced mainstem aquatic habitat • Reduction in upstream passage • Dewatered floodplain habitat (important for chub) • Dewatering of redds • Decreased spawning habitat
	Downstream Temperature - warmer conditions in summer, especially in a low-flow year such as 2015	• Delayed upstream migration of adult Chinook salmon, shift in fry emergence, and increased stress / mortality of salmonids in warm water years
	Increased turbidity Downstream	• Water quality and habitat degradation (sedimentation) for aquatic environment, including ESA listed species habitat and recently delisted chub habitat
	Increased Reservoir Temperatures	• Increased stress levels and mortality in Chinook and reservoir fish populations with limited cold water refuge area
	Low DO	• Increased stress levels due to crowding of fish in smaller areas
	Blasting	• Noise and pressure waves may displace or injury fish

MAJOR F&W IMPACTS

Action Alternative	Effect	Impact/Risk to community
4	High flows during spawning for drawdown immediately followed by reduced flows	• Dewatering of redds
	Lower fall flows	• Reduced spawning habitat
	Increased turbidity -drawdown will mobilize reservoir sediments and move it downstream of dam (winter)	• Water quality (turbidity) and habitat degradation (sedimentation)
	Increased Reservoir Temperatures	• Increased stress levels and mortality in Chinook and reservoir fish populations with limited cold water refuge area (less than Alts 2&3)
	Low DO	• Increased stress levels due to crowding of fish into smaller areas
	Underwater Blasting (would use signal blasts and bubble curtains to mitigate impacts)	• Noise and pressure waves may displace, injury, or kill fish
5	Underwater Blasting (would use signal blasts and bubble curtains to mitigate impacts)	• Noise and pressure waves may displace, injury, or kill fish

US Army Corps of Engineers ®
Portland District

U.S.ARMY

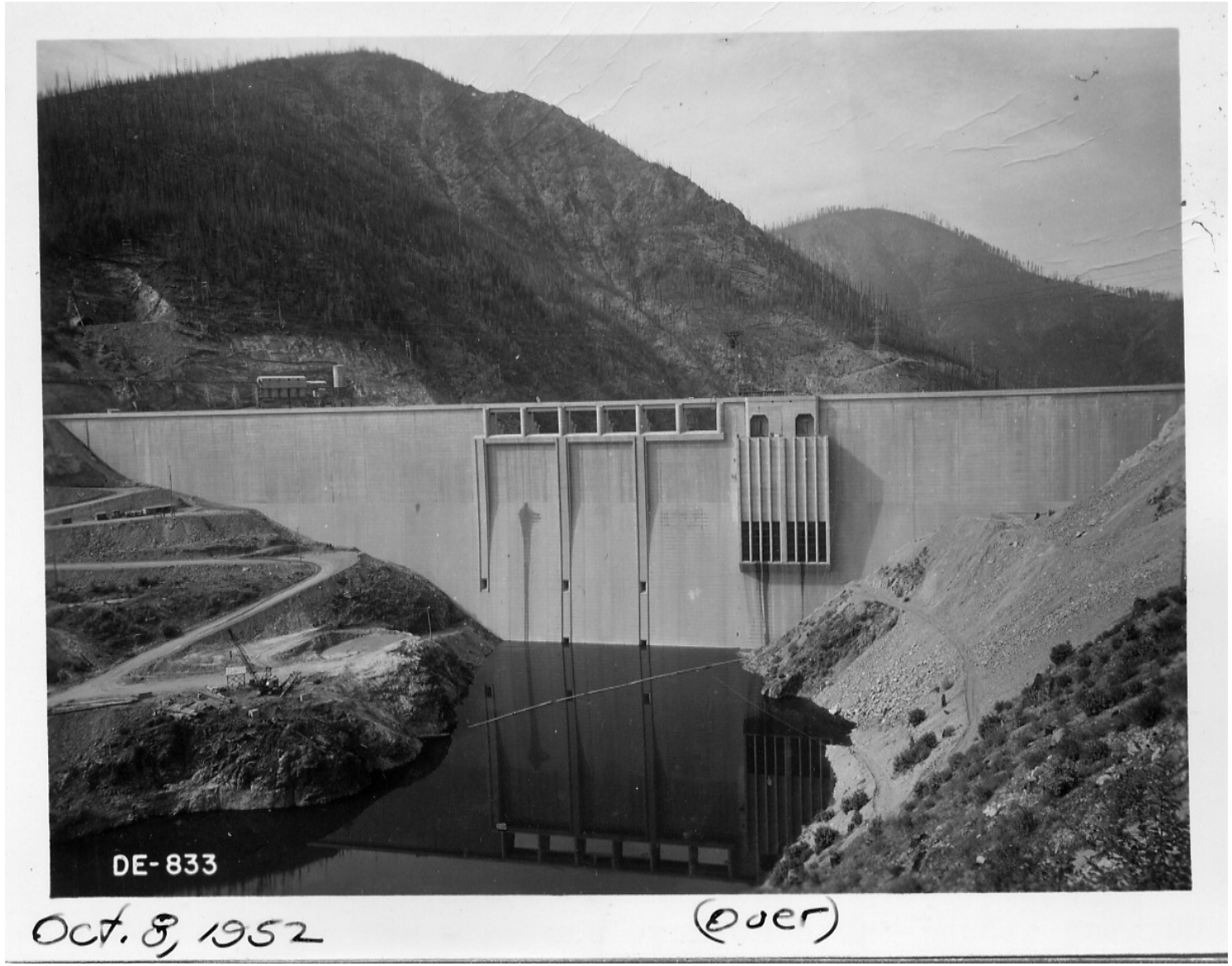
COOPERATING AGENCY REQUESTS

- Ensure all potential effects under 4 action alternatives are appropriately characterized for aquatic species.
- Ensure chub data use and associated effects analysis is correct
- Provide write up on non fish aquatic species (mussels, other BMIs, etc.) and analysis of potential effects to these resources under 4 action alternatives.
- Provided input on effects under 4 action alternatives to off channel habitat

US Army Corps of Engineers ®
Portland District

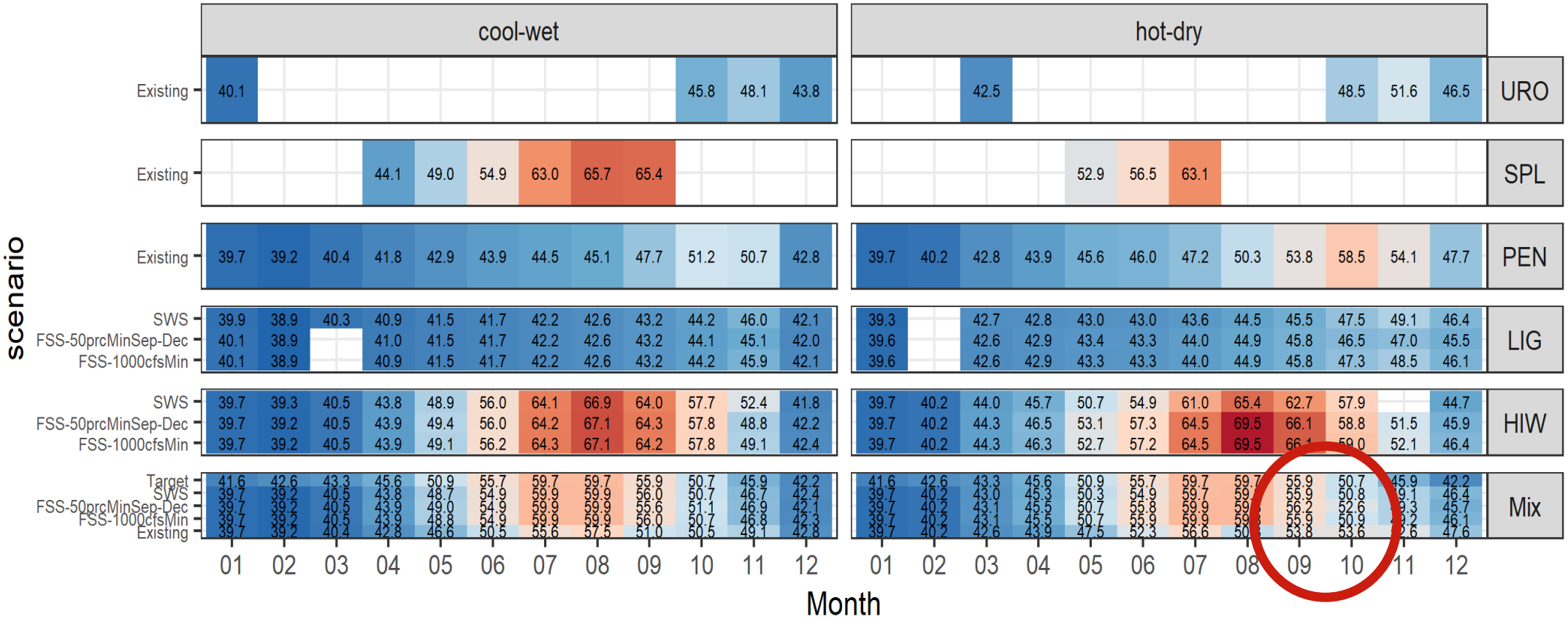
U.S.ARMY

QUESTIONS



US Army Corps of Engineers ®
Portland District

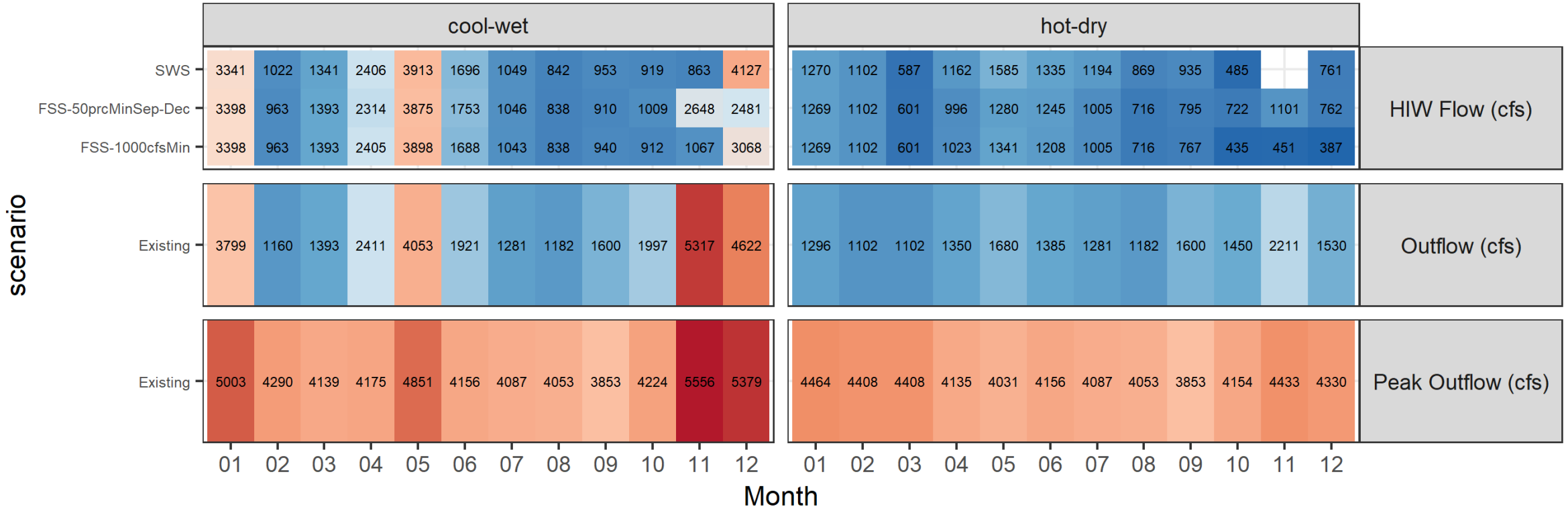
TEMPERATURE MODELING CONTINUED



Simulated monthly average Detroit Dam release temperatures from each outlet in cool-wet and hot-dry design years.
Explanation: URO: upper RO, SPL: Spillway, PEN: Penstocks, LIG: Low invert gates, HIW: High invert weirs, Mix: Mixed outflow temperature

US Army Corps of Engineers ®
Portland District

HIGH INTAKE WEIR OUTFLOW



US Army Corps of Engineers ®
Portland District