ZONE 3 ADVISORY COMMITTEE

San Luis Obispo County Flood Control and Water Conservation District

AGENDA

Thursday, January 15, 2026 at 10:30 A.M.

Arroyo Grande, 10:30 AM
215 E. Branch St

I. CALL TO ORDER AND ROLL CALL

II. PUBLIC COMMENT
This is also an opportunity for members of the public to address the Committee on items that are not on the agenda.

III. MEETING MINUTES
A. November 20, 2025, Meeting – Attachment 1

IV. OPERATIONS REPORT
A. Water Plant Operations, Reservoir Storage, Downstream Releases - Verbal Update
B. Projected Reservoir Levels – Attachment 2
C. November and December Monthly Operations Report – Attachment 3
D. Projects Updates - Attachment 4

V. LOPEZ RECREATION REPORT

VI. INFORMATIONAL ITEMS

A. 5-Year CIP – Attachment 5
B. Fish Passage Feasibility Assessment – Attachment 6

VII. ACTION ITEMS (No Subsequent Board of Supervisors Action Required)

VIII. ACTION ITEMS (Board of Supervisors Action is Subsequently Required)

IX. FUTURE AGENDA ITEMS

X. COMMITTEE MEMBER COMMENTS

Next Regular Meeting is Scheduled for
March 19, 2026, at 10:30 AM at Pismo Beach, 760 Mattie Road
Agendas accessible online at www.slocounty.ca.gov/pw/zone3

SAN LUIS OBISPO COUNTY FLOOD CONTROL
AND WATER CONSERVATION DISTRICT
ZONE 3 ADVISORY COMMITTEE
MEETING MINUTES
THURSDAY November 20, 2025
ARROYO GRANDE

I. CALL TO ORDER AND ROLL CALL

- **Action:** The Zone 3 Advisory Committee meeting was called to order at 10:30 AM by Member at Large Ron Reilly
- **Action:** Roll call conducted by David Spiegel

Members in Attendance:

- Brian Talley, Agriculture
- Ron Reilly, Member at Large
- Brad Hagemann, CSA-12
- Jules Tuggle, Grover Beach Member
- Marcia Guthrie, Pismo Beach Member
- Shirley Gibson, Oceano CSD
- Aileen Loe, City of Arroyo Grande

*Marcia Guthrie joined the meeting at 10:43

II. PUBLIC COMMENT

Jesse Swanhuyser, Partner, Sycamore Law

The plaintiffs reiterated their continued interest in pursuing a settlement with the County, noting that prolonged litigation was never their goal. They expressed appreciation for the committee's increased engagement and viewed the anticipated closed session as a positive step toward resolution. The plaintiffs also emphasized their belief that formal mediation would be beneficial as it would allow the parties to focus on the technical details necessary to work toward a mutually agreeable settlement.

Sara Sternberg, Restoration Hydrologist, Creek Lands Conservation

Construction from Creeklands Conservation thanked the group for its support of the AG Stream Gauge project and noted that the upcoming one-year post-construction monitoring shows positive results for hydrology, habitat, and fish passage The organization also reminded the community that Creeklands Conservation is located nearby, has biologists and hydrologists on staff, and is a non-litigious resource available to support the community on waterway-related matters.

Brad Hagemann, CSA 12

Brad Hagemann asked Creeklands Conservation whether they assist with monitoring required for regulatory BIN submittals. Sara from Creeklands confirmed that they do provide this service, noting that scientific hydrologic monitoring is a core part of their work and that they aim to keep costs manageable. Sara stated they have experience with HCP-related monitoring and have conducted similar work throughout the County since 1983.

Brad Hagemann then addressed comments from the earlier speaker, Jessie Swanhuyser, regarding litigation and the HCP. He noted that the HCP has been submitted to regulatory agencies and expressed that many local agencies would welcome a settlement. He stated his understanding that the County has made a settlement offer and that discussions are ongoing among the attorneys. He also commented on the water rights issue mentioned previously, stating it is a matter between the Conty and the State Water Resources Control Board and that work on that issue is underway

Jessie Swanhuyser, asked to respond, clarified that while the parties have exchanged settlement concepts, these have remained at a broad level. He emphasized that meaningful progress would require detailed discussions about technical issues such as base flows, pulse flows, and monitoring. He reiterated that mediation would help the parties engage at that deeper technical level and move toward a realistic settlement proposal.

III. MEETING MINUTES- Attachment 1

Reilly presented item for approval of September 18, 2025, minutes.

Motion for approval: Brian Talley; Seconded: Jules Tuggle; The motion was approved with all ayes and no nays.

IV. APPROVAL OF 2026 MEETING SCHEDULE

Reilly presented item for approval of 2026 Meeting Schedule.

Motion for approval: Aileen Loe: Seconded: Jules Tuggle; The motion was Passed.

V. OPERATIONS REPORT

A. Water Plant Operations, Reservoir Storage, Downstream Releases – Attachment 2

- **Action:** Report provided by Spiegel

B. Projected Reservoir levels- Attachment 3

- **Action:** Report provided by Spiegel.

C. September and October Monthly Operations Report

- **Action:** Report provided by Spiegel.

D. Project Updates-Attachment 5

- **Action:** Report provided by Spiegel.

VI. LOPEZ RECREATION REPORT

Brian Wilder, reporting period: September- October

Lopez Lake saw approximately 36,000 visitors over the two-month period, generating about $450,000 in revenue. Good fall weather helped maintain strong visitation despite the seasonal slowdown. Volunteer efforts were active, particularly in shoreline litter cleanup, which is a major off-season focus. No fish plants have occurred since April 2025.

The Firesafe council funded a $30,000 fuel reduction project in developed campground areas. This continues a series of successful fire-prevention projects completed at Lopez over the past several years. The water tank replacement project is progressing. Construction of the new tank base is underway, and the project remains on schedule. Ranger staff are also engaged in routine off-season training and preparation for next summer.

The Aquatic Invasive Species program conducted 1,052 vessel inspections in the last two months, rejecting 17 vessels that did not meet clean-and-dry standards. Wildlife coordination has increased, particularly regarding bear activity. Two bears were collared through a partnership with the Department of Fish and Wildlife; one was relocated, and the other shed its collar. A depredation permit has been issued for a persistent problem bear- the first ever for Lopez Lake. In response to Brian Talley's question on Feral pig activity staff reported that feral pig activity at Lopez Lake has been minimal, though pigs have caused significant damage at Santa Margarita Lake and nearby community parks. Various deterrents have been attempted with limited success.

VII. INFROMATIONAL ITEMS

Present 1st Quarter FY 2025/26 Budget Status- Attachment 6

A high-level overview of the first quarter financials shows overall spending on track for this point in the fiscal year.

Total Budget & Expenditures

- Approved Budget: $7 million
- Carryforward: $1.1 million
- Total Budget $8.2 million
- Q1 Expenditures: $2.369 million
- Available Balance: $5.874 million
- Percent Expended: 29%

Operations & Maintenance

- Routine O&M: 27% expended, appropriate for Q1
- Non-Routine O&M: 79% expended, driven primarily by $589,000 in litigation costs.

Capital Outlay

- Many capital projects were deferred this fiscal year
- Budget: $95,00
- Carryforward: $712,000
- Total Capital Budget: $807,000
- Spending is under 1% to date.
- All carryforward funds have been allocated to membrane rack replacements. Once invoicing ($550,000-$560,000) is received, expenditure will increase significantly.

Final Notes

- Finance staff are coordinating with member agencies on true-up billings.
- Fiscal year runs July 1- June 30, explaining high early percentages in some categories.

VIII. ACTION ITEMS (No Subsequent Board of Supervisors Action Required)

IX. ACTION ITEMS (Board of Supervisors Action is Subsequently Required)

A. Endorse Agriculture Member Appointment Byron Talley

Brian Talley presented endorsement for Byron Talley to become the new Agriculture Member. Motion for approval: Brian Talley; Seconded: Aileen Loe; The motion was approved with all ayes and no nays.

X. FUTURE AGENDA ITEMS

Member Jules Tuggle requested a feasibility study either on the website or a presentation.

XI. COMMITTEE MEMBER COMMENTS

*This comment was presented following Item VII.

Aileen Loe noted that while this was an information item rather than an action item, they wished to offer a comment. Speaking on behalf of the water-drinking public of Arroyo Grande, she emphasized that this represents an extraordinary expense. The City is working to cover its portion; however, she requested that all parties collaborate to expedite a resolution to reduce the overall burden on the community. David Spiegel informed the Advisory board that they cannot hold closed sessions. The following is a summary of the board's response: Members discussed the lack of access to closed session options, noting that County counsel confirmed this committee cannot hold closed sessions. Concerns were raised about ensuring appropriate and consistent legal guidance for all members, particularly since some participants do not have access to agency attorneys. Members expressed a desire for a shared understanding of what can and cannot be communicated publicly to avoid misstatements and improve transparency. The Chair acknowledged the issue and noted the need to explore options for providing legal support or clarification for all committee members.

ADJOURNMENT

- **Action**: The meeting was adjourned at 11:06 AM by Reilly

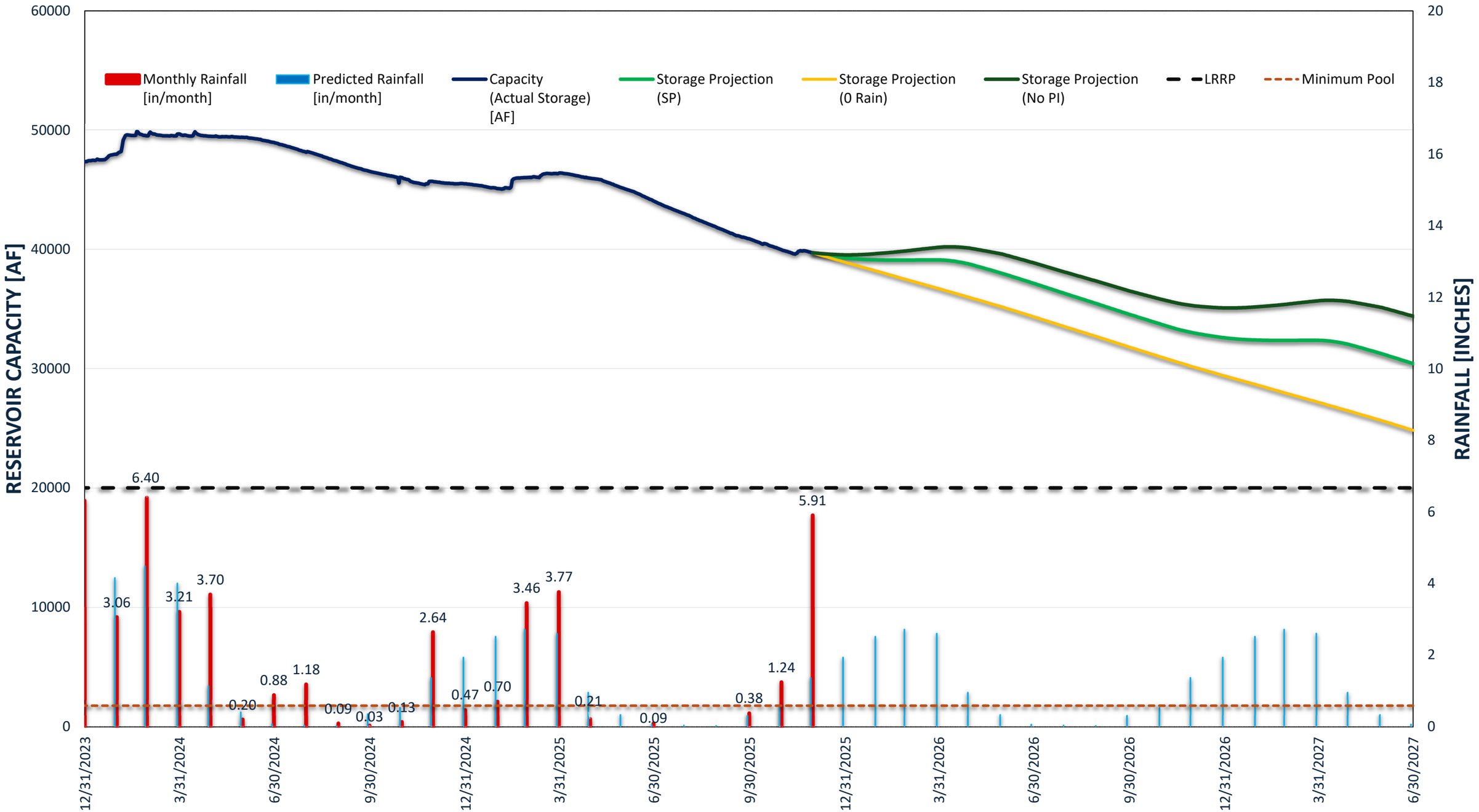
Next Meeting: Scheduled for January 15, 2026, at Arroyo Grande

Respectfully Submitted,

Darla Budge

County of San Luis Obispo Public Works Department

LOPEZ RESERVOIR STORAGE PROJECTON CHART



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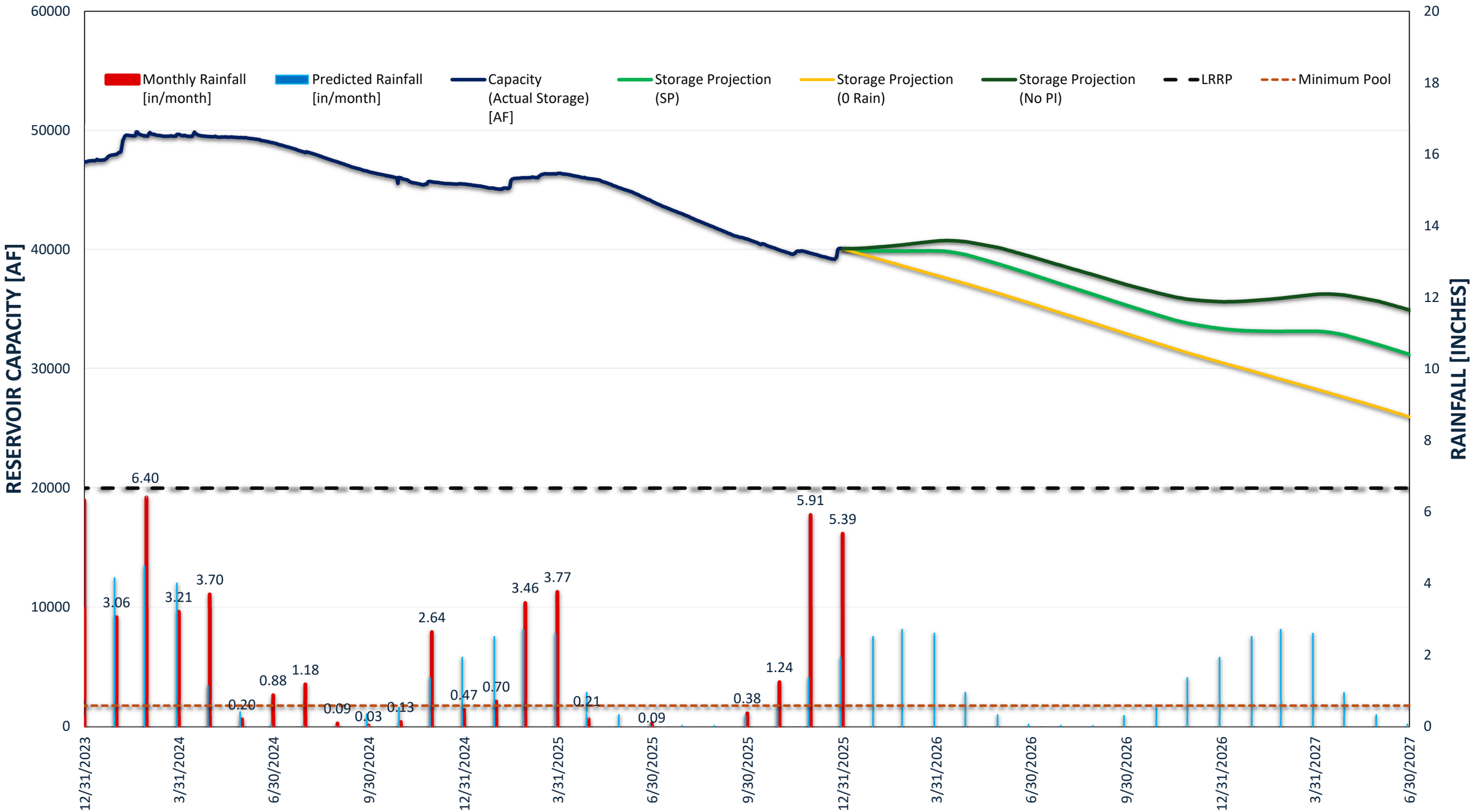

San Luis Obispo County Flood Control and Water District
Zone 3 - Lopez Project - Monthly Operations Report
November, 2025

PROJECT WATER

	AVAILABLE WATER (APR-MAR)				DELIVERIES															
					THIS MONTH								APRIL TO PRESENT							
CONTRACTOR	ENTITLEMENT	STORED PW*	SURPLUS WATER AVAILABLE	TOTAL AVAILABLE PW	ENTITLEMENT USAGE	ENTITLEMENT %	STORED PW USAGE	SURPLUS PW USAGE	DELIVERIES DURING DIE USAGE	DELIVERIES DURING SPILL USAGE	TOTAL USAGE	TOTAL %	ENTITLEMENT USAGE	ENTITLEMENT %	STORED PW USAGE	SURPLUS PW USAGE	DELIVERIES DURING DIE USAGE	DELIVERIES DURING SPILL USAGE	TOTAL USAGE	TOTAL %
AG	2290	740	470	3500	130.57	6%	17.92	0.0	0.00	0.00	148.49	4%	130.6	6%	740.00	470.33	0.0	0.0	1340.90	38%
OCSD	303	119	0	422	48.13	16%	0.00	0.00	0.00	0.00	48.13	11%	200.6	66%	118.91	0.00	0.0	0.0	319.52	76%
GB	800	542	164	1507	60.52	8%	0.00	0.0	0.00	0.00	60.52	4%	462.6	58%	0.00	0.00	0.0	0.0	462.63	31%
PB	892	398	183	1473	113.56	13%	0.00	0.0	0.00	0.00	113.56	8%	490.3	55%	397.81	0.00	0.0	0.0	888.12	60%
CSA 12	245	185	50	480	8.14	3%	0.00	0.0	0.00	0.00	8.14	2%	83.3	34%	0.00	0.00	0.0	0.0	83.29	17%
SM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TOTAL	**4530**	**1983**	**868**	**7381**	**360.92**	**8.0%**	**17.9**	**0.00**	**0.00**	**0.00**	**378.84**	**5.1%**	**1367.4**	**30.2%**	**1256.72**	**470.3**	**0.00**	**0.00**	**3094.46**	**42%**

STATE WATER PROJECT WATER

		CUMULATIVE AIE SSWPW ***	DELIVERIES											
			THIS MONTH						JANUARY TO PRESENT					
			ALLOCATION			DIE STORAGE	AIE	TOTAL	ALLOCATION		DIE STORAGE	AIE	TOTAL	
CONTRACTOR	ANNUAL REQUEST**		REQUEST	USAGE	%	USAGE	USAGE	USAGE	USAGE	%	USAGE	USAGE	USAGE	
AG	N/A	0.0	N/A	N/A	N/A	0.0	0.0	0.00	N/A	N/A	0.00	0.00	0.00	
OCSD	95.0	0.0	15.0	0.00	0.0%	0.0	0.0	0.00	54.5	57%	40.46	0.00	95.00	
GB	N/A	0.0	N/A	N/A	N/A	0.0	0.0	0.00	N/A	N/A	0.00	0.00	0.00	
PB	1190.0	0.0	0.0	0.00	0%	0.0	0.0	0.00	419.5	35%	66.90	0.00	486.38	
CSA 12	96.0	0.0	1.5	1.35	1%	0.0	0.0	1.35	47.1	49%	6.85	0.00	53.91	
SM	90.0	0.0	7.0	6.06	7%	0.0	0.0	6.06	81.5	91%	0.00	0.00	81.52	
TOTAL	**1471.0**	**0.0**	**23.5**	**7.41**	**1%**	**0.00**	**0.0**	**7.41**	**602.60**	**41%**	**114.21**	**0.00**	**716.81**	

DISTRICT INITIATED EXCHANGE		
PW STORAGE DURING DIE		
THIS MONTH	JAN TO PRESENT	
ADDITIONAL SW BROUGHT IN	ADDITIONAL SW BROUGHT IN	STORAGE BALANCE
0.00	0.00	0.00
0.00	40.46	0.00
0.00	0.00	0.00
0.00	66.90	0.00
0.00	6.85	0.00
N/A	N/A	N/A
0.00	**114.21**	**0.00**

CONTRACTOR	TOTAL MONTHLY DELIVERIES [AF]
AG	148.49
OCSD	48.13
GB	60.52
PB	113.56
CSA 12	9.49
SM	6.06
TOTAL	**386.25**

DAM & OTHER OPERATIONS				
	THIS MONTH	WY TO DATE	MAX CAPACITY	
LAKE ELEVATION (ft)	511.27	N/A	522.60	
STORAGE [AF]	39,683	N/A	49,476	80%
MONTHLY RAINFALL [in]	5.90	28.69	N/A	
(Annual: July 1- June 30)		-		
DOWNSTREAM RELEASES [AF]	481.51	3,406.87	4,200.00	
LAKE TO TERMINAL [AF]	382.38	3,223.79	N/A	
SPILLAGE [AF] (WY)	-	-	N/A	
AG WHEELING OCEANO WATER	1.80	N/A	N/A	

District Stored SWPW	
	[AF]
PREVIOUS DISTRICT SSWPW	TBD
DWR METER DELIVERIES	TBD
CHANGE IN STORAGE	TBD
EVAPORATION	TBD
LOSSES DUE TO SPILL	TBD
REMAINING DISTRICT SSWPW	**TBD**

WATER ACCT. AFFECTED DUE TO SPILLAGE	
	[AF]
DISTRICT SSWPW LOST DURING SPILL	0.00
CUMULATIVE SSWPW LOST	0.00
STORED PW LOST	0.00

GLOSSARY
AIE: Agency Initiated Exchange
DIE: District Initiated Exchange
N/A: Not Applicable
PW: Project Water aka Lopez Water
Stored PW: Generated from unused entitlement water at end of WY
Surplus Water: Generated from unused DS Releases at end of WY
SWP: State Water Project
SSWPW: Stored SWP Water
* Stored PW includes Declared Surplus Water
** Actual amount available is dependent on DWR's delivery %
*** Stored SWP water resulting from AIE

NOTES

1) District Initiated Exchange (DIE): In effect from February 11 - March 2, 2025 due to the LWTP shutoff; deliveries were supplemented with State Water.
2) 114.21 AF of "DIE Exchange" water (114.21 AF) was obtained by calculating the difference between the "DWR Meter Deliveries" (214 AF) and the "SWPW Usage" (99.79 AF).
3) On 4/29/25 Arroyo Grande requested all 470.33 AF of Surplus Water Available for immediate delivery
4) On 5/5/25 Pismo Beach requested all 183.2 AF of Surplus Water Available to be converted to storage after spill
5) On 5/12/25 OCSD requested all 62.23 AF of Surplus Water Available to be converted to storage for immediate delivery
6) On 7/9/25 Arroyo Grande requested all 739.71 AF of Stored PW available for immediate delivery.
7) On 7/10/25 Pismo Beach requested all 330.91 AF of Stored PW available for immediate delivery.
8) On 9/15/2025 Legal clarification of DIE prompted recalculation of End of Year Stored Project Water calculations. Unused entlement of 1,169.69 AF plus unused surplus of 751.39 AF totaled 1,921.09 AF of Lopez Water converted to storage available as of April 1, 2025.
9) Agencies requested a total of 930.39 AF of Surplus Water for the 2025-2026 Water Year.

San Luis Obispo County Flood Control and Water District
Zone 3 - Lopez Project - Monthly Operations Report
December, 2025

PROJECT WATER

CONTRACTOR	AVAILABLE WATER (APR-MAR) ENTITLEMENT	STORED PW*	SURPLUS WATER AVAILABLE	TOTAL AVAILABLE PW	DELIVERIES THIS MONTH ENTITLEMENT USAGE	%	STORED PW USAGE	SURPLUS PW USAGE	DELIVERIES DURING DIE USAGE	DELIVERIES DURING SPILL USAGE	TOTAL USAGE	%	APRIL TO PRESENT ENTITLEMENT USAGE	%	STORED PW USAGE	SURPLUS PW USAGE	DELIVERIES DURING DIE USAGE	DELIVERIES DURING SPILL USAGE	TOTAL USAGE	%
AG	2290	739.71	470.33	3500	140.86	6%	0.00	0.00	0.00	0.00	140.86	4%	271.4	12%	740.00	470.33	0.00	0.00	1481.76	42%
OCSD	303	118.91	0.00	422	47.08	16%	0.00	0.00	0.00	0.00	47.08	11%	247.7	82%	118.91	0.00	0.00	0.00	366.60	87%
GB	800	542.28	164.31	1507	59.46	7%	0.00	0.00	0.00	0.00	59.46	4%	522.1	65%	0.00	0.00	0.00	0.00	522.09	35%
PB	892	397.81	183.20	1473	105.11	12%	0.00	0.00	0.00	0.00	105.11	7%	595.4	67%	397.81	0.00	0.00	0.00	993.23	67%
CSA 12	245	184.61	50.32	480	7.94	3%	0.00	0.00	0.00	0.00	7.94	2%	91.5	37%	0.00	0.00	0.00	0.00	91.54	19%
SM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TOTAL	**4530**	**1983**	**868.16**	**7381**	**360.45**	**8.0%**	**0.0**	**0.00**	**0.00**	**0.00**	**360.45**	**4.9%**	**1728.17**	**38.1%**	**1256.72**	**470.33**	**0.00**	**0.00**	**3455.22**	**47%**

STATE WATER PROJECT WATER

CONTRACTOR	ANNUAL REQUEST**	CUMULATIVE AIE SSWPW ***	DELIVERIES THIS MONTH ALLOCATION REQUEST	ALLOCATION USAGE	%	DIE STORAGE USAGE	AIE USAGE	TOTAL USAGE	JANUARY TO PRESENT ALLOCATION USAGE	%	DIE STORAGE USAGE	AIE USAGE	TOTAL USAGE
AG	N/A	0.0	N/A	N/A	N/A	0.0	0.0	0.00	N/A	N/A	0.00	0.00	0.00
OCSD	95.0	0.0	0.0	0.00	0.0%	0.0	0.0	0.00	54.5	57%	40.46	0.00	95.00
GB	N/A	0.0	N/A	N/A	N/A	0.0	0.0	0.00	N/A	N/A	0.00	0.00	0.00
PB	496.0	0.0	0.0	0.00	0%	0.0	0.0	0.00	419.5	85%	66.90	0.00	486.38
CSA 12	60.0	0.0	2.5	1.22	2%	0.0	0.0	1.22	48.0	80%	6.85	0.00	54.81
SM	90.0	0.0	7.0	5.68	6%	0.0	0.0	5.68	87.2	97%	0.00	0.00	87.20
TOTAL	**741.0**	**0.0**	**9.5**	**6.90**	**1%**	**0.00**	**0.0**	**6.90**	**609.18**	**82%**	**114.21**	**0.00**	**723.39**

DISTRICT INITIATED EXCHANGE

CONTRACTOR	PW STORAGE DURING DIE THIS MONTH ADDITIONAL SW BROUGHT IN	JAN TO PRESENT ADDITIONAL SW BROUGHT IN	JAN TO PRESENT STORAGE BALANCE
AG	N/A	N/A	N/A
OCSD	0.00	40.46	0.00
GB	N/A	N/A	N/A
PB	0.00	66.90	0.00
CSA 12	0.00	6.85	0.00
SM	N/A	N/A	N/A
TOTAL	**0.00**	**114.21**	**0.00**

CONTRACTOR	TOTAL MONTHLY DELIVERIES [AF]
AG	140.86
OCSD	47.08
GB	59.46
PB	105.11
CSA 12	9.16
SM	5.68
TOTAL	**367.35**

DAM & OTHER OPERATIONS

	THIS MONTH	WY TO DATE	MAX CAPACITY	
LAKE ELEVATION (ft)	511.27	N/A	522.60	
STORAGE [AF]	39,683	N/A	49,476	80%
MONTHLY RAINFALL [in]	5.90	28.69	N/A	
(Annual: July 1- June 30)		-		
DOWNSTREAM RELEASES [AF]	481.51	3,881.01	4,200.00	
LAKE TO TERMINAL [AF]	382.38	3,554.92	N/A	
SPILLAGE [AF] (WY)	-	-	N/A	
AG WHEELING OCEANO WATER	1.80	N/A	N/A	

District Stored SWPW

	[AF]
PREVIOUS DISTRICT SSWPW	-29.24
DWR METER DELIVERIES	0.00
CHANGE IN STORAGE	-6.90
EVAPORATION	0.00
LOSSES DUE TO SPILL	0.00
REMAINING DISTRICT SSWPW	**-36.14**

WATER ACCT. AFFECTED DUE TO SPILLAGE

	[AF]
DISTRICT SSWPW LOST DURING SPILL	0.00
CUMULATIVE SSWPW LOST	0.00
STORED PW LOST	0.00

GLOSSARY

AIE: Agency Initiated Exchange
DIE: District Initiated Exchange
N/A: Not Applicable
PW: Project Water aka Lopez Water
Stored PW: Generated from unused entitlement water at end of WY
Surplus Water: Generated from unused DS Releases at end of WY
SWP: State Water Project
SSWPW: Stored SWP Water
* Stored PW includes Declared Surplus Water
** Actual amount available is dependent on DWR's delivery %
*** Stored SWP water resulting from AIE

NOTES

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ZONE 3 Lopez Project

San Luis Obispo County Flood Control and Water Conservation District

TO: Zone 3 Advisory Committee

FROM: David Spiegel, PE, Utilities Engineer

DATE: January 15, 2026

SUBJECT: Zone 3 Projects Update

Project Updates:

- Membrane Module Replacement (No Change)
  - Two racks ordered
  - Installation scheduled for December 9th
  - Budget ~$600,000

- Spillway Assessment and Investigation (No Change)
  - Geotechnical Data Report submitted to DSOD
  - Remainder of project ~ minimum of $300,000

- Geotechnical Testing & Seismic Alternatives Study of Terminal Reservoir Dam (No Change)
  - With DSOD for Review, new staff member says letter is coming
  - Geotechnical Engineering Report Complete
  - Budget ~$500,000

- Cathodic Protection Repair Project (No Change)
  - Working on transient monitoring station plans for DWR/State water line crossing
  - System working well
  - Budget ~$449,933

- Fire Flow Tank Replacement (on hold)
  - Reviewing grant opportunities

- ~$500k in Zone 3 Funds moved to Membrane Module Project, $0 remaining
- Budget ~$1,400,000

Complete

- Steelhead Passage Feasibility Assessment of Lopez Dam
- Lopez Dam Flow Sensor

Zone 3
5-Year Capital Outlay Plan

DRAFT Flood Control Zone 3 (Lopez Project)
FY 2026-2027 BUDGET

New funding requested

Revised
12/6/2024

Non-Routine O&M

Item	PROJECT	IO/WBS	NOTES 2025/26	Project Estimate	BUDGET: Approved Prior Budget Totals (thru 2024/25)	BUDGET: Prior Expenditures (thru 2024/25)	BUDGET: Approved 2025/26 Budget	BUDGET: Total 2025/26 Budget Available (includes carry forward from prior yrs)	BUDGET: 2025/26 Expenditures thru 09/30/2025	BUDGET: 25/26 budget changes	FUTURE YEAR - ANTICIPATED BUDGETS: 2026/27	2027/28	2028/29	2029/30
1	Equipment Audit/Replacement Plan - On-Going	552R235691	1	$ -	$ -	$ -	$ -	$ -	$ -	$ -				
2	Fireflow Tank repair /replacement	300639	2	$ 1,476,000	$ 579,674	$ 116,266	$ -	$ -		$ -				
3	Membrane Replacements (2 Racks/year)	300668	3	$ 700,000	$ 610,094	$ 803,253	$ -	$ 570,445		$ -				
4	HCP - Instream Studies of AG Creek	552R235006	4	$ 500,000	$ 594,160	$ 709,157	$ 745,780	$ 936,454	$ 428,608	$ -	$ 300,000			
5	Cloud Seeding Program	552R235671	5	$ 350,000	$ 450,495	$ 806,592	$ 3,148	$ 3,148		$ -				
	Lopez HCP Litigation	552R235770									$ 450,000			
				SUB-TOTAL	**$ 2,234,423**		**$ 748,928**	**$ 1,510,047**	**$ 428,608**	**$ -**	**$ 750,000**	**$ -**	**$ -**	**$ -**

Capital Outlay

	PROJECT	IO/WBS	NOTES 2025/26	Project Estimate	BUDGET: Approved Prior Budget Totals (thru 2024/25)	BUDGET: Prior Expenditures (thru 2024/25)	BUDGET: Approved 2025/26 Budget	BUDGET: Total 2025/26 Budget Available (includes carry forward from prior yrs)	BUDGET: 2025/26 Expenditures thru 09/30/2025	BUDGET: 25/26 budget changes	FUTURE YEAR - ANTICIPATED BUDGETS: 2026/27	2027/28	2028/29	2029/30
6	Unanticipated Equipment Purchases		6	$ 55,000	$ -	$ -	$ -	$ -		$ -		$ 55,000		
7	Safety Upgrades	552R235654	7	$ 120,000	$ 65,000	$ 136,348	$ -	$ -		$ -				
8	Spillway Physical Investigation per DSOD - Main Dam	552R235715	8	$ 500,000	$ 403,953	$ 518,944	$ -	$ 100,914	$ 8,245	$ -				
9	Spillway Repairs per DSOD - Main Dam	New WBS	9	TBD	$ -	$ -	$ -	$ -		$ -				
10	Geotechnical Testing & Seismic Alternatives Study for Terminal Dam	552R235647	10	$ 500,000	$ 640,000	$ 645,204	$ -	$ 6,632		$ -				
11	WTP Perimeter Security Fencing - Phase II	WBS	11	TBD	$ -	$ -	$ -	$ -		$ -				
12	Replace Carbon Feed System (Non-auger)	31007	12	TBD	$ -	$ -	$ 50,000	$ 50,000		$ -				
13	Upgrade EQ Pump	New WBS	13	$ 20,000	$ 37,623	$ -	$ -	$ 37,623		$ -				
14	Carbon Dioxide Injection System	300657	14	$ 200,000	$ 293,933	$ 332,029	$ -	$ -		$ -				
15	Dam Intakes #2 & #3 Valve Maintenance		15	TBD	$ -	$ -	$ -	$ -		$ -				
16	Mower		16	$ 105,000	$ 148,000	$ 147,469	$ -	$ -		$ -				
17	CATHODIC PROTECTION UNITS 1-3	300656	17	$ 848,000	$ 757,370	$ 619,018	$ -	$ 19,735	$ 243	$ -				
18	Membrane Rack Valve Installation	New IO	18	$ 250,000	$ 50,000	$ -	$ 25,000	$ 75,000		$ -		$ 50,000	$ 50,000	
19	Terminal Dam Peizometer Replacement Project	New WBS	19	TBD	$ -	$ -	$ -	$ -		$ -				
20	Membrane Rack Piping Replacements	New IO	20	$ 50,000	$ 34,722	$ -	$ 20,000	$ 54,722						
	Increase of Agency Reserves													
21	- Contributed by agencies for Equipment Replacement		21				$ -			$ -	TBD	TBD	TBD	TBD
				SUB-TOTAL	**$ 2,430,601**		**$ 95,000**	**$ 344,626**	**$ 8,489**	**$ -**	**$ -**	**$ 105,000**	**$ 50,000**	**$ -**
				TOTAL	**$ 4,665,024**		**$ 843,928**	**$ 1,854,673**	**$ 437,097**	**$ -**	**$ 750,000**	**$ 105,000**	**$ 50,000**	**$ -**

Annual Target: $750,000

Notes:

0 Consultant and vendor amounts should include 4.4% in 2022. Inflation is 5% per year after original estimate unless noted otherwise

1 Completion of plant system audit to determine scope of replacement/upgrades and costs. The estimate is based upon prior years expenses and the FY1617 budget allocation of $25,000.

2 Funds requested to begin implementing repairs to Domestic and Fireflow tanks identified per Tank inspection report Nov. 2016 by ATI. Fireflow quantity assessment by Fire Engineer completed in 2019. Fire flow alternatives analysis completed. Domestic Tank in fairly good condition. Domestic tank repair estimate approx $16,000, to be done in 19/20. Next inspection/cleaning in 21/22. Fireflow tank has 2 options, could be re-habilitated and a new coating 400K -600K or install a new fireflow tank for ~ $1.5M. Staff recommending budgeting $200K per year until sufficient funds and evaluate the tank at that time. Eric Laurie Project Manager. See estimates on tab below.

3 Replacement of Membrane Racks (Pall), installed in 2007 design life is 10 to 20 years. First rack replaced in 21/22. Cost based on $2000 per module 64 modules per rack, repair 2 racks each time. 3.4% overhead included

4	Additional funding for Envr. Staff to manage consultant and review work related to the HCP Instream Studies, funding for Instream studies previously budgeted in FY 19/20. Studies will identify habitat in AG Creek downstream of dam and the effects of various release scenarios.
5	Continuation of a Cloud Seeding Program. Contract with NAWC for up to 3 year program NTE $350,000/yr. This will be for an air based but could include some ground based after year 1.
6	For unanticipated purchases of equipment that fail during the fiscal year. Including this line item in the budget allows for immediate purchase of critical equipment that unexpectedly fails during the fiscal year. Amount increased starting 17/18 to include those items noted in Equipment Audit reports; ammortized at $30,000/yr.
7	Safety upgrades DAF building 24/25. Replace I Beam for Fall protection tether.
8	Physical investigation of spillway may be necessary pending results of the non-destructive testing in FY 24/25. This work could occur in FY 25/26 using reserves.
9	Repairs to Spillway based on results of the non-destructive and physical investigation occuring in FY 24/25 and required by DSOD.
10	Geophysical testing and Seismic Alternatives Study to help determine if Seismic remediation is a better alternative than De-commissioning the terminal reservoir. Estimate based on $300K for physical testing and $200K for alternatives study. De-commissionig the terminal reservoir has some major issues related to treatment of algae blooms and downstream releases so it was agreed on by TAC (Oct 2020) to pursue this first.
11	Install and replace security fence around west side of terminal reservoir and water treatment plant property. Phasing dependent upon available funding.
12	System is aging and should be replaced within next 10 years. May not need this or scope could change depending on what is chosen for Water Treatment Alternative. Re-evaluate need ozone pilot plant study.
13	The DAF System EQ pump has been replaced and refurbished on several occasions in the past few years and a new style EQ pump with self priming capability will reduce downtime for maintenance and repairs and increases reliability of the system.
14	This project is to replace the existing HCL (mineral acid) system set up in 2018. The pilot pH suppression project using Mineral Acid (HCl) provided successful results in reducing pH and eliminating water treatment plant scaling issues such as the analyzers, header piping to the membranes, and DAF air diffuser systems. Mineral Acid is a dangerous chemical to handle and for safety reasons, a Carbon Dioxide pH suppresion system is recommended to perform with similar results of pH suppression.
15	Intake Valve Actuator #2's hydraulic sytem sprung a leak in 2018 and was isolated to prevent hydraulic fluid from entering the lake. Intake Valve Actuator #1 was subsequently taken apart to confirm custom repair parts and components for Valve Actuator #2. When lake levels allow, it is advised that staff complete repairs of the actuators and hydraulic system for each intake valve to reduce the chance for future failures and leaks and to inspect the systems completely while performing touch up on parts and coatings.
16	Skid Steer with Deck Mower
17	Repair/Replace Cathodic Protection System on Units 1 and 3. Unit 2 needs to be assessed for a completely new system as it never had an impressed current CP system.
18	Replace all valves on membrane racks 1 through 5. Funding for 1 rack/year depending on available budget.
19	The terminal Dam Peizometers need replacing. An analysis is needed to determine the type needed and verification/approval from DSOD.
20	Stainless steel piping on membrane racks needs replacing. Rack 6 came with HDPE piping which is performing well. The original racks 1-5 have stainless piping that has corrosion and will need replacing over time.
21	Contributions toward the Agency Funded Reserves accumulate for the purpose of funding replacement of equipment and capital outlays at the treatment plant.

Steelhead Passage Feasibility Assessment of Lopez Dam

Design Criteria & Alternatives Pre-Screening Evaluation for TAC Review

9 JUNE 2025 (UPDATED 23 JUNE 2025

Presentation Purpose

Purpose: To receive feedback and input on the design criteria, alternatives pre-screening evaluation, and evaluation matrix.

Outline

A. Project Background, Problem and Goal Statements
B. Overview of
    1. Draft Design Criteria Technical Memorandum (TM002)
    2. Draft Fish Passage Alternatives Pre-Screening Evaluation Technical Memorandum (TM003)
C. Technical Advisory Committee Feedback Process & Next Steps

Problem & Goal Statements

PROBLEM

- Lopez Dam is an impassable barrier on Arroyo Grande Creek, blocking fish passage.

GOAL

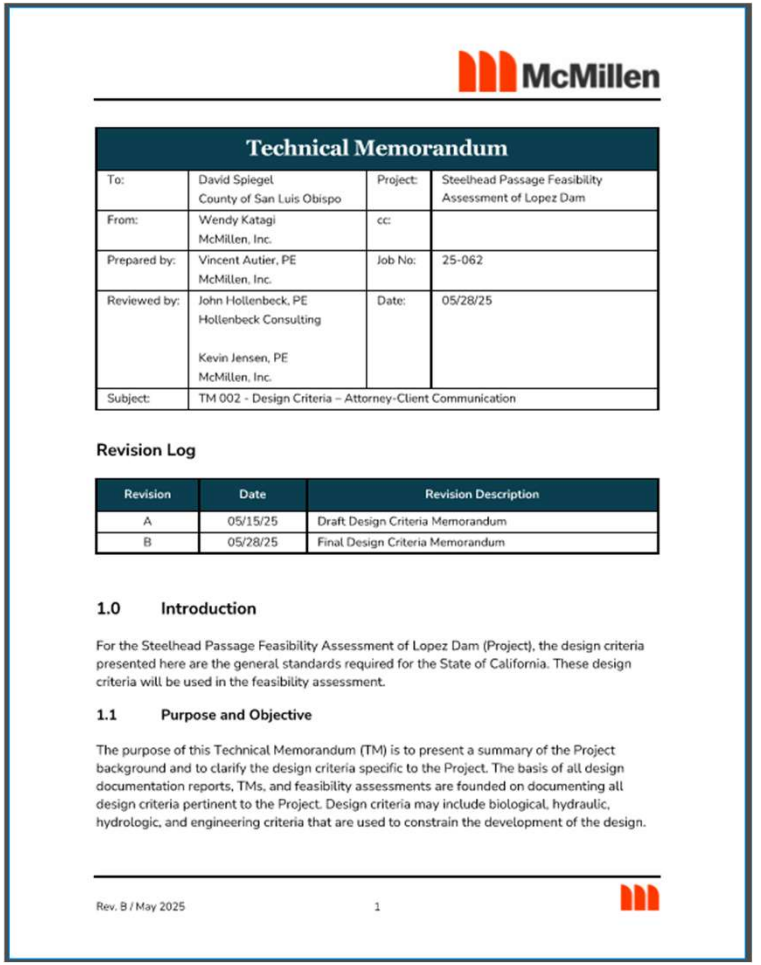
- The purpose of the Project is to identify and describe technically feasible upstream and downstream fish passage options that support the threatened South-Central California Coast (SCCC) Distinct Population Segment (DPS) steelhead trout (*Oncorhynchus mykiss*), contributing to species conservation and compliance with state and federal regulations, using technologies and operations that are proven within the specific context of the Lopez Dam, while preserving the dam's primary functions.
- Assess volitional fish passage feasibility at Lopez Dam.

Design Criteria DRAFT
(TM 002)

Design Criteria TM Introduction

Purpose and Objective

- The purpose of this TM is to present a summary of the Project background and to clarify the design criteria specific to the Project.
- The objective of this TM is to **collectively** establish project-related design criteria with the Project stakeholders.
- To this end, the design criteria are developed early in the process and are distributed across the Project's team to **solicit input and obtain agreement** from stakeholders at the Project onset.



McMillen

Technical Memorandum

To:	David Spiegel County of San Luis Obispo	Project:	Steelhead Passage Feasibility Assessment of Lopez Dam
From:	Wendy Katagi McMillen, Inc.	cc:	
Prepared by:	Vincent Autier, PE McMillen, Inc.	Job No:	25-062
Reviewed by:	John Hollenbeck, PE Hollenbeck Consulting Kevin Jensen, PE McMillen, Inc.	Date:	05/28/25
Subject:	TM 002 - Design Criteria – Attorney-Client Communication		

Revision Log

Revision	Date	Revision Description
A	05/15/25	Draft Design Criteria Memorandum
B	05/28/25	Final Design Criteria Memorandum

1.0 Introduction

For the Steelhead Passage Feasibility Assessment of Lopez Dam (Project), the design criteria presented here are the general standards required for the State of California. These design criteria will be used in the feasibility assessment.

1.1 Purpose and Objective

The purpose of this Technical Memorandum (TM) is to present a summary of the Project background and to clarify the design criteria specific to the Project. The basis of all design documentation reports, TMs, and feasibility assessments are founded on documenting all design criteria pertinent to the Project. Design criteria may include biological, hydraulic, hydrologic, and engineering criteria that are used to constrain the development of the design.

Rev. B / May 2025 1

Two Key Categories of Fishery Design Criteria

*What are the Key Ecological **Structures and Functions** Necessary for Successful Fish Passage?*

Biological

Hydraulic & Hydrology

Fishery Design Criteria: Biological

Target Species: South-Central California Coast (SCCC) Distinct Population Segment (DPS) steelhead trout (*Oncorhynchus mykiss*).

Size, Swimming Speeds, fish numbers, etc. can be found in Table 2-1 of the TM002.

Table 2-1

Criteria	Units	Value	Comments / Reference
Species	-		
Target Species			
SCCC steelhead trout	-	Juvenile/Adult	*Oncorhynchus mykiss*. Migratory steelhead spawn and rear within the creek downstream of Lopez Dam. Resident Rainbow Trout spawn and rear in the tributaries upstream of Lopez Lake (Stetson Engineering, Inc. 2004).
Native Species (in Reservoir)			
Hitch	-	Juvenile/Adult	*Lavinia exilicauda*
Speckled Dace	-	Juvenile/Adult	*Rhinichthys osculus*
California Roach	-	Juvenile/Adult	*Lavinia symmetricus*
Three-spined Stickleback	-	Juvenile/Adult	*Gasterosteus aculeatus*
Non-Native and Invasive Species			
Largemouth bass	-	Juvenile/Adult	*Micropterus nigricans* (CCSE 2009)
Black Crappie	-	Juvenile/Adult	*Pomoxis nigromaculatus* (CCSE 2009)
Green Sunfish	-	Juvenile/Adult	*Lepomis cyanellus* (CCSE 2009)
Other Species in Reservoir (introduced)	-	See comment	Lopez Reservoir provides habitat for Sacramento Pikeminnow (*Ptychocheilus grandis*), Channel Catfish (*Ictalurus punctatus*), Blue Catfish (*Ictalurus furcatus*), brown bullhead (*Ameiurus nebulosus*), smallmouth bass (*Micropterus dolomieu*), bluegill (*Lepomis macrochirus*), Redear Sunfish (*Lepomis microlophus*) Mosquitofish (Gambusia Sp.), Threadfin Shad (*Dorosoma petenense*), Goldfish (*Carassius auratus*), and Golden Shiner (*Notemigonus crysoleucas*) (Stetson Engineering, Inc. 2004; Woodward 2025)

Fishery Design Criteria: Biological

- Overall Migration season:

  December 1 – June 30 (U.S. District Court 2024)

- Adult Upstream Migration:

  December 1 to May 1 (Note: the bar at Arroyo Grande Lagoon typically closes in April, reducing the migration season by a month when compared to other watersheds).

- Smolt Outmigration:

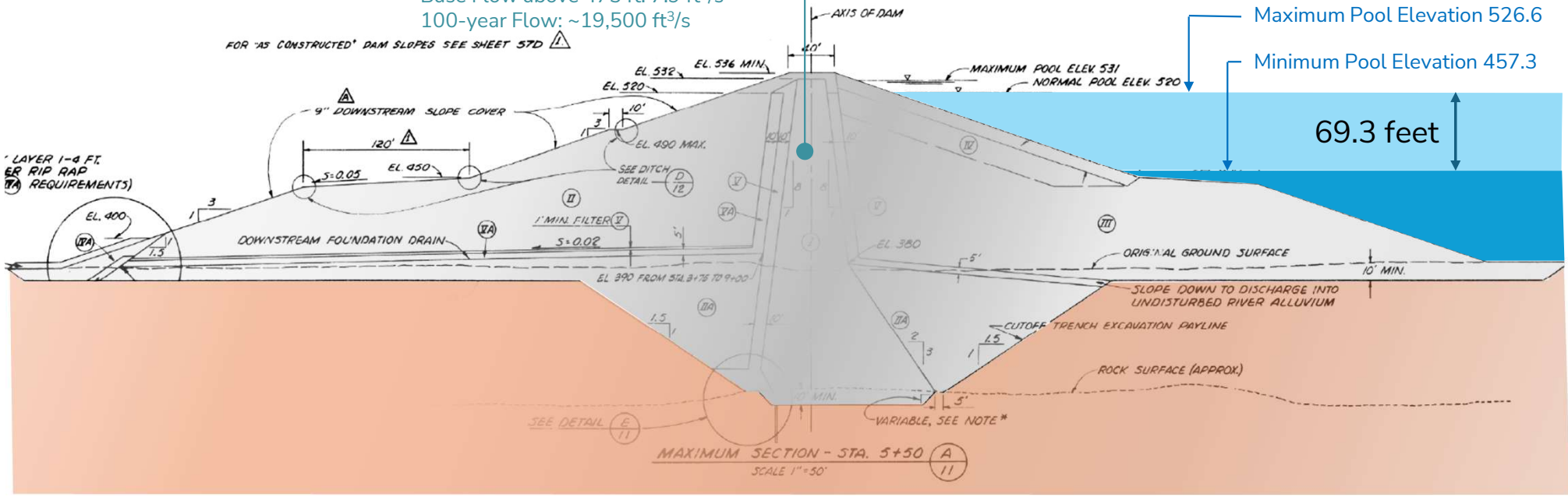
  February 15 - June 15

Source: Sea Grant California

Lopez Reservoir Fluctuation
During Upstream Migration

Lopez Dam
Crest Elevation: 538.6 ft
Maximum Pool Elevation: 533.6 ft
Spillway Crest Elevation: 522.6 ft
Minimum Pool Elevation: 426.0 ft
Outlet Flow Capacity: 100 ft^3/s
Base Flow below 475 ft: 5.9 ft^3/s
Base Flow above 475 ft: 7.9 ft^3/s
100-year Flow: ~19,500 ft^3/s

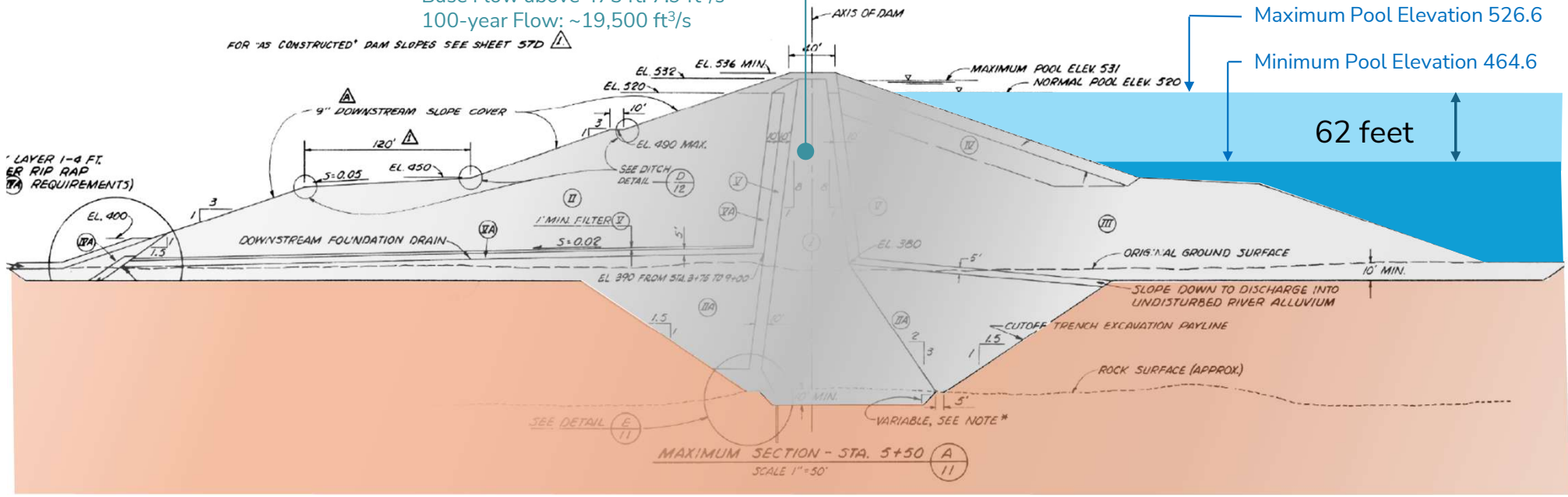
	Upstream Migration (12/01-04/30)		
	WSE (feet)	Storage (ac-feet)	ΔH (feet)
Median	501.8	32540	3.5
25 percentile	512.0	40215	14.9
75 percentile	490.9	25472	2.3
Max	526.6	53119	66.0
Min	457.3	10837	0.9



Lopez Reservoir Fluctuation
During Downstream Migration

	Out Migration (02/15-06/15)		
	WSE (feet)	Storage (ac-feet)	ΔH (feet)
Median	506.7	36122	3.6
25th percentile	515.5	43100	7.8
75th percentile	492.7	26591	2.3
Max	526.6	53119	29.6
Min	464.6	13371	0.6

Lopez Dam
Crest Elevation: 538.6 ft
Maximum Pool Elevation: 533.6 ft
Spillway Crest Elevation: 522.6 ft
Minimum Pool Elevation: 426.0 ft
Outlet Flow Capacity: 100 ft^3/s
Base Flow below 475 ft: 5.9 ft^3/s
Base Flow above 475 ft: 7.9 ft^3/s
100-year Flow: ~19,500 ft^3/s



Fishery Design Criteria: Hydraulic and Hydrology

Table 2-4. High and Low Fish Passage Design Criteria by Species and Life Stage (NMFS 2023b and CDFW 2003)

Species/Life Stage	High Design Flow	Low Design Flow	
	Exceedance	Exceedance	Alternate Minimum Flow (ft^3/sec)
Adult Anadromous Salmonids	**1%**	50%	3
Adult Non-Anadromous Salmonids	5%	90%	2
Juvenile Salmonids	10%	**95%**	**1**
Native Non-Salmonids	5%	90%	1

Attraction Flow:

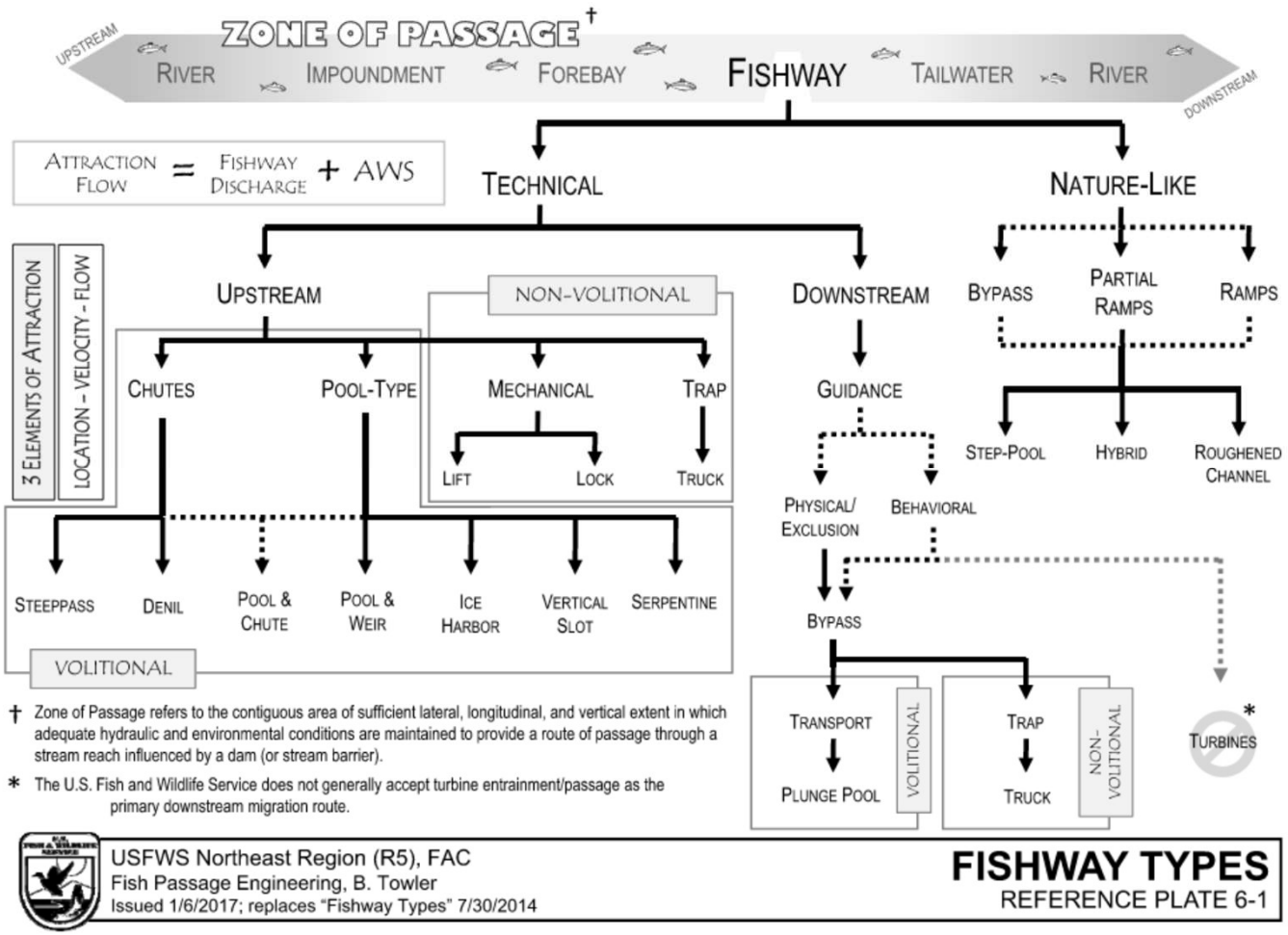
- If using 1% Exceedance (182 ft^3/sec): 9.1 to 18.2 ft^3/sec
- If using 5% Exceedance (59.6 ft^3/sec): 3.0 to 5.96 ft^3/sec

Fish Passage Design Criteria (Table 2-6)

Fish Ladder	Drop per pool, energy dissipation, flow range, orifice and slot velocities, length and width, wall height, auxiliary water flows, and ladder type.
Nature-Like Fishway	Nature-Like Fishways with step-pools and plane-bed morphologies.
Fish Screening Facility	Maximum approach velocity, transport velocity, time exposure to fish screen, cleaning requirements, and screen opening size.
Pre-Sort Holding Pool	Holding density, flow, length, width, depth, wall height, surface spray, and brail floor.
Fish Bypass Facility	Bypass velocity, impact velocity, pipe size, and pipe material.

Fish Passage Alternatives Pre-Screening DRAFT (TM 003)

Upstream & Downstream Fishway Types



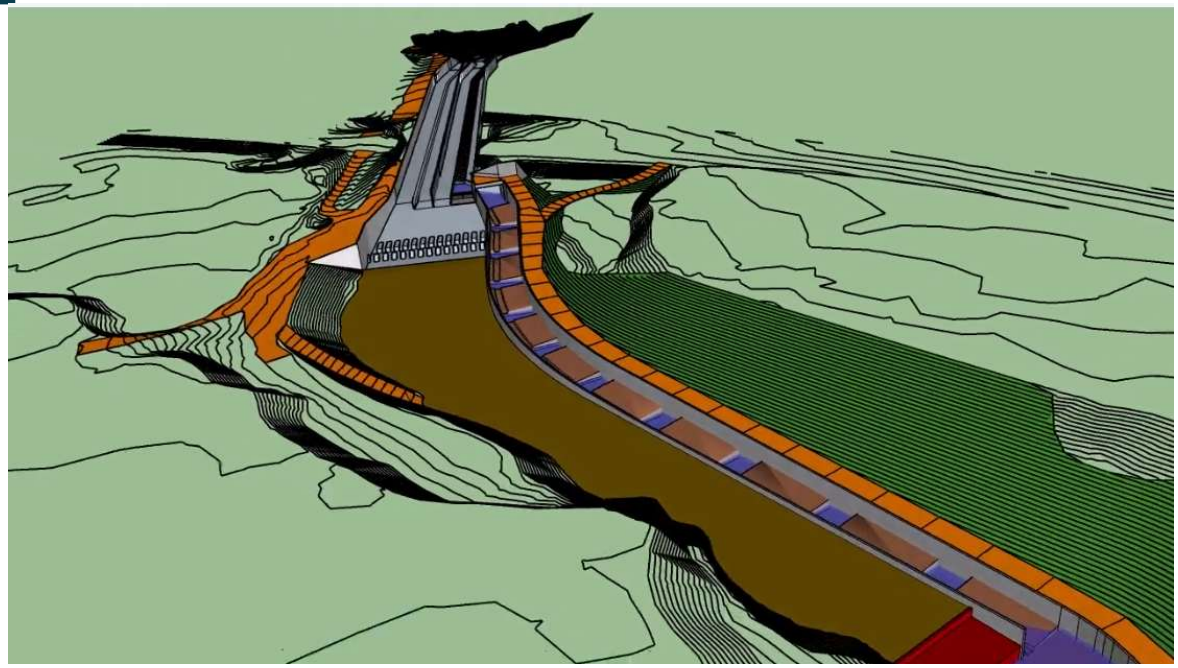
Example of Volitional Fishways

Photo	Description	Total Head (ft) and Reservoir Fluctuation (ft)
	Howland Fish Bypass Channel, Piscataquis River, Maine, USA (Source: The Nature Conservancy)	21; ~2
	Nature-Like Fishway Constructed on the Cariboo Dam Located on the Brunette River, for Metro Vancouver (Source: NHC)	9; <1

Example of Volitional Fishways

Photo	Description	Total Head (ft) and Reservoir Fluctuation (ft)
	Okanagan Lake Outlet Dam East Salmon Passage, British Columbia.	<9; <1
	Opal Springs Volitional Fish Passage, Crooked River, Oregon. Vertical Slot.	30; <3

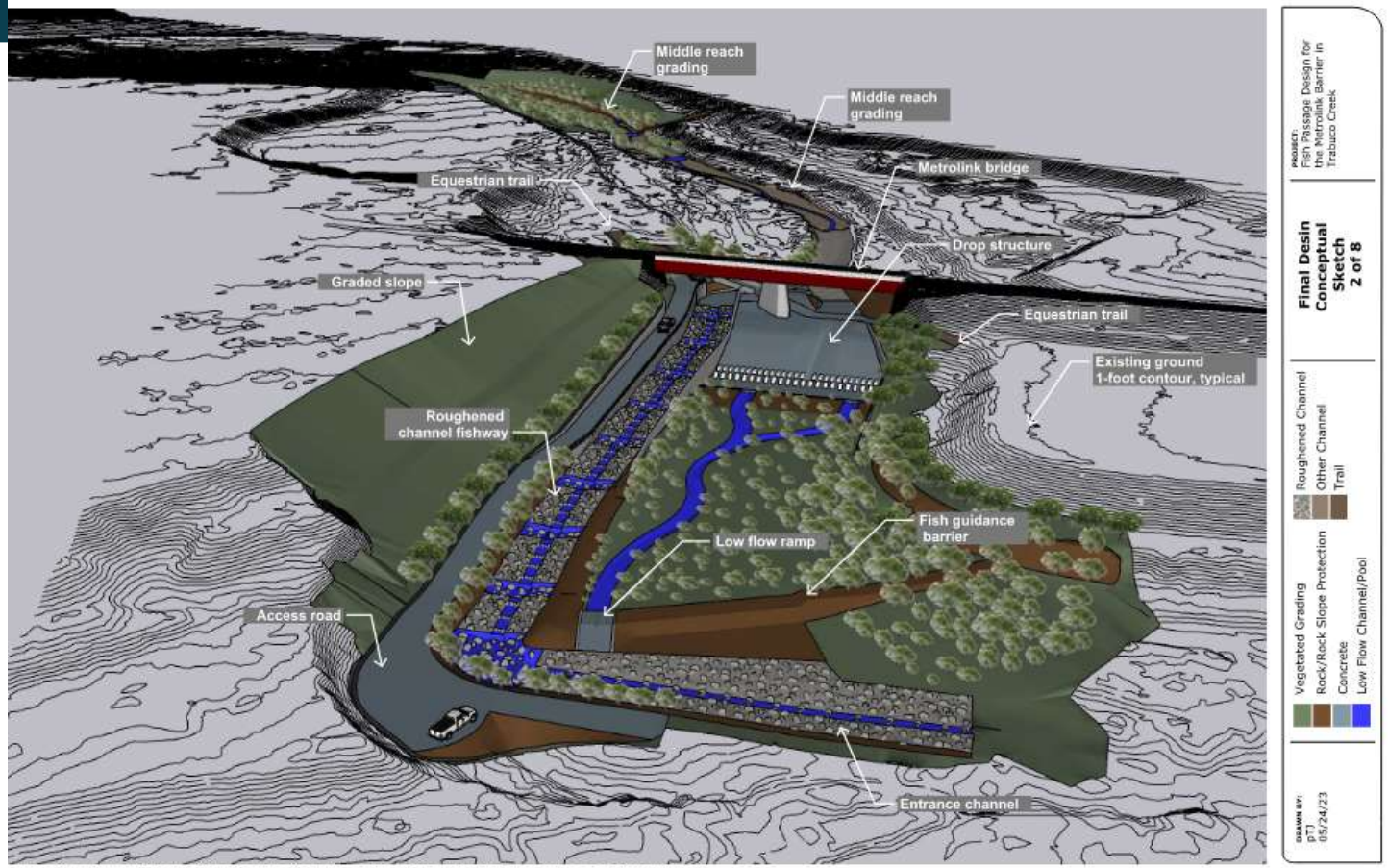
Example of Volitional Fishways



Trabuco Creek Chute and Pool Roughened Channel Fishway across I-5 Bridge Array
650-foot long bypass chute and pool connected to 675-foot transport channel (Source: Caltrout)

Example of Volitional Fishways

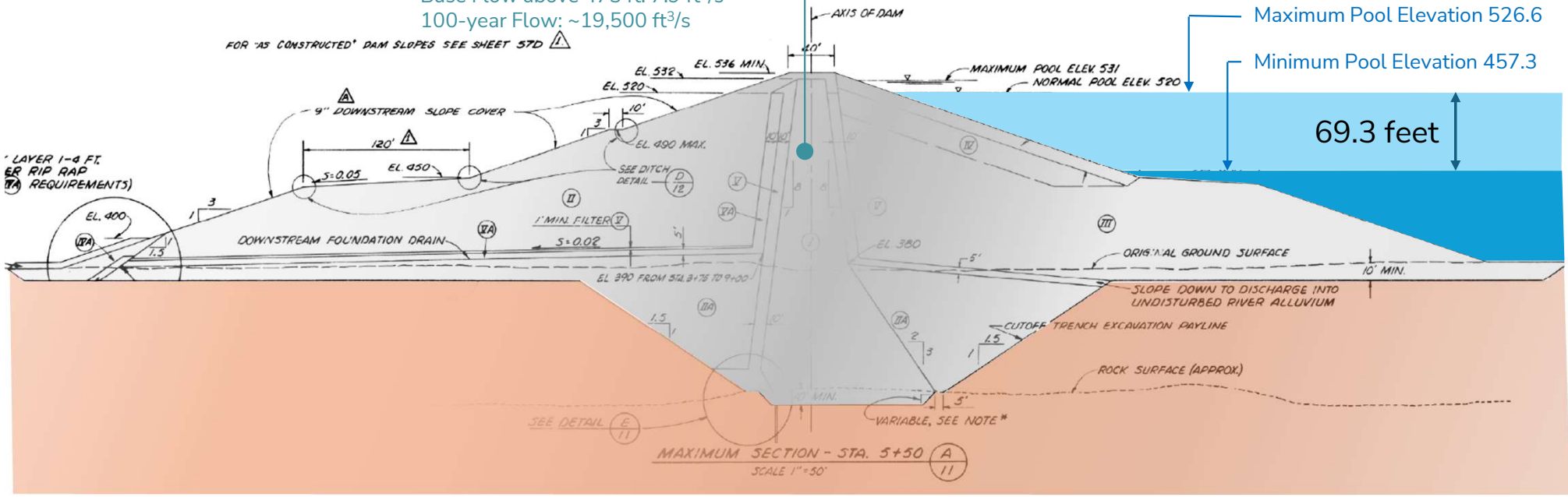
Trabuco Creek at Metrolink Rail Roughened Ramp Fish Passage (Source: Caltrout)



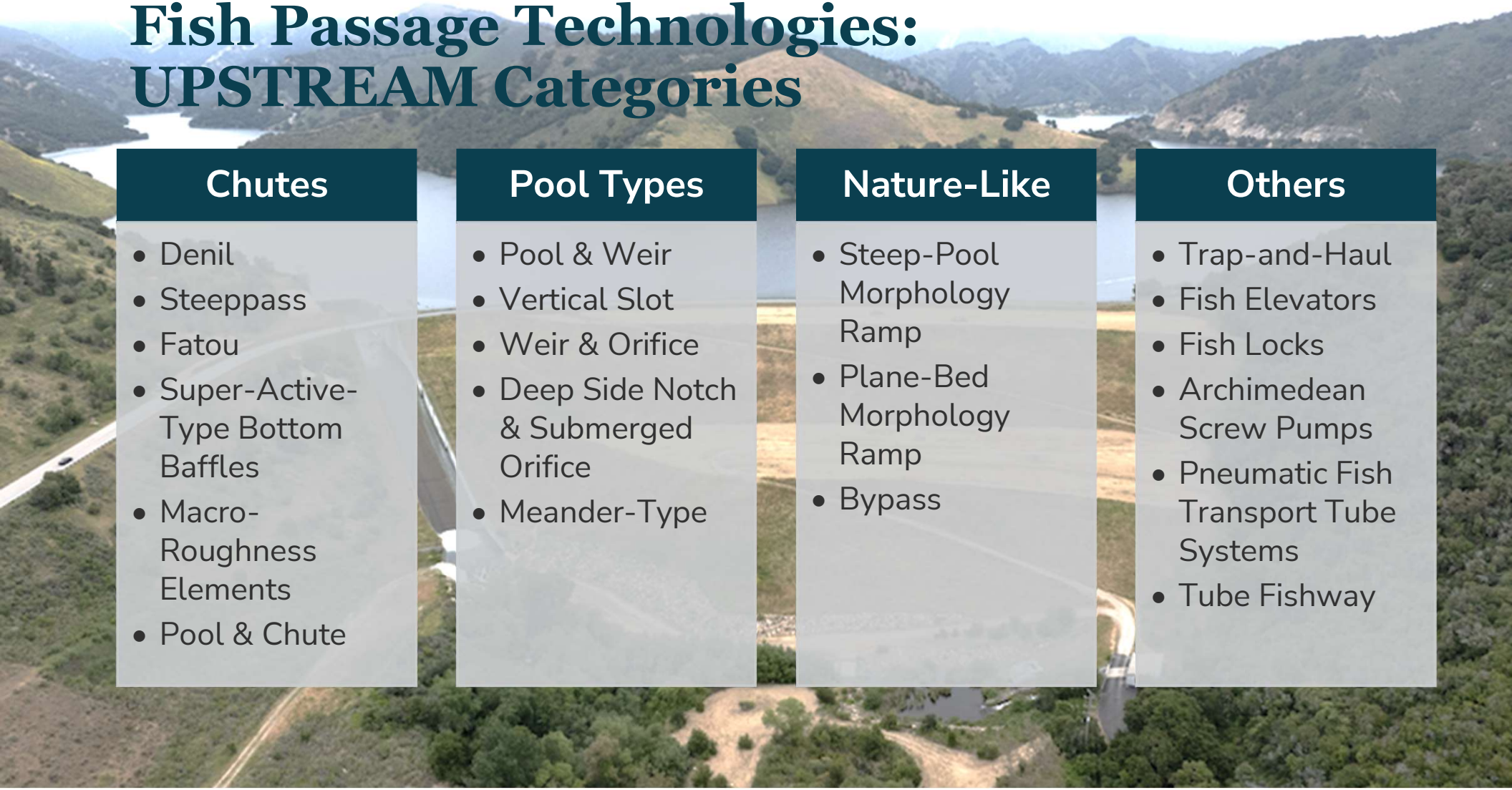
Lopez Reservoir – Summary

Dam Height = 168.2 ft > 120 ft
Reservoir Fluctuation = 69.3 ft > ~2 ft
Required No. of Exit Pools = 70 > 20

Lopez Dam
Crest Elevation: 538.6 ft
Maximum Pool Elevation: 533.6 ft
Spillway Crest Elevation: 522.6 ft
Minimum Pool Elevation: 426.0 ft
Outlet Flow Capacity: 100 ft^3/s
Base Flow below 475 ft: 5.9 ft^3/s
Base Flow above 475 ft: 7.9 ft^3/s
100-year Flow: ~19,500 ft^3/s



Fish Passage Technologies:
UPSTREAM Categories



Chutes	Pool Types	Nature-Like	Others
• Denil • Steeppass • Fatou • Super-Active-Type Bottom Baffles • Macro-Roughness Elements • Pool & Chute	• Pool & Weir • Vertical Slot • Weir & Orifice • Deep Side Notch & Submerged Orifice • Meander-Type	• Steep-Pool Morphology Ramp • Plane-Bed Morphology Ramp • Bypass	• Trap-and-Haul • Fish Elevators • Fish Locks • Archimedean Screw Pumps • Pneumatic Fish Transport Tube Systems • Tube Fishway

Volitional

Chutes – Denil
Source: CSKT – Jocko K Canal
Photo Courtesy: V. Autier

Chutes – Steeppass
Source: USFWS – Little Sheep Creek
Photo Courtesy: V. Autier

Chutes – Fatou
Source: Elle river, Britanny, France
Photo Courtesy: Larinier, 2002

Chutes – Larinier
Source: Saltaire Weir UK
Photo Courtesy: EnvAgencyYNE

Chutes – Macro-Roughness Elements
Source: Toorale Station, Darling River, Australia
Photo Courtesy: NSW Government

Chutes - Pool and Chute
Source: USACE – Lebanon Dam
Photo Courtesy: F. Khan

Pool and Weir
Source: PG&E – Cape Horn Dam
Photo Courtesy: V. Autier

Vertical Slot
Source: Tassebach Weir, Drava River, Austria
Photo Courtesy: Martin Schletterer

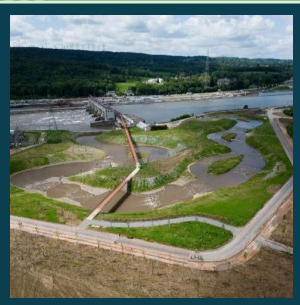
Weir and Orifice
Source: Pend Oreille PUD – Box C.
Photo Courtesy: V. Autier

Deep Side Notch / Orifice
Source: HydroWatt Pont de Beauvoisin
Photo Courtesy: M. Larinier

Nature-Like

Step-Pool morphology ramp
Source: USFWS – Little Sheep Creek
Photo Courtesy: V. Autier

Plane-bed Morphology Ramp
Source: NID, Hemphill, Nevada, USA
Photo Courtesy: Jon Burgi



Bypass
Source: Ampsin-Neuville Lock,
Meuse River, Belgium
Photo Courtesy: Sofico

Meander-Type
Source: Pichoux Gorge, Switzerland
Photo Courtesy: reddit

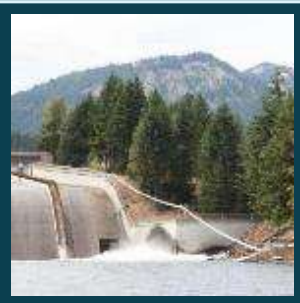
Non-Volitional

Fish Elevator
Source: USACE – Foster Dam
Photo Courtesy: V. Autier

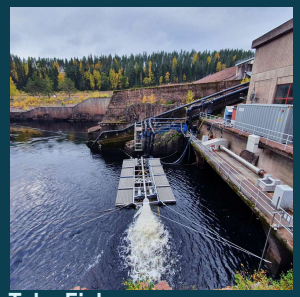
Fish Lock
Source: Pend Oreille PUD – Box C.
Photo Courtesy: V. Autier

Archimedean Screw Pump
Source: Thorne Moors PS UK
Photo Courtesy: Aquatic Control Eng.

Trap and Haul
Source: PGE - Clackamas
Photo Courtesy: M. McMillen



Pneumatic Fish Tubes
Source: USBOR – Cle Elum Dam
Photo Courtesy: Whoosh



Tube Fishway
Source: Raasakka Hydropower Plant Iijoki River, Finland
Photo Courtesy: Fishheart

Fish Passage Technologies: DOWNSTREAM Categories

Physical Barriers

- Screens
  - Eicher Screens
  - Floating Surface Collectors
  - Fixed Screen Structure
- Fish Bypass System
  - Bypass Pipe
  - Open Channel
  - Helix
  - Transport (truck or barge)

Behavioral Guidance Devices (Structural)

- Louvers
- Angled Bar & Trash Racks
- Floating Fish Guidance Boom
- Hanging Chains
- Barrier/Guidance Nets
- Removable Spillway Weir

Behavioral Guidance Devices (Non-Structural)

- Lights
- Sounds (Acoustic)
- Electric Fields
- Air Bubble Curtains
- Hybrid Barriers

Other Methods

- Spilling
- Turbine Passage
- Trap-and-Haul
- Reservoir Drawdown
- Dam Removal

Source: Cleveland Dam, BC. North Shore News.

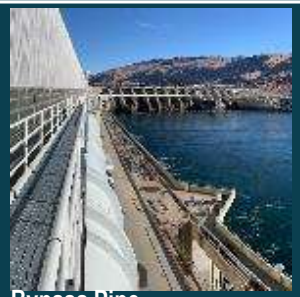
Screens

Eicher Screens
Source: Sullivan Hydroelectric
Photo Courtesy: Fish Screen Oversight Committee

Floating Surface Collectors
Source: North Fork, Clackamas, OR
Photo Courtesy: PGE

Fixed Screen Structure
Source: Round Butte, Oregon
Photo Courtesy: CH2M HILL

Fish Bypass System



Bypass Pipe
Source: Chelan PUD, Rocky Reach
Photo Courtesy: V. Autier

Open Channel
Source: USFWS, Coleman NFH
Photo Courtesy: V. Autier

Helix
Source: USBOR, Cle Elum Dam

Transport Truck
Source: Chelan PUD, Eastbank
Photo Courtesy: V. Autier

Removable Spillway Weir
Source: USACE, Ice Harbor
Photo Courtesy: USACE

Behavioral Guidance (Structural)

Louvers
Source: ETH Zurich
Photo Courtesy: Dr. Meister

Angled Bars
Source: Publication
Photo Courtesy: S. Raynal

Floating Fish Guidance
Source: Worthington

Hanging Chains
Source: NA

Guidance Nets
Source: Upper Baker FSC
Photo Courtesy: PGE

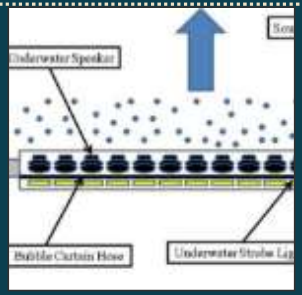
Behavioral Guidance (Non-Structural)

Lights
Source: Hydro Review
Photo Courtesy: P. Patrick

Sounds (Acoustics)
Source: power mag
Photo Courtesy: Ovivo USA

Electric Fields
Source: Elysian Lake, MN
Photo Courtesy: Smith-Root

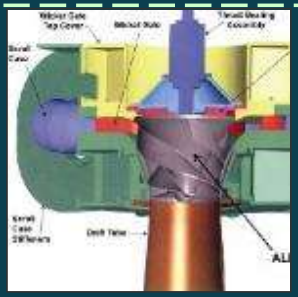
Air Bubble Curtains
Source: Canadianpond.ca
Photo Courtesy: Canadian Pond



Hybrid Barriers
Source:
Image Credit:

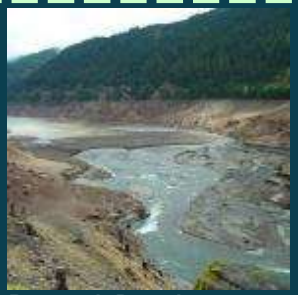
Other Methods

Spilling
Source: BC Hydro, Alouette Dam



Turbine Passage
Source: Alden Turbine Runner
Image Credit: EPRI

In-Tributary Trap (Fyke)
Source: AFS
Photo Courtesy: Duluth Nets



Reservoir Drawdown
Source: Fall Creek, OR
Photo Courtesy: USACE, Portland

Dam Removal
Source: Glines Canyon Dam, WA
Photo Courtesy: U.S. NPS

Pre-Screening Evaluation

High-Level Evaluation of Potential Upstream Fish Passage Technologies

	Upstream Technology	Recommendation
Chute	Denil	Do Not Advance
	Steeppass	Do Not Advance
	Fatou	Do Not Advance
	Super-Active-Type Bottom Baffles (i.e., Larinier)	Do Not Advance
	Macro-Roughness Elements	Do Not Advance
	Pool and Chute	Do Not Advance
Pool Types	Pool and Weir	Do Not Advance
	Vertical Slot	Advance
	Weir and Orifice	Do Not Advance
	Deep Side Notch and Submerged Orifices	Do Not Advance
	Meander-Types	Do Not Advance
Nature -Like	Step-Pool Morphology Ramp	Do Not Advance
	Plane-Bed Morphology Ramp	Do Not Advance
	Bypass	Do Not Advance
Others	Trap-and-Haul	Advance
	Fish Elevators	Do Not Advance
	Fish Lock	Do Not Advance
	Archimedean Screw Pumps	Do Not Advance
	Pneumatic Fish Transport Tube Systems	Do Not Advance
	Tube Fishway	Do Not Advance

High-Level Evaluation of Potential Downstream Fish Passage Technologies

	Downstream Technology	Recommendation
Physical Barriers	Eicher Screens	Do Not Advance
	Floating Surface Collectors	Advance (?)
	Fixed Screen Structures	Do Not Advance
	Bypass Pipe	Advance
	Open Channel	Do Not Advance
	Helix	Advance (?)
	Transport (Truck or Barge)	Advance (?)
Behavioral-Structural	Louvers	Do Not Advance
	Angled Bar and Trash Racks	Do Not Advance
	Floating Fish Guidance Boom	Do Not Advance
	Hanging Chains	Do Not Advance
	Barrier/Guidance Nets	Advance
	Removable Spillway Weir	Do Not Advance
Behavioral-Non-Struct.	Lights	Do Not Advance
	Sounds (Acoustics)	Do Not Advance
	Electric Fields	Do Not Advance
	Air Bubble Curtains	Do Not Advance
	Hybrid Barriers	Do Not Advance
Others	Spilling	Do Not Advance
	Turbine Passage	Do Not Advance
	Trap-and-Haul (In-Tributaries Trap e.g., Fyke Net)	Advance
	Reservoir Drawdown	Do Not Advance
	Dam Removal	Do Not Advance

Alternatives Evaluation Matrix (Draft)

Evaluation Criteria

Once alternatives are selected, they will be developed and evaluated using a rigorous quantitative evaluation process.

The evaluation criteria are grouped in 7 categories:

- Biological Efficiency
- Constructability
- Operation
- Design approach
- Environmental impact
- Regulatory compliance
- Financial

					Upstream Fish Passage				Downstream Fish Passage			
	Criterion	Performance Measure (Units)	Importance - Relative (L, M, H)	Importance Weighting (H=3; M=2; L=1)	*Alternative 1*	*Alternative 2*	*Alternative 3*	*Alternative 4*	*Alternative 1*	*Alternative 2*	*Alternative 3*	*Alternative 4*
Biological Efficiency												
	Volitional Passage	Degree (1-10)	H	3								
	Attract and Collect Fish	Degree (1-10)	M	2								
	Energy Expenditure	Degree (1-10)	M	2								
	Stress Factor	Degree (1-10)	L	1								
	Smolt mortality	Mortality (%)	L	1								
	Fish Return Safety	Degree (1-10)	L	1								
	Juvenile passage efficiency (if applicable)	Efficiency (%)	L	1								
	Adult mortality	Mortality (%)	H	3								
	Adult passage efficiency	Efficiency (%)	H	3								
	Daily Transport Capacity	Degree (1-10)	M	2								
	Fallback Risk	Proportion (%)	H	3								
	Weighted Score	Relative Measure			7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Constructability												
	Site Access	Degree (1-10)	H	3								
	Cofferdam Impact	Degree (1-10)	M	2								
	Dewatering Difficulty	Degree (1-10)	M	2								
	Utilities Availability	Degree (1-10)	M	2								
	Limited reservoir drawdown requirements	Degree (1-10)	H	3								
	Weighted Score	Relative Measure			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Operation												
	Low Mechanical Equipment	Degree (1-10)	H	3								
	Limited Screen Cleaning Effort	Degree (1-10)	H	3								
	Limited Pump O&M Effort	Degree (1-10)	H	3								
	Limited Gates O&M Effort	Degree (1-10)	H	3								
	Low Risk (Safety)	Degree (1-10)	H	3								
	Low Winter Operation Impacts	Degree (1-10)	H	3								
	Low Flood Risks	Degree (1-10)	H	3								
	Low Debris Management	Degree (1-10)	H	3								
	Weighted Score	Relative Measure			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Design Approach												
	Proven Technology	Degree (1-10)	H	3								
	Ability to Meet Fish Passage Goals	Degree (1-10)	H	3								
	Simple system	Degree (1-10)	M	2								
	Low human intervention required for Passage	Degree (1-10)	M	2								
	Design Complexity	Degree (1-10)	H	3								
	Weighted Score	Relative Measure			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Environmental Impact												
	Limited impact to water quality	Degree (1-10)	M	2								
	Low impact to habitat	Degree (1-10)	M	2								
	limited impact on non-target species	Degree (1-10)	M	2								
	Weighted Score	Relative Measure			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Regulatory Compliance												
	Low Permitting Effort	Degree (1-10)	H	3								
	Low Regulatory Constraints	Degree (1-10)	H	3								
	Weighted Score	Relative Measure			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Financial												
	Capital Costs (Design/Construction)	NPV ($)	H	3								
	Estimated Life Expectancy	Years	M	2								
	Annualized Capital Cost (over life expectency)	$/yr	**H**	**3**	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
	Annual operations and maintenance costs	$/yr	H	3								
	Annual NET revenue loss	$/yr	H	3								
	Annual monitoring costs	$/yr	H	3								
	Total Annualized Cost	$/yr	H	3	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

Evaluation Matrix

Each criterion, within each category, will be given an importance factor (L, M, H). The importance factor will be given a relative weight (L=1, M=2, H =3).

Each alternative will be evaluated against each other within a criterion and a grade given between 1 and 10 (1 = worst and 10 = best).

With this quantitative process, each of the seven categories will receive a combined weighted score for each alternative. The total score will then be used to identify which alternative has the most merit.

Biological Efficiency	
CRITERION	**PERFORMANCE MEASURE (Units)**
Volitional Passage	Degree (1-10)
Attract and Collect Fish	Degree (1-10)
Energy Expenditure	Degree (1-10)
Stress Factor	Degree (1-10)
Smolt mortality	Mortality (%)
Fish Return Safety	Degree (1-10)
Juvenile passage efficiency (if applicable)	Efficiency (%)
Adult mortality	Mortality (%)
Adult passage efficiency	Efficiency (%)
Daily Transport Capacity	Degree (1-10)
Fallback Risk	Proportion (%)

Constructability	
CRITERION	**PERFORMANCE MEASURE (Units)**
Site Access	Degree (1-10)
Cofferdam Impact	Degree (1-10)
Dewatering Difficulty	Degree (1-10)
Utilities Availability	Degree (1-10)
Limited reservoir drawdown requirements	Degree (1-10)

TAC Feedback Process

Thank you.