Mono Basin Runoff Year 2024-25
Annual Operations Plan

Licenses 10191 and 10192
Order WR 2021-0086 EXEC – October 1, 2021

May 2024

Los Angeles Department of Water and Power

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I. Abbreviations, Definitions, Memberships Table

amsl	above mean sea level
AF	acre-feet
AFA	acre-feet per annum
AOP	Annual Operations Plan
BAU	Business-As-Usual
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
cfs	cubic feet per second
DSOD	California Department of Water Resources, Division of Safety of Dams
Deputy Director	Deputy Director for the Division of Water Rights
Division	Division of Water Rights
GLOMP	Grant Lake Operations and Management Plan
GLR	Grant Lake Reservoir
Grant Outlet	Grant Lake Outlet
LADWP	Los Angeles Department of Water and Power (Licensee)
License(s)	Amended Licenses 10191 and 10192
MAT	Mono Basin Monitoring Administration Team
MBOP	Mono Basin Operations Plan
MGORD	Mono Gate One Return Ditch
Monitoring Directors	Stream Monitoring Team, Limnology Director, and Waterfowl Director
Parties	California Department of Fish and Wildlife, Mono Lake Committee, and California Trout
RCTE	riffle crest thalweg elevation
RY	runoff year
SCE	Southern California Edison
SEFs	Stream Ecosystem Flows
SMT	Stream Monitoring Team
SMR	Storage Management Release
State Water Board	California State Water Resources Control Board
TUCP	Temporary Urgency Change Petition
USFS	United States Forest Service
USGS	United States Geological Service
Teams and Directors as of Current Runoff Year:	
MAT	The Parties and the Licensee
SMT	Bill Trush (streams) & Ross Taylor (fisheries)
Waterfowl Director	Debbie House
Limnology Director	Dr. John Melack

II. Introduction

The purpose of the AOP is to describe how operations will commence for the current year-type to accomplish exports and stream releases in accordance with the Licenses. The AOP will provide specific information about the flow schedule, export, and facility operations for the year ahead. The AOP will also review the prior year's plan and compare it to actual runoff and operations.

The timeline for AOP development and submittal is as follows:

- By March 31: convene a meeting to prepare for developing the AOP. Meeting attendees to include the SMT, the Waterfowl Director, the Limnology Director, and the Parties.
- By April 15: distribute a draft AOP to the Waterfowl Director, SMT, Limnology Director, and the Parties.
- By April 24: receive written comments from Parties, SMT, and Directors on the draft AOP.
- By May 5: convene a meeting to resolve any unresolved issues.
- By May 15: submit AOP to the SWRCB Deputy Director for a 30-day review, modification, and approval if necessary. No Division approval will be necessary if the terms of the AOP are entirely within the parameters of the MBOP then in effect.

The draft MBOP submitted in October 2022 is not in effect at the time of this writing. LADWP will be filling a TUCP for the Snowmelt Peak hydrograph component of Table 1 due to GLR outlet valve limitations.

III. Summary of Mono Basin RY 2023-24 Operations

Mono Basin operations were conducted in accordance with the 2023-24 AOP summarized below with some deviations. No water diversions occurred on Walker or Parker Creeks. The appropriate SEF tables were utilized for Rush and Lee Vining Creeks, exports were approximately 1,510 AF, and GLR spilled 19,400 AF.

Planned Operations for RY	2023-24
Year Type	Extreme-Wet
April 1 Mono Lake Elev (USGS)	6379.99 ft
April 1 GLR Elev. & Storage	7,104.8 ft & 22,719 AF
Rush Creek SEF Table	1A (with SMRs)
Lee Vining SEF Tables	2A (with curtailment), 2C
Projected Five Siphons Operation	No
Projected West Portal (AF)	4,500
Projected GLR Spill (AF)	Appx. 25,000 AF
SMT Adaptive Management	Yes

On July 28, 2023, LADWP reduced flow to the Grant Lake Outlet to approximately 200 cfs due to concerning and atypical noises and vibrations. Subsequent investigation by LADWP mechanics indicated the valve was experiencing cavitation when flow was above approximately 200 cfs. Since then, controlled outflow from Grant Lake Outlet has been limited to 175 cfs, as flows above 175 cfs may result in permanent damage and loss of operability. GLR releases fell below SEFs on August 5, 2023 when the combined release from Return Ditch and GLR Spillway dropped to between 207 to 187 cfs and returned to Table 1A values on August 13, 2023. In accordance with Section 18.b. of the Amended License, “Licensee shall notify the Division as soon as practical but not later than 5 business days after any event when the required SEFs are not met”. Due to the reduced outflow capacity of the Grant Lake outlet valve causing an inability to meet required SEFs, notification was made to the Division via electronic mail on August 9, 2023.

Diversions to Lee Vining Conduit were curtailed after the Snowmelt Peak as planned, with exception to October 3-10, 2023 in order to reduce flows at Lee Vining Creek for SMT fish surveys.

DSOD valve cycling did not occur.

The April 1, 2023 runoff forecast was 268,100 AF of runoff, while actual runoff was approximately 230,000 AF. Final runoff data will be presented in the corresponding Quarterly Reports along with any comments on operations.

Planned exports were 4,500 AF, however hydrologic conditions and minimal available Los Angeles Aqueduct reservoir storage space led to a total export of about 1,510 AF.

Lee Vining Creek operations were based on upstream flows according to Table 2A and adjusted on an hourly basis. Diversions may have occurred throughout the day when flows exceeded appropriate Table 2A values and stopped when flows decreased below those values. This hourly method of operation maintained compliance with the SEF requirements, but may not be apparent when viewing average daily flow data. The SMT appreciates this method of operation on Lee Vining Creek and prefers it over daily-based operations. Refer to the 2023-24 AOP for a detailed explanation of this operation methodology.

IV. Proposed Mono Basin Operations Plan for RY 2024-25

A. Forecast for RY 2024-25

The runoff forecast for RY 2024-25 is 103% of normal, which is classified as a “Normal” year. The Mono Basin’s May 1 forecast for RY 2024-25 for April to March period is 121,900 AF (see Attachments), with a reasonable range of 108,700 AF to 135,000 AF.

B. Adaptive Management

LADWP has received written adaptive management comments for RY 2024-25 after submittal of the Draft AOP. Given the current flow capacity of the GLR outlet valve, LADWP held a meeting with the Parties and SMT in February 2024 to discuss the upcoming RY. The attachments are based on the adaptive management changes discussed during that meeting.

The SMT can provide adaptive management recommendations for flow requirements (such as ramping rates, durations, timing, and/or start and end dates) for SEF Tables 1 and 2, per amended license 11.a.1, 20.f.3 and 20.f.4. The SMT will produce an Annual Monitoring Report to document monitoring observations and discuss possible adaptive management recommendations; the SMT may also include adaptive management recommendations in comments on the draft AOP.

Real-time adaptive management in response to unforeseen circumstances may also be proposed by the SMT, per Licenses 3.7 and 20.f. Unforeseen circumstances are extreme events (e.g. structural failures or natural disasters) that are not expected variations of regular operations. Such recommendations will be made by written notice to the Division, and they shall be developed in consultation with the Licensee and Parties.

Adaptive management recommendations are subject to review, modification, and approval by the Deputy Director.

SMT adaptive management comments regarding flows / SEFs received for RY 2024-25:

1. The AOP does a good job incorporating our SMT comments from the February 2024 meeting.
2. An important aspect of the RY2024 field season will be to connect streamflow to specific desired outcomes stated in the Synthesis Report.

C. Planned Operations

Planned operations are summarized in the below table, and will be based on the Mono Basin runoff forecast, SEF tables, Mono Lake elevation, SMT adaptive management comments, and any events that may arise during the course of the year. RY operations were modeled in eSTREAM using April 1 elevations for GLR and Mono Lake.

Year Type	Normal
April 1 Mono Lake Elev. (USGS)	6,383.70 ft
April 1 GLR Elev. & Storage	7,128.7 ft & 45,781 AF
Staff Gages & zero elevation (USGS)	1Q (6383.12) 1U (6380.10)
Rush Creek SEF Table	1D (with modifications)
Lee Vining SEF Tables	2A, 2C, potential curtailment
Projected Five Siphons Operation	No
Projected West Portal (AF)	4,500 – 16,000
Projected GLR Spill (AF)	9,700
SMT Adaptive Management	Yes

The operational plan presented in this AOP was modeled using RY 2016-17 hydrology which was 94% of normal. Planned Lee Vining Creek flows will follow Table 2. Lower Rush Creek flows are based on Table 1D with modifications due to GLR outlet valve flow capacity, and adaptive management discussions in February 2024. The flows in Table 1D from June 17, 2024 through July 3, 2024 include peak flows of up to 380 cfs. To accommodate the flow difference, the period of peak flow (175 cfs due to current rotovalve limitation) will be extended to a 15-day period between June 17 and July 3. Additional flows will be released between the Spring Baseflow (starting April 1) to Slow Recession (ending August 17) hydrograph components to match the volume of water released in normal Table 1D operations. This methodology was developed in consultation with the SMT as described in the Amended Licenses.

Modeled flows show GLR spills during winter months. Planned operations in this Draft AOP are to cease Lee Vining Creek diversions and release SMRs if GLR storage is above 46,000 AF during fall and winter months to avoid winter spills. SMRs will stop and Lee Vining Creek diversions will resume when GLR drops below 46,000 AF. Target SMRs will be at or below values discussed in Chapter 8.3.2 of the draft MBOP (shown below).

Month	MBOP # cfs	SEF # cfs	cfs increase	Possible AF/period
October	70	27	43	2,600
November	35	27	8	500
December	35	27	8	500
Jan - Mar	90	27	63	11,400
			Total =	15,000

Planned export is 4,500 AF. Amended License rules allow for 16,000 AF to be exported this year. A review of available aqueduct system storage and hydrologic conditions will be made in November and a determination made on whether to export up to 16,000 AF. Considerations will include maintaining Rush Creek fishery and streambed in good health, environmental obligations and water supply to the City. Modeled export flow in eSTREAM was approximately 45 cfs from October through March and totaled 16,000 AF; actual export may vary from the model run but will be at a steady rate starting in October, likely to be 35-50 cfs.

If a determination is made to take less than 16,000 AF, then Lee Vining Creek Diversions will be adjusted to limit or prevent SMRs from occurring during the October to March period.

Rush Creek and Lee Vining Creek and Conduit daily flows depend on both hydrology and SCE operations, and therefore may differ from eSTREAM model flows. During any fish survey periods, creek flows will be adjusted as directed by the SMT.

Each year includes planned cycling of the GLR outlet valve per DSOD requirements. The planned cycling period will depend on the particular SEF tables for Rush Creek and typically occurs during periods of higher SEF flows in the summer months. This years planned cycling is uncertain at this time and is pending consultation with DSOD and technical experts based on the condition of the outlet valve. The downstream effects of valve cycling include a reduction and then an increase in flows, followed by a return to the SEF flow rate at the completion of the cycling exercise. The cycling procedure occurs over a two or three hour period and the reduction and increase in flows is attenuated downstream due to the relatively short duration of flow variation. Based on past experience, SEF flow values would likely be met during any cycling exercise.

No sediment bypass operations are planned for this year at Walker and Parker creeks. The slide gates used for sediment bypass at both Walker Creek and Parker Creek are broken. The record runoff of 2023, along with Tropical Storm Hilary, has added significant volumes of repair work to water infrastructure. Scheduling and prioritization for infrastructure repair is ongoing, and the gates will not be repaired in 2024.

This AOP is based on projections from eSTREAM modeling and forecasts with the understanding that actual creek flows and runoff may vary substantially due to actual hydrology, weather patterns, SCE and other agency operations, and/or other factors. LADWP will notify the Parties of adjustments in operations via electronic communication within 5 business days if changes are in conflict with License requirements. Otherwise, monthly and quarterly reports will document adjustments in operations.

V. Monitoring Tasks

Stream monitoring of the 8 Side Channel diversion amounts and how such diversions affect surrounding areas.

Proposed Fisheries population sampling in the fall of this season occur at MGORD Rush, Upper Rush, Bottomlands Rush, Lee Vining Creek main channel, and Walker Creek. In addition to the annual sampling locations, the scientists propose to sample Caddis Channel, Jeffrey Connector Channel, and the beaver dam pools of the Old Main Channel.

The Waterfowl Director will be performing annual monitoring tasks including hydrology, lake limnology, waterfowl fall aerial counts, aerial photography of waterfowl habitats, and ground counts. Spring survey will be occurring during this operational period as will an aerial photographic survey of riparian corridors since this period follows an Extreme-Wet year.

Planned limnological monitoring tasks will be routine monitoring activities to include meterological measurements, water profiling (depth, temperature, conductivity, dissolved oxygen, fluorescence, and turbidity), chlorophyll and ammonium sampling, and *Artemia* sampling.

ATTACHMENTS

TABLE 1D: RUSH CREEK STREAM ECOSYSTEM FLOWS FOR NORMAL YEARS

Hydrograph Component	Timing	Flow Requirement	Ramping Rate
Spring Baseflow	April 1 – April 30	40 cfs	Maximum: 10% or 10 cfs*
Spring Ascension	May 1 – May 15	40 cfs ascending to 80 cfs	Target: 5% Maximum: 25%
Spring Bench	May 16 – June 11	80 cfs	Maximum: 20%
Snowmelt Ascension	June 12 – June 16	80 cfs ascending to 120 cfs	Target: 10% Maximum: 20%
Snowmelt Bench	June 17 – July 14	120 cfs	Maximum Ascending: 20% Maximum Descending: 10% or 10 cfs*
Snowmelt Flood and Snowmelt Peak	Starting between June 17 and June 25 with the 3-day peak between June 23 and July 3	120 cfs ascending to 380 cfs, 380 cfs for 3 days, 380 cfs descending to 120 cfs	Target Ascending: 20% Maximum Ascending: 40% Maximum Descending: 10% or 10 cfs*
Medium Recession (Node)	July 15 – July 26	120 cfs descending to 58 cfs	Target: 6% Maximum: 10% or 10 cfs*
Slow Recession	July 27 – August 17	58 cfs descending to 30 cfs	Target: 3% Maximum: 10% or 10 cfs*
Summer Baseflow	August 18 – September 30	30 cfs target 28 cfs minimum	Maximum: 10% or 10 cfs*
Fall and Winter Baseflow	October 1 – March 31	27 cfs target 25 cfs minimum and 29 cfs maximum	Maximum: 10% or 10 cfs*
			* whichever is greater

TABLE 2A LEE VINING CREEK STREAM ECOSYSTEM FLOWS

Timing: April 1 – September 30						Year-type: Extreme/Wet, Wet, Wet/Normal, Normal, Dry/Normal II				
Maximum ramping at the beginning and end of this period is 20%.										
Inflow	**Flow Requirement**									
30 cfs or less	Licensee shall bypass inflow.									
31 – 250 cfs	Licensee shall bypass flow in the amount corresponding to inflow which is displayed as blocks of 10 cfs (left-hand vertical column) and 1 cfs increments within such blocks (top horizontal row).									
	0	1	2	3	4	5	6	7	8	9
30		30	30	30	30	30	31	32	33	34
40	30	31	32	33	34	35	36	37	38	39
50	35	36	37	38	39	40	41	42	43	44
60	45	46	47	48	49	50	51	52	53	54
70	55	56	57	58	59	60	61	62	63	64
80	60	61	62	63	64	65	66	67	68	69
90	70	71	72	73	74	75	76	77	78	79
100	75	76	77	78	79	80	81	82	83	84
110	85	86	87	88	89	90	91	92	93	94
120	95	96	97	98	99	100	101	102	103	104
130	100	101	102	103	104	105	106	107	108	109
140	110	111	112	113	114	115	116	117	118	119
150	120	121	122	123	124	125	126	127	128	129
160	130	131	132	133	134	135	136	137	138	139
170	135	136	137	138	139	140	141	142	143	144
180	145	146	147	148	149	150	151	152	153	154
190	155	156	157	158	159	160	161	162	163	164
200	160	161	162	163	164	165	166	167	168	169
210	170	171	172	173	174	175	176	177	178	179
220	180	181	182	183	184	185	186	187	188	189
230	190	191	192	193	194	195	196	197	198	199
240	195	196	197	198	199	200	201	202	203	204
250	200									
251 cfs and greater	Licensee shall bypass inflow.									

TABLE 2C: LEE VINING CREEK STREAM ECOSYSTEM FLOWS

Timing: October 1 – March 31				Year-type: All
Maximum ramping at the beginning and end of this period and at all times is 20%.				
Timing	Flow Requirement			
	Extreme/Wet, Wet	Wet/Normal	Normal	Dry/Normal II, Dry/Normal I, Dry
October 1 – October 15	30 cfs	28 cfs	20 cfs	16 cfs
October 16 – October 31	28 cfs	24 cfs	18 cfs	
November 1 – November 15	24 cfs	22 cfs		
November 16 – March 31	20 cfs	20 cfs		

2024 MONO BASIN RUNOFF FORECAST
May 1, 2024

APRIL THROUGH SEPTEMBER RUNOFF

	MOST PROBABLE VALUE (Acre-feet)	MOST PROBABLE VALUE (% of Avg.)	REASONABLE MAXIMUM (% of Avg.)	REASONABLE MINIMUM (% of Avg.)	LONG-TERM MEAN (1971 - 2020) (Acre-feet)
MONO BASIN:	**103,300**	**103%**	113%	93%	100,307

APRIL THROUGH MARCH RUNOFF

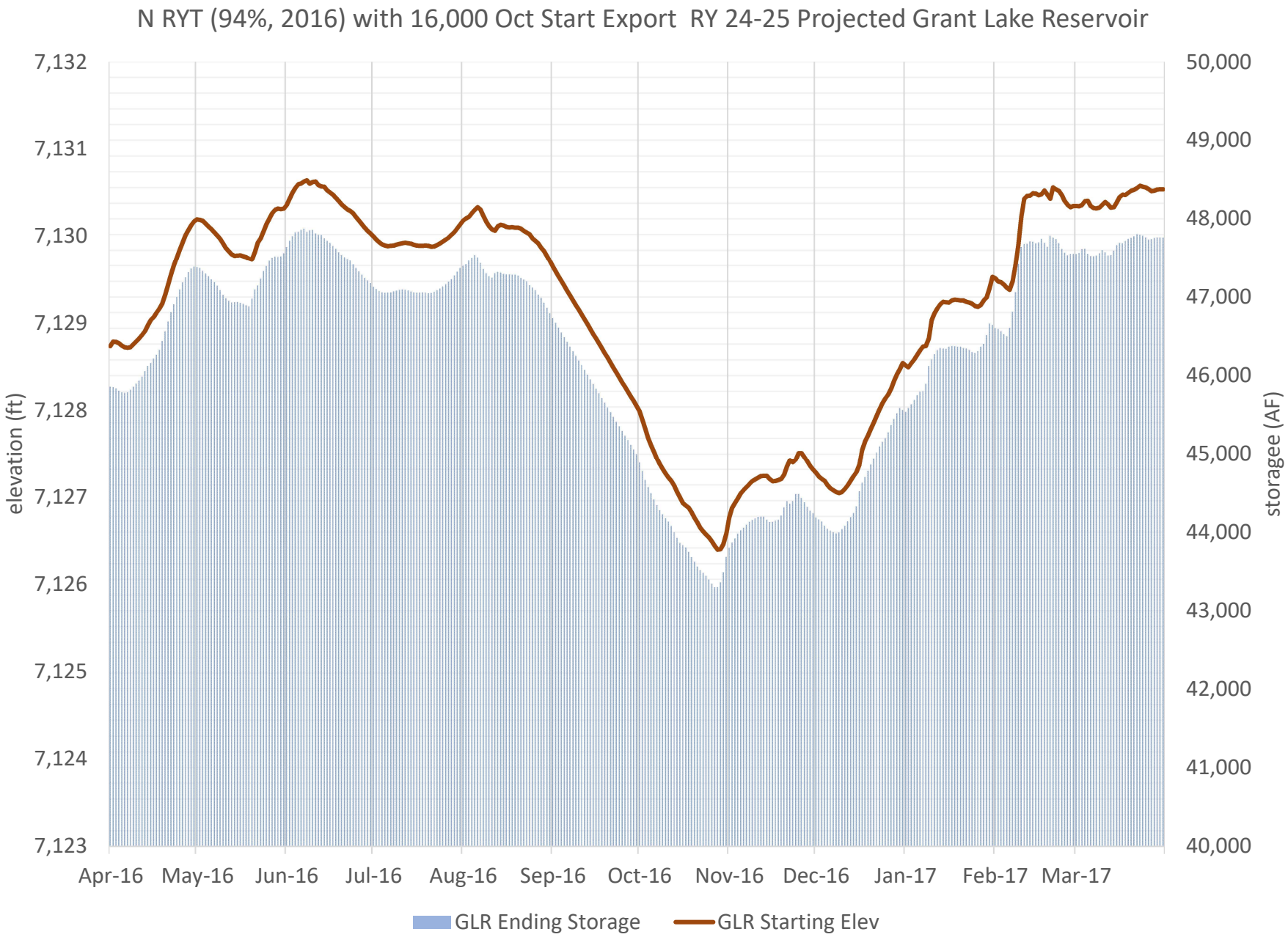
	MOST PROBABLE VALUE (Acre-feet)	MOST PROBABLE VALUE (% of Avg.)	REASONABLE MAXIMUM (% of Avg.)	REASONABLE MINIMUM (% of Avg.)	LONG-TERM MEAN (1971 - 2020) (Acre-feet)
MONO BASIN:	**121,900**	**103%**	114%	92%	118,156

NOTE - Owens River Basin includes Long, Round, and Owens Valleys

MOST PROBABLE - That runoff which is expected if median precipitation occurs after the forecast date.

REASONABLE MAXIMUM - That runoff which is expected to occur if precipitation subsequent to the forecast is equal to the amount which is exceeded on the average once in 10 years.

REASONABLE MINIMUM - That runoff which is expected to occur if precipitation subsequent to the forecast is equal to the amount which is exceeded on the average 9 out of 10 years.


N RYT (94%, 2016) with 16,000 Oct Start Export RY 24-25 Projected Grant Lake Reservoir
elevation (ft)
7,132
7,131
7,130
7,129
7,128
7,127
7,126
7,125
7,124
7,123
storagee (AF)
50,000
49,000
48,000
47,000
46,000
45,000
44,000
43,000
42,000
41,000
40,000
Apr-16
May-16
Jun-16
Jul-16
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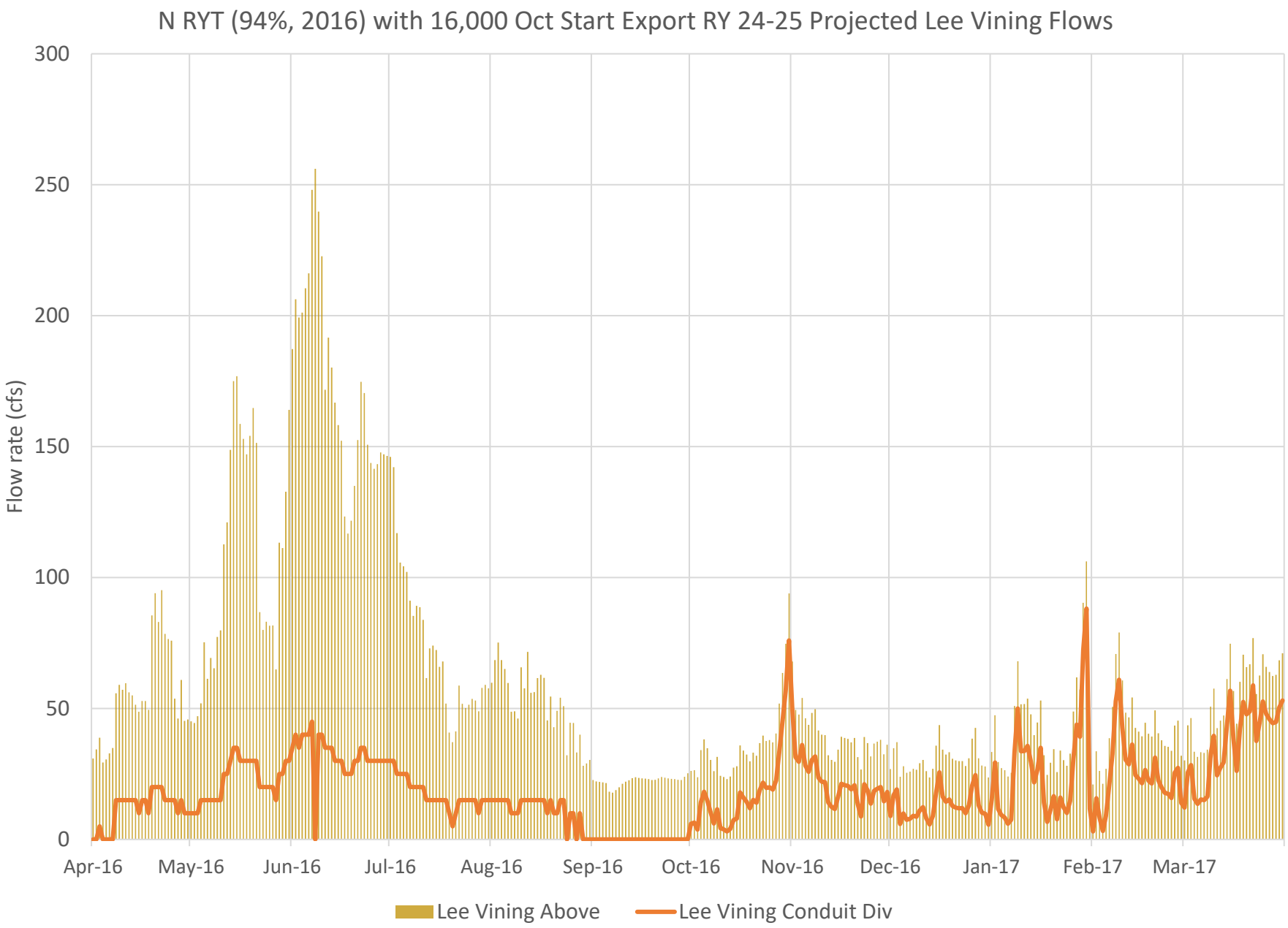
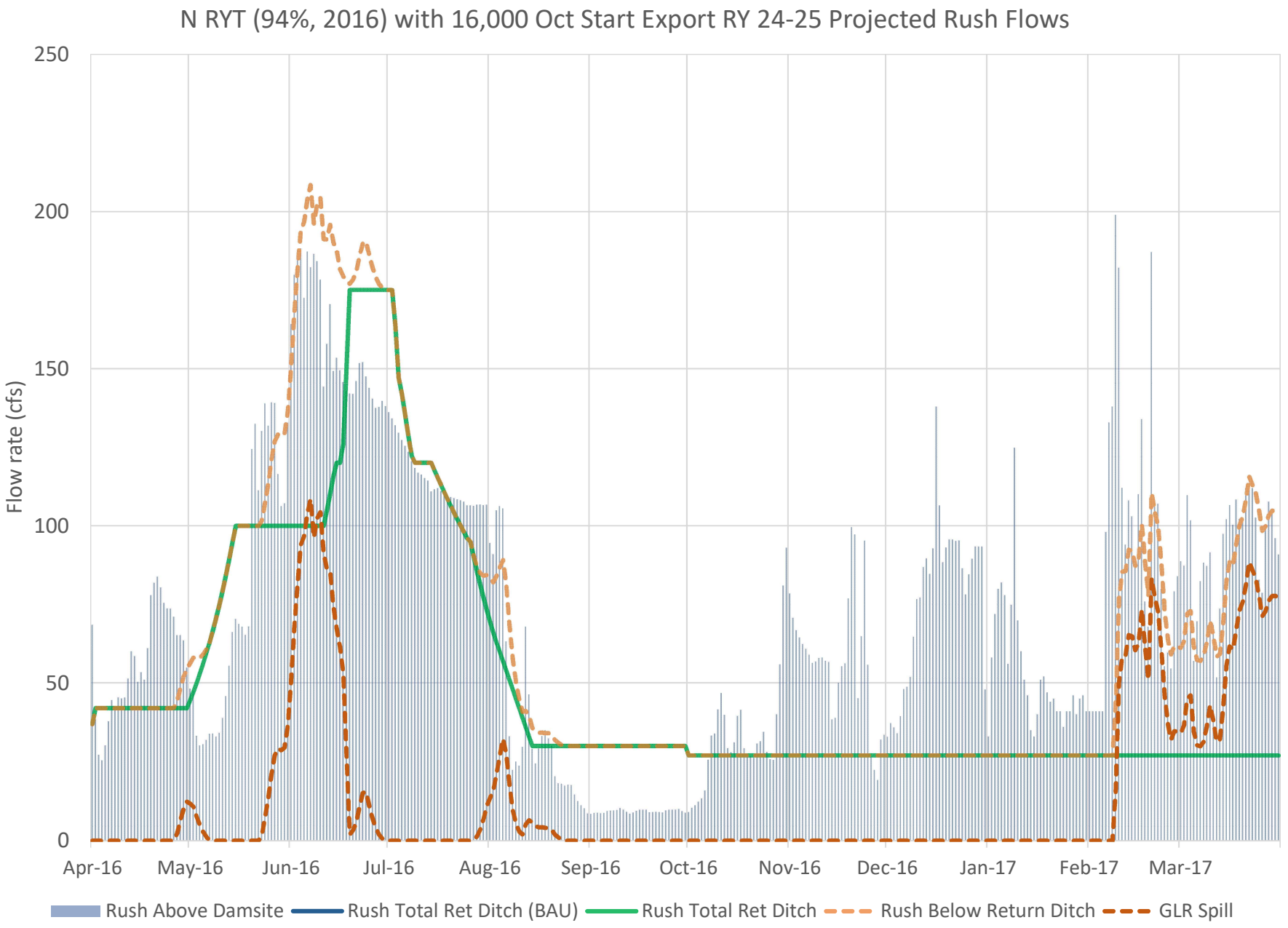
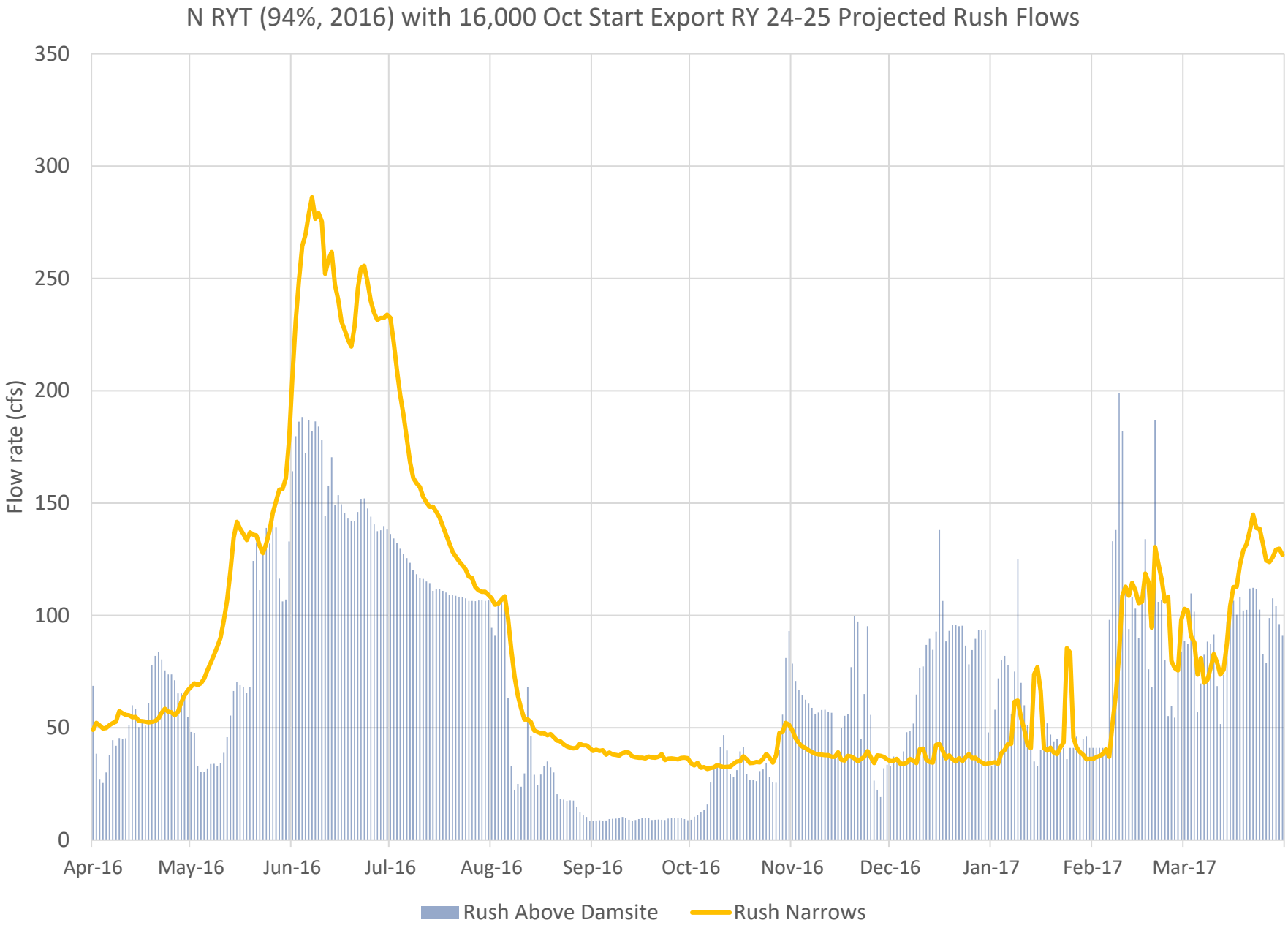
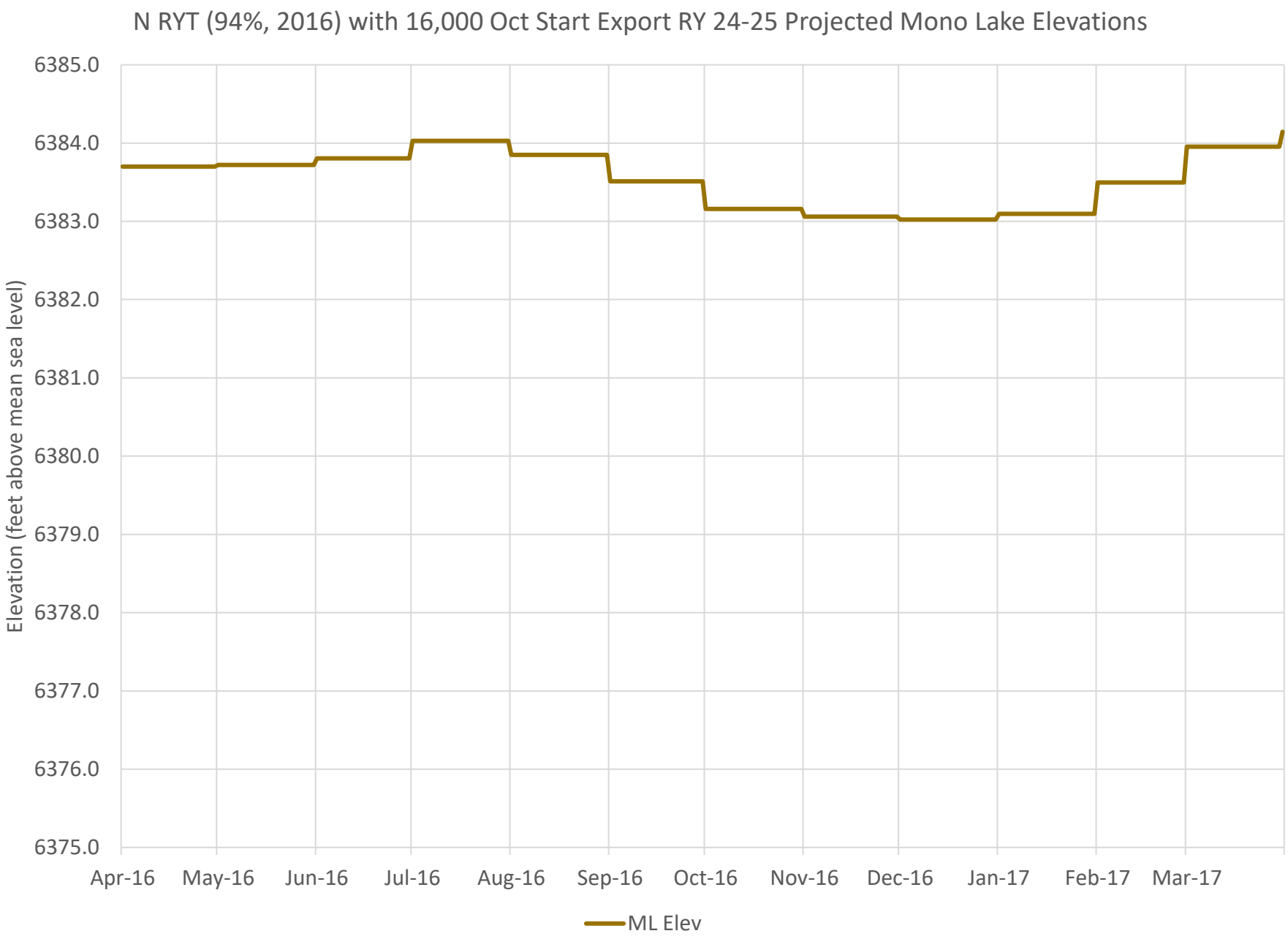
Oct-16
Nov-16
Dec-16
Jan-17
Feb-17
Mar-17
GLR Ending Storage
GLR Starting Elev


N RYT (94%, 2016) with 16,000 Oct Start Export RY 24-25 Projected Lee Vining Flows
Flow rate (cfs)
300
250
200
150
100
50
0
Apr-16
May-16
Jun-16
Jul-16
Aug-16
Sep-16
Oct-16
Nov-16
Dec-16
Jan-17
Feb-17
Mar-17
Lee Vining Above
Lee Vining Conduit Div


N RYT (94%, 2016) with 16,000 Oct Start Export RY 24-25 Projected Rush Flows
Flow rate (cfs)
250
200
150
100
50
0
Apr-16
May-16
Jun-16
Jul-16
Aug-16
Sep-16
Oct-16
Nov-16
Dec-16
Jan-17
Feb-17
Mar-17
Rush Above Damsite
Rush Total Ret Ditch (BAU)
Rush Total Ret Ditch
Rush Below Return Ditch
GLR Spill


N RYT (94%, 2016) with 16,000 Oct Start Export RY 24-25 Projected Rush Flows
Flow rate (cfs)
350
300
250
200
150
100
50
0
Apr-16
May-16
Jun-16
Jul-16
Aug-16
Sep-16
Oct-16
Nov-16
Dec-16
Jan-17
Feb-17
Mar-17
Rush Above Damsite
Rush Narrows


N RYT (94%, 2016) with 16,000 Oct Start Export RY 24-25 Projected Mono Lake Elevations
Elevation (feet above mean sea level)
6385.0
6384.0
6383.0
6382.0
6381.0
6380.0
6379.0
6378.0
6377.0
6376.0
6375.0
Apr-16
May-16
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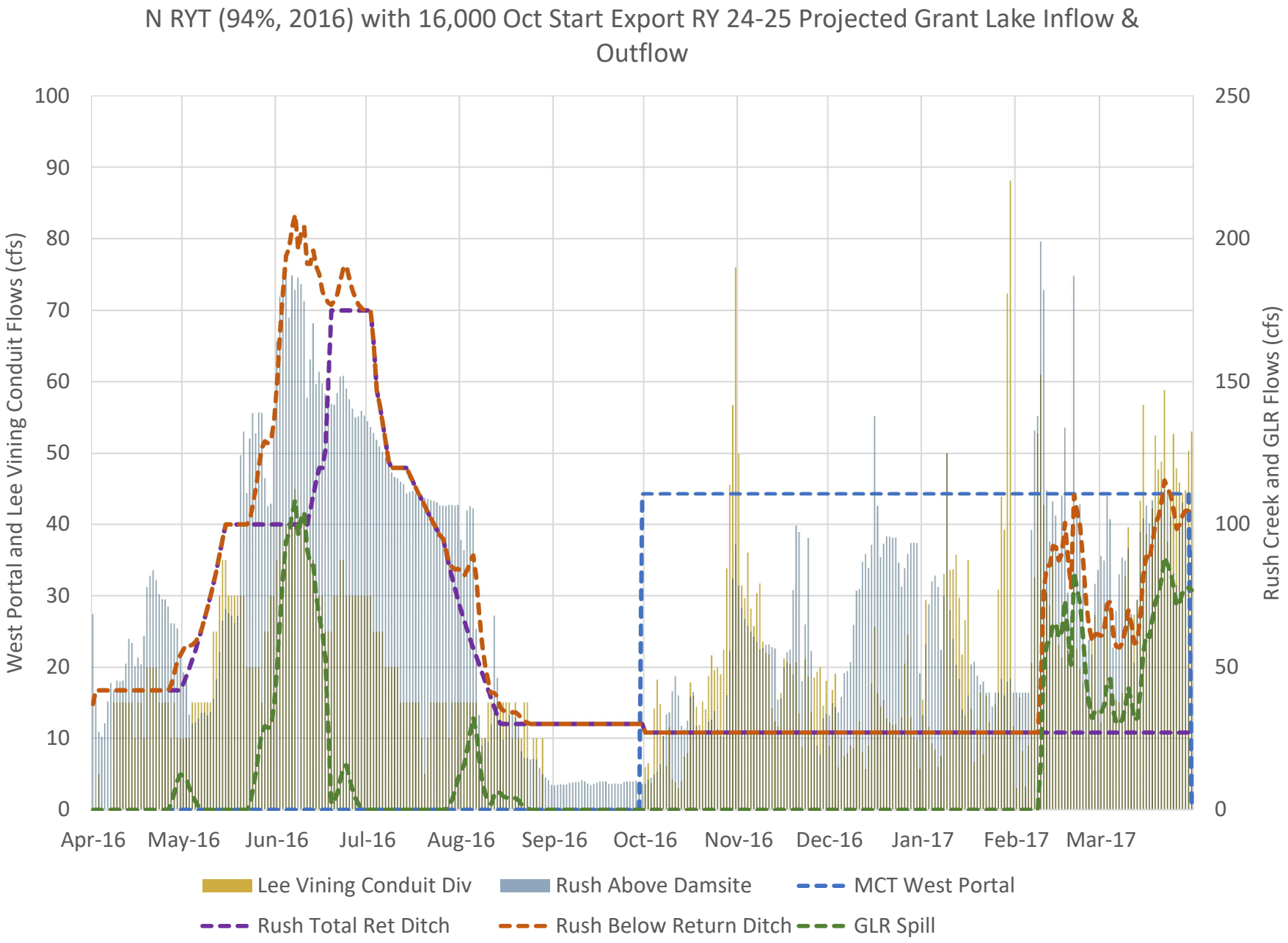
Nov-16
Dec-16
Jan-17
Feb-17
Mar-17
ML Elev


N RYT (94%, 2016) with 16,000 Oct Start Export RY 24-25 Projected Grant Lake Inflow & Outflow
West Portal and Lee Vining Conduit Flows (cfs)
Rush Creek and GLR Flows (cfs)
100
90
80
70
60
50
40
30
20
10
0
250
200
150
100
50
0
Apr-16
May-16
Jun-16
Jul-16
Aug-16
Sep-16
Oct-16
Nov-16
Dec-16
Jan-17
Feb-17
Mar-17
Lee Vining Conduit Div
Rush Above Damsite
MCT West Portal
Rush Total Ret Ditch
Rush Below Return Ditch
GLR Spill