Water Supply Operating Board

Water Supply

October 6, 2016

Paul Faulds
Water Resources Manager

Seattle Public Utilities

Topics

Water Supply

Water Management Challenges
Commissioning Morse Lake Pump Plant

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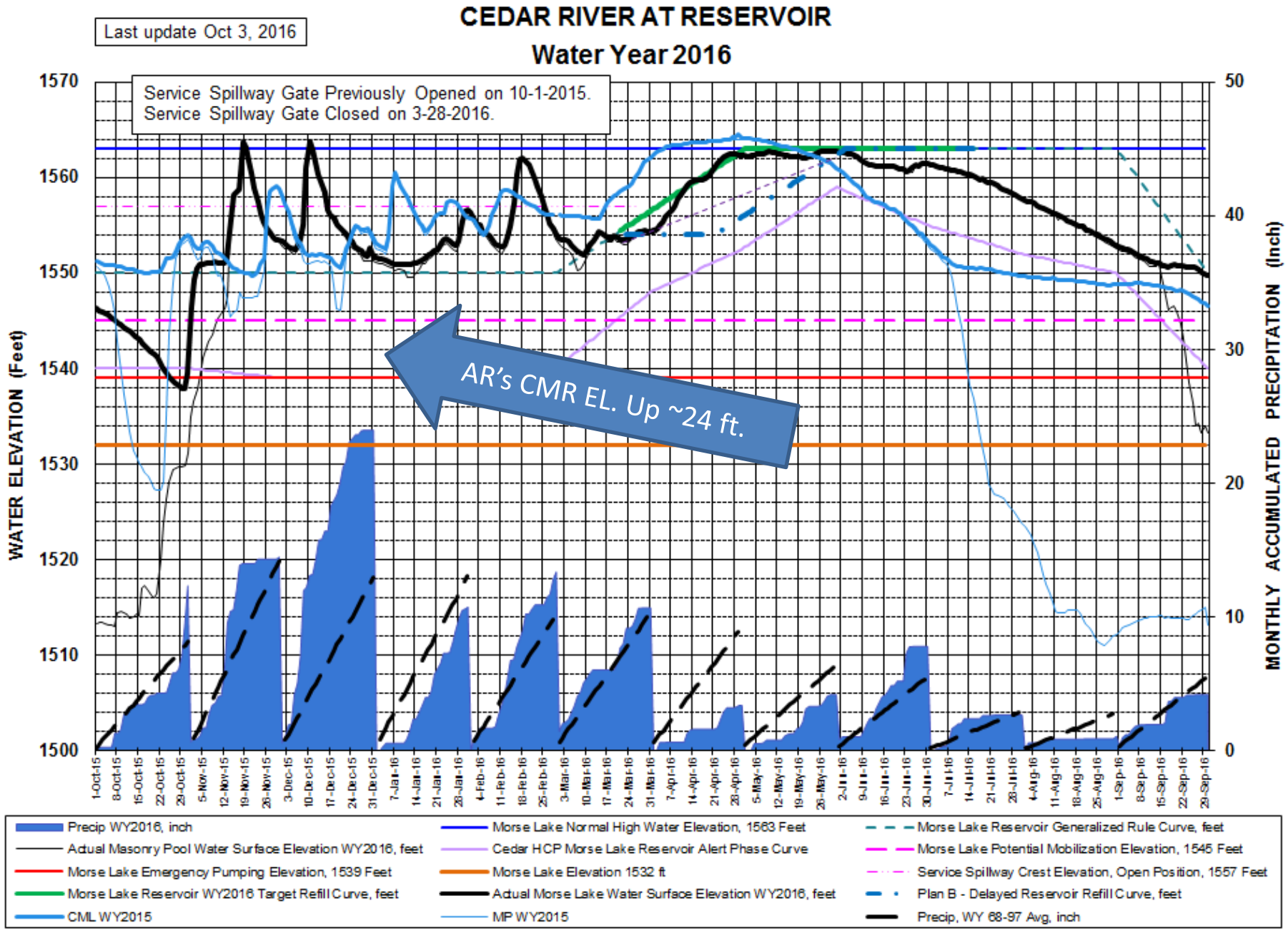
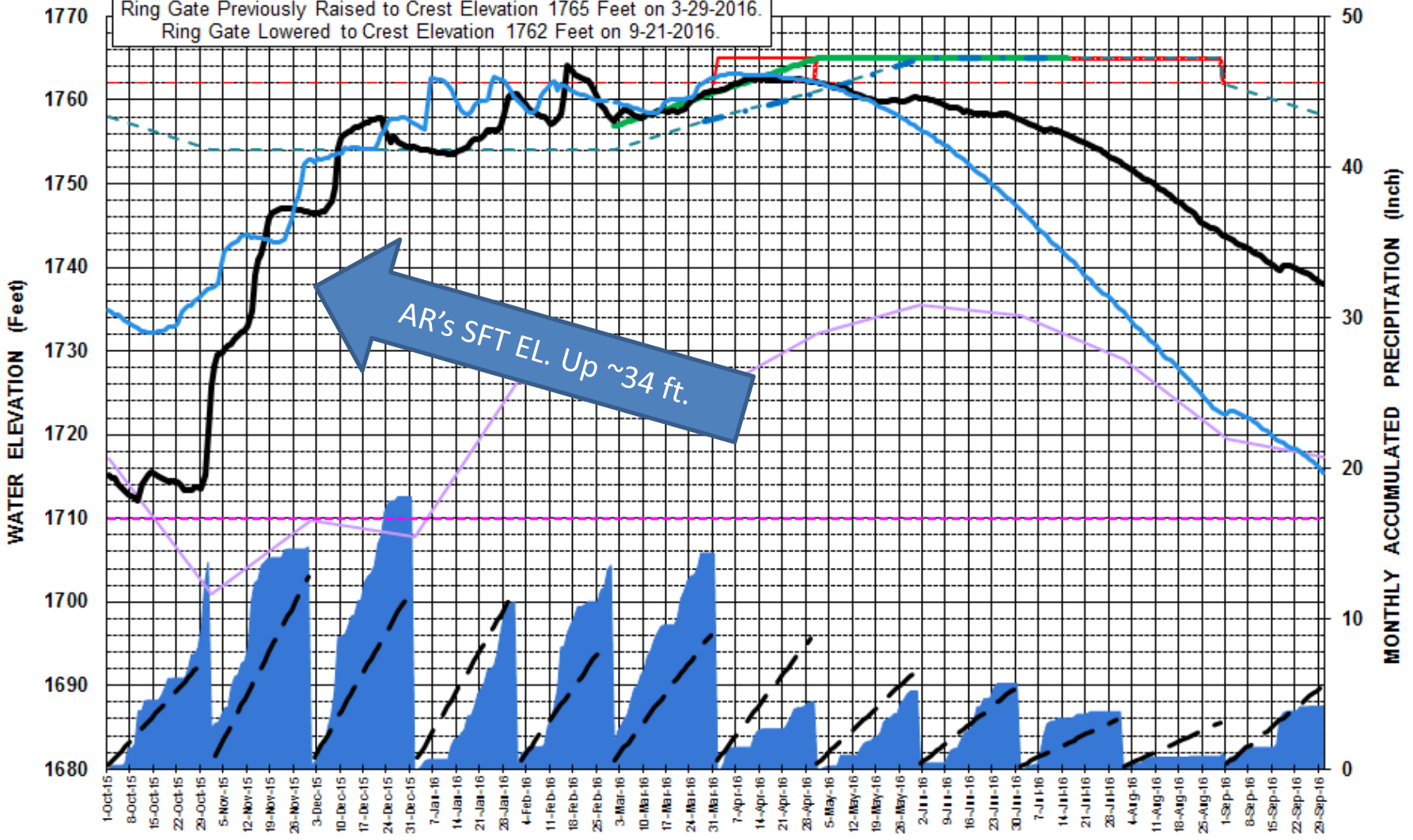

CEDAR RIVER AT RESERVOIR
Water Year 2016
Last update Oct 3, 2016
Service Spillway Gate Previously Opened on 10-1-2015.
Service Spillway Gate Closed on 3-28-2016.
AR's CMR EL. Up ~24 ft.
WATER ELEVATION (Feet)
MONTHLY ACCUMULATED PRECIPITATION (Inch)
1570
1560
1550
1540
1530
1520
1510
1500
50
40
30
20
10
0
1-Oct-15
8-Oct-15
15-Oct-15
22-Oct-15
29-Oct-15
5-Nov-15
12-Nov-15
19-Nov-15
26-Nov-15
3-Dec-15
10-Dec-15
17-Dec-15
24-Dec-15
31-Dec-15
7-Jan-16
14-Jan-16
21-Jan-16
28-Jan-16
4-Feb-16
11-Feb-16
18-Feb-16
25-Feb-16
3-Mar-16
10-Mar-16
17-Mar-16
24-Mar-16
31-Mar-16
7-Apr-16
14-Apr-16
21-Apr-16
28-Apr-16
5-May-16
12-May-16
19-May-16
26-May-16
2-Jun-16
9-Jun-16
16-Jun-16
23-Jun-16
30-Jun-16
7-Jul-16
14-Jul-16
21-Jul-16
28-Jul-16
4-Aug-16
11-Aug-16
18-Aug-16
25-Aug-16
1-Sep-16
8-Sep-16
15-Sep-16
22-Sep-16
29-Sep-16
Precip WY2016, inch
Morse Lake Normal High Water Elevation, 1563 Feet
Morse Lake Reservoir Generalized Rule Curve, feet
Actual Masonry Pool Water Surface Elevation WY2016, feet
Cedar HCP Morse Lake Reservoir Alert Phase Curve
Morse Lake Potential Mobilization Elevation, 1545 Feet
Morse Lake Emergency Pumping Elevation, 1539 Feet
Morse Lake Elevation 1532 ft
Service Spillway Crest Elevation, Open Position, 1557 Feet
Morse Lake Reservoir WY2016 Target Refill Curve, feet
Actual Morse Lake Water Surface Elevation WY2016, feet
Plan B - Delayed Reservoir Refill Curve, feet
CML WY2015
MP WY2015
Precip, WY 68-97 Avg, inch

SOUTH FORK TOLT RIVER AT RESERVOIR
Water Year 2016

Last update Oct 3, 2016

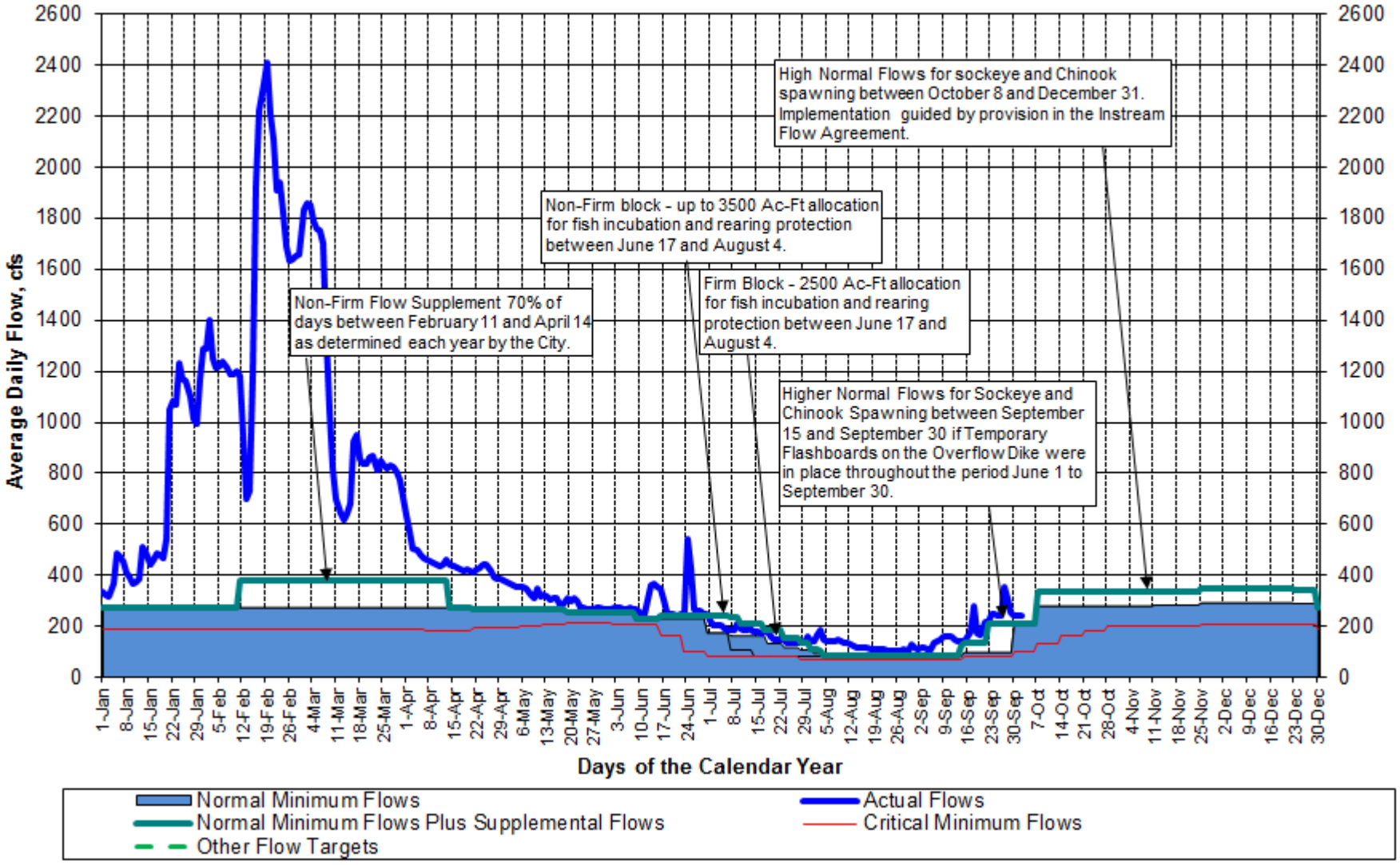
Ring Gate Previously Raised to Crest Elevation 1765 Feet on 3-29-2016.
Ring Gate Lowered to Crest Elevation 1762 Feet on 9-21-2016.



Precip WY2016, inch
Morning Glory Overflow El, feet
Early Raising of Ring Gate El, feet
Normal Raising of Ring Gate El, feet
SFT Generalized Reservoir Rule Curve, feet
SF Tolt Reservoir WY2016 Target Curve, feet
Plan B - Normal Reservoir Refill Curve, feet
SFT Reservoir Critical Rule Curve, feet
SF Tolt Reservoir, Low Water Level Elevation, 1710 Feet
Actual SF Tolt Water Surface Elevation WY2016, feet
SFT WY2015
Precip, WY 68-97 Avg, inch

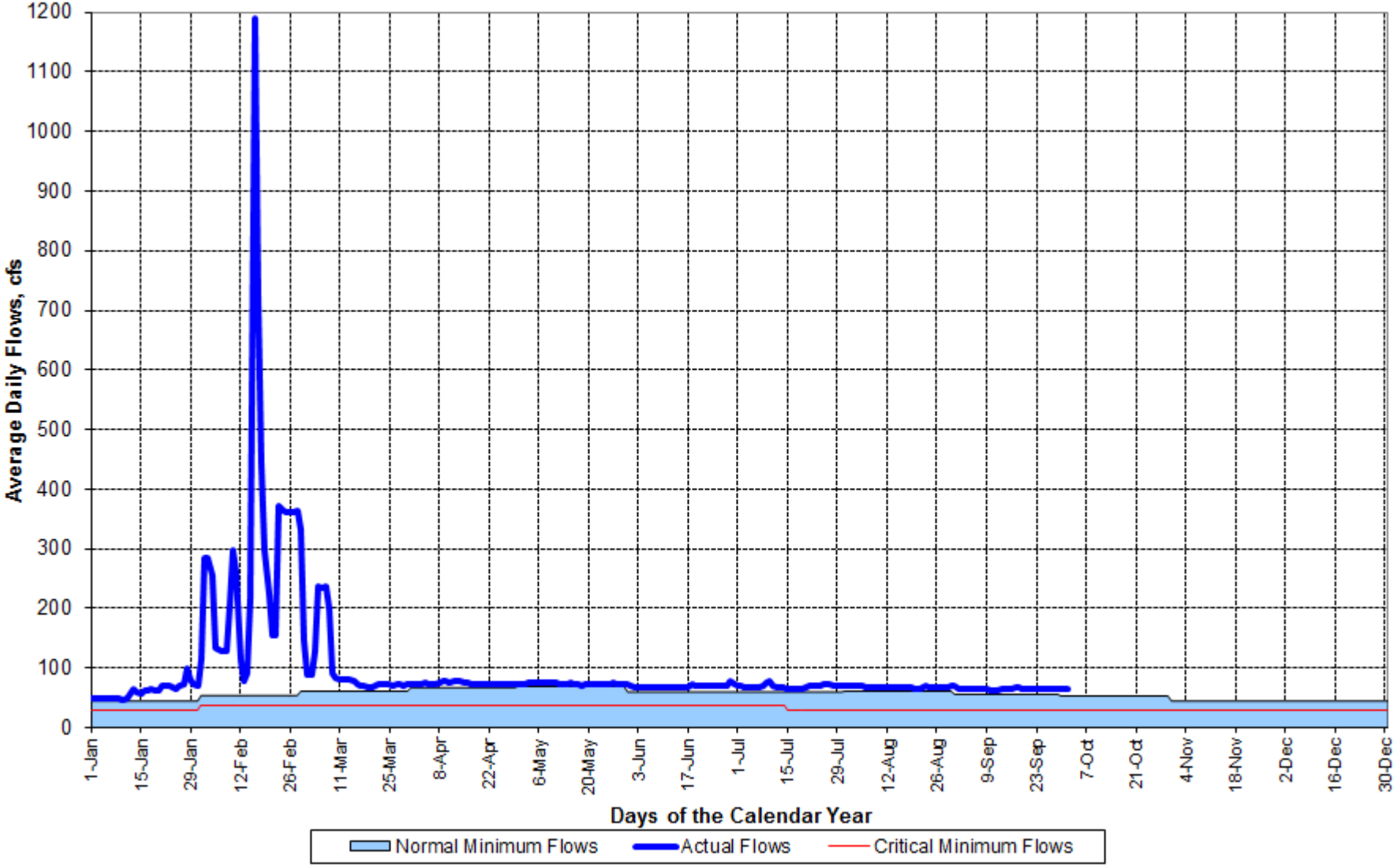
Last Update: 10/02/2016

Calendar Year 2016
Cedar River Instream Flows Measured at USGS Stream Gage No. 12117600
All Data is Provisional and Subject to Revision



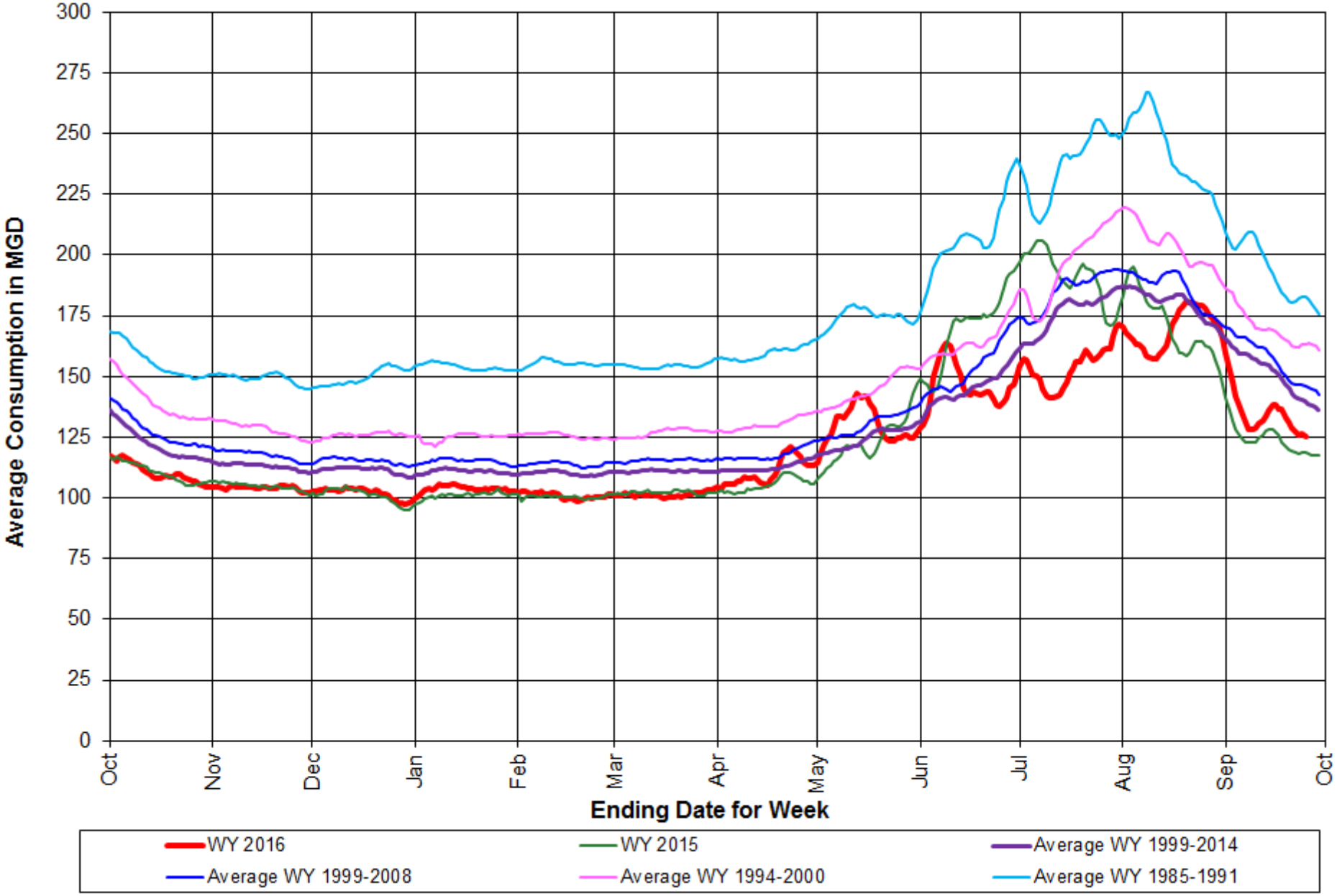
Last Updated: 10/2/2016

Calendar Year 2016
South Fork Tolt River Instream Flows Measured at USGS Stream Gage No. 12148000
All Data is Provisional and Subject to Revision



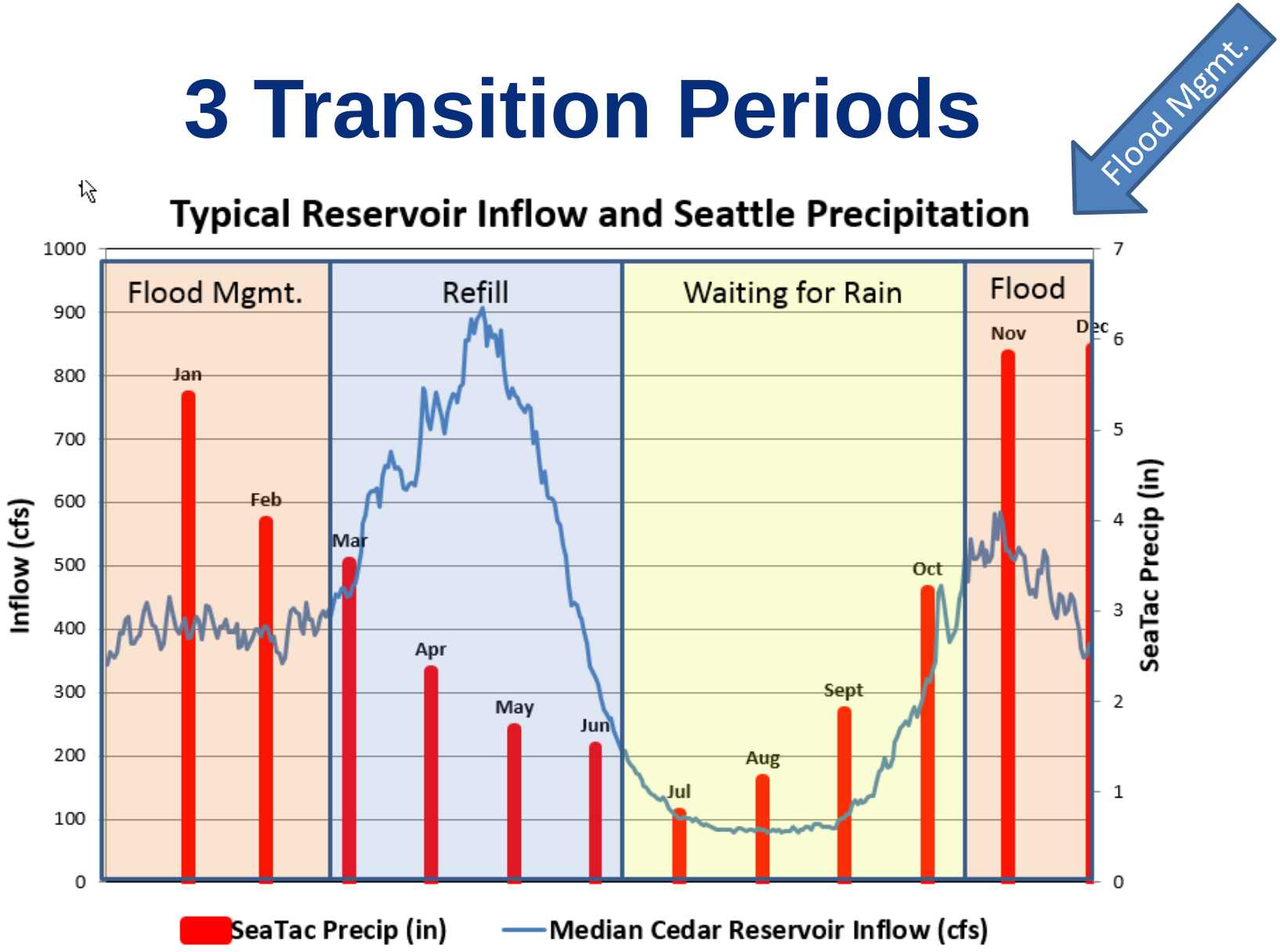
24-hr Consumption, 7-Day Moving Average

Through September 26, 2016



Notes: A. 7-day moving average is calculated using data from the day of and the previous 6 days.
All Data is Provisional and Subject to Change

3 Transition Periods



Masonry Dam and Reservoir

Reservoir Drawdown

Flood Management
SCL projects and
Lower Service Spillway

SF Tolt Dam and Reservoir

Flood Management
Lower Ring Gate

Water Supply Challenges with Commissioning New Pump Plant

Max operating level is 1552 ft. with 2 ft. buffer to 1554 ft. to account for wave action.

Challenges:

- Contractor likely starts to demob plant around elevation 1551 +.
- Water Resources tasked with trying to maintain a reservoir elevation (flood pocket) of 1548 ft. to 1552 for commissioning.
- SOP - do not release water from storage in anticipation of high precipitation events because weather forecasts in fall are dynamic, models are inconsistent, forecasts are poor.
- SOP - backfill to near peak flow of event in the lower Cedar River, which can take a week or more to recover a flood pocket.
- Minimize turbidity so Landsburg can divert water to Lake Youngs.
- Stay below scour redd scour thresholds.
- Maintain flows to benefit sockeye hatchery broodstock collection.
- Keep sustained flows near minimum to prevent Chinook from spawning high on the river margins.

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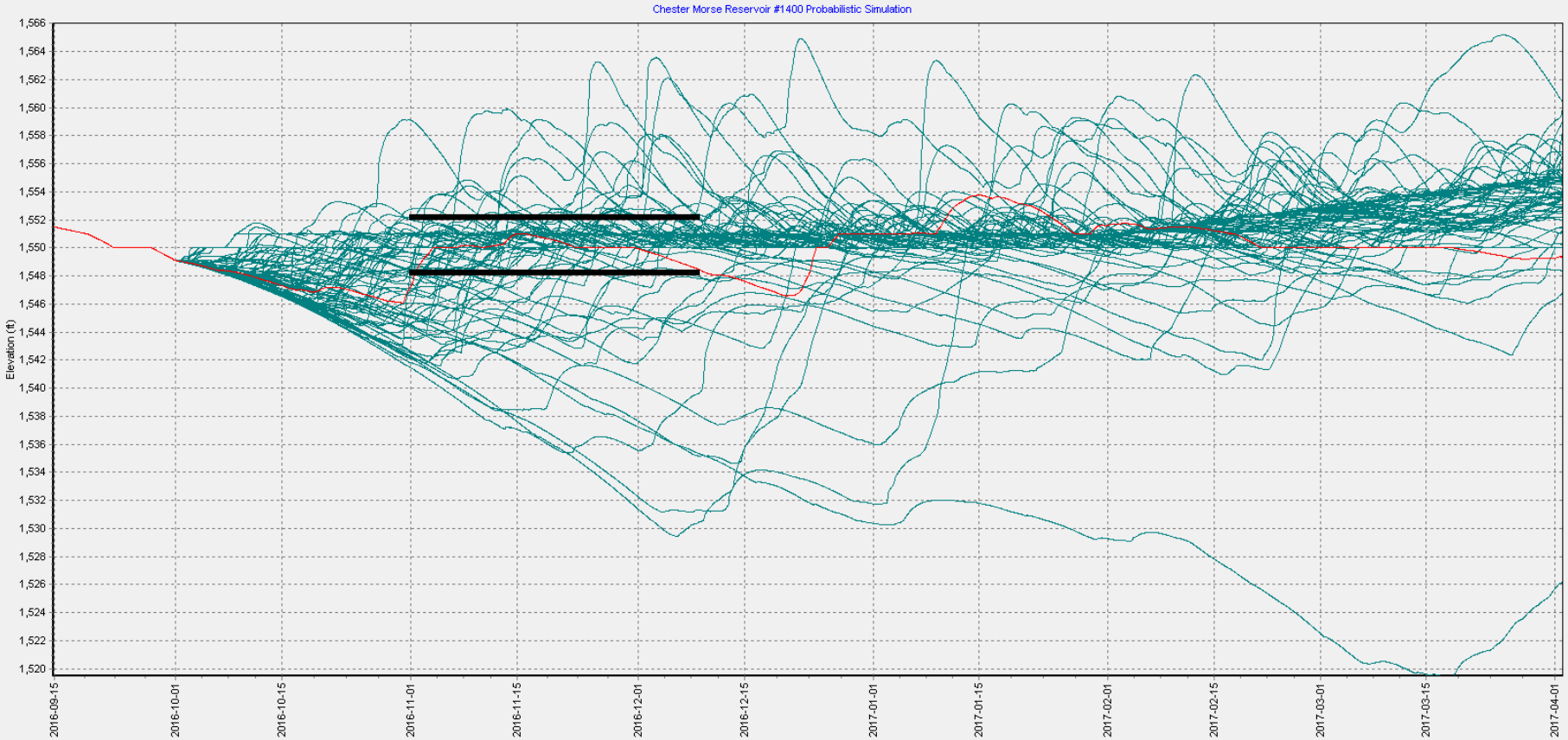

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End

Background materials follow if needed

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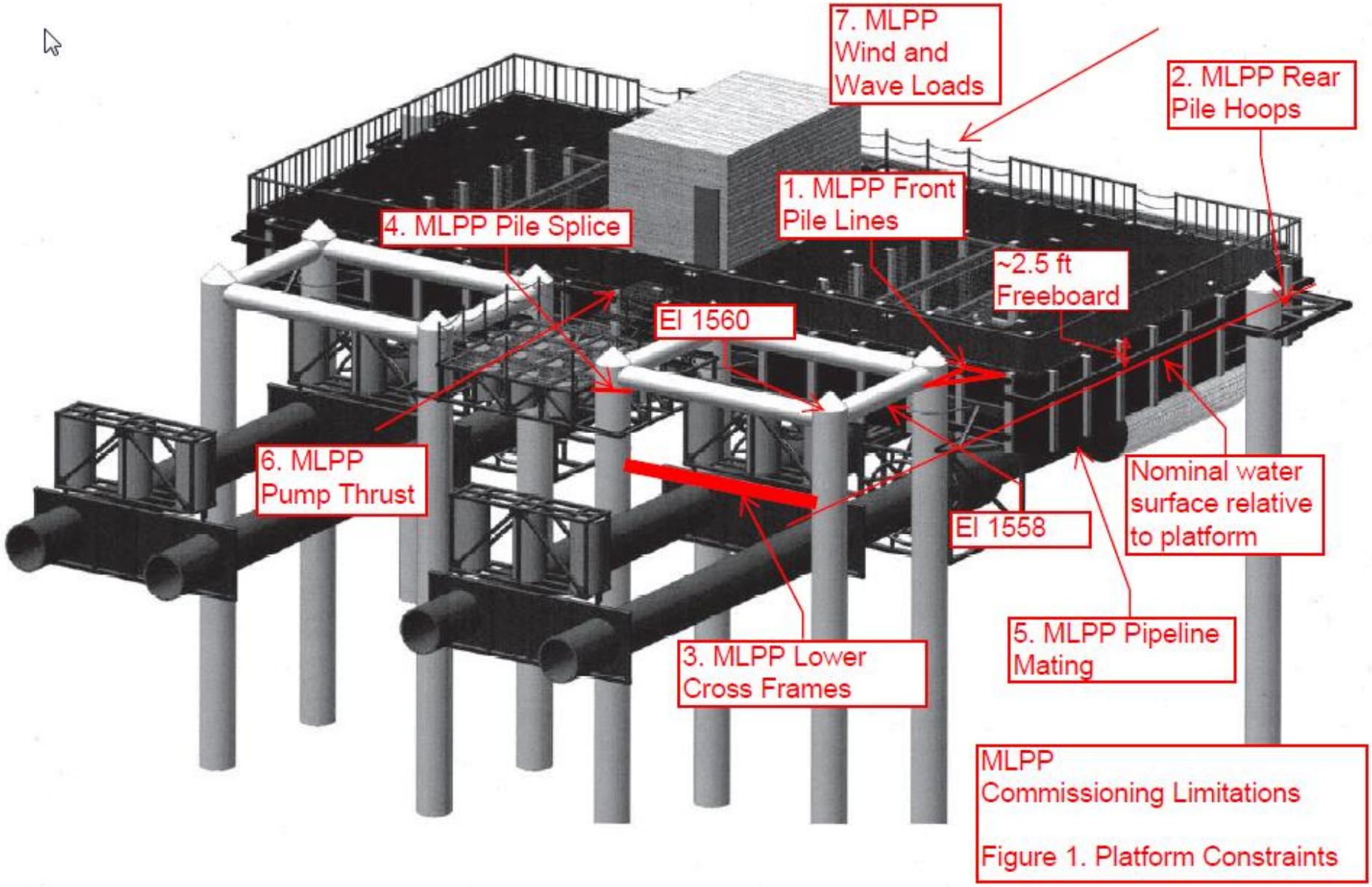

Figure 1. Platform Constraints

Masonry Dam Controls

- **Passive**
  - Service Spillway (Flood Invert at 1557 ft., flow ~4000 cfs at 1568 ft.)
    - Opening Service Spillway this week for flood mgt.
- **Active**
  - Hydro Generation (~700 cfs max)
    - SCL reports only one generator is in service
    - Second generator is planned to be in service soon
  - Release Valve (bypasses hydro ~700 cfs)
  - R-Gates Spillway (3 gates, inverts at 1538 ft., closed most of time, capable of ~75,000 cfs)
    - Turnbuckle repairs and debris removal planned for next week with Masonry Pool is at EL 1523.

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Tolt Reservoir – Outlet Controls

- **Morning glory Spillway (Ring Gate)**
  - Sep 30th to May 1st lower to 1762 ft. for flood mgt.
    - The Ring Gate has been exercised and lowered for flood mgt
  - May 1st to Sep 30th raise to 1765 ft., for refill
  - Capacity approx. 12,300 cfs
- **Spill Valve**
  - 600 cfs max, can not discharge while water discharging over Ring Gate.
    - Valve 15 maintenance work complete, ready for service.
- **Discharge to Treatment plant**
  - Approximately 50 to 60 cfs
  - Additional 120 cfs to River
    - Valve 25 maintenance work complete, ready for service
- **Fish Flow**
  - 50 to 60 cfs

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