Salinas Valley Water Conditions for the First Quarter of Water Year 2017-2018

RECOMMENDATION:

None – item presented for informational purposes.

CHANGES TO PRESENTATION OF GROUNDWATER LEVEL TRENDS:
Beginning with this first quarter Water Year 2018 (WY18) report, we introduced changes to the presentation of groundwater level data. The aim of these changes is to enhance understanding of the nature of Salinas Valley groundwater level data and its relationship to basin health and management, to better communicate this information to stakeholders, and to improve the efficiency of the long-term maintenance of the Agency's groundwater level monitoring network.

The changes are graphically incorporated into attachments E through J. As in past Quarterly Reports, attachments E through J summarize water level trends for the current and previous water years (WY18 and WY17, respectively). However, instead of "depth to water," water levels are now presented as "water surface elevation," relative to mean sea level. Unlike depth to water, water surface elevation is independent of well elevation, making replacement of study wells a less costly and more objective process. Water surface elevation also ties Salinas Valley groundwater level data directly to a universally recognized datum, facilitating comparative analysis and scientific collaboration.

A second change is the replacement of the "normal" conditions water level trend curve, as represented by a single selected water year (WY85), with the more objective "long-term average" water level curve, a data set based on averaged monthly water levels for the most recent 30-years for each subarea. In this way, each month's data will now be compared to an objective measure of central tendency based on data that encompass a more representative range of climatic and operational conditions in the Salinas Valley.

Finally, for comparison to water levels in dry conditions, WY15 replaces WY91. With this change, current groundwater level data will now be compared to data from a recent extended drought within a time of contemporary operational constraints. Using WY15 also minimizes uncertainty associated with the gradual loss and replacement of study wells since WY91.

SUMMARY/DISCUSSION:
This report covers the first quarter of Water Year 2017-2018 (WY18), October through December, 2017. It provides a brief overview of water conditions in the Salinas Valley (Attachment A) with discussion of precipitation, reservoir storage, and groundwater level trends. Data for each of these components are included as graphs and tables in Attachments B through J.

Precipitation – Preliminary National Weather Service rainfall data indicates that the first quarter of WY18 brought below normal rainfall to Salinas and King City. Totals for the quarter were 0.78 inches (20% of normal rainfall of 3.91 inches for the quarter) at the Salinas Airport, and 0.58 inches (16% of normal rainfall of 3.72 inches for the quarter) in King City.

Attachment B contains graphs for both stations showing monthly and cumulative precipitation data

for the current and a "normal" water year, based on long-term monthly precipitation averages. Attachment B also includes tables showing values for precipitation totals as well as percent of "normal" precipitation.

Reservoirs - The following table compares first quarter storage at Nacimiento and San Antonio reservoirs for the past two years. Storage in Nacimiento Reservoir is 63,540 acre-feet higher than in December 2016, and storage in San Antonio Reservoir is 83,313 acre-feet higher.

Reservoir	**December 31, 2017 (WY18) Storage in acre-feet**	**December 31, 2016 (WY17) Storage in acre-feet**	**Difference in acre-feet**
Nacimiento	156,815	93,275	63,540
San Antonio	104,463	21,150	83,313

Graphs showing daily reservoir storage for the last five water years along with 30-year average daily storage for comparison are included as Attachments C and D.

Groundwater Levels – More than 80 wells are measured monthly throughout the Salinas Valley to monitor seasonal groundwater level fluctuations. Data from approximately 50 of these wells are used in the preparation of this report. The measurements are categorized by hydrologic subarea, averaged, and graphed to compare current water levels (WY18) with selected past conditions. Graphs for individual subareas, showing the current year's water level conditions, last year's conditions (WY17) and dry conditions (WY15) are found in Attachments E through I. For comparison to long term conditions, a curve showing monthly water levels averaged over the most recent 30 years (WY1987-WY2017) is included on each graph. Attachment J is a summary of water level changes for all subareas.

Groundwater level measurements indicate that, by the end of the first quarter of WY18, water levels had recovered to varying degrees in all subareas. Over the last month of the quarter, average groundwater levels remained nearly unchanged in the Pressure 180-Foot Aquifer, while rising by two feet in the Pressure 400-Foot Aquifer, by four feet in the East Side Subarea and by one foot in the Forebay and Upper Valley Subareas.

Compared to December 2016, average groundwater levels in December 2017 were up by nine feet in the Pressure 180-Foot Aquifer, by four feet in the Pressure 400-Foot Aquifer, by two feet in the East Side Subarea, by 20 feet in the Forebay Subarea, and by 17 feet in the Upper Valley Subarea.

When compared to 30 year average groundwater conditions, December 2017 water levels were six feet lower in the Pressure 180-Foot Aquifer, two feet lower in the Pressure 400-Foot Aquifer, fourteen feet lower in the East Side Subarea, three feet lower in the Forebay Subarea and two feet lower in the Upper Valley Subarea.

After falling to historic lows during the recent drought, average groundwater levels recovered in WY17 and in the first quarter of WY18 remain higher than WY15 (dry conditions) levels in all

subareas with the exception of the East Side, where water levels remain five feet below WY15 levels and seven feet below sea level.

OTHER AGENCY INVOLVEMENT:
None

FINANCING:
Funds 113, 114, 115, 116

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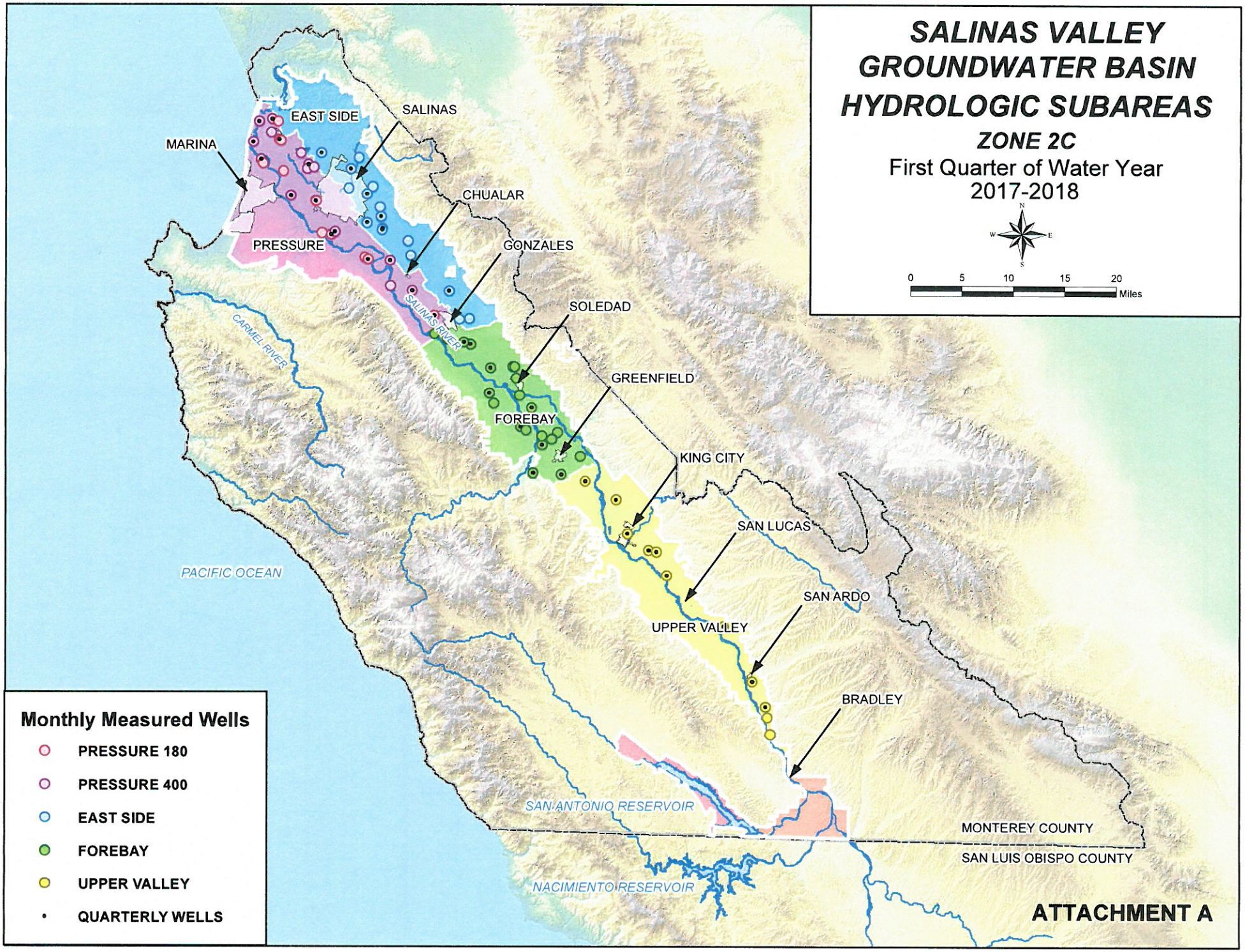
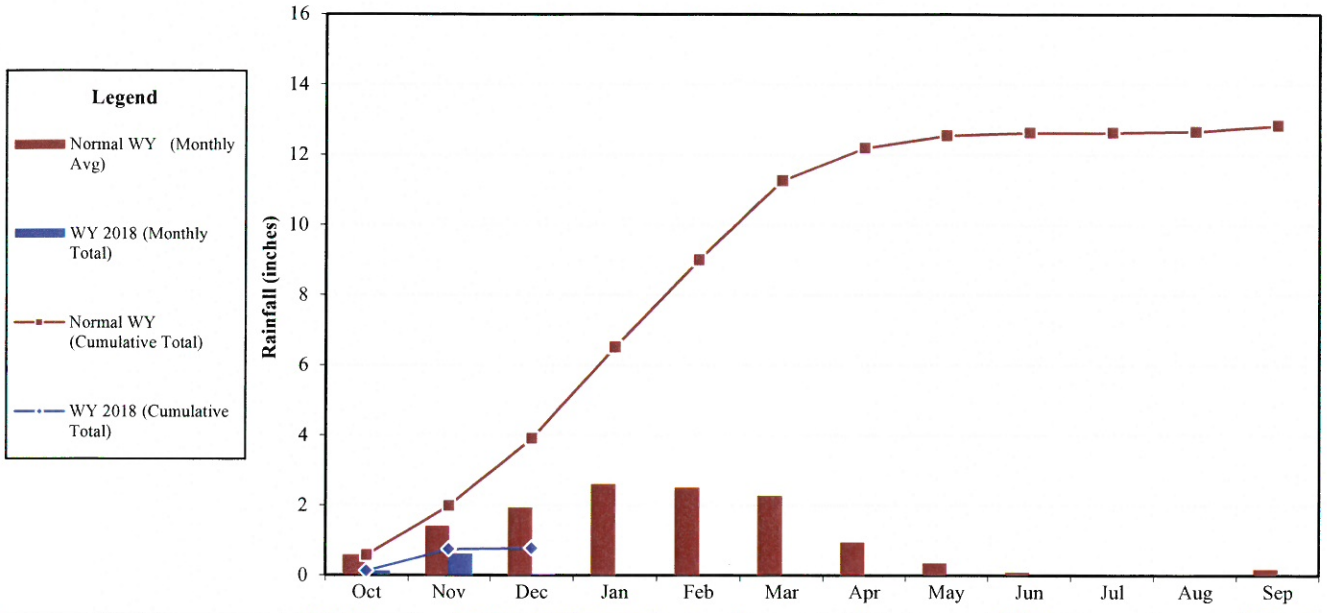
Attachments:

1. Attachment A, Salinas Valley Hydrologic Subareas Map
2. Attachment B, Salinas and King City Precipitation Graphs
3. Attachment C, Nacimiento Reservoir Graph
4. Attachment D, San Antonio Reservoir Graph
5. Attachment E, Groundwater Trends Pressure 180-Foot Aquifer
6. Attachment F, Groundwater Trends Pressure 400-Foot Aquifer
7. Attachment G, Groundwater Trends East Side Subarea
8. Attachment H, Groundwater Trends Forebay Subarea
9. Attachment I, Groundwater Trends Upper Valley Subarea
10. Attachment J, Groundwater Trends Summary

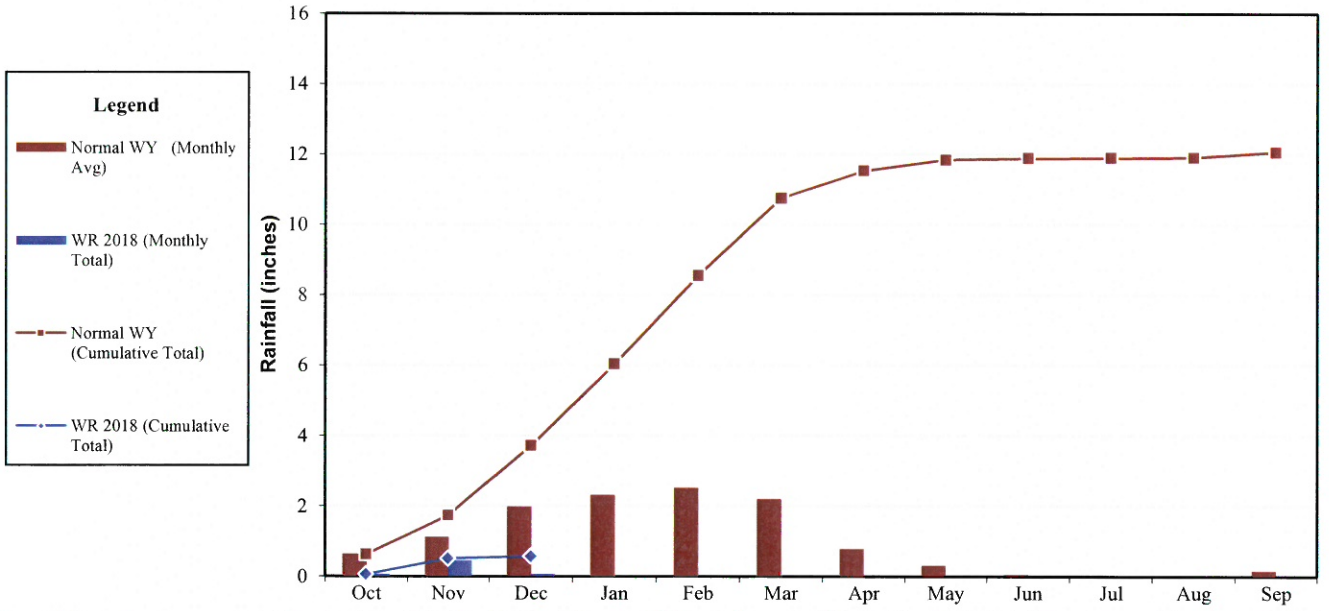

SALINAS VALLEY
GROUNDWATER BASIN
HYDROLOGIC SUBAREAS
ZONE 2C
First Quarter of Water Year
2017-2018
N
W
E
S
0
5
10
15
20
Miles
EAST SIDE
SALINAS
MARINA
CHUALAR
PRESSURE
GONZALES
SOLEDAD
SALINAS RIVER
CARMEL RIVER
GREENFIELD
FOREBAY
KING CITY
SAN LUCAS
PACIFIC OCEAN
SAN ARDO
UPPER VALLEY
BRADLEY
SAN ANTONIO RESERVOIR
MONTEREY COUNTY
SAN LUIS OBISPO COUNTY
NACIMIENTO RESERVOIR
Monthly Measured Wells
PRESSURE 180
PRESSURE 400
EAST SIDE
FOREBAY
UPPER VALLEY
QUARTERLY WELLS
ATTACHMENT A

SALINAS AIRPORT RAINFALL
WATER YEAR 2018



Monthly Rainfall (WY 2018)	0.13	0.62	0.03									
Monthly Rainfall (Normal WY*)	0.58	1.40	1.93	2.60	2.49	2.26	0.93	0.35	0.09	0.00	0.03	0.17
Percent of Normal for Month	22%	44%	2%									
Cumulative Rainfall (WY 2018)	0.13	0.75	0.78									
Cumulative Rainfall (Normal WY*)	0.58	1.98	3.91	6.51	9.00	11.26	12.19	12.54	12.63	12.63	12.66	12.83
Percent of Cumulative Normal	22%	38%	20%									

KING CITY RAINFALL
WATER YEAR 2018

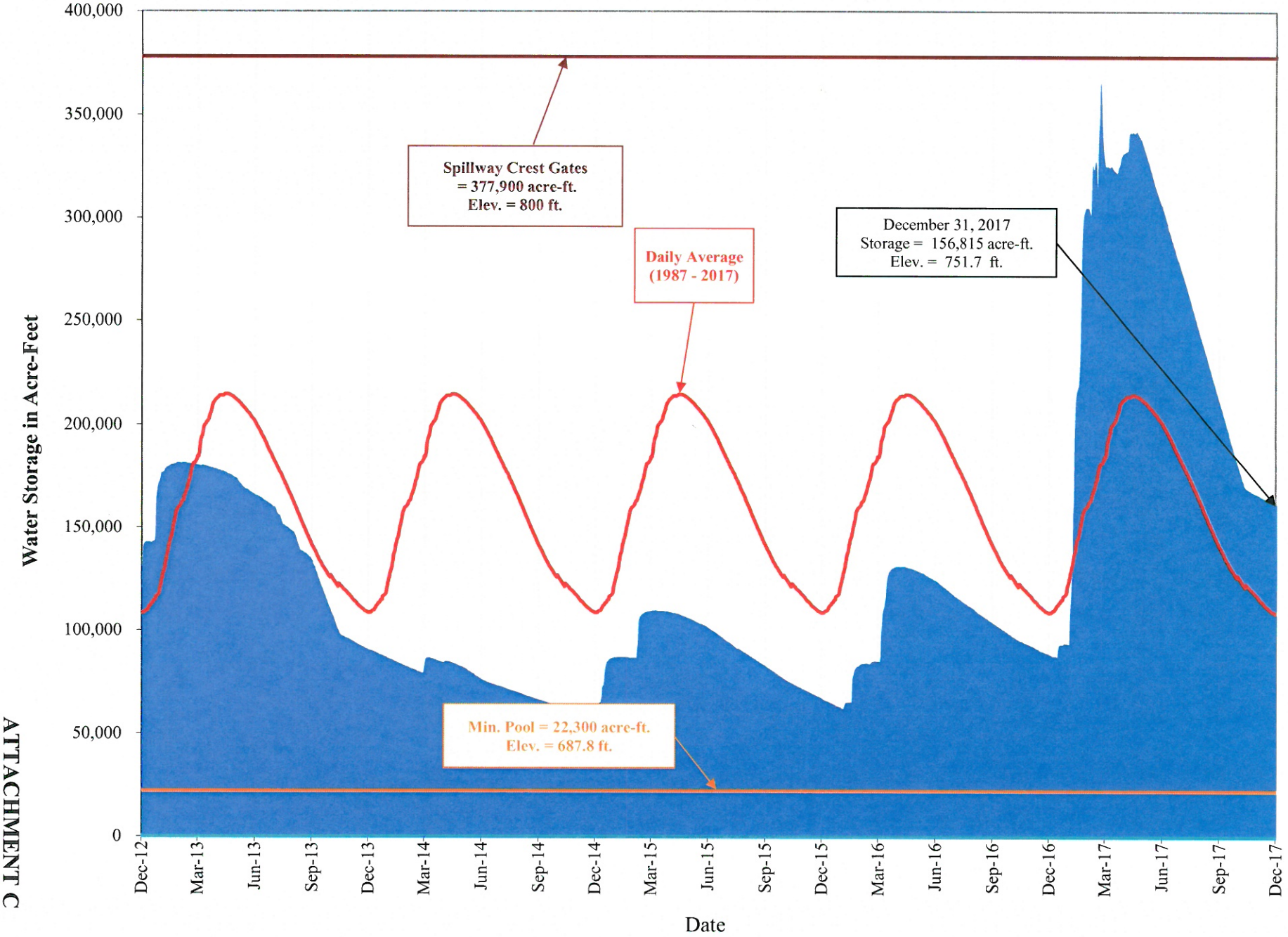


Monthly Rainfall (WR 2018)	0.06	0.45	0.07									
Monthly Rainfall (Normal WY*)	0.63	1.11	1.98	2.32	2.51	2.20	0.78	0.31	0.05	0.01	0.01	0.15
Percent of Normal for Month	22%	44%	2%									
Cumulative Rainfall (WR 2018)	0.06	0.51	0.58									
Cumulative Rainfall (Normal WY*)	0.63	1.74	3.72	6.04	8.55	10.75	11.53	11.84	11.89	11.90	11.91	12.06
Percent of Cumulative Normal	10%	29%	16%									

*Average precipitation over the most recent 30-year period ending in a decade (1981-2010)

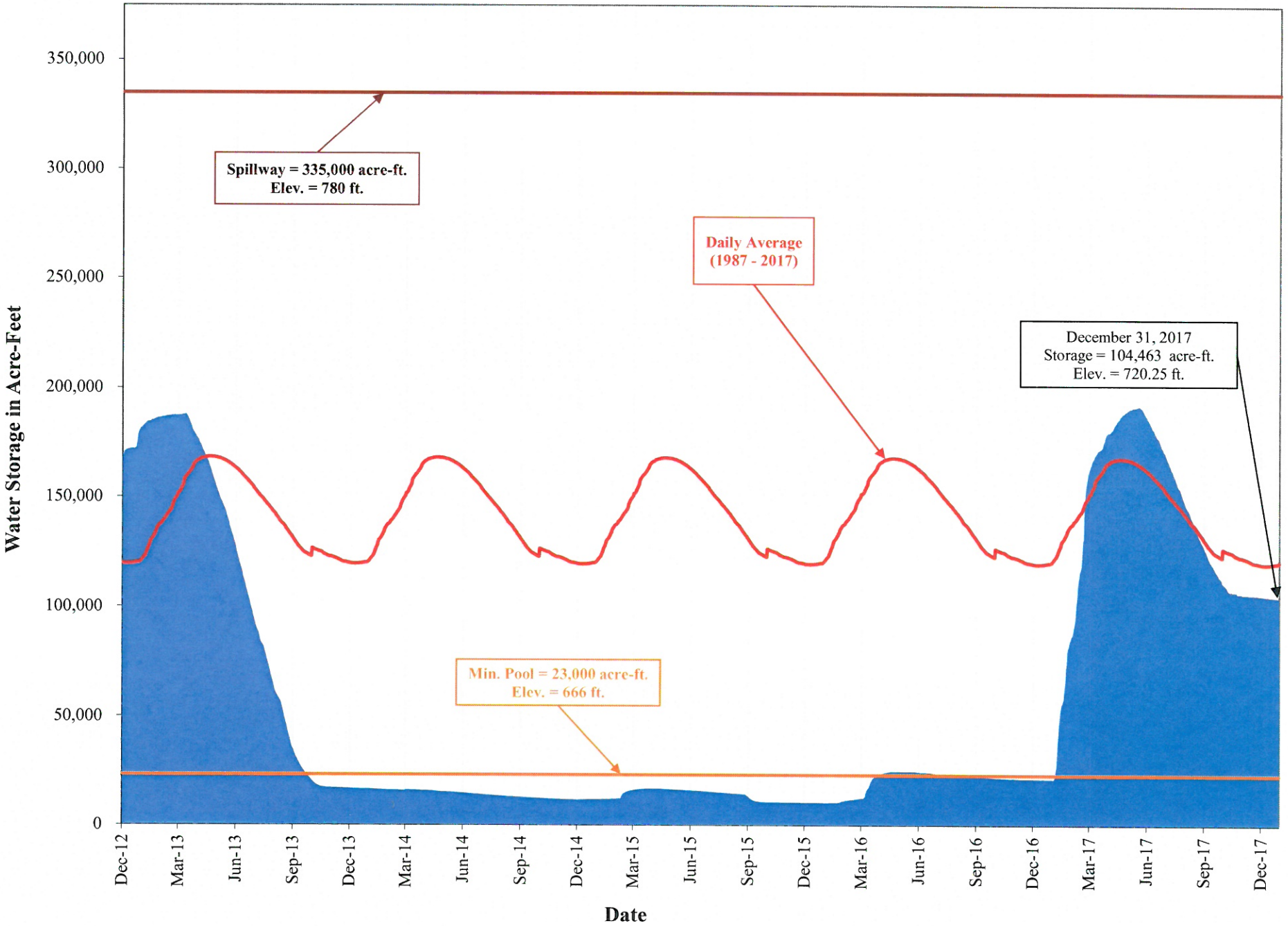
ATTACHMENT B

NACIMIENTO RESERVOIR
DAILY STORAGE



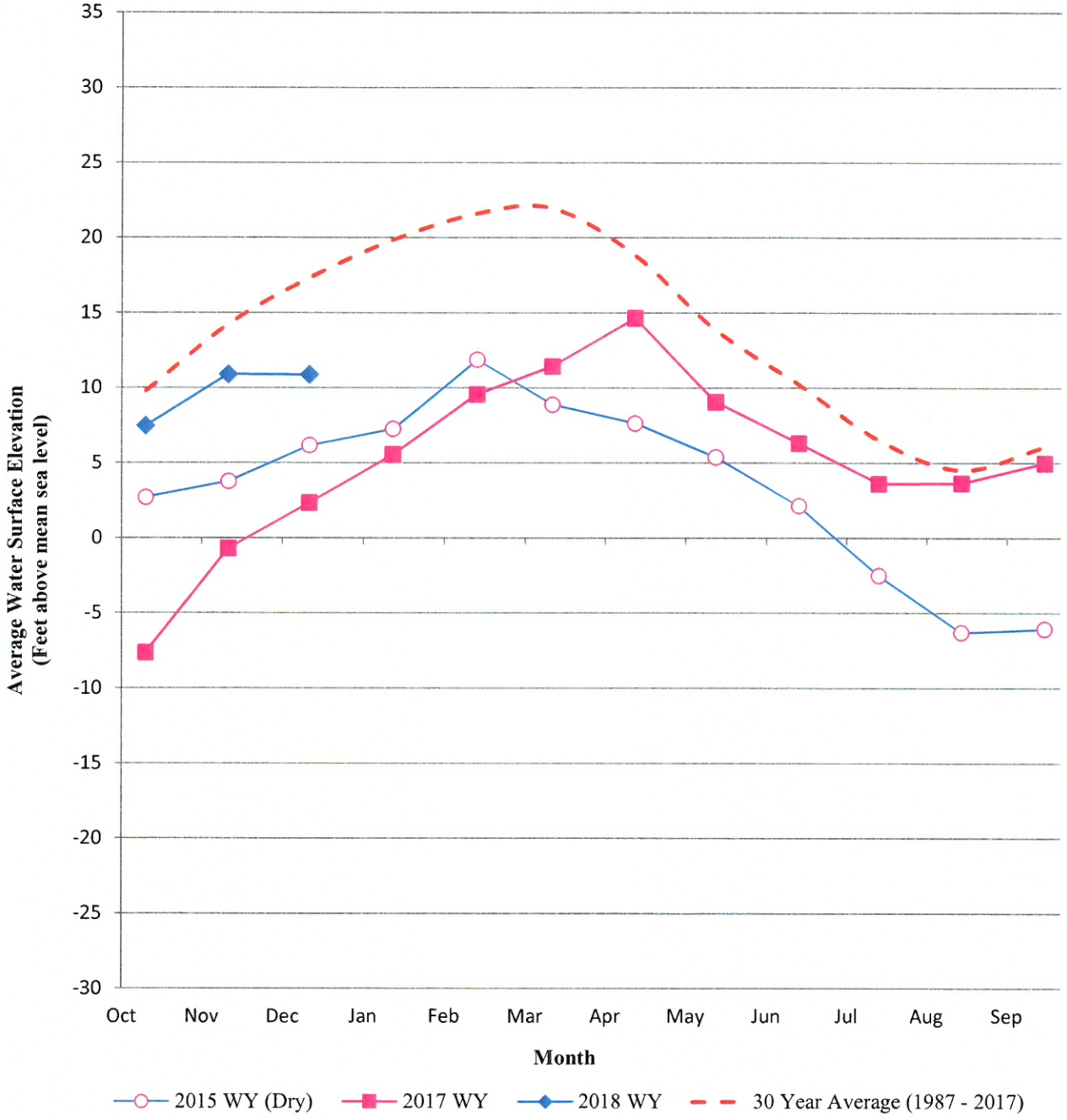
ATTACHMENT C

SAN ANTONIO RESERVOIR
DAILY STORAGE



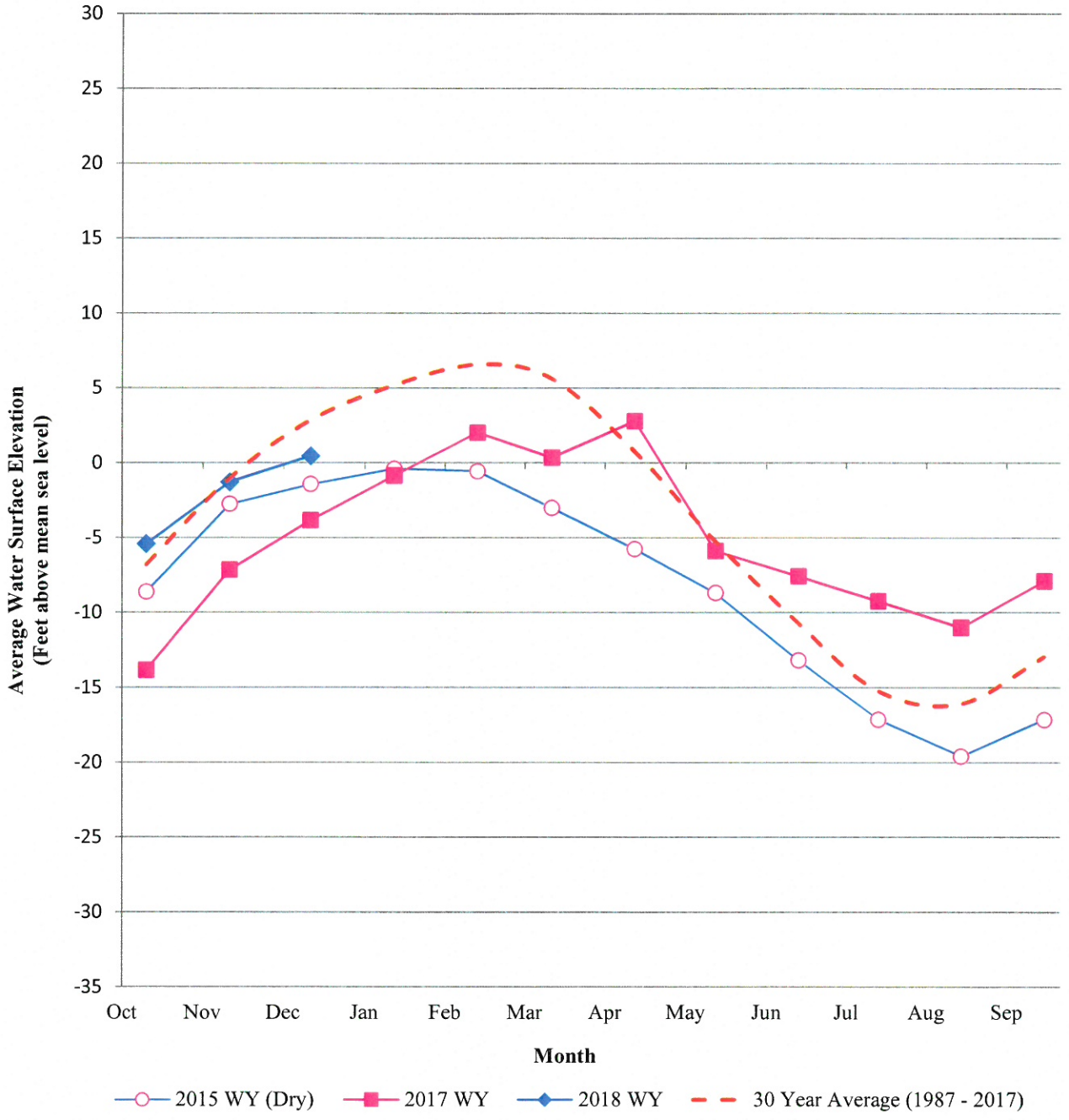
ATTACHMENT D

GROUNDWATER TRENDS
PRESSURE 180-FOOT AQUIFER
5 Wells



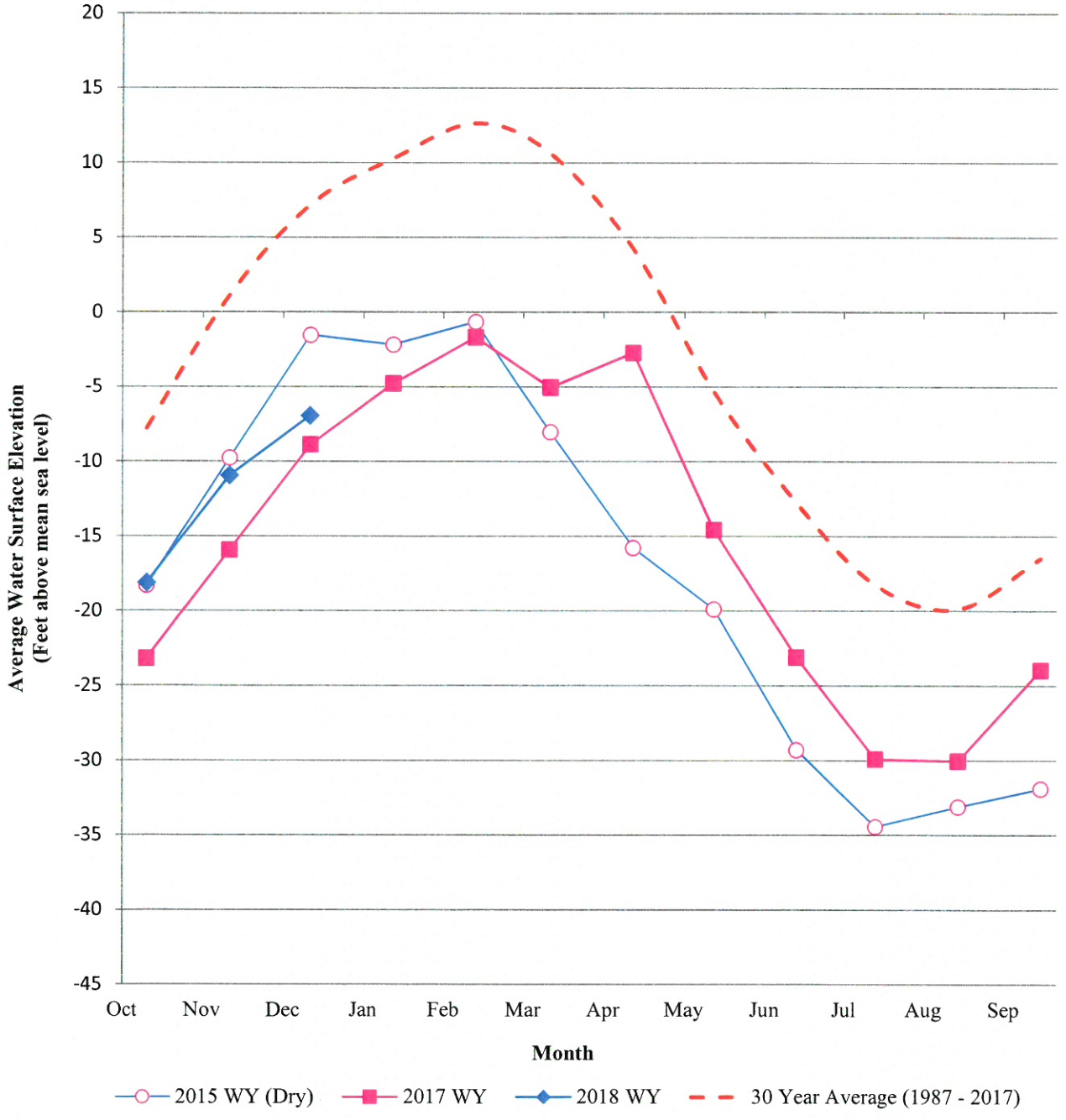
ATTACHMENT E

GROUNDWATER TRENDS
PRESSURE 400-FOOT AQUIFER
11 Wells



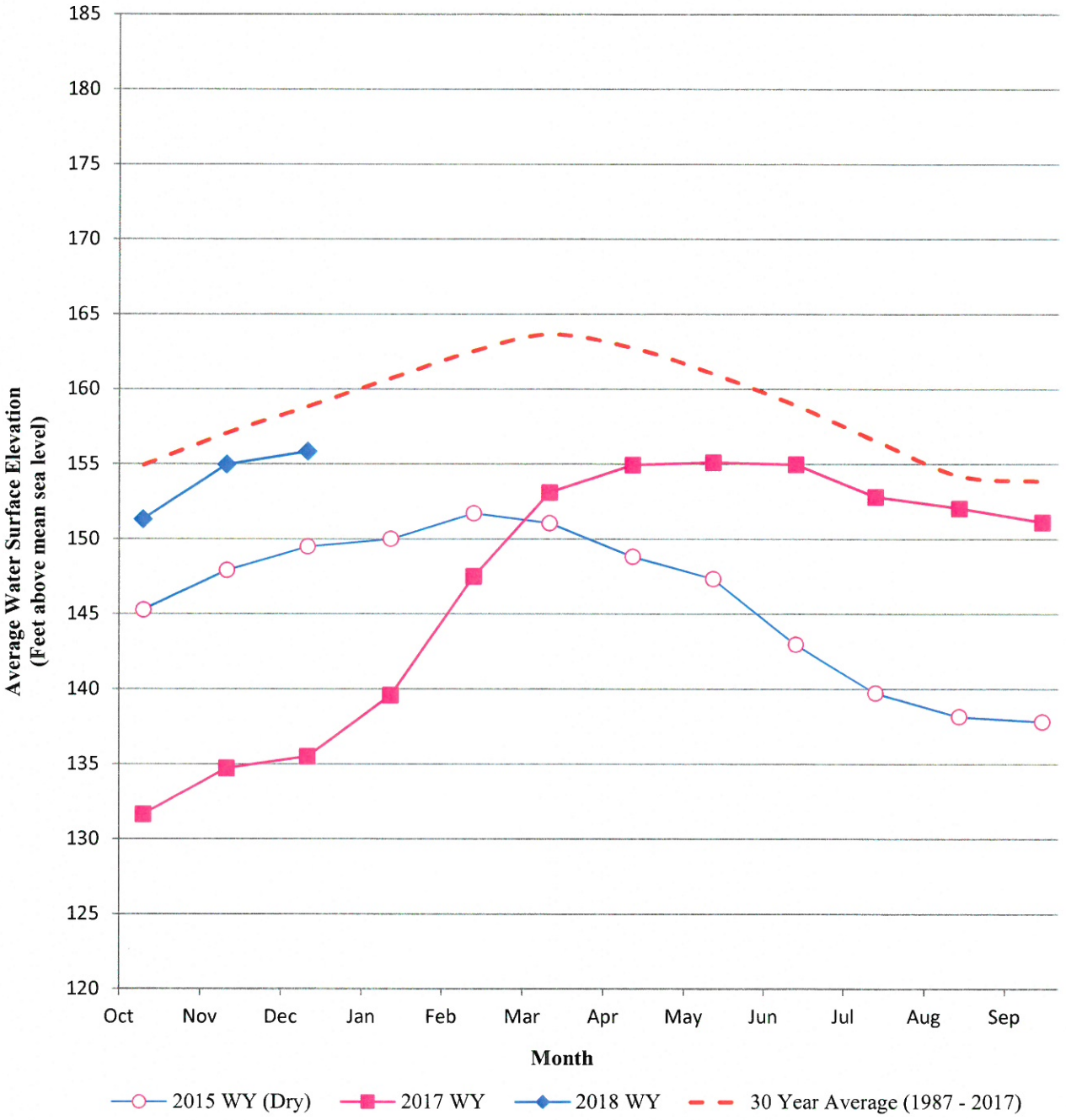
ATTACHMENT F

GROUNDWATER TRENDS
EAST SIDE SUBAREA
11 Wells



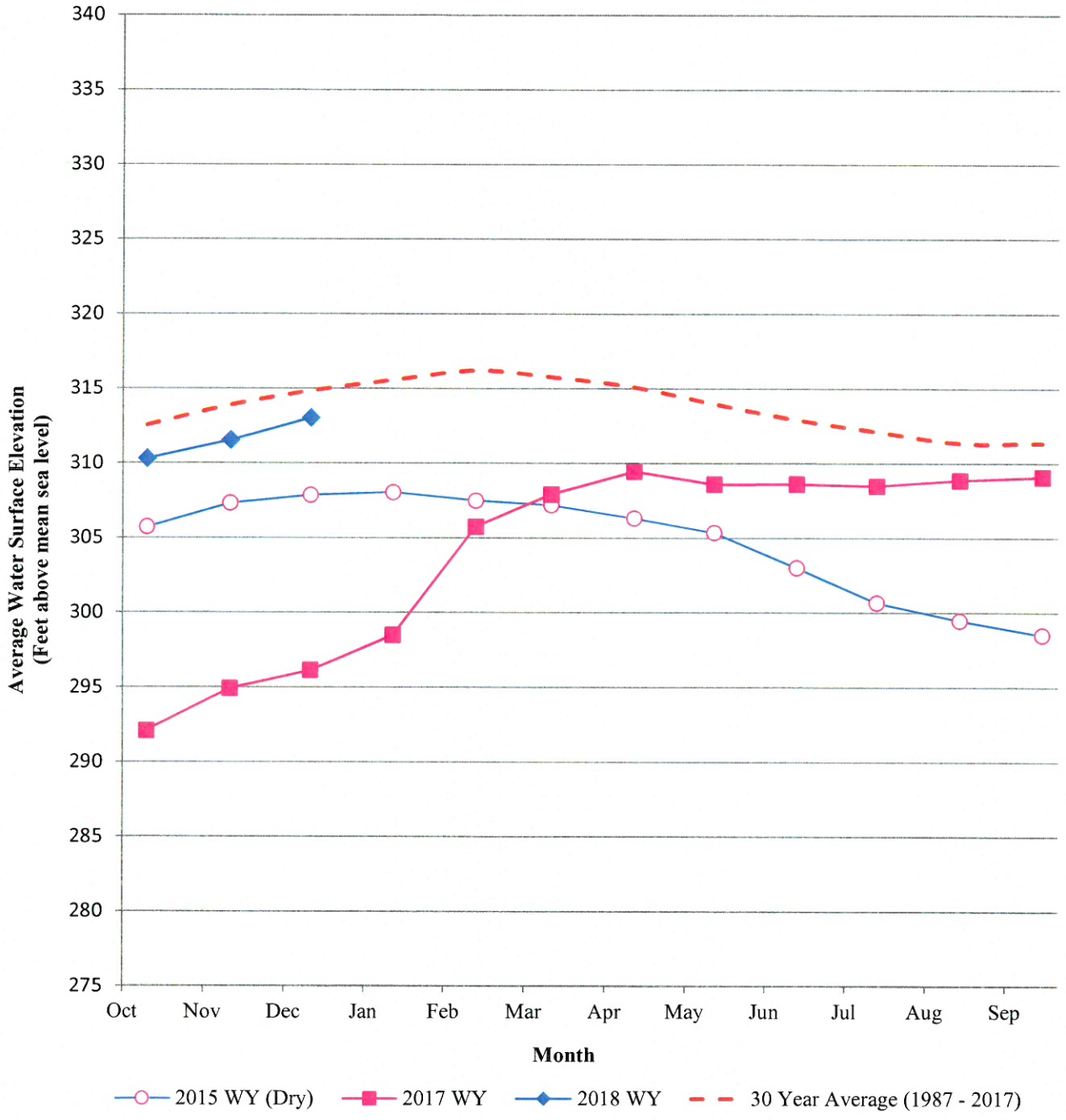
ATTACHMENT G

GROUNDWATER TRENDS
FOREBAY SUBEREA
10 Wells



ATTACHMENT H

GROUNDWATER TRENDS
UPPER VALLEY SUBAREA
9 Wells



ATTACHMENT I

Groundwater Trends Summary
December 2017

Area	December 2017 Groundwater Elevation (ft msl)	1 Year Change	Difference from 30 year Average Elevation	1 Month Change
Pressure 180-Foot Aquifer	11 '	up 9 '	down 6 '	No Change
Pressure 400-Foot Aquifer	0 '	up 4 '	down 2 '	up 2 '
East Side Subarea	-7 '	up 2 '	down 14 '	up 4 '
Forebay Subarea	156 '	up 20 '	down 3 '	up 1 '
Upper Valley Subarea	313 '	up 17 '	down 2 '	up 1 '

ATTACHMENT J