MEMORANDUM

TO: CITY COUNCIL
FROM: BILL ROBESON, PUBLIC WORKS DIRECTOR
BY: SHANE TAYLOR, UTILITIES MANAGER
SUBJECT: MONTHLY WATER SUPPLY AND DEMAND UPDATE AND TWO-YEAR WATER SUPPLY AND DEMAND PROJECTIONS
DATE: APRIL 24, 2018

SUMMARY OF ACTION:
This update reports the water supply and demand for March 2018. Current Lopez Reservoir levels and projected levels are provided in the attachments.

IMPACT ON FINANCIAL AND PERSONNEL RESOURCES:
Approximately two (2) hours of staff time was required to prepare the report.

RECOMMENDATION:
It is recommended the City Council receive and file the monthly Water Supply and Demand Report and two-year Water Supply and Demand projections.

BACKGROUND:
On April 25, 2017, the City Council, by resolution, rescinded the Stage 1 Water Shortage Emergency along with related emergency water conservation measures and restrictions. During the public hearing the City Council requested staff to continue preparing the monthly water supply and demand updates. The Council urged citizens to continue to practice every day water saving measures, and reiterated that the previously adopted water conservation measures were to remain in effect.

In March 2018, the City's water use was 144.2 acre-feet with a per capita use of 86 gallons per day/per person. There was a total of 5.43" of rainfall in March. The water use for the current "rolling" water year from March 2017 to March 2018 was 2,424 acre-feet, which equates to a per capita use of 123 gallons per day/per person. There was a total of 10.75" of rain fall for this period.

ANALYSIS OF ISSUES:
The United States Drought Monitor, as of April 12, 2018 shows San Luis Obispo County in a severe drought. Rain fall to date (July 1, 2017 to April 12, 2018):

- 9 inches at the Corporation Yard rain gauge.
Lopez Lake, as of April 12, 2018 is at 52.3% capacity (25,834 acre-feet of storage).

The projected water use in water year 2017/18 was 2,500 acre-feet. The actual use was 2,294 acre-feet.

The new water year began on April 1, 2018 and the current total available supply from Lopez is 2,290 acre-feet, our normal entitlement. In addition we have 1,323 acre-feet of ground water entitlement from the Santa Maria Basin and 200 acre-feet from the Pismo Formation. The projected water use for 2018/19 is 2,000 acre-feet. In conclusion, based on average rainfall for the next two years, the current supply will meet the projected demand.

ADVANTAGES:
No advantages noted at this time.

DISADVANTAGES:
No disadvantages noted at this time.

ALTERNATIVES:
Not applicable at this time.

ENVIRONMENTAL REVIEW:
No environmental review is required for this item.

PUBLIC NOTIFICATION AND COMMENTS:
The Agenda was posted at City Hall and on the City’s website in accordance with Government Code Section 54954.2.

Attachment:
1. Water Year 2018 Water Supply and Demand Update Presentation
Water Year 2018
Water Supply & Demand Update
Presentation Topics

• Background
• Supply Summary
• Demand Summary
• Two Year Water Supply and Demand Look-Ahead
• Supporting Supply Reports
Background

• April 25, 2017
  – City Council rescinded Stage 1 Water Shortage Emergency and related water conservation measures and restrictions
  – Directed staff to prepare ongoing monthly water supply and demand updates since direction
    • As of April 12, 2018, the United States Drought Monitor shows Arroyo Grande in a severe drought.
    • Rainfall to date (July 1, 2017 to April 12, 2018) is 9 inches at the Corporation Yard rain gauge.
    • Lopez Lake, as of April 12, 2018 is at 52.3% capacity (25,834 acre-feet (AF) of storage)
Supply Summary

• May 23, 2017, the County BOS rescinded the drought emergency proclamation. However, as recommended by Zone 3 Advisory Board, the BOS kept the Low Reservoir Response Plan (LRRP) in place.
• New water year (WY) began on April 1, 2018 with new allocations available, or 2,290 AF of entitlement
• 1,323 AF of Santa Maria Groundwater Basin (SMGB)
• 200 AF from the Pismo Formation
## Demand Summary

<table>
<thead>
<tr>
<th></th>
<th>SMGB (AF)</th>
<th>Pismo Formation (AF)</th>
<th>Lopez (AF)</th>
<th>Monthly Total (AF)</th>
<th>Monthly Rainfall (in.)</th>
<th>Water Year Cumulative Rainfall (in)</th>
<th>Population</th>
<th>Monthly Per Capita Water Use (gpcd)</th>
</tr>
</thead>
<tbody>
<tr>
<td>April-17</td>
<td>2.6</td>
<td>0.0</td>
<td>156.0</td>
<td>158.6</td>
<td>0.7</td>
<td>0.7</td>
<td>17,636</td>
<td>97.7</td>
</tr>
<tr>
<td>May-17</td>
<td>2.3</td>
<td>1.9</td>
<td>192.5</td>
<td>196.7</td>
<td>0.4</td>
<td>1.0</td>
<td>17,636</td>
<td>117.2</td>
</tr>
<tr>
<td>June-17</td>
<td>6.5</td>
<td>11.6</td>
<td>190.0</td>
<td>208.1</td>
<td>0.0</td>
<td>1.0</td>
<td>17,636</td>
<td>128.2</td>
</tr>
<tr>
<td>July-17</td>
<td>7.5</td>
<td>10.3</td>
<td>219.9</td>
<td>237.7</td>
<td>0.0</td>
<td>1.0</td>
<td>17,636</td>
<td>141.7</td>
</tr>
<tr>
<td>August-17</td>
<td>44.4</td>
<td>7.8</td>
<td>144.5</td>
<td>196.7</td>
<td>0.0</td>
<td>1.0</td>
<td>17,636</td>
<td>117.2</td>
</tr>
<tr>
<td>September-17</td>
<td>3.0</td>
<td>10.4</td>
<td>204.3</td>
<td>217.7</td>
<td>0.2</td>
<td>1.2</td>
<td>17,636</td>
<td>134.1</td>
</tr>
<tr>
<td>October-17</td>
<td>5.8</td>
<td>12.9</td>
<td>215.8</td>
<td>234.4</td>
<td>0.1</td>
<td>1.3</td>
<td>17,636</td>
<td>139.7</td>
</tr>
<tr>
<td>November-17</td>
<td>0.0</td>
<td>4.3</td>
<td>182.0</td>
<td>186.3</td>
<td>0.2</td>
<td>1.4</td>
<td>17,636</td>
<td>114.7</td>
</tr>
<tr>
<td>December-17</td>
<td>0.0</td>
<td>0.0</td>
<td>199.8</td>
<td>199.8</td>
<td>0.0</td>
<td>1.4</td>
<td>17,636</td>
<td>119.1</td>
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<tr>
<td>January-18</td>
<td>0.9</td>
<td>0.0</td>
<td>151.5</td>
<td>152.4</td>
<td>2.7</td>
<td>4.1</td>
<td>17,636</td>
<td>90.8</td>
</tr>
<tr>
<td>February-18</td>
<td>17.8</td>
<td>0.0</td>
<td>146.1</td>
<td>163.9</td>
<td>0.2</td>
<td>4.3</td>
<td>17,636</td>
<td>108.2</td>
</tr>
<tr>
<td>March-18</td>
<td>0.1</td>
<td>0.0</td>
<td>144.1</td>
<td>144.2</td>
<td>5.4</td>
<td>9.7</td>
<td>17,636</td>
<td>85.9</td>
</tr>
<tr>
<td><strong>Water Year 2017/18</strong></td>
<td><strong>90.8</strong></td>
<td><strong>59.3</strong></td>
<td><strong>2,146.3</strong></td>
<td><strong>2,296.4</strong></td>
<td><strong>9.7</strong></td>
<td><strong>9.7</strong></td>
<td><strong>17,636</strong></td>
<td><strong>116.2</strong></td>
</tr>
</tbody>
</table>
Demand Summary

• Historical per capita water use, measured in gallons per capita per day (gpcd), compared to rainfall
Demand Summary WY 13/14-17/18

- gpcd correlated to rainfall using regression analysis

**Regression Trendline Type** | **Water Year Total Rainfall (in.) "x"** | **Projected GPCD Using Regression Trendline to Solve "y"** | **Actual GPCD Comparison WY 17/18**
--- | --- | --- | ---
Linear | \(-2.91349113024438\) \(*\) 9.7 + 160.548207810 8 | | 116
Polynomial | \(0.251272647960824x^2 - 10.6733937149632x + 201.6320132\) | 121.6 | 116

1Regression analysis: statistical processes for estimating the relationships among variables (rainfall & gpcd). Focus is on the relationship between a dependent variable (gpcd) and one or more independent variables (or 'predictors', such as rainfall). Helps one understand how the typical value of the dependent variable (or 'criterion variable') changes when any one of the independent variables is varied. The observed water demand trend is assumed to be correlated to multiple factors in addition to rainfall, such as water conservation efforts. However, it is difficult to directly and discretely calculate all factors’ impact on water use. Therefore, rainfall is a reasonably attainable and discrete data source that can be used to project water demand due to their strong correlation with each other.
Using the average of 105 gpcd from the regression analysis formulas and assuming average rainfall (16 in.), projected demand for WY 18/19 & WY 19/20 is 2,000 AF.

<table>
<thead>
<tr>
<th>Water Supply Source</th>
<th>Entitlement (AFY)</th>
<th>WY 2017/18 Actual Use (AFY)</th>
<th>WY 2018/19 Projected Use (AFY)</th>
<th>WY 2019/20 Projected Use (AFY)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Groundwater- SMGB</td>
<td>1,323</td>
<td>91</td>
<td>79</td>
<td>79</td>
</tr>
<tr>
<td>Groundwater- Pismo Formation</td>
<td>200</td>
<td>59</td>
<td>52</td>
<td>52</td>
</tr>
<tr>
<td>Lopez</td>
<td>2,290</td>
<td>2,146</td>
<td>1,869</td>
<td>1,869</td>
</tr>
<tr>
<td>Total</td>
<td>3,813</td>
<td>2,296</td>
<td>2,000</td>
<td>2,000</td>
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</table>
Supporting Supply Reports
San Luis Obispo County Flood Control and Water District  
Zone 3 - Lopez Project - Monthly Operations Report  
March, 2018

### Lopez Water Deliveries

<table>
<thead>
<tr>
<th>Contractor</th>
<th>Ent.</th>
<th>Surplus</th>
<th>Total</th>
<th>Entitlement</th>
<th>Surplus</th>
<th>Total</th>
<th>April to Present</th>
<th>Surplus</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arroyo Grande</td>
<td>2390</td>
<td>1349.20</td>
<td>3539.20</td>
<td>144.13</td>
<td>6.3%</td>
<td>0.00</td>
<td>2146.32</td>
<td>93.7%</td>
<td>0.00</td>
</tr>
<tr>
<td>Oceano CSD</td>
<td>303</td>
<td>540.50</td>
<td>1143.50</td>
<td>0.00</td>
<td>0.0%</td>
<td>50.60</td>
<td>303.10</td>
<td>100.0%</td>
<td>404.39</td>
</tr>
<tr>
<td>Grover Beach</td>
<td>800</td>
<td>1040.20</td>
<td>1840.20</td>
<td>65.10</td>
<td>8.3%</td>
<td>0.00</td>
<td>748.85</td>
<td>93.6%</td>
<td>0.00</td>
</tr>
<tr>
<td>Pismo Beach</td>
<td>892</td>
<td>1294.20</td>
<td>2186.20</td>
<td>0.00</td>
<td>0.0%</td>
<td>91.82</td>
<td>892.00</td>
<td>100.0%</td>
<td>458.17</td>
</tr>
<tr>
<td>CSA 12</td>
<td>245</td>
<td>499.60</td>
<td>744.60</td>
<td>3.17</td>
<td>1.3%</td>
<td>0.00</td>
<td>87.92</td>
<td>35.9%</td>
<td>0.00</td>
</tr>
<tr>
<td>San Miguelito</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>4530</td>
<td>4665.70</td>
<td>9195.70</td>
<td>213.40</td>
<td>4.7%</td>
<td>142.42</td>
<td>4178.19</td>
<td>92.2%</td>
<td>862.56</td>
</tr>
</tbody>
</table>

Note: Deliveries are in acre feet. One acre foot = 325, 850 gallons or 43, 500 cubic feet. Safe yield is 8,750 acre feet.

### State Water Deliveries

<table>
<thead>
<tr>
<th>Contractor</th>
<th>Annual Request</th>
<th>This Month</th>
<th>% of Annual Request</th>
<th>SWP Deliveries</th>
<th>Change in Storage</th>
<th>January to Present</th>
<th>SWP Deliveries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arroyo Grande</td>
<td>227</td>
<td>0.00</td>
<td>0.0%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oceano CSD</td>
<td></td>
<td>0.00</td>
<td>0.0%</td>
<td></td>
<td></td>
<td></td>
<td>227</td>
</tr>
<tr>
<td>Grover Beach</td>
<td>1120</td>
<td>19.00</td>
<td>1.7%</td>
<td></td>
<td></td>
<td></td>
<td>28.00</td>
</tr>
<tr>
<td>Pismo Beach</td>
<td>27</td>
<td>6.02</td>
<td>22.3%</td>
<td></td>
<td></td>
<td></td>
<td>16.12</td>
</tr>
<tr>
<td>CSA 12</td>
<td>127</td>
<td>8.99</td>
<td>7.1%</td>
<td></td>
<td></td>
<td></td>
<td>20.55</td>
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<tr>
<td>San Miguelito</td>
<td></td>
<td>1501</td>
<td>23.3%</td>
<td></td>
<td></td>
<td></td>
<td>32.00</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>1501</td>
<td>23.3%</td>
<td></td>
<td></td>
<td></td>
<td>111.00</td>
</tr>
</tbody>
</table>

**Last Month Stored State Water:** 1143.09  
**This Month Stored State Water:** 1176.08

### Diagrams

- **April to Present Lopez Entitlement-Surplus Water Usage**
- **January to Present State Water Usage**

- "Year to Date" is January to present for State water. April to present for Lopez deliveries, and July to present for rainfall.

### Comments

- Reservoir is currently operated under the Low Reservoir Response Plan. Reservoir is above 20,000 AF therefore no reduction in entitlements.
- Surplus water shown is actually “Carry Over” water as designated in the LRRP and updated per BOS May 2, 2017 Declaration of Surplus.
- 1) Oceano supplied State Water to Canyon Crest via Arroyo Grande’s Edna turn out. A total of 1.55 AF delivered to Canyon Crest was added to Oceano’s State Water usage this month and 1.55 AF was subtracted from Arroyo Grande’s usage this month.
LOPEZ RESERVOIR STORAGE PROJECTION

Note: Storage Projection is based on Water Years 14/15 and 15/16 municipal and downstream releases, rainfall, and evaporation.
Deep Well Index Level
(Wells -24B03, -30F03 and -30N02)

Deep Well Index Threshold: 7.5 feet

Deep Well Index is the average of groundwater elevations in the deep wells of Sentry Well clusters 24B, 30F, and 30N (See Figure 1 for locations and Figure 2 for Sentry Well Depths).

FIGURE 9

Average Deep Sentry Well Groundwater Elevation and Chloride Concentration Period of Record
Northern Cities Management Area
San Luis Obispo County, California

Well - 30N02
Well - 24B03
Well - 30F03