

CSA-11 Pescadero Water Budget Study

Progress

December 10, 2020

Scope Tasks 1 through 8

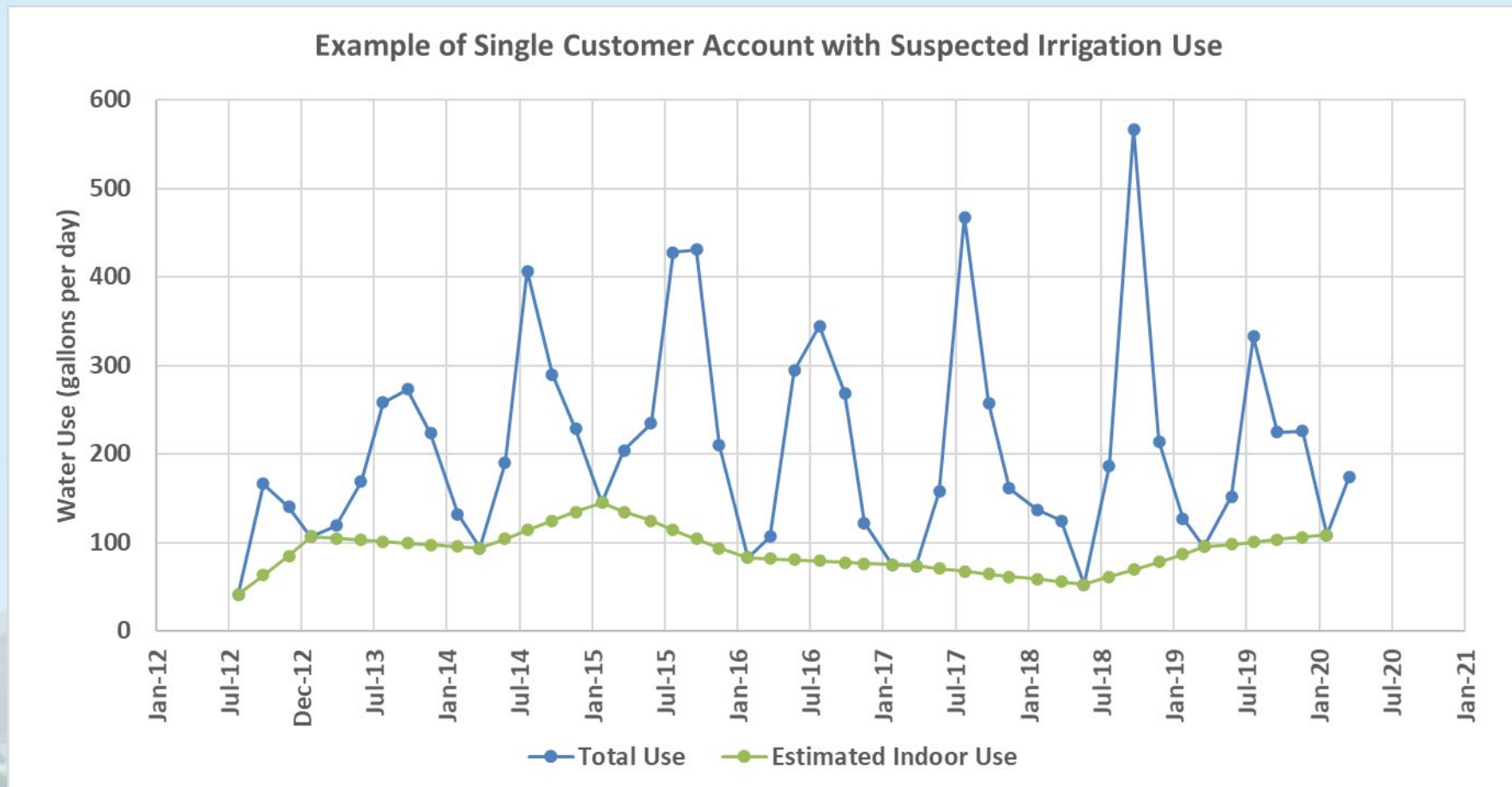
1. Water use audit
2. High school and fire station: short-term effects
3. High school and fire station: long-term effects
4. High school and fire station: water quality effects
5. Local Coastal Program future water demand
6. Fire station use (see task 2)
7. Climate change and future land use near CSA-11 wells
8. Risk of pipe leaks along water main extension to high school

Study Area Features



Audit: Unauthorized Uses

Irrigation use estimated from customer usage accounts with strongly seasonal usage pattern. For example:



Audit: Unauthorized Uses

- Irrigation use suspected at 11 accounts that use >180 gpd
- Estimated irrigation use averaged 1,516 gpd, or 8% of systemwide water use.

Audit: Unmetered Uses

- Fire hydrants no longer routinely tested or flushed
- Flushing of five “dead-ends” in the CSA-11 distribution system reduced to annual frequency and amounts to 0.007% of total water use.

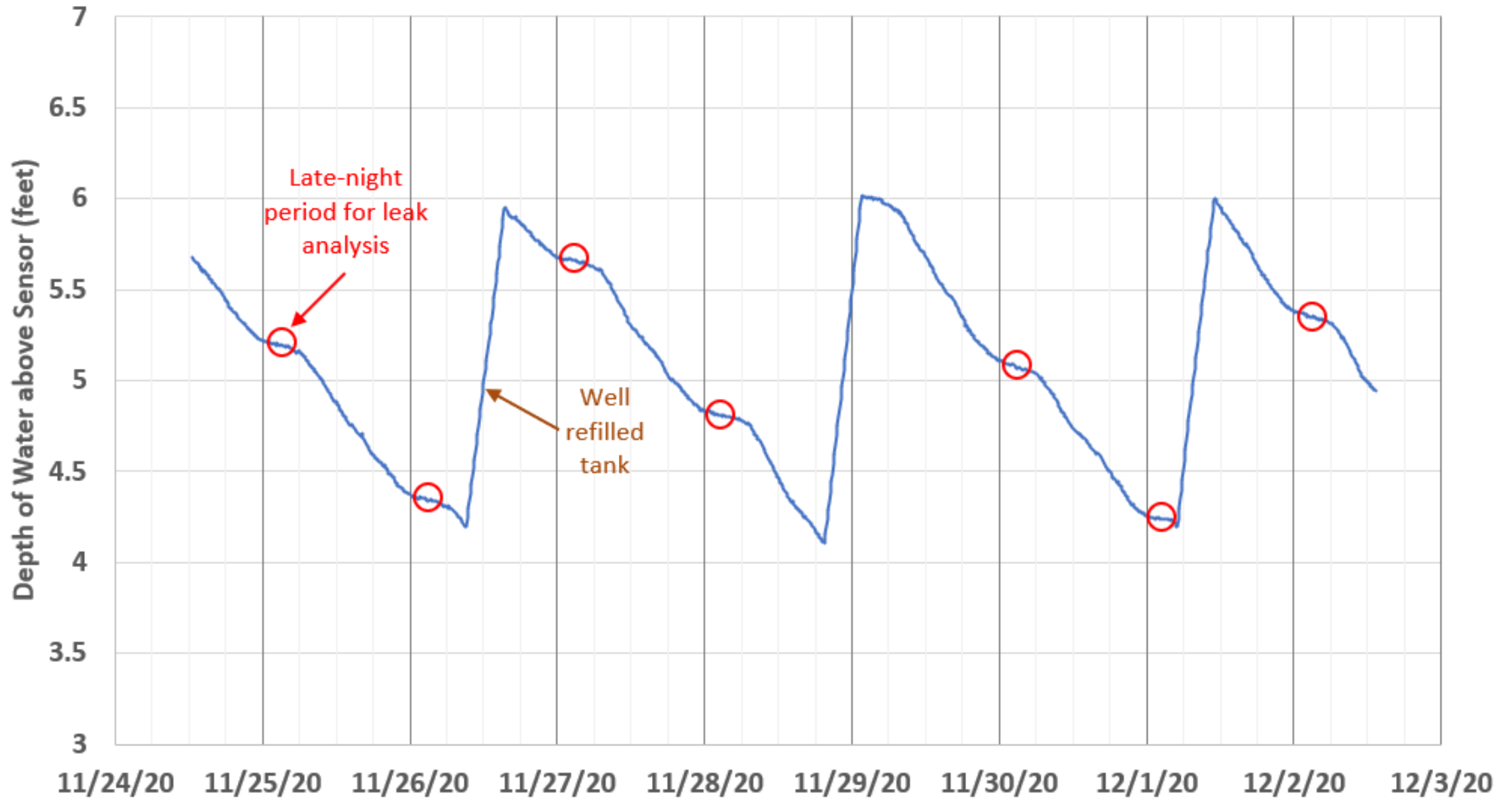
Audit: Leaks in Customer Plumbing

- Customer water meters have “spinner dial” for detecting leaks greater than about 0.1 gpm. Bracewell routinely checks these and alerts customer if leak is suspected.
- Leaks smaller than 0.1 gpm could be collectively significant for the 101 active accounts.

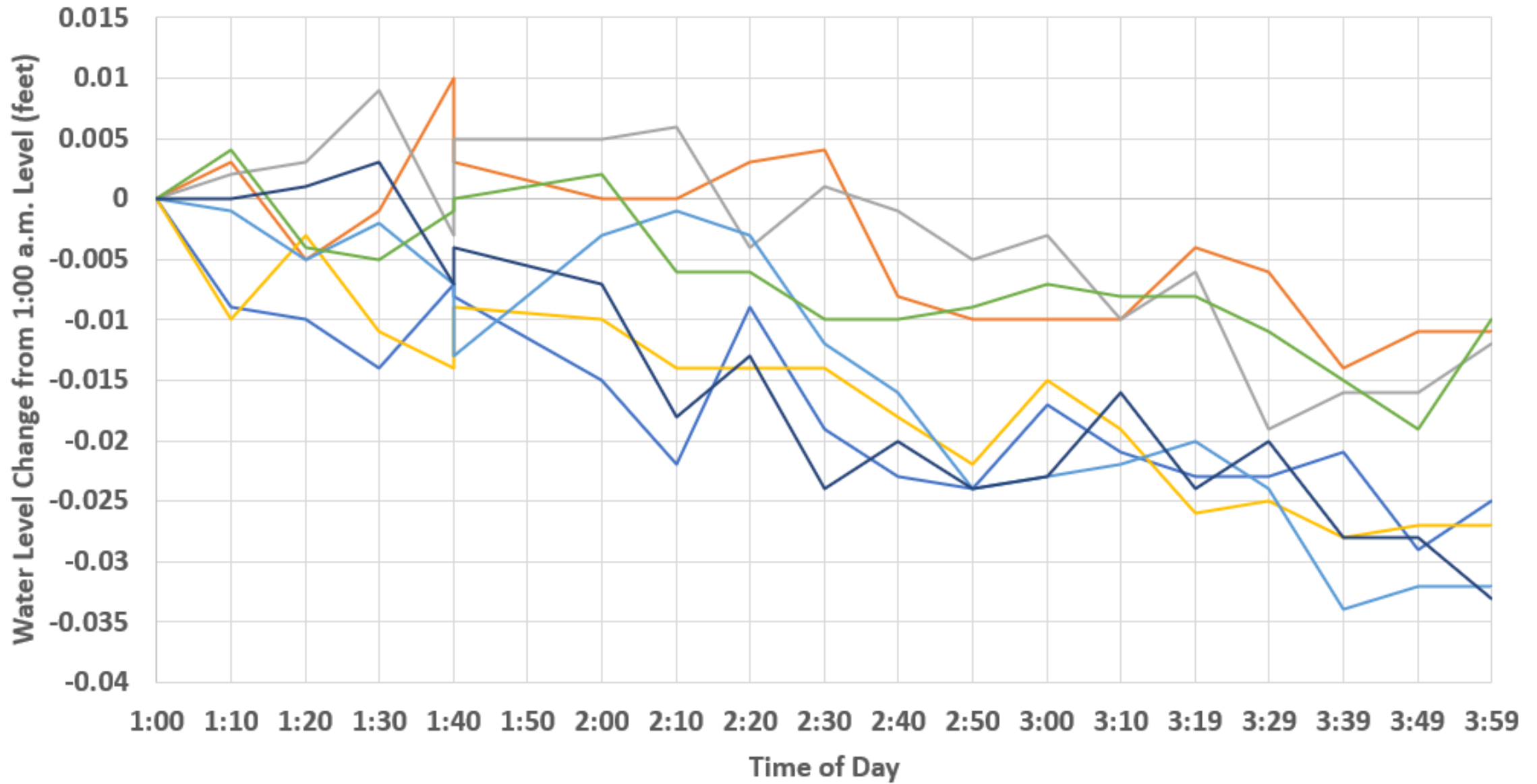
Audit: System-wide Leakage

- Measured storage tank water levels every 10 minutes for 1 week.
- Analyzed water-level declines during 1:00-4:00 a.m.
- Assuming normal water use is negligible, late-night use is primarily leakage.

A. Water Level in Storage Tanks



B. Storage Tank Late-Night Water-Level Decline



Audit: System-wide Leakage

- Late-night water use equaled 1,470-3,080 gpd or 7-15% of total daily use.
- Caveat: late-night use for toilet flushing or drip irrigation systems are both potentially of similar magnitude to the observed usage.

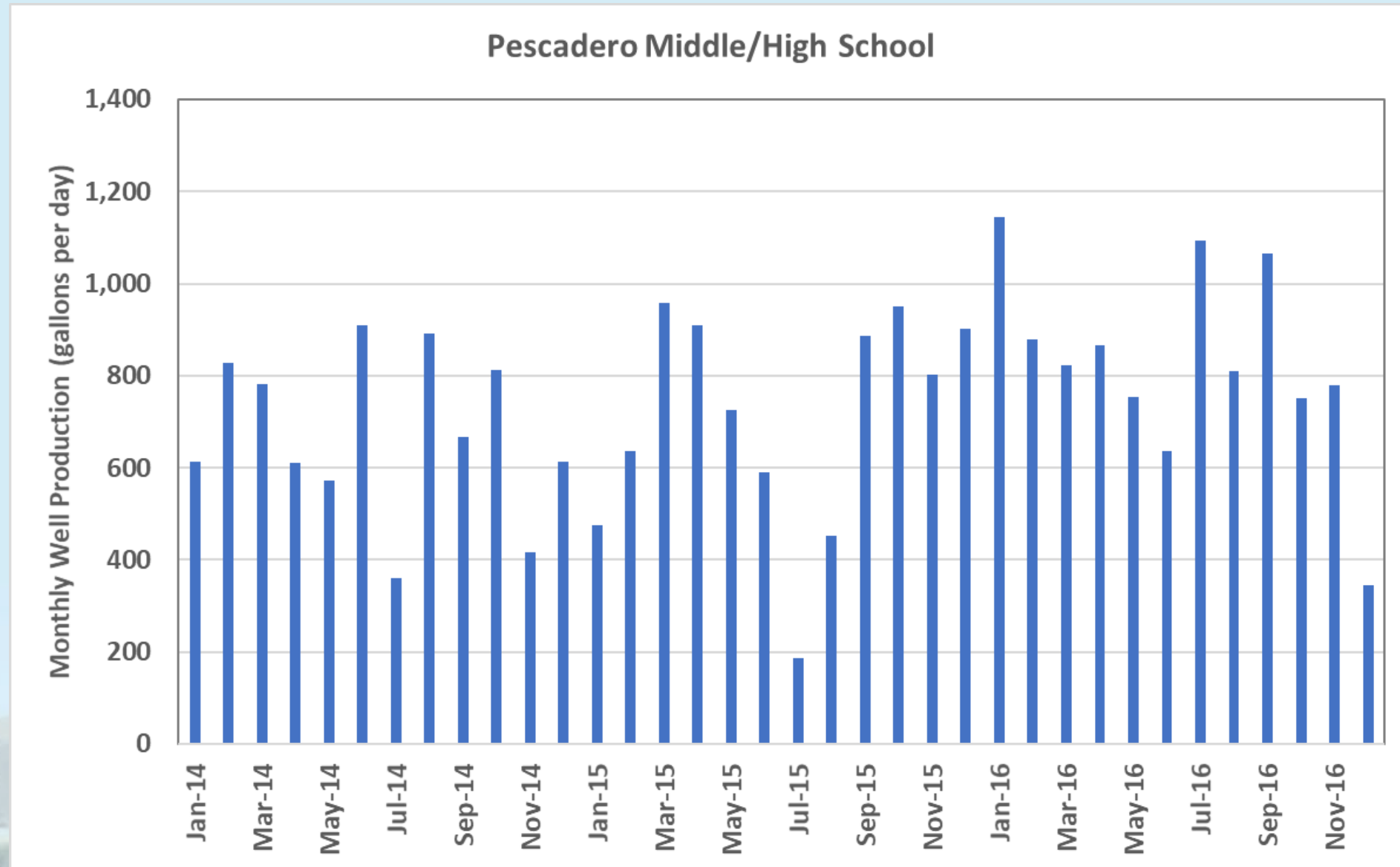
Fire Station Water Use

- Main (barracks) building at existing fire station has been connected to CSA-11 system for many years.
- Measured use averages 326 gpd.
- New station would use the same amount of potable water as the existing station, so no impact to CSA-11 supplies due to connecting the new station.
- Existing station would be staffed in emergencies only. Estimated 8 days/yr of occupancy. Averaged over 1 year equals 8 gpd of water use (0.04% of total use).

Fire Station Well

- Well is on hillside behind the station.
- 30-minute specific capacity test on November 24.
- Pumping rate declined from 4.6 to 1.7 gpm during the test, while depth to water declined from 91 to 118 feet.
- Well pumps into an above-ground cistern with a capacity of approximately 2,400 gallons.
- Continuous pumping would probably lower water level to pump intake within 1-2 hours.
- With intermittent pumping, well could keep up with a demand of possibly 1,270 gpd.
- Current use of well water for Apparatus Bay is about 25 gpd.

Middle/High School Water Use



Middle/High School Water Use

- Non-potable use from well = about 821 gpd
- Bottled water consumption = about 9 gpd
- If these demands are added to CSA-11 system, they would amount to an increase of about 4.3%

Short-Term Demand Impacts

- Increases in maximum month demand can easily be absorbed by increasing daily CSA-11 pump operation time.
- Increases in peak daily demand can easily be absorbed by storage capacity of the tanks.

Water Levels

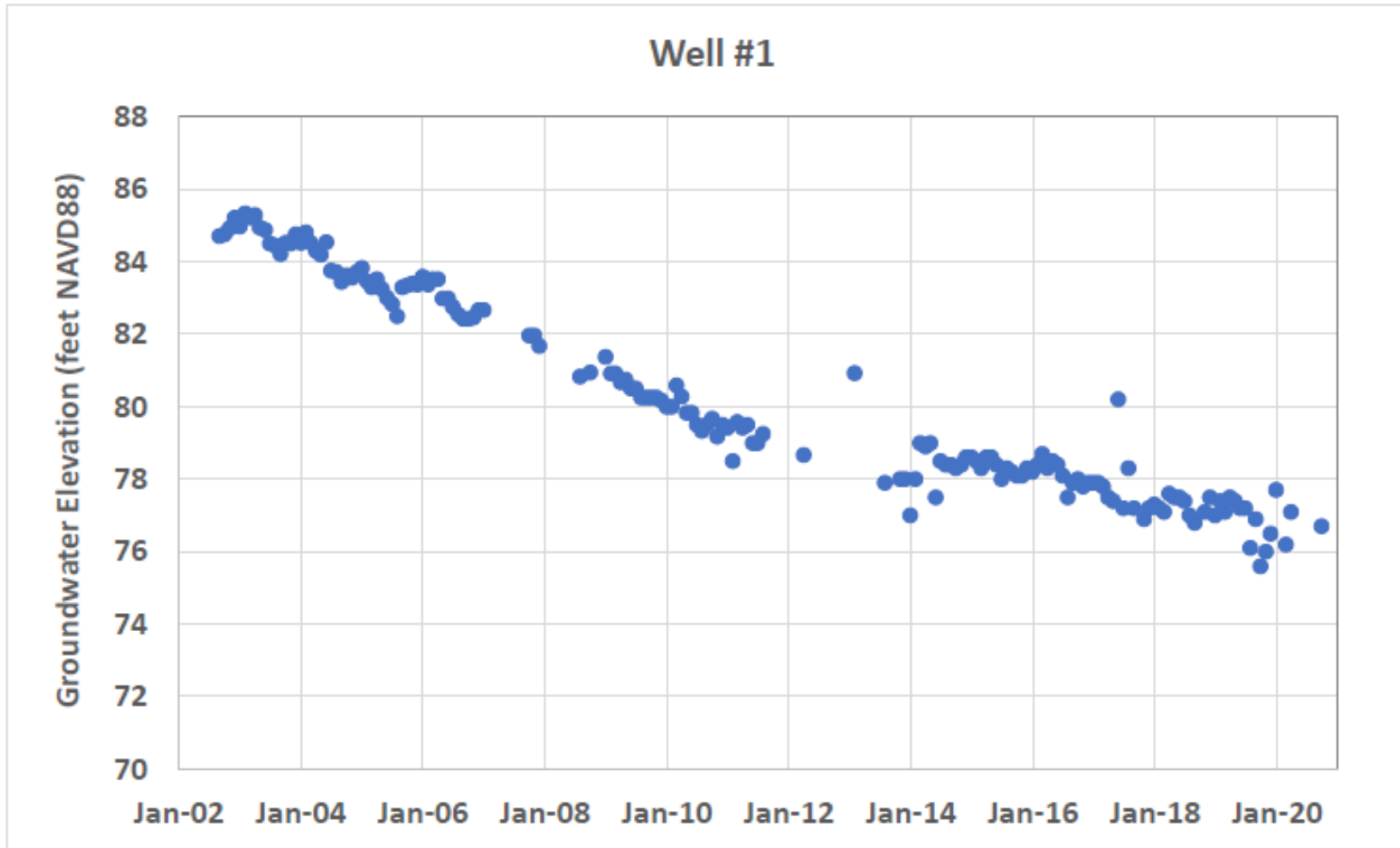
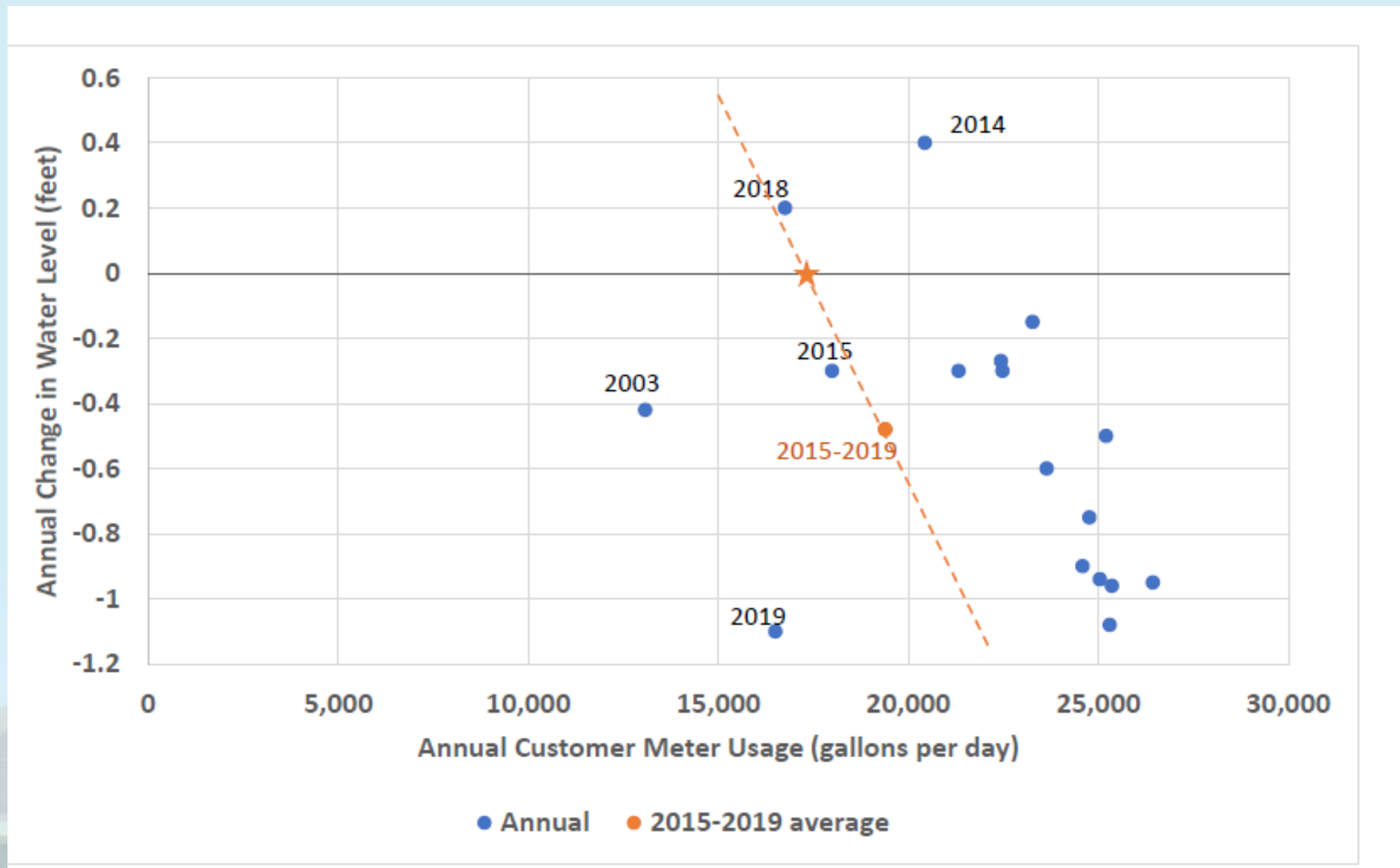
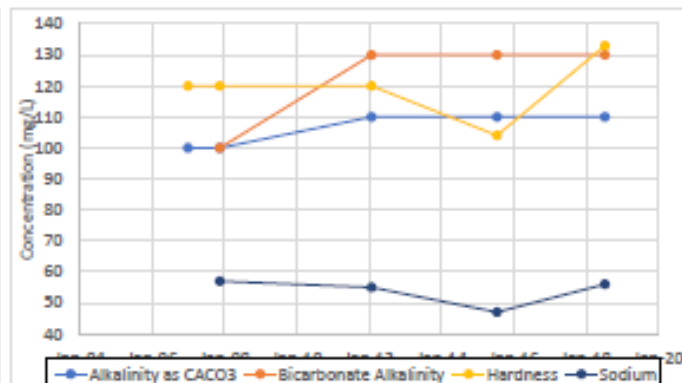
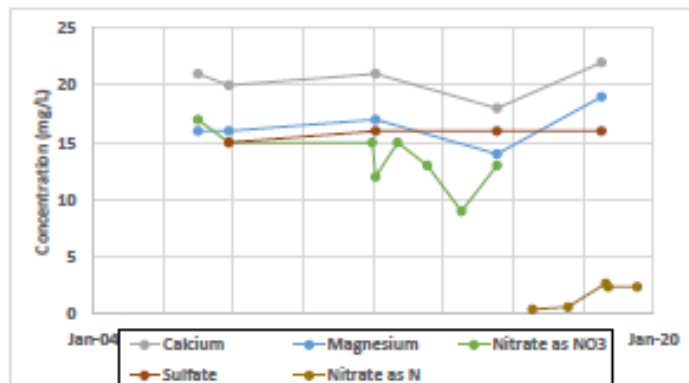
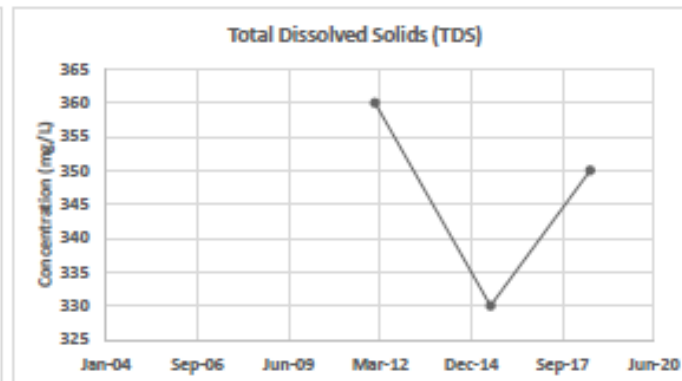
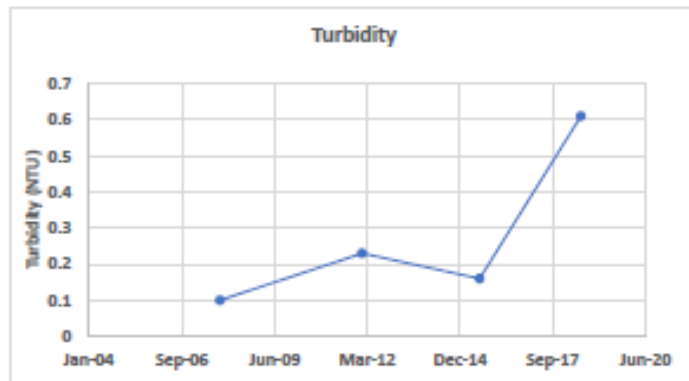
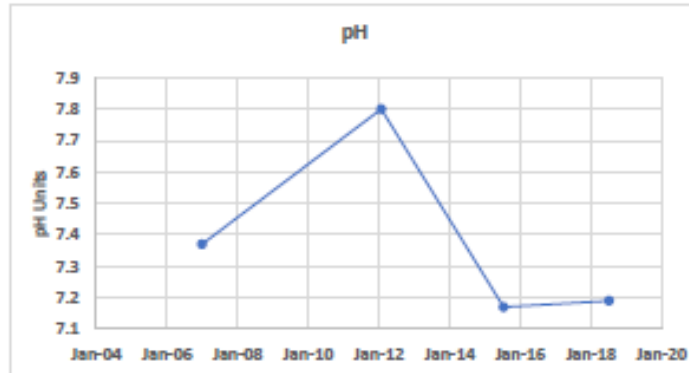


Figure 6. Well No. 1 Water Levels 2002-2020

Water Levels



Water Quality



LCP Existing and Future Water Demand

Table 1. Estimates of Existing and Future CSA-11 Water Demand

| Water Use Category | Local Coastal Program Table 2.16 | | Actual 2015-2019 | |
|-------------------------------------|----------------------------------|-----------------------|-----------------------|---------------|
| | Number of Connections | Gallons/Day | Number of Connections | Gallons/Day |
| Existing Uses | | | | |
| Dwelling units | 125 | 30,625-48,500 | 90 | 15,128 |
| Commercial outlets | 20 | 4,600-7,760 | 11 | 3,988 |
| Pescadero fire station | 1 | 1,000 | 1 | 326 |
| Subtotal | 146 | 36,500-57,260 | 102 | 19,442 |
| Proposed Uses | | | | |
| Dwelling units | 125 | 30,625-48,500 | 125 | 21,011 |
| Commercial outlets | 20 | 4,600-7,760 | 20 | 7,251 |
| Pescadero fire station ¹ | 1 | 1,000 | 1 | 8 |
| Middle/high school | n.a. | n.a. | 1 | 832 |
| Subtotal | 146 | 36,500-57,260 | 147 | 29,102 |
| Total | | 72,050-113,520 | | 48,544 |

Notes:

¹ The existing fire station use is expected to transfer to a new station that will also be connected to the CSA-11 system. The existing station will generate new use when occupied by additional firefighters during emergency operations.