# Lake Francis Mutual Water Company

# Source Water Capacity Plan


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## Purpose

The purpose of this document is to provide the Lake Francis Mutual Water Company (LFMWC) with estimates of source water capacity and storage requirements (excluding storage needed for fire flow) that would satisfy a full build-out of the Lake Francis Estates subdivision. This report was developed using historical data, static and pumping levels obtained in March 2022, and information provided by the LFMWC. Well capacity tests were not completed as a part of this report; however, a well capacity test was completed for Well 4 in 2016. The data provided herein relies on the results of that test. There is no evidence of a capacity test done for Well 5, however, upon speaking with board members of the LFMWC, Well 5 is presumed to produce at a rate of 30gpm for arsenic blending purposes. The information in this report relies on the presumption that Well 5 produces 30 gpm.

## Overview of the LFMWC

The LFMWC services the Lake Francis Estates subdivision located one-half mile southwest of Dobbins and is adjacent to the western shore of Lake Francis. The streets encompassing the subdivision are Shirley Drive, Ingersoll Drive, and Kenneth Avenue. The subdivision comprises 20 acres of land subdivided into 58 lots. As of February 2022, 21 lots have residential dwellings. The remaining 37 lots have not yet been developed.

The LCMWC is serviced by two active wells – well 4 and well 5. Wells 1 and 2 are destroyed and well 3 is inactive (see Table 1). Well 4 (figure 1) is 297 feet deep with a 4 inch casing and provides 23 gallons per minute to the distribution system. The gpm is substantiated by the drillers report dated in September 2016. Well 5 (figure 2) is 419 feet deep with a 6 inch casing and is presumed to provide 30 gallons per minute to the distribution system. Both wells are equipped with a production meter and production readings are logged monthly. Chlorination is only used for emergency disinfection purposes; no continuous disinfection practices are used. Both wells draw from a fractured rock aquifer.

Arsenic levels in well 5 exceed the Maximum Contaminant Level (MCL) of 10µg/L, therefore, water from Well 5 can only be pumped when it is blended with water from Well 4. Blended samples are taken from the sample tap located near well 3 (figure 3). Analytical results taken from the blended sample tap suggest that the blending ratio meets state and federal standards for arsenic.

*Table 1: Lake Francis Mutual Water Company Sources and Sampling Points*

| Well | PWSID | Status |
|---|---|---|
| Well 01 | CA5800805_001_001 | INACTIVE- DESTROYED |
| Well 02 | CA5800805_002_002 | INACTIVE- DESTROYED |
| Well 03 | CA5800805_003_003 | INACTIVE |
| Well 04 | CA5800805_004_004 | ACTIVE |
| Well 05 | CA5800805_005_005 | ACTIVE |
| Well 4 & 5 BLENDED | CA5800805_006_006 | ACTIVE |


Figure 1: Inside Well 4 Enclosure

Figure 2: Inside Well 5 Enclosure


Figure 3: Well 3 Enclosure and Blended Sample Tap

The main transmission line is 4-inch class 160 polyvinyl chloride (PVC) pipe configured in a loop system to avoid stagnant dead ends. All service connections, except lot 58, are serviced by a double service connection. The system is currently unmetered and does not have a method to determine water loss from unknown leaks. The system has five 4-inch standpipe hydrants and three gate valves.

Three gravity storage facilities maintain pressure in the distribution system and satisfy demand when the wells are not running. The system has one pressure zone. Tank 1 is approximately 7,000 gallons, Tank 2 is approximately 10,000 gallons, and Tank 3 is approximately 14,000 gallons for a total storage capacity of 22,000 gallons. However, a float gauge prevents the tanks from filling above 2/3 full, therefore, the usable storage is approximately 14,500 gallons. The storage facilities are not National Sanitation Federation (NSF) 61 certified and are therefore not suitable for use in drinking water systems. Efforts are currently underway to replace the existing storage facilities. See Appendix A for system maps.

## Methods

Historical production records from January 2019 – December 2021 were used to calculate the following parameters summarized in Table 2

*Table 2: Methods For Water Needs in Current Buildout*

| Parameter | Equation | Description |
|---|---|---|
| Combined Production | $\sum_{n=36} P_{well\ 4} + P_{\ well\ 5}$ | *Combined production was found by summing well 4 production (in gals) in a given month to the production for well 5 (in gals) in the same month. This process was repeated for all 36 months in the timeseries.* |
| Average monthly Demand | $\frac{CP._{Jan19} + \cdots + CP_{Dec22}}{36}$ | *Average monthly demand was found by summing all values for combined production and dividing by 36. This value is the average monthly demand of the current buildout (21 lots).* |
| Maximum Monthly Demand | $= MAXIMUM(CP)$ | *Maximum Monthly demand was determined by finding the maximum combined production value in the timeseries* |
| Average household Monthly demand | $\frac{Av.\ monthly\ demand}{21}$ | *Average household monthly demand was found by dividing average monthly demand by the number of lots with active service connections (21)* |
| Maximum monthly household demand | $\frac{Max.\ monthly\ demand}{21}$ | *Maximum household monthly demand was found by dividing maximum monthly demand by the number of lots with active service connections (21)* |
| Maximum Day Demand | $\frac{Max.\ Mo.Demand}{30}$ | *Maximum day demand was found by dividing maximum monthly demand by the average days in a month (30). Daily production meter reads are not currently available at the LFMWC; therefore, this calculation is an estimate based on maximum monthly demand.* |
| Current monthly pump run times for Well 4 and Well 5 | $\frac{Mo.\ prod.}{gpm\ *\ 60\ min}$ | *Monthly pump run time for well 4 and 5 were found by dividing monthly production for each month by the sustained yield of the well (in gpm) multiplied by 60 minutes. The resulting value is a monthly pump run time in hours.* |
| Current daily pump run times for Well 4 and Well 5 | $\frac{Mo.pump\ run\ time}{30}$ | *Daily pump run time for well 4 and 5 were found by dividing monthly pump run time by the average number of days in a month (30). The resulting value is daily pump run time in hours.* |

The data calculated in Table 2 was used to estimate the water needs for a full buildout of 58 lots. Table 3 summarizes the parameters estimated for a full buildout.

*Table 3: Methods for Estimated Future Needs (Full Buildout)*

| Parameter | Equation | Description |
|---|---|---|
| Average Monthly Demand | $Av.HH\ mo.demand * 58$ | *The average monthly demand for a full buildout was estimated by multiplying the current average household (HH) monthly demand by the number of lots in a full buildout (58)* |
| Maximum Monthly Demand | $Max.HH\ mo.demand * 58$ | *The maximum monthly demand for a full buildout was estimated by multiplying the current maximum household (HH) monthly demand by the number of lots in a full buildout (58)* |
| Maximum Day Demand | $\frac{Max\ Monthly\ Demand}{30}$ | *The maximum day demand for a full buildout was estimated by dividing the maximum monthly demand by the average number of days in a month (30)* |
| Production percentage increase | $\frac{Max\ mo.demand_{FB}}{Max\ mo.demand_{CB}}$ | *The percentage increase in production needed to sustain a full buildout was estimated by dividing the maximum monthly demand of the full build by the maximum monthly demand of the current build.* |
| Anticipated average daily run times | $Av.daily\ run\ time_{CB} * \%\ prod\ increase$ | *Anticipated average daily run times to sustain a full build was calculated by multiplying the average daily run times for the current build out by the percentage production increase needed to sustain a full buildout. This process was completed separate for well 4 and well 5.* |
| Anticipated summer run times (June-September) | $av.(RT_{june-sept}) * \%\ prod\ increase$ | *The anticipated summer rune times for a full buildout was estimated by averaging the current summer run times from June to September for each year in the time series and multiplying that value by the % production increase required to sustain a full buildout.* |
| Additional storage needs (not including needs for fire flow) | $current\ storage\ Vol + 10\% - Max\ day\ demand_{FB}$ | *Additional storage needs (excluding fire flow) was calculated by summing the current storage capacity and adding a 10% increase to account for an upcoming grant to expand storage capacity by 10%. This value is the total amount of storage the LFMWC will have when the grant project is complete. This value was subtracted by the estimated maximum day demand of the full buildout to determine how much extra storage is required to meet maximum day demand* |

Using the sustained yield for Well 4 provided by driller's report (23gpm) and information provided by LFMWC that well 5 produces 30 gpm, maximum daily and monthly yield were calculated and summarized in Table 4.

*Table 4: Methods for Estimated Maximum Yield for Full Buildout*

| Parameter | Equation | Description |
|---|---|---|
| Max Daily Yield | $CP\ rate * 1440\ minutes$ | *Maximum daily yield for both wells was calculated by multiplying the combined production (53gpm) by the number of minutes in a day (1440). This calculation depends on the combined production rates of 23gpm & 30gpm and relies on the assumption that the wells can pump 24 hours a day without causing a drawdown below the perforations.* |
| Maximum Monthly Yield | $Max\ daily\ yield * 30$ | *Maximum monthly yield was calculated by multiplying the maximum daily yield by the average number of days in a month (30). This value relies on the assumption that the wells can pump 24 hours a day without causing a drawdown below the perforations.* |

Drawdown rate was measured at each well site on March 2nd, 2022. Well 4 required the use of a solinst because the sounding port was too narrow to fit a sonic Eno Scientific well sounder. The sounding port for Well 5 was wide enough to accommodate a sonic Eno Scientific well sounder device. The following parameters were measured on March 2nd, 2022:

1. Static level
2. Pumping level
3. Recharge

Using the measurements obtains on March 2nd, 2022 and information about well construction, a drawdown rate was established for each well. Table 5 summarized the calculated needed to determine drawdown rate.

*Table 5: Methods for Drawdown Rate Calculations*

| Parameter | Equation | Description |
|---|---|---|
| Drawdown | $pumping\ level - static\ level$ | *Total drawdown was calculated by subtracting the pumping level by the static level* |
| Volume at Static Level | $Casing, ft^2 * 0.785 * (depth - SL) * 7.48$ | *The volume at the static level was determined by multiplying the square of the casing (in ft) by 0.785, then multiplying that value by the difference between the total depth and the static level to find the volume. The value is then turned into gallons by multiplying the value by 7.48* |
| Volume of water/ft of depth | $Casing, ft^2 * 0.785 * 7.48$ | *The volume of water per foot of depth in the casing was calculated by multiplying the square of the casing (in ft) by 0.785 and multiplying that value by 7.48* |
| Drawdown Rate | $\frac{drawdown * vol/ft}{gpm}$ | *The drawdown rate was calculated by multiplying the drawdown by the volume of water per foot of depth and then dividing by the sustained yield (gpm) of the well. These values were compared with observed values in the field.* |

## Results

Table 6 outlines historical monthly production, monthly run time, and daily run time for both Well 4 and Well 5. Combined production is also shown in Table 6. Figure 4 shows combined production over the timeseries and Figure 5 shows a comparison between production values for Well 4 and Well 5. Figure 5 shows that Well 4 runs roughly 1/3 more than Well 5 for the purpose of blending. Peak demand over the historical period was in August 2020 (390,000 gallons).

*Table 6: Historical Monthly Production & Pump Run Times (Jan2019-Dec2021)*

| Date | Well 4 | | | | Well 5 | | | | Combined Production |
|---|---|---|---|---|---|---|---|---|---|
| | Meter Read | Production (gal) | Mo. run time (Hrs) | Daily run time (Hrs) | Meter Read | Production (gal) | Mo. run time (Hrs) | Daily run time (Hrs) | |
| Jan-19 | 3323800 | 39700 | 28.77 | 0.96 | 4181600 | 36500 | 20.28 | 0.68 | 76200 |
| Feb-19 | 3363500 | 34300 | 24.86 | 0.83 | 4218100 | 13000 | 7.22 | 0.24 | 47300 |
| Mar-19 | 3397800 | 40300 | 29.20 | 0.97 | 4231100 | 26900 | 14.94 | 0.50 | 67200 |
| Apr-19 | 3438100 | 55100 | 39.93 | 1.33 | 4258000 | 37200 | 20.67 | 0.69 | 92300 |
| May-19 | 3493200 | 79000 | 57.25 | 1.91 | 4295200 | 53300 | 29.61 | 0.99 | 132300 |
| Jun-19 | 3572200 | 141800 | 102.75 | 3.43 | 4348500 | 95300 | 52.94 | 1.76 | 237100 |
| Jul-19 | 3714000 | 170600 | 123.62 | 4.12 | 4443800 | 113700 | 63.17 | 2.11 | 284300 |
| Aug-19 | 3884600 | 176800 | 128.12 | 4.27 | 4557500 | 117700 | 65.39 | 2.18 | 294500 |
| Sep-19 | 4061400 | 100600 | 72.90 | 2.43 | 4675200 | 66600 | 37.00 | 1.23 | 167200 |
| Oct-19 | 4162000 | 74700 | 54.13 | 1.80 | 4741800 | 49200 | 27.33 | 0.91 | 123900 |
| Nov-19 | 4236700 | 69000 | 50.00 | 1.67 | 4791000 | 45900 | 25.50 | 0.85 | 114900 |
| Dec-19 | 4305700 | 39900 | 28.91 | 0.96 | 4836900 | 26200 | 14.56 | 0.49 | 66100 |
| Jan-20 | 4345600 | 39500 | 28.62 | 0.95 | 4863100 | 26100 | 14.50 | 0.48 | 65600 |
| Feb-20 | 4385100 | 75800 | 54.93 | 1.83 | 4889200 | 50000 | 27.78 | 0.93 | 125800 |
| Mar-20 | 4460900 | 45700 | 33.12 | 1.10 | 4939200 | 29800 | 16.56 | 0.55 | 75500 |
| Apr-20 | 4506600 | 79900 | 57.90 | 1.93 | 4969000 | 52700 | 29.28 | 0.98 | 132600 |
| May-20 | 4586500 | 116400 | 84.35 | 2.81 | 5021700 | 75300 | 41.83 | 1.39 | 191700 |
| Jun-20 | 4702900 | 162800 | 117.97 | 3.93 | 5097000 | 105600 | 58.67 | 1.96 | 268400 |
| Jul-20 | 4865700 | 185800 | 134.64 | 4.49 | 5202600 | 120500 | 66.94 | 2.23 | 306300 |
| Aug-20 | 5051500 | 240000 | 173.91 | 5.80 | 5323100 | 151100 | 83.94 | 2.80 | 391100 |
| Sep-20 | 5291500 | 220000 | 159.42 | 5.31 | 5474200 | 134300 | 74.61 | 2.49 | 354300 |
| Oct-20 | 5511500 | 186500 | 135.14 | 4.50 | 5608500 | 112700 | 62.61 | 2.09 | 299200 |
| Nov-20 | 5698000 | 71500 | 51.81 | 1.73 | 5721200 | 43400 | 24.11 | 0.80 | 114900 |
| Dec-20 | 5769500 | 52200 | 37.83 | 1.26 | 5764600 | 31500 | 17.50 | 0.58 | 83700 |
| Jan-21 | 5821700 | 50700 | 36.74 | 1.22 | 5796100 | 30700 | 17.06 | 0.57 | 81400 |
| Feb-21 | 5872400 | 44100 | 31.96 | 1.07 | 5826800 | 26600 | 14.78 | 0.49 | 70700 |
| Mar-21 | 5916500 | 62600 | 45.36 | 1.51 | 5853400 | 38300 | 21.28 | 0.71 | 100900 |
| Apr-21 | 5979100 | 99200 | 71.88 | 2.40 | 5891700 | 60500 | 33.61 | 1.12 | 159700 |
| May-21 | 6078300 | 158500 | 114.86 | 3.83 | 5952200 | 95800 | 53.22 | 1.77 | 254300 |
| Jun-21 | 6236800 | 194500 | 140.94 | 4.70 | 6048000 | 116500 | 64.72 | 2.16 | 311000 |
| Jul-21 | 6431300 | 206300 | 149.49 | 4.98 | 6164500 | 124200 | 69.00 | 2.30 | 330500 |
| Aug-21 | 6637600 | 203900 | 147.75 | 4.93 | 6288700 | 122000 | 67.78 | 2.26 | 325900 |
| Sep-21 | 6841500 | 159900 | 115.87 | 3.86 | 6410700 | 96800 | 53.78 | 1.79 | 256700 |
| Oct-21 | 7001400 | 82000 | 59.42 | 1.98 | 6507500 | 49500 | 27.50 | 0.92 | 131500 |
| Nov-21 | 7083400 | 37100 | 26.88 | 0.90 | 6557000 | 22700 | 12.61 | 0.42 | 59800 |
| Dec-21 | 7120500 | 46300 | 33.55 | 1.12 | 6579700 | 28400 | 15.78 | 0.53 | 74700 |

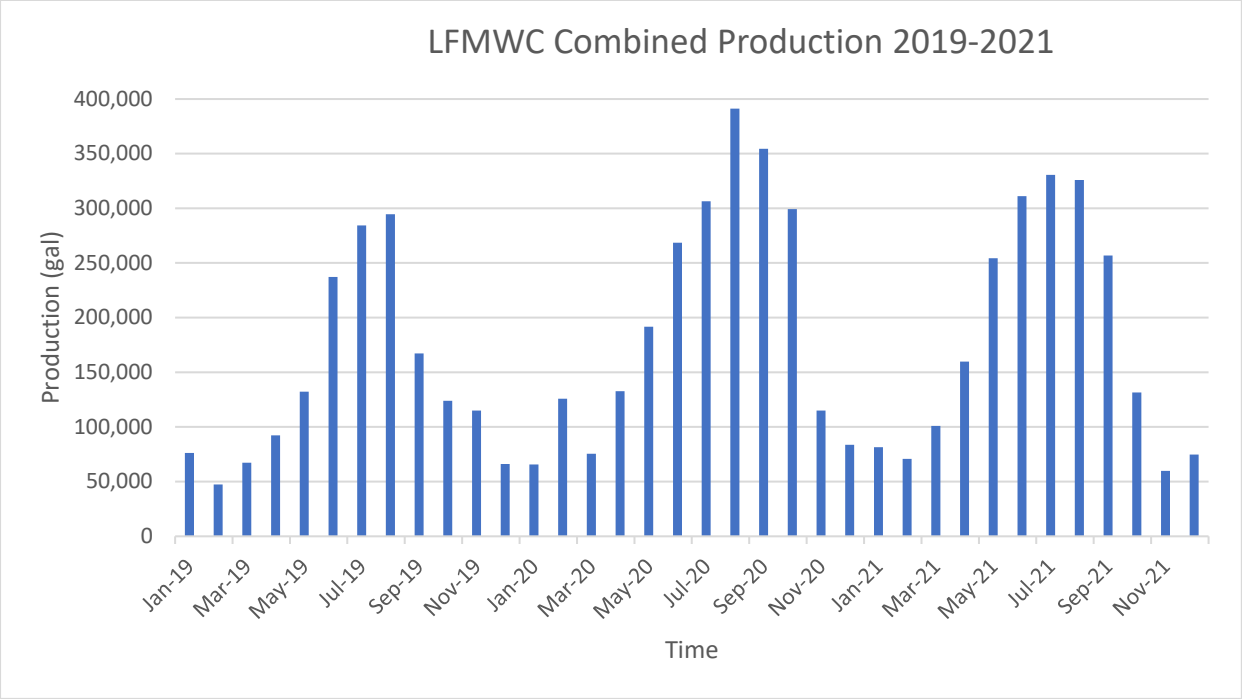



Figure 4: LFMWC Combined Production (Jan2019-Dec2021)

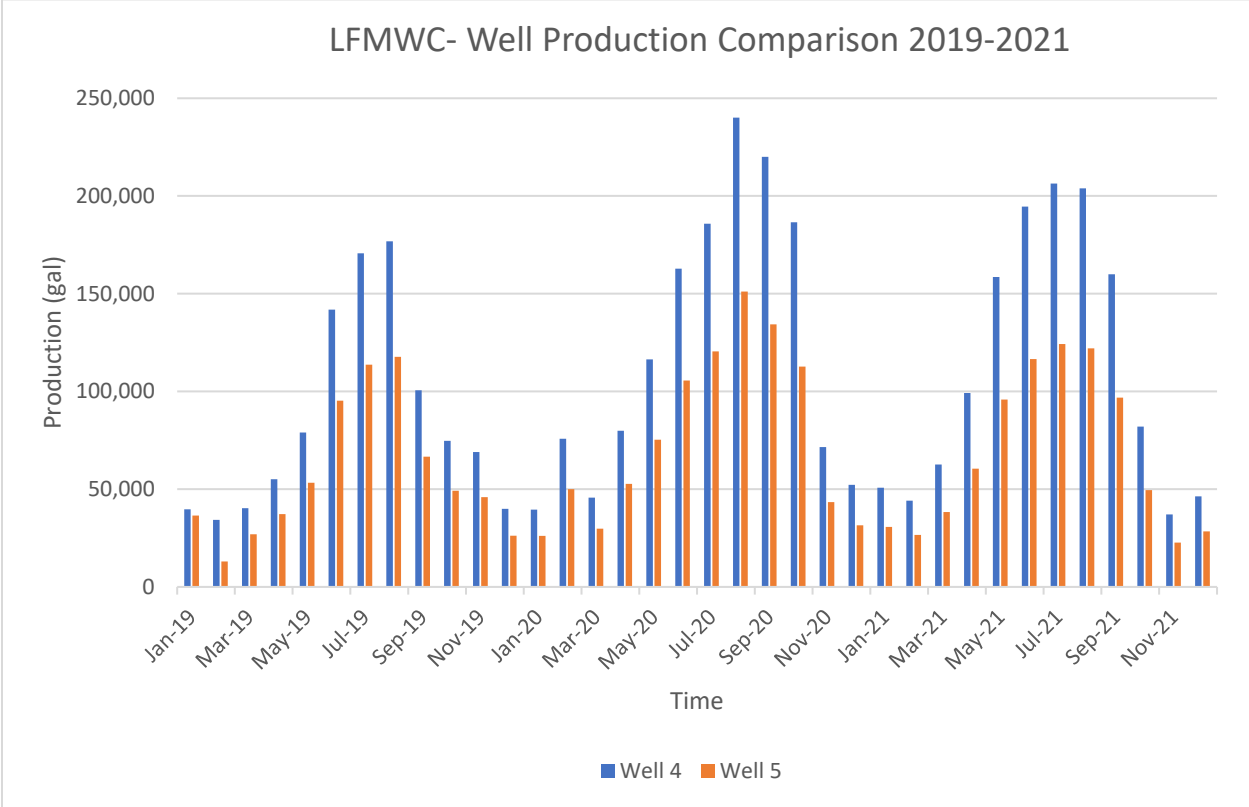



Figure 5: LFMWC Production Comparison (Jan2019-Dec2021)

Figure 6 shows monthly pump run times for Well 4 and Well 5 and Figure 7 shows average daily pump run time for Well 4 and Well 5. While there are variations in pump run time throughout the year, Well 4 and Well 5 have an average daily pump run time of 2.58 hours and 1.25 hours, respectively. These findings conclude that the current buildout of 21 lots requires the wells to run an average of 2.58 hours (Well 4) and 1.25 hours (Well 5) per day to sustain demand. The average daily summer month (June-September) run times are 4.35 hours and 2.11 hours for Well 4 and Well 5 respectively. These results conclude that the peak demand of the current buildout requires the wells to run 4.35 hours (Well 4) per day and 2.11 hours (Well 5) per day to sustain the current demand.

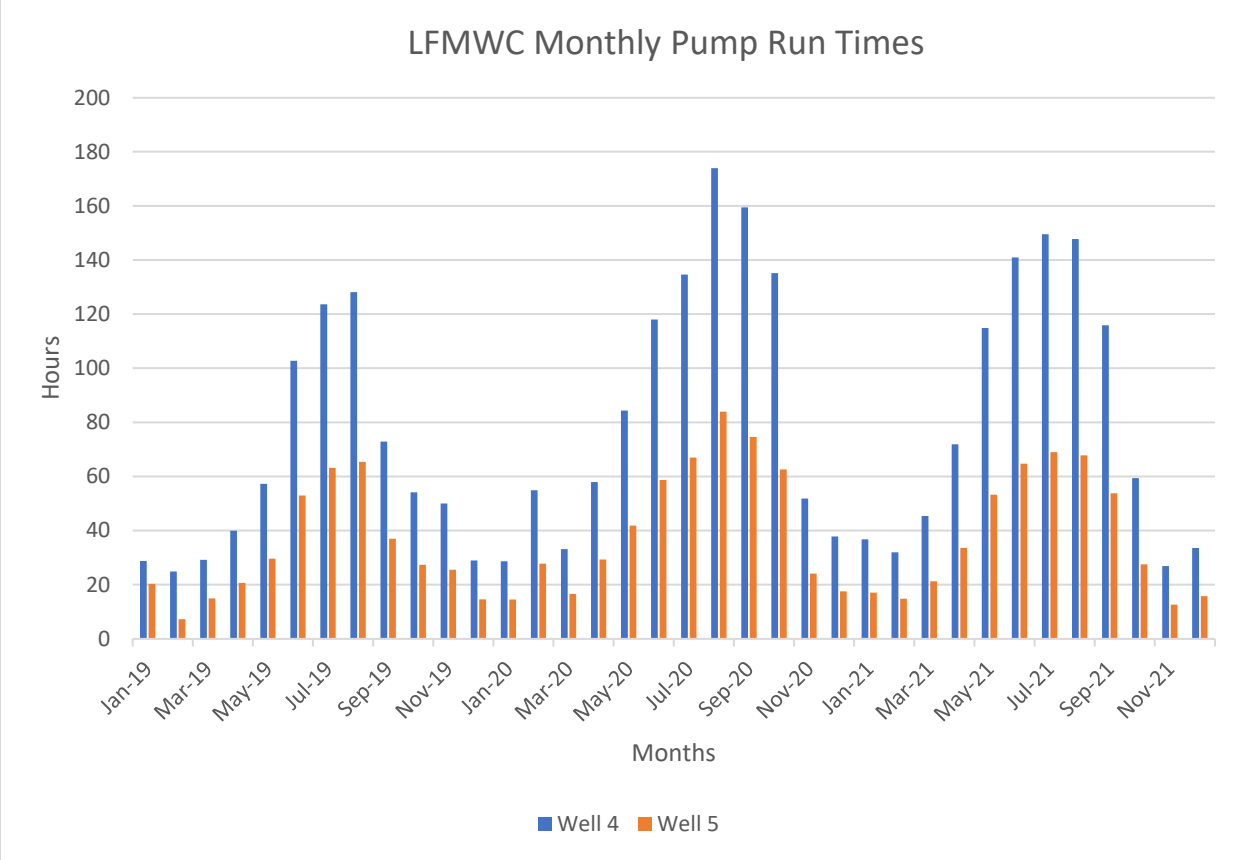



Figure 6: LFMWC Monthly Pump Run Times

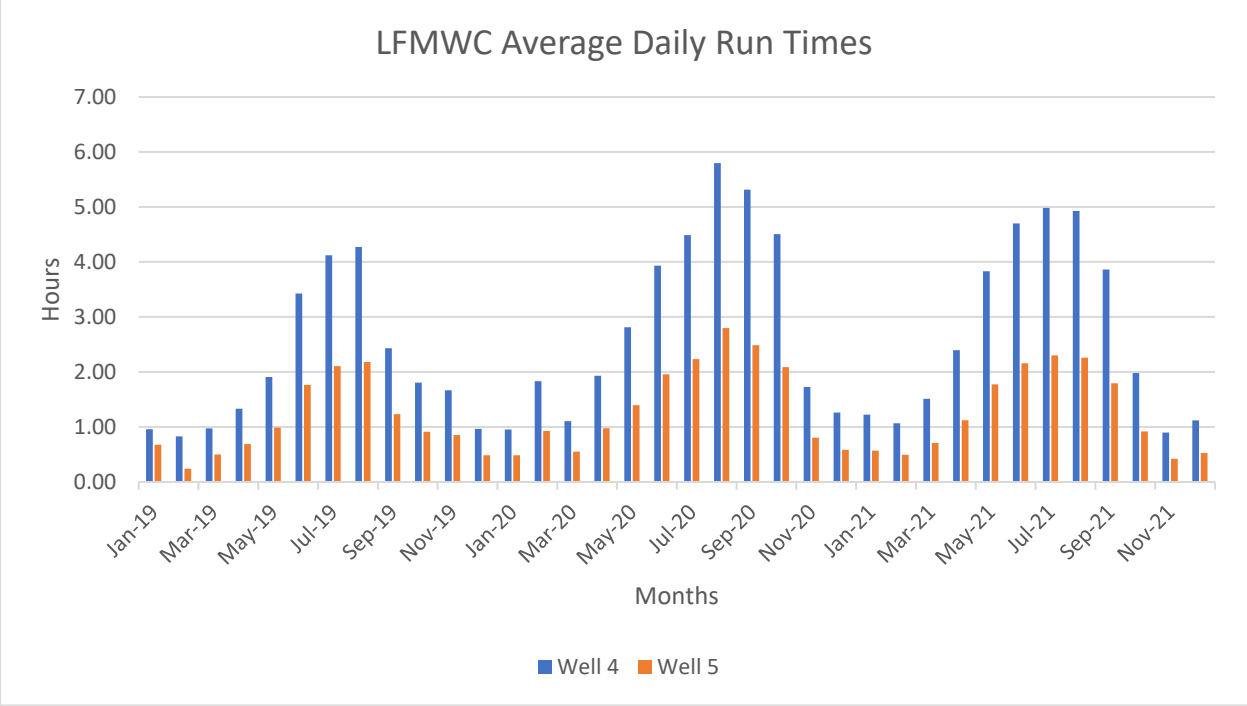



Figure 7: LFMWC Average Daily Pump Run Times

Table 7 summarizes the current buildout statistics using the production data in Table 6. Table 8 summarizes the anticipated growth statistics. It is estimated that a full buildout will increase average monthly demand by 307,000 gallons, increase maximum monthly demand by 690,000 gallons, and increase the maximum day demand by 23,000 gallons. A full buildout is estimated to require Well 4 to run 4.5 more hours on average throughout the year and an estimated 7.6 more hours during the summer months. Likewise, a full buildout is estimated to require Well 5 to run 2.2 more hours on average throughout the year and an estimated 3.7 more hours during the summer months.

*Table 7: Current Buildout Statistics*

| Parameter | Result |
|---|---|
| Average Monthly Demand (gal) | 174,153 |
| Maximum Monthly Demand (gal) | 391,100 |
| Average Monthly Household Demand (gal) | 8,293 |
| Maximum Monthly Household Demand (gal) | 18,624 |
| Maximum Day Demand (gal) | 13,037 |
| Well 4 Average Daily Pump Run Time (hrs) | 2.58 |
| Well 4 Average Summer Daily Pump Run Time (hrs) | 4.35 |
| Well 5 Average Daily Pump Run Time (hrs) | 2.11 |
| Well 5 Average Summer Daily Pump Run Time (hrs) | 1.25 |

*Table 8: Anticipated Growth Statistics (full buildout)*

| Parameter | Result |
|---|---|
| Average Monthly Demand (gal) | 480,993 |
| Maximum Monthly Demand (gal) | 1,080,181 |
| Maximum Day Demand (gal) | 36,006 |
| Well 4 Anticipated Daily Pump Run Time (hrs) | 7.12 |
| Well 4 Anticipated Summer Daily Pump Run Time (hrs) | 12.02 |
| Well 5 Anticipated Daily Pump Run Time (hrs) | 3.45 |
| Well 5 Anticipated Summer Daily Pump Run Time (hrs) | 5.81 |

Table 9 shows the calculated storage requirements for the LFMWC. The calculations include the 10% increase in capacity that is included in a current grant application. This analysis does not include the volume needed for fire flow. Additional storage is needed for fire flow and methods for determining the volume needed for fire flow may be obtained from the local Fire Marshall or the Local Primacy Agency regulator. It is estimated that the LFMWC needs at least 12,000 gallons in additional storage after the project upgrade. Without the 10% increase upgrade, the LFMWC will need at least 14,200 gallons in additional storage.

*Table 9: Storage Requirement Calculations*

| Parameter | Result |
|---|---|
| Current capacity (gal) | 22,000 |
| 10% increase from grant (gal) | 2,200 |
| Maximum Day Demand for full buildout | 36,006 |
| Extra needed for Fire Flow | Not included in this analysis |
| Additional storage needed to sustain full build-out with 10% upgrade (based on total storage) | 11,806 |
| Additional storage needed to sustain full build-out without 10% upgrade (based on total storage) | 14,200 |

Based on the sustained yield of 23 gallons per minute for Well 4 and 30 gallons per minute for Well 5, the system can produce a combined effluent of 53 gallons per minute. Theoretically, if the wells ran 24 hours per day, they could produce a maximum of 76,320 gallons per day and 2,289,600 gallons per month. The volume that can theoretically be produced by Well 4 and 5 far exceed the demands of the system at full buildout. However, to further substantiate this effort, both wells were sounded on March 2nd, 2022. Static level was measured first and pumping level was measured every 1-2 minutes at each well. Groundwater recovery was also measured every 1-2 minutes. Figures 8-10 show the drawdown and recovery of Well 4 and Figures 11-13 show the drawdown and recovery of Well 5.

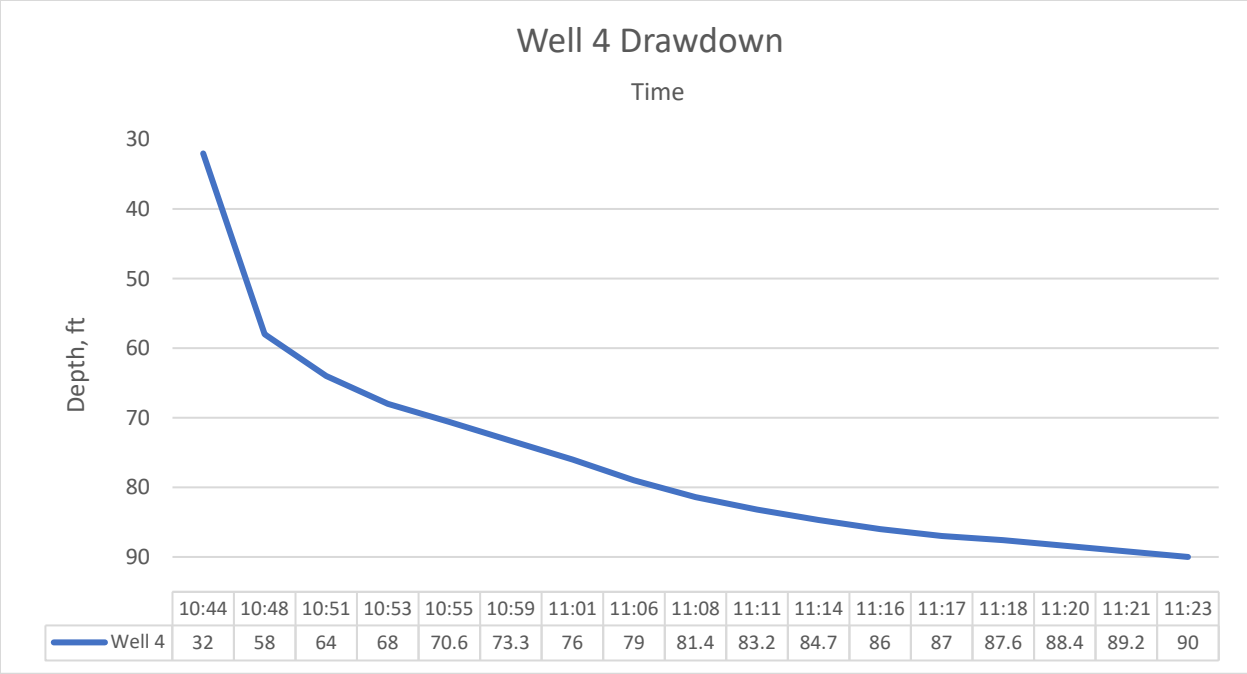



Figure 8: Well 4 Drawdown Measurements

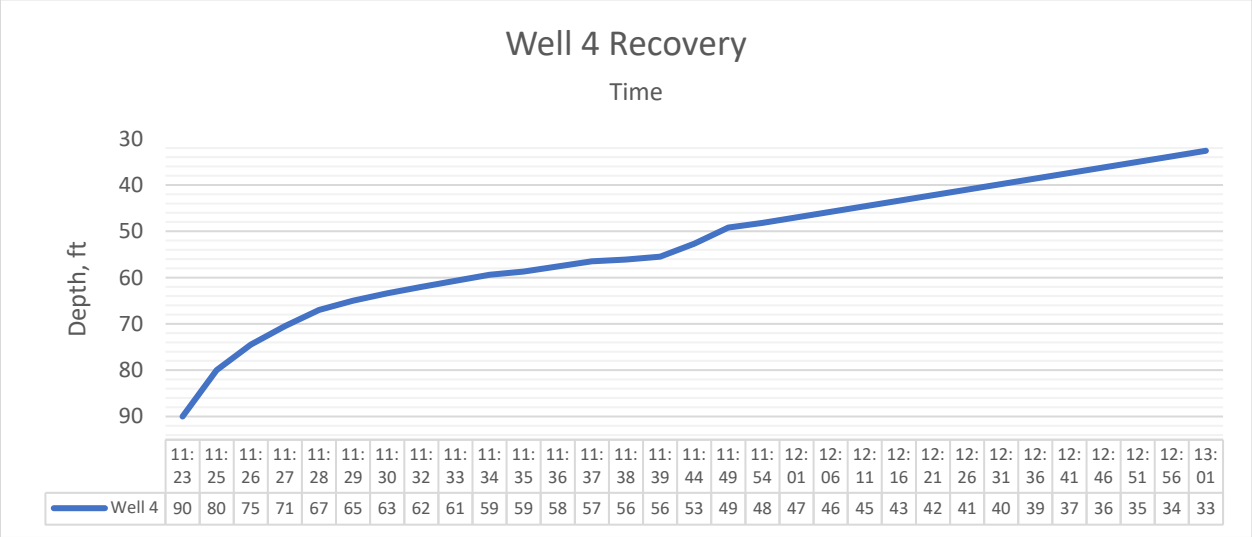



Figure 9: Well 4 Recovery Measurements

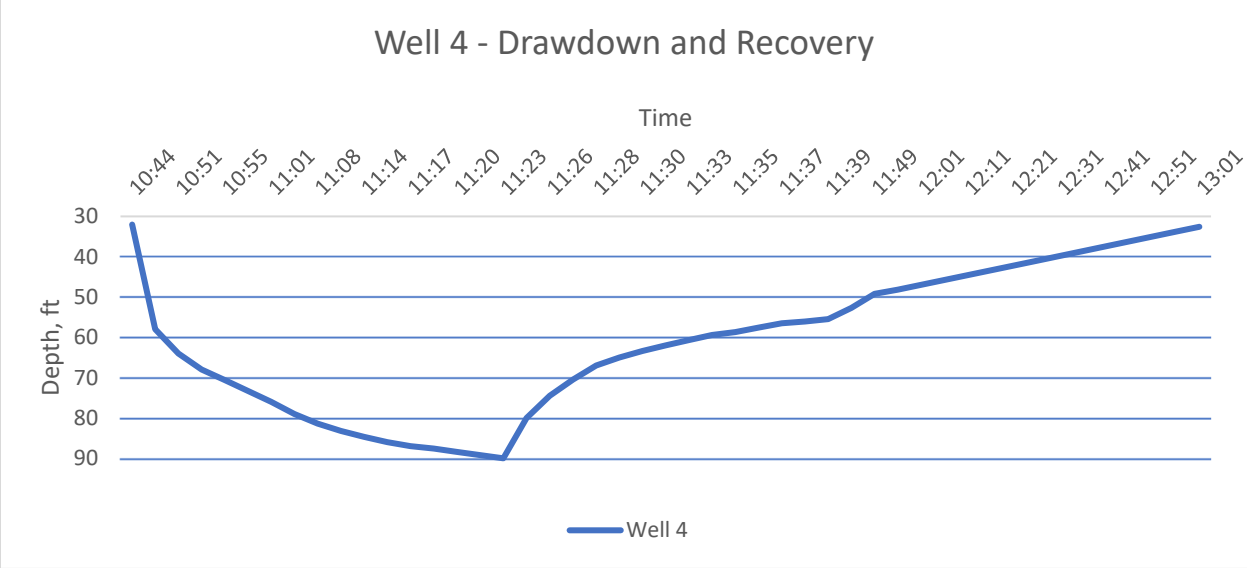
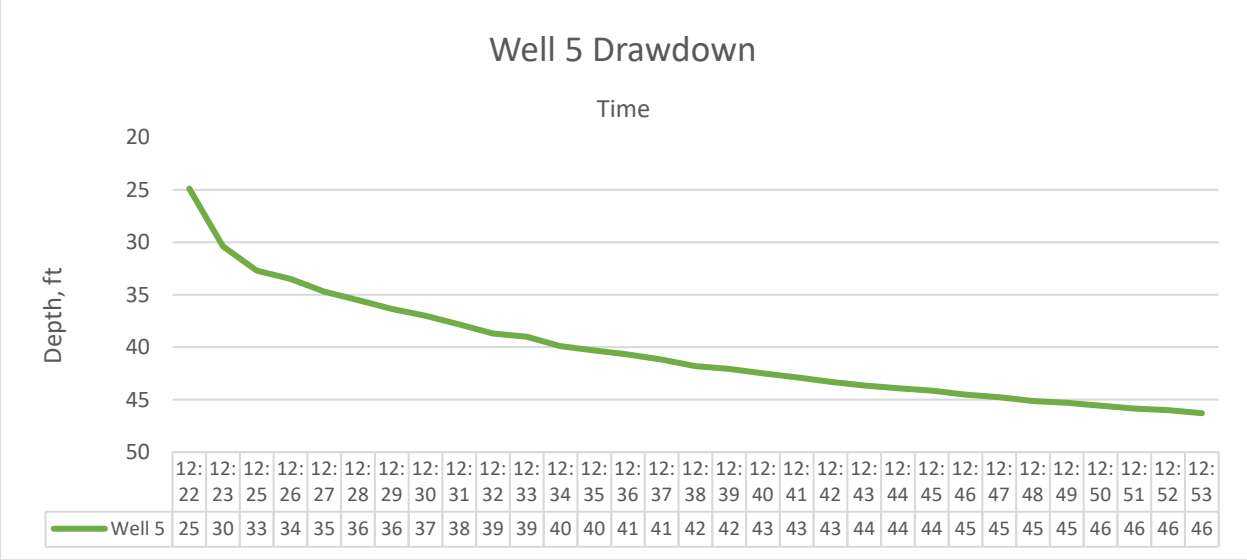
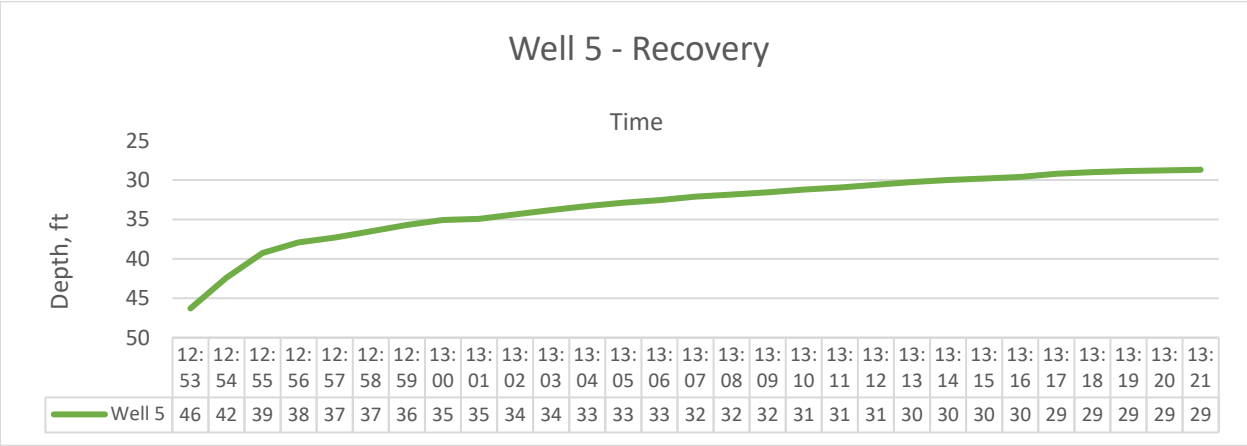
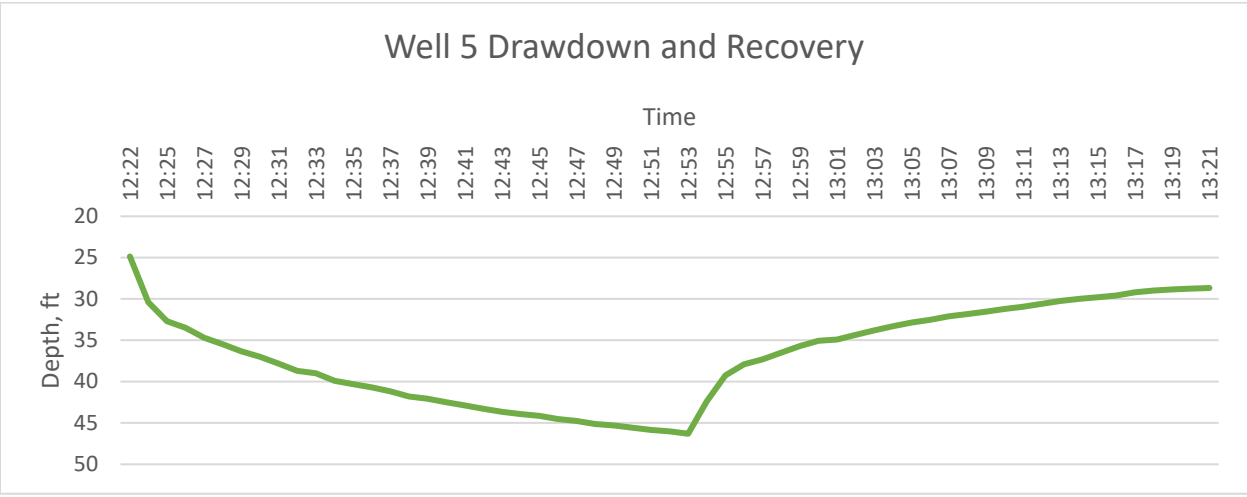



Figure 10: Well 4 Drawdown and Recovery Measurements

Well 4 has a static level of 32 ft and a total casing depth is 297 feet, indicating a relatively full column. Upon startup of the well, the groundwater level initially dropped quickly, but then tapered to a level of 90 feet within 40 minutes. Although a pumping level was not sustained during the field measurements, the degree to which the rate was slowing was indicative that the true pumping level is not much lower than 90 feet. Considering the column depth is 297 feet deep, field staff were not concerned that the pumping level would fall below the perforations. The drawdown rate for Well 4 is 1.65 feet/minute until the pumping level is achieved (≈ 90 feet). Recovery was also monitored for Well 4. Well 4 recovered to the static level with 1.5 hours. As of March 2nd, 2022, field staff at the California Rural Water Association have no concerns about the ability for Well 4 to produce water for a full buildout. Well 4 is estimated to run 12 hours per day during peak summer months at full buildout. Since the pumping level is unlikely to fall far below 90ft, the well has little chance of having supply problems. However, an additional field investigation should also take place during the summer months to confirm these results.


Well 5 Drawdown
Time
Depth, ft
20
25
30
35
40
45
50
12:22 12:23 12:25 12:26 12:27 12:28 12:29 12:30 12:31 12:32 12:33 12:34 12:35 12:36 12:37 12:38 12:39 12:40 12:41 12:42 12:43 12:44 12:45 12:46 12:47 12:48 12:49 12:50 12:51 12:52 12:53
Well 5 25 30 33 34 35 36 36 37 38 39 39 40 40 41 41 42 42 43 43 43 44 44 44 45 45 45 45 46 46 46 46


Well 5 - Recovery
Time
Depth, ft
25
30
35
40
45
50
12:53 12:54 12:55 12:56 12:57 12:58 12:59 13:00 13:01 13:02 13:03 13:04 13:05 13:06 13:07 13:08 13:09 13:10 13:11 13:12 13:13 13:14 13:15 13:16 13:17 13:18 13:19 13:20 13:21
Well 5 46 42 39 38 37 37 36 35 35 34 34 33 33 33 32 32 32 31 31 31 30 30 30 30 29 29 29 29 29

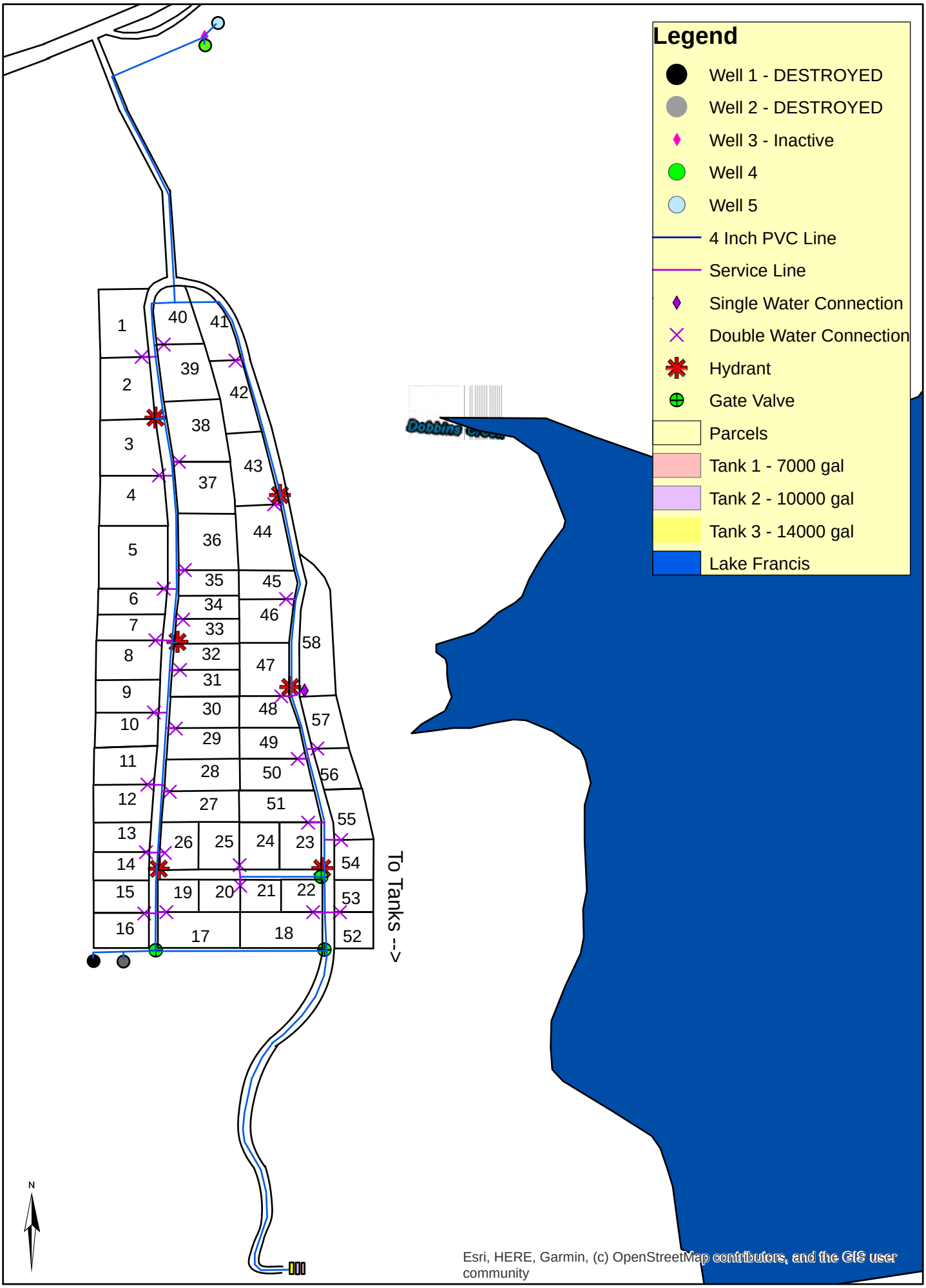

Well 5 Drawdown and Recovery
Time
12:22 12:25 12:27 12:29 12:31 12:33 12:35 12:37 12:39 12:41 12:43 12:45 12:47 12:49 12:51 12:53 12:55 12:57 12:59 13:01 13:03 13:05 13:07 13:09 13:11 13:13 13:15 13:17 13:19 13:21
Depth, ft
20
25
30
35
40
45
50

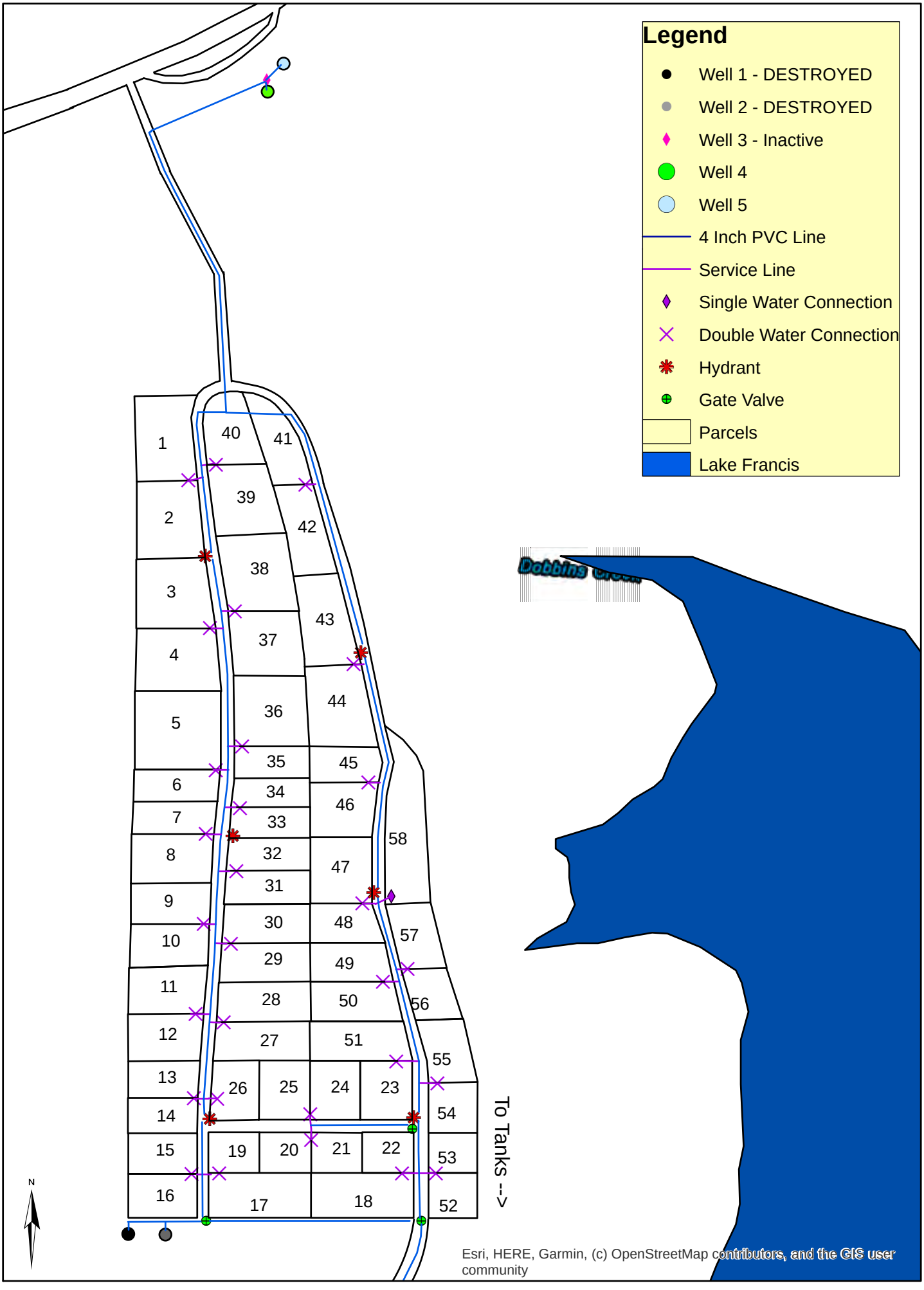
Well 5 has a static level of 24.8 ft and a total casing depth is 419 feet, indicating a relatively full column. Upon startup of the well, the groundwater level initially dropped quickly, but then tapered to a level of 46 feet within 30 minutes. Although a pumping level was not sustained during the field measurements, the degree to which the rate was slowing was indicative that the true pumping level is not much lower than 46 feet. Considering the column depth is 419 feet deep, field staff were not concerned that the pumping level would fall below the perforations. The drawdown rate for Well 5 is 1.57 feet/minute until the pumping level is achieved (≈ 46 feet). Recovery was also monitored for Well 5. Well 5 recovered to 28 feet (four feet from static level) 25 minutes. As of March 2nd, 2022, field staff at the California Rural Water Association have no concerns about the ability for Well 5 to produce water for a full buildout. Well 5 is estimated to run 5.8 hours per day during peak summer months at full buildout. Since the pumping level is unlikely to fall far below 46ft, the well has little chance of having supply problems. However, an additional field investigation should also take place during the summer months to confirm these results.

## Conclusions

Based on the results of this analysis and the field data collected on March 2nd, 2022, Well 4 and Well 5 are able to produce the volume of water needed to sustain a full buildout of 58 lots. However, additional field investigations taken during the summer months may be necessary to further substantiate these findings. The additional storage required for a full buildout is 12,000 gallons with the 10% increase in storage or 14,200 gallons without the 10% increase in storage. This is the minimum additional volume needed to meet the estimated maximum day demand at full buildout. This value does not include the additional volume needed for fire protection.

# Appendix A – System Maps




Legend
Well 1 - DESTROYED
Well 2 - DESTROYED
Well 3 - Inactive
Well 4
Well 5
4 Inch PVC Line
Service Line
Single Water Connection
Double Water Connection
Hydrant
Gate Valve
Parcels
Lake Francis
Dobbins Creek
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Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community

# Drinking Water Source Assessment

*Water System*

## LAKE FRANCIS MUTUAL WATER

Yuba County

*Water Source*

## WELL 03

*Assessment Date*

## October, 2001

California Department of Health Services
Drinking Water Field Operations Branch
LPA Yuba County

| | |
|---|---|
| **District No.** | **88** |
| **System No.** | **5800805** |
| **Source No.** | **003** |
| **PS Code** | **17N/07E-05G02 M** |

# Vulnerability Summary

**District Name** LPA Yuba County **District No.** 88 **County** Yuba

**System Name** LAKE FRANCIS MUTUAL WATER **System No.** 5800805

**Source Name** WELL 03 **Source No.** 003 **PS Code** 17N/07E-05G02 M

**Completed by** Jodi Bird **Date** October, 2001

**THE FOLLOWING INFORMATION MUST BE INCLUDED IN THE SYSTEM CONSUMER CONFIDENCE REPORT**

A source water assessment was conducted for the **WELL 03**

of the **LAKE FRANCIS MUTUAL WATER** water system in **October, 2001** .

The source is considered most vulnerable to the following activities not associated with any detected contaminants:

Septic systems - low density

A copy of the complete assessment may be viewed at:

Yuba County Environmental Health
938 14th Street
Marysville, CA 95901

You may request a summary of the assessment be sent to you by contacting:

Jodi E. Bird
Water Program Coordinator
(530) 741-6251

# Delineation of Ground Water Protection Zones

**District Name** LPA Yuba County **District No.** 88 **County** Yuba

**System Name** LAKE FRANCIS MUTUAL WATER **System No.** 5800805

**Source Name** WELL 03 **Source No.** 003 **PS Code** 17N/07E-05G02 M

**Completed by** Jodi Bird **Date** October, 2001

**Method Used to Delineate Protection Zones**

**X 1. Calculated Fixed Radius**

2. Modified Calculated Fixed Radius (Attach documentation for direction of ground water flow.)
3. More Detailed Methods
4. Arbitrary Fixed Radius (For use only by or permission of DHS)

| | | | |
|---|---|---|---|
| Maximum Pumping Rate of Well (Q) | 10 | gallons/minute | |
| | 16 | acre feet/year | |
| | 702,670 | cubic feet/year | |
| Effective Porosity | 0.20 | | [X] Default Value |
| Screened Interval of Well | 10 | feet | [X] Default Value |

| Protection Zone | Calculated Value | Minimum Value | Radius of Protection Zone |
|---|---|---|---|
| Zone A - 2 Year TOT* | 709 Feet | 900 Feet | **900** Feet |
| Zone B5 - 5 Year TOT* | 1,122 Feet | 1,500 Feet | **1,500** Feet |
| Zone B10 - 10 Year TOT* | 1,586 Feet | 2,250 Feet | **2,250** Feet |

# Physical Barrier Effectiveness (PBE)

**District Name** LPA Yuba County **District No.** 88 **County** Yuba

**System Name** LAKE FRANCIS MUTUAL WATER **System No.** 5800805

**Source Name** WELL 03 **Source No.** 003 **PS Code** 17N/07E-05G02 M

**Completed by** Jodi Bird **Date** October, 2001

| Parameter | Possible Points | This Source | Score |
|---|---|---|---|
| **Type of Aquifer** **Confinement** | | | |
| 1. Unconfined, Semi-confined, Fractured Rock, Unknown Aquifer | 0 | X | 0 |
| 2. Confined | 50 | | |
| **Aquifer Material (Unconfined Aquifers)** **Type of material within aquifer** | | | |
| 1. Porous Media (Interbedded sands, silts, clays, gravels) with continuous clay layer minimum 25' thick above water table within Zone A | 20 | | |
| 2. Porous Media (Interbedded sands, silts, clays, gravels) | 10 | | |
| 3. Fractured rock ( Low Physical Barrier Effectiveness - no further questions required) | 0 | X | 0 |

| Score | Effectiveness |
|---|---|
| 0 to 35 | Low |
| 36 to 69 | Moderate |
| 70 to 100 | High |

**Score** 0

**Effectiveness** Low

# Inventory of Possible Contaminating Activities (PCA Inventory)

**District Name** LPA Yuba County **District No.** 88 **County** Yuba

**System Name** LAKE FRANCIS MUTUAL WATER **System No.** 5800805

**Source Name** WELL 03 **Source No.** 003 **PS Code** 17N/07E-05G02 M

**Completed by** Jodi Bird **Date** October, 2001

| PCA (Risk Ranking) | PCA in Zone A | PCA in Zone B5 | PCA in Zone B10 | * | Comments |
|---|---|---|---|---|---|
| **Residential/Municipal** | | | | | |
| Airports - Maintenance/ fueling areas (VH) | N | N | N | | |
| Landfills/dumps (VH) | N | N | N | | |
| Railroad yards/ maintenance/ fueling areas (H) | N | N | N | | |
| Septic systems - high density (>1/acre) (VH if in Zone A, otherwise M) | N | N | N | | |
| Sewer collection systems (H, if in Zone A, otherwise L) | N | N | N | | |
| Utility stations - maintenance areas (H) | N | N | N | | |
| Wastewater treatment plants (VH in Zone A, otherwise H) | N | N | N | | |
| Drinking water treatment plants (M) | N | N | N | | |
| Golf courses (M) | N | N | N | | |
| Housing - high density (>1 house/0.5 acres) (M) | N | N | N | | |
| Motor pools (M) | N | N | N | | |
| Parks (M) | N | N | N | | |
| Waste transfer/recycling stations (M) | N | N | N | | |
| Apartments and condominiums (L) | N | N | N | | |
| Campgrounds/ Recreational areas (L) | N | Y | Y | | |
| Fire stations (L) | N | N | N | | |
| RV Parks (L) | N | Y | Y | | |
| Schools (L) | N | N | Y | | |
| Hotels, Motels (L) | N | N | N | | |
| **Agricultural/Rural** | | | | | |
| Grazing (> 5 large animals or equivalent per acre) (H in Zone A, otherwise M) | N | N | N | | |
| Concentrated Animal Feeding Operations (CAFOs) as defined in federal regulation1 (VH in Zone A, otherwise H) | N | N | N | | |
| Animal Feeding Operations as defined in federal regulation2 (VH in Zone A, otherwise H) | N | N | N | | |
| Other Animal operations (H in Zone A, otherwise M) | N | N | N | | |

**Y = Yes N = No U = Unknown**
*** = A contaminant potentially associated with this activity has been detected in the water supply.**

# Inventory of Possible Contaminating Activities (PCA Inventory)

**System Name** LAKE FRANCIS MUTUAL WATER **System No.** 5800805

**Source Name** WELL 03 **Source No.** 003 **PS Code** 17N/07E-05G02 M

| PCA (Risk Ranking) | PCA in Zone A | PCA in Zone B5 | PCA in Zone B10 | * | Comments |
|---|---|---|---|---|---|
| **Agricultural/Rural** | | | | | |
| Farm chemical distributor/ application service (H) | N | N | N | | |
| Farm machinery repair (H) | N | N | N | | |
| Septic systems - low density (<1/acre) (H in Zone A, otherwise L) | **Y** | **Y** | **Y** | | |
| Lagoons / liquid wastes (H) | N | N | N | | |
| Machine shops (H) | N | N | N | | |
| Pesticide/fertilizer/ petroleum storage & transfer areas (H) | N | N | N | | |
| Agricultural Drainage (H in Zone A, otherwise M) | N | N | N | | |
| Wells - Agricultural/ Irrigation (H) | N | N | N | | |
| Managed Forests (M) | N | N | N | | |
| Crops, irrigated (Berries, hops, mint, orchards, sod, greenhouses, vineyards, nurseries, vegetable) (M) | N | N | N | | |
| Fertilizer, Pesticide/ Herbicide Application (M) | N | N | N | | |
| Sewage sludge/biosolids application (M) | N | N | N | | |
| Crops, nonirrigated (e.g., Christmas trees, grains, grass seeds, hay, pasture) (L) (includes drip-irrigated crops) | N | N | N | | |
| **Other** | | | | | |
| NPDES/WDR permitted discharges (H) | N | N | N | | |
| Underground Injection of Commercial/Industrial Discharges (VH) | N | N | N | | |
| Historic gas stations (VH) | N | N | **Y** | | |
| Historic waste dumps/ landfills (VH) | N | N | N | | |
| Illegal activities/ unauthorized dumping (H) | N | N | N | | |
| Injection wells/ dry wells/ sumps (VH) | N | N | N | | |
| Known Contaminant Plumes (VH) | N | N | N | | |
| Military installations (VH) | N | N | N | | |
| Mining operations - Historic (VH) | N | N | N | | |
| Mining operations - Active (VH) | N | N | N | | |
| Mining - Sand/Gravel (H) | N | N | N | | |
| Wells - Oil, Gas, Geothermal (H) | N | N | N | | |
| Salt Water Intrusion (H) | N | N | N | | |

**Y = Yes N = No U = Unknown**
*** = A contaminant potentially associated with this activity has been detected in the water supply.**

# Inventory of Possible Contaminating Activities (PCA Inventory)

**System Name** LAKE FRANCIS MUTUAL WATER **System No.** 5800805

**Source Name** WELL 03 **Source No.** 003 **PS Code** 17N/07E-05G02 M

| PCA (Risk Ranking) | PCA in Zone A | PCA in Zone B5 | PCA in Zone B10 | * | Comments |
|---|---|---|---|---|---|
| **Other** | | | | | |
| Recreational area - surface water source (H) | N | N | N | | |
| Underground storage tanks - Confirmed leaking tanks (VH) | N | N | N | | |
| Underground storage tanks - Decommissioned - inactive tanks (L) | N | N | **Y** | | |
| Underground storage tanks - Non-regulated tanks (tanks smaller than regulatory limit) (H) | N | N | N | | |
| Underground storage tanks - Not yet upgraded or registered tanks (H) | N | N | **Y** | | |
| Underground storage tanks - Upgraded and/or registered - active tanks (L) | N | N | N | | |
| Above ground storage tanks (M) | N | N | N | | |
| Wells - Water supply (M) | **Y** | **Y** | **Y** | | |
| Construction/demolition staging areas (M) | N | N | N | | |
| Contractor or government agency equipment storage yards (M) | N | N | N | | |
| Dredging (M) | N | N | N | | |
| Transportation corridors - Freeways/state highways (M) | N | N | N | | |
| Transportation corridors - Railroads (M) | N | N | N | | |
| Transportation corridors - Historic railroad right-of-ways (M) | N | N | N | | |
| Transportation corridors - Road Right-of-ways (herbicide use areas) (M) | N | N | N | | |
| Transportation corridors - Roads/ Streets (L) | **Y** | **Y** | **Y** | | |
| Hospitals (M) | N | N | N | | |
| Storm Drain Discharge Points (M) | N | N | N | | |
| Storm Water Detention Facilities (M) | N | N | N | | |
| Artificial Recharge Projects - Injection wells (potable water) (L) | N | N | N | | |
| Artificial Recharge Projects - Injection wells (non-potable water) (M) | N | N | N | | |
| Artificial Recharge Projects - Spreading Basins (potable water) (L) | N | N | N | | |
| Artificial Recharge Projects - Spreading Basins | N | N | N | | |

**Y = Yes N = No U = Unknown**
*** = A contaminant potentially associated with this activity has been detected in the water supply.**

# Inventory of Possible Contaminating Activities (PCA Inventory)

**System Name** LAKE FRANCIS MUTUAL WATER **System No.** 5800805

**Source Name** WELL 03 **Source No.** 003 **PS Code** 17N/07E-05G02 M

| PCA (Risk Ranking) | PCA in Zone A | PCA in Zone B5 | PCA in Zone B10 | * | Comments |
|---|---|---|---|---|---|
| **Other** | | | | | |
| (non-potable water) (M) | | | | | |
| Medical/dental offices/clinics (L) | N | N | N | | |
| Veterinary offices/clinics (L) | N | N | N | | |
| Surface water - streams/ lakes/rivers (L) | N | N | Y | | |
| Wells - monitoring, test holes (L) | N | N | N | | |

Y = Yes N = No U = Unknown
* = A contaminant potentially associated with this activity has been detected in the water supply.

# Vulnerability Ranking

**District Name** LPA Yuba County **District No.** 88 **County** Yuba

**System Name** LAKE FRANCIS MUTUAL WATER **System No.** 5800805

**Source Name** WELL 03 **Source No.** 003 **PS Code** 17N/07E-05G02 M

**Completed by** Jodi Bird **Date** October, 2001

| Zone | PCA (Risk Ranking) | * | PCA Risk Points | Zone Points | PBE Points | Vulnerability Score |
|---|---|---|---|---|---|---|
| A | Septic systems - low density (<1/acre) (H in Zone A, otherwise L) | | 5 | 5 | 5 | 15 |
| A | Wells - Water supply (M) | | 3 | 5 | 5 | 13 |
| B10 | Historic gas stations (VH) | | 7 | 1 | 5 | 13 |
| A | Transportation corridors - Roads/ Streets (L) | | 1 | 5 | 5 | 11 |
| B5 | Wells - Water supply (M) | | 3 | 3 | 5 | 11 |
| B10 | Underground storage tanks - Not yet upgraded or registered tanks (H) | | 5 | 1 | 5 | 11 |
| B5 | Campgrounds/ Recreational areas (L) | | 1 | 3 | 5 | 9 |
| B5 | RV Parks (L) | | 1 | 3 | 5 | 9 |
| B5 | Septic systems - low density (<1/acre) (H in Zone A, otherwise L) | | 1 | 3 | 5 | 9 |
| B5 | Transportation corridors - Roads/ Streets (L) | | 1 | 3 | 5 | 9 |
| B10 | Wells - Water supply (M) | | 3 | 1 | 5 | 9 |

*** = A contaminant potentially associated with this activity has been detected in the water supply.**

# Assessment Summary

**District Name** LPA Yuba County **District No.** 88 **County** Yuba

**System Name** LAKE FRANCIS MUTUAL WATER **System No.** 5800805

**Source Name** WELL 03 **Source No.** 003 **PS Code** 17N/07E-05G02 M

**Completed by** Jodi Bird **Date** October, 2001

## Description of System and Source

The LAKE FRANCIS MUTUAL WATER water system is located in Dobbins - a foothill community 35 miles northeast of Marysville in Yuba County, CA. There are approximately 28 service connections serving a population of 60.

The drinking water source for the LAKE FRANCIS MUTUAL WATER water system is a series of four (4) groundwater wells that are pumped to three (3) steel tanks providing 34,000 gallons of storage capacity. General land use is rural/residential.

## Assessment Procedures

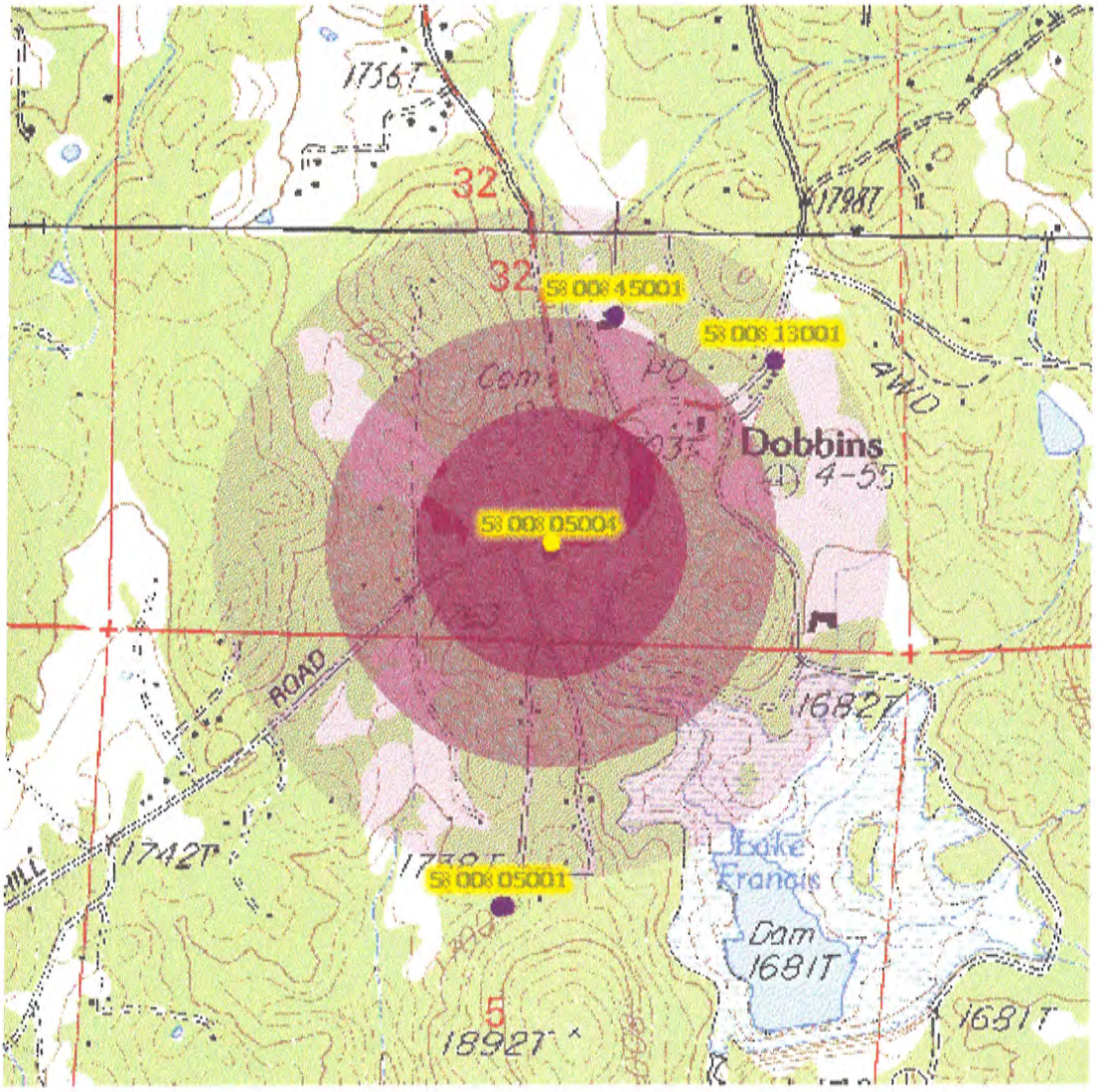
The assessment of the source WELL 01 was conducted by Yuba County Environmental Health Department staff. The following sources of information were used in the assessment: water system files, County records, well drillers logs, and USGS information.

Procedures used to conduct the assessment include:

File review, protection zone calculations, field studies, and contact with the water system operators.

## Contents of this Assessment

| | | |
|---|---|---|
| Yes [X] | No [ ] | **Assessment Summary** |
| Yes [X] | No [ ] | **Vulnerability Summary** |
| Yes [ ] | No [X] | **Source Location Form** |
| Yes [X] | No [ ] | **Delineation of Ground Water Protection Zones** |
| Yes [X] | No [ ] | **Physical Barrier Effectiveness Checklist** |
| Yes [X] | No [ ] | **Well Data Sheet** |
| Yes [X] | No [ ] | **Inventory of Possible Contaminating Activities** |
| Yes [X] | No [ ] | **Vulnerability Ranking** |
| Yes [X] | No [ ] | **Assessment Map** |




**LAKE FRANCIS MUTUAL WATER COMPANY**
**PUBLIC WATER SYSTEM 5800805-003**

# Drinking Water Source Assessment

*Water System*

## LAKE FRANCIS MUTUAL WATER

Yuba County

*Water Source*

## WELL 04

*Assessment Date*

## October, 2001

California Department of Health Services
Drinking Water Field Operations Branch
LPA Yuba County

| | |
|---|---|
| **District No.** | **88** |
| **System No.** | **5800805** |
| **Source No.** | **004** |
| **PS Code** | **17N/07E-32Q02 M** |

# Vulnerability Summary

**District Name** LPA Yuba County **District No.** 88 **County** Yuba

**System Name** LAKE FRANCIS MUTUAL WATER **System No.** 5800805

**Source Name** WELL 04 **Source No.** 004 **PS Code** 17N/07E-32Q02 M

**Completed by** Jodi Bird **Date** October, 2001

**THE FOLLOWING INFORMATION MUST BE INCLUDED IN THE SYSTEM CONSUMER CONFIDENCE REPORT**

A source water assessment was conducted for the **WELL 04**

of the **LAKE FRANCIS MUTUAL WATER** water system in **October, 2001** .

The source is considered most vulnerable to the following activities not associated with any detected contaminants:

Septic systems - low density

A copy of the complete assessment may be viewed at:

Yuba County Environmental Health
938 14th Street
Marysville, CA 95901

You may request a summary of the assessment be sent to you by contacting:

Jodi E. Bird
Water Program Coordinator
(530) 741-6251

# Delineation of Ground Water Protection Zones

**District Name** LPA Yuba County **District No.** 88 **County** Yuba

**System Name** LAKE FRANCIS MUTUAL WATER **System No.** 5800805

**Source Name** WELL 04 **Source No.** 004 **PS Code** 17N/07E-32Q02 M

**Completed by** Jodi Bird **Date** October, 2001

**Method Used to Delineate Protection Zones**

**X 1. Calculated Fixed Radius**

2. Modified Calculated Fixed Radius (Attach documentation for direction of ground water flow.)
3. More Detailed Methods
4. Arbitrary Fixed Radius (For use only by or permission of DHS)

| | | | |
|---|---|---|---|
| Maximum Pumping Rate of Well (Q) | 10 | gallons/minute | |
| | 16 | acre feet/year | |
| | 702,670 | cubic feet/year | |
| Effective Porosity | 0.20 | | [X] Default Value |
| Screened Interval of Well | 10 | feet | [X] Default Value |

| Protection Zone | Calculated Value | Minimum Value | Radius of Protection Zone |
|---|---|---|---|
| Zone A - 2 Year TOT* | 709 Feet | 900 Feet | **900** Feet |
| Zone B5 - 5 Year TOT* | 1,122 Feet | 1,500 Feet | **1,500** Feet |
| Zone B10 - 10 Year TOT* | 1,586 Feet | 2,250 Feet | **2,250** Feet |

# Physical Barrier Effectiveness (PBE)

**District Name** LPA Yuba County **District No.** 88 **County** Yuba

**System Name** LAKE FRANCIS MUTUAL WATER **System No.** 5800805

**Source Name** WELL 04 **Source No.** 004 **PS Code** 17N/07E-32Q02 M

**Completed by** Jodi Bird **Date** October, 2001

| Parameter | Possible Points | This Source | Score |
|---|---|---|---|
| **Type of Aquifer** **Confinement** | | | |
| 1. Unconfined, Semi-confined, Fractured Rock, Unknown Aquifer | 0 | X | 0 |
| 2. Confined | 50 | | |
| **Aquifer Material (Unconfined Aquifers)** **Type of material within aquifer** | | | |
| 1. Porous Media (Interbedded sands, silts, clays, gravels) with continuous clay layer minimum 25' thick above water table within Zone A | 20 | | |
| 2. Porous Media (Interbedded sands, silts, clays, gravels) | 10 | | |
| 3. Fractured rock ( Low Physical Barrier Effectiveness - no further questions required) | 0 | X | 0 |

| Score | Effectiveness |
|---|---|
| 0 to 35 | Low |
| 36 to 69 | Moderate |
| 70 to 100 | High |

**Score** 0

**Effectiveness** Low

# Inventory of Possible Contaminating Activities (PCA Inventory)

**District Name** LPA Yuba County **District No.** 88 **County** Yuba

**System Name** LAKE FRANCIS MUTUAL WATER **System No.** 5800805

**Source Name** WELL 04 **Source No.** 004 **PS Code** 17N/07E-32Q02 M

**Completed by** Jodi Bird **Date** October, 2001

| PCA (Risk Ranking) | PCA in Zone A | PCA in Zone B5 | PCA in Zone B10 | * | Comments |
|---|---|---|---|---|---|
| **Residential/Municipal** | | | | | |
| Airports - Maintenance/ fueling areas (VH) | N | N | N | | |
| Landfills/dumps (VH) | N | N | N | | |
| Railroad yards/ maintenance/ fueling areas (H) | N | N | N | | |
| Septic systems - high density (>1/acre) (VH if in Zone A, otherwise M) | N | N | N | | |
| Sewer collection systems (H, if in Zone A, otherwise L) | N | N | N | | |
| Utility stations - maintenance areas (H) | N | N | N | | |
| Wastewater treatment plants (VH in Zone A, otherwise H) | N | N | N | | |
| Drinking water treatment plants (M) | N | N | N | | |
| Golf courses (M) | N | N | N | | |
| Housing - high density (>1 house/0.5 acres) (M) | N | N | N | | |
| Motor pools (M) | N | N | N | | |
| Parks (M) | N | N | N | | |
| Waste transfer/recycling stations (M) | N | N | N | | |
| Apartments and condominiums (L) | N | N | N | | |
| Campgrounds/ Recreational areas (L) | N | Y | Y | | |
| Fire stations (L) | N | N | N | | |
| RV Parks (L) | N | Y | Y | | |
| Schools (L) | N | N | Y | | |
| Hotels, Motels (L) | N | N | N | | |
| **Agricultural/Rural** | | | | | |
| Grazing (> 5 large animals or equivalent per acre) (H in Zone A, otherwise M) | N | N | N | | |
| Concentrated Animal Feeding Operations (CAFOs) as defined in federal regulation1 (VH in Zone A, otherwise H) | N | N | N | | |
| Animal Feeding Operations as defined in federal regulation2 (VH in Zone A, otherwise H) | N | N | N | | |
| Other Animal operations (H in Zone A, otherwise M) | N | N | N | | |

**Y = Yes N = No U = Unknown**
*** = A contaminant potentially associated with this activity has been detected in the water supply.**

# Inventory of Possible Contaminating Activities (PCA Inventory)

**System Name** LAKE FRANCIS MUTUAL WATER **System No.** 5800805

**Source Name** WELL 04 **Source No.** 004 **PS Code** 17N/07E-32Q02 M

| PCA (Risk Ranking) | PCA in Zone A | PCA in Zone B5 | PCA in Zone B10 | * | Comments |
|---|---|---|---|---|---|
| **Agricultural/Rural** | | | | | |
| Farm chemical distributor/ application service (H) | N | N | N | | |
| Farm machinery repair (H) | N | N | N | | |
| Septic systems - low density (<1/acre) (H in Zone A, otherwise L) | **Y** | **Y** | **Y** | | |
| Lagoons / liquid wastes (H) | N | N | N | | |
| Machine shops (H) | N | N | N | | |
| Pesticide/fertilizer/ petroleum storage & transfer areas (H) | N | N | N | | |
| Agricultural Drainage (H in Zone A, otherwise M) | N | N | N | | |
| Wells - Agricultural/ Irrigation (H) | N | N | N | | |
| Managed Forests (M) | N | N | N | | |
| Crops, irrigated (Berries, hops, mint, orchards, sod, greenhouses, vineyards, nurseries, vegetable) (M) | N | N | N | | |
| Fertilizer, Pesticide/ Herbicide Application (M) | N | N | N | | |
| Sewage sludge/biosolids application (M) | N | N | N | | |
| Crops, nonirrigated (e.g., Christmas trees, grains, grass seeds, hay, pasture) (L) (includes drip-irrigated crops) | N | N | N | | |
| **Other** | | | | | |
| NPDES/WDR permitted discharges (H) | N | N | N | | |
| Underground Injection of Commercial/Industrial Discharges (VH) | N | N | N | | |
| Historic gas stations (VH) | N | N | **Y** | | |
| Historic waste dumps/ landfills (VH) | N | N | N | | |
| Illegal activities/ unauthorized dumping (H) | N | N | N | | |
| Injection wells/ dry wells/ sumps (VH) | N | N | N | | |
| Known Contaminant Plumes (VH) | N | N | N | | |
| Military installations (VH) | N | N | N | | |
| Mining operations - Historic (VH) | N | N | N | | |
| Mining operations - Active (VH) | N | N | N | | |
| Mining - Sand/Gravel (H) | N | N | N | | |
| Wells - Oil, Gas, Geothermal (H) | N | N | N | | |
| Salt Water Intrusion (H) | N | N | N | | |

**Y = Yes N = No U = Unknown**
*** = A contaminant potentially associated with this activity has been detected in the water supply.**

# Inventory of Possible Contaminating Activities (PCA Inventory)

**System Name** LAKE FRANCIS MUTUAL WATER **System No.** 5800805

**Source Name** WELL 04 **Source No.** 004 **PS Code** 17N/07E-32Q02 M

| PCA (Risk Ranking) | PCA in Zone A | PCA in Zone B5 | PCA in Zone B10 | * | Comments |
|---|---|---|---|---|---|
| **Other** | | | | | |
| Recreational area - surface water source (H) | N | N | N | | |
| Underground storage tanks - Confirmed leaking tanks (VH) | N | N | N | | |
| Underground storage tanks - Decommissioned - inactive tanks (L) | N | N | **Y** | | |
| Underground storage tanks - Non-regulated tanks (tanks smaller than regulatory limit) (H) | N | N | N | | |
| Underground storage tanks - Not yet upgraded or registered tanks (H) | N | N | **Y** | | |
| Underground storage tanks - Upgraded and/or registered - active tanks (L) | N | N | N | | |
| Above ground storage tanks (M) | N | N | N | | |
| Wells - Water supply (M) | **Y** | **Y** | **Y** | | |
| Construction/demolition staging areas (M) | N | N | N | | |
| Contractor or government agency equipment storage yards (M) | N | N | N | | |
| Dredging (M) | N | N | N | | |
| Transportation corridors - Freeways/state highways (M) | N | N | N | | |
| Transportation corridors - Railroads (M) | N | N | N | | |
| Transportation corridors - Historic railroad right-of-ways (M) | N | N | N | | |
| Transportation corridors - Road Right-of-ways (herbicide use areas) (M) | N | N | N | | |
| Transportation corridors - Roads/ Streets (L) | **Y** | **Y** | **Y** | | |
| Hospitals (M) | N | N | N | | |
| Storm Drain Discharge Points (M) | N | N | N | | |
| Storm Water Detention Facilities (M) | N | N | N | | |
| Artificial Recharge Projects - Injection wells (potable water) (L) | N | N | N | | |
| Artificial Recharge Projects - Injection wells (non-potable water) (M) | N | N | N | | |
| Artificial Recharge Projects - Spreading Basins (potable water) (L) | N | N | N | | |
| Artificial Recharge Projects - Spreading Basins | N | N | N | | |

**Y = Yes N = No U = Unknown**
*** = A contaminant potentially associated with this activity has been detected in the water supply.**

# Inventory of Possible Contaminating Activities (PCA Inventory)

**System Name** LAKE FRANCIS MUTUAL WATER **System No.** 5800805

**Source Name** WELL 04 **Source No.** 004 **PS Code** 17N/07E-32Q02 M

| PCA (Risk Ranking) | PCA in Zone A | PCA in Zone B5 | PCA in Zone B10 | * | Comments |
|---|---|---|---|---|---|
| **Other** | | | | | |
| (non-potable water) (M) | | | | | |
| Medical/dental offices/clinics (L) | N | N | N | | |
| Veterinary offices/clinics (L) | N | N | N | | |
| Surface water - streams/ lakes/rivers (L) | N | N | Y | | |
| Wells - monitoring, test holes (L) | N | N | N | | |

**Y = Yes N = No U = Unknown**
*** = A contaminant potentially associated with this activity has been detected in the water supply.**

# Vulnerability Ranking

**District Name** LPA Yuba County **District No.** 88 **County** Yuba

**System Name** LAKE FRANCIS MUTUAL WATER **System No.** 5800805

**Source Name** WELL 04 **Source No.** 004 **PS Code** 17N/07E-32Q02 M

**Completed by** Jodi Bird **Date** October, 2001

| Zone | PCA (Risk Ranking) | * | PCA Risk Points | Zone Points | PBE Points | Vulnerability Score |
|---|---|---|---|---|---|---|
| A | Septic systems - low density (<1/acre) (H in Zone A, otherwise L) | | 5 | 5 | 5 | 15 |
| A | Wells - Water supply (M) | | 3 | 5 | 5 | 13 |
| B10 | Historic gas stations (VH) | | 7 | 1 | 5 | 13 |
| A | Transportation corridors - Roads/ Streets (L) | | 1 | 5 | 5 | 11 |
| B5 | Wells - Water supply (M) | | 3 | 3 | 5 | 11 |
| B10 | Underground storage tanks - Not yet upgraded or registered tanks (H) | | 5 | 1 | 5 | 11 |
| B5 | Campgrounds/ Recreational areas (L) | | 1 | 3 | 5 | 9 |
| B5 | RV Parks (L) | | 1 | 3 | 5 | 9 |
| B5 | Septic systems - low density (<1/acre) (H in Zone A, otherwise L) | | 1 | 3 | 5 | 9 |
| B5 | Transportation corridors - Roads/ Streets (L) | | 1 | 3 | 5 | 9 |
| B10 | Wells - Water supply (M) | | 3 | 1 | 5 | 9 |

*** = A contaminant potentially associated with this activity has been detected in the water supply.**

# Assessment Summary

**District Name** LPA Yuba County **District No.** 88 **County** Yuba

**System Name** LAKE FRANCIS MUTUAL WATER **System No.** 5800805

**Source Name** WELL 04 **Source No.** 004 **PS Code** 17N/07E-32Q02 M

**Completed by** Jodi Bird **Date** October, 2001

## Description of System and Source

The LAKE FRANCIS MUTUAL WATER COMPANY water system is located in Dobbins - a foothill community 35 miles northeast of Marysville in Yuba County, CA. There are approximately 26 service connections serving a population of 60.

The drinking water source for the LAKE FRANCIS MUTUAL WATER COMPANY water system is a series of four (4) groundwater wells that are pumpted to three (3) steel tanks that provide 34,000 gallons of storage capacity. General land use is rural/residential.

## Assessment Procedures

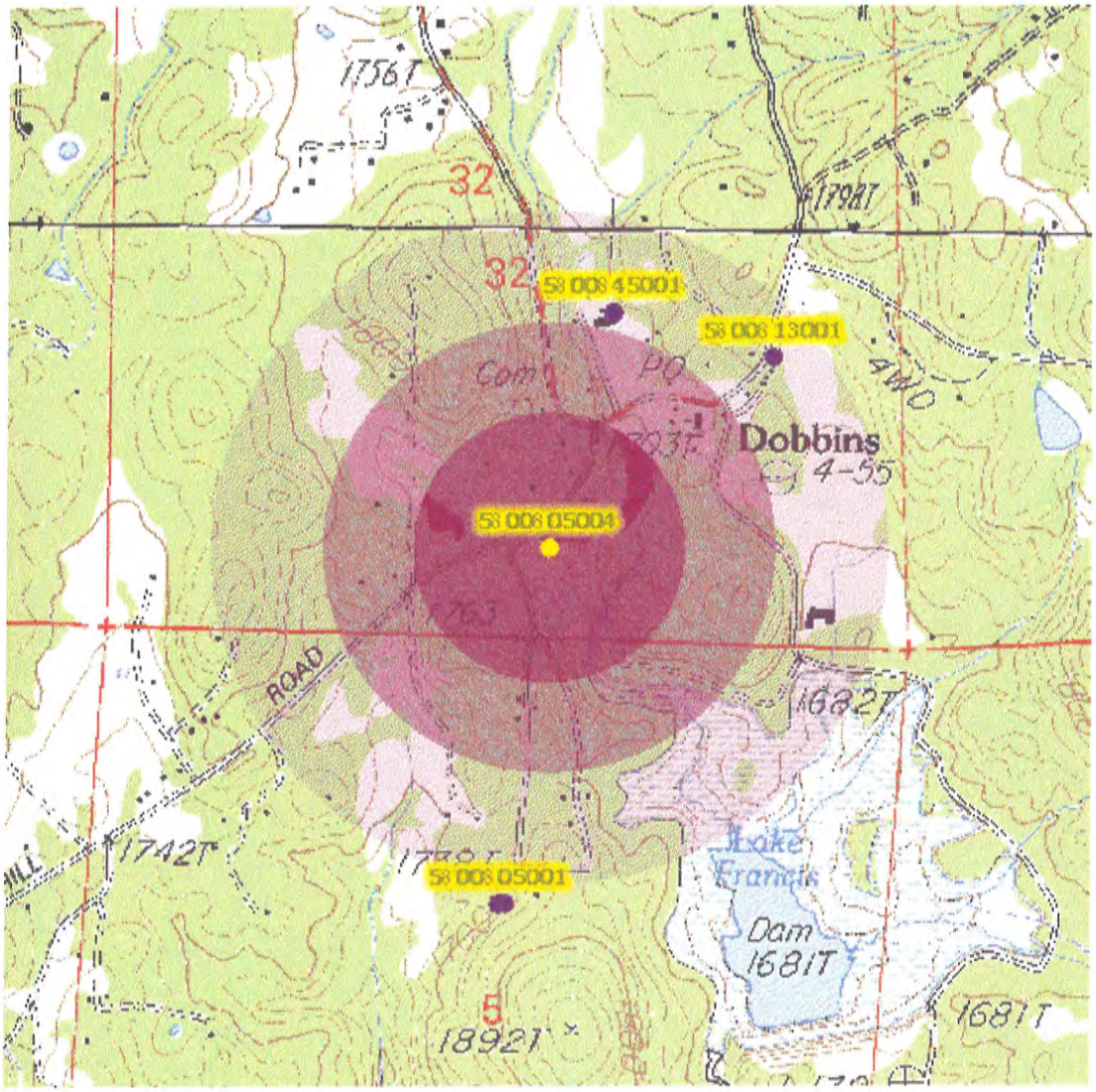
The assessment of the source WELL 01 was conducted by Yuba County Environmental Health Department staff. The following sources of information were used in the assessment: water system files, County records, well drillers logs, and USGS information.

Procedures used to conduct the assessment include:

File review, protection zone calculations, field studies, and contact with the water system operators.

## Contents of this Assessment

| | | |
|---|---|---|
| Yes [X] | No [ ] | **Assessment Summary** |
| Yes [X] | No [ ] | **Vulnerability Summary** |
| Yes [ ] | No [X] | **Source Location Form** |
| Yes [X] | No [ ] | **Delineation of Ground Water Protection Zones** |
| Yes [X] | No [ ] | **Physical Barrier Effectiveness Checklist** |
| Yes [X] | No [ ] | **Well Data Sheet** |
| Yes [X] | No [ ] | **Inventory of Possible Contaminating Activities** |
| Yes [X] | No [ ] | **Vulnerability Ranking** |
| Yes [X] | No [ ] | **Assessment Map** |




**LAKE FRANCIS MUTUAL WATER COMPANY**
**PUBLIC WATER SYSTEM 5800805-004**