

Clear Lake Information Order: How to Measure Groundwater Extractions

If you receive the Clear Lake Information Order,¹ you are required to measure and report your weekly groundwater extraction volumes² from March 1, 2024, through July 31, 2024, using a method acceptable to the State Water Resources Control Board (Board). This document outlines the two methods the Board has identified as acceptable for measuring groundwater extraction volumes.³

Totalizer Method

A totalizer is a device that is permanently attached to a well and keeps a running total of how much water is extracted from the well, like an odometer in a car. This is the simplest way to measure weekly groundwater extraction volumes. Totalizers may be built into a flow meter or a separate device. Three examples of totalizers are shown below:



Using the Totalizer method to measure weekly groundwater extraction volumes:

1. Record the totalizer's volume reading at the start of the week.
2. Record the totalizer's volume reading at the end of the week.
3. Subtract the start volume from the end volume. The difference is the total volume extracted for that week. Some systems can do this calculation automatically.

Example: If the volume reading at the start of the week is 300,342 gallons and the volume reading at the end of the week is 745,222 gallons, the total volume extracted for that week would be 453,880 gallons (745,222 gallons - 300,342 gallons = 444,880 gallons).

Tracking:

A reporting log for the Totalizer Method is available at the end of this document.

¹ The Clear Lake Information Order means [State Water Resources Control Board Order 2024-0003-DWR: Information Order and Reporting Requirements in the Matter of the Clear Lake Watershed](#).

² Groundwater extraction volumes must be measured and reported by well for each well you own or operate on the parcels identified in the Clear Lake Information Order.

³ The State Water Resources Control Board's Division of Water Rights identified the two methods outlined in this document as acceptable for measuring groundwater extraction volumes for the specific purposes of the Clear Lake Information Order.

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Run Time Method

For wells without a totalizer, you can estimate weekly groundwater extraction volumes if you know the well's Run Time and Flow Rate. Run Time is the amount of time the well is on. Flow Rate is the amount of water produced by the well over time, such as gallons per minute (GPM).

Using the Run Time method to estimate weekly groundwater extraction volumes:

1. Record the well pump's Run Time for the entire week using an hour meter or manual log as described in the *How to Measure Run Time* section below.
2. Record the well pump's Flow Rate using one of the procedures described in the *How to Obtain Flow Rate* section below.
3. Multiply the Run Time for the week by the Flow Rate. The result is the total volume used for that week.

Example:

If the pump's Run Time for the week is 16.5 hours (hrs), which equals 990 minutes (mins) (16.5 hrs x 60 mins per hour = 990 mins), and the pump's Flow Rate is 250 gallons per minute (GPM), the total volume extracted for the week is 247,500 gallons (990 mins x 250 GPM = 247,500 gallons).

Note: The measurement units you use for Run Time and Flow Rate must be compatible. Often, Run Time is recorded in hours and Flow Rate is recorded in gallons per minute (GPM). The easiest way to make these compatible is to convert hours to minutes before completing step three (above) as detailed in the following example.

How to Measure Run Time

You can measure Run Time with (A) an hour meter or (B) a manual record:

(A) Hour Meter: An hour meter (also known as a pump run time meter) is permanently attached to the pump and keeps a running total of how much time the well pump is running, like a car's odometer. Two examples are shown below:



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How to measure weekly Run Time with an hour meter:

1. Record the hour meter's hour reading at the start of the week.
2. Record the hour meter's hour reading at the end of the week.
3. Subtract the start hour from the end hour. The difference is the total run time for that week in hours.

Example:

If the hour reading at the start of the week is 46.2 hrs and the hour reading at the end of the week is 61.1 hrs, the total run time for that week would be 14.9 hrs (61.1 hrs - 46.2 hrs = 14.9 hrs), or 894 minutes (14.9 hrs x 60 mins per hour = 894 mins).

Tracking:

An hour meter reporting log for the Run Time method is available at the end of this document.

(B) Manual Record: For wells that are not equipped with an hour meter, you can keep a written record of the pump's operation for the week.

Steps for using a Manual Record to measure weekly Run Time:

1. Each time you turn the pump on and off during the week, record the date and time in a log. A sample manual log for the Run Time Method is available at the end of this document.
2. Use these dates and times to calculate the amount of time the pump was running during the week.

Example:

On Monday, the pump ran from 5 a.m. to 12 p.m., which equals 7 hrs. On Thursday, the pump ran from 7 a.m. to 4:45 p.m., which equals 9.75 hrs. The pump did not run during the rest of the week. This means the pump ran for a total of 16.75 hrs (7 hrs + 9.75 hrs = 16.75 hrs), or 1,005 mins (16.75 hrs x 60 mins per hour = 1,005 mins).

Tracking:

A manual reporting log for the Run Time Method is available at the end of this document.

How to Obtain Flow Rate

You can obtain the Flow Rate of a well using a flowmeter, pump efficiency test, or maximum pumping rate as described below:

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- **Flowmeter:** A flowmeter automatically tracks the well's Flow Rate, like a car's speedometer, and provides the reading on a screen or faceplate.
- **Pump Efficiency Test:** A pump efficiency test measures various aspects of a pump's operation, including Flow Rate. The test is often performed when the pump is first installed but can be performed at any time.
- **Maximum Pumping Rate:** If a flowmeter is not installed and a pump efficiency test is not available, you can use the pump's maximum pumping rate for Flow Rate. This information is typically available from the pump manufacturer. This is the least reliable method for obtaining flow rate.

Because Flow Rate can fluctuate over time, you should measure flow rate periodically and use the most recent Flow Rate when estimating extraction volumes for each week.

Other Approaches

There may be other approaches for measuring or estimating groundwater extraction volumes. If you want to use a different approach, it must be acceptable to the Deputy Director of the Division of Water Rights. The Deputy Director will evaluate each approach on a case-by-case basis. All requests for different measurement approaches must be emailed to ClearLakeHitch@waterboards.ca.gov by February 21, 2024.

**Images used in this document are for illustration purposes only. Their inclusion does not constitute endorsement, recommendation, or favoring by the State Water Board.*

Reporting Logs

The reporting logs on pages 5, 6, and 7 of this document were designed to help you track your weekly groundwater extraction volumes. You are not required to use these logs.

Questions

If you have questions about measuring your weekly groundwater extraction volumes, please email clearlakehitch@waterboards.ca.gov or call 916-341-5355.

Last Updated: February 5, 2024

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TOTALIZER METHOD REPORTING LOG

Well Name:
Measurement Units:

Week	Start Date	Start Volume (SV)	End Date	End Volume (EV)	Total Volume (TH=EV-SV)	Notes
Example	03/01/24	300,342 gallons	03/03/24	745,222 gallons	444,880 gallons	This is an example.
1	03/01/24		03/03/24			
2	03/04/24		03/10/24			
3	03/11/24		03/17/24			
4	03/18/24		03/24/24			
5	03/25/24		03/31/24			
6	04/01/24		04/07/24			
7	04/08/24		04/14/24			
8	04/15/24		04/21/24			
9	04/22/24		04/28/24			
10	04/29/24		05/05/24			
11	05/06/24		05/12/24			
12	05/13/24		05/19/24			
13	05/20/24		05/26/24			
14	05/27/24		06/02/24			
15	06/03/24		06/09/24			
16	06/10/24		06/16/24			
17	06/17/24		06/23/24			
18	06/24/24		06/30/24			
19	07/01/24		07/07/24			
20	07/08/24		07/14/24			
21	07/15/24		07/21/24			
22	07/22/24		07/28/24			
23	07/29/24		07/31/24			

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HOUR METER REPORTING LOG

Well Name:

Week	Start Date	Start Hour (SH)	End Date	End Hour (EH)	Total Hours (TH=EV-SV)	Total Minutes (TM=THx60)	Flow Rate in GPM (FR)	Total Volume (TV=TMxFR)	Notes
Example	03/01/24	46.2 hrs	03/03/24	61.1 hrs	14.9 hrs	894 mins	250 GPM	223,500 gallons	This is an example.
1	03/01/24		03/03/24						
2	03/04/24		03/10/24						
3	03/11/24		03/17/24						
4	03/18/24		03/24/24						
5	03/25/24		03/31/24						
6	04/01/24		04/07/24						
7	04/08/24		04/14/24						
8	04/15/24		04/21/24						
9	04/22/24		04/28/24						
10	04/29/24		05/05/24						
11	05/06/24		05/12/24						
12	05/13/24		05/19/24						
13	05/20/24		05/26/24						
14	05/27/24		06/02/24						
15	06/03/24		06/09/24						
16	06/10/24		06/16/24						
17	06/17/24		06/23/24						
18	06/24/24		06/30/24						
19	07/01/24		07/07/24						
20	07/08/24		07/14/24						
21	07/15/24		07/21/24						
22	07/22/24		07/28/24						
23	07/29/24		07/31/24						

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Well:

MANUAL RUN TIME LOG

Pump Turned On		Pump Turned Off		Hours On	Minutes On	Notes
Date	Time	Date	Time			
3/1/2024	5:00 a.m.	3/1/2024	12:00 p.m.	7 hrs	420 mins	This is an example.
3/2/2024	7:00 a.m.	3/2/2024	4:45 p.m.	9.75 hrs	585 mins	This is an example.
Total Minutes On for the Week (Run Time)						
Flow Rate in gallons per minute (Flow Rate)						
Total Extractions for the Week (Run Time x Flow Rate)						