

Community Groundwater Level Monitoring

Groundwater Level Measurement: Goals for Scientifically Useful Data

1. Measure at wells with well log(s) having construction & sub-surface geology data
2. Measure at wells with OWRD well ID tags (existing or project established)
3. Measure a static groundwater level (the most useful measurement)
4. Measure to the nearest 1/100th foot to confirm measurement & static level
5. Measure 4 times minimum to confirm measurement & static level
6. Confirm measurement is a true groundwater level, not a false measurement
7. Document measurement completely on Water Level Data Sheet
8. Submit Water Level Data Sheet for QA/QC review and database entry
9. Keep a Water Level Data Sheet copy for own file

Community Groundwater Level Monitoring

Groundwater Level Measurement: Step by Step

1. Know the well that is being measured
 - Its well log(s) having construction, sub-surface geology, & water level data
 - Its well identification (well tag) number
 - Its use: domestic, stock, irrigation, community, other
 - Its pump type and set-up
 - Its measuring point(s) & measuring point height(s)
 - Its previous groundwater level measurements (to assess this measurement)
 - Its previous hang-up, obstacle, sticking, & false reading issue history
2. Bring the basic tools
 - Co-axial e-tape, flat e-tape (bring at least 1 spare co-axial e-tape)
 - Engineer's tape measure with 1 ft., 1/10th ft., & 1/100th ft. increments
 - Bleach, water, & spray bottle for sanitizing equipment
 - Extra copper weights and rubber tubing for replacing e-tape weights
 - Hand tools
3. Turn off pump before measurement (prefer off 2 or more hours)
4. Conduct the groundwater level measurement
 - a. Test the water level meter (turn switch to test)
 - b. Turn water level meter switch to buzz
 - c. Turn sensitivity switch completely to the right
 - d. Slowly lower e-tape line down the well (no free fall)
 - e. Check feel of e-tape line with each lower (increasing weight)
 - f. Lower line until meter indicates water or line becomes hung-up
 - If hung-up, line weight does not change, slowly raise the line 2 or more feet, bounce the line, and slowly lower again (repeat until line weight increases at and past hang-up depth)
 - If the meter indicates water, be sure it is a real water level contact (steady buzz from that depth down), not cascading water, moisture on well or liner wall, or well equipment shorting the probe (unsteady buzz or buzz ends after that depth)
 - g. For a real water level contact:
 - Set the meter reel down
 - Grab the line at the measuring point
 - Measure water level & record on Water Level Data Sheet
 - Repeat measurement & recording data at 1-minute intervals 3 or more times to confirm static level (repeat more for falling or rising level)
 - h. Calculate depth to water below land surface on Water Level Data Sheet
 - i. Compare calculated depth to previous measurements for reasonableness
 - j. Slowly rewind e-tape line onto e-tape reel (can get stuck during rewind)
 - k. Turn water level meter off and sanitize it with diluted chlorine bleach
 - l. Secure well & measuring point
 - m. Turn pump on again if on before measurement

Obstacles in Well: What to do when hung-up

1. Gently shake the line free (do not yank the line).
2. If unable to free line, pull line up slowly to release the attached line weights.
3. Note the "hand-hold-point" if unable to free line or weights & strong pull is needed (strong pull may stretch the line).
4. Use back-up e-tape for additional measurements.
5. Recalibrate e-tape line after strong pull and/or remove & discard affected section of e-tape line and/or replace the e-tape with new e-tape.

Community Groundwater Level Monitoring Well Information Sheet

Well Name: _____ Well Tag No.: _____

Completed By: _____ Date: _____ Well Log ID No.: _____

Well Location:

Well Address: _____

Directions to Well: _____

County: _____

Tax Lot No.: _____

Township: _____ N or S

Range: _____ E or W

Section: _____

Please enter the GPS location for the well, if available.

Please draw a sketch of the well location here:



N

Degrees / Minutes / Seconds

Latitude (N)

 °

 '

 "

Longitude (W)

 °

 '

 "

Decimal Degrees

Latitude (N)

Longitude (W)

Please attach map showing well location and photo(s) of the well, if available

Map: ☐ Tax Lot ☐ Google Earth ☐ USGS Quad ☐ Other _____
(1:24,000)

Please attach photo(s) of the well, if available

Well Use and History:

Use: ☐ Unused ☐ Domestic ☐ Irrigation ☐ Industrial ☐ Community ☐ Other _____

Pump Type: ☐ None ☐ Submersible ☐ Turbine ☐ Other _____

Pump Depth: _____ Well Depth: _____ Casing Diameter: _____

Enter all well logs connected to the well (include well logs for deepening, reconditioning, or other well alterations).

Well Log Number	Well Log Type	Date Well Completed	Owner Name on Well Log

Property/Well Owner:

Name: _____ Phone (H): _____

Address: _____ Phone (W): _____

City / State / Zip: _____ Phone Cell: _____

Email: _____

Well Information Sheet General Procedures & Explanations

General Procedures

- One sheet per well.
- Send copies of each Well Information Sheet for each well to the designated coordinator.
- Keep copies of each form, map(s), photos, and water well report(s) (well logs) for your files.
- Well deepening, reconstruction, alteration, and other driller activity is important information. Note all of these activities and the associated driller water well reports (well logs).

Field Explanations

- **Well name:** A convenient name to use for reference. For example, Carter's southern irrigation well.
- **Well Tag No.:** The well tag on the well, as verified in the field (not always the well tag reported on the driller's water well report, "well log").
- **Completed By:** The person who completed the Well Information Sheet (first and last name (not initials). It should be the same person who visited the well, and it should be completed during the well visit.
- **Date:** The date the Well Information Sheet was completed.
- **Well Log ID No.:** The OWRD assigned well log ID (county and number) for the original or earliest driller water well report found for the well.
- **Well Address:** The actual street address of the well location. When there is no actual street address, use the road name and the distance (0.1 mile accuracy) from the nearest mile post (note the milepost number) to the gate or other drivable access entrance to the well.
- **Directions to Well:** For example, well is located in white 4'x4' well house about 75 feet southeast of the southeast corner of house. If the well is remote, road and off-road directions with distances to the nearest 0.1 mile should be included to help others find the well.
- **County:** The actual county the well is located in.
- **Tax Lot No.:** The tax lot the well is located in.
- **Township/Range/Section:** Township, range, section the well is located in. If a GPS or surveyed location is used, the TRS location should be determined after plotting the well using GIS.
- **Well Location Sketch:** A sketch and/or attached photos is needed to show the location of the well relative to houses, barns, driveways, etc.
- **Latitude (N):** GPS latitude of well location in Degrees/Minutes/Seconds or Decimal Degrees (at least 5 decimal places).
- **Longitude (W):** GPS longitude of well location in Degrees/Minutes/Seconds or Decimal Degrees (at least 5 decimal places). Note: Longitude is a negative number for all locations west of the Prime (Greenwich) Meridian.
- **Map attachments:** All useful paper and/or digital maps showing well location.
- **Use:** Principal use of the well at time of completing the Well Information Sheet.
- **Pump type:** Type of pump in the well at time of completing the Well Information Sheet.
- **Pump Depth:** Well owners and/or pump installers often have information on pump depth.
- **Well Depth:** Typically from the driller's water well report ("well log").
- **Casing Diameter:** As measured in the field – not from the Well Log.
- **Well Log Information:** The original and subsequent driller water well reports ("well logs") documenting the original well construction and subsequent work conducted by a driller at the well (deepening, reconstruction, alteration, and other driller activity).
- **Property/Well Owner:** Property/well owner and their contact information at the time of completing the Well Information Sheet.

Community Groundwater Level Monitoring

Water Level Data Sheet

(Use single sheet per well visit)

Well Name/Owner _____

Well Tag No. _____

Measuring Points (MP): Please update if the measuring point changes.

Month/ Day /Year	feet +/- land surface*	Description

* feet above (+) or below (-) land surface.

Measuring Point Sketch:

Water Levels:

Month	Day	Year	Time (24 hr.)	HOLD (Coaxial Tape)	CUT (Coaxial Tape)	Tape Missing (-)	Water Level Below MP (=)	MP Correction (+) or (-)	Water Level Below Land Surface (=)	Well Status*	Pump Idle Time	Measured By:

Water Level Comments: (Please note the date and any conditions that affected the water level measurements.)

* **Status:** **S** = Static, **R** = Rising, **P** = Pumping, **F** = Flowing, **D** = Falling

Water Level Data Sheet General Procedures & Explanations

Water Level Data Sheet General Procedures

- All wells with water-level measurements must be inventoried using the Well Information Sheet. Water levels for wells not having a corresponding Well Information Sheet will not be entered into OWRD databases. Fill out a corresponding Well Information Sheet for this well if one does not exist.
- Use one Water Level Data Sheet per well per visit
- Document at least 4 measurements at 1-minute minimum intervals to establish a static groundwater level measurement.
- If the groundwater level is not static, stay at the well long enough for a static groundwater level. If that wait is more than 1-hour or not possible, make 10 or more measurements at 1-minute minimum intervals to document the rate of groundwater level rise or fall per 5-minutes for the non-static measurements. If necessary, use additional sheets to document all the measurements. Document possible reason for rise or fall in the comment section.
- Send copies of each Water Level Data Sheet for each well to the designated coordinator at the designated times.
- Keep copies of each data sheet for your files.

Water Level Data Sheet Field Explanations

- **Well Name/Owner:** Copy from Well Information Sheet.
- **Well tag No.:** Well tag number on well as verified in field. Copy from Well Information Sheet.
- **Measuring Points:** The measuring point, or MP, is a referenced point on the well from which the water level measurement is made. This is commonly an access port in the well seal or an angled port pipe welded onto the side of the casing. **In all cases, the measuring point needs to be documented with a description and a sketch (or attached photos).** The sketch and/or photos should show the relation between the MP, the well seal, land surface and, other pertinent features. If a new measuring point is established, the description and sketch should indicate how it is related to the old MP (For example, MP #2 is top lip of steel nipple in ½ inch access port at 2.75 inches above MP #1).
- **MP Month/Day/Year:** Date measuring point was established (use mm/dd/yyyy format).
- **MP feet +/- land surface:** Distance in decimal feet to the nearest 1/100th foot from MP to land surface. By convention, an MP above land surface is positive (+); below land surface is negative (-).
- **Water Levels:** Fields for water-level measurements are designed to document measurement procedures and to help minimize math errors. Measurement data should be filled in from left to right on a row. Plus (+) signs should be used before numbers that are to be added; minus (-) signs should be used before numbers that are to be subtracted. By convention, water levels below land surface are designated as positive numbers (+); water levels above land surface are designated as negative (-) numbers.
- **Month/Day/Year:** Date of measurement (use mm/dd/yyyy format).
- **Time:** Time of measurement (hh:mm). 24 hour format (example 8:00am = 08:00; 2:00pm = 14:00).
- **Hold:** Hold is reported for coaxial e-tape or steel tape measurements.
- **Cut:** Cut is reported for e-tape or steel tape measurements to the nearest 1/100th foot. It is 0.00 ft. for flat e-tape measurements.
- **Tape Missing:** The amount of tape missing from your reel if you have an incomplete spool.
- **Water Level Below MP:** The calculated water level below measuring point to the nearest 1/100th foot.
- **MP corr:** Measuring point correction to the nearest 1/100th foot. If the measuring point is +2.14 feet above land surface, the MP correction is -2.14 feet.
- **Water Level Below Land Surface:** Water level below land surface datum to the nearest 1/100th foot (Water Level Below MP – MP Correction).
- **Well Status:** Status reflects the behavior of the water in the well at the time of the measurement (static, rising, falling), and it also reflects the status of the pump.
- **Measured by:** The name of the person who made the measurement (first and last name, not initials).
- **Comments:** Comments are encouraged to document any conditions that might affect water levels or their interpretation. For example, well not used for last 6 months; pumped heavily this morning; cascading water; nearby well (1000 ft away) pumping @ 250 gpm; well cycling on for 30 seconds every 15 minutes.