COMMONWEALTH OF VIRGINIA
DEPARTMENT OF ENVIRONMENTAL QUALITY
GW-2 / UNIFORM WATER WELL COMPLETION REPORT FORM GUIDANCE
GW-5 / WELL ABANONMENT FORM GUIDANCE

Section § 62.1-258 of the Code of Virginia requires that private wells constructed in a groundwater management area be registered with the Board by the certified well water system provider within 30 days of the completion of well construction. This section requires registration of private wells as specified in law by submission of a form to be provided by the Department and provides the minimum information needed by the Department for registration purposes.

This document has been created in coordination with the Virginia Department of Health to provide clarification and assist any certified water well system provider in completing the form completely and accurately.

Header Information:

Provide the appropriate identification number for any well that has been assigned a unique identification number by one or all of the following State and Federal Agencies.

DEQ Well # - Virginia Department of Environmental Quality, well number
USGS Local # - United States Geologic Survey Local, well number
VDH HDIN # - Virginia Department of Health Identification Number
For private wells, you must include the VDH HDIN exactly as shown on the private well construction permit issued to the owner by the local health department
VDH PWSID # - Virginia Department of Health Public Water Supply Identification Number

1. Contact Information

Provide contact information for the following three individuals (Owner, Driller and System Provider).

Owner - the owner of the property where the well is being constructed.
Driller - the Company, Business or Legal entity who is drilling the well.
System Provider - the Certified Water Well System Provider whom will be certifying the form.

2. Well Location

Physical Location – use the 911 street address not a post office box or name of neighborhood. In cases where there is no 911 address associated with the well location then provides a physical description of the site.

- Example: For a pivot well in a field you may need to put intersection of two roads or the physical address of the farm and provide expanded description in Physical Location Description at the end of this section.

County/City – provide either the county or city the well is located in.
Subdivision Name - if the property where the well is being constructed is in a subdivision provide the subdivision name and the appropriate Section, Block and Lot number.
Tax Map/GPIN# - provide the property tax map or Grid Parcel Identification Number (GPIN) as shown on the private well construction permit issued to the owner by the local health department.
Latitude and Longitude – geographic coordinates that specify precise locations (north-south/latitude, east-west/longitude) on the earth.
Datum Source – a datum is a model of the earth that is used in mapping. There are a large number of geodetic datum's in use and therefore, identifying the datum used in acquiring location information allows for appropriate conversion of the data to ensure location accuracy.
Horizontal – a collection of specific points on the Earth that have been identified according to their precise northerly or southerly location (latitude) and easterly or westerly location (longitude) (National Geodetic Survey, 1986).

- WGS84 - World Geodetic System 1984 is an earth centered, Earth fixed terrestrial reference system and geodetic datum WGS84 is the standard U.S. Department of Defense definition of a global reference system for geospatial information and is the reference system for the Global Positioning System (GPS).

- NAD83 - the North American Datum 1983 (NAD83) is a geocentric datum that was established in 1986 for the United States, Canada, Mexico, Central America and the Caribbean Islands. Hawaii and Greenland were also connected to this datum.
- NAD27 – North American Datum of 1927, commonly used in surveying, cartography and land-use.

Lat/Long Source – check the box that describes what device was used to collect the latitude and longitude of the well.

- Map – topographic, or general reference maps.
- GPS – Global Positioning System (handheld device, cell phone app, etc.).
- PPDGPS – Post Processed Differential Global Positioning System (accuracy within 10 cm).
- Survey – traditional land surveying methods.
- Imagery – locational information collected from geospatial metadata.
- Wide Area Augmentation System (WAAS) - an air navigation aid developed by the Federal Aviation Administration (prime contractor Raytheon Company) to augment the Global Positioning **System** (GPS), with the goal of improving its accuracy, integrity, and availability.

Location Information Collected By – provide the name of the individual that provided latitude and longitude information.

Physical Location Description – provide any additional information that could be used to help someone find the well.

3. Facility & Use

Type of Facility – mark the type of well that is being drilled.

Type of Use – check all types of use that apply to this well.

Additional information and specific considerations regarding ground source geothermal (cooling/heating) wells *(*can be found on page 5.

4. Well Construction

All depths should be in depth below land surface.

Well Designation Name or Number - this is the designation or number used by the owner to differentiate the well form other wells that may be on the same property or part of a well system. This description or number is required on each page of the form.

- Date Started – date construction started.
- Date Completed – date construction was completed and approved by the Virginia Department of Health.

Type Rig - provide one of the following responses: air rotary, mud rotary, bored/auger, cable tool, driven, or jetted.

Class Well – choose class of well:

- I, IIA, IIB are Public water supply wells,
- III A, IIIB and IIIC Private Wells for drinking water use.
- Class IIID and IIIE have been left on the form to capture any legacy data from existing paper files and is not meant to be used for construction of new wells, or
- IV Private wells for non-drinking water use

Construction Type – check box for new or existing-modified. Check whether an modification to an existing well by selecting well subtype (ex. modified 6 inch casing to 4 inch casing and screening interval). Check pump subtype to indicate modified pump settings.

Well Depth – well depth is the depth associated with the borehole, casing and screens (in feet) that transmits the movement of water from below ground-surface.

Total Hole (borehole) Depth– the total depth from the subsurface to the depth where drilling ceased. Total hole depth is intended to capture any well collapse between casing depth and total hole depth where well collapse may have occurred indicating a difference (in feet) between the two.

Depth to Bedrock – the depth to bedrock encountered it (in feet).
Hole Size (include reamed zones) – provide hole size in inches and depth in feet.
Height of Casing above Land Surface – measured distance in feet and inches from the ground to the top of the well casing. If the well is flush to a pad measure height of pad, if well is flush to the ground the value would be zero (in feet and inches).
Casing Size (I.D.) - provide the casing Inner Diameter (I.D.) size in inches and provide the interval as a start and finishing depth for each casing segment.

- Infilled – check infilled box to identify at what casing or screening interval infilled was encountered. Typically identified during a camera survey, the depth at which material fills the casing or screening interval preventing further exploration of lower depths inside the well.
- Casing Material – use one of the following responses: wrought iron, concrete tile, clay tile, steel, stainless steel, PVC plastic, Sch 40 PVC WC, Sch 80 PVC WC, SDR 17 PVC WC, SDR 21 PVC WC, SDR 26 PVC WC, or SDR 32.5 PVC WC. Provide the weight per foot or wall thickness in inches.

Total Depth of Casing – provide the total depth of casing (in feet).
Screen Size & Mesh - provide the screen inside diameter in inches and depth in feet.

- Mesh Size - provide the slot size opening in thousands of an inch (example .020).
- Type - provide one of the following responses: stainless steel or plastic.

Water Zones – provide depth in feet below land surface to water bearing fractures, joints, and bedding planes. This section is used for rock wells completed west of the fall line and barefoot wells completed in the Piney Point aquifer east of the fall line and is not needed if well is screened and located in the coastal plain.
Gravel Pack – provide the depth of gravel pack in feet.
Grout Type - provide one of the following responses: bentonite slurry, bentonite pellets/chips, neat cement, neat cement/bentonite mixture (6%), concrete (per exception in 12 VAC 5-630-410(C)(3) of the Virginia Private Well Regulations) and depth grouted in feet.
Grout Method - provide one of the following responses: poured from surface, poured through tremmie pipe, or pumped from bottom upward.
Type of Seal - referring to the well seal or device used in the well construction that prevents potential surface contamination. Provide one of the following responses: pitless adapter or sanitary seal.
Camera Survey - check appropriate box to demonstrate if well construction data was collected by camera Survey.

- Date Conducted – if conducted put date of camera survey.

Additional Well Construction Form Information Attached – if additional space is needed to complete the well construction section of this form please mark this box and continue entering data on the Additional Well Construction Data form.

5. Disinfection

Well Disinfection - check the box if the well was disinfected and provide the date of disinfection.

6. Abandonment

When abandoning the well referenced in the GW-2/UWWCR form, Sections 1 thru 6 are required to be completed. The GW-5 form should only be used to abandon a well when the original GW-2/UWWCR form could not be located for the well being abandoned.

Date Started – date abandonment started.
Date Completed – date abandonment was completed and approved by the Virginia Department of Health.
Static Water Level (unpumped level measured) - the level of water in a well under non-pumping conditions (in feet.).
Casing Size (I.D.) and Materials - provide the casing Inner Diameter (I.D.) size in inches and provide the interval as a start and finishing depth for each casing segment.

- Casing Material – use one of the following responses: wrought iron, concrete tile, clay tile, steel, stainless steel, PVC plastic, Sch 40 PVC WC, Sch 80 PVC WC, SDR 17 PVC WC, SDR 21 PVC WC, SDR 26 PVC WC, or SDR 32.5 PVC WC. Provide the weight per foot or wall thickness in inches.

Casing Pulled – mark appropriate box regarding removal of casing.
Depth of Fill – Depth below land surface (in feet) that fill added.
Type and Source of fill – impermeable material used to fill the well to prevent contamination of the aquifer.
Grout – ex. neat cement grout, sand-cement grout, concrete or approved bentonite chips.
Method of permanently marking location – Abandonment should be marked making it identifiable that it is a well abandonment location. ex. concrete slab.

7. Pump Test

Static Water Level (unpumped level measured) - the level of water in a well under non-pumping conditions (in feet.).

- Date – date the static water level measurement was collected.
- Method – method used to collect the static water level measurement (ex. electronic water level indicators, steel tape, chalked tape, sliding float, air-line pressure, and automatic recording).

Stabilized measured pumping level - a water level that has not fluctuated by more than plus or minus 0.5 foot for each 100 feet of water in the well (i.e., static water level to bottom of well) over at least a six hour period of constant pumping flow rate, and plotted measurements that have not shown a trend of decreasing water level.

- Date – date that the stabilized measure pumping level was collected
- Method – the method used for measuring drawdown of a well (ex. transducer, acoustic well sounder, electric sounder method, airline method).

Test Pump Intake Depth – pump intake location of the pumping well used in a drawdown tests.
Stabilized Yield – well yield when drawdown has reached stabilization.
Natural Flow – the movement of groundwater without any manmade device.

- Flow Rate – the volume of water which passes per unit time.

8. Pump Data

Type – centrifugal, submersible, shallow jet, deep jet, or turbine
Motor HP – rate of motor power in a pump.
Production Pump Intake Depth - the actual depth the bottom of the pump is set in the well bore.
Rated Capacity – the maximum capacity of the pump.

9. Geologic Information

This information is primarily used by USGS and DEQ staff.

Type Logs – detailed logging records of geologic formations penetrated by a borehole (ex. image, resistivity, density, neutron porosity, sonic, gamma ray, self-spontaneous/potential, caliper, nuclear magnetic resonance, spectral noise, memory, coring, mud logging).
Aquifer Test Performed – aquifer test conducted to determine properties of the aquifer (ex. constant rate, step drawdown, and recovery).
Water Quality Results Attached – Any water quality samples collected and analyzed during well construction.
Comments – Provide any additional comments if needed.

Comments

Please use this section to provide additional information not covered in other sections of the form or to clarify information.

10. Driller's Log (Use additional sheets if necessary)

Depth – the borehole depth of the well (in feet).

Type of Rock or Soil – type of rock or soil encountered during drilling.
Remarks – comments regarding drilling.
Drilling Time – total drilling time (in hours and minutes).
Diagram of Well Construction (with dimensions) – well sketch indicating seal, hole, casing, screen(s), pump, grouting, gravel pack.

11. Certification

A certification required. Please sign and date the form and include your water well service provider number assigned from the Department of Professional and Occupational Regulation (DPOR).

12. Additional Well Construction Data Form

This page should be used if additional space was needed to complete the well construction section (Section 4) of this form. Please continue where you left off on Section 4. Please do not submit this page if it was not used.

GW-5 Well Abandonment Form

When abandoning a well, a copy of the original GW-2/Uniform Water Well Completion Report may be obtained from the well/property owner or from the local health department, DEQ, DGMR, USGS, well drillers, Publications. Water Well Completion Reports can also be obtained through the Virginia DEQ online water well registration database. When the original water well completion report cannot be obtained for documenting well abandonment, a GW-5 well abandonment form should be submitted.

Geothermal Wells (Cooling/Heating)

For the purposes of this guidance, the DEQ and VDH use the term Geothermal (Cooling/Heating) Well to address wells used for heating/cooling that use the earth's surface in a cooling/heating exchange process. Geothermal wells are closed or open loop systems installed in well fields.

A closed loop geothermal well system is designed to prevent the discharge or escape of fluids from the loop system. Since these geothermal systems can contain multiple wells, only one completion report is required per well loop field, so long as each well is confined to the same aquifer.

An open loop geothermal well system is designed to discharge groundwater to the surface (lake, creek, stream, etc.) or the subsurface aquifer system following the heating/cooling exchange system. In cases where a second well was constructed to return a withdrawal to the subsurface aquifer system, the second well is commonly referred to as the discharge well. In such cases, these submissions should include:

- Well Construction
  Please submit one GW-2 / Uniform Water Well Completion Report form for each open loop well field that discharges to the surface.

  Please submit two separate GW-2 / Uniform Water Well Completion Report forms demonstrating well completion for each open loop geothermal withdrawal well and the discharge well.

- Discharge Information

Please indicate whether groundwater from the geothermal open loop well discharges into the surface (lake, creek, stream, etc.) by indicating "Returned to Surface". If the well discharges into the subsurface aquifer system please indicate "Returned to Aquifer".

In addition to the information required by regulation, reports submitted under the requirement for all geothermal wells should include the following:

Well Construction
Please submit one form for each closed loop well field, so long as each well is confined to the same aquifer.

Latitude and Longitude
Please provide a central latitude and longitude of the closed loop well field.

Pump Data
For closed loop geothermal installations this section may be left blank.

Casing Information
Section 12VAC5-630-410(A)(3)(e) of the Virginia Private Well Regulations states closed loop ground source geothermal wells do not have to be cased.