

Chapter 6. Well Construction, Completion, and Equipment Standards

Sections:

6.1 Preamble

6.2 Applicability

6.3 Exemptions

6.4 Additional Well Construction and Completion Standards

6.5 Authorized Well Drillers and Well Pump Installers

6.6 Reporting and Recordkeeping

6.7 Sealing Wells

6.8 Capping Wells

6.9 Plugging Wells

6.10 Right to Inspect and Enter Property

6.11 Measuring Device

6.12 Geothermal Wells

6.13 Pump Test

The purpose of these well construction requirements is to promote groundwater conservation, provide for long-term availability of groundwater resources, reduce localized depletion of groundwater, prevent interference between wells, and prevent the degradation of groundwater.

6.1 Preamble

(1) The following boring and completion standards are enacted to provide for the health and safety of individuals and communities utilizing groundwater within the District, to prevent the unintentional contamination of potable groundwater resources, and to ensure the long-term quality of potable water supplies within the boundaries of the District.

(2) A copy of the District's approved boring/modification authorization (authorization for test boring, new well, deepen or alter an existing well) must be on-site while the well is being constructed, re-worked, or modified. The owner or agent, water well driller, and pump installer are equally responsible for compliance with this requirement.

6.2 Applicability

(1) Construction of all boreholes and installation of all pumps located within the District shall be in accordance with the Texas Occupations Code Chapter 1901, "Water Well Drillers" and Chapter 1902, "Water Well Pump Installers," as amended, and the Administrative Rules of the Texas Department of Licensing and Regulation (TDLR), 16 Texas Administrative Code (TAC), Chapter §76, as amended. In addition, all wells and pumping equipment must comply with the rules of Comal Trinity Groundwater Conservation District effective 1 January 2019.

6.3 Exemptions

(1) The following wells are exempt from Chapter 6.4 requirements: environmental sampling wells, environmental monitoring wells, geotechnical wells, and geologic exploration wells.

6.4 Well Construction, Completion Standards and Test Boring;

(1) Every driller who bores, deepens, or alters a well; or pump installer who alters a well within the District, shall record and maintain a legible and accurate form required in Administrative Rules of the Texas Department of Licensing and Regulation 16 Texas Administrative Code, Chapter §76.70. These recordings will also be sent to this District as stated in Administrative Rules of the Texas Department of Licensing and Regulation 16 Texas Administrative Code, Chapter §76.70. The District shall be notified at least 24 hours prior to the boring or altering operation. If written authorization has been granted by the District, this notification can be done by telephone.

(2) The borehole shall be a minimum of four inches (4") larger in diameter than the outside diameter of the casing used. The casing will extend into the water bearing formation that is to be utilized as a water source, to a minimum of twelve inches (12") above the ground's surface. The driller will not allow the mixing, mingling, blending, or combining through the borehole, annulus, casing, or the filter pack of waters that differ in chemical quality.

(3) All water wells will have the annulus above the water bearing formation that is designated for use, as well as the annulus directly below the ground surface to be properly sealed with cement by positive displacement or pressure tremie pipe method.

- a) The well's lower annular seal shall be cemented immediately above the water bearing formation chosen for usage for a total distance of one hundred feet (100') or the ground surface, should the ground surface be less than one hundred feet (100') above the desired production formation. Annular seal will be completed as soon as casing has been installed to prevent loose materials from compromising the sealing of annular space. This annular space will be sealed by positive displacement [Administrative Rules of the Texas Department of Licensing and Regulation 16 Texas Administrative Code, Chapter §76.10.(43)] or by a pressure tremie pipe method [Administrative Rules of the Texas Department of Licensing and Regulation 16 Texas Administrative Code, Chapter §76.10.(52)].
- b) The well's surface seal of the annular space shall be cemented from the ground's surface, or one-foot (1') below pitless adapter connection, for a total distance of one hundred feet (100') or to the top of the lower seal should that be less than the one hundred feet (100') requirement. This annular space will be sealed by positive displacement [Administrative Rules of the Texas Department of Licensing and Regulation 16 Texas Administrative Code, Chapter §76.10.(43)] or pressure tremie pipe method [Administrative Rules of the Texas Department of Licensing and Regulation 16 Texas Administrative Code, Chapter §76.10.(52)].

(4) When pressure sealing the annular space by tremie pipe method, the end of the tremie pipe shall be set within twenty feet (20') from the bottom of area to be sealed and pressure pumped to depth as stated in 6.4.C.(1). Cement shall be placed in successive lifts of appropriate depths so as not to collapse the casing. Each lift shall be allowed to cure prior to beginning the next lift. An adequate number of lifts shall be placed until the concrete slurry reaches the ground surface or one foot (1') below a pitless adapter connection.

(5) If an annular space should remain which was not filled with cement by positive displacement or pressure tremie pipe method as stated in Chapter 6.4.(3) a) & b), this annular space may be filled with bentonite or bentonite slurry. Washed and disinfected sand or pea gravel free of flocculants or other chemicals may also be used. Sealants which require hydration, will be placed in successive lifts to ensure proper hydration.

(6) The casing shall be either polyvinyl chloride (PVC) or new steel.

- a) PVC casing will have a minimum inner diameter of four point three six five inches (4.365") and have a wall thickness minimum of zero point two four eight inches (0.248"). It shall be the responsibility of the licensed driller to select the proper hydraulic collapse pressure for casing to be installed.
- b) Steel casing will be new ASTM A-53 Grade or better and have a minimum weight and thickness of American National Standards Institute (ANSI) schedule 10 with a minimum inner diameter of four point five zero three inches (4.503").
- c) Casing shall extend into the water-bearing formation chosen for use to a minimum of twelve inches (12") above ground surface at a site not within the 100-year floodplain, as determined from Flood Insurance Rate Maps (FIRM) prepared by the Federal Emergency Management Agency (FEMA).
- d) When either PVC or steel perforated or screened casing is installed in the water bearing formation it shall be a manufactured slotted or well screen. Installer will select the correct slot size or the screen in the installation of a domestic (household use) or landscape irrigation water well to prevent sand or sediment from entering the well.

(7) Wells shall not be located at a site location that is generally subject to flooding. If a well is placed in an area subject to flooding or within the 100-year floodplain, it shall be completed with a water tight sanitary well seal and steel casing extending a minimum of thirty-six inches (36") above the 100-year floodplain level. The well owner shall provide a certificate, signed and sealed by a Registered Professional Land Surveyor, or Professional Engineer, which indicates the floodplain elevation as indicated on the FEMA map, along with the elevation of the top of the casing.

(8) All wells shall be completed per one of the three surface completion methods as follows:

- a) Slab – A concrete slab will be used with either steel or PVC casing and shall extend at least two twenty-four inches (24") from the outside wall of the well

casing in all directions and have a minimum thickness of four inches (4") and shall be separated from the well casing by a plastic or mastic coating or sleeve to prevent bonding of the slab to the casing. The surface of the slab shall be sloped to drain away from the well.

- b) Sleeve – The sleeve shall be a minimum of twenty-four inches (24") in length and extend a minimum of twelve inches (12") into the surface annular cement seal and be filled to the top of the sleeve with cement. In this surface completion method, the well casing shall extend a minimum of one inch (1") above the top of the sleeve.
 - i. The plastic sleeve shall be a minimum of Schedule 80 and UV-resistant. When a PVC sleeve is used, the inside diameter of the PVC sleeve shall be two inches (2") larger than the outside diameter of the PVC well casing.
 - ii. The steel sleeve shall be a minimum of 3/16" in thickness. The steel sleeve shall be two inches (2") larger in diameter than the outside diameter of the PVC well casing.

- c) Pitless Adapter - The pitless adapter, with either steel or PVC casings, shall be fitted to the casing by the manufacturer's specified installation requirements. The annular space shall be completed as stated in Chapter 6.4 (3), (4) & (5) and have a slab as stated in Chapter 6.4 (8) a). All wells completed with pitless adapters will use equipment designed for such an installation.

(9) All wells shall be equipped with a water tight sanitary seal, a screened vent, and an inspection port. The inspection port shall be constructed to allow easy access for water level measurement equipment and disinfection. Any well not equipped with these items or equipped but not in a manner to allow easy access prior to 1 January 2019, shall be brought into compliance when the well's down hole equipment is serviced. On wells with odd sized casing, which cannot be fitted with a factory-made water tight sanitary seal, or the wedge style used in a windmill operation allowing for the pipe adjustment to valve travel, the completion shall be done in a manner that will prevent pollutants from entering the well.

(10) All borings, either new or reworked, shall use potable water in drilling fluids.

(11) When a new well, a repaired well, a reconditioned well, a pump installation, or repairs of equipment in a well has been completed, the well will be properly disinfected. The landowner may waive the disinfection process by submitting a written request to the driller or pump installer.

(12) Comal Trinity Groundwater Conservation District reserves the right to work with the well owner, or authorized representative, at the District's expense, to obtain a geophysical log of a well, including, but not limited to natural gamma and caliper logging.

(13) Test Hole Boring

- a) A person wishing to bore for testing purposes must, prior to commencement of boring, submit an authorization form with the District requiring an authorization to bore a test hole.

- i. An agreement by the Applicant that the location of the test boring(s) and driller's log(s) will be furnished to the District by the Applicant, or by the Applicant's authorized representative, upon completion of the test boring operation. The location of the test boring(s) shall be identified by a metes and bounds description or by a Global Positioning System (GPS) longitude and latitude reading (§ 36.112).
 - ii. A declaration that the test borings(s) will be plugged 60 days after the completion of boring and log(s) or plugging report(s) will be furnished to the District. Alternatively, a written report will be made to the District that the test boring(s) was completed as a functioning water well; the test boring(s) was properly cased, sealed, and the test borings will be capped with a covering capable of sustaining a weight of at least 400 pounds until the test well is converted to a functioning water well.
 - iii. A declaration of whether the drilling and operation of the test boring is restricted to a geophysical exploration, will include pumping tests and the short-term production of groundwater for testing purposes only.
 - iv. (d) Any other information deemed necessary by the General Manager of the District, subject to the approval of the Board.
- b) No person may commence a boring prior to District approval. The General Manager is delegated approval authority for test boring(s) restricted to geophysical exploration absent pumping tests
 - c) Each authorization of intent to bore a test hole shall be delivered to the District office accompanied by the appropriate fee as stated in Chapter 11. The test boring application fee may be applied to the fee required for a well authorization application if made prior to the final expiration date of the test well application.
 - d) Authorization for test boring and production evaluation will expire six (6) months from the date of approval by either the General Manager or the Board.

6.5 Authorized Well Drillers and Well Pump Installers

(1) A Water Well Driller operating in the State of Texas is required to have a valid Water Well Drilling license issued by the Executive Director of the Texas Department of Licensing and Regulation pursuant to Texas Occupations Code Chapter 1091 and a District representative may verify such a license during operations within District.

(2) A Pump Installer operating in the State of Texas is required to have a valid Pump Installer license issued by the Executive Director of the Texas Department of Licensing and Regulation pursuant to Texas Occupations Code Chapter 1902 and a District representative may verify such a license during operations within District.

(3) The only exceptions from the requirements of Chapter 6.5 are the exemptions provided by Administrative Rules of the Texas Department of Licensing and Regulation 16 Texas Administrative Code, Chapter §76.30.(3). §76.30.(3) exempts only the licensing requirement, not from compliance of State and District rules.

(4) When a water well driller or pump installer is performing activities within the District, they are subject to the authority of the State and District rules. When such activities are undertaken on behalf of a well owner, the driller or installer is acting as the well owner's agent and is subject to enforcement for non-compliance to the same extent as the well owner.

6.6 Reporting

(1) Well Drilling and Completion Reports. The Administrative Rules of the Texas Department of Licensing and Regulation 16 Texas Administrative Code, Chapter 76.10.(54) states that, any pump test data, water level data, water quality data, natural gamma or caliper log, or any other data pertinent to a well shall be submitted to the Comal Trinity GCD office within 60 days after completion of the well or after the data is compiled or prepared, whichever is earlier. This shall include information on the production capability of the well, the type of water, GPS location of the well, and proposed usage of the groundwater. Although the information will ordinarily be submitted by the well driller or pump installer, the well owner is equally responsible for ensuring compliance with this rule.

(2) Reporting Methods

- a) The well driller, pump installer, or well's owner shall hand deliver, transmit electronically, or send by first-class mail a copy to the Comal Trinity GCD, within sixty (60) days from the completion or cessation of drilling, deepening, otherwise altering a well or the well's equipment in such a way that it affects the limits set in Chapter 11.

(3) Reporting Undesirable Water or Constituents

- a) Each well driller shall inform, within 24 hours, the landowner or person having a Trinity Aquifer well drilled, deepened, or otherwise altered or their agent when undesirable water or constituents have been encountered. The well driller shall, within thirty (30) days of encountering undesirable water or constituents, submit to the District, and the landowner or person having the well drilled, deepened, or otherwise altered, on forms authorized by the District:
 - i. A statement signed by the well driller indicating that the landowner or person having the well drilled, deepened, or otherwise altered, has been informed that undesirable water or constituents have been encountered; and
 - ii. A copy of the Undesirable Water or Constituents Report required pursuant to 16 Texas Administrative Code § 76.71, as may be amended.

6.7 Sealing Wells

(1) Following public notice, the Board may order the sealing of a well that is in violation of District Rules or that has been prohibited from producing groundwater. The reasons for ordering the sealing of a well include, but are not limited to:

- a) Failure to apply for a drilling or modification authorization prior to drilling the well;
- b) Operating a non-exempt well without District registration; or

- c) The Board has denied, cancelled, or revoked for non-compliance with a District written rule.

(2) Once the Board has ordered that a well be sealed, the District, following the procedures as outlined in Chapter 6.10, shall seal the well by physical means, record that the well has been sealed by the District, or take any other appropriate action necessary to clearly indicate that the well has been sealed. The seal is intended to preclude operation of the well and identify unauthorized operation of the well.

(3) Tampering with, altering, damaging, removing, or violating the seal of a sealed well in any way, or pumping groundwater from a well that has been sealed constitutes a violation of District Rules and subjects the person who performs that action, as well as the well owner, to enforcement and penalties pursuant to all applicable District Rules.

6.8 Capping Wells

(1) The District shall require an open or uncovered well that is in a non-deteriorated condition to be capped to prevent waste, pollution, or prevent deterioration.

(2) The well shall remain capped until conditions that led to the capping are eliminated. The cap shall provide a sanitary seal to prevent the introduction of potential contaminants and shall be capable of sustaining a weight of at least four hundred (400) pounds.

(3) If the owner fails to close or cap the well in compliance with District Rules, the District, following the procedures of Chapter 6.10, shall cap the well. Reasonable expenses incurred by the District in capping a well constitute a lien on the land on which the well is located pursuant to Texas Water Code Section §36.118.

6.9 Plugging Wells

(1) Not later than the 30th day after the date a landowner or other person who possesses a deteriorated or abandoned well learns of its condition, the well shall either be brought back into District compliance as outlined in Chapter 6 to protect the aquifer or be plugged in accordance with Administrative Rules of the Texas Department of Licensing and Regulation 16 Texas Administrative Code, Chapter §76, as amended, or as stated in Chapter 6.9.

(2) Prior to plugging a well's casing, liner, or bore hole, the plugging plan shall be submitted to the District. Written authorization shall be obtained from the District prior to initiating the plugging operation.

(3) The District shall be notified at least 24 hours prior to the plugging operation. If written authorization has been granted by the District, this notification can be done by telephone.

(4) The slab and all removable casing shall be removed from the borehole. Non-removable casing shall be cut off at or below the ground level. The well must be free of any obstructions to the bottom of the borehole. If the borehole has obstructions, all debris must be removed prior to the commencement of the plugging operation.

(5) The total depth of the borehole and static water level shall be determined prior to plugging.

(6) From the bored depth; either open hole or cased; to the top of water bearing formation may be filled with:

- a) Washed and disinfected sand or pea gravel free of flocculants or other chemicals; or
- b) Three-eighths inch (3/8") bentonite; or
- c) Cement, using the pressure tremie pipe method, Administrative Rules of the Texas Department of Licensing and Regulation 16 Texas Administrative Code, Chapter §76.10(52).

(7) The remainder of the borehole shall be pressure-cemented via tremie pipe from the top of the washed and disinfected sand or pea gravel that is free of flocculants or other chemicals or 3/8-inch bentonite to the land surface. A hand written and signed document from the land owner delivered to the District office requesting that the cemented atmospheric seal be placed up to six (6) ft. below ground level, for aesthetic or ground working reasons, and the remaining borehole may be filled with topsoil.

(8) It is the responsibility of the landowner to ensure that such a well is plugged to prevent pollution of the groundwater and to prevent injury to persons.

(9) Not later than the 30th day after the date the well is plugged, a State of Texas Plugging Report and any driller's or geologist's logs (field notes on stratigraphy), shall be submitted to the District.

(10) Environmental sampling wells, environmental monitoring wells, geotechnical wells, and geologic exploration wells shall comply with Chapter 6.9 and Administrative Rules of the Texas Department of Licensing and Regulation 16 Texas Administrative Code, Chapter §76.104, except that submittal of a plugging plan prior to plugging is not required.

(11) If the owner fails to plug the well in compliance with District Rules, the District, following the procedures of Chapter 6.10, shall plug the well. Reasonable expenses incurred by the District in plugging a well constitute a lien on the land on which the well is located pursuant to Texas Water Code Section §36.118.

6.10 Right to Inspect and Enter Property

(1) The District has authority under Texas Water Code Section §36.123 to enter any public or private property located within the District at any reasonable time for purposes of inspecting and investigating conditions relating to water quality, wells, or compliance with District Rules, regulations, permits, or orders.

(2) The District respects individual property rights and shall endeavor to minimize any inconvenience to property owners while conducting District business.

- a) Whenever possible, the District shall notify, coordinate, and schedule well and property access in advance with the property owner, his agent, tenant, or other local contact. Notice is not required if prior permission to enter land or access wells has been granted by the property owner, his agent, tenant, or other local

contact.

- b) District employees or agents accessing public or private wells or property shall exhibit proper credentials upon request.
- c) District employees or agents acting under this authority shall observe all applicable rules and regulations concerning safety, internal security, and fire protection. If unexpected, emergency, or critical conditions require the District to access public or private wells or property without prior access arrangements, the District shall, at the first reasonable opportunity, contact the property owner, his agent, tenant, or other local contact. The District shall inform the owner or authorized agent that the District accessed the well or property, the reasons for the District access, and any pertinent information or action resulting from the District's access.

6.11 Measuring Device

(1) Should the well require a measuring device, as defined under Chapter 5.1(2). Fee Schedule, specifically Chapter 11.4 the measuring device shall be installed at the owner's expense.

6.12 Geothermal Wells

(1) All geothermal wells shall comply with these standards, as well as the requirements of Chapter 6.2. Each system shall register with the District on a form available from the District office or the District's web page.

(2) The annular space will be sealed by positive displacement or pressure tremie pipe method from the hydrologic unit being utilized to the ground surface. No commingling of hydrologic units is allowed.

(3) All fill used in the borehole (e.g., gravel or crushed limestone) shall be washed and disinfected prior to use.

(4) Open loop geothermal wells are prohibited in the District.

(5) Within 60 days after completion a State of Texas Well Report for boreholes drilled shall be submitted to the District to ensure compliance with 6.6(1).

6.13 Pump Test

(1) When a pump test is required by the District, it must conform to these minimum standards;

- a) Following determination of the static water level, and prior to pumping, the well capacity shall be tested with a pump or other capable means of varying the discharge rate. During the testing period, the discharge rate shall be adjusted until the water level in the well stabilizes and the pump's discharge remains constant for a continuous pumping period of thirty-six (36) hours.

- b) After the well's capacity has been determined, water levels shall be taken every hour for thirty-six (36) hours after the test to determine the recovery rate of the well. If the water level recovers to within one (1) foot of the pre-test level before the thirty-six (36) hour period following the test, the test can be concluded.

- c) The discharge of the testing equipment shall be equipped with a measuring device properly sized for accurately determining the flow rate of the pump. Measuring device readings and water levels shall be taken within a reasonable period after the test has been initiated and just prior to the conclusion of the test. Readings shall be taken every hour during the pumping test and the well's recovery period.

Adopted March 19, 2018 by Board Order; effective January 1, 2019.