

MPGCD Pump Test and Pump Test Report Guidance Document

The American Society of Testing and Materials (ASTM) documents D4043 and D4050 provide additional guidance for designing and implementation of pump tests, and D4105 or D4106 provide guidance to determine aquifer properties. The applicant can purchase these documents at; <http://global.ihc.com/standards.cfm?publisher=ASTM&RID=Z06&MID=5280> and is encouraged to review them prior to designing and conducting pump tests.

Pump Tests

Pump tests conducted without prior approval from the District may be deemed noncompliant with MPGCD production permit requirements. The District must be notified at least 48 hours in advance of any pump test conducted as part of the hydrogeological investigation.

Texas registered geoscientists (PG) and/or engineers (PE) will be required to oversee the design and implementation of each pump test and associated monitor wells and will evaluate the pump test results to determine aquifer properties. Aquifer properties determined from the pump tests will include: specific capacity, transmissivity, hydraulic conductivity and possibly storage coefficient or storativity values.

Pump Test Monitor Wells

Monitor wells are required for applicant well fields with multiple wells. Monitor wells selected by the applicant for the pump test must comply with the District's monitor well requirements and monitor-well selection must be pre-approved by the District's General Manager. Monitor well(s) may not be actively pumping during the pump test. The use of existing private wells within two miles of the pumping wells will be acceptable to the District if the well meets the District's monitor well requirements.

A monitor well selected for the pump test is required to monitor only the Applicant's aquifer and exhibit a connection with the pumping wells indicated by a minimum of one half a foot of drawdown during the pump test. In the case of confined aquifers, the District may require a monitor well in an overlying aquifer to monitor potential water level fluctuations and to determine if there is communication between the Applicant's aquifer and overlying aquifers.

Pump Test Requirements

- 1) **If possible**, the District and/or Applicant will meet with adjacent landowners (if any) with large operating wells (>250 gpm) within a 2 mile radius of the pump test pumping wells prior to the pump test. The District and/or Applicant will inform the landowners of the date of the pump test, and if possible, determine if the landowner's wells will be active during the scheduled pump test.
- 2) Static water levels of the test and monitor wells should be measured every 6 hours for the 24 hours prior to the beginning of the pump test.
- 3) Flow meters will be used to monitor each pumping well's groundwater production.
- 4) Measure water levels during pump test at acceptable frequency.
- 5) A metered pump test of not less than a continuous 36 hours for the Pecos Valley Alluvium (clastic), Edwards-Trinity Plateau (carbonate and clastic), Dockum (clastic) and Rustler (evaporite and clastic) aquifers (dominantly clastic aquifers). The District may require a 72 hour continuous pump test for the Capitan Reef Complex Aquifer to

better determine aquifer storage properties of the thick carbonate (limestone and dolomite) karst system.

- 6) A recovery phase of a period sufficient for a 95% recovery of beginning water levels at the test and the monitor well locations, not to exceed time period of pumping activity.
- 7) Water quality parameters (pH, temperature, and conductivity) of discharged water should be measured every eight hours during pump test.
- 8) Water quality analysis should include (TDS, SO₄, Cl, Ca, Mg, Na, HCO₃, F, Br, and NO₃) for each pumping well will be collected prior to and at the end of each pump test.

The Applicant may request for the District's General Manager to consider a variation of the above pump test requirements. The District's General Manager has 30 days to review and approve or disapprove the request variance.

Pump Test Report Requirements

- 1) A discussion about the general characteristics of the aquifer: confined or unconfined, clastic, carbonate, or evaporite, variation in aquifer thickness, intensity of karst development, etc. Discuss if the production wells partially or fully penetrating.
- 2) For each pump test, pumping and monitor well tables listing water levels collected during the pump test, initial water levels at start of pump test (pumping and monitor wells), pump test date, start time, end time, changes during and final pumping rates, and water quality parameters measured during pump test will be provided in a report appendix.
- 3) For each pump test, a table listing the water level recovery measurements with time for pumping and monitoring wells in a report appendix.
- 4) Copies of field notes collected during pump test(s) (in a report appendix).
- 5) A table listing final estimated aquifer properties for each pumping and monitor well involved in the pump test.
- 6) The pump test report will include a discussion of any observed groundwater quality changes (if any) that occurred during the pump test.

If the pump test activity or analysis is found to be flawed or not acceptable by the District's General Manager, the District's General Manager may require the pump test or analysis be repeated *in* an acceptable manner before the groundwater production permit application may be considered.