

The Texas Natural Resource Conservation Commission (commission) adopts new §§230.1-230.11, Groundwater Availability Certification for Platting. Sections 230.2, Definitions; 230.3, Certification of Groundwater Availability for Platting; 230.5, Proposed Subdivision Information; 230.6, Projected Water Demand Estimate; 230.8, Obtaining Site-Specific Groundwater Data; 230.10, Determination of Groundwater Availability; and 230.11, Groundwater Availability and Usability Statements and Certification, are adopted with changes to the proposed text as published in the February 11, 2000, issue of the *Texas Register* (25 TexReg 1028). Sections 230.1, Applicability; 230.4, Administration Information; 230.7, General Groundwater Resource Information; and 230.9, Determination of Groundwater Quality are adopted without changes and will not be republished.

BACKGROUND AND SUMMARY OF THE FACTUAL BASIS FOR THE ADOPTED RULES

The purpose of the adopted rules is to implement the provisions of Senate Bill (SB) 1323, 76th Legislature, 1999, which added §212.0101 and §232.0031 to the Local Government Code. New Local Government Code, §212.0101(a), provides that if a person submits a plat to a municipality for the subdivision of a tract of land for which the intended source of water supply is groundwater under that land, the municipal authority responsible for approving plats by ordinance may require the plat application to have attached a statement that is prepared by a Texas licensed professional engineer that certifies that adequate groundwater is available for the subdivision. New Local Government Code, §232.0031(a), provides that if a person submits a plat to a county for the subdivision of a tract of land for which the intended source of water supply is groundwater under that land, the commissioners court of a county by order may require the plat application to have attached a statement that is prepared by a Texas licensed professional engineer that certifies that adequate groundwater is available for the subdivision.

Under Local Government Code, §212.0101(b) and §232.0031(b), the commission is required to establish by rule the appropriate form and content of a certification to be attached to plat applications. New Chapter 230 establishes the appropriate form and content of the certification. Local Government Code, §212.0101 and §232.0031, do not provide the commission with any additional authority or jurisdictional responsibility related to plat applications or groundwater availability certification.

The adopted form and rules will be used only by the municipal and county authorities which choose to require groundwater availability certification. By municipal ordinance or county commissioner court order, the type(s) of subdivision subject to this platting requirement will be identified. The statute is permissive by allowing a municipal authority by ordinance or a county commissioner court by order to choose to require the plat application to have attached to it a statement, that is prepared by an engineer registered to practice in this state, which certifies that adequate groundwater is available for the subdivision. If the municipality or county commissioner court requires this certification under Local Government Code, §212.0101 and §232.0031, the use of the adopted form and rules under new Chapter 230 is mandatory.

Counties within designated priority groundwater management areas (PGMAs) were provided similar authority with the passage of SB 1, 75th Legislature, 1997. SB 1 added Texas Water Code (TWC), §35.019, which allows the commissioners court of a county in a designated PGMA to adopt water availability requirements in an area where platting is required if the commissioners court determines that the requirements are necessary to prevent current or projected water use in the county from exceeding the safe, sustainable yield of the county's water supply. In developing adopted Chapter 230, the commission reviewed and evaluated several groundwater availability regulations that had been

adopted in the Hill Country PGMA counties (Bandera, Comal, Hays, and Kendall Counties). The commission also reviewed proposed regulations developed by the Texas Center for Policy Studies for Blanco County.

The authority for counties within designated PGMA's under TWC, §35.019, is broader in scope than the authority granted to municipalities and counties under Local Government Code, §212.0101 and §232.0031. However, the commission considered various provisions from the existing county regulations developed under TWC, §35.019, that were determined to be applicable in the development of adopted Chapter 230. In addition, the commission reviewed and considered statutory and regulatory groundwater availability guidelines used in the states of Arizona and Michigan. While groundwater law differs in these two states from groundwater law in Texas, evaluation of the other state guidelines provided useful information for the development of adopted new Chapter 230.

The commission also utilized an external review group in the preparation of adopted Chapter 230. Informal meetings were held with review group members to discuss the scope of the rules and to obtain public and local government perspective on effectiveness, impact, and cost. Comments from the review group members (on an initial draft of the rules) were solicited and considered in preparing the rules as they were proposed. The review group consisted of representatives from county government and county associations; scientific and engineering interests; and local and state management, planning, and regulatory agencies. Within the external review group, input was also solicited from a municipal association, a council of government, and a builders association.

In developing new Chapter 230, the commission recognizes that multiple factors must be considered to determine the adequacy of groundwater availability for a proposed subdivision. The following describes some of these factors. Information about the landowner(s), plat applicant, and the property should be clearly identified. The purpose, size, proposed configuration, and the anticipated method of water delivery should also be clearly indicated. The ultimate groundwater demand for residential and nonresidential uses for the proposed subdivision must be estimated. The aquifer(s) underlying the proposed subdivision, which is planned to be used as the source of water, must be identified and general geologic and groundwater information should be considered and understood. Site-specific groundwater availability and usability information must be obtained, evaluated, and understood. The estimated water demand must be weighed against the site-specific groundwater data and availability and usability determinations must be made. The effects of the proposed method of water delivery must be weighed against site-specific groundwater availability. Determining usability also requires an analysis of the quality of the available groundwater.

New Chapter 230 provides the necessary guidance and requirements to demonstrate (certify) that adequate groundwater is available for a proposed subdivision if groundwater under the land is to be the source of water supply. It provides the form that is required to be attached to a plat application, and the information required by new Chapter 230 is indicated on the form. The adopted rules provide for a standardized approach to statewide certification of groundwater availability for platting. If a platting authority voluntarily chooses to require certification under Local Government Code, §212.0101 and §232.0031, platted subdivisions should be built with an adequate water supply. This may avoid the cost to local government and taxpayers of having to provide unplanned or emergency service to a subdivision developed without an adequate water supply.

SECTION BY SECTION DISCUSSION

Adopted new §230.1, Applicability, provides for the condition under which Chapter 230 is in effect: if a municipal or county platting authority requires groundwater availability certification in the plat application for the approval process as allowed under Local Government Code, §212.0101 or §232.0031, respectively. A municipal or county authority is not required to exercise this authority; however, if it does, the form and content of adopted Chapter 230 must be used. If required, adopted Chapter 230 is applicable for proposed subdivisions that will utilize groundwater under that land as the source of water supply. Adopted Chapter 230 does not replace other state and federal requirements applicable to public drinking water supply systems nor does it replace the authority of counties in designated PGMA's under TWC, §35.019, or the authority of groundwater conservation districts under TWC, Chapter 36.

Adopted new §230.2, Definitions, provides for definitions of certain words, terms, or phrases that are used in the rules. Definitions are provided for the following: aquifer, aquifer test, certification, drinking water standards, full build out, licensed professional engineer, plat applicant, and requirements applicable to public drinking water supply systems. In response to comments, the definition of "certification" has been changed to mean a written statement of best professional judgement or opinion as attested to on the certification form required under adopted §230.3(c). The commission has changed the specific references to sections of Chapter 290, Public Drinking Water, to a more general reference to the subchapters for drinking water standards and requirements applicable to public drinking water supply systems. The commission currently is proposing modifications to the specific sections which are cited in the proposed definitions and a more general cross-reference is sufficient for clarity. "Full build out" is defined at the final expected number of residences, businesses, or other dwellings in the

proposed subdivision. “Licensed professional engineer” is defined as an engineer who maintains a current license through the Texas Board of Professional Engineers in accordance with its requirements for professional practice. “Plat applicant” is defined as the owner or the authorized representative or agent seeking approval of a proposed subdivision plat application pursuant to municipal or county authority. Staff have removed definitions for “licensed driller” and “State Well Report” in the adopted rule because they do not appear elsewhere in the rule and are therefore not needed.

Adopted new §230.3, Certification of Groundwater Availability for Platting, contains procedural instructions for providing certification. Subsection (a) requires the certification to be prepared by a Texas licensed professional engineer. Subsection (b) provides that the plat applicant submit the certification to the municipal or county authority. Subsection (c) establishes the appropriate form and content that must be used for the certification. In response to comments, staff have removed an unnecessary reference to “professional engineer” from this subsection and restructured the language because it was overly restrictive. In addition, staff corrected a typographical error in the second sentence of this subsection to read “director” instead of “direct.”

The adopted form in §230.3(c) is divided into sections that mirror the structure of adopted Chapter 230. The form appears in the Tables and Graphs section in this issue of the *Texas Register*. The three-page form must be signed, sealed, and dated by a licensed professional engineer and submitted with the plat application. The executive director is allowed to make minor changes to this form which do not conflict with the requirements of the chapter. In response to comments, number 34, the heading pertaining to §230.11, and numbers 41 and 42 of the form have been changed. The reasons for these amendments are discussed under “Analysis of Testimony.” On the form, the commission has also

clarified: 1) the title of the form, 2) that the form and 30 TAC Chapter 230 do not replace the authority of counties or groundwater conservation districts under either §35.019 or Chapter 36 of the Texas Water Code, and 3) that the Texas Water Development Board publication *Aquifers of Texas* may serve as a reference to obtain general information pertaining to the state's aquifers.

Adopted new §230.4, Administrative Information, contains a listing of administrative information pertaining to the proposed subdivision that must be provided to the municipal or county platting authority. This information includes the name of the proposed subdivision, any previous name(s) that identifies the tract of land, the property owner's name(s) and contact information, the plat applicant's name and contact information, the licensed professional engineer's name and contact information, the location and property description of the proposed subdivision, and the tax assessor parcel numbers for the proposed subdivision property. The information required under §230.4 must be provided to the municipal or county platting authority on the form required under §230.3 and is necessary to identify the property, owner, plat applicant, and person performing the certification.

Adopted new §230.5, Proposed Subdivision Information, requires certain information pertaining to the proposed subdivision be provided on the form required under adopted §230.3. This information includes the purpose and size of the proposed subdivision, the number and size of proposed lots, and the anticipated method of water delivery. Under paragraph (6), written application for service to existing water providers within a 1/2-mile radius of the subdivision must be supplied to the platting authority if the anticipated method of water distribution for the proposed subdivision is from an expansion of an existing public water supply system or from a proposed public water supply system. This application for service is required under existing §290.39(c)(1), concerning Rules and Regulations for Public Water

Systems, General Provisions, if a public water supply is proposed. A punctuation error at the end of §230.5(6) has been corrected.

Adopted new §230.6, Projected Water Demand Estimate, requires that the total projected water demand for the proposed subdivision at full build out be estimated and reported on the form specified in §230.3(c). At full build out, water demand estimates must be developed for residential and nonresidential use and the total annual water demand estimate is to be determined. Under §230.6(a), the residential water demand estimate at full build out is to be based on the current demand of any existing residential well(s) and the number of proposed housing units, the average number of persons per proposed housing unit, the gallons of water required per person per day, and the water demand estimate per proposed housing unit per year (reported in acre feet per year). Under §230.6(b), any proposed nonresidential uses must be specified by type of use and groundwater demand per year for each type of use. The nonresidential demand estimate also includes the nonresidential demand of any existing well(s) in the subdivision. The total annual water demand estimate for the proposed subdivision is required under §230.6(c). Under §230.6(d), the commission has clarified that the sources of information used and calculations performed to determine the groundwater demand estimates must be made available upon request of the local platting authority. The demand estimates required by this section are necessary to determine the adequacy of the projected need of the proposed subdivision to the projected supply from the underlying aquifer(s).

Adopted new §230.7, General Groundwater Resource Information, contains instructions for the reporting of general aquifer information and consideration of other information. Under subsection (a), the aquifer(s) underlying the proposed subdivision that is planned to be used as the source of water must

be identified using common names that have been identified by the Texas Water Development Board.

The information required under subsection (a) must be provided to the municipal or county platting authority on the form required under §230.3. *Aquifers of Texas* (Ashworth, John B. and Hopkins, Janie, 1995, Texas Water Development Board Report 345, November, 1995) is a readily available resource that provides general information on the location, geology, quality, yield, common use, and specific problems of the state's aquifers and is available electronically on the Texas Water Development Board's Internet Homepage at www.twdb.state.tx.us. Subsection (b) requires that certain geologic and groundwater information be considered prior to conducting the aquifer test (required under adopted §230.8, concerning Obtaining Site-Specific Groundwater Data) to properly plan and design a successful aquifer test.

Adopted new §230.8, Obtaining Site-Specific Groundwater Data, provides requirements for obtaining site-specific groundwater data relevant to the certification. Site-specific groundwater data is needed to determine groundwater availability for the proposed subdivision. Subsection (a) provides that this section is applicable only if the anticipated method of water distribution for the proposed subdivision is individual water wells on individual lots. If a public water supply system is anticipated, the site-specific groundwater data must be developed under Chapter 290, Subchapter D, concerning Rules and Regulations for Public Water Systems.

Adopted new §230.8(b) requires that existing wells within the subdivision be identified, located, and mapped by on-site surveys. Existing wells shall be located on the plat required by the municipal or county platting authority. Existing wells must be included in the demand estimates determined under

adopted §230.6. Some existing wells may be used for aquifer testing purposes (as provided under adopted §230.8(c)).

Under adopted new §230.8(c), on-site aquifer testing is to be conducted to obtain sufficient information to allow for the evaluation of each aquifer that is being considered for the purpose of water supply for the proposed subdivision. Paragraph (c)(1) provides that one test well and one observation well are required to conduct an adequate aquifer test. In response to a comment, the commission has amended this paragraph to clarify that the test and observation wells must be completed in the same aquifer or aquifer production zone. The location of the test and observation well(s) must be shown on the plat required by the municipal or county platting authority.

The commission considered several aquifer testing scenarios: a pumping test with no observation wells, an aquifer test with a single observation well, and an aquifer test with multiple observation wells. A pumping test with no observation wells would be the least expensive option and would give an indication of hydraulic conductivity. However, this scenario does not provide sufficient data to determine the coefficient of storage which is needed to adequately determine groundwater availability.

An aquifer test utilizing a test well along with a single observation well allows for the determination of the coefficient of storage and hydraulic conductivity and also allows for the detection of recharge or barrier boundaries. Drilling and utilizing an observation well for the aquifer test adds additional expense; however, the commission believes that the expense is justified by the additional aquifer data that can be gathered in this type of test. The commission believes that this aquifer data is necessary for determining groundwater availability for the range of aquifer types which may be encountered. Also,

an existing well may be used as an observation well if it fully meets the requirements of adopted §230.8(c)(7).

Test data from an aquifer test with multiple observation wells can be analyzed by studying both time-drawdown and distance-drawdown relationships and can provide greater assurances that the determined coefficient of storage and hydraulic conductivity values are correct. While additional observation wells would be beneficial for verifying determined aquifer parameters, sufficient information should be obtained from a single observation well if it is properly located and the test is properly conducted and evaluated. There may be situations (i.e., large areal developments, moderately productive carbonate aquifers, etc.) where it is determined that additional observation wells are needed to adequately characterize the aquifer. Adopted §230.8(c)(8) provides guidance for determining the need for additional aquifer testing or observation wells. This determination will need to be made using best professional judgement on a case-by-case basis.

Adopted §230.8(c)(2) provides for the location of the test and observation wells. The general instructions provided in this paragraph are taken from Driscoll, 1986. Observation wells in unconfined aquifers should be placed no farther than 300 feet from the test well and no farther than 700 feet in thick confined aquifers. The observation well should also be placed no closer to the test well than two times the thickness of the aquifer's production zone. The wells must be placed within the proposed subdivision and the observation well must be located at a distance so that the time-drawdown data collected during the planned pumping period falls on a type curve of unique curvature. The optimal location for the observation well can be determined by best professional judgement after completion and evaluation of the test well (as provided in adopted §230.8(c)(4)).

Adopted §230.8(c)(3) provides that lithologic and geophysical logging are required to map and characterize the geologic formation(s) and the aquifer(s) in which the test will be performed. This information is necessary to adequately understand the subsurface conditions and to understand the thickness and lithology of water bearing strata, aquifer characteristics, and groundwater quality. The subsection provides that the municipal or county authority may waive the requirement for geophysical logs if it can be adequately demonstrated that the logs are not necessary to characterize the aquifer for testing purposes. In response to comments, staff have removed an unnecessary reference to “professional engineer” from §230.8(c)(3)(C) and restructured the language because it was overly restrictive.

Adopted §230.8(c)(4) provides for the development of the test and observation wells and well performance. The wells will be developed prior to conducting the aquifer test in order to repair damage done to the aquifer(s) by drilling. If the wells are not properly developed, the wells will not function efficiently and the information derived from aquifer testing will not be indicative of actual aquifer parameters. During development, the test well will be pumped for several hours to determine the specific capacity of the well (the rate of discharge of the well per unit of drawdown; commonly expressed in gallons per minute per foot), the maximum anticipated drawdown (lowering of water level), the volume of water produced at certain pump speeds and drawdown, and to properly locate observation wells to provide meaningful data. Water pumped from the well during its development shall not influence the initial well performance results. Aquifer testing required by this section must be performed before any acidization or other flow-capacity enhancement procedures are applied to the well.

Adopted §230.8(c)(5) provides that groundwater quality be protected during construction of the wells to ensure that surface contaminants do not reach the subsurface environment and that undesirable groundwater, if encountered, is sealed off and confined to the zone(s) of origin. This requirement ensures that groundwater intended to be utilized by the subdivision is protected from man-affected activities or from cross-contamination from differing water-quality zones.

Adopted §230.8(c)(6) addresses the duration of the aquifer test and recovery measurements. While the duration of the aquifer test depends entirely on local and geologic conditions, it must be long enough to observe a straight-line trend on a plot of water level versus the logarithm of time pumped. The test shall not begin until water levels have recovered at or near the levels prior to well development. Water pumped during the test should not influence the test results. At a minimum, a 24-hour uniform rate aquifer test is required; however, exceptions for shorter or longer testing periods are provided. The commission recognizes that under most scenarios, adequate aquifer test data can be obtained within a 24-hour testing period. If a straight-line trend of water level versus the logarithm of time pumped is not observed within a 24-hour period and it is impractical to continue the test, the test shall continue at least until a consistent pumping-level trend is observed and the failure to observe a straight-line trend shall be recorded. If pumping rates remain constant for a period of at least four hours and a straight-line trend is observed on a plot of water level versus the logarithm of time pumped before the 24-hour limit has been reached, the pumping portion of the test may be terminated. The frequency of water-level measurements during the aquifer test shall allow for an adequate definition of the time-drawdown data. Water-level recovery data shall also be obtained to verify the accuracy of the data obtained during the pumping portion of the test. If the test is for a proposed public water supply well, a 36-hour uniform rate aquifer test described in Chapter 290, Subchapter D, is required as provided under §230.8(a).

Adopted §230.8(c)(7) provides that existing wells and aquifer test data may be used if they meet the full requirements of the rule. An existing well may be used as an observation well if sufficient information is available for the well to demonstrate that it meets the requirements of this section. If a previous aquifer test is used, it must have been performed on a well within a 1/4-mile radius of the subdivision that is utilizing the same aquifer (under approximately the same conditions) which is being considered as the source of water supply for the proposed subdivision.

Adopted §230.8(c)(8) provides guidance for the determination of whether additional aquifer testing and observation wells are needed. Best professional judgment must be used to determine if additional observation wells or aquifer tests are needed to adequately demonstrate groundwater availability. The Theis and Cooper-Jacob nonequilibrium equations and acceptable modifications thereof, that are commonly used in evaluating aquifer test data, are based on well documented assumptions. To determine if additional information is needed, best professional judgement must be used to consider these assumptions, the site-specific information derived from the aquifer test, the size of the proposed subdivision, and the proposed method of water delivery. In response to comments, staff have removed an unnecessary reference to “professional engineer” from this subsection and restructured the language because it was overly restrictive.

Section 230.8(d) requires the information, data, and calculations prepared under this section be made available to the municipal or county platting authority, if requested, to document the requirements of this section as part of the plat application.

If groundwater is to be the source of water for the proposed subdivision, the commission recognizes that the water must be of sufficient quality to meet the intended use in order to be considered an adequate water supply.

Adopted new §230.9, Determination of Groundwater Quality, provides that the quality of groundwater be determined through the analysis of samples collected near the end of the aquifer test. The section provides the minimum suite of constituents which must be analyzed. If individual water wells serving individual lots are the anticipated method of water distribution, the samples must be analyzed for chloride, conductivity, fluoride, iron, nitrate (as nitrogen), manganese, pH, sulfate, total hardness, total dissolved solid, and the presence/absence of total coliform bacteria. If a public water supply system is anticipated, the bacterial and chemical analysis required by Chapter 290, Subchapter F, concerning Drinking Water Standards Governing Drinking Water Quality and Reporting Requirements For Public Water Supply Systems, must be utilized. The samples must be analyzed by a Texas Department of Health approved laboratory using methods approved by the commission. The information, data, and calculations required by this section shall be made available to the platting authority, if requested, to document the requirements of this section as part of the plat application.

Adopted new §230.10, Determination of Groundwater Availability, outlines the steps to be taken to make a determination of groundwater availability. These determinations will be based on the anticipated method of water delivery, the annual groundwater demand estimate, and the aquifer parameters derived from the site-specific aquifer testing and water-quality sampling.

Section 230.10(a) provides for the minimum time frames to be used in determining groundwater availability at full build out. Groundwater availability must be determined for ten- and 30-year time frames. The municipal or county platting authority may also require other time frames under their respective ordinance or order to correspond with ongoing local water planning initiatives and objectives. The ten-year time frame is required to allow municipalities or counties to assess short-term availability and if alternative supplies of water are known or believed to be available for the proposed subdivision in the near future. The 30-year time frame is the time frame utilized by the Texas Water Development Board and the Regional Water Planning Groups under 31 TAC Chapters 357 and 358 in developing the state and regional water plans and under the Texas Water Development Board's 31 TAC Chapter 364, Model Subdivision Rules. The 30-year time frame will allow municipalities or counties to assess a longer term of groundwater availability for the proposed subdivision.

Section 230.10(b) requires that the groundwater availability determination consider the anticipated method of water delivery for the proposed subdivision as identified under §230.5 and be compared to the annual groundwater demand estimates at full build out as determined under §230.6. The anticipated method of water delivery and the groundwater demand estimates at full build out will identify the number of wells which will be required for the proposed subdivision and the groundwater demands of the proposed subdivision on the underlying aquifer, respectively. This information must be considered and compared to site-specific aquifer parameters to make a determination of groundwater availability.

Section 230.10(c) requires that aquifer parameters be determined utilizing the aquifer test data obtained under either §230.8 for individual water wells or under Chapter 290, Subchapter D, for public water supply wells. In response to a comment, the commission has clarified that the determination of aquifer

parameters shall also utilize the geologic and groundwater information considered under §230.7. The commission recognizes that site-specific aquifer parameters must be utilized to adequately determine groundwater availability for certification. The time-drawdown and time-recovery data obtained during the aquifer test must be used to determine aquifer parameters utilizing the nonequilibrium equations developed by Theis or Cooper-Jacob, or acceptable modifications thereof. These are the most commonly used equations for determining aquifer parameters and evaluating aquifer test data. The commission recognizes that groundwater availability must consider the rate of yield of the pumped well and drawdown of the water level and the specific capacity, efficiency of the pumped well, transmissivity, coefficient of storage, and hydraulic conductivity of the aquifer. Recharge or barrier boundaries, if any are present, and thickness of the aquifer should also be considered in making groundwater availability determinations. This information must be provided to the municipal or county platting authority on the form required under §230.3.

Section 230.10(d) requires that the anticipated method of water delivery, the annual groundwater demand estimate, and the aquifer parameters be used to make groundwater availability determinations. Time-drawdown calculations are required to determine the amount of drawdown (water-level decline) at the pumped well (or at the pumped wells if multiple wells are anticipated) and the amount of drawdown at the boundaries of the proposed subdivision for the ten- and 30-year time frames and other time frames determined by the platting authority to be necessary. These calculations will allow the municipal or county platting authority to review the anticipated amount of drawdown at the pumped well(s) and at the boundary of the proposed subdivision at ten- and 30-years time. Distance-drawdown calculations are required to determine the distance the well's (or wells' if multiple wells are proposed) cone-of-depression (area influenced by the pumpage of the well) will extend from the well for the ten-

and 30-year time frames. This calculation will allow the municipal or county platting authority to review the anticipated distance the pumped well(s) will affect water levels and other wells. Well interference calculations are required if multiple wells are proposed. These interference calculations will determine how the wells will affect each other for the ten- and 30-year time frames and will provide the basis for recommending spacing limits between individual wells and well yields (pumping rates) that will allow for the continued use of the wells for the ten- and 30-year time frames. These calculations will allow the municipal or county platting authority to review the anticipated groundwater availability and the density and number of water wells within the proposed subdivision. The municipal or county platting authority may also require the time-drawdown, distance-drawdown, and well interference calculations for any other specified time frame which they have so chosen. This information must be provided to the municipal or county platting authority on the form required under §230.3.

Section 230.10(e) requires the water quality analysis required under §230.9 to be compared to primary and secondary drinking water standards. This requirement will allow the municipal or county platting authority to review the anticipated usability of the groundwater for its stated purposes, and thus assess the groundwater quality for supplying the proposed subdivision. A listing of the constituents that meet or exceed these standards must be provided to the municipal or county platting authority on the form required under §230.3.

Section 230.10(f) requires that the information, data, and calculations required by this section be made available to the platting authority, if requested, to document the requirements of this section as part of the plat application.

Adopted new §230.11 has been retitled Groundwater Availability and Usability Statements and Certification in response to comments and specifies that groundwater availability and usability conclusions be drawn based on the information developed under §230.10. These statements must be provided to the municipal or county platting authority on the form required under §230.3(c). The statements required by §230.11(a) provide a summary of the groundwater availability determinations to the municipal or county platting authority and relate to the estimated drawdown of the aquifer at the pumped well(s) over a ten- and 30-year period, the estimated drawdown of the aquifer at the subdivision boundary over a ten- and 30-year period, the estimated distance from the pumped well(s) to the outer edges of the cone(s)-of-depression over a ten- and 30-year period, the recommended spacing limit between wells and the recommended well yields, and the sufficiency of available groundwater quality to meet the intended use of the platted subdivision. In response to comments, staff have removed an unnecessary reference to “professional engineer” from this subsection and restructured the language because it was overly restrictive.

In response to comments, the commission has added new §230.11(b) and amended and moved portions of proposed §230.11(b) and (c) into new §230.11(c) relating to Certification. New §230.11(b) provides that the assumptions and uncertainties that are inherent in the determination of groundwater availability should be clearly identified on the form required under §230.3(c). These conditions must be identified to adequately define the limitations that are inherent in assessing a natural aquifer system for availability and usability and may address such uncontrollable or unknown factors as future pumpage from the aquifer from wells outside of the proposed subdivision, long-term impacts to the aquifer based on climatic variations, and future impacts to groundwater quality. Such information is necessary because the platting authority should fully understand any limitations of the groundwater availability

certification. Furthermore, stating any inherent assumptions and uncertainties should place the certification in a historic context if future evaluations are required for adjoining properties.

Section 230.11(c), Certification, was amended in response to comments (contains language proposed in §230.11(b) and (c)) and provides for the licensed professional engineer's certification of groundwater availability. Based on best professional judgement, current groundwater conditions, and the information developed and presented in the form specified by adopted §230.3(c), the licensed professional engineer certifies by signature, seal, and date that adequate groundwater is available from the underlying aquifer(s) to supply the anticipated use of the proposed subdivision.

FINAL REGULATORY IMPACT ASSESSMENT

The commission has reviewed the rulemaking in light of the regulatory analysis requirements of Texas Government Code, §2001.0225, and has determined that the rulemaking is not subject to §2001.0225 because it does not meet the definition of a "major environmental rule" as defined in that statute.

"Major environmental rule" means a rule the specific intent of which is to protect the environment or reduce risks to human health from environmental exposure and that may adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, or the public health and safety of the state or a sector of the state. The specific purpose of the adopted rules is to implement certain provisions in SB 1323 which direct the commission to establish the appropriate form and content of a groundwater certification to be attached to a plat application to demonstrate if adequate groundwater is available for a proposed subdivision. The form and content of the adopted rules are intended to allow municipal or county platting authorities to consider groundwater availability in their decision-making. These rules only specify the form and content of the groundwater availability

certification and are not mandatory unless the platting authority opts to require the certification as specified in SB 1323. If a platting authority opts to require the adopted certification, it is not anticipated that these rules could have an adverse material effect on the economy, a sector of the economy, productivity, competition, jobs, the environment, or the public health and safety of the state or a sector of the state. Furthermore, these rules are not a “major environmental rule” because their specific intent is not to protect the environment or reduce risks to human health from environmental exposure, but to provide a public benefit by establishing uniform standards for platting authorities who choose to require certification of adequate groundwater availability for the subdivision of land.

In addition, §2001.0225 only applies to a major environmental rule, the result of which is to: 1) exceed a standard set by federal law, unless the rule is specifically required by state law; 2) exceed an express requirement of state law, unless the rule is specifically required by federal law; 3) exceed a requirement of a delegation agreement or contract between the state and an agency or representative of the federal government to implement a state and federal program; or 4) adopt a rule solely under the general powers of the agency instead of under a specific state law.

This rulemaking does not meet any of these four applicability requirements of a “major environmental rule.” Specifically, the adopted rules do not exceed a standard set by federal law nor exceed the requirement of a delegation agreement because there is no federal equivalent for provisions in the Texas Local Government Code. The adopted rules do not exceed an express requirement of state law because the statute requires the commission to enact rules that provide the form and content of a certificate that groundwater is “adequate.” Groundwater which will be used for drinking water can only be adequate if it is of sufficient quantity and quality. These rules relate to that determination of adequacy. The

adopted rules were not developed solely under the general powers of the agency, but are proposed under the specific authority of the Texas Local Government Code, as amended by SB 1323.

TAKINGS IMPACT ASSESSMENT

The commission has prepared a takings impact assessment for these rules pursuant to Texas Government Code, §2007.43. The following is a summary of that assessment. Local Government Code, §212.0101 and §232.0031, require the commission, by rule, to establish the appropriate form and content of a certification to be attached to plat applications. Local Government Code, §212.0101 and §232.0031, do not provide the commission with any additional authority or jurisdictional responsibility related to plat applications or groundwater availability certification.

The use of the adopted form and rules is not mandatory. A municipal authority by ordinance or a county commissioner court by order shall determine if the adopted form and rules shall be used in the plat application process for that municipality or county, respectively. The adopted form and rules will be used and implemented only by the municipal and county authorities which choose to do so. The action to establish the form and rules in itself does not create a burden on private real property. The adopted rules establish standards for certification of groundwater availability if a municipality or county chooses to require certification.

Implementation of the form and rules would not decrease the current value of the tract of land. The land value will increase with the subdivision of the land regardless of whether the plat application is accepted as proposed or whether the municipal or county authority requires the plat application to be amended after the authority's analysis of the information required under the form and rules that will be

attached to the plat application. Adequate groundwater either does or does not exist on the land. The certification implemented in these rules does not change that fact and therefore cannot constitute a burden on the property.

COASTAL MANAGEMENT PLAN CONSISTENCY REVIEW

The commission has reviewed the adopted rulemaking and found that the rules are neither identified in Texas Coastal Coordination Act Implementation Rules, 31 TAC §505.11, relating to Actions and Rules Subject to the Texas Coastal Management Program (CMP), nor will they affect any action/authorization identified in Coastal Coordination Act Implementation Rules, 31 TAC §505.11. Therefore, the adopted rules are not subject to the CMP.

HEARING AND COMMENTERS

The proposed rules were published in the February 11, 2000 issue of the *Texas Register* (25 TexReg 1028). A public hearing for this rulemaking was held in Austin on March 7, 2000. The comment period closed on March 13, 2000.

A total of 20 commenters provided both general and specific comments on the overall proposal. The following commented on the proposed rules: American Institute of Professional Geologists - Texas Section (AIPG-TX); Association of Engineering Geologists - Texas Section (AEG-TX); Blanco County Commissioner Victor L. Tellez (Commissioner Tellez); two individuals from Citizens for Groundwater Conservation, Incorporated, Blanco County (CGC); GEOS Consulting (GEOS); Hill Country Roundtable (HCR); two individuals from the Houston Geological Society (HGS); HydroGeology International (HydroGeology); Iron Harbor Development Group, LLC (Iron Harbor); MFG,

Incorporated (MFG); RMT, Incorporated (RMT); R.W. Harden & Associates (Harden & Asso.); Science Applications International Corporation (SAIC); Strata Geological Services, Incorporated (Strata); Texas Association of Builders (TAB); and two individuals. Two additional comments (State Representative Joe Nixon and GEOS) were received after the close of the comment period and were also considered in the analysis of testimony.

Of these, two individuals from CGC and HCR indicated that they were generally in favor of the proposal. Commissioner Tellez provided general comments on the overall proposal. One individual, Iron Harbor, SAIC, and TAB expressed no support or opposition but suggested changes. AEG-TX, AIPG-TX, GEOS, Harden & Asso., both representatives of the HGS, HydroGeology, an individual, MFG, RMT, State Representative Joe Nixon, and Strata indicated that they were opposed to specific areas of the proposal and suggested changes.

ANALYSIS OF TESTIMONY

GENERAL COMMENTS

Two individuals from CGC and HCR provided comments generally supporting the proposed rules. HCR commented that explosive growth over the Trinity Aquifer and the drought has increased the need for water availability rules and the commission should go forward with the promulgation of the rules. One individual from CGC commented that water availability regulations are the only tools counties currently have to deal with over-development where known water shortages exist and that failure to promulgate the proposed rules would not be in the best interest of the citizens or the State of Texas. This individual commented that failure to adopt the proposed rules would seriously handicap counties

attempting to address over-development in areas where known water shortages exist. A second individual from CGC commented that the authority to develop water availability regulations is a critical county power. This individual noted considerable local support for such regulations in Blanco County and supported commission efforts to establish reasonable rules. Furthermore, Iron Harbor noted the statute was intended to protect consumer rights, promote public health, and enable county officials to better supervise responsible development.

The commission recognizes and agrees with these comments and notes the rules are being adopted to protect consumer rights and to provide a tool to aid those municipal and county platting authorities that choose to use the rule to oversee development. The use of the rules is not mandatory unless the platting authority opts to require the certification as specified in the Local Government Code. The commission agrees that local platting authorities can use these rules to help assure adequate groundwater is available as part of the subdivision platting process.

One individual from CGC noted that having water availability regulations does not always mean that water will be available and that although certification does not guarantee water, it does demonstrate that some effort has been made to take possible limitations in water supply into consideration when a subdivision is created. SAIC commented that the lack of quality water supplies could create numerous problems and hardships if a new development were allowed to build in an area that is not capable of supplying sufficient water, during both times of drought and adequate recharge.

The commission agrees with these comments and responds that the form and content of the rules are intended to allow municipal or county platting authorities to consider groundwater availability in their decision-making.

AEG-TX, AIPG-TX, one individual from CGC, Commissioner Tellez, GEOS, Harden & Asso., two members of HGS, HydroGeology, MFG, RMT, SAIC, Strata, and two individuals made similar comments on the expertise, education, training, knowledge, and experience of hydrogeologists, geologists, and groundwater hydrologists in conducting groundwater availability assessments, investigations, and studies. These respondents noted that these professions represent the majority of the groundwater professionals who have historically performed groundwater availability determination services.

The commission agrees with these comments and recognizes that hydrogeologists, geologists, and groundwater hydrologists have the appropriate training, education, expertise, and capabilities to study and quantify groundwater availability and usability. Changes were made to the rules concerning these professions and are discussed in detail later in the text.

AEG-TX, AIPG-TX, GEOS, Harden & Asso., two members of HGS, HydroGeology, MFG, SAIC, Strata, and two individuals made comments that requested the proposed rules be amended so that qualified hydrogeologists, geologists, and groundwater hydrologists, as well as Texas licensed professional engineers, be authorized to certify groundwater availability. GEOS commented that most of the critical basic information required to properly characterize an aquifer and to determine how the aquifer will be impacted by groundwater withdrawal is fundamentally geologic in nature and not

engineering based. MFG specifically suggested that the commission consider adding the basic definition of a “qualified ground-water scientist” from Title 40, Code of Federal Regulations, §260.10 for those authorized to certify groundwater availability under the proposed rules.

The commission does not agree that aquifer characterization required by the rules does not have an engineering basis. Aquifer characterization required by the rules is a mixed combination of geology, hydrology, and engineering, and the design and interpretation of the aquifer test may be considered engineering based. The commission recognizes that these rules exclude qualified groundwater professionals without a professional engineering license from being able to certify groundwater availability. However, the Local Government Code, §212.0101(a)(1) and 232.0031(a)(1) specify that a municipal or county platting authority may require the plat application to have attached to it a statement that “is prepared by an engineer registered to practice in this state...” The commission must follow and is bound by this express statutory language. The statute does not allow the commission the flexibility to allow other groundwater professionals to certify the adequacy of groundwater under these rules. Therefore, no change has been made to certification-specific language in the rules in response to these comments. However, other changes to the rules and form were made, as discussed later in the text.

One individual commented that geologists currently perform many services related to the health, safety, and welfare of the people of Texas including the certification of geological assessments performed on the Edwards Aquifer Recharge Zone. Two members of HGS commented that they were registered Corrective Action Project Managers under 30 TAC Chapter 334, Subchapter J, who were recognized as being accountable for their work and the protection of groundwater resources under the Petroleum

Storage Tank Program. These commenters suggested that consultants with their specific professional registration are qualified to take accountability for other water resource program requirements including the certification of availability under these rules.

The commission acknowledges these comments but has not changed the certification requirement in response to the comments. The statute does not allow the commission the flexibility to allow other groundwater professionals to certify the adequacy of groundwater under these rules.

MFG commented that while there are many competent and qualified Texas professional engineers who could appropriately provide certification as required by the proposed rules, most Texas professional engineers do not have specialized training or experience in groundwater availability studies. AIPG-TX, GEOS, and one individual commented that while there are undoubtedly engineers in Texas well qualified to perform the work necessary to make these certifications, the significance of the geologic component of the work demands that the certifying professional have a comprehensive geologic education and extensive work experience in the area of hydrogeology. SAIC suggested that the proposed rules should include language to state that engineers must have the appropriate experience and qualifications to perform hydrogeological and aquifer testing required by the rules.

The commission recognizes and acknowledges that under the rules of the Texas Board of Professional Engineers (Title 22, Texas Administrative Code, Part 6, Chapter 131, Subchapter I), Texas licensed professional engineers may practice only in their areas of competence and may not perform any assignment for which they are not qualified by education or experience. However, a Texas licensed professional engineer may accept an assignment which includes phases outside of

the engineer's area of competence if those other phases are performed by legally qualified consultants, associates, or employees. The commission anticipates that qualified groundwater professionals will largely serve in this capacity if implementation of the rules are required by local platting authorities.

Strata specifically suggested the commission consider adding "or Certified American Institute of Professional Geologists or equivalent" to all references that mention "professional engineer."

As previously noted, the commission disagrees because the statute does not allow the commission the flexibility to allow other qualified groundwater professionals to certify the adequacy of groundwater under these rules. However, the commission has reevaluated all references to "professional engineer" in the proposed rules and agrees that changes should be made to some of the reference to not exclude other qualified groundwater professionals from performing rule requirements other than providing the groundwater adequacy certification. In response to the comment, the commission has removed the references to "professional engineer" and restructured the language in adopted §§230.3(c), 230.8(c) and (3)(C)(8), and 230.11(a). These references were removed because the proposed language was overly restrictive as to who was authorized to perform these rule functions. All other references to "professional engineer" are required because they: 1) provide the definition of the term; 2) provide information for administrative purposes; or 3) are specific to the certification of groundwater adequacy as required by statute.

One individual suggested the certification should be made with the advice of a hydrogeologist or other qualified geoscientist and commented on the working relationship of engineers and geologists at his

place of employment. AIPG-TX commented that over the next 50 years, the water resource issues in the State of Texas will be so great that it will take the expertise of both geologists and engineers to address everything and that geologists have brought immense value to the resource management of the State of Texas. AIPG-TX commented that excluding other qualified groundwater professionals under the rules is unconscionable and renders these professionals to nothing more than secondary technicians who are subordinate to professional engineers. GEOS commented that the rules, as proposed, were a disservice to the citizens of Texas who will be affected by the rules and noted that the citizens of Texas are severely restricted in their choice of qualified groundwater professionals to provide the services required by the statute and rules.

The commission acknowledges these comments and recognizes and understands that the expertise of both geologists and engineers will be required to address water resource management issues within the state. The commission also recognizes that working relationships between geologists and engineers, each working toward a common goal under their own area of expertise, presently exist and have existed for many years. The commission expects that professional engineers will consult with other qualified groundwater professionals as necessary if implementation of the rules is required by local platting authorities. Furthermore, the commission responds that statute does not allow flexibility to include other qualified groundwater professionals to certify groundwater adequacy under these rules. However, nothing in the adopted rules excludes other qualified groundwater professionals from performing rule requirements other than the certification. If implementation of the rules is required by the local platting authority under the Local Government Code, a Texas licenced professional engineer will ultimately have to sign and seal the certification even if phases of rule implementation outside of the engineer's area of competence are

performed by other legally qualified professionals. The commission does not have the flexibility to address this issue under the existing statute and has made no changes in response to these comments.

AEG-TX, AIPG-TX, GEOS, one member of HGS, RMT, Strata and one individual commented that the exclusion of geologist and hydrogeologist from performing groundwater availability studies could have a significant, adverse economic impact on these groundwater resource professionals. GEOS further commented that many of these groundwater professionals operate as small or micro-businesses. GEOS and Strata commented that since most of the work required by the rules has been traditionally performed by groundwater professionals, including non-engineers, implementation of the rules may constitute a restraint of trade on many of these qualified professionals. Strata further suggested that the exclusion of all classes of geologist allows only engineers to practice geology which is unethical and may be considered a violation of deceptive trade law.

The commission disagrees with these comments. If a traditional demand for similar groundwater professional services has predated the statutory changes and these rules, that traditional demand will remain in effect after the adoption of these rules. The commission further responds that the adopted rules' scope is limited solely to instances when a municipal platting authority or county commissioners court exercises its authority under the Local Government Code and requires groundwater availability certification to accompany plat applications. This is a new power that has been granted to these platting authorities and the rules do not represent a restraint on an activity that was not previously authorized. As adopted, the rules do not restrict other

groundwater professionals from performing any rule requirement except for certifying the adequacy of groundwater.

One individual from CGC commented that expenditures related to certifying water availability can be regarded as an expense related to the cost of subdividing land. This individual noted that implementing water availability regulations does not mean water will always be available. The respondent further noted that lack of sufficient water supply severely diminishes the value of any property.

The commission agrees with these comments and notes that it is unknown how many landowners or developers may already conduct tests and analysis similar to the requirements of the certification prior to considering the development of land. However, adequate groundwater either does or does not exist on the land. The certification implemented under these rules does not change that fact.

HydroGeology commented that the economic impact of the drawdown of the proposed well field on neighbors' water supply has not been addressed and noted that pumping often lowers water levels below adjoining properties.

The commission agrees with this comment; however, it has made no change in response to this comment. The commission notes that the express scope of the statute is directed at groundwater availability for a proposed subdivision and the commission does not have the flexibility to expand this scope. Under the rule of capture which has been established by the courts, groundwater is owned privately upon its capture by a well. A landowner can pump as much groundwater as he

chooses without liability to neighbors who might claim that pumping has depleted their wells unless groundwater pumpage is done maliciously to injure a neighbor, amounts to wilful waste of the resource, or negligently causes subsidence of surrounding land. Existing uses are not protected against new uses. Under Texas Water Code, Chapter 36, groundwater conservation districts are authorized to conserve and manage groundwater resources. Where present, these districts are required to permit water wells and authorized to adopt regulations for the spacing of wells and production of water from these wells. If a groundwater conservation district has adopted such regulations, the rule of capture is limited by the district regulations. This agency cannot directly control the amount of groundwater use.

Commissioner Tellez commented that a groundwater availability certification under the rule could have a tremendous impact on the property value and the property rights of individuals.

The commission disagrees with this comment. Local government implementation of the form and rules would not decrease the current value of a tract of land. The land value will increase with the subdivision of the land regardless of whether the plat application is accepted as proposed, or whether the plat application must be amended after the platting authority's analysis of the information contained in the groundwater availability certification form. Adequate groundwater either does or does not exist on the land. The certification implemented in these rules does not change that fact and therefore does not constitute a burden on the property.

GEOS, Harden & Asso., and SAIC requested the commission delay adoption of the rules until such time that the statute has been amended to include certification by other qualified groundwater

professionals. A similar request was received from State Representative Joe Nixon after the comment period had expired. AEG-TX, AIPG-TX, one individual from CGC, GEOS, HCR, one member of HGS, and SAIC suggested that there will be an opportunity to reexamine the statute during the next legislative session as needed. Furthermore, Iron Harbor volunteered its services in amending the statute at that time.

The commission responds that it cannot delay the adoption of the rules and has a policy of adopting rules to implement legislation within the first fiscal year of the biennium following the legislative session. To delay the adoption of these rules would deny these local platting authorities the ability to require groundwater availability certification as part of the plat application process. The commission further responds that if new legislation is passed during the next or a subsequent legislative session which would result in a modification of these rules, the agency will also not delay in the proposal and adoption of those changes.

GEOS questioned whether the professionals on the external review group truly represented the groundwater professionals who practice in this area.

The commission responds that the external review group consisted of active representatives from county government and county associations; geologic, engineering, and academic interests; and local and state management, planning, and regulatory agencies. Within the external review group, input was also solicited from a municipal association, a council of government, and a builders association. Furthermore, the commission notes that the groundwater professionals on the review group raised many of the same concerns as the commenters (e.g., exclusion of other

groundwater professionals, liability issues, definition of certification, etc.) during the preparation of the proposal. In addition, the review group members were very cognizant of the limitation of commission flexibility under the statute.

SPECIFIC COMMENTS

§230.1. Applicability.

GEOS and Harden and Asso. commented that water availability regulations in Hays and Kendall counties allow for hydrogeologists to make the necessary determinations of groundwater availability and the statewide rules should be similarly worded.

The commission responds that the authority of counties in designated PGMA's (including Hays and Kendall counties) under TWC, §35.019 is broader in scope than the authority granted to municipalities and counties under Local Government Code, §212.0101 and §232.0031. The commission notes that the rules do not replace the authority of counties within designated PGMA's (as reflected in §230.1(b)). These counties are authorized to adopt their own availability requirements under TWC, §35.019 if the commissioners court determines that the requirements are necessary to prevent the county from exceeding the county's water supply. Counties in designated PGMA's are not restricted to exercising groundwater availability authority in the platting process solely under the Local Government Code. The commission has made no changes in response to these comments. However, the commission has clarified on the certification form, Figure 30 TAC §230.3(c), that the form and Chapter 230 do not replace the authority of counties or groundwater conservation districts under TWC, §35.019 or Chapter 36, respectively.

Concerning §230.1(b), the HCR commented that three counties in the designated Hill Country PGMA had adopted water availability rules, but many counties in the PGMA had not. The HCR also commented that standardized rules for the entire state under Chapter 230 may encourage counties in designated PGMA's to establish availability rules.

The commission agrees with this comment and responds that the public benefit anticipated from the platting authority's use of the proposed certification rules will be a standardized approach to statewide certification of groundwater availability for platting and the proper planning for the use of available groundwater supplies by assuring that platted subdivisions are built with an adequate water supply.

A member of HGS commented that the proposal is short-sighted as it does not address effects of groundwater withdrawal and noted land subsidence as a result of groundwater withdrawal as an example. This individual suggested the proposal ignores special law subsidence districts and as such could accelerate development.

The commission disagrees with this comment and notes that under §230.1(b) the rules do not replace the authority of groundwater conservation districts under TWC, Chapter 36. The subsidence districts (Harris-Galveston Coastal and Fort Bend Subsidence Districts) are included under this provision, and their rules and regulation would supercede any municipal or county platting authority implementation of the rules under the Local Government Code and these rules. Additionally, the statute did not give the commission authority to address subsidence in these rules. The commission has made no changes in response to this comment.

Commissioner Tellez questioned who will be responsible for analyzing the final information that is brought forth by a subdivider.

The commission responds that the certification rule and form have been developed so that the information should stand on its own merits as presented to the platting authority. Furthermore, the platting authority is authorized to request any supporting information or data to document the certification as necessary. If properly completed, the form should provide sufficient information about groundwater demand, groundwater availability, projected drawdown, and the effects of projected drawdown by the proposed subdivision at full build out. The commission notes that the groundwater availability and usability statements under adopted §230.11(a) and (b) should ultimately summarize the findings of the groundwater availability certification.

§230.2. Definitions.

AIPG-TX, GEOS, Harden & Asso., MFG, and the TAB commented about the use and definition of the term “certification.” These commenters generally suggested that the term “certification” was too strong and suggested its replacement with “best professional judgement.”

The commission disagrees that “certification” should be replaced with “best professional judgement” because the statute requires the use of the term. However, the commission agrees that best professional judgement is a clearer term than “professional opinion” and amends the definition of “certification” in §230.2(3) and the certification form in §230.3(c).

§230.3. Certification of Groundwater Availability for Platting.

GEOS commented that the certification form should be amended to require attachment of the underlying data supporting the certification and noted that this affords the platting authority and others the opportunity to review and evaluate the basis of the information on their own.

The commission notes that competent groundwater professionals should submit such information upon request to document and support the certification they have provided. As it is not the evaluator of these certifications, the commission will not mandate what information shall be submitted in addition to the form to document the certification. The rules include sufficient provisions, under §§230.6(d), 230.8(d), 230.9(b), and 230.10(f), to provide the municipal or county platting authority with the ability to require such information, data, and documentation. No changes were made in response to this comment.

§230.7. General Groundwater Resource Information.

GEOS commented that the proposal does not address the issues of aquifer heterogeneity and anisotropy or boundary conditions and noted these conditions are widespread in many aquifers.

The commission disagrees with the comment and responds that §230.7(b) requires the certifying professional to consider geologic and groundwater information in planning and designing the aquifer test. Though not specifically named, aquifer heterogeneity and anisotropy are considered under §230.7(b)(2), the lithology of the geologic strata, and under §230.7(b)(4), the characteristics of the aquifer(s) and their hydraulic relationships. The purpose of the aquifer test required under §230.8(c) is to quantify site-specific aquifer conditions, including heterogeneity and anisotropy. Furthermore, the certifying professional is required under §230.8(c)(8) to determine if the

minimum aquifer testing required by the rule is sufficient to adequately quantify site-specific aquifer conditions. If best professional judgement determines that the minimum aquifer testing standards are not sufficient, additional testing to adequately determine aquifer conditions is required. Using the aquifer test data, positive and negative boundary conditions are considered under §230.7(b)(5) relating to the recharge to the aquifer(s) and movement and discharge of groundwater from the aquifer(s). The commission has not made any changes in response to this comment.

§230.8. Obtaining Site-Specific Groundwater Data.

GEOS commented that the level of technical detail in §230.8 is unwarranted and that competent groundwater professionals conducting this type of work are cognizant of these technical considerations.

While the commission agrees that competent groundwater professionals conducting this type of work should be cognizant of these technical considerations, the commission disagrees that the level of technical detail in §230.8 is unwarranted. The level of technical detail contained in the rule represents the minimum criteria utilizing the best available science for making site-specific groundwater availability determinations based on aquifer testing. Site-specific aquifer testing ultimately forms the basis for making site-specific groundwater availability determinations.

The commission further responds that the level of detail in the adopted rule is included as much for the local platting authority as it is for the groundwater professional. The level of detail gives the platting authority confidence that the aquifer testing and the certification of groundwater

availability prepared under this rule will at least meet the minimum requirements as specified by the rule. The commission did not make any changes in response to this comment.

GEOS commented that because of the broad variabilities in aquifer types, conditions, and characteristics the details of how to test and characterize the aquifer should be left to the discretion of the professional to determine on a case-specific basis. Further, GEOS commented that how the data is collected and evaluated should be up to the professional and justification thereto should be a required part of the submittal. GEOS suggested that a major risk in implementing the current “cook book” language is that it will tend to suppress the identification and use of the testing and evaluation techniques most suitable to each case and instead, foster an attitude of “just follow the rules to get by.”

The commission responds that Local Government Code, §212.0101 and §232.0031 require that the commission “establish the appropriate form and content of a certification to be attached to a plat application.” Establishing minimum requirements for determining groundwater availability are therefore justified. Establishing minimum standards are necessary to provide an acceptable level of accountability for the certification for the municipal or local platting authority who will be responsible for making decisions based on the certification.

The adoption represents the minimum requirements that are appropriate for determining aquifer characteristics and they are applicable for all ranges of aquifer types found within the state. Furthermore, the rule specifically empowers and challenges the certifying professional to utilize best professional judgement and does not limit case-specific evaluations. Adopted §230.8(c) provides that the aquifer test must provide sufficient information to allow evaluation of each

aquifer being considered as a source of water supply, be based on typical well completions, and be conducted utilizing established methods. The underlying science must be addressed regardless of the evaluation method utilized. In addition, §230.8(c)(6) provides that the duration of the aquifer test depends entirely on local and geologic conditions. Under §230.8(c)(8), the certifying professional, utilizing best professional judgement, must determine if the minimum standards outlined in the rule are adequate for each site and if additional testing is necessary at the site to characterize the aquifer.

After the close of the comment period, a GEOS commented that the proposed rule should be clarified regarding the completion of the observation well. This individual noted that the observation well must be completed or screened in the same aquifer to validly monitor the pumping well.

The commission agrees with this comment and has amended §230.8(c)(1) to clarify that the observation well(s) shall be completed in the same aquifer or aquifer production zone as the test well.

In regard to proposed §230.8(c)(3)(B), GEOS commented that there are certain well or borehole situations in which the running of electric and spontaneous potential logs is inappropriate and will yield meaningless data.

The commission agrees with this comment and notes that §230.8(c)(3)(C) was included in the proposal and remains in the adoption to address these certain situations. If it can be adequately

demonstrated that these logs are not necessary to characterize the aquifer for testing purposes, the platting authority may waive this requirement.

§230.10. Determination of Groundwater Availability.

GEOS commented that if the certifying professional is not aware or does not consider the issues of aquifer heterogeneity and anisotropy or boundary conditions, the resulting calculations of spatial and temporal effects of pumping and projections of water availability can be seriously in error.

The commission agrees that these issues must be considered and notes they are required to be considered under adopted §230.7(b) as previously discussed. The commission has changed §230.10(c), related to determination of aquifer parameters, to again reiterate the importance of this information and to assure that these issues are considered when aquifer parameters are determined. In conjunction, the commission has also amended number 34 on Figure 30 TAC §230.3(c) in the adoption to reflect this change.

§230.11. Groundwater Availability and Usability Statements and Certification.

HydroGeology suggested that the impact of drawdown to adjoining properties should be evaluated and explicitly stated to the governing body authorizing the development and that the governing body should make decisions in light of likely impact to neighbors.

The commission notes that the express scope of the statute is directed at groundwater availability for a proposed subdivision and the commission does not have the flexibility to expand this scope. However, the commission responds that §293.11(a)(2) and (3) require that the drawdown of the

aquifer at the subdivision boundary, and the distance from the pumped well(s) to the outer edges of the cone(s)-of-depression over ten- and 30-year periods be estimated. These estimates, based on full build out demand, will give an indication to the platting authority of the impact of the proposed subdivision's groundwater pumpage to the adjoining properties. The drawdown estimates will give an indication of expected water-level declines at 10 and 30 years at the boundary of the proposed subdivision; therefore also at the boundary of the adjacent property. The distance-drawdown estimates will give an indication of the area being impacted by the proposed subdivision's wells which certainly can extend to the adjoining properties.

AEG-TX, AIPG-TX, GEOS, Harden & Asso., Iron Harbor, MFG, and TAB expressed concerns about the potential liability of those certifying groundwater availability under the rule without establishing understandable parameters around the availability and usability determinations and the certification. The commenters noted that by quantifying these parameters, the certifying professional should be protected from unforeseen future events. These commenters suggested that competent groundwater professionals would be reluctant or unwilling to accept the liability of certifying groundwater availability because of such uncontrollable and unknown factors such as: future pumpage from the aquifer or interconnected aquifers from area wells; long-term impacts to the aquifer based on climatic variations beyond what would historically be expected; spacial variabilities in the physical and hydraulic properties of an aquifer that cannot be readily or practicably fully characterized; unpredicted contamination to the aquifer; or other factors that affect the storage of water in the aquifer. These commenters suggested that the certification should clearly identify and state the assumptions and uncertainties that are inherent in the determination of groundwater availability.

The commission partially agrees with these comments. Explicitly stating limitations that are inherent in characterizing or predicting behavior of natural systems is necessary to adequately define what the availability and usability statements, and thus the certification, are based upon and what they do not consider. The commission has added new §230.11(b), Groundwater Availability Determination Conditions, to the adoption. This amendment requires identification of the inherent limitations or uncertainties applicable to the groundwater availability and usability determinations. In conjunction, the commission has amended Figure 30 TAC §230.3(c) to reflect this change. Proposed language in §230.11(b) and (c), pertaining to the certification, has been moved to adopted §230.11(c) as discussed in the following text.

§230.11(c). Certification.

AEG-TX, AIPG-TX, one individual from CGC, Commissioner Tellez, GEOS, Harden & Asso., two members of HGS, HydroGeology, MFG, RMT, SAIC, Strata, and two individuals commented negatively on the language utilized under proposed §230.11(b) and (c) pertaining to the certification of groundwater availability and usability. Many of these commenters suggested the terminology “certification” be removed and replaced with “an opinion or judgement based on best professional judgment” as previously discussed. Many of these commenters also suggested that the certification, as worded, amounted to a guarantee of groundwater availability, and that competent groundwater professionals would be reluctant to certify such a statement.

The commission partially agrees with these comments and has made the following amendments to the adoption. Adopted §230.2(3) changed the definition of “certification” to: “A written statement of best professional judgement or opinion as attested to on the certification form

contained under subsection §230.3(c), relating to Certification of Groundwater Availability for Platting, Form required.” Adopted §230.11(c) has been modified to specifically address the certification of groundwater adequacy. Proposed §230.11(b) and (c) have been amended and combined into adopted §230.11(c) which requires one certification that addresses groundwater adequacy to supply the estimated demand of the proposed subdivision based on best professional judgement, current groundwater conditions, and the information developed and presented in the form specified by §230.3(c). In conjunction, the commission has amended adopted Figure 30 TAC §230.3(c) to reflect this change.

However, the commission does not agree that certification under this section is equivalent to a guarantee of groundwater availability for a proposed subdivision. The data as assimilated under adopted §§230.5-230.9 and evaluated under adopted §230.10 and §230.11(a) and (b) will determine if groundwater is currently available for the subdivision as proposed. The certification under §230.11(c) represents the Texas licensed professional engineer’s summary statement based on the evaluation of all of this information.

The TAB requested that the commission define what constitutes “availability” in the rule so that engineers would be willing to provide certification if so required.

The commission responds that “availability” can be considered to be the conclusions drawn upon the sum of the information required by the rules. The commission disagrees with this comment and notes that availability should be determined on a case-by-case basis by the local platting authority. Furthermore, it would be detrimental to dictate a strict statewide definition of

availability, such as a specific volume of water per acre, to these platting authorities because of the variability of the state's aquifers. The commission has not made any changes in response to this comment.

STATUTORY AUTHORITY

The new sections are adopted under Local Government Code, §212.0101 and §232.0031. Both sections of the Local Government Code provide that the commission shall establish, by rule, the appropriate form and content of a groundwater availability certification to be attached to a plat application. Texas Water Code, §5.103 and §5.105, authorize the commission to adopt rules necessary to carry out its responsibilities and duties under the Texas Water Code and other laws of Texas.

CHAPTER 230. GROUNDWATER AVAILABILITY CERTIFICATION FOR PLATTING

§§230.1-230.11

§230.1. Applicability.

(a) Subdivisions utilizing groundwater as the source of water supply. In the plat application and approval process, municipal and county authorities may require certification that adequate groundwater is available for a proposed subdivision if groundwater under that land is to be the source of water supply. The municipal or county authority is not required to exercise their authority under Local Government Code, §212.0101 or §232.0031. However, if they do exercise their authority, the form and content of this chapter must be used.

(b) Use of this chapter. If required by the municipal or county authority, the plat applicant and the Texas licensed professional engineer shall use this chapter and the attached form to certify that adequate groundwater is available under the land of a subdivision subject to platting under the Local Government Code, §212.004 and §232.001. These rules do not replace other state and federal requirements applicable to public drinking water supply systems. These rules do not replace the authority of counties within designated priority groundwater management areas under Texas Water Code, §35.019, or the authority of groundwater conservation districts under Texas Water Code, Chapter 36.

§230.2. Definitions.

The following words and terms, when used in this chapter, shall have the following meanings, unless the context clearly indicates otherwise. If a word or term used in this chapter is not contained in this section, it shall have the same definition and meaning as used in the practices applicable to hydrology and aquifer testing.

(1) **Aquifer** - A geologic formation, group of formations, or part of a formation that contains water in its voids or pores and may be used as a source of water supply.

(2) **Aquifer test** - A test involving the withdrawal of measured quantities of water from or addition of water to a well and the measurement of resulting changes in water level in the aquifer both during and after the period of discharge or addition for the purpose of determining the characteristics of the aquifer. For the purposes of this chapter, bail and slug tests are not considered to be aquifer tests.

(3) **Certification** - A written statement of best professional judgement or opinion as attested to on the Certification of Groundwater Availability for Platting Form contained under §230.3(c) of this title (relating to Certification of Groundwater Availability for Platting).

(4) **Drinking water standards** - As defined in commission rules covering drinking water standards contained in Chapter 290, Subchapter F of this title (relating to Drinking Water

Standards Governing Drinking Water Quality and Reporting Requirements for Public Water Supply Systems).

(5) **Full build out** - The final expected number of residences, businesses, or other dwellings in the proposed subdivision.

(6) **Licensed professional engineer** - An engineer who maintains a current license through the Texas Board of Professional Engineers in accordance with its requirements for professional practice.

(7) **Plat applicant** - The owner or the authorized representative or agent seeking approval of a proposed subdivision plat application pursuant to municipal or county authority.

(8) **Requirements applicable to public drinking water supply systems** - The requirements contained in commission rules covering public drinking water supply systems in Chapter 290, Subchapter D of this title (relating to Rules and Regulations for Public Water Systems).

§230.3. Certification of Groundwater Availability for Platting.

(a) Certification. The certification required by this chapter must be prepared by a Texas licensed professional engineer.

(b) Submission of information. The plat applicant shall provide to the municipal or county authority the certification of adequacy of groundwater under the subdivision required by this chapter.

(c) Form required. This chapter and the following form shall be used and completed if plat applicants are required by the municipal or county authority to certify that adequate groundwater is available under the land to be subdivided. The executive director may make minor changes to this form that do not conflict with the requirements of these rules.

Figure: 30 TAC §230.3(c).

FIGURE 30 TAC §230.3(c)

CERTIFICATION OF GROUNDWATER AVAILABILITY FOR PLATTING FORM

Use of this form: If required by a municipal authority pursuant to §212.0101, Local Government Code or a county authority pursuant to §232.0031, Local Government Code, the plat applicant and the Texas licensed professional engineer shall use this form based upon the requirements of Title 30, Texas Administrative Code, Chapter 230 to certify that adequate groundwater is available under the land to be subdivided (if the source of water for the subdivision is groundwater under the subdivision) for any subdivision subject to platting under §§212.004 and 232.001, Local Government Code. The form and Chapter 230 do not replace state requirements applicable to public drinking water supply systems or the authority of counties or groundwater conservation districts under either §35.019 or Chapter 36 of the Texas Water Code.

Administrative Information (30 TAC, §230.4).

- 1. Name of Proposed Subdivision: _____
- 2. Any Previous Name Which Identifies the Tract of Land: _____

- 3. Property Owner's Name(s): _____
Address: _____
Phone: _____
Fax: _____
- 4. Plat Applicant's Name: _____
Address: _____
Phone: _____
Fax: _____
- 5. Licensed Professional Engineer's Name: _____
Address: _____
Phone: _____
Fax: _____
Certificate Number: _____
- 6. Location and Property Description of Proposed Subdivision: _____

- 7. Tax Assessor Parcel Number(s).
Book: _____
Map: _____
Parcel: _____

Proposed Subdivision Information (30 TAC, §230.5).

- 8. Purpose of Proposed Subdivision (single family/multi-family residential, non-residential, commercial): _____

- 9. Size of Proposed Subdivision (acres): _____
- 10. Number of Proposed Lots: _____
- 11. Average Size of Proposed Lots (acres): _____
- 12. Anticipated Method of Water Distribution.
Expansion of Existing Public Water Supply System: Yes No
New (Proposed) Public Water Supply System: Yes No
Individual Water Wells to Serve Individual Lots: Yes No
Combination of Methods: Yes No
Description (if needed): _____

- 13. Additional Information (if required by the municipal or county authority): _____

Note: If public water supply system is anticipated, written application for service to existing water providers within a 1/2-mile radius should be attached to this form [30 TAC, §230.5(f)].

Projected Water Demand Estimate (30 TAC, §230.6).

14. Residential Water Demand Estimate at Full Build Out (includes both single family and multi-family residential).
 Number of Proposed Housing Units (single and multi-family): _____
 Average Number of Persons per Housing Unit: _____
 Gallons of Water Required per Person per Day: _____
 Water Demand per Housing Unit per year (acre feet/year): _____
 Total Expected Residential Water Demand per Year (acre feet/year): _____
15. Non-residential Water Demand Estimate at Full Build Out.
 Type(s) of Non-residential Water Uses: _____

 Water Demand per Type per Year (acre feet/year): _____
16. Total Water Demand Estimate at Full Build Out (acre feet/year): _____
17. Sources of Information Used for Demand Estimates: _____

General Groundwater Resource Information (30 TAC, §230.7).

18. Identify and describe, using Texas Water Development Board names, the aquifer(s) which underlies the proposed subdivision: _____

Note: Users may refer to Aquifers of Texas (Texas Water Development Board Report 345, 1995) to obtain general information pertaining to the state's aquifers. This reference is available via the Internet (www.twdb.state.tx.us).

Obtaining Site-Specific Groundwater Data (30 TAC, §230.8).

19. Have all known existing, abandoned, and inoperative wells within the proposed subdivision been located, identified, and shown on the plat as required under §230.8(b)? Yes No
20. Were the geologic and groundwater resource factors identified under §230.7(b) considered in planning and designing the aquifer test required under §230.8(c)? Yes No
21. Have test and observation wells been located, drilled, logged, completed, developed, and shown on the plat as required by §230.8(c)(1 through 4)? Yes No
22. Have all reasonable precautions been taken to ensure that contaminants do not reach the subsurface environment and that undesirable groundwater has been confined to the zone(s) of origin (§230.8(c)(5))? Yes No
23. Has an aquifer test been conducted which meets the requirements of §§230.8(c)(1 and 6)? Yes No
24. Were existing wells or previous aquifer test data used? Yes No
25. If yes, did they meet the requirements of §230.8(c)(7)? Yes No
26. Were additional observation wells or aquifer testing utilized? Yes No

Note: If expansion of an existing public water supply system or a new public water supply system is the anticipated method of water distribution for the proposed subdivision, site-specific groundwater data shall be developed under the requirements of 30 TAC, Chapter 290, Subchapter D (related to Rules and Regulations for Public Water Systems) and the applicable information and correspondence developed in meeting those requirements shall be attached to this form pursuant to §230.8(a).

Determination of Groundwater Quality (30 TAC, §230.9).

27. Have water quality samples been collected as required by §230.9? Yes No
28. Has a water quality analysis been performed which meets the requirements of §230.9? Yes No

Determination of Groundwater Availability (30 TAC, §230.10).

29. Have the aquifer parameters required by §230.10(c) been determined? Yes No
30. If so, provide the aquifer parameters as determined.

Rate of yield and drawdown: _____
 Specific capacity: _____
 Efficiency of the pumped well: _____
 Transmissivity: _____
 Coefficient of storage: _____
 Hydraulic conductivity: _____
 Were any recharge or barrier boundaries detected? Yes No
 If yes, please describe: _____

Thickness of aquifer(s): _____

- 31. Have time-drawdown determinations been calculated as required under §230.10(d)(1) Yes No
- 32. Have distance-drawdown determinations been calculated as required under §230.10(d)(2)? Yes No
- 33. Have well interference determinations been made as required under §230.10(d)(3)? Yes No NA
- 34. Has the anticipated method of water delivery, the annual groundwater demand estimates at full build out, and geologic and groundwater information been taken into account in making these determinations? Yes No
- 35. Has the water quality analysis required under §230.9 been compared to primary and secondary public drinking water standards as required under §230.10(e)? Yes No
 Does the concentration of any analyzed constituent exceed the standards? Yes No
 If yes, please list the constituent(s) and concentration measure(s) which exceed standards: _____

Groundwater Availability and Usability Statements (30 TAC, §230.11(a) and (b)).

- 36. Drawdown of the aquifer at the pumped well(s) is estimated to be _____ feet over a 10-year period and _____ feet over a 30-year period.
- 37. Drawdown of the aquifer at the property boundary is estimated to be _____ feet over a 10-year period and _____ feet over a 30-year period.
- 38. The distance from the pumped well(s) to the outer edges of the cone(s)-of-depression is estimated to be _____ feet over a 10-year period and _____ feet over a 30-year period.
- 39. The recommended minimum spacing limit between wells is _____ feet with a recommended well yield of _____ gallons per minute per well.
- 40. Available groundwater is / is not (circle one) of sufficient quality to meet the intended use of the platted subdivision.
- 41. The groundwater availability determination does not consider the following conditions (identify any assumptions or uncertainties that are inherent in the groundwater availability determination): _____

Certification of Groundwater Availability (30 TAC, §230.11(c)). Must be signed by a Texas Licensed Professional Engineer.

42. I, _____, Texas Licensed Professional Engineer, certificate number _____, based on best professional judgement, current groundwater conditions, and the information developed and presented in this form, certify that adequate groundwater is available from the underlying aquifer(s) to supply the anticipated use of the proposed subdivision.

Date: _____

(affix seal)

§230.4. Administrative Information.

At a minimum, the following general administrative information as specified in §230.3(c) of this title (relating to Certification of Groundwater Availability for Platting), shall be provided for a proposed subdivision for which groundwater under the land will be the source of water supply:

- (1) the name of the proposed subdivision;
- (2) any previous or other name(s) which identifies the tract of land;
- (3) the name, address, phone number, and facsimile number of the property owner or owners;
- (4) the name, address, phone number, and facsimile number of the person submitting the plat application;
- (5) the name, address, phone number, facsimile number, and registration number of the licenced professional engineer preparing the certification as required in this chapter;
- (6) the location and property description of the proposed subdivision; and
- (7) the tax assessor parcel number(s) by book, map, and parcel.

§230.5. Proposed Subdivision Information.

At a minimum, the following information pertaining to the proposed subdivision shall be provided as specified in §230.3(c) of this title (relating to Certification of Groundwater Availability for Platting):

(1) the purpose of the proposed subdivision, for example, single family residential, multi-family residential, non-residential, commercial, or industrial;

(2) the size of the proposed subdivision in acres;

(3) the number of proposed lots within the proposed subdivision;

(4) the average size (in acres) of the proposed lots in the proposed subdivision;

(5) the anticipated method of water distribution to the proposed lots in the proposed subdivision including, but not limited to:

(A) an expansion of an existing public water supply system to serve the proposed subdivision (if groundwater under the subdivision is to be the source of water supply);

(B) a new public water supply system for the proposed subdivision;

(C) individual water wells to serve individual lots; or

(D) a combination of methods;

(6) if the anticipated method of water distribution for the proposed subdivision is from an expansion of an existing public water supply system or from a proposed public water supply system, evidence required under §290.39(c)(1) of this title (relating to Rules and Regulations for Public Water Systems) which shall be provided demonstrating that written application for service was made to the existing water providers within a ½-mile radius of the subdivision; and

(7) any additional information required by the municipal or county authority as part of the plat application.

§230.6. Projected Water Demand Estimate.

(a) Residential water demand estimate. Residential water demand estimates at full build out shall be provided as specified in §230.3(c) of this title (relating to Certification of Groundwater Availability for Platting). Residential demand estimates shall, at a minimum, be based on the current demand of any existing residential well including those identified under §230.8(b) of this title (relating to Obtaining Site-Specific Groundwater Data), or §290.41(c) of this title (relating to Rules and Regulations for Public Water Systems), and:

- (1) the number of proposed housing units at full build out;
- (2) the average number of persons per housing unit;
- (3) the gallons of water required per person per day;
- (4) the water demand per housing unit per year (acre feet per year); and
- (5) the total expected residential water demand per year for the proposed subdivision (acre feet per year).

(b) Non-residential water demand estimate. Water demand estimates at full build out shall be provided for all non-residential uses as specified in §230.3(c) of this title. Non-residential uses shall be specified by type of use and groundwater demand per year (acre feet per year) for each type of use. The estimate shall also include the existing non-residential demand of any well including those identified under §230.8(b) of this title or §290.41(c) of this title.

(c) Total annual water demand estimate. An estimate of the total expected annual groundwater demand, including residential and non-residential estimates at full build out (acre feet per year), shall be provided as specified in §230.3(c) of this title.

(d) Submission of information. The sources of information used and calculations performed to determine the groundwater demand estimates as required by this section shall be made available to the municipal or county authority if requested. The plat applicant shall provide any additional groundwater demand information required by the municipal or county authority as part of the plat application.

§230.7. General Groundwater Resource Information.

(a) Aquifer identification. Using Texas Water Development Board aquifer names, the aquifer(s) underlying the proposed subdivision which is planned to be used as the source of water for the subdivision shall be identified and generally described as specified in §230.3(c) of this title (relating to Certification of Groundwater Availability for Platting).

(b) Geologic and groundwater information. To meet the requirements of this chapter, the following geologic and groundwater information shall be considered in planning and designing the aquifer test under §230.8(c) of this title (relating to Obtaining Site-Specific Groundwater Data):

- (1) the stratigraphy of the geologic formations underlying the subdivision;
- (2) the lithology of the geologic strata;
- (3) the geologic structure;

(4) the characteristics of the aquifer(s) and their hydraulic relationships;

(5) the recharge to the aquifer(s), and movement and discharge of groundwater from the aquifer(s); and

(6) the ambient quality of water in the aquifer(s).

§230.8. Obtaining Site-Specific Groundwater Data.

(a) Applicability of section. This section is applicable only if the proposed method of water distribution for the proposed subdivision is individual water wells on individual lots. If expansion of an existing public water supply system or installation of a new public water supply system is the proposed method of water distribution for the proposed subdivision, site-specific groundwater data shall be developed under the requirements of Chapter 290, Subchapter D of this title (relating to Rules and Regulations for Public Water Systems) and the information developed in meeting these requirements shall be attached to the form required under §230.3 of this title (relating to Certification of Groundwater Availability for Platting).

(b) Location of existing wells. All known existing, abandoned, and inoperative wells within the proposed subdivision shall be identified, located, and mapped by on-site surveys. Existing well locations shall be illustrated on the plat required by the municipal or county authority.

(c) Aquifer testing. Utilizing the information considered under §230.7(b) of this title (relating to General Groundwater Resource Information), an aquifer test shall be conducted to characterize the aquifer(s) underlying the proposed subdivision. The aquifer test must provide sufficient information to allow evaluation of each aquifer that is being considered as a source of residential and non-residential water supply for the proposed subdivision. Appropriate aquifer testing shall be based on typical well completions. An aquifer test conducted under this section utilizing established methods shall be reported as specified in §230.3(c) of this title and shall include, but not be limited to, the following items.

(1) Test well and observation well(s). At a minimum, one test well (i.e., pumping well) and one observation well, shall be required to conduct an adequate aquifer test under this section. Additional observation wells shall be used for the aquifer test if it is practical or necessary to confirm the results of the test. The observation well(s) shall be completed in the same aquifer or aquifer production zone as the test well. The locations of the test and observation well(s) shall be shown on the plat required by the municipal or county authority.

(2) Location of wells. The test and observation well(s) must be placed within the proposed subdivision and shall be located by latitude and longitude. The observation well(s) shall be located at a radial distance such that the time-drawdown data collected during the planned pumping period fall on a type curve of unique curvature. In general, observation wells in unconfined aquifers should be placed no farther than 300 feet from the test well, and no farther than 700 feet in thick, confined aquifers. The observation well should also be placed no closer to the test well than two times

the thickness of the aquifer's production zone. The optimal location for the observation well(s) can be determined by best professional judgement after completion and evaluation of the test well as provided in paragraph (4) of this subsection.

(3) Lithologic and geophysical logs. The test and observation wells shall be lithologically and geophysically logged to map and characterize the geologic formation(s) and the aquifer(s) in which the aquifer test(s) is to be performed.

(A) A lithologic log shall be prepared showing the depth of the strata, their thickness and lithology (including size, range, and shape of constituent particles as well as smoothness), occurrence of water bearing strata, and any other special notes that are relevant to the drilling process and to the understanding of subsurface conditions.

(B) Geophysical logs shall be prepared which provide qualitative information on aquifer characteristics and groundwater quality. At a minimum, the geophysical logs shall include an electrical log with shallow and deep-investigative curves (e.g., 16-inch short normal/64-inch long normal resistivity curves or induction log) with a spontaneous potential curve.

(C) The municipal or county authority may, on a case-by-case basis, waive the requirement of geophysical logs as required under this section if it can be adequately demonstrated that the logs are not necessary to characterize the aquifer(s) for testing purposes.

(4) Well development and performance. The test and observation well(s) shall be developed prior to conducting the aquifer test to repair damage done to the aquifer(s) during the drilling operation. Development shall insure that the hydraulic properties of the aquifer(s) are restored as much as practical to their natural state.

(A) Well development procedures applied to the well(s) may vary depending on the drilling method used and the extent of the damage done to the aquifer(s).

(B) During well development, the test well shall be pumped for several hours to determine the specific capacity of the well, the maximum anticipated drawdown, the volume of water produced at certain pump speeds and drawdown, and to determine if the observation well(s) are suitably located to provide useful data.

(C) Water pumped out of the well during well development shall not be allowed to influence initial well performance results.

(D) Aquifer testing required by this section shall be performed before any acidization or other flow-capacity enhancement procedures are applied to the test well.

(5) Protection of groundwater. All reasonably necessary precautions shall be taken during construction of test and observation wells to ensure that surface contaminants do not reach the subsurface environment and that undesirable groundwater (water that is injurious to human health and

the environment or water that can cause pollution to land or other waters) if encountered, is sealed off and confined to the zone(s) of origin.

(6) Duration of aquifer test and recovery. The duration of the aquifer test depends entirely on local and geologic conditions. However, the test shall be of sufficient duration to observe a straight-line trend on a plot of water level versus the logarithm of time pumped. Water pumped during the test shall not be allowed to influence the test results. Aquifer testing shall not commence until water levels (after well development) have completely recovered to their pre-development level or at least to 90% of that level.

(A) At a minimum, a 24-hour uniform rate aquifer test shall be conducted. Testing shall continue long enough to observe a straight-line trend on a plot of water level versus the logarithm of time pumped. If necessary, the duration of the test should be extended beyond the 24-hour minimum limit until the straight-line trend is observed.

(i) If it is impractical to continue the test until a straight-line trend of water level versus the logarithm of time pumped is observed within the 24-hour limit, the test shall continue at least until a consistent pumping-level trend is observed. In such instances, failure to observe the straight-line trend shall be recorded.

(ii) If the pumping rates remain constant for a period of at least four hours and a straight-line trend is observed on a plot of water level versus the logarithm of time pumped before the 24-hour limit has been reached, the pumping portion of the test may be terminated.

(iii) The frequency of water level measurements during the aquifer test shall be such that adequate definition of the time-drawdown curve is made available. As much information as possible shall be obtained in the first ten minutes of testing (i.e., pumping).

(B) Water-level recovery data shall be obtained to verify the accuracy of the data obtained during the pumping portion of the test. Recovery measurements shall be initiated immediately at the conclusion of the pumping portion of the aquifer test and shall be recorded with the same frequency as those taken during the pumping portion of the aquifer test. Time-recovery measurements shall continue until the water levels have recovered to pre-pumping levels or at least to 90% of that level. If such recovery is not possible, time-recovery measurements should continue until a consistent trend of recovery is observed.

(7) Use of existing wells and aquifer test data.

(A) An existing well may be utilized as an observation well under this section if sufficient information is available for that well to demonstrate that it meets the requirements of this section.

(B) The municipal or county authority may accept the results of a previous aquifer test in lieu of a new test if:

(i) the previous test was performed on a well located within a 1/4-mile radius of the subdivision;

(ii) the previous test fully meets all the requirements of this section;

(iii) the previous test was conducted on an aquifer which is being considered as a source of water supply for the proposed subdivision; and

(iv) aquifer conditions (e.g., water levels, gradients, etc.) during the previous test were approximately the same as they are presently.

(8) Need for additional aquifer testing and observation wells. Best professional judgement shall be used to determine if additional observation wells or aquifer tests are needed to adequately demonstrate groundwater availability. The Theis and Cooper-Jacob nonequilibrium equations, and acceptable modifications thereof, are based on well documented assumptions. To determine if additional information is needed, best professional judgement shall be used to consider these assumptions, the site-specific information derived from the aquifer test required by this section, the size of the proposed subdivision, and the proposed method of water delivery.

(d) Submission of information. The information, data, and calculations required by this section shall be made available to the municipal or county authority, if requested, to document the requirements of this section as part of the plat application.

§230.9. Determination of Groundwater Quality.

(a) Water quality analysis. Water samples shall be collected near the end of the aquifer test for chemical analysis. Samples shall be collected from each aquifer being considered for water supply for the proposed subdivision and reported as specified in §230.3(c) of this title (relating to Certification of Groundwater Availability for Platting).

(1) For proposed subdivisions where the anticipated method of water delivery is from an expansion of an existing public water supply system or a new public water supply system, the samples shall be submitted for bacterial and chemical analysis as required by Chapter 290, Subchapter F of this title (relating to Drinking Water Standards Governing Drinking Water Quality and Reporting Requirements For Public Water Supply Systems).

(2) For proposed subdivisions where the anticipated method of water delivery is from individual water supply wells on individual lots, samples shall be analyzed for the following:

(A) chloride;

(B) conductivity;

(C) fluoride;

(D) iron;

(E) nitrate (as nitrogen);

(F) manganese;

(G) pH;

(H) sulfate;

(I) total hardness;

(J) total dissolved solids; and

(K) presence/absence of total coliform bacteria.

(3) Conductivity and pH values may be measured in the field, and the other constituents shall be analyzed in a Texas Department of Health approved laboratory using methods approved by the commission.

(b) Submission of information. The information, data, and calculations required by this section shall be made available to the municipal or county authority, if requested, to document the requirements of this section as part of the plat application.

§230.10. Determination of Groundwater Availability.

(a) Time frame for determination of groundwater availability. At a minimum, both a short- and long-term determination of groundwater availability shall be made, each considering the estimated total water demand at full build out of the proposed subdivision. Groundwater availability shall be determined for ten years and 30 years and for any other time frame(s) required by the municipal or county authority.

(b) Other considerations in groundwater availability determination. Groundwater availability determinations shall take into account the anticipated method of water delivery as identified under §230.5 of this title (relating to Proposed Subdivision Information) and will be compared to annual demand estimates at full build out as determined under §230.6 of this title (relating to Projected Water Demand Estimate).

(c) Determination of aquifer parameters. The parameters of the aquifer(s) being considered to supply water to the proposed subdivision shall be determined utilizing the information considered under §230.7 of this title (relating to General Groundwater Resource Information) and data obtained during the aquifer test required under §230.8 of this title (relating to Obtaining Site-Specific Groundwater Data) for individual water wells or under Chapter 290, Subchapter D of this title (relating to Rules and Regulations for Public Water Systems) and reported as specified in §230.3(c) of this title (relating to Certification of Groundwater Availability for Platting). The time-drawdown and time-recovery data obtained during the aquifer test shall be used to determine aquifer parameters utilizing the nonequilibrium equations developed by Theis or Cooper-Jacob, or acceptable modifications thereof. The following aquifer parameters shall be determined:

- (1) rate of yield and drawdown;
- (2) specific capacity;
- (3) efficiency of the pumped (test) well;
- (4) transmissivity;
- (5) coefficient of storage;
- (6) hydraulic conductivity;

(7) recharge or barrier boundaries, if any are present; and

(8) thickness of the aquifer(s).

(d) Determination of groundwater availability. Using the information and data identified and determined in subsections (b) and (c) of this section, the following calculations shall be made.

(1) Time-drawdown. The amount of drawdown at the pumped well(s) and at the boundaries of the proposed subdivision shall be determined for the time frames identified under subsection (a) of this section.

(2) Distance-drawdown. The distance(s) from the pumped well(s) to the outer edges of the cone(s)-of-depression shall be determined for the time frames identified under subsection (a) of this section.

(3) Well interference. For multiple wells in a proposed subdivision, calculations shall be made to:

(A) determine how pumpage from multiple wells will affect drawdown in individual wells for the time frames identified under subsection (a) of this section; and

(B) determine a recommended minimum spacing limit between individual wells and well yields from the wells that will allow for the continued use of the wells for the time frames identified under subsection (a) of this section.

(e) Determination of groundwater quality. The water quality analysis required under §230.9 of this title (relating to Determination of Groundwater Quality) shall be compared to primary and secondary public drinking water standards and the findings documented as specified in §230.3(c) of this title.

(f) Submission of information. The information, data, and calculations required by this section shall be made available to the municipal or county authority, if required, to document the requirements of this section as part of the plat application.

§230.11. Groundwater Availability and Usability Statements and Certification.

(a) Groundwater availability and usability statements. Based on the information developed under §230.10 of this title (relating to Determination of Groundwater Availability), the following information shall be provided as specified in §230.3(c) of this title (relating to Certification of Groundwater Availability for Platting):

(1) the estimated drawdown of the aquifer at the pumped well(s) over a ten-year period and over a 30-year period;

(2) the estimated drawdown of the aquifer at the subdivision boundary over a ten-year period and over a 30-year period;

(3) the estimated distance from the pumped well(s) to the outer edges of the cone(s)-of-depression over a ten-year period and over a 30-year period;

(4) the recommended minimum spacing limit between wells and the recommended well yield; and

(5) the sufficiency of available groundwater quality to meet the intended use of the platted subdivision.

(b) **Groundwater Availability Determination Conditions.** The assumptions and uncertainties that are inherent in the determination of groundwater availability should be clearly identified as specified in §230.3(c) of this title. These conditions must be identified to adequately define the bases for the availability and usability statements. These bases may include, but are not limited to, uncontrollable and unknown factors such as:

(1) future pumpage from the aquifer or from interconnected aquifers from area wells outside of the subdivision or any other factor that cannot be predicted that would affect the storage of water in the aquifer,

(2) long-term impacts to the aquifer based on climatic variations,

(3) future impacts to usable groundwater due to unforeseen or unpredictable contamination.

(c) Certification. Based on best professional judgement, current groundwater conditions, and the information developed and presented in the form specified by §230.3(c) of this title, the licensed professional engineer certifies by signature, seal, and date that adequate groundwater is available from the underlying aquifer(s) to supply the estimated demand of the proposed subdivision.